MSC SUSTAINABLE FISHERIES CERTIFICATION

New Zealand Southern Blue Whiting Trawl Fishery

Final Report

August 2018

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Glossary

ACAP	Agreement on the Conservation of Albatrosses and Petrels
ACE	Annual Catch Entitlement
AEWG	Aquatic Environment Working Group
BOMEC	Benthic-Optimised Marine Environment Classification
BPA	Benthic Protection Area
B_0	Virgin Biomass
CAY	Current Annual Yield
CITES	Convention on International Trade in Endangered Species
CPUE	Catch per Unit Effort
DOC	Department of Conservation
DWG	Deepwater Group Limited
EEZ	Exclusive Economic Zone
ENGO	Environmental Non-Governmental Organisation
ETP	Endangered, Threatened, Protected Species
F	Fishing Mortality
FAO	Food and Agriculture Organisation of the United Nations
FCV	Foreign Charter Vessel
FL	Fork length
FMA	Fishery Management Area
GWT	Green weight tonnes
ITQ	Individual Transferable Quota
KPI	Key Performance Indicator
LFR	Licensed Fish Receiver
M	Natural Mortality
MARPOL	International Convention for the Prevention of Pollution from Ships
MAY	Maximum Average Yield
MCMC	Markov Chain Monte Carlo
MCS	Monitoring, Control and Surveillance
MCY	Maximum Constant Yield
MHR	Monthly Harvest Return
MMOPs	Marine Mammal Operational Procedures
MPA	Marine Protected Area
MPI	Ministry for Primary Industries (also now referred to as Fisheries New Zealand, after an organisational change that took place in 2018)
MSC	Marine Stewardship Council
MSY	Maximum Sustainable Yield

NFPSCR	Non-fish/Protected Species Catch Return
NIWA	National Institute of Water and Atmospheric Research Limited
PBR	Potential biological removal
PI	Performance Indicator
PST	Population sustainability threshold
QMS	Quota Management System
SG	Scoring Guidepost
SI	Scoring Issue
SLED	Sea lion exclusion device
TAC	Total Allowable Catch
TACC	Total Allowable Commercial Catch
TCEPR	Trawl Catch, Effort and Processing Return
TL	Total Length
U_{max}	Maximum Exploitation Rate
UNCLOS	United Nations Convention on the Law of the Sea
VMP	Vessel Management Plan
VMS	Vessel Monitoring System

1 Executive Summary

This report provides details of the MSC re-assessment of the New Zealand Southern Blue Whiting Trawl Fishery that operates in the New Zealand Exclusive Economic Zone (EEZ). Two Units of Certification (UoC) have been assessed – 1. Bounty Platform (SBW 6B) and 2. Campbell Rise (SBW 6I)

The fishery was previously assessed against the MSC standard and certified in April 2012. In order to make cost and time efficiencies this fishery is being re-assessed at the same time as the New Zealand Hoki, Hake and Ling Trawl Fishery and the Ling Longline Fishery.

The re-assessment process began on the 20th June 2017 when the fisheries were announced as entering re-assessment (https://fisheries.msc.org/en/fisheries/new-zealand-deepwater-group-hake-hoki-ling-and-southern-blue-whiting/@@assessments) and was concluded (to be determined at a later date).

This re-assessment was conducted using the MSC Certification Requirements (CR) version (v) 1.3 (MSC 2013) default assessment tree with no changes made to the text of any default Performance Indicator (PI). The assessment followed CR v 2.0 process (MSC 2014).

The fishery met the requirements for a "reduced re-assessment" (MSC FCR v 2.0 section 7.24.6), i.e. southern blue whiting each has been independently assessed at least once against the MSC standard; all conditions of certification were closed by the third surveillance audit and, all standard related stakeholder comments were addressed by the third surveillance audit.

This report has been presented using the MSC Reduced Assessment Reporting Template v 2.0 (noting that the scoring section is from v 1.3). The assessment team has added additional sections, in order to assist peer reviewers and stakeholders in better understanding the background and information that supports their evaluation.

The Risk-Based Framework (RBF) was not used in this re-assessment.

A comprehensive programme of stakeholder consultations was carried out as part of this re-assessment, complemented by a full and thorough review of relevant literature and data sources.

The assessment team undertook a detailed and rigorous re-assessment of the wide-ranging MSC Principles and Criteria. A fully referenced scoring rationale is provided in the evaluation table provided in 'Appendix 1 - Performance Indicator Scores and Rationale' of this report.

The assessment team for this fishery comprised of: Paul Knapman, Lead Assessor; Bob O'Boyle, Principle 1 (P1) specialist; Rob Blyth-Skyrme, Principle 2 (P2) specialist; and Jo Akroyd, Principle 3 (P3) specialist.

Client fishery strengths – all UoCs

The fishery is very selective, in that it has no main retained or bycatch species.

The overarching legislation and regulation affecting P1 and P2 are highly developed and applied specifically to the fisheries. New Zealand implements high levels of control over the fisheries to ensure compliance with regulation and minimise environmental impacts.

A working relationship between the client group - Deepwater Group Limited (DWG) http://deepwatergroup.org - and the government department responsible for New Zealand's fisheries – the Ministry for Primary Industries (MPI) https://www.mpi.govt.nz (also now referred to as Fisheries New Zealand, after an organisational change that took place in 2018) – is

underpinned by a Memorandum of Understanding which sets out how DWG and MPI are to work collaboratively to improve the management of deepwater fisheries. As a result, DWG and MPI have developed a single joint-management framework with agreed strategic and operational priorities and workplans.

The amount of data available to evaluate consistency with the MSC Criteria is also a significant strength.

Client fishery weaknesses

UoC 1 - Bounty Platform (SBW 6B)

The harvest strategy for the Bounty Platform (SBW 6B) has recently been updated and therefore, while there is evidence that the strategy can control fishing mortality to a sustainable level, there is presently limited information to show the strategy is achieving its objectives of maintaining biomass at its 40% B_0 target.

Determination

On completion of the re-assessment and scoring process, the assessment team concluded that that the fishery **should be certified** for a period of 5 years, subject to annual surveillance audits. The MSC Principle-level scores are set out in the tables below.

	UoC 1	UoC 2
Principle	**Score**	**Score**
Principle 1 – Target Species	85.6	90.6
Principle 2 – Ecosystem	90.0	92.7
Principle 3 – Management System	97.3	97.3

Conditions & Recommendations

No Performance Indicators scored < 80 and so no conditions of certification were applied to the fishery. The Assessment Team has also made no recommendations.

1 Authorship and Peer Reviewers

1.1 Assessment Team

All team members listed below have completed all requisite training and signed all relevant forms for assessment team membership on this fishery.

Assessment team leader: Paul Knapman

Paul is an independent consultant based in Halifax, Nova Scotia, Canada. Paul began his career in fisheries nearly 30 years ago as a fisheries officer in the UK, responsible for the enforcement of UK and EU fisheries regulations. He then worked with the UK government's nature conservation advisors (1993-2001), as their Fisheries Programme Manager, responsible for establishing and developing an extensive programme of work with fisheries managers, scientists, the fishing industry and ENGOs, researching the effects of fishing and integrating nature conservation requirements into national and European fisheries policy and legislation.

Between 2001-2004 he was Head of the largest inshore fisheries management organisation in England, with responsibility for managing an extensive area of inshore fisheries on the North Sea coast. The organisations responsibilities and roles included: stock assessments; setting and ensuring compliance with allowable catches; developing and applying regional fisheries regulations; the development and implementation of fisheries management plans; the lead authority for the largest marine protected area in England.

In 2004, Paul moved to Canada and established his own consultancy providing analysis, advisory and developmental work on fisheries management policy in Canada and Europe. He helped draft the management plan for one of Canada's first marine protected areas, undertook an extensive review on IUU fishing in the Baltic Sea and was appointed as rapporteur to the European Commission's Baltic Sea Regional Advisory Council.

In 2008, Paul joined Moody Marine as their Americas Regional Manager, with responsibility for managing and developing their regional MSC business. He became General Manager of the business in 2012. Paul has been involved as a lead assessor, team member and technical advisor/reviewer for more than 50 different fisheries in the MSC programme. He returned to fisheries consultancy in 2015.

Expert team member: Robert (Bob) O'Boyle (Principle 1)

Bob received his B.Sc. and M.Sc. from McGill and Guelph Universities in 1972 and 1975 respectively. He was with Canada's Department of Fisheries and Oceans (DFO) at the Bedford Institute of Oceanography (BIO) in Dartmouth, Nova Scotia during 1977 - 2007.

During this time, he conducted assessments of the region's fish resources (e.g. herring, capelin, cod, haddock, pollock, flatfishes, sharks). He headed the Marine Fish Division, with responsibility for the research programs and assessment-related activities of over 80 scientific and support staff. He subsequently coordinated the regional science advisory process for fisheries resources and ocean uses and as Associate Director of Science, managed science programs at the regional and national level. He has been involved in a number of national and international reviews, ranging from resource assessment and management to science programs.

Bob is currently president of Beta Scientific Consulting Inc. (betasci.ca) that provides technical review, analyses and assessment of ocean resources and their management. Projects have included analyses and assessments of forage species (e.g. Atlantic Herring, Gulf and Atlantic Menhaden), deepwater species (e.g. Scotian Shelf Cusk) and endangered species (e.g. Atlantic Leatherback Turtles). He has been and is currently the Principle 1 or 2 expert for a number of MSC certifications (e.g. BC Dogfish, Nova Scotia, US and Australian Swordfish,

Barents Sea Cod, Haddock, and Saithe, North Sea and Baltic Sea Haddock and Danish Plaice, Deepwater Black Scabbardfish, Blue Ling, and Roundnose Grenadier, Russian Pollack. Lake Erie Walleye and Yellow Perch and US West Coast groundfish) and is a member of the MSC's Peer Review College.

Bob has been the chair and / or reviewer of numerous stock assessments and has prepared special reports on ocean management issues for government, industry and NGO groups. He was a member of the Scientific and Statistical Committee of the New England Fisheries Management Council during 2008-2016. He pursues research related to resource and ocean management and assessment and has published over 100 primary papers, special publications and technical reports. Recent projects include the impact of climate change on New England groundfish assessments, the trophic dynamics of the Eastern Scotian Shelf ecosystem, the impact of fish migrations on assessed fishery selectivity patterns, risk analysis in data poor assessments and the interaction of cod and grey seals in the Northwest Atlantic.

Expert team member: Rob Blyth-Skyrme (Principle 2)

Rob started his career in commercial aquaculture, but subsequently shifted focus to the sustainable management of wild fisheries. After his PhD he went to the Eastern Sea Fisheries Joint Committee, one of the largest inshore fisheries management bodies in England, where he became the Deputy Chief Fishery Officer. He then moved to Natural England, the statutory adviser to UK Government on nature conservation in England and English waters, to lead the team dealing with fisheries policy, science and nationally significant fisheries and environmental casework. Rob now runs Ichthys Marine Ecological Consulting Ltd., a marine fisheries and environmental consultancy. As well as carrying out general consultancy, since 2009 he has undertaken all facets of MSC work as a lead assessor, expert team member and peer reviewer across a wide range of fisheries. Rob is a member of the MSC's Peer Review College, and has completed the MSC v1.3 and v2.0 training modules.

Expert team member: Jo Akroyd (**Principle 3**)

Jo has been a team member for the MSC assessments and surveillance audits for hoki, hake, ling and southern blue whiting. Jo is a fisheries management and marine ecosystem consultant with extensive international and Pacific experience. She has worked at senior levels in both the public and private sector as a fisheries manager and marine policy expert. Jo was with the Ministry of Agriculture and Fisheries in New Zealand for 20 years. Starting as a fisheries scientist, she was promoted to senior chief fisheries scientist, then Fisheries Management Officer, and the Assistant Director, Marine Research. She was awarded a Commemoration Medal in 1990 in recognition of her pioneering work in establishing New Zealand's fisheries quota management system. She has carried out MSC pre and full assessments on multiple fisheries as well as these NZ fisheries she has been a lead assessor and team member on NZ albacore and scallops, Fiji albacore, Japanese albacore and yellowfin tunas, flatfish, snowcrab and scallops, Chinese scallops and Antarctic toothfish. Jo has also undertaken multiple MSC chain of custody (CoC) audits.

Expert advisor: Paul MacIntyre (responsible for advice on MSC (CoC).

Paul started working in the Aquaculture sector in 1975, managing salmon farms and processing factories for a large multi-national before transferring in 1990 to aquaculture audit and inspection. During the last 25 years Paul has carried out over 3,000 audits and inspections of aquaculture and fish processing operations across the UK salmon and trout industry and internationally in the cod, tilapia and shrimp aquaculture sectors. Paul's primary interest is salmonids however his role as Aquaculture Director with Acoura Marine has involved him in the development and trial audit of a number of new aquaculture and agricultural standards. Paul is a qualified Lead Assessor and approved to audit BRC, MSC / ASC Chain of Custody, GlobalGAP, Organic Aquaculture, Freedom Food, Label Rouge, Best Aquaculture Practices, ASC Salmon and Friend of the Sea. Paul also audits to UK and French retailer standards.

1.1.1 Peer Reviewers

As this is a reduced re-assessment and, in accordance with FCR 7.28.4(b), only one peer reviewer is required to review the peer review draft report.

Two potential peer reviewers were proposed and their details posted on the MSC website. Their details are provided below:

Tristan Southall
Tristan is an experienced fisheries assessor who has worked as both a Principles 2 and 3 expert on a number of previous MSC assessments, including the Scottish Pelagic assessments for both herring and mackerel. More recently Tristan led the IPSG Mackerel Assessment and has also been involved in the development and trialling of a new MSC assessment methodology, based on risk analysis, for use in data deficient situations. When not assessing the sustainability of fisheries Tristan specialises in fishing and marine industry consultancy, combining detailed understanding of marine ecosystems with broad experience of fishing and aquaculture industry systems, infrastructure and management. This provides him with an informed position which balances the needs of marine ecosystems, biodiversity and wider environment with the practicalities of the industry operation. Bridging these two important areas enables sustainably-minded consultancy, able to interpret and advise upon the impacts of different management decisions on both marine ecosystems and economics. Tristan's professional experience also includes the evaluation of fisheries on sub-sea environments, analysis of fishery and fleet performance, and a wide range of fisheries and aquaculture planning and management studies, all of which seek to combine both socio-economic and environmental perspectives. Tristan has recently coordinated EU fisheries training and promotion activities – covering all aspects of sustainable fisheries management and control. Tristan has passed MSC training and has no Conflict of Interest in relation to this fishery. A full CV is available upon request from Acoura Marine Ltd.

Andrew Payne
Andy is an honours graduate of the University of London and completed post-graduate degrees at the Universities of Stellenbosch and Port Elizabeth in South Africa. He worked in Namibia for five years, South Africa for 25 years (eventually leaving in 2000 as Director of the Sea Fisheries Research Institute), and retired in 2013 from the Centre for Environment, Fisheries and Aquaculture Science (Cefas), UK, where he was first Science Area Head for Fisheries and then "roving" international fisheries consultant in which role he inter alia managed a large commercial contract evaluating sites for future nuclear power stations to be built in the UK, and the Fisheries Science Partnership, an initiative bringing scientists and fishers together in a common aim to produce information of use to those charged with managing Europe's fish stocks. Most of his research work was conducted in South Africa, and he has published widely in the scientific literature, mainly about fisheries management and demersal fish in particular. He was an active player in the Benguela Ecology Programme, was involved in drafting South Africa's first democratic fisheries policy (which later became enshrined as the Marine Living Resources Act) and was a leading player in the establishment of the Benguela Current Large Marine Ecosystem project and the BENguela Environment, Fisheries, Interaction, and Training (BENEFIT) project, the latter two concentrating on three countries, Angola, Namibia and South Africa. From 2003 to 2011, he was Editor-in-Chief (and from 2000 to 2003 editor) of the ICES Journal of Marine Science, was the founding editor/editor-in-chief (and now international panel member) of the (South) African Journal of Marine Science and is Series editor of the Springer book series Humanity and the Seas.

Andy has conducted expert peer review of fisheries in Argentina, South Africa and the USA, and was involved in the EU's TACIS project on Sustainable Management of Caspian Fisheries, among other EU projects. He has conducted several accreditation reviews for the MSC, full ones being for the Antarctic krill continuous pumping fishery (AkerBiomarine; twice,

the second being a recertification assessment), a similar one for a separate Norwegian midwater trawl fishery for Antarctic krill, and another one for Russian pollock, has acted as expert peer reviewer of the report on US Limited Entry Groundfish Trawl fishery recertification and for SA deepsea hake trawl fishery recertification, has led or participated in several surveillance audits for different fisheries and CABs, and has twice acted as condition-meeting evaluator for the client for the SA deepsea hake trawl fishery. Recently too, he was part of a three-man international team that formally evaluated the ICCAT Bluefin tuna research programme. Finally, he has personally written/edited one book − "Oceans of Life off Southern Africa", and WAS lead-edior and contributed to two more − "Management of Shared Fish Stocks", and "Advances in Fisheries Science; 50 years on from Beverton and Holt", the latter two both for Cefas, and provides editorial services (including formal instruction courses in scientific writing) for a variety of clients.

Andy has passed MSC training and has no Conflict of Interest in relation to this fishery. A full CV is available upon request from Acoura Marine Ltd.

1.1.2 Risk Based Framework (RBF)

The RBF was not used for this fishery assessment.

1.1.3 Introduced Species Based Fishery (ISBF)

None of the target species are an introduced species.

2 Description of the Fishery

2.1 Unit of Certification (UoC) and Scope of Certification Sought

The UoC is defined by MSC as, “Target stock(s) combined with the fishing method/gear and practice (including vessel type/s) pursuing that stock, and any fleets, or groups of vessels, or individual fishing operators that are covered by an MSC fishery certificate. Note that other eligible fishers may also be included in some UoCs but not initially certified (until covered by a certificate sharing arrangement). The fishery proposed for certification, in this instance, is therefore defined as:

2.1.1 Target Species and Stocks

Target Species	Stocks
Southern blue whiting (*Micromesistius australis*)	Bounty Platform SBW 6B
	Campbell Rise SBW 6I

2.1.2 Fishing Method

Catches of southern blue whiting are taken mostly by semi-pelagic trawls. The trawl vessels deploy high aspect ratio multipurpose doors, which allow bottom or mid-water operation. Vessels predominantly use electronic net-monitoring systems, which capture data on the headline height, the distance between the groundrope and the seabed, and water temperature, and transmit this data in real-time through an acoustic link to the vessel’s bridge to assist with the deployment in the water column. Some of the fleet use net monitoring equipment to measure door spread and catch sensors to assess the amount of catch in the cod end. “Third wire” systems, i.e. where a cable is hard wired to a trawl sonar attached to the net head rope to allow monitoring of the nest position and catch entering the net, are not permitted in New Zealand waters in order to prevent seabird mortalities - seabirds attracted to fishing vessels may either strike the hard-to-see cable while in flight, or get caught and tangled in the cable while they sit on the water due to the forward motion of the vessel.

Table 1. A table showing the number of vessels by size, type and year operating in the southern blue whiting fishery (Tiffany Bock, pers. comm.)

	>43m	
Year	Limited Processing	Surimi
2011/12	12 (11)	1
2012/13	9 (8)	1
2013/14	11 (9)	1
2014/15	9 (9)	1
2015/16	7 (6)	1

Numbers in brackets indicates the number of vessels with onboard fishmeal plants

The midwater trawls come in a wide range of sizes measured by either headline length or headline opening (opening from 25 - 75m) and can be used in pelagic or semi-pelagic mode. All are constructed of synthetic materials with “rope” construction in the fore-panels mesh in the body and with floats on the headline to open the net. Mesh sizes range from 65 metres to a prescribed minimum mesh size of 60 mm in the cod end.

2.1.3 Client Group

Deepwater Group Limited (DWG) http://deepwatergroup.org - Formed in September 2005, the

non-profit organisation is an amalgamation of EEZ fisheries quota owners in New Zealand. Fisheries targeted by DWG are usually fished at depths between 200 and 1,200 m within the New Zealand Exclusive Economic Zone (EEZ). These include southern blue whiting, hoki, hake, ling, orange roughy, oreo dory, squid and jack mackerel.

2.1.4 Other Eligible Fishers

Other eligible fishers are those operators who have been fully assessed against the MSC's Principles and Criteria for Sustainable Fishing as part of the UoCs and are not currently part of the client group, but may become eligible to join the client group under a certificate sharing arrangement. The client group has stated their willingness to enter into certificate sharing arrangements.

2.1.5 The UoCs

From the above, the UoCs can be summarized as:

Fishing Method	Species	Management Area	Stock	UoC
Demersal & Semi Pelagic Trawl	Southern blue whiting (*Micromesistius australis*)	SBW 6B	Bounty Platform	1
		SBW 6I	Campbell Rise	2

Client Group	Deepwater Group Limited (DWG) http://deepwatergroup.org

Other Eligible Fishers	New Zealand flagged vessels, licensed to fish for southern blue whiting with demersal and semi demersal pelagic trawl, in management areas SBW 6B and SBW 6I and with access to quota for these species

Acoura Marine Ltd confirm that the fishery is within scope of the MSC standard, i.e. it does not operate under a controversial unilateral exemption to an international agreement, use destructive fishing practices, target amphibians, birds, reptiles or mammals and is not overwhelmed by dispute.

The following figure shows the geographic extent of the UoCs:

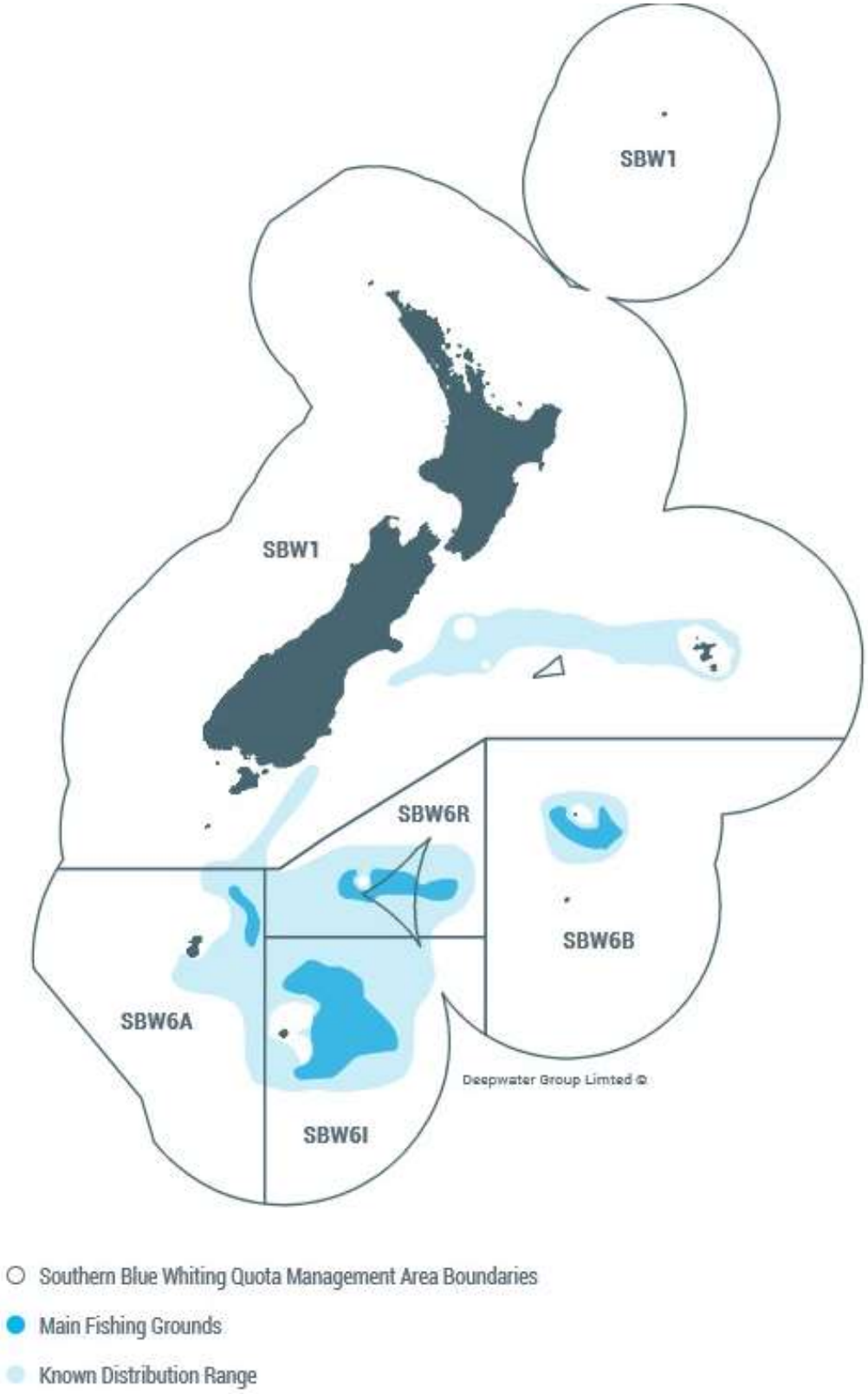


Figure 1. The management units for southern blue whiting. The outer boundary represents the New Zealand 200 mile EEZ

2.2 Final UoC(s)

(PCR ONLY)
The final Unit of Certification for this fishery is as defined below. This has not changed throughout the process. Alternatively provide rationale for why this has changed.

Species:	
Stock:	
Geographical area:	
Harvest method:	
Client Group:	
Other Eligible Fishers:	

2.2.1 Total Allowable Commercial Catch (TACC) and Catch Data

Table 2. UoC 1 - TACC and catch data for Bounty Platform SBW 6B

TACC	**Year**	**2017-18**	**Amount**	**2,377 t**
	Year	**2016-17**	**Amount**	**2,940 t**
UoA share of TACC	**Year**	**2017-18**	**Amount**	**2,377 t**
UoC share of TACC	**Year**	**2017-18**	**Amount**	**2,377 t**
Total green weight catch by UoC	**Year (most recent)**	**2016-17**	**Amount**	**2,569 t**
	Year (second most recent)	**2015-16**	**Amount**	**2,405 t**

Table 3: UoC 2 - TACC and catch data for Campbell Rise SBW 6I

TACC	**Year**	**2017-18**	**Amount**	**39,200 t**
UoA share of TACC	**Year**	**2017-18**	**Amount**	**39,200 t**
UoC share of TACC	**Year**	**2017-18**	**Amount**	**39,200 t**
Total green weight catch by UoC	**Year (most recent)**	**2016-17**	**Amount**	**19,875 t**
	Year (second most recent)	**2015-16**	**Amount**	**22,100 t**

2.3 Overview of the fishery

Southern blue whiting are almost entirely restricted in distribution to Sub-Antarctic waters. They are dispersed throughout the Campbell Plateau and Bounty Platform for much of the year, but during August and September they aggregate to spawn near the Campbell Islands, on Pukaki Rise, on Bounty Platform, and near the Auckland Islands over depths of 250–600 m (Figure 2). During most years fish in the spawning fishery range between 35–50 cm fork length (FL), although occasionally smaller males (29– 32 cm FL), may also be present.

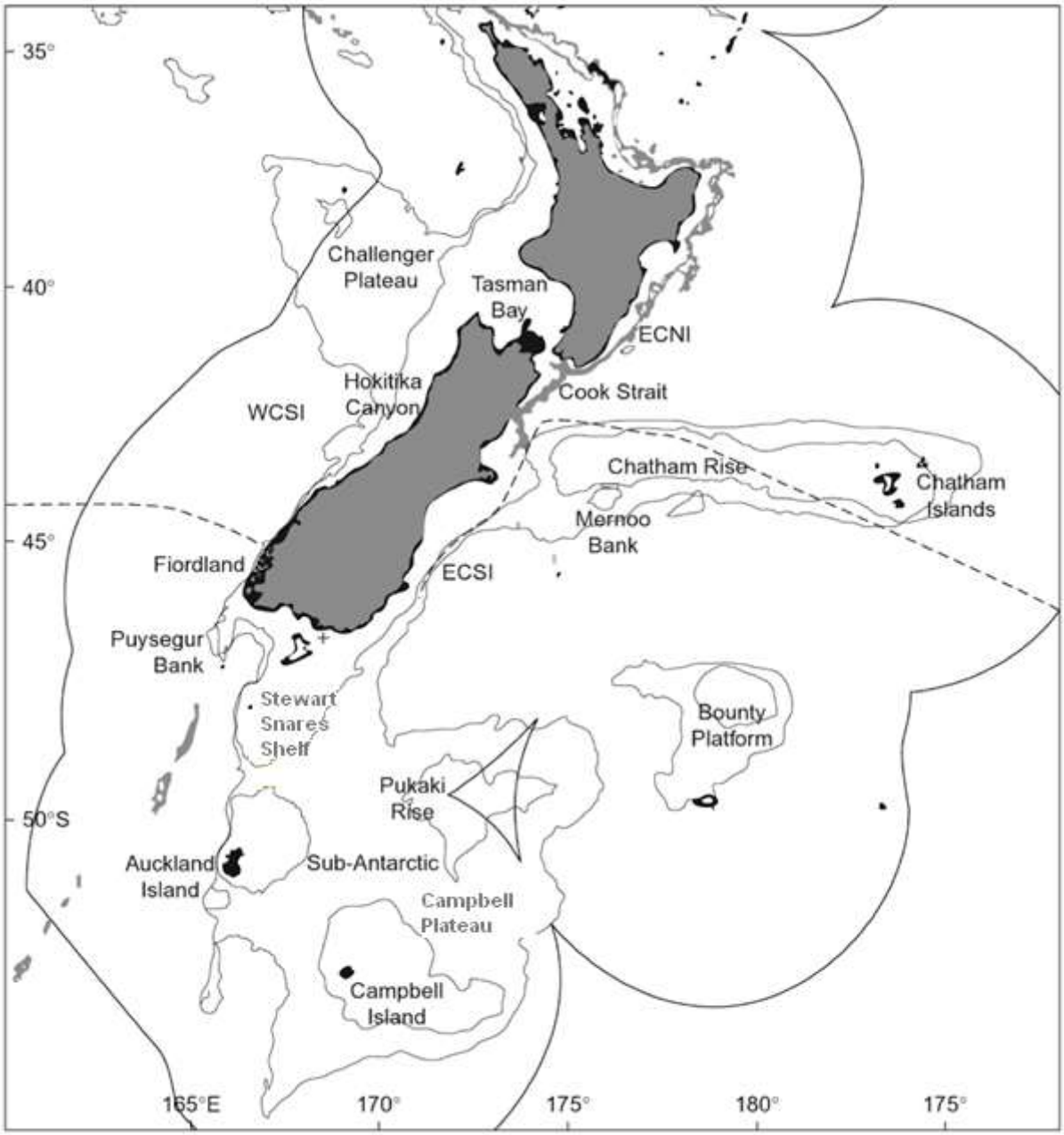


Figure 2. Oceanographic map showing some of the key features within New Zealand 200 mile EEZ (solid line) mentioned throughout the report. Bathymetry lines are 500 m and 1,000 m depths. The dashed line is the approximate position of the Subtropical Front with sub-tropical water to the north and sub-Antarctic water to the south. WCSI = West Coast South Island; ECSI = East Coast South Island; ECNI = East Coast North Island (adapted from: Livingston and Sullivan, 2007)

During the 1970s and early 1980s most of the catches were taken by the Soviet foreign licensed fleet, and the size of the fishery fluctuated considerably peaking at almost 50,000 t in 1973 and again at almost 30,000 t in 1979. Japanese surimi vessels first entered the fishery in 1986 and catches gradually increased to a peak of 76,000 t in 1991–92. Southern blue whiting were introduced to the Quota Management System (QMS) on 1 Nov 1999, with the TACCs given in Table 3. The fishing year was also changed from 1 October – 30 September to 1 April - 31 March to better align with timing of the main fishing season. TACC changes since 2000–01 are shown in Table 3. A nominal TACC of 8 t (SBW 1) was set for the rest of the EEZ. Less than 20 t per year has been reported from SBW 1 since 2000–01.
The majority of the catch is currently taken by domestic vessels that produce a dressed

product. On the Bounty Platform (SBW 6B), the TACC has been almost fully caught in each of the last 5 years. However, on the other grounds, the catch limits have generally been under-caught in most years since their introduction. This reflects the low economic value of southern blue whiting. On the Bounty Platform, the amount of fishing effort in any season depends largely on the timing of the west coast hoki fishery. If there is a delayed hoki season, then the vessels remain longer on the hoki grounds and consequently may miss the peak fishing season on the Bounty Platform.

3 Changes Since Initial Assessment

3.1 Overview

This is a "reduced re-assessment". A fishery is eligible for reduced reassessment if:

a. The fishery was covered under the previous certification or scope extension;
b. The fishery had no conditions remaining after the third surveillance audit, and
c. The CAB confirms that all standard related stakeholder comments have been addressed by the third surveillance audit (MSC FCR v2.0 section 7.24.6).

The fishery meets the above requirements as it has already been independently assessed against the MSC standard (certified 25th April 2012); all conditions of certification were closed by the third surveillance audit (in this instance, at the first audit) and, Acoura Marine has confirmed that all the standard related stakeholder comments were addressed by the third surveillance audit.

3.2 Specific Changes Since Initial Assessment

3.2.1 Principle 1

Principle 1 of the MSC Standard states: "*The fishing activity must be at a level which is sustainable for the fish population. Any certified fishery must operate so that fishing can continue indefinitely and is not overexploiting the resources*". (MSC 2013a).

3.2.1.1 Stock Status

Campbell Island Rise (SBW 6I)

Intertek (2012a) based its scoring of stock status on the 2010 assessment of the Campbell Island Rise (SBW 6I) stock. Since then, the stock has been assessed in 2012, 2014 and most recently in 2017 (Dunn and Hanchet, 2017), the results of which are reported below.

Catch and Fishing Mortality

The fishery started in the early 1970s by Soviet foreign licensed vessels. TACCs were first imposed in 1992/93. Japanese surimi vessels first entered the fishery in 1986 and catches gradually increased to a peak of 33,445 t in 2002/03. Since then, catch first declined to about 20,000 t in 2008/09, but has risen modestly subsequently (Figure 3). The post 2013 average catch of 25,100 t is above the long-term average of 18,982 t.

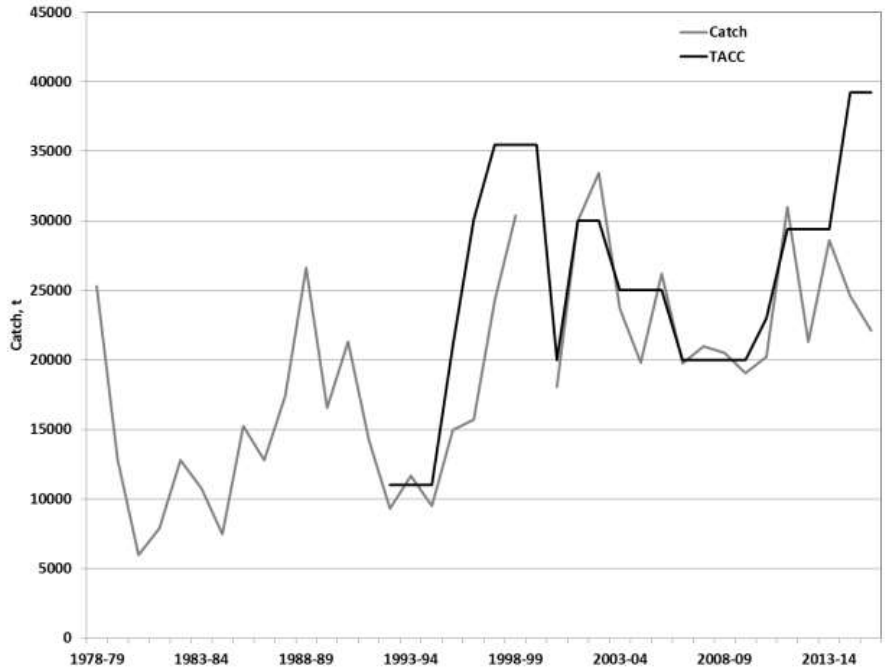


Figure 3. Catch and TACC of Campbell Island Rise stock since 1978/79; data from MPI (2017a).

The exploitation rate (U) rose to above 0.40 in the late 1980s, declined to below 0.10 by 1995, in response to the imposition of TACCs in 1992/93 and thereafter increased and has been fluctuating around 0.10 (Figure 4). Consistent with industry's indication (site visit) of a recent reduction of fishery effort, there has been a modest decline in exploitation since 2002.

Best available information indicates there is no customary or recreational harvest of southern blue whiting.

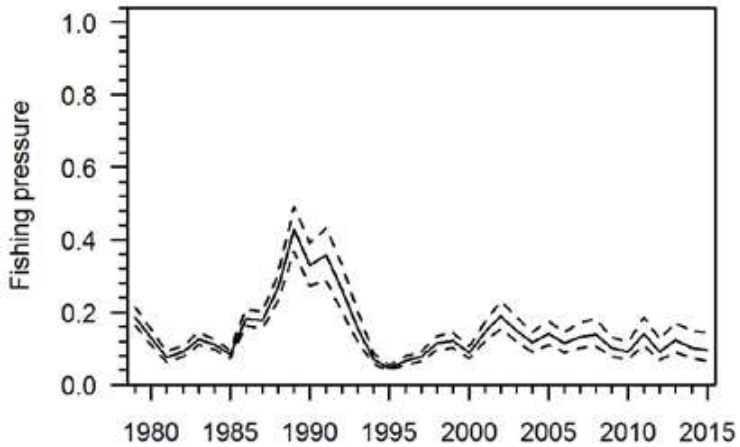


Figure 4. Trend in median exploitation rate of the Campbell Island southern blue whiting stock for the base case model; 95% credible intervals indicated; from Dunn and Hanchet (2017)

Biomass and Recruitment

Year-class strength has been highly variable over the course of the fishery (Figure 5). The 1991 year-class was about six times stronger than any other year-class until at least 2006, and gave rise to the large increase in biomass observed during the mid-1990s. There were several above average year-classes during the mid to late 1990s and in the early 2000s, but

these contributed to only a small proportion of the catch and have probably been largely removed from the population. The size of the 2006, 2009 and 2011 year-classes was estimated to be at about 3–4 times the average, with large numbers of the 2006 and 2009 year-classes caught in the fishery and large numbers of both year-classes observed by the 2009, 2011, and 2013 acoustic surveys (Dunn and Hanchet, 2017).

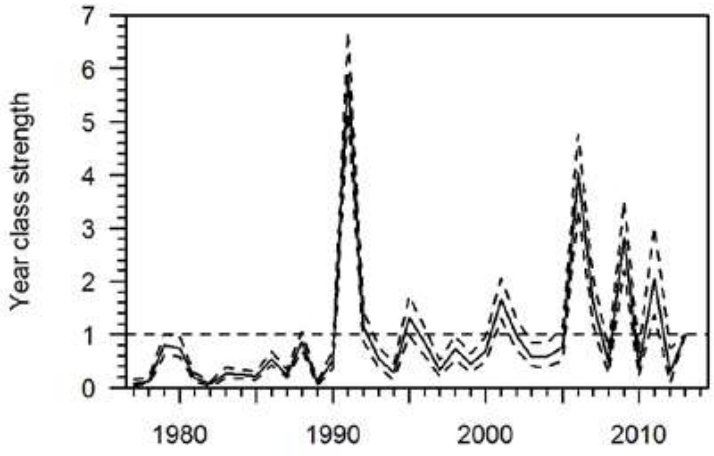


Figure 5. Trend in median relative year-class strength of the Campbell Island southern blue whiting stock for the base case model; 95% credible intervals indicated; from Dunn and Hanchet (2017)

Spawning stock biomass declined steadily from the early 1980s until 1993, followed by a large increase to 1995 resulting from the recruitment of the strong 1991 year-class. The spawning population then declined steadily from 1997 until 2008, and then showed a moderate increase to 2015 as the 2006, 2009 and then 2011 year-classes recruited to the fishery. In 1979, the spawning stock biomass was estimated to be at about 45% B_0. During the late 1980s and early 1990s, the biomass was estimated to have dropped below 20% B_0 for several years but then to have increased to about 60% B_0 when the strong 1991 year-class entered the fishery. Since then, the spawning stock biomass is estimated to have been above 40% B_0 (Figure 6) (Dunn and Hanchet, 2017).

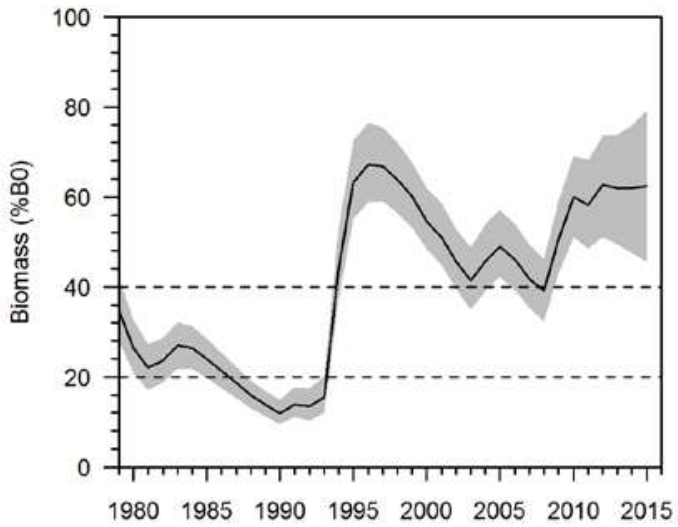


Figure 6. Trend in median stock status (%B_0) of the Campbell Island southern blue whiting stock for the base case model; 95% credible intervals indicated by shaded area; from Dunn and Hanchet (2017)

The biomass trajectories for all (three) sensitivity runs (see Stock Assessment section) exhibited very similar patterns to the base case (Table 4). However, the key difference was in the scale of biomass and thus stock status. The estimate of B_0, current biomass and stock status was lower for model run 2.1 but higher for model runs 2.2 and 1.3. Although the current status for model run 2.1 was more pessimistic than the base case, the median was still above 40% B_0. In contrast, the current status for model run 1.3 was much more optimistic at 90% B_0. However, natural mortality was estimated to be 0.34 for males and 0.32 for females, which was considered too high by the Deepwater Fisheries Assessment Working Group (Dunn and Hanchet, 2017).

Table 4. Median and 95% credible intervals of equilibrium (B_0), current spawning stock biomass, and current status (%B_0) for base and sensitivity cases; from Dunn and Hanchet (2017)

Model	B_0	B_{2015}	B_{2015} (%B_0)
Base case	352 200 (307 200–412 500)	220 200 (141 700–323 400)	62 (46–79)
2.1	394 100 (354 900–447 900)	175 400 (113 100–261 900)	44 (32–58)
2.2	375 800 (312 800–474 200)	293 000 (192 000–450 200)	78 (60–97)
1.3	638 400 (387 100–792 800)	575 000 (295 600–805 400)	90 (72–109)

Projections were made for the base case model and the two plausible sensitivity model runs 2.1 and 2.2 assuming fixed catch levels of 23,000 t and 40,000 t. For each scenario, the probability that the mid-season biomass for the specified year will be less than the soft limit (20% B_0) is given in Table 5. The 20% B_0 reference point is considered in this assessment as being equivalent to the Limit Reference Point (see Reference Point section). The probability of dropping below the soft limit by 2019 at a catch of 23,000 t was less than 10% for all models and all years. The probability of dropping below the soft limit by 2019 at a catch of 40,000 t exceeded 10% by 2019 for the base case. Under average recruitment conditions, the biomass is expected to steadily decline until 2020 under both catch scenarios in the base case model, although it will remain above the target reference point with a high degree of certainty until at least 2017.

Table 5. Probability that the projected mid-season spawning stock biomass for 2016–2020 will be less than 20% B_0 at a projected catch of 23000 t and 40000 t, for model run 1.1 (*M*=0.20), 2.1 (*M*=0.15), and 2.2 (*M*=0.25) assuming average recruitment during 1977–2012 for 2013+; from Dunn and Hanchet (2017)

Model	Catch	$Pr(B < 0.2B_0)$				
	(t)	2016	2017	2018	2019	2020
1.1	23 000	0.00	0.00	0.00	0.01	0.03
	40 000	0.00	0.00	0.04	0.16	0.31
2.1	23 000	0.00	0.00	0.02	0.06	0.11
	40 000	0.00	0.05	0.23	0.42	0.58
2.2	23 000	0.00	0.00	0.00	0.00	0.01
	40 000	0.00	0.00	0.01	0.04	0.11

Bounty Platform (SBW 6B)

Intertek (2012a) used the 2010 assessment of the Bounty Platform stock. Since then, stock assessments have been conducted in 2013 and 2014 using a Bayesian population model (see Stock Assessment section). These assessments did not provide a satisfactory fit to both the high local area aggregation acoustic biomass estimates observed in 2007 and 2008 and the

lower local area aggregation biomass estimates observed since 2009 (see Information and Monitoring section). Consequently, TACC setting has been informed by the estimation of current annual yield (CAY) based on the local area aggregation surveys (see Stock Assessment section). Until issues with the assessment model could be resolved, the Deepwater Fisheries Assessment Working Group (DWFAWG) explored a range of models with different assumptions that allowed a comparison of the extent to which the high acoustic biomass and its subsequent decline were fit. These have not proven successful, and in 2017, the Bayesian population model was put aside in favour of a harvest control rule approach (see Stock Assessment section) to inform TACC setting (MPI, 2017a).

Notwithstanding the issues with the assessment models, they provide an overall indication of stock status. Dunn and Hanchet (2015b) updated the 2010 assessment model (to 2011) and projected status through to 2015. It provides a relatively pessimistic view of current stock status. In contrast, the 2014 assessment model reported in MPI (2014a) provides a relatively optimistic view of current stock status. Both are used in the reporting of stock status below.

Catch and Fishing Mortality

Catch of southern blue whiting from the Bounty Plateau stock was low in the late 1970s-mid 1980s but dramatically peaked at 58,928 t in 1991/92. The first TACCs were introduced a year later and since then catch has varied 2,200 – 16,000 t. Since 2009/10, catch has declined from a recent peak of 14,700 t to 2,940 t in 2015/16 with catches closely following the TACC (Figure 7. Catch and TACC of Bounty Plateau stock since 1978/79; 2013-14 TACC was 6860 t but ACE was limited to 4028 t under voluntary industry agreement; data from MPI (2017a).). The majority of the most recent catch is taken as part of the local area acoustic biomass survey.

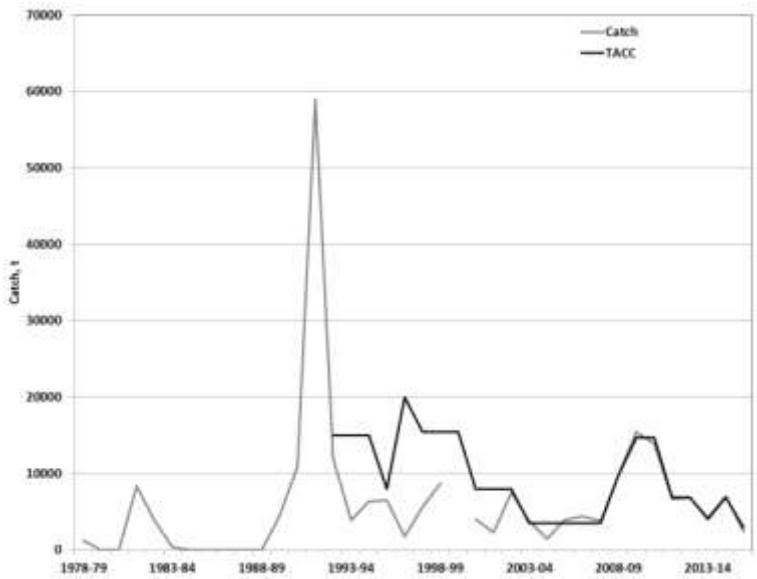


Figure 7. Catch and TACC of Bounty Plateau stock since 1978/79; 2013-14 TACC was 6860 t but ACE was limited to 4028 t under voluntary industry agreement; data from MPI (2017a).

Dunn and Hanchet (2015b) do not provide an indication of historical exploitation (fishing pressure or U) trends although MPI (2017a) states that it is unlikely (Pr < 40%) that overfishing is occurring and that it is likely (Pr > 60%) that fishing mortality is below the target (U = 0.24) provided by the new Harvest Control Rule (HCR). The 2014 assessment model (MPI, 2014) indicates that exploitation was high in the early 1990s, subsequently declined and has fluctuated around 0.10 (Figure 8). It was concluded by the DWFAWG (MPI, 2017a), that it is unlikely (Pr < 40%) that overfishing is occurring. Thus, it is likely that fishing mortality has been

below the fishing mortality consistent with maintenance of the biomass target (40% B_0) since the mid-1990s or about 2.6 generations.

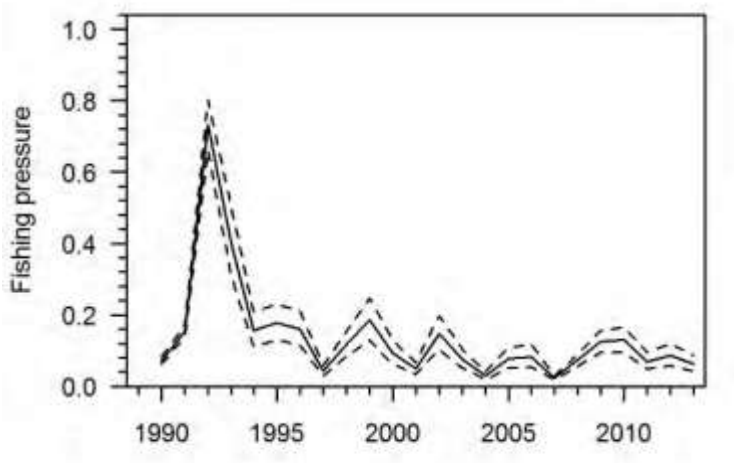


Figure 8. Estimated posterior distributions of exploitation rate for the Bounty Platform stock for the base case; from MPI (2014a)

Best available information indicates there is no customary or recreational harvest of Bounty Platform southern blue whiting.

Biomass and Recruitment

Dunn and Hanchet (2015b) indicate that, across the four assessment models considered, recruitment has exhibited a long-term declining trend since 1988, was extremely high in 2002 and has been low since then. The 2007 year-class appears to be above average (Figure 9). The 2014 assessment model (not shown) exhibited a very similar temporal trend. It is evident that the stock, similar to Campbell Island Rise, experiences long-term average recruitment interspersed with strong year-class events.

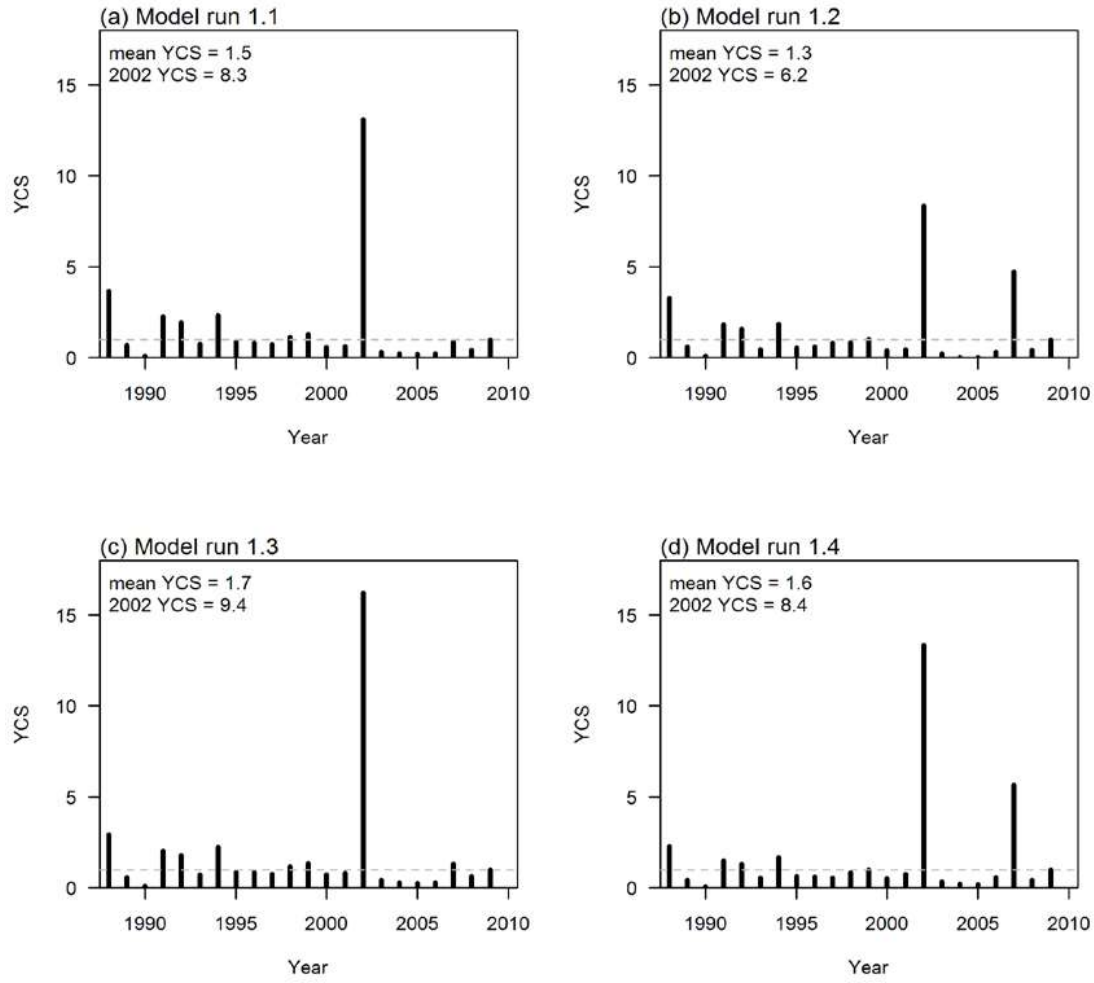


Figure 9. Estimated relative year-class strengths in the models 1.1, 1.2, 1.3, and 1.4; plots also show mean of year-class strengths during 1988–2008 including the 2002 year-class, and the equivalent 2002 year-class multiplier assuming a mean of one during 1988– 2008; from Dunn and Hanchet (2015b).

The trends in stock biomass provided by Dunn and Hanchet (2015b) suggest that biomass was high in the early 1990s, first declined and then increased to a high level in the late 2000s (the extent of which depends on model assumptions) and has subsequently declined (Figure 10). While the projections were highly uncertain, assuming an annual catch of 15,000 t (TACC during 2009/10 – 2010/11, the stock was expected to significantly decline until at least 2015. The probability that biomass would be less than the soft limit (20% B_0) by 2015 ranged 2% - 84% depending on the model (Table 6). Under average recruitment and an annual catch of 15,000 t, the models predicted that biomass is expected to decrease after 2011 and, in all scenarios, is expected to be below 50%B_0 by 2015 with three of the four models indicating that biomass would be below 20% B_0 by 2015. It is important to note that since 2013, the average annual catch of Bounty Platform southern blue whiting has been 4,579 t, considerably below the 15,000 t used in the projections and thus the above projected trends in biomass are very pessimistic.

The 2014 – 2016 local aggregation surveys exhibited a progressive decline in stock biomass to the lowest level observed since 2004 although the most recent survey (September 2017) indicates that biomass has increased since 2016 perhaps due to a relatively strong 2012 year-class. Dunn and Hanchet (2015b) indicated that in order to fit the time series of local area aggregation acoustic surveys, the estimates of the annual survey-specific catchability (q) ranged from 0.15 to 2.77 across the four model runs. They considered that it was not credible

that an acoustic survey could overestimate the abundance of fish by such a large amount, and so on the basis of the acoustic q estimates, the model runs 1.1 and 1.2 are judged to be less likely (Table 6). In 2015, the projected status (%B_0) of models 1.3 and 1.4 averaged 32.5% with Pr (B< 20% B_0) = 0.28. As noted above, these projections were conducted assuming catch considerably higher than actual levels and thus, the projected stock decline would be expected to be less.

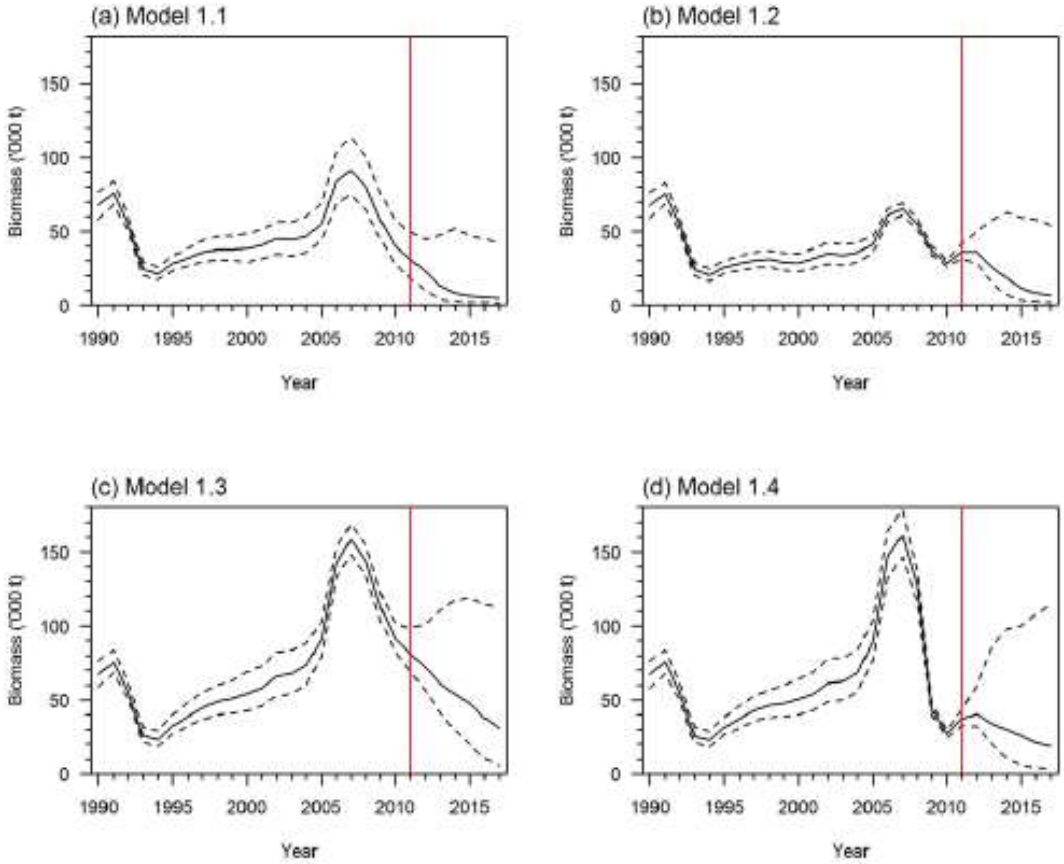


Figure 10. MCMC posterior plots of median biomass (solid line) and 95% credible intervals (dashed lines) for models 1.1 to 1.4; vertical line represents the beginning of the projection period (2012–2015); from Dunn and Hanchet (2015b)

Table 6. Probability that projected Bounty Platform stock biomass during 2012–2015 would be less than 20% B_0 and as %B_0 at projected catch of 15,000 t for models 1.1, 1.2, 1.3, and 1.4; from Dunn and Hanchet (2015b)

Catch	Model	Pr (SSB < 0.2B_0)				Median SSB (%B_0)			
		2012	2013	2014	2015	2012	2013	2014	2015
15 000 t	Model 1.1	0.12	0.58	0.76	0.84	30.6	17.4	11.0	8.6
	Model 1.2	0.00	0.04	0.45	0.68	43.0	31.2	21.8	13.7
	Model 1.3	0.00	0.00	0.00	0.02	70.4	59.7	52.2	46.2
	Model 1.4	0.00	0.20	0.43	0.54	29.9	25.1	22.0	18.7

The 2014 stock assessment estimated the same temporal trends in biomass but a less significant decline since the peak in the late 2000s (Figure 11). Projected biomass (base case) during 2014 – 2016 across a range of annual catch indicated that the probability of biomass being below 20% B_0 was zero while, by 2015, status was expected to range 42 – 44% although it was declining (Table 7).

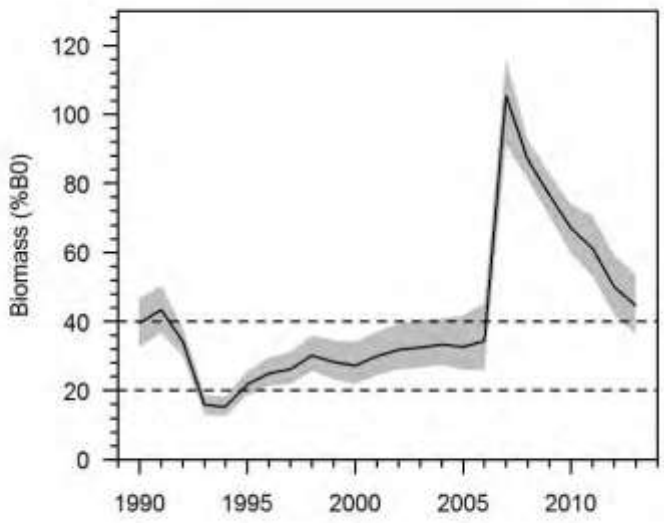


Figure 11. MCMC posterior plot of stock status (%B_0) for the base case; horizontal dotted lines indicate the soft limit (20% B_0) and target (40% B_0); from MPI (2014a)

Table 7. Probability that projected biomass during 2014-2016 will be less than 20% B_0, and median projected biomass (%B_0), assuming catch of 6,860 t, 8,000 t, and 10,000 t and average recruitment from 1988–2010 for 2011 onwards for the base case model, from MPI (2014a)

Model	Catch (t)	Pr (SSB < $0.2B_0$)			Median SSB (%B_0)		
		2014	2015	2016	2014	2015	2016
6.3 (base)	6 860	0.00	0.00	0.00	47	44	43
	8 000	0.00	0.00	0.00	47	43	41
	10 000	0.00	0.00	0.00	47	42	38

These assessments provide alternate views of stock status but on balance suggest that current biomass is likely below the 40% B_0 target. MPI (2017b) concurs that the best available information indicates that the current stock biomass is likely to be below the management target of 40% of unfished biomass (B_0) and for this reason, management actions have been put in place to rebuild biomass (see Harvest Strategy section). Notwithstanding this, fishing mortality has likely been below that consistent with the biomass target over the long-term.

The stock status in relation to 20% B_0 is unclear although the projections of Dunn and Hanchet (2015b) and MPI (2014a) suggest that it is likely to be above the soft limit. This is consistent with MPI not initiating a formal rebuilding plan as stipulated by the 2008 Harvest Strategy Standard (HSS: MPI, 2008) if biomass were below the soft limit.

3.2.1.2 Reference Points

The basis of the southern blue whiting reference points (RPs) has not changed since Intertek (2012a). The spawning stock biomass (SSB) and fishing mortality (F) reference points (RPs) in use in New Zealand fisheries are outlined in MPI (2008) with their technical basis described in MPI (2011). The overarching objective of the 1996 Fisheries Act (see Harvest Strategy section) is achievement of MSY stock conditions and as a consequence, the primary SSB and F target RPs are B_{MSY} and F_{MSY} respectively. The Operational Guidelines (MPI, 2011) provide a range of methods, based on a review and consideration of practice elsewhere in the world, to estimate MSY- compatible RPs, from analytical models to proxies based upon a percent of virgin biomass (B_0) with default proxies provided based upon a stock's productivity.

The HSS also outlines SSB limit RPs at which further reductions in stock size are likely to lead to an unacceptably high risk of stock collapse and/or a point at which current and future utility

values are diminished or compromised. While target RPs are an objective of management, limit RPs are stock biomass levels that are to be avoided. Both soft and hard limits are defined above extinction thresholds – upper bounds where depensation may occur, and associated management actions should prevent stocks from falling into such zones – and from which the stock is likely to recover in a reasonable time. Soft limits are higher than hard limits. When a soft limit is breached, a formal, time-constrained, rebuilding plan is implemented. When a hard limit is breached, the fishery will be considered for closure until the stock has rebuilt to at least the level of the soft limit with an acceptable probability (70%). The ultimate goal of both limits is to ensure full rebuilding of the stock to the biomass target with an acceptable probability (70%). MPI (2011) states that the reason for requiring a probability level greater than 50% is that a stock that has been severely depleted is likely to have a distorted age structure (an over-reliance on juvenile fish, with relatively few large, highly fecund fish). In such instances, it is necessary to rebuild both the biomass and the age composition. MPI (2011) provides default hard and soft limits of 10% and 20% virgin biomass.

The SSB RPs for the three southern blue whiting stocks are based upon the HSS defaults and thus are a percent of the virgin biomass (B_0) as estimated in the stock assessments, available information on the population dynamics and biomass surveys (see Section 3.2.1.13, Stock Assessment). As per the HSS defaults, the SSB hard, soft limit and target RPs are set at 10%, 20% and 40% of unexploited biomass respectively, the latter based upon the low productivity of southern blue whiting. The 20% B_0 soft limit is consistent with MSC guidance on the limit RP in MSC CR v1.3 and is used in this assessment for scoring purposes. The 40% B_0 target is consistent with the MSC CR v1.3 default for a B_{MSY} proxy. This interpretation is consistent with Intertek (2012a) as well as that of MSC teams who have assessed other New Zealand deepwater fisheries (Intertek, 2012b; 2014a; 2014b).

Steepness, *h*, is defined as the fraction of recruitment expected at virgin biomass (R_0) obtained at 20% of virgin biomass (B_0) (Haddon, 2001). The Campbell Island stock assessment is the only one that uses a stock-recruitment relationship with an assumed steepness = 0.9. This implies that expected biomass at the soft limit (20%B_0) will maintain recruitment at 90% of that at virgin levels. Further, research on B_{MSY} and related proxy RPs (e.g. Punt et al, 2014) indicates that at steepness of 0.9, B_{MSY}/B_0 ratios can be expected to be less than 0.4, implying that RPs based upon the HSS defaults are conservative. Evidence from the stock assessments suggests that recruitment has not been significantly affected by past exploitation in these fisheries.

The HCR explorations undertaken on the Bounty Platform stock tested a range of assumptions about the biology of the stock, including natural mortality rate and recruitment fluctuations (see Section 3.2.1.3, Harvest Strategy). These suggested that an exploitation (U) of 0.24 best meets the objective of maintaining the stock at or above the management target of 40% B_0 and ensuring that it does not decline below the 20% B_0 soft limit.

Southern blue whiting is not a low trophic species. It is a member of family Gadidae of the genus *Micromesistius* and is not in MSC CR v1.3 Box CB1. Predation by marine mammals and large teleosts is likely the main source of mortality for adults, and juveniles are frequently taken by seabirds (see SIc of PI 2.3.1)(does not meet CB2.3.13ai). Crustaceans and teleosts are the dominant prey groups for southern blue whiting, its mean age of maturity is 3.5 years, and its maximum age is in the order of 25 years (does not meet CB2.3.13bi).

3.2.1.3 Harvest Strategy

The harvest strategy for southern blue whiting has not changed since Intertek (2012a). The latter did not include detail on the strategy and thus the Acoura assessment team considered that it would be useful to more fully describe the harvest strategy in this report. The following sections are based upon the interpretation of the New Zealand deepwater fisheries harvest

strategy by the MSC assessment teams of the southern blue whiting (Intertek, 2012a), hoki (Intertek, 2012b), hake (Intertek, 2014a) and ling (Intertek, 2014b) fisheries.

Objectives

The 1996 Fisheries Act provides the legislative framework for New Zealand fisheries management, within New Zealand's fisheries waters out to 200 nm and for New Zealand flagged vessels and nationals on the high seas. The overarching objective outlined in the Fisheries Act is to provide for utilisation of fisheries resources while ensuring their sustainability. Thus, the Minister of Fisheries is responsible for ensuring that fish stocks are maintained at or above a level (B_{MSY}) that can produce Maximum Sustainable Yield (MSY), which is the greatest yield that can be achieved over time while maintaining a stock's productive capacity, having regard to the population dynamics of the stock and any environmental factors that influence the stock. The Act also outlines information principles related to the precautionary approach which state that decisions should be based on the best available information, decision makers should consider any uncertainty in the information available and be cautious when information is uncertain, unreliable, or inadequate, but that the absence of, or any uncertainty in, any information should not be used as a reason for postponing or failing to take any measure to achieve the purpose of this Act. The Annual Operational Plan for Deepwater Fisheries (MPI, 2016) provides the management objectives guiding the deepwater fisheries which follow from the 1996 Fisheries Act.

The conceptual sustainability objectives of the Fisheries Act are operationalized through the HSS (MPI, 2008) which is a policy statement of best practice in relation to the setting of stock targets and limits for fish stocks in New Zealand's Quota Management System (QMS), which has been in place since 1986. It outlines the approach on how fisheries law will be applied in practice, by establishing a consistent and transparent framework for decision-making to achieve the objectives of the Fisheries Act so that there is a high probability of achieving targets, a very low probability of breaching limits, and acceptable probabilities of rebuilding stocks that nevertheless become depleted, in a timely manner.

The associated operational guidelines of the HSS (MPI, 2011) provide suggested methods for calculating or approximating the biological reference points specified in the HSS, a more detailed basis and justification for the metrics specified in the HSS and elaboration on how the HSS should be implemented. The sections on implementation specify the respective roles and responsibilities of fisheries managers, scientists and stakeholders in giving effect to the HSS.

MPI (2008) states that the core standards will not change substantively in the short-term, but are subject to review in a period not exceeding five years, based on the evolution of fisheries plans and fisheries management strategies in New Zealand, and the evolution of international best practice. The Operational Guidelines (MPI, 2011) on the other hand, continually evolve as new data, analyses and insights become available.

3.2.1.4 Harvest Control Rules

The TACC – setting process must conform to section 13 (2) of the 1996 Fisheries Act, which states

The Minister shall set a total allowable catch that -

a) maintains the stock at or above a level that can produce the maximum sustainable yield, having regard to the interdependence of stocks; or
b) enables the level of any stock whose current level is below that which can produce the maximum sustainable yield to be altered -
    i. in a way and at a rate that will result in the stock being restored to or above a level that can produce the maximum sustainable yield, having regard to the interdependence of stocks; and

ii. within a period appropriate to the stock, having regard to the biological characteristics of the stock and any environmental conditions affecting the stock; or
iii. enables the level of any stock whose current level is above that which can produce the maximum sustainable yield to be altered in a way and at a rate that will result in the stock moving towards or above a level that can produce the maximum sustainable yield, having regard to the interdependence of stocks.

MPI (2008) outlines the generic Harvest Control Rule (HCR) which is used to inform sustainable harvesting of all New Zealand fisheries, including southern blue whiting. It consists of three core elements:

- Specified target based upon MSY-compatible reference points (B_{MSY} and F_{MSY}) or better about which a fishery or stock should fluctuate with at least a 50% probability of achieving the target
- Soft limit (default of 50% B_{MSY} or 20% B_0 whichever is higher) that triggers a requirement for a formal, time-constrained rebuilding plan when probability that stock biomass is below this soft limit is greater than 50% probability
- Hard limit (default of 25% B_{MSY} or 10% B_0 whichever is higher) below which fisheries should be considered for closure when probability that stock biomass is below this hard limit is greater than 50% probability

The status of fisheries and stocks is characterised according to these RPs:

- If the MSY-compatible fishing mortality rate, F_{MSY}, or an appropriate proxy is exceeded on average (over 3.5 years), *overfishing* is deemed to have been occurring, as stocks fished at rates exceeding F_{MSY} will ultimately be depleted below B_{MSY}.
- A stock that is determined to be below the soft limit will be designated as *depleted* and in need of rebuilding.
- A stock that is determined to be below the hard limit is designated as *collapsed*.

The relationship amongst these RPs and the management actions that should be invoked are illustrated (Figure 12) in the harvest control rule outlined in the Operational Guidelines (MPI, 2011). The example is applicable only for high information stocks where it is possible to estimate biomass relative to B_{MSY} and fishing mortality relative to F_{MSY} (or some other measure of fishing intensity). However, MPI (2011) notes that it can also be adapted to other, lower information situations. When biomass is between the target and the soft limit, management actions to reduce catch are to be taken to prevent stocks declining to the level of the soft limit. Besides TACCs, these could consist of measures such as changes in minimum legal sizes of fish caught (through, for example, increases in the minimum allowable mesh size of fishing nets), and closures of areas with high levels of catches of juveniles. MPI (2011) emphasizes that Figure 12 is primarily for illustrative purposes, to provide an example of one type of control rule that is likely to achieve the requirements of the Harvest Strategy Standard.

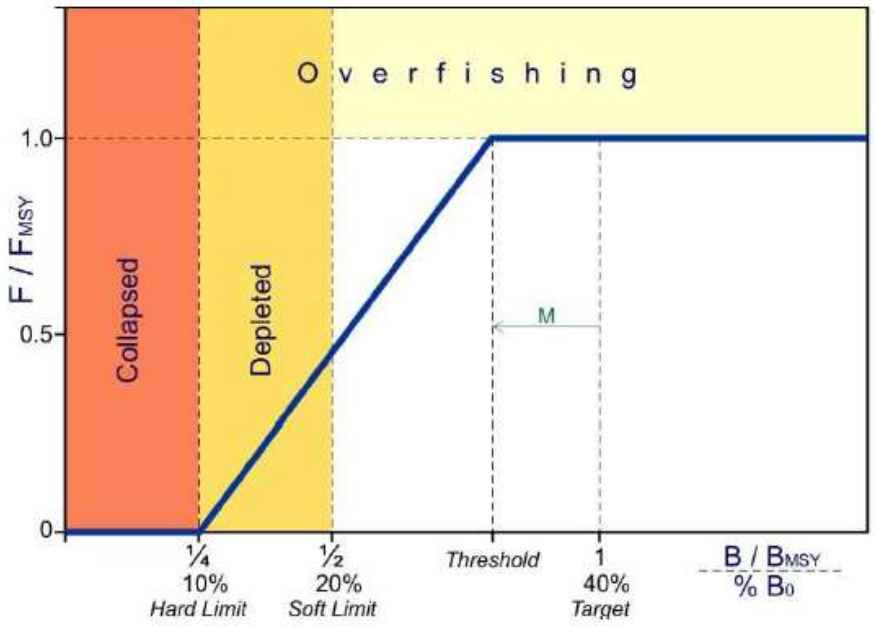


Figure 12. Illustrative example of a harvest strategy control rule that would be in conformance with the Harvest Strategy Standard (HSS); *M* is natural mortality (from MPI, 2011)

The requirements of the HSS are outlined in its Implementation Guidelines (MPI, 2011). These outline the MSY-compatible target and limit RPs as noted above, and the actions to be taken if and when stock biomass declines below the target. The latter include formal rebuilding plans when biomass is below 20% B_0 and actions when current biomass is likely to be above soft and hard limits but below targets:

Rebuilding Plans:

1. Science Working Groups (SWGs) will estimate the probability that current and/or projected biomass is below 50% B_{MSY} or 20% B_0, whichever is higher. If this probability is greater than or equal to 50%, SWGs should calculate T_{MIN} where T_{MIN} is the number of years required to rebuild in the absence of fishing.
2. SWGs will work with fisheries managers to define and evaluate alternative rebuilding plans that will rebuild the stock back to the target with a 70% probability within a timeframe ranging from T_{MIN} to 2 * T_{MIN}
3. The Ministry will provide advice to the Minister on a range of rebuilding plans that satisfy the T_{MIN} to 2 * T_{MIN} time constraint (or an alternative that can be adequately justified), and the specified probability levels.
4. Once a rebuilding plan has been implemented, SWGs will regularly evaluate and report on the performance of the rebuilding plans.
5. The Ministry will provide advice to the Minister on appropriate TACCs to achieve the rebuilding plan.

Actions when current biomass is likely to be above soft and hard limits but below targets (or thresholds):

1. SWGs will provide best estimates and confidence intervals for current biomass and/or fishing mortality (or related biological reference points).

2. If current biomass is estimated to be between the target (or the threshold) and the soft limit, SWGs should work with fisheries managers to define and evaluate the TACC consequences of:
    a. reducing fishing mortality proportionately to the estimated decrease in biomass below the target or threshold (or taking steps to approximate this for low information stocks), in order to avoid breaching either the soft or hard limits, and/or
    b. reducing catch super-proportionately to the estimated decrease in biomass below the target or threshold (or taking steps to approximate this for low information stocks), in order to avoid breaching either the soft or hard limits.
3. If current biomass is estimated to be above some threshold, SWGs will work with fisheries managers to define and evaluate the TACC consequences of:
    a. maintaining a constant F that will achieve the target biomass on average (or taking steps to approximate this for low information stocks), and/or
    b. reducing catch proportionately to the estimated decrease in biomass towards the threshold (or taking steps to approximate this for low information stocks), and/or
    c. increasing catch proportionately to the estimated increase in biomass above the threshold (or taking steps to approximate this for low information stocks).

Stocks will be considered to have been fully rebuilt when it can be demonstrated that there is at least a 70% probability that the target has been achieved.

The HSS does not stipulate the details of the HCR to be implemented in a fishery but rather sets the standard by which it is designed. During the site visit, MPI emphasised that in its consideration of TACC options, it follows the HSS. The HSS is consistent with GCB2.6 of CR1.3 in requiring that a well-designed HCR acts to keep a stock above its limit RP and maintain the stock at its target RP. Also, it acts to rebuild the stock if it drops below both the target and the limit RPs.

The HCRs for southern blue whiting stocks are consistent with the HSS and associated Operational Guidelines and consist of the following:

- Assessment by the DWFAWG every two – three years to estimate probability of current biomass and/or fishing mortality relative to limit and target reference points (see Stock Assessment section); if assessment model is deemed not sufficient to inform management decisions, annually estimate CAY based upon agreed stock indicators.
- Conduct 5-year projections to evaluate Pr(SSB<0.2 B_0) and median SSB as % B_0; these are done for a base case model and for models which explore the main uncertainties in the assessment; these are made using the MCMC samples from the stock assessment, with recruitment drawn randomly from the distribution of year-class strengths over the assessment time period, or more recently (e.g. 10 years) as deemed appropriate by the DWFAWG.
- Decision by New Zealand Minister of Fisheries on TAC (and associated TACC) during projection period, consistent with HSS and informed by SWG and stakeholder engagement; consultation during this step can result in additional projections undertaken by MPI.
- Monitoring of stock performance during projection period to ensure that stock status is not being compromised by the management actions and/or stock processes (e.g. reduction in recruitment, change in natural mortality).

The form of the biomass – fishing mortality relationship is an emergent property of the above HCR and is not a proscribed analytical function. This is consistent with MSC CR v1.3. GCB2.6 which states that the requirement that an HCR reduces exploitation rates as the limit reference

point is approached should not always be interpreted as requiring the control rule to deliver an exploitation rate that is a monotonically decreasing function of stock size. Any exploitation rate function may be acceptable so long as it acts to keep the stock above the limit reference point and attempts to maintain the stock at the target reference point. Also, it acts to rebuild the stock if it drops below both the target and the limit RPs. During the site visit, MPI emphasised that in its consideration of southern blue whiting TACC options, it follows the HSS.

Experience with the southern blue whiting HCR is available in the Kobe plot of the 2014 Campbell Island Rise assessment, provided in the 2017 Plenary report (Figure 13). In the early 1990s, there was a dramatic decline in fishing mortality (F) which allowed SSB to grow. SSB then went through a decline in the mid-2000s which was arrested by management intervention before it dropped below 40% B_0. Since then, SSB has been maintained above the target while fishing intensity has modestly declined (see Stock Status section).

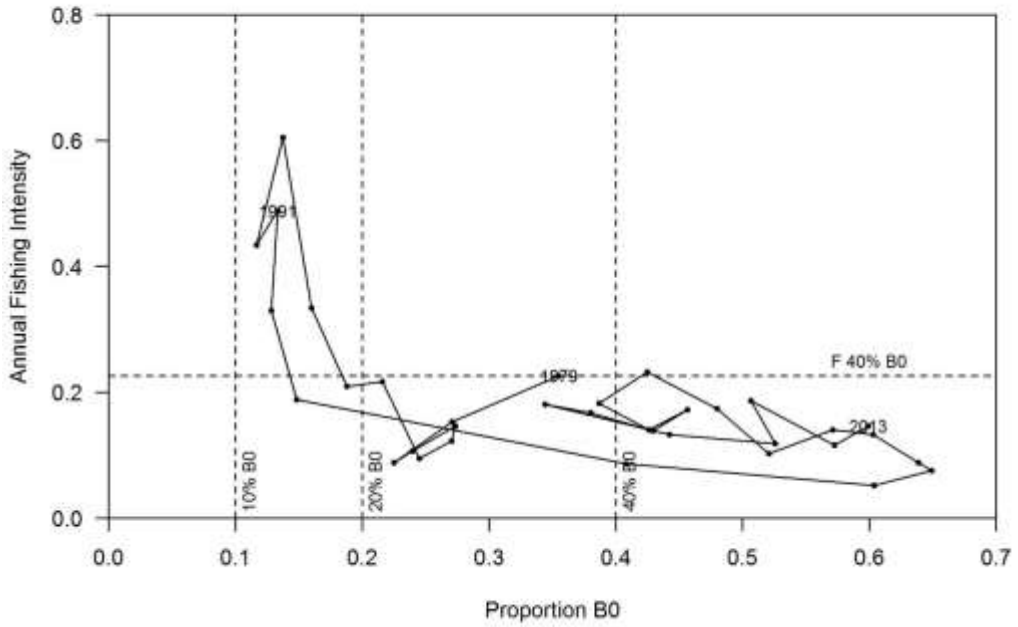


Figure 13. Trajectory over time of fishing intensity (*U*) and spawning biomass (%B_0), for the Campbell Island Rise southern blue whiting stock from the start of the assessment period during 1979 – 2013; year indicated on solid line; dotted horizontal line shows fishing intensity (40% B_0) in stock status and fishing intensity, and hard limit (10% B_0) and soft limit (20% B_0) in stock status; biomass estimates based on MCMC results, while fishing intensity is based on corresponding MPD results; from MPI (2017a).

3.2.1.5 Management Strategy Evaluation

The HSS and its associated Operational Guidelines describe the role of Management Strategy Evaluation (MSE) in the management system. MSE, rather than focusing solely on biological RPs, seeks to take into account the robustness of alternative management procedures and socio-economic implications of management decisions. MSE attempts to model and simulate the whole management process. It makes projections about the state of the fishery resources and other ecosystem parameters for a number of years into the future under a variety of decision-rule options. The management measures and rules that achieve the best results in terms of specified objectives can then be selected and applied. This procedure greatly assists in identifying management strategies that are resilient to uncertainties in scientific understanding. The HSS provides minimum performance standards, or minimum performance measures, for MSEs and does not restrict alternative management objectives, or innovative

management strategies, or additional performance measures beyond this. It states that MSEs should be designed to ensure that:

- the probability of achieving the MSY-compatible target or better is at least 50%;
- the probability of breaching the soft limit does not exceed 10%; and,
- the probability of breaching the hard limit does not exceed 2%.

Up until 2015, a review of the Campbell Island Rise southern blue whiting harvest strategy had not been conducted. An industry-funded MSE (Cordue, 2015) was initiated in 2015 for the stock with the broad objective to determine appropriate limit and target reference points (in contrast to the HSS defaults) and an updated HCR consistent with the HSS. The 2014 assessment model of the stock (that was available at the time) was used in the MSE but with some modifications. The modified assessment estimated natural mortality (*M*) and used a new prior on the acoustic survey q (borrowing the prior for the Bounty Platform stock that incorporated the recent large increase in target strength uncertainty). The estimation of virgin biomass (B_0) and *M* were found to be confounded, necessitating the use of a strongly informed prior for B_0, *M*, or the mature acoustic survey q to stabilize model estimation. This is perhaps not a surprising result as the close linkage amongst key life history parameters and reference points is well recognized (e.g. Mangel et al, 2013). Note that Roberts and Dunn (2017) subsequently investigated alternative model structures for the estimation of *M* in the Campbell Island Rise assessment but were unable to identify a model structure which produced stable and unbiased estimates of *M* (see Stock Assessment section). The modified stock assessment model was used to ground-truth the operating model of the MSE with the joint posterior of stock-recruitment steepness (*h*) and *M* used to describe uncertainty in the productivity of the stock.

Bayesian estimation was used to determine the reference points for the operating model and performance indicators for the numerous HCRs that were trialed.

The estimates of deterministic B_{MSY} over a range of *h* and *M* values, were all less than 40% B_0 and hence the limit reference point (LPR) was estimated at 20% B_0 with high certainty. A target biomass range of 30–60% B_0 was selected to trial draft HCRs. The objective was to identify HCRs that maintained spawning stock biomass above the lower bound of the target biomass range “most of the time” (at least 70%) and rarely allowed it to go below the LRP (no more than 5% of the time). A further requirement of an updated HCR was relative stability in the TACCs. To accommodate this requirement, HCR options were explored which differed in the level of constraint that they imposed on year-to-year changes in the TACC.

Four main HCR scenarios with associated variations in acoustic survey and assessment frequency were constructed using the same relationship between estimated stock status and the following year’s exploitation rate. This relationship set a maximum exploitation rate of 20% when stock status is estimated at 60% B_0 or higher with the exploitation rate monotonically decreasing to zero at 10% B_0, with a higher rate of decline below 30%B_0. Over the range of target SSB (30% - 60% B_0), target exploitation (U) ranged 0.10 – 0.20. The four HCRs had contrasting outcomes in terms of the likely variability of TACCs and the possible increases in TACC over the next few years with a trade-off between variability and yield - the lower the variability in the TACC, the lower the average yield and the higher the variability in the TACC, the higher the average yield. All HCR scenarios displayed acceptable risk profiles and would very likely meet MSC requirements and the requirements of the HSS. All of the HCRs, over the long-term, would lead to substantial changes in the TACC as SSB fluctuates due to natural changes in recruitment. Only a constant catch policy would avoid long-term fluctuations in catch. However, to have acceptable risk, such a policy would set the TACC at a very low level.

The HCRs assumed that catch-at-age data would be collected annually and included in stock assessment updates. The frequency of acoustic surveys was found to have little effect on the performance of the HCRs if the stock assessment estimators were unbiased. However, if the absence of acoustic survey indices leads to an accumulating bias then, to maintain low risk, acoustic surveys would need to occur every 2–5 years depending on which HCR was adopted. Cordue (2015) recommended that the MSE be revised and the survey frequency be reconsidered when more information is available on southern blue whiting tilt-averaged target strength. The MSE is currently scheduled to be updated in 2021/2022 (T. Bock, pers. comm.).

In the case of Bounty Platform southern blue whiting, since at least 2010, stock assessment models have been explored but deemed not sufficient to inform the HCR and management decisions. Thus, CAY, based upon the local aggregation acoustic survey biomass and F_{REF} = 0.20 has been annually calculated to inform management decisions (see Section 3.2.1.13, Stock Assessment). MPI decided to put aside the SCAA Bayesian modelling approach in 2016 and an MSE was conducted to define an update to the HCR such that it would be sufficient to inform management consistent with the requirements of the HSS, including stock rebuilding, and be robust to the uncertainties identified in the model-based assessments. The update to the HCR calculates $TACC_{t+1} = U * (B_t – C_t / 2)$, where $TACC_{t+1}$ is the desired catch in fishing year t+1, B_t is the acoustic survey biomass estimate in the previous fishing year t, C_t is the catch during the previous fishing year t, and U, an input, is the target exploitation (MPI, 2017b; T. Bock, pers. comm.). The – Ct / 2 term assumes that the survey takes place mid-fishing year.

The MSE consisted of long-term simulations of Bounty Platform stock dynamics, acoustic surveys and management decision-making using a single sex, two-fishing year time period, age-structured stock model created to evaluate the performance of the above HCR. The values of U investigated in the MSE were 0.10, 0.15, 0.20, 0.25 and 0.30. The performance measure (risk) was that $B_{current}$ should not fall below 20% B_0 more than 10% of the time over a 120 year projection period, as per the HSS (MPI, 2011). While there was no explicit performance measure associated with 40% B_0, it was confirmed that as per the HSS guidance of the MSE, the target U is designed to recover the stock to biomass target (T. Bock, pers. comm.). The HCR can be considered as an updated version of the previously employed CAY estimate which has been tested for robustness to assessment uncertainties.

For each of the 1,000 simulation runs (details in Doonan, 2017), stock and observation parameters were either assumed constant or sampled from assumed error distributions (see below). The unfished stock was first simulated for 40 years, then a constant fishing mortality applied over 20 years to reduce the biomass to a selected level of depletion by the start of application of the HCR. The fishing mortality during the first 20 years thus varied depending on the selected level of depletion and the pattern of recruitment. This allowed examination of the performance of the HCR in rebuilding the stock from different levels of depletion. There followed a period of 120 years simulated under the HCR with the latter applied annually. The annual acoustic survey estimates were used to modify the TACCs, according to the HCR, for each following year. It was assumed that the catch calculated by the HCR was fully taken, except when the exploitation rate was greater than 80% of the mature stock, in which case the catch was reduced so that 20% of the mature stock remained. Simulations were performed on two recruitment scenarios: using “usual” recruitment, seen in 19 of the 20 years of the fishery, and adding a single very large recruitment event 10 years into the HCR period. The constant parameters were the size of the unfished stock (B_0 = 100,000 t), maturity ogive, and the fish growth rate. It was thus assumed that the carrying capacity of the environment was fixed, productivity was determined primarily by recruitment levels, not by individual growth or age at first maturity or spawning, and that the fishery exploitation pattern was constant. No correlation was assumed between the demographic parameters.

Uncertainties in the following key Bounty Platform stock and observation processes were explored (all parameters derived from assessments):

- natural mortality (0.10, 0.15, 0.20, 0.25, 0.30)
- recruitment determination (Beverton & Holt) based on steepness (0.84 or 0.90), auto-correlation (one year lag with mean=0.15 and sd=0.06) and recruitment deviation (0.83)
- acoustic survey qs (see below)
- acoustic survey process error (CV = 0.0, 0.10, 0.10)
- large recruitment events.

The 'true' acoustic biomass, B_{obs}, was drawn from a lognormal distribution with a mean equal to the true stock biomass (from the simulation model) with sampling CV=27% and multiplied by the 'true' survey q_i, where q_i is a random draw from the acoustic q distribution (lognormal with mean = 0.54 and CV = 0.35). The error in the acoustic survey q is composed of several sources of error: target strength uncertainty and fish tilt angle, target identification, vertical availability, areal availability, and system calibration, which has been extensively explored in previous studies (see Information and Monitoring section). The contribution from areal availability was ignored in the 'true' q as it was considered that its exclusion would make the HCR more conservative.

For use in the Bounty Platform HCR, B_{obs} is divided by the $q_{assumed}$, i.e., not the 'true' q, but what the management rule has assumed catchability to be. Doonan (2017) used $q_{assumed}$ = 0.54/0.9 to provide acoustic biomass for the HCR (0.9 is aerial availability in *q* prior for the 2014 assessment). As the 'true' q did not include aerial availability, this has the effect of informing the HCR with less biomass than might actually be available. During the site visit, NIWA scientists noted that the areal availability q of 0.9 is likely higher than the spatial q for the Bounty Platform local aggregation survey. Further, target strength research on southern blue whiting undertaken in the last five years suggests that current estimates in use are biased high. These observations imply that a conservative estimate of acoustic biomass is being used in the HCR. Stock size and other parameters were recorded for the last 120 years so that performance criteria could be calculated.

The main outputs of the Bounty Platform MSE simulation are tables of risk organized by *M* and U. While Doonan (2017) provides an extensive set of these for the various options explored in the MSE, T. Bock (pers. comm.) indicated that the risk table used to inform the 2017 Bounty Platform TACC consultations is provided below (Table 8). Each cell of the table is the mean risk of the simulation runs for the *M* x U combination. Thus, for *M* = 0.20 and U = 0.20, the risk of not achieving the management objective is 0.058. As indicated above, acceptable risk is defined as being equal to or less than 0.010. For a given M, risk increases as a quadric function of the U. For a given *M*, the U at risk = 0.10 can be found through interpolation of the risk in the appropriate row of the table and, along with the acoustic biomass, used to calculate the TACC advice as per the HCR. Based upon *M* = 0.20 and an acceptable risk of 0.10, a U of 0.24 was estimated, which was the target U used to inform the 2017 Bounty Platform TACC consultations (MPI, 2017b).

Table 8. Risk for a combination of *M* and U (here indicated as □) with steepness set to 0.90 and survey process CV = 0; risk is probability of SSB being below 20% B_0 over 120 year projection; mean over two runs with sd = 0.0025; acceptable risks below the thick black border (Table 2 of Doonan, 2017)

M	ξ				
	0.1	0.15	0.2	0.25	0.3
0.1	0.037	0.151	0.305	0.460	0.589
0.15	0.010	0.053	0.131	0.229	0.332
0.2	0.003	0.021	0.058	0.113	0.180
0.25	0.002	0.012	0.035	0.070	0.117
0.3	0.001	0.007	0.020	0.042	0.071

3.2.1.6 Tools

The tools to control fishing to achieve the objectives of the harvest strategy have not changed since Intertek (2012a). To summarize, since 1986, the 636 fish stocks harvested by the major commercial fisheries in New Zealand fisheries waters, have been managed through a quota management system (QMS) using individual transferable quotas (ITQs). Each fish stock has 100,000,000 quota shares issued in perpetuity. The quota shares are a property right. This system is fully described on MPI's website:
http://fs.fish.govt.nz/Page.aspx?pk=81&tk=574

Within the QMS, fisheries sustainability objectives are achieved by setting an overall annual total allowable catch (TAC) that is consistent with the productivity of a fishery. The TAC is apportioned amongst user groups such as the TACC for the commercial fishery, allocations for the Maori and recreational sector, and an allocation to address other fishing-related mortality such as illegal fishing or accidental loss of fish from nets.

Regarding the latter, in its consideration of TACC options, MPI explicitly addresses whether or not illegal catch and misreporting are issues. Determination on whether or not adjustment to the TACC is required is based upon risk analyses undertaken by MPI as part of its compliance monitoring (see section 3.2.17 on Compliance and Enforcement). Recent decisions on southern blue whiting TACCs illustrate the approach. During the 2014 consultations of the Campbell Island TACCs (MPI, 2014b), the allowance for 'other sources of fishing related mortality" including catch under-reporting, was set at about 2% of the TAC, a percentage that can be changed based upon the MPI compliance risk profile. While lower than the potential level of under-reporting, the stock has been well above the 40%B_0 target biomass since the late 2000s and the TACC have not been caught (see section 3.2.1.1 on Stock Status. Consequently, under-reported catch represented limited risk to the stock. During the 2017 consultations on the Bounty Platform TACCs, the allowance for 'other sources of fishing related mortality" including catch under-reporting, was also set at 2% of the TAC (MPI, 2017b; 2017c), again implying low risk of under-reporting to the stock.

Each licence holder owns a set of tradable shares associated with a particular fish stock. The TACC for each fishery is split across these shares and thus apportioned amongst quota owners. The sum of these shares is the licencee's Annual Catch Entitlement (ACE). The ACE is a hard limit. Each commercial fishing permit holder must balance their catch against their ACE holding. If the permit holder does not hold ACE, they must purchase ACE from another ACE holder. Some ACE is held by entities that do not intend to fish but sell their ACE to fishers who need to balance their catch against ACE. If a licensee catches more fish than their ACE, a charge is levied as per a Deemed Value (DV) determined annually by MPI based upon a set of principles (MPI, 2012) on an increasing scale above the ACE. Thus, while TACC overruns can occur and are indeed permitted, there is a large financial incentive for licensees to maintain their catch within their allotted ACEs. During the site visit, the Acoura assessment

team was informed that TACC overruns are most frequently due to licensees trading quota shares near the end of a fishing year to cover unexpected bycatch.

The 1996 Fisheries Act and associated regulations describe a wide array of effort-based tools (e.g. gear configuration, time and area closures, etc.) which are used in addition to quotas to control fishing mortality.

3.2.1.7 Linkage between Components of Harvest Strategy

To evaluate the linkage amongst the science advice, TACC setting and harvest regulation, it is important to understand the steps in the management process. The first step in the process is the stock assessment and five-year projections under a range of catch scenarios. The latter can involve the current TACC, recent average catch and catch scenarios which ensure that biomass does not breach the soft limit (Pr >10%) and achieve the target (Pr >= 50%), consistent with the requirements of the HSS. These scenarios are made publically available in an MPI Consultation Document (formally termed Initial Position Paper or IPP) which outline the management options and their rationale and seek stakeholder views and additional management options. After a consultation period of about four weeks, MPI compiles a Decision Document (formally termed Final Advice Paper). This document summarises MPI's and stakeholder's views on the issues being reviewed, and provide final advice and recommendations to the Minister of Fisheries. The Minister's letter setting out his/her final decision is subsequently posted on the MPI website. During the site visit, MPI confirmed that while the Minister has the final decision, this is guided by the requirements of the 1996 Fisheries Act and its associated HSS.

For the Campbell Island (SBW 6I) stock, the 2010 assessment and consultation process advised TACCs during 2011/12 – 2013/14 ranging 23,000 – 40,000 t (Table 10). The Minister set the TACC at 29,400 t during this period and catch was maintained consistent with this TACC. Note that a small overage occurred in 2011/12 as permitted by ACE requirements (see Section 3.2.1.6, Tools, above). The 2014 assessment and consultation process advised TACCs in the range of 30,000 – 40,000 t with TACCs set at 39,200 t. Catch has been maintained well within the TACC.

For the Bounty Platform (SBW 6B) stock, the 2010 assessment and consultation process advised a TACC in 2011/12 ranging 3,435 – 4,424 t (Table 10) but the TACC was set above this (6,860 t) due to uncertainty in the stock assessment. When no stock assessment model was accepted by the DWFAWG, a CAY was instead calculated from the acoustic biomass estimate available at the time (see Section 3.2.1.13, Stock Assessment). The DWFAWG agreed to provide a catch limit for the 2012/13 season based on a proxy yield calculated by multiplying the 2011 acoustic survey estimate by the CAY exploitation rate. The 2013/14 TACC was set at 6,860 t but the industry voluntarily applied an ACE of 4,028 t in response to an observed decrease in acoustic survey biomass. During 2014/15 – 2016/17, catch advice has been based upon the CAY. Since 2012/13, catch has generally been consistent with the TACCs and ACEs. For 2017/18, three TACC options were developed by MPI, the first of which was based upon the CAY (1,982 t). Option 2 (2,377 t), and MPI's preferred option, was based upon the exploitation rate (0.24) recommended by the MSE (see Section 3.2.1.13, Stock Assessment) which best meets the objective of maintaining the stock at or above the management target of 40% B_0 and ensuring that it does not decline below the soft limit. Option 3 (2,575 t) was based upon a CAY calculation using the fishing mortality rate associated with the upper bound of natural mortality for the species (M = 0.25 instead of 0.20, resulting in a fishing mortality rate of 0.26). The Minister ultimately decided to set the TACC at 2,377 t based upon Option 2 (MPI, 2017c).

Overall, the linkage amongst the management components of the southern blue whiting stocks has been good.

Table 9. Comparison of southern blue whiting advice from MPI and stakeholder consultation, TACC set by the Minister and reported catch (t) by fishing year; data from http://www.mpi.govt.nz/news-and-resources/consultations/review-of-fisheries-su/ http://www.mpi.govt.nz/news-and-resources/consultations/fisheries-sustainability-measures-1-april-2015/

Fishing Year	SBW 6I				SBW 6B			
	Options	Advice	TACC	Catch	Options	Advice	TACC	Catch
2011/12			29,400	30,971			6,860	6,660
2012/13			29,400	21,321			6,860	6,827
2013/14			29,400	28,607			6,860*	4,278
2014/15	29,400; 34,300; 39,200	39,200	39,200	24,592			6,860	7,054
2015/16			39,200	22,100	3,920; 2,940; 1,960**	2,940	2,940	2,405
2016/17			39,200				6,860	

Options' are the TACC options proposed by MPI and publicly consulted on
Advice' is the final TACC recommendation presented by MPI to the Minister
TACC' is the final decision made by the Minister

* Industry voluntarily shelved ACE to apply catch limit of 4,028 t
** Options were based on 2015 CAY estimate of 3,425 t

3.2.1.8 Information & Monitoring

This section describes information and monitoring activities conducted on southern blue whiting, summarizing those presented in Intertek (2012a) and noting new activities which have occurred since then. During the site visit, MPI noted that the 10-year rolling research plan provided in the Deepwater Fishery Annual Operational Plan (AOP) has been re-packaged to provide more information, although the planning process (scientific prioritization, stakeholder engagement, budgeting, etc.) has not changed. The re-packaged plan now includes specific information on, for instance, assessment schedules, fishery and observer sampling, survey activities and upcoming Management Strategy Evaluations. Also, the annual Plenary Report of the southern blue whiting stocks provides not only information on monitoring and assessment activities but also recommendations for future research.

3.2.1.9 Stock Structure and Distribution

Southern blue whiting is a schooling species that is predominantly found in sub-Antarctic waters, and is a highly synchronised batch spawner. A review of the evidence on the southern blue whiting stock structure is provided in Intertek (2012a) and is based upon historical data on distribution and abundance, reproduction, growth, and morphometrics. Four spawning areas have been identified - Auckland Islands Shelf (SBW 6A), Bounty Platform (SBW 6B), Campbell Island Rise (SBW 6I) and Pukaki Rise (SBW 6R).

Multiple discriminant analyses of data collected in October 1989 and 1990 showed that fish from Bounty Platform, Pukaki Rise and Campbell Island Rise could be distinguished on the basis of their morphometric measurements. There are also consistent differences in the size and age distributions of fish, in the recruitment strength, and in the timing of spawning between these areas. Spawning begins on Bounty Platform in mid-August and finishes there by mid-September; spawning begins 3–4 weeks later in the other areas, finishing in late September/early October. No genetic studies have been carried out, but given their close proximity, it is unlikely that there would be detectable genetic differences in the fish between these four areas.

For the purposes of stock assessment, it is assumed that there are three stocks of southern blue whiting with fidelity within stocks: Bounty Platform (SBW 6B), Campbell Island (SBW 6I) and Pukaki Rise (SBW 6R), The first two stocks are the focus of this MSC assessment.

During the site visit, NIWA scientists confirmed that there have not been more recent stock structure studies than those considered by Intertek (2012a). It was noted that fish spawning condition is monitored in the annual surveys and confirms the assumed stock structure.

3.2.1.10 Stock Productivity

Intertek (2012a) provides an overview of southern blue whiting stock productivity. Early growth has been well documented with fish reaching a length of about 20 cm fork length (FL) after one year and 30 cm FL after two years. Growth slows down after five years and virtually ceases after ten years. There is some indication of density-dependent growth. For example, the very strong 1991 year-class on the Campbell Island Rise grew at a much slower rate (smaller length and weight at age) than previous year-classes. A similar large reduction in growth rate occurred on the Bounty Platform with the strong 2002 year-class, with the subsequent two year-classes also growing at a similar slower rate (Large and Hanchet, 2017). For this reason, mean length at age is input into the assessment models as a year-specific matrix of lengths at age rather than a vector of length at age based on the von Bertalanffy growth parameters (e.g. Dunn and Hanchet, 2015a; 2017). Some adjustment for this is also made in the stock projections. For instance, due to the link between mean size at age of fish in the population and the population density, Dunn and Hanchet (2015a; 2017) assumed that the projected mean size at age would remain at the 2013 estimates, rather than return to the average size at age that might be expected at lower abundances.

The ages and lengths at maturity, and at recruitment into the fishery, vary between areas and between years. In some years, a small proportion of males mature at age 2, but the majority do not mature until age 3 or 4, usually at lengths of 33–40 cm FL. The majority of females also mature at age 3 or 4 usually at lengths of 35–42 cm FL.

Natural mortality (*M*) has been estimated as 0.2 = ln(100)/maximum age, where maximum age (22 years) is the age to which 1% of the population survives in an unexploited stock. Recent Campbell Island stock assessments (e.g. Dunn and Hanchet, 2015a; 2017) have estimated *M* within the model, using an informed prior with a mean of 0.2. and have produced estimates close to 0.2. Roberts and Dunn (2017) have recently published a report of southern blue whiting *M* which has implications for the assessment model's starting population age structure, and which has been accepted for the base case. This study estimated natural mortality to be higher than 0.2 and, if true, would suggest that current harvest strategies based upon the lower M = 0.2 are conservative.

Without knowledge of the catch before 1978 and with strong evidence that the population was not at an equilibrium age structure, Dunn and Hanchet (2015a; 2017) assumed a non-equilibrium age structure as the initial state of the stock in 1979. The numbers of individuals in the stock at the start of the model ($C_{initial}$) were estimated for each age group (by sex) as independent parameters.

Assuming an average age of maturity = 3.5, M = 0.2 implies a southern blue whiting generation time (T_{GEN}) of 3.5+1/0.2 = 8.5 years.

Stock assessments, which assume a Beverton and Holt stock-recruitment relationship with a steepness of 0.9, indicate that recruitment to the stock exhibits very high variability (see Stock Status section). There has been some study of the relationship between year-class strength and potential environmental predictors (e.g. Willis and Hanchet, 2007). The models provided good correlation of climate variables and year-class strength but had poor predictive power outside the medium range of year-class strength.

3.2.1.11 Fleet Composition and Fishery Removals

The southern blue whiting fishery is characterised by large, "clean" catches of the target species with minimal fish bycatch. MPI maintains a registry of all licence holders and

associated vessel and operational characteristics. The monitoring of the fishery has not changed significantly since Intertek (2012a). Landing information is required from each registered fishing vessel once all fish and fish product has been landed to a Licensed Fish Receiver (LFR) following each fishing trip. All permit holders are also required to supply a Monthly Harvest Return (MHR) by the 15th of the month following the month the catch was taken. The MHR lists, by fish stock, all fish taken in the month reported. Electronic reporting of the logbook data has been in place for the past decade on vessels >28 m LOA (length overall). The reporting regime also requires LFRs to report monthly to MPI all fish species received during that month from each fisher (LFRR). This is an independent check on all fish landed from all vessels by commercial fishers. The information from these reports is used by MPI to cross-check the information provided by permit holders. . During the site visit, MPI Compliance staff described an initiative to develop enhanced surveillance capacity based upon the integration of information from multiple monitoring activities. Implementation of an 'Integrated Electronic Monitoring and Reporting System' has been underway for a number of years, with an update on progress provided to the assessment team. Renamed the 'Digital Monitoring' program, electronic reporting has now been implemented on all trawl vessels >28m LOA. Note that all southern blue whiting vessels are >28 m and have had electronic catch and effort reporting as well as VMS for some time. In late 2017, the Minister of Fisheries announced a delay in the introduction of cameras on commercial fishing vessels to allow for further consultation on the proposal to ensure effective implementation. No decision as yet has been made on the date of implementation of this video surveillance. Further audits will need to keep informed of these developments.

The level of illegal and unreported catch is thought to be low although there have been a few convictions for area misreporting and illegal discards (MPI, 2017a). The corrected catches by area are included in the assessments and provided in the plenary report.

The MPI scientific observer programme provides information on the fishery's catch volume and composition on an on-going basis and represents a significant component of the management of the fishery and assessments of the stocks. During 2002/03 – 2010/11, observer coverage of the southern blue whiting trawl fishery ranged 25 – 41% and since 2012/13, has been 100% (Figure 14).

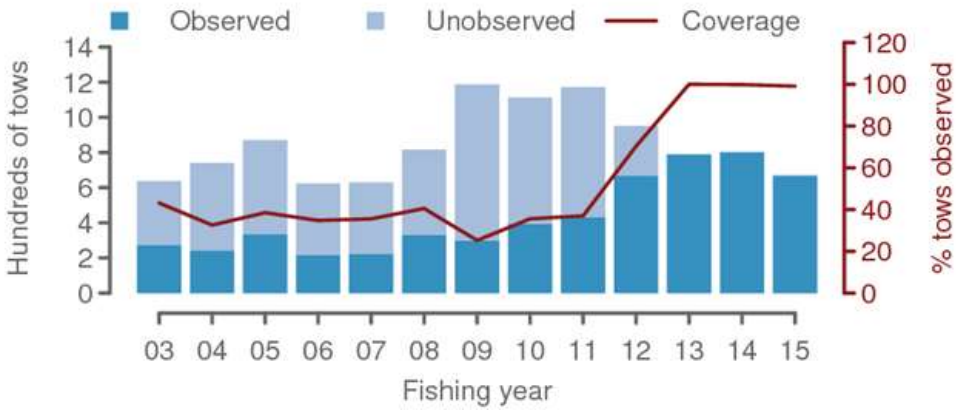


Figure 14. Number of tows and percent tows observed of the southern blue whiting trawl fishery by fishing year during 2002/03 – 2014/15; from https://psc.dragonfly.co.nz/2016v1/

The observers have occasionally reported discards of undersize fish and accidental loss from torn or burst codends with amounts reported in MPI (2017a). Total annual discard estimates (including estimates of fish lost from the net at the surface) range 0.4% - 2.0% of the estimated southern blue whiting catch over all the southern blue whiting fisheries. Based on a review of fish and invertebrate bycatch and discards in the southern blue whiting fishery in observer data during 2002 – 2007, an estimated 0.23% of the catch was discarded from observed

vessels. The low levels of discarding occur primarily because most catch comes from vessels that targeted spawning aggregations. Based upon these low discard estimates, stock assessments typically do not include this source of mortality.

There is no recreational or customary non-commercial fishery for southern blue whiting (MPI, 2017a).

3.2.1.12 Stock Abundance

The primary source of southern blue whiting abundance trends used in stock assessments continues to be acoustic surveys, which provide a direct estimate of the biomass of the aggregations which are fished (Intertek, 2012a; MPI, 2017a).

Wide area stratified-random September acoustic surveys commenced in 1993 and sampled the three main stocks (6I, 6B and 6R) until 2000, at which time, due to low catch limits on the Bounty and Pukaki stocks, the economic return from the fishery was too low to afford the wide area acoustic surveys and the time series in these areas were discontinued; it continues until the present for the Campbell Island Rise stock (Table 11). During the site visit, MPI indicated that the latter survey used to be conducted biannually but is now conducted tri-annually with the next survey to be conducted in 2019.

For the Bounty Platform stock, cooperative industry – government local aggregation acoustic surveys commenced in 2004 and have continued until the present using one industry vessel in each year. The fishing vessels opportunistically collect acoustic data between fishing activities from the Bounty Platform fishing grounds using a random survey design over an ad-hoc area that encompasses an aggregation of southern blue whiting. The local area aggregation surveys have had mixed success. Acoustic data collected in 2005 could not be used because of inadequate survey design and acoustic interference from the scanning sonar used by the vessel in its search for fish aggregations. There was concern that the surveys in 2006 and 2009 may not have sampled the entire aggregation as the acoustic fish marks extended beyond the area being surveyed on some transects. However, the surveys during 2010–2012 appeared to have sampled the entire aggregation and gave a similar estimate of biomass to that in 2009. Higher biomass was detected on the 2013 aggregation survey than the preceding four surveys, but since then biomass estimates have progressively declined, supporting the view that biomass has declined in this stock. O'Driscoll (2011) explored various reasons for the much lower observed biomass estimates from the surveys in 2009 and 2010 compared with 2007 and 2008. No reason in the survey methodology, equipment (including calibration), or changes in timing and extent of survey coverage could be found to explain the observed reduction in these estimates. The Bounty Platform local aggregation survey (O'Driscoll et al, 2016) provides the index of abundance which is used in the harvest control rule (HCR) as an absolute measure of biomass.

The design and operation of these surveys is discussed in O'Driscoll et al (2016) and O'Driscoll and Ladroit (2017). The wide area survey design has been consistent across years, with one vessel (R.V. Tangaroa) used. Vessels use calibrated Simrad ES60 echosounders. The absorption coefficient and target strength (TS) relationship has recently been re-evaluated (O'Driscoll et al, 2013). Target strength estimates for southern blue whiting are based on measurements made with a trawl-mounted acoustic-optical system (AOS) that measures fish and records their acoustic scattering as they enter the trawl. Because the tilt angle of fish in a trawl may be different from those swimming undisturbed in situ, there is uncertainty about how representative the TS values are. It is more likely that TS values are biased high because fish swimming in a net tend to be swimming horizontally (and therefore have higher TS) than southern blue whiting swimming naturally (which may have a wider range of tilts angles). The simulation work to estimate potential bias due to TS was conducted as part of the estimation of priors for the catchability parameter (q) for the acoustic surveys. This was presented to Deepwater Working Group in November 2014 and November 2015 for

the Bounty Platform and Campbell Island stocks respectively.

The local aggregation surveys use an adaptive design to cover all areas of high southern blue whiting density with hull-mounted 38 kHz transducers and have had mixed success (MPI, 2017a). The uncertainties in these surveys have been studied over a number of years and are well understood.

The sampling CVs provided in Table 10 are considered low; during the stock assessment process, these are increased to better represent the contribution of these data to stock status determination (see Section 3.2.1.13, Stock Assessment).

Table 10. Estimates of southern blue whiting biomass (t) for immature and mature fish from wide-area acoustic and local aggregation surveys; for Bounty Platform, proportion of fishing mortality assumed to occur before biomass estimate in each year (based on catch effort data, and sample dates for acoustic snapshots); sampling CV in parentheses (from MPI, 2017a)

a. Campbell Island (SBW 6I)

	Wide area surveys	
Year	Immature	Mature
1993	35 208 (25%)	16 060 (24%)
1994	8 018 (38%)	72 168 (34%)
1995	15 507 (29%)	53 608 (30%)
1998	6 759 (20%)	91 639 (14%)
2000	1 864 (24%)	71 749 (17%)
2002	247 (76%)	66 034 (68%)
2004	5 617 (16%)	42 236 (35%)
2006	3 423 (24%)	43 843 (32%)
2009	24 479 (26%)	99 521 (27%)
2011	14 454 (17%)	53 299 (22%)
2013	8 004 (55%)	65 801 (25%)
2016	4 456 (19%)	97 117 (16%)

b. Bounty Platform (SBW 6B)

	Wide area surveys		Local aggregation surveys	
Year	Immature	Mature	Mature	Proportion
1993	15 269 (33%)	43 338 (58%)	-	-
1994	7 263 (27%)	17 991 (25%)	-	-
1995	0 (-)	17 945 (24%)	-	-
1997	3 265 (54%)	27 594 (37%)	-	-
1999	344 (37%)	21 956 (75%)	-	-
2001	668 (28%)	11 784 (35%)	-	-
2004		-	8 572 (69%)	0.73
2005		-	-	-
2006		-	11 949 (12%)	0.78
2007		-	79 285 (19%)	0.93
2008		-	75 889 (34%)	0.68
2009		-	16 640 (21%)	0.29
2010		-	18 074 (36%)	0.35
2011		-	20 990 (28%)	0.89
2012		-	16 333 (7%)	0.84
2013		-	28 533 (27%)	0.76
2014		-	11 852 (31%)	-
2015		-	6 726 (42%)	-
2016		-	6 201 (35%)	-

Trawl survey estimates for southern blue whiting on the Auckland Islands Shelf and Campbell Island Rise are available for 1991 to 2009. Although the surveys are not designed to monitor southern blue whiting, the biomass estimates generally had moderate levels of noise, showed some consistency between years, and the biomass trends showed some correspondence with the biomass trajectories from the stock assessments. However, these indices have not been used in the stock assessments.

Standardised commercial CPUE indices have been produced for the Bounty Platform and Campbell Rise stocks (1990-2002). There has been concern that due to the highly aggregated nature of southern blue whiting, the nature of the fishing operations and the associated difficulty in finding and maintaining contact with the highly mobile schools in some years, the CPUE series may not be monitoring abundance. This is consistent with the well documented issues of CPUE – biomass relationships, particularly of highly aggregated species such as southern blue whiting (e.g. Maunder et al, 2006). Therefore, these indices have not been used in the stock assessments since 1998.

Other Data

Beyond the UoC fisheries, there are additional deepwater trawl fleets, for which sampling and monitoring is conducted in an identical manner as described above.

3.2.1.13 Stock Assessment

Campbell Island Rise (SBW 6I)

Assessments of the Campbell Island Rise (SBW 6I) stock were conducted in 2011 and 2014 with the latest conducted in 2017. The 2017 assessment was not included in the 2017 plenary report and the following is based upon the Fishery Assessment Report (Dunn and Hanchet, 2017).

The assessment modelling approach has not changed significantly since Intertek (2012a) which used the 2011 in its scoring. These assessments use catch history, proportion-at-age,

and acoustic survey data from 1979 – present in a two-sex, single stock and area Bayesian Statistical Catch-At-Age (SCAA) modeling framework (implemented by the NIWA stock assessment program CASAL, Bull et al, 2012). This approach explicitly considers process error in the surveys and observation error in the catch and survey inputs. In common with stock assessments for most whitefish fisheries, the key outputs from the assessments are unfished spawning biomass, B_0, for each stock, current spawning biomass for each stock, the selectivity patterns for the fisheries and the surveys, and the time-trajectories of spawning stock biomass, fishing mortality and recruitment by stock. The model structure is fully described in MPI (2017a) with details also in Intertek (2012a) and will not be repeated here. In general, the base case model includes:

- Two sexes and 15 age groups & age 15+ group (2011 assessment used age 11+ group)
- Two annual time steps (pre and post spawning) to account for migration
- Recruitment estimated as deviations around assumed Beverton and Holt stock-recruitment relationship (steepness assumed as 0.9) with sex ratio assumed as 0.5
- Starting population numbers at age estimated separately for each age (assumed equal by sex)
- Cohort equation to estimate population numbers by year-class
- Growth as empirical size at age matrix
- Natural mortality (0.2) fixed
- Year-invariant acoustic survey catchability estimated separately for immature & mature fish
- Year-invariant fishery selectivities at age (logistic) estimated.

The objective function consists of priors on all (fixed) parameters, likelihood functions for the sex-specific catch proportions at age (multinomial) and acoustic survey indices (lognormal), and penalty functions to constrain the model so that parameter combinations that did not allow historical catch to be taken were strongly penalised. Additional 'process' error, assumed to arise from differences between model simplifications and real-world variation, was estimated separately for the catch proportions (as per Francis, 2011) and survey data (estimated to be zero) and added to their observation error.

In general, the prior distributions used in the assessment were intended to be non-informative with wide bounds (Table 11). The exceptions to this were the priors and penalties on the acoustic biomass catchability coefficient and on relative year-class strengths. A new log-normal prior was developed for the wide area acoustic survey catchability coefficient obtained using the approach of Cordue (1996). The main difference between the revised prior and the original prior used in the earlier assessments was the inclusion of uncertainty over the tilt angle of southern blue whiting. While the earlier analysis had indicated a lower bound of 0.39, this did not account for recent updates to the target strength of southern blue whiting based on *in situ* measurements using an acoustic-optical system (AOS) (O'Driscoll et al 2013). The AOS target strength estimate was based on observations of fish in the mouth of a trawl, which had a mean swimming angle of 16° and standard deviation of 15° (O'Driscoll et al 2013). This may have over-estimated target strength of fish in spawning aggregations, as spawning fish are likely to have a different tilt angle distribution to those being herded by a trawl. Hence, the 2017 assessment models assumed a lower bound on the catchability prior of 0.11 to account for possibility of this bias. The aggregation of these individual priors provided an overall lognormal prior which had a mean of 0.54 and CV = 0.44 (Table 12).

Table 11. Distributions, priors, and bounds assumed for parameters estimated for Campbell Island southern blue whiting stock assessment; from Dunn and Hanchet (2017)

Parameter	N	Priors			
	Distribution	Values		Bounds	
		Mean	CV	Lower	Upper
B_0	1	Uniform-log	–	–	30 000	800 000
Initial population (by sex)	14	Uniform	–	–	2e2	2e9
Male maturation ogive	5	Uniform	–	–	0.001	0.999
Female fishing selectivity	5	Uniform	–	–	0.001	0.999
Year class strength	36	Lognormal	1.0	1.3	0.001	100
Acoustic catchability q						
Mature	1	Lognormal	0.54	0.44	0.1	1.71
Immature	1	Uniform	–	–	0.1	1.71
*Natural mortality (average)	1	lognormal	0.2	0.2	0.075	0.325
*Natural mortality (difference)	1	Normal	0.0	0.05	-0.05	0.05

Table 12. Original and revised 'best', lower and upper bounds for the factors for the acoustic catchability prior; lognormal prior with mean 0.54 and CV 0.44 was used in assessment; from Dunn and Hanchet (2017)

Factor	Original			Revised		
	Lower	Best	Upper	Lower	Best	Upper
Target strength: Uncertainty	0.72	0.90	1.13	0.80	1.00	1.20
Target strength: Tilt angle	-	-	-	0.25	0.70	1.00
Target identification	0.90	1.15	1.45	0.85	1.00	1.15
Vertical availability	0.75	0.85	0.95	0.90	0.95	1.00
Areal availability	0.90	0.95	1.00	0.80	0.90	1.00
System calibration	0.90	1.00	1.10	0.90	1.00	1.10
Combined	0.39	0.84	1.71	0.11	0.60	1.52
Lognormal parameters	mu=0.87, CV=0.30			mu=0.54, CV=0.44		

Natural mortality was estimated to be 0.20 by Hanchet (1991). When estimated in the 2017 assessment, natural mortality was parameterised by the average of male and female, with the difference estimated with an associated normal prior with a mean of zero and bounds of 0.05. The prior on the average natural mortality was assumed to be a normal distribution with mean of 0.20 and CV= 0.20 following Dunn & Hanchet (2015a). Penalty functions were used to constrain the model so that any combinations of parameters that did not allow the historical catch to be taken were strongly penalised. A small penalty was applied to encourage the estimates of year-class strengths to have mean equal to one.

Estimation of the parameters and associated uncertainty occurs in two phases. The first 'exploratory' phase is conducted on a range of candidate models as an optimization and is used to identify the mode of the joint posterior distribution (MPD). During this phase, model fit diagnostics (e.g. residual analyses) are examined and a base case model along with additional 'sensitivity' models which bracket the main uncertainties are identified. Dunn and Hanchet (2017) provide the model fits, which are generally good. During the site visit, it was queried whether or not retrospective analyses are conducted during this phase. NIWA scientists indicated that due to the nature of these SCAA models, with a variety of data sources of varying time period length, retrospective analyses are not an effective diagnostic tool. In the second phase, the full posterior distribution of the parameters of all models is characterized using Markov Chain Monte Carlo (MCMC) methods based upon the Metropolis-Hastings

algorithm and tests for chain convergence. This allows interpretation of stock status indicators in probabilistic terms relative to reference points (e.g. $Pr(B_{current} > 0.40B_0)$.

In the 2011 assessment, in addition to the base case, a sensitivity model was run to test the impact of assuming size-based, as opposed to age-based, fishery selectivity. Based upon the analyses, the DWFAWG agreed the age-based model would be reported as the base case. In the 2014 assessment, three models were run: the base case model and two sensitivities – base case excluding the 2009 survey and base case with natural mortality estimated. Dunn and Hanchet (2015a) noted that the assessment was strongly influenced by the high biomass estimates from the 2009 and 2011 acoustic surveys. These surveys observed some of the highest estimates of adult and immature biomass since the survey series began in 1993. There was no reason to doubt that the 2006 and 2009 year-classes are strong, but the size of these year-classes was not well estimated. The relative strength of these year-classes differed slightly between the models with the 2009 year-class being stronger than the 2006 year-class. The most recent assessment (Dunn and Hanchet, 2017) has confirmed the relative size of these year-classes, and noted a strong 2011 year-class as well. This more recent assessment estimates a similar stock trajectory up until 2013 with slight differences: (i) a slightly lower spawning biomass in 2013, (ii) a slightly higher B_0, and (iii) a higher estimate of the 2011 year-class. The main driver for the slight decrease in spawning biomass was the lower estimates of adult biomass in the 2011 and 2013 acoustic surveys compared to the 2009 survey.

Regarding natural mortality (*M*), Roberts and Dunn (2017) attempted to identify an appropriate assessment model for the stable, unbiased estimation of *M*. The 2014 and 2017 assessment models assumed *M* = 0.20 along with sensitivity runs with *M* estimated. A model run, in which *M* was estimated, produced an *M* of 0.17 at MPD and 0.33 at MCMC. Using simulated data sets, Roberts and Dunn (2017) determined that the model produced a median *M* of 0.28 at MCMC, indicating a positive bias. The estimation of *M* was sensitive to the selection of its prior CV (0.20 in base case), with a contraction of the *M* posterior towards the prior mu (0.20) as the CV was reduced. Alternative models which explored an equilibrium age structure in1960 instead of a non-equilibrium age structure in 1979 and the choice of the lognormal priors on *M*, year-class strength and acoustic mature biomass index q were influential on the estimation of *M* in their base case. The investigations were unable to identify a model structure that produced stable and unbiased estimates of *M*. Roberts and Dunn (2017) recommended that the assessment continue to use 0.20 with sensitivity analyses at 0.15 and 0.25 until the causes of bias could be identified and corrected. Dunn and Hanchet (2017) followed this recommendation.

Virgin biomass (B_0) has been poorly estimated in the models as a consequence of a few very strong year-classes strongly influencing estimates of average recruitment. In recent years, the influx of several new and strong year-classes has impacted the estimate of average recruitment, and hence has resulted in changing estimates of B_0. In earlier assessments, B_0 was estimated to be lower – for example, in 2006, it was estimated as 245,000 t. With the recent occurrence of several strong year-classes in the fishery, the estimate of B_0 has increased to 343,000 t in the 2013 assessment (Dunn & Hanchet 2015a) and again to 352,200 t in the 2017 assessment (Dunn and Hanchet, 2017).

Bounty Platform (SBW 6B)

Assessments of the Bounty Platform (SBW 6B) stock were conducted in 2004 and 2010 employing a Bayesian modeling approach similar to that of the Campbell Island stock as described in Intertek (2012a). The 2010 assessment differed from that in 2004 primarily with the inclusion of the time series of industry based acoustic local aggregation surveys from 2003 to 2009 as well as proportion-at-age data from 1990 to 2009. Intertek (2012a) used the 2010 assessment in its evaluation. Because of problems with the assessment model, the DWFAWG decided to use the lower estimates from the recent acoustic surveys to calculate the Current

Annual Yield (CAY) for management advice until the model could be improved, which is precautionary. As per the HSS, the CAY is estimated as CAY = F_{REF} * Biomass where F_{REF} is the reference fishing mortality expected to achieve average Maximum Sustainable Yield (MAY) in the long-term and Biomass is the fishable component of the stock and the beginning of the fishing year. In the case of Bounty Platform southern blue whiting, $F_{REF} = M = 0.20$ was considered to be a conservative proxy for the fishing mortality that would result in the stock biomass moving to B_{MSY}. The CAY was therefore estimated to be approximately 20% of the available biomass estimated from the acoustic survey. Intertek (2012a) provides the assumptions used by the DWFAWG in estimating the annual CAYs. Notwithstanding this, the model has been used to undertake stock projections and estimate reference points.

An assessment of the stock was conducted in 2013 although only MPD runs were considered due to MCMC convergence problems. The next full assessment was conducted in 2014 (MPI, 2017a). Preliminary model runs did not provide a satisfactory fit to both the high local area aggregation acoustic biomass estimates observed during 2007–2008 and the lower local area aggregation biomass estimates observed since 2009. Thus, the DWFAWG evaluated models with different assumptions that compared the extent to which the high biomass and subsequent decline were fitted. A base case model was developed, with sensitivity runs on the assumed acoustic survey catchability (q) prior, which indicated that the observed 2013 biomass and recent age structures were only consistent with the observed biomass in 2007 and 2008, if it was assumed that the 2009–2012 acoustic observations underestimated the true biomass.

Further developments of the assessment focused on evaluating models with different assumptions that allowed a comparison of the extent to which the high biomass and its subsequent decline were fit. Models focused on investigating the outcomes of fitting either (i) the early part of the local aggregation survey time series, (ii) the later part of its time series, or (iii) model assumptions that may allow both parts to be equally fit. Dunn and Hanchet (2015b), in their update of the 2010 assessment, describe these and other model explorations in detail. The main uncertainty in the assessment is that the overall proportion of the adult biomass being sampled by each local aggregation survey is unknown and may vary annually. For instance, annual estimates of local aggregation survey q reported by Dunn and Hanchet (2015b) ranged from 0.15 – 2.77 across the various models and surveys fit. Consequently, the stock assessment models have been unable to fit the acoustic survey observations, which would require a separate q for each survey, resulting in an over-parameterized model. In summary, the models have not been able to reconcile the trends in the acoustic indices and the age frequency data and/or the results have been ambiguous.

Ultimately, these explorations have not proven successful and the results of recent stock assessments are not thought to be reliable for informing TACC setting. Thus in 2017, the DWFAWG put aside the SCAA Bayesian modelling approach in favour of an update to the Harvest Control Rule based upon a Management Strategy Evaluation (MSE) of the main uncertainties in the assessments. It was considered that the local aggregation acoustic survey can still provide an absolute estimate of biomass sufficient to inform management through an HCR as long as it is shown to be robust to the uncertainties identified in the earlier assessments. The current stock assessment, in effect, is the annual local aggregation survey informed by an MSE exploration of the uncertainties and the utility of the acoustic survey index in an updated HCR (see Section 3.2.1.3, Harvest Strategy).

3.2.1.14 Peer Review

The stock assessment peer review process has not significantly changed since Intertek (2012a) and is described in the introductory section of the annual Plenary Report. The compilation of an assessment is contracted out by MPI and in recent years, a team of NIWA scientists has prepared most stock assessments, a review of which is initially conducted within

NIWA. The input data and then the assessment are then presented to MPI's Deepwater Working Group (DWFAWG), which reviews the input data and draft assessment and provides observations and recommendations to the assessment team on its analysis. The DWFAWG is open to all. Meeting proceedings and working papers are made available on MPI's website to those who have registered as members to the group. The DWFAWG typically meet during Nov-Jan to review the southern blue whiting assessments which include fishery and survey data up to the end of the previous fishing year (e.g. Nov-Jan 2017/18 SBW assessment included data up until fishing year April 2016 – March 2017). The Plenary meeting is held in June, the consensus summary of which is made publically available in a Plenary Report (e.g. MPI, 2017), which provides the key findings of the assessment. The more detailed technical descriptions of the assessments are subsequently (September) published in a New Zealand Fisheries Assessment Report (FAR) (e.g. Dunn and Hanchet, 2015a).

The management response to the assessment is prepared during Feb-March after the assessment as part of the public consultation process on the upcoming year's TACCs. The Plenary Report is considered by MPI in its development of harvest options for the Minister of Fisheries. During this process, stakeholders may provide input on harvest options additional to those provided by the DWFAWG. During the site visit, it was noted that during this process, MPI requests stock projections and related analyses from the stock assessment scientists to inform management options and decisions (Table 13).

Table 13. Annual Schedule of Southern Blue Whiting Science Working Groups and Management process; from T. Bock (pers. comm.)

	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar
Southern blue whiting	Fishing Year							Fishing Year											
(usual process)			SBW Working Groups			Mgmt response				Plenary (1 June)			FAR publication						
(Recent years)			SBW Working Groups								SBW WGs cont				FAR publication				

During the site visit, MPI indicated that in recent years, there has been discussion by the DWFAWG continuing into July – August, due to the recent changes in the stocks, which has delayed release of the FARs to November (Table 13).

The schedule of southern blue whiting stock assessments was on a 2-year cycle until 2014 at which time it changed to a 3-year cycle (Table 14). The most recent assessments of the Campbell Rise and Bounty Platform stocks were conducted in 2017.

During the site visit, it was indicated that during years between full assessments, catch and survey data are monitored and if there is indication of a change in stock status, a full analysis can be initiated, either at request of industry or solely by MPI (T. Bock, pers. Comm.).

Table 14. Schedule of southern blue whiting assessments by stock since 2002; italics indicate assessments used in Intertek (2012a)

	Campbell Is Rise (SBW 6I)	Bounty Platform (SBW 6B)
2002		
2003		
2004		SCAA (Bayesian)
2005		
2006		
2007		
2008		
2009		
2010	*SCAA (Bayesian)*	*SCAA (Bayesian)*
2011		
2012	SCAA (Bayesian)	
2013		SCAA (Bayesian; MPD only)
2014	SCAA (Bayesian)	SCAA (Bayesian)
2015		
2016		
2017	SCAA (Bayesian)	MSE

No external reviews have been conducted of the southern blue whiting stock assessments. However, there is a Stock Assessment Methods Working Group which considers technical issues of the assessment models and has participation of international experts.

3.2.2 Principle 2

Principle 2 of the MSC Standard states: "*Fishing operations should be managed to maintain the structure, productivity, function and diversity of the ecosystem on which the fishery depends*" (MSC 2013a).

3.2.3 Background

Following the format for a reduced reassessment, it is noted that a thorough introduction to the New Zealand marine environment is provided in the previous certification report for the New Zealand southern blue whiting trawl fishery (Intertek 2012a). Readers are encouraged to refer to that report (specifically Section 7) for additional background information.

3.2.4 Retained and bycatch species

Under the CR v.1.3 (MSC 2013a), retained species are those that are "*retained by the fishery (usually because they are commercially valuable or because they are required to be retained by management rules)*", while bycatch species are "*Organisms that have been taken incidentally and are not retained (usually because they have no commercial value)*".

For retained species, a 'main' designation may then be given, which allows for "*consideration of the weight, value or vulnerability of species caught. For instance, a species that comprises less than 5% of the total catch by weight may normally be considered to be a minor species (i.e., not 'main') in the catch, unless it is of high value to the fisher or of particular vulnerability, or if the total catch of the fishery is large, in which case even 5% may be a considerable catch. A species that normally comprises 20% or more of the total catch by weight would almost always be considered a 'main' retained species*" (GCB3.5.2 MSC 2013b). Near identical guidance is provided for 'main' bycatch species (GCB3.8.2).

It is noted that some elasmobranchs (e.g., sharks and skates) and deepwater fish species that are relatively slow growing, late to mature, and long lived, may be considered to be 'of particular vulnerability' according to the MSC requirements, although the MSC provides no guidance in CR v.1.3 (MSC 2013a, MSC 2013b) as to what percentage of the catch should be used in considering such species as 'main'. The MSC's CR v2.0 requirements do, though, provide a 2% threshold for considering 'less resilient' species to be 'main' (MSC 2014, SA 3.4.2). The New Zealand southern blue whiting trawl fishery Assessment Team was guided by this approach in determining 'main' or 'minor' species.

Catch data from the southern blue whiting trawl fishery are available for the period 1991-2014 (Anderson 2017). Table 15 shows there were no main retained or main bycatch species in the catch in the most recent five years, with only ling (other than southern blue whiting) accounting for more than 0.1% of the catch. Species comprising ≤0.1% of the catch are considered to be negligible components and are not considered further, here or in scoring. In total, there were 28 such species recorded in the catch, which all together comprised an average of 0.43% of the catch over the most recent five years for which data are available (Table 15).

The Assessment Team made an exception to the approach to assessing negligible species for porbeagle shark, which comprised 0.04% of the catch on average for the 2010-2014 period. Porbeagle shark was considered as a minor bycatch species, in part because it may be considered 'of particular vulnerability', but also because catch data for 2014 showed an increase from the previous four years (Table 15). Ling and porbeagle shark are discussed in more detail on the following pages.

Table 15. Observer data adjusted to the whole fleet showing catches in the southern blue whiting trawl fishery, 2010-2014 (Anderson 2017).

Species		2010 (t)	2011 (t)	2012 (t)	2013 (t)	2014 (t)	5 Year Mean (t)	2010 %	2011 %	2012 %	2013 %	2014 %	5 Year Mean %
SBW	*Micromesistius australis*	39540	38708	38412	29906	32950	35903	99.33	99.51	99.50	99.34	99.48	99.43
Ling	*Genypterus blacodes*	35	49	69	35	62	50	0.09	0.13	0.18	0.12	0.19	0.14
Porbeagle Shark	*Lamna nasus*	12	13	2	12	27	13.2	0.03	0.03	0.01	0.04	0.08	0.04
28 other species each comprising <0.1% of the catch		218	127	122	152	83	140	0.55	0.33	0.32	0.50	0.25	0.39
Total		39805	38897	38605	30105	33122	36107	100.0	100.0	100.0	100.0	100.0	100.0

Key: Target species, Minor retained species, Minor bycatch species, Negligible species

3.2.4.1 Minor retained species

Ling is managed as a Tier 1 QMS species, and the trawl and longline fisheries for ling are MSC certified at the present time (Intertek 2014a). Two stocks are relevant to the assessment of the southern blue whiting trawl fishery – LIN 6B (Bounty Plateau – relevant to SBW 6B [UoC 1]) and LIN 5 & 6 (Sub-Antarctic, excluding Bounty Platform – relevant to SBW 6I [UoC 2].

The most recent assessment of LIN 6B was in 2007, and the projections at that time were for the stock to decline but to still be above 50% of B_0 by 2011. A CPUE update was provided in 2014, and MPI 2017a reported that while estimates of current and virgin stock size are not well known, current biomass of the LIN 6B stock is very likely to be above 50% B_0.

The LIN 5 & 6 stock was last assessed in 2015. From a very high level, status declined through the 1990s, but has exhibited an upturn during the last 15 years. The biomass trajectory from the base case model was little different to that derived from the reference model. MPI 2017a reported that B_{2014} was estimated to be 86% B_0 and virtually certain (>99%) to be above the target, and exceptionally unlikely (< 1%) to be below either the soft or hard limit. Overfishing was exceptionally unlikely (<1%) to be occurring.

3.2.4.2 Minor bycatch species

Porbeagle shark was added in to the QMS system on 1st October 2004 under a single quota management area (POS 1). The POS 1 TACC is set at 110 t, and total New Zealand EEZ commercial catches for 2013-2016 have been 83.2 t, 70.1 t, 94.1 t and 45.9 t, respectively (MPI 2018).

Francis & Large (2017) reported that there is some inconsistency amongst trends identified for porbeagle shark in New Zealand waters, and that some year-to-year CPUE variations were too large to represent changes in population biomass, and may instead reflect changes in availability to the fishery. However, it was concluded that, when taken as a group, the indicators suggest that the porbeagle population around New Zealand has been stable or increasing during the last decade.

An assessment of Southern hemisphere porbeagle shark population was undertaken for the first time, recently (Hoyle et al. 2017). The assessment was split into five areas, with New Zealand waters included within the Western Pacific region of the assessment. The New Zealand midwater trawl fleet was determined to account for around 10% of the fishing mortality on this stock component, but the assessment results indicated that the annual upper 95%

confidence interval for the ratio of F to F_{MSM} (the instantaneous fishing mortality rate that corresponds to the maximum number of fish in the population that can be killed by fishing in the long term) for the Western Pacific region has averaged just 0.62 for the 23 years (1992-2014) covered by the assessment. This indicates the stock has been fished sustainably over a long period of time and, overall, the impact of fishing was determined to be low across the entire Southern hemisphere range of the porbeagle shark population (Hoyle et al. 2017).

3.2.5 Endangered, threatened or protected (ETP) species

Following the format for a reduced reassessment, it is noted that an introduction to ETP species is provided in the previous certification report for the New Zealand southern blue whiting trawl fishery (specifically Sections 3.4.2.2 to 3.4.2.5) (Intertek 2012a). A detailed review of issues around the capture of New Zealand sea lions in the fishery was also undertaken as part of an expedited audit in 2013 (Intertek 2013). Readers are encouraged to refer to both reports for additional background information.

Protected corals

It is noted that the southern blue whiting fishery functions as a midwater trawl fishery, and bottom contact is minimal, being restricted mainly to the start of a trawl when the gear is being set. The potential for catching or impacting protected coral species is very low, therefore. Nevertheless, there are just a very few records of coral being taken in the fishery (Baird et al. 2013), and so this ETP species group is included in the assessment.

Most corals in New Zealand waters are protected under the Wildlife Act 1953. The legislation means it is not illegal to incidentally catch corals, but any corals that are taken must be returned immediately and the capture reported on a Non-Fish Protected Species Catch Report (NFPSCR). DOC (undated) lists the protected coral groups specifically as follows (noting it is understood that 'Gorgonacea' is no longer scientifically valid, and 'Alcyonacea' is now the accepted name for that Order):

- Black corals (all species in the order Antipatharia)
- Gorgonian corals (all species in the order Gorgonacea)
- Stony corals (all species in the order Scleractinia)
- Hydrocorals (all species in the family Stylasteridae).

A considerable body of research has been amassed on the biology and distribution of deep-sea coral species around New Zealand, and the potential impact of fishing activities, including reports by Consalvey *et al*. 2006 and Baird *et al*. 2013.

Baird et al. (2013) used predictive models and coral occurrence data from research sampling and commercial fishing trips where observers were carried to map the distribution of corals. Their dataset contained 7731 records, of which 10% were black corals, 33% were gorgonians, 46% were stony corals, and 11% were hydrocorals. However, Table 16 shows that only 2 out of the total of 3,141 observer records (i.e., 0.06%) were reported from the southern blue whiting fishery, or 2 out of 828 observer records from Fishery Management Area (FMA) 6 (i.e., 0.24%).

Table 16. Observer reports of catches of protected corals (all species) in fisheries targeting different species (adapted from Baird et al. 2013).

	Fishery Management Area (FMA)									
Target Fishery	1	2	3	4	5	6	7	9	10	All
SBW	0	0	0	0	0	2	0	0	0	2
All Fisheries	343	78	289	925	152	828	22	488	17	3141
% from SBW	0.00	0.00	0.00	0.00	0.00	0.24	0.00	0.00	0.00	0.06

Baird et al. (2013) concluded: "*The areas where the environmental conditions were most suited to the coral groups were generally in deeper waters where the seafloor had steep slopes. Most of the known coral distributions were within the areas predicted by the models to have suitable environment; however, some deepwater and steep relief areas where corals were known to exist were not identified by the predicted distribution. ... Generally the areas predicted to have the greatest probability of conditions suitable for corals were outside the main fisheries areas, except for some deepwater fisheries that occurred on areas of steeper relief. The fisheries that pose the most risk to protected corals are the deepwater trawl fisheries for species such as orange roughy, oreo species, black cardinalfish, and alfonsino.*"

There is also now a regular collation and review of trawl footprint data for each of the main deepwater fisheries in New Zealand waters (e.g., Black et al. 2013, Black & Tilney 2015, Black & Tilney 2017). Overall, the amount of ground that is towed in the New Zealand deepwater trawl fisheries has halved in recent years, from a peak in the mid-late 1990s to early 2000s of 150,000 – 190,000 km^2 per year, to the current level of around 70,000 – 80,000 km^2 per year (Black & Tilney 2017).

Given their sensitivity to fishing impacts, and the slow rate of recovery of coral species, demersal trawling that opens up new locations can be a particular concern. Of all the New Zealand deepwater trawl fisheries, the southern blue whiting trawl fishery is the one for which newly swept area comprises the largest part of the fishery's total swept area (50% in 2010/11, 52% in 2011/12, 36% in 2012/13 – data for 2010/11 from Black & Tilney 2015, data for later years from Black & Tilney 2017). However, these data reflect that the southern blue whiting fishery mainly occurs in midwater and targets shoals of blue whiting (which are mobile), rather than targeting seabed features or fishing on particular tows along the seabed which are known to provide risk of snagging gear. As such, rather than raising concerns with respect to impacting protected corals, the footprint data in fact provide further assurance that the southern blue whiting trawl fishery presents a very low risk to these species.

Marine Mammals

There are a wide variety of marine mammals present in the waters around New Zealand, and all are designated as protected species under the Marine Mammals Protection Act and the Fisheries Act. The southern blue whiting trawl fishery is known to interact rarely or never with most species, however, including cetaceans (estimated = 0 captures annually, 2002/03 – 2014/15) and pinniped species other than New Zealand fur seal and New Zealand sea lion (estimated = 1 capture only, in 2004/05, over the entire 2002/03 – 2015/16 period) (data from https://psc.dragonfly.co.nz/2017v1/).

The southern blue whiting fishery does, though, interact with New Zealand fur seals and New Zealand sea lions, and these species have been the focus of management and mitigation efforts; MPI 2016 provides a thorough overview of the issues. The most recent threat assessment for New Zealand marine mammals (Baker et al. 2016) classified New Zealand fur seals as 'Not threatened', on the basis that it is a resident native species with a large, stable population. New Zealand sea lions were assessed as 'Nationally Critical', on the basis of this species having a moderate population with high, on-going or predicted decline.

Under the National Deepwater Fisheries Plan (Ministry of Fisheries 2010), the objective most relevant for management of New Zealand fur seals and sea lions is Management Objective 2.5: "*Manage deepwater and middle-depth fisheries to avoid or minimise adverse effects on the long term viability of endangered, threatened and protected species.*"

In this regard, Deepwater Group issued Marine Mammal Operational Procedures (MMOPs – DWG 2014b) to reduce the risk of marine mammal captures. The MMOPs are currently applied

to trawlers greater than 28 m LOA and are supported by annual training. They include a number of mitigation measures, such as managing offal discharge, refraining from shooting the gear when New Zealand fur seals or New Zealand sea lions congregate around the vessel, and the introduction of 'trigger' points – if two fur seals are captured within 24 hours, or five fur seals are captured over 7 days then the following procedure is triggered:

1. Advise vessel manager;
2. Record capture event including location of capture in ship's log;
3. Ensure gear failures are addressed with the gear either on board or at a depth >50m;
4. Report capture to Deepwater Group either directly or via shore management.

For sea lions, the trigger point is the capture of a single animal, and the additional step of completing the 'sea lion capture questionnaire' is required. These reports are used to inform the development of changes and improvements to management and mitigation.

(2016) notes that the major focus of the MMOPs is to reduce the time gear is at or near the surface, at which time it poses the greatest risk of capturing marine mammals. However, finding ways to mitigate captures has proven difficult because both New Zealand fur seals and New Zealand sea lions are free swimming, can easily dive to the depths of the net when it is being deployed, hauled, or brought to the surface during a turn, and are known to actively and deliberately enter nets to feed.

Performance in relation to the MMOPs is monitored by observers and audited by MPI and reported in the Annual Review Report for Deepwater Fisheries (MPI 2017e).

The risk to New Zealand marine mammals from commercial fishing activities (trawl, longline, set-net and purse-seine fisheries within New Zealand's EEZ) was assessed recently (Abraham et al. 2017). Risk was defined by the ratio of Annual Potential Fatalities (APF – an estimate of the number of marine mammals killed in the fisheries each year) to the Population Sustainability Threshold (PST – a measure of the population productivity). A risk index higher than one indicates that fisheries mortalities are at a level that may prevent the population increasing to, or remaining above, half the carrying capacity in the long term. The results indicate that the New Zealand fur seal has a mean risk of 0.31 (95% c.i. = 0.13-0.64), while New Zealand sea lion has a mean risk of 0.10 (95% c.i. = 0.05-0.19) (Table 17).

Table 17. Risk ratio for New Zealand fur seal and New Zealand sea lion, based on the number of annual potential fatalities in fisheries to the population sustainability threshold (PST) for each population, using PST values based on expert opinion (shown are mean values, 95% confidence intervals (c.i.) and the coefficient of variation (CV) (from Abraham et al. 2017).

	Risk Ratio		
Species	Mean	95% c.i.	CV
New Zealand fur seal	0.31	0.13-0.64	0.42
New Zealand sea lion	0.10	0.05-0.19	0.37

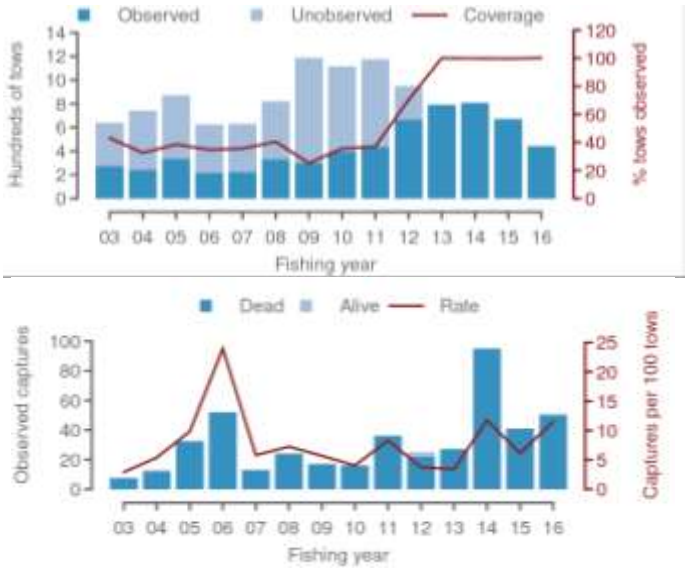
New Zealand fur seals

The southern blue whiting fishery is responsible for the capture of an estimated annual average of 70 New Zealand fur seals from 2002/03 – 2014/15, which equates to 11.8% of the total taken in New Zealand trawl fisheries over the same period. The estimated average annual number of captures of New Zealand fur seals in the most recent five years for which data are available is similar, at 62 animals, which equates to 13.8% of the number taken in New Zealand trawl fisheries in total (Table 18).

Table 18. Estimated total captures of New Zealand fur seals in the southern blue whiting fishery and in all New Zealand trawl fisheries, 2002/03 – 2014/15 (data from https://psc.dragonfly.co.nz/2017v1/).

	Southern blue whiting trawl	All trawl	SBW as % of total
2002/03	22	924	2.4
2003/04	36	1120	3.2
2004/05	103	1487	6.9
2005/06	67	949	7.1
2006/07	25	570	4.4
2007/08	110	795	13.8
2008/09	129	564	22.9
2009/10	114	495	23.0
2010/11	76	443	17.2
2011/12	69	451	15.3
2012/13	27	438	6.2
2013/14	97	416	23.3
2014/15	41	536	7.6
Mean 02/03 - 14/15	70	707	11.8
Mean 10/11 - 14/15	62	457	13.9

It is noted that the observed rate of capture of New Zealand fur seals in the fishery (i.e., the number observed captured per hundred tows) was relatively stable for the latter part of the 2000s and the early part of the 2010s, but appears to have increased slightly in the recent period (Figure 15, middle panel). The decline in the annual average number taken in recent years, however, reflects that fewer tows have been undertaken in the southern blue whiting fishery in recent years (Figure 15, top panel). The tight confidence intervals associated with total captures in recent years (Figure 15, bottom panel) reflects that very nearly all tows in the southern blue whiting fishery have been observed since 2012/13.



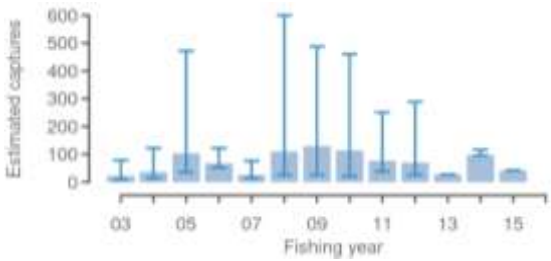


Figure 15. For the southern blue whiting trawl fishery, effort and observer coverage (top panel), observed captures and observed capture rate of New Zealand fur seals (middle panel), and estimated total captures of New Zealand fur seals (bottom panel) for 2003-2016 (Data downloaded from https://psc.dragonfly.co.nz/2017v1/).

New Zealand sea lions

The southern blue whiting fishery is responsible for the capture of an estimated annual average of nine New Zealand sea lions from 2002/03 – 2014/15, which equates to 27.7% of the total taken in New Zealand trawl fisheries over the period. The estimated average annual number of captures of New Zealand fur seals in the most recent five years the same, at nine animals, but less have been taken in all trawl fisheries overall, so the number captured in recent years in the southern blue whiting fishery equates to 39.9% of the total (Table 19).

The risk index (Table 17) indicates that mortalities from all fisheries are at a level that will not prevent the population increasing to, or remaining above, half the carrying capacity in the long term, but there has also been a very strong bias towards males in observed captures in the southern blue whiting fishery (31 out of 32 animals from 2002 – 2011 were male, Thompson et al 2013), which is likely to reduce the overall impact of interactions on population sustainability. An array of female-only Population Sustainability Threshold (PSTs) was estimated by halving the PST for all animals; female-only PSTs were not exceeded by female captures in any year, regardless of which combination of parameter values (i.e., population growth rate, natural mortality rate, recovery factor) was used (Roberts, Roux & Ladroite 2014, reported in MPI 2016).

Table 19. Estimated total captures of New Zealand sea lions in the southern blue whiting fishery and in all New Zealand trawl fisheries, 2002/03 – 2014/15 (data from https://psc.dragonfly.co.nz/2017v1/).

	Southern blue whiting trawl	All trawl	SBW as % of total
2002/03	1	31	3.2
2003/04	3	58	5.2
2004/05	5	50	10.0
2005/06	10	49	20.4
2006/07	15	42	35.7
2007/08	8	30	26.7
2008/09	1	19	5.3
2009/10	24	44	54.5
2010/11	15	27	55.6
2011/12	1	12	8.3
2012/13	21	32	65.6
2013/14	2	10	20.0
2014/15	6	12	50.0
Mean 02/03 - 14/15	9	32	27.7
Mean 10/11 - 14/15	9	19	39.9

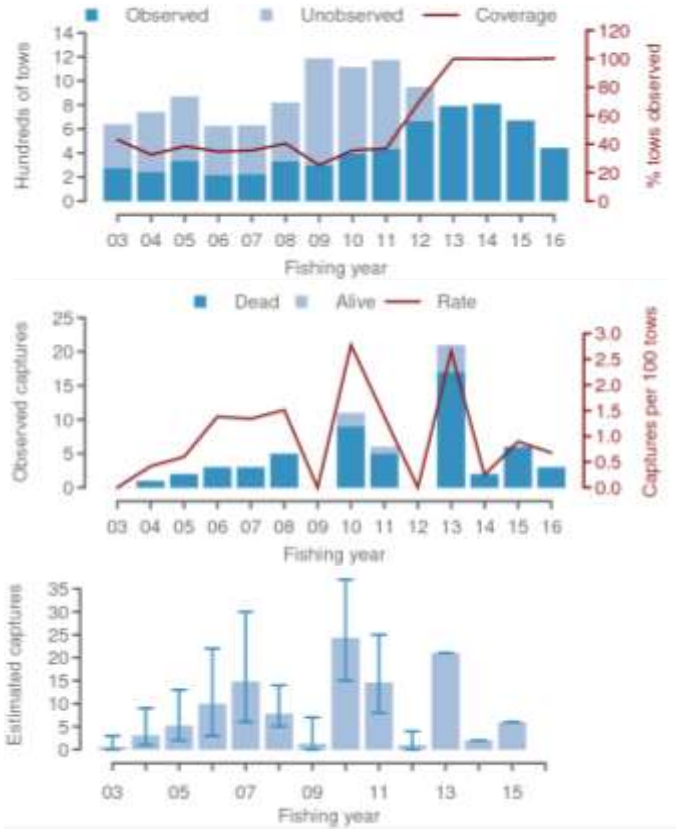


Figure 16. For the southern blue whiting trawl fishery, effort and observer coverage (top panel), observed captures and capture rate of New Zealand sea lions (middle panel), and estimated total captures of New Zealand sea lions (bottom panel) for 2003-2016 (Data downloaded from https://psc.dragonfly.co.nz/2017v1/).

The marine environment out to 12 nautical miles around the Auckland Islands was protected for marine mammals in 1993 when the area became a marine mammal sanctuary. In 2003, the value of the wider marine ecosystem was recognised with the area covered by the marine mammal sanctuary also becoming a marine reserve.

In 2017, a new threat management plan was published for New Zealand sea lion (DOC & MPI 2017). This document replaces a previous 'species management plan' for 2009-2014, and describes the first five years of a 20 year programme of work, the objectives of which are 1) To halt the decline of the New Zealand sea lion population within 5 years, and 2) Ensure the New Zealand sea lion population is stable or increasing within 20 years, with the ultimate goal of achieving 'Not Threatened' status.

DOC & MPI (2017) describes rookery-specific objectives (i.e., for the Auckland Islands, Campbell Island/Motu Ihupuku, Stewart Island/Rakiura and South Island/Te Waipounamu), as well as the basis for the community engagement, direct mitigation, research and evaluation that is planned in order to deliver the objectives. Direct mitigation that is planned includes reducing sea lion pup mortality from pups falling in to natural holes at the rookeries, and research will be undertaken to develop and trial actions to reduce pup mortality from disease caused by the *Klebsiella pneumonia* bacterium (which was assessed as having the largest impact on the potential growth rate of the New Zealand sea lion population of those threats considered by Roberts & Doonan 2016). Encouragingly, DOC & MPI (2017) noted that while a decline in pup production on the Auckland Islands since 1998 was a key driver to establishing

the threat management plan, pup counts at the Auckland Islands appear to have stabilised around 1,600 to 1,700 pups per year since 2009, and the January 2017 count was 1,965 pups, a 14% increase on the previous year (1,727). While the pup counts suggest a potential stabilisation in the Auckland Islands breeding population, other demographic parameters such as adult female and pup survival are still lower than what would be expected for a growing population.

As detailed above, however, DWG has established MMOPs, with procedures in place to minimise risk to sea lions from the southern blue whiting fishery (DWG 2014b). In addition, the main area of interaction between the fishery and New Zealand sea lions has been around the Campbell Islands (SBW6I, UoC 2), and there has been a requirement to use sea lion exclusion devices (SLEDs) in the fishery in that area since a relatively large number of captures were observed in 20012/13 (Figure 17). It is noted that in 2013, an expedited MSC audit was requested by DWG to review management of the fishery and to determine if the fishery was still compliant with MSC requirements (Intertek 2013). At that time, it was considered that a comprehensive strategy was in place.

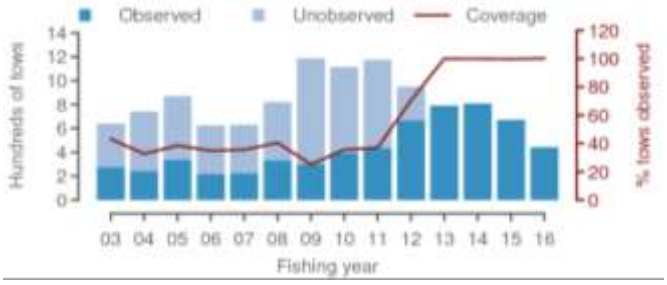
A significant amount of research has already been undertaken to understand New Zealand sea lion demography and to assess interactions between the fisheries and New Zealand sea lions. This includes researching the effectiveness of SLEDs and the potential for cryptic (i.e., unseen) mortality to occur as a result of the animals entering a trawl and being ejected through a SLED, but not subsequently making it back to the surface. Readers are again encouraged to read MPI 2016, which provides an excellent overview. DOC & MPI (2017) also provides a large amount of useful background information and links to further information.

Seabirds

In assessing the impact of the hoki, hake and ling trawl fishery on seabirds, the Assessment Team was cognizant of the stakeholder submission from Forest and Bird (see Appendix 3 – Stakeholder Submissions). Stakeholder input is exceptionally useful to the assessment process and sharpens the Assessment Team's focus. In this regard, we sought the latest risk assessment and catch data available, including catch data from the 2016 year (which may not have been available when the Forest and Bird submission was prepared), and carefully considered both the impact of the fishery and the approach taken to manage impacts.

Since the southern blue whiting trawl fishery was initially certified, there has been further intensive focus on seabird research, including on interactions with New Zealand fisheries, and further efforts to avoid, remedy or minimise fishery impacts. MPI (2016) provides a thorough review of the status of knowledge.

New data on interactions between the different New Zealand fisheries continue to be collected and analysed, including for the southern blue whiting trawl fishery. Estimated captures of all seabirds (based on models using observer data) are presented for southern blue whiting tows (Figure 17). Data are recorded at the species level, but are not presented in this way in this report (but see Abrahams & Richard (2017) for more details).



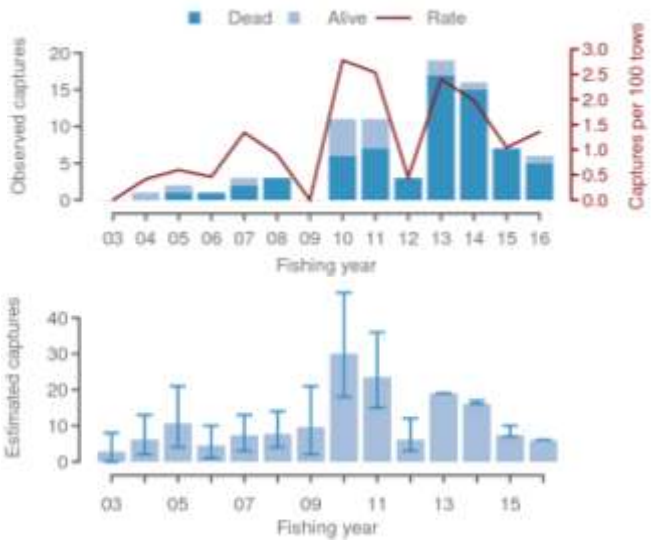


Figure 17. For the southern blue whiting trawl fishery, effort and observer coverage (top panel), observed captures and capture rate of all birds (middle panel), and estimated total captures of all birds (bottom panel) for 2003-2016 (Data downloaded from https://psc.dragonfly.co.nz/2017v1/).

Overall, the southern blue whiting fishery is responsible for relatively few seabird mortalities. In the 2015–16 fishing year, there was a total of six birds observed captured in the fishery, made up of three grey petrels (one released alive), one Salvin's albatross, one Cape petrel, and one Campbell black-browed albatross.

DOC is developing a seabird threat framework to better understand and manage at-sea threats to seabirds, and a database of demographic parameters has been prepared that supports a tool to assess the impact of changes in parameters on population growth rates; this has been tested on the 12 New Zealand albatross taxa (Abraham et al. 2016).

A seabird risk assessment process has also been undertaken over recent years to identify the risks posed to 70 seabird taxa by trawl, longline and setnet fisheries within New Zealand's Territorial Sea and EEZ (e.g., Richard & Abraham 2013, Richard & Abraham 2015). Results of the most recent iteration of the risk assessment are presented in Richard et al. 2017. Changes to the risk assessment have been incorporated over time (for example, in response to recommendations from a review workshop – Walker et al. 2015), and the most recent version incorporated modifications to the methodology and changes to the structural assumptions and underlying data, including:

1. Applying a revised correction factor, as the previous was found to be biologically implausible;
2. Applying a constraint on the fatalities calculated based on observed survival rates;
3. Included live release survival allowing change in vulnerability over time where there is enough data;
4. Seabird demographic data were updated, based on input from seabird experts and reviewed by the AEWG.

The risk assessment calculates a 'risk ratio', which is an estimate of the total fisheries-related mortality of each seabird species across New Zealand trawl, longline and set net fisheries relative to their Population Sustainability Threshold (PST), which is an adaptation of the Potential Biological Removals (PBR) metric developed for the US Marine Mammal Protection Act and estimates the level of human-induced mortality a population can incur while meeting

the long-term goal for seabird populations of remaining above half their carrying capacity, in the presence of environmental variability (Richard et al. 2017). As noted in MPI 2016, the combination of the use of the total population size, the allometric modelling of adult survival and age at first reproduction, and the use of different corrections for the calculation of PST led to significant changes to the estimated risk ratio between the previous and most recent versions of the risk assessment.

Table 20. Median risk ratio and 95% confidence intervals for seabird species rated very high, high or medium risk from fishing in New Zealand waters, and estimated mean annual captures of these seabirds in the southern blue whiting (SBW) trawl fishery and in all New Zealand trawl, longline (LL) and set net (SN) fisheries (adapted from Richard et al. 2017).

Species	Median risk ratio	95% confidence interval	Risk Classification	Estimated annual captures in trawl + LL + SN	Estimated annual captures in SBW trawl	SBW trawl (%)
Black petrel	1.15	0.51 – 2.03	Very High	468	0	0.00
Salvin's albatross	0.78	0.51 – 1.09	High	2780	35	1.26
Flesh-footed shearwater	0.67	0.39 – 1.15	High	987	0	0.00
Westland petrel	0.48	0.18 – 1.19	High	180	0	0.00
Southern Buller's	0.39	0.22 – 0.66	High	528	0	0.00
Chatham Island albatross	0.36	0.18 – 0.66	High	155	0	0.00
NZ white-capped albatross	0.35	0.21 – 0.58	High	3830	1	0.03
Gibson's albatross	0.34	0.19 – 0.59	High	166	0	0.00
Northern Buller's albatross	0.25	0.14 – 0.41	Medium	397	1	0.25
Antipodean albatross	0.20	0.11 – 0.36	Medium	74	0	0.00
Yellow-eyed penguin	0.18	0.07 – 0.45	Medium	23	0	0.00
Otago shag	0.14	0.07 – 0.28	Medium	41	0	0.00
Northern giant petrel	0.14	0.03 – 0.47	Medium	47	0	0.00

Richard et al. 2017 reported that only the black petrel was classified as 'very high risk', with a median risk ratio of greater than 1 (i.e., median catches exceeded the PST) or an upper 95% confidence interval (c.i.) limit greater than 2. Seven species were classified as 'high risk' because they have a risk ratio with a median above 0.3 or with the upper 95% c.i. limit above 1, and four species were classified as 'medium risk' because they had a median risk above 0.1 or an upper c.i. limit above 0.3 (Table 20). However, the observed catches and estimated total catches for show that the no species of very high, high or medium risk is taken in the southern blue whiting fishery in anything other than very small quantities (Table 20).

Salvin's albatross is the most commonly encountered seabird (35 animals, annually), but the PST for this species is estimated to be 3,600 animals (95% confidence interval = 2,710 – 4,940, Richard et al. 2017).

The operational approach to managing and mitigating risk to seabirds is based around the requirement to use seabird scaring devices (bird bafflers, paired streamer lines and/or warp deflectors – NZG 2010), and implementation of seabird mitigation measures as specified in vessel-specific Vessel Management Plans (VMPs) for trawl vessels.

DWG 2015 sets out the obligations for deepwater vessel, which include requirements around maintaining a fish waste control system, deployment of bafflers and/or tori lines, removal of all

stickers (fish trapped in net meshes), minimising the time the gear is at the surface when shooting and hauling, and a requirement to report all interactions on NFPSCRs, and to alert DWG if trigger points are hit - 3 x large birds (albatross or mollymawk) or 5 x any bird within any 24 hour period or 10 birds alive and/or dead within any 7-day period. Implementation is supported through crew training and MPI observers monitor vessel adherence to VMPs and reporting seabird interaction data.

3.2.6 Habitats

Following the format for a reduced reassessment, it is noted that an introduction to habitats, fishery impacts and habitat management is provided in the previous certification report for the New Zealand southern blue whiting fishery (Intertek 2012a). Readers are encouraged to refer to that report (specifically Section 7.4) for additional background information.

There are several important considerations when assessing the habitat outcome component; normative text indicates the following (MSC 2013a):

CB 3.1.2: "*The team shall consider each P2 species within only one of the Retained species, Bycatch species or ETP species components.*"

In this regard, it is noted that protected coral species are scored as ETP species, and so these species are not also considered directly in the Habitat PIs. Nevertheless, community structure and function, towards which these species contribute, is considered within the Habitat PIs. MSC guidance then notes (MSC 2013b):

GCB3.14.1 "*While the productivity and regenerative ability of biogenic habitats would affect their resilience under fishing, and may be useful surrogates for consideration of status and reversibility, it is the ecological function of the habitat and the ecosystem services that it provides that is the intent of assessment.*"

As reported in Section 3.2.5 of this report for protected coral species, there is an on-going, annual review process to determine the swept area of the main New Zealand trawl fisheries. This review process is based on tow-by-tow data submitted on trawl catch, effort and processing returns (TCEPRs). For the southern blue whiting fishery, the data show that over the years 2009/10 to 2013/14, the swept area within each of the southern blue whiting management areas is relatively small, with the overall figure for the swept area within the two FMAs being <3% of the 200-800 m depth band (Table 21, and see Figure 18).

Table 21. Swept area by depth range for the southern blue whiting fishery in each fishery management area (FMA), 2009/10 – 2013/14 (from Black 2016).

	SWB 6B (UoC 1)		SWB 6I (UoC 2)		Total for 6B + 6I		
Depth (m)	Habitat Area (km^2)	Swept Area (km^2)	Habitat Area (km^2)	Swept Area (km^2)	Habitat Area (km^2)	Swept Area (km^2)	Swept Area (%)
600-800	13,156	5	24,059	46	37,215	51	0.14
400-600	7,497	349	69,223	2,407	76,720	2,756	3.59
200-400	6,249	703	21,902	638	28,151	1,341	4.76
Totals					142,086	4,148	2.92

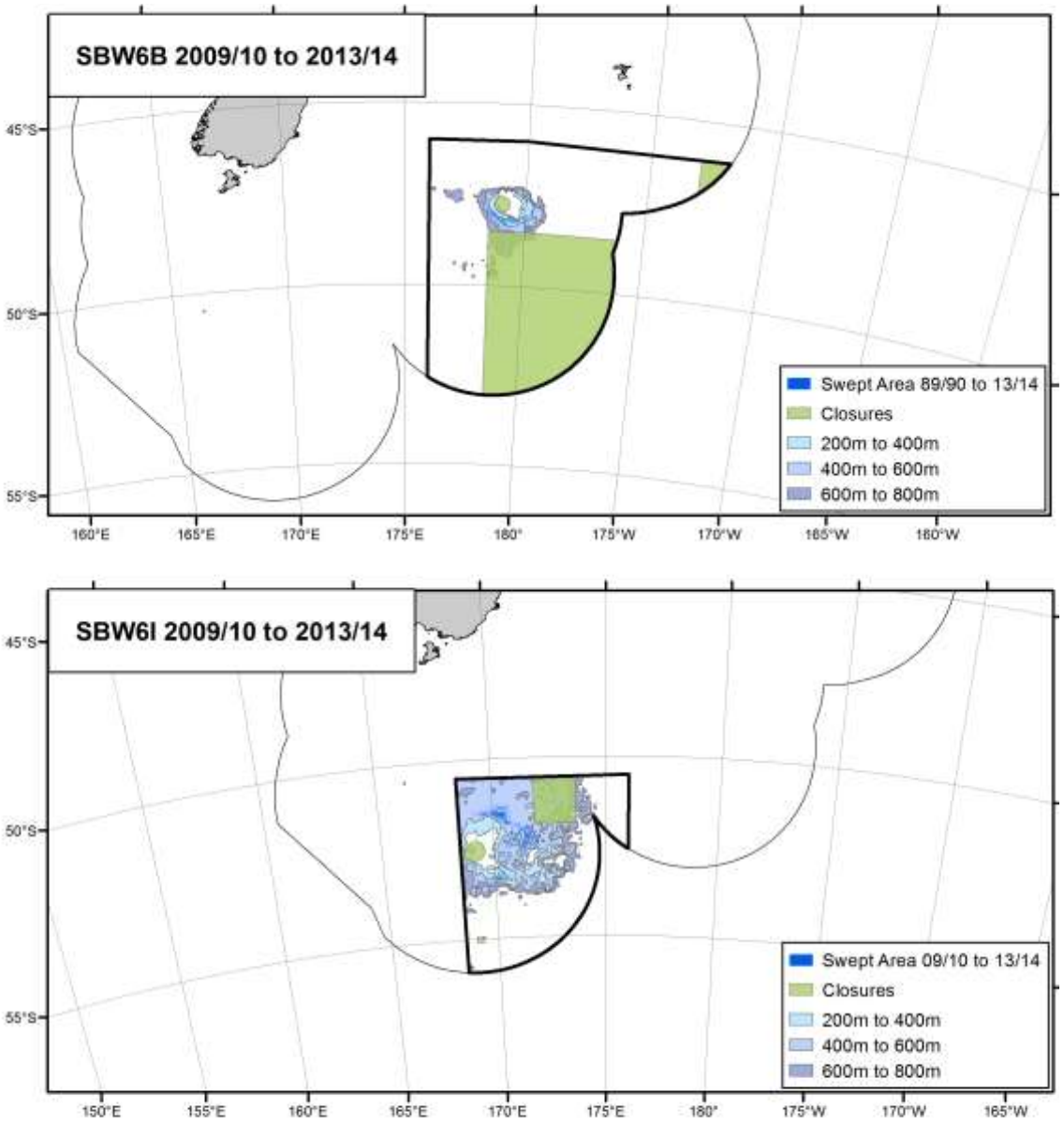


Figure 18. Swept area for the southern blue whiting trawl fishery for 2009/10 – 2013/14. SWB 6B / UoC 1 (top panel), SWB 6I / UoC 2 (bottom panel) (From Black 2016).

It is noted, however, that the MSC requires Assessment Teams to "*consider the full extent of the habitats when assessing the status of habitats and the impacts of fishing, and not just the part of the habitats that overlap with the fishery"* (CB3.14.3, MSC 2013a). As such, while the fishery occurs within SBW6B and SBW6I, almost exclusively at depths of 200-600 m (Table 21), it is the impact of the southern blue whiting trawl fishery on habitats at these depths within the wider New Zealand EEZ that will be considered in scoring.

Nevertheless, because the southern blue whiting fishery uses midwater trawls, bottom contact is minimal, and impacts on seabed habitats and communities are also minimal. It is therefore considered that there are no 'main' benthic habitats in the fishery, while minor habitats are considered to be incidentally impacted upper slope habitats. There is no reason to consider that pelagic habitats will be impacted significantly by the southern blue whiting fishery.

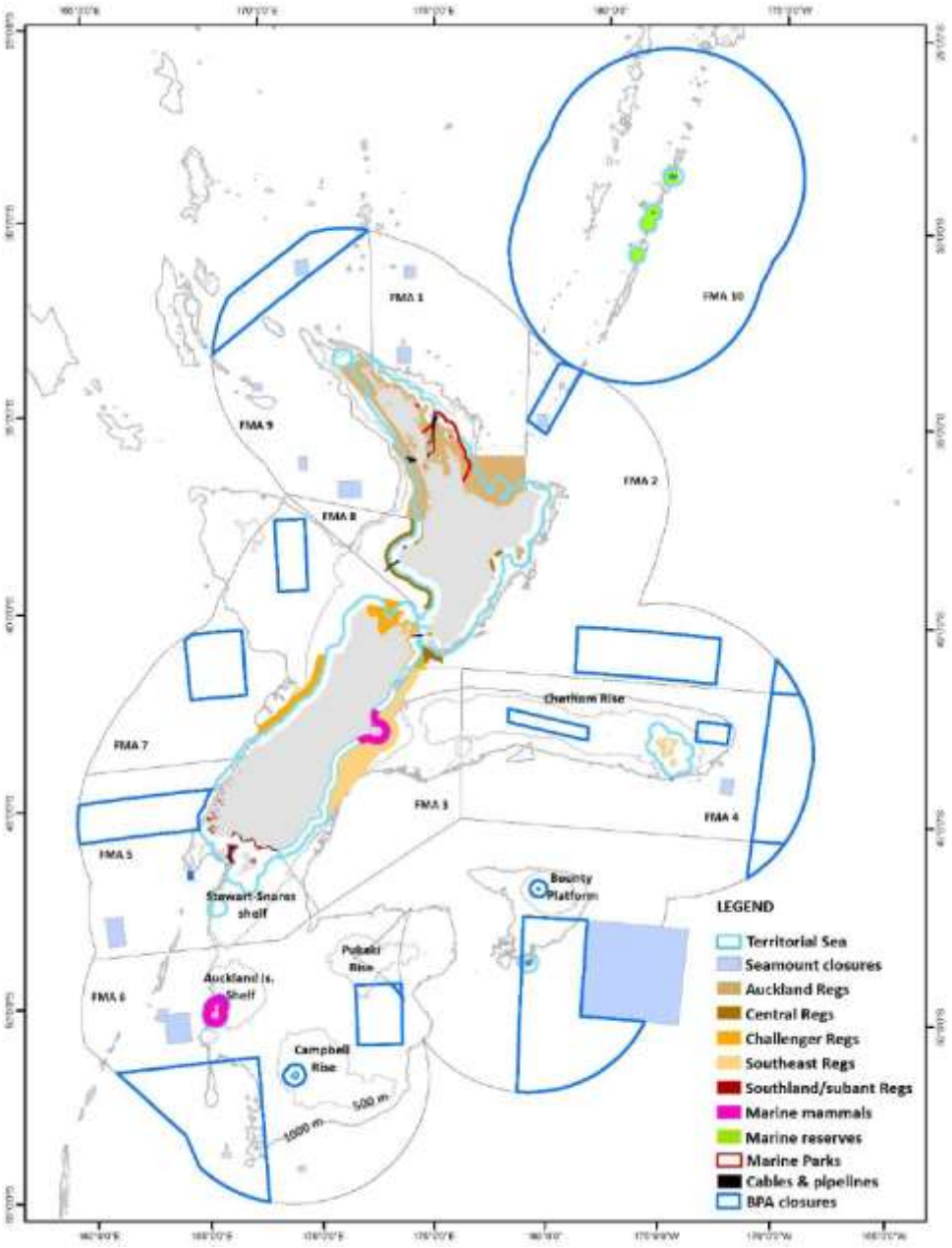


Figure 19. Map of the major spatial restrictions to trawling and the Fishery Management Areas (FMAs) within the New Zealand EEZ (from MPI 2016, adapted from Baird & Wood 2010).

The Marine Environment Classification (MEC) system (Snelder et al. 2006) and, more recently the Benthic-Optimised Marine Environment Classification (BOMEC) system (Leathwick et al. 2012) have been developed in New Zealand to enable the identification of broad-scale spatial patterns in marine ecosystems, However, their use in assessing potential fishing impacts on benthic habitats was not universally accepted (MPI 2016). Various issues were identified as part of the rationale for a review of approaches to assess trawl and dredge impacts on New Zealand habitats that was undertaken at an expert workshop in 2015 (Ford et al. 2016). Further work has been undertaken since that time (e.g., as reported in MPI 2016, through field validation and development work on new predictive models under MPI project ZBD2016-011 (e.g., Bowden et al. 2017), and a benthic risk assessment process developed under MPI project BEN2014-01); however, no new approach has yet been agreed on.

In order to provide protection to seabed habitats, a network of benthic protection areas (BPAs) was designated in the New Zealand EEZ in 2007, covering approximately 1.1 million square

km (32%) of the seabed to bottom trawling and dredging (Figure 19). These include 12 large seamounts more than 1,000 m high and covering 81,000 square km. Trawling within 100 m of the seabed is prohibited in these areas, and any vessel conducting midwater trawling in these areas must carry an approved net monitoring system and two observers, and notify the observers of the intention to commence midwater trawling operations prior to commencement (MPI 2016).

3.2.7 Ecosystem

Following the format for a reduced reassessment, it is noted that an introduction to ecosystem features influencing or affected by the fishery is provided in the previous certification report for the New Zealand southern blue whiting trawl fishery (Intertek 2012a). Readers are encouraged to refer to that report (specifically Section 7.4) for additional background information.

When assessing the ecosystem component; normative text indicates the following (MSC 2013a):

> "CB3.17.2 *The team should interpret serious or irreversible harm in relation to the capacity of the ecosystem to deliver ecosystem services.*"
>
> (Where examples of 'serious or irreversible harm in relation to the capacity of the ecosystem to deliver ecosystem services' are provided in Guidance (MSC 2013b) as including trophic cascade, severely truncated size composition, gross changes in biodiversity, and change in genetic diversity).
>
> "CB3.17.3 *The team should note that "key" ecosystem elements are the features of an ecosystem considered as being most crucial to giving the ecosystem its characteristic nature and dynamics, and are considered relative to the scale and intensity of the fishery. They are features most crucial to maintaining the integrity of its structure and functions and the key determinants of the ecosystem resilience and productivity*."

There has been much work conducted on developing ecosystem indicators for New Zealand's marine environment (MPI 2016), and Tuck et al. (2009) provided a review of indicators and an indicator-focused review of data from the Sub-Antarctic trawl surveys from 1983-2005. Their analyses determined that there was no change in species richness in the Pukaki Rise and Campbell Shelf region, but there was evidence of a decline in the biomass ratio of piscivorous fish to demersally-feeding species, and the median length of fish species declined over time. However, these changes were not correlated with overall trawling intensity.

An Ecopath model of the Southern Plateau was developed by Bradford-Grieve et al. (2003). Although the model was not designed to test how changes in abundance of different groups (e.g., more or less phytoplankton, more or less mesopelagic fish, etc.) may impact other groups, the model nevertheless confirmed that the Southern Plateau system is iron limited and driven by phytoplankton abundance; energy fluxes and, to a lesser extent, biomass, are concentrated in the pelagic environment. Fisheries (of all species) were estimated to account for around 32% of the fish production from the Southern Plateau.

The previous assessment of the southern blue whiting fishery essentially considered trophic interactions as the key ecosystem element, and in the context of the assessed fishery and based on the available data showing the complexity of the foodweb and importance of primary production, it is trophic structure in the Southern Plateau region that is considered as the key ecosystem element for this new assessment.

3.2.8 Principle 3

Principle 3 of the MSC Standard states: "*The fishery must meet all local, national and international laws and must have a management system in place to respond to changing circumstances and maintain sustainability*" (MSC 2013a).

3.2.9 Background

Following the format for a reduced reassessment, it is noted that a thorough introduction to the New Zealand fishery management framework is provided in the previous certification report for the New Zealand southern blue whiting trawl fishery (Intertek 2012a). Readers are encouraged to refer to that report (specifically Section 6) for additional background information.

3.2.10 Jurisdiction

The UoAs for the southern blue whiting fishery fall within a single jurisdiction and occur within New Zealand's EEZ.

The management system consists of a structured public-private partnership consisting of agreements between MPI and DWG, with a high level of stakeholder involvement. This overall structure forms the basis for operation of the fishery in terms of goals and objectives, fishing rights, planning, consultations, decision-making, monitoring and enforcement, and regulation.

As this fishery is eligible for a reduced re assessment (FCR v2 S 7.24.6), this section aims to highlight any changes since Intertek 2012.

3.2.11 Legal and Customary Framework

There has been no significant change in the legal or customary framework.

The Legislative Framework includes:

a) The Fisheries Act 1996. The most pertinent sections being:
   - Part 2 Purpose & Principles which provides for utilisation while ensuring sustainability and stipulates Environmental and Information Principles
   - S11A Fisheries Plans
   - S12 Consultation Requirements
   - S13 Setting TACs
   - Part 4 The QMS system
   - Part 7 The Dispute Resolution process

b) The Fisheries (Commercial Fishing) Regulations 2001 which provides for:
   - Fishing gear restrictions
   - Authorising seabird mitigation measures
   - Ban on shark finning

c) Fisheries (Reporting) Regulations 2001 (2017 from 1 Oct)

   These stipulate requirements for:
   - Catch Effort Returns
   - Catch Landing Returns
   - Non-fish and Protected Species,
   - Monthly Harvest Returns
   - LFR (Licenced Fish Receiver) Reporting

There are a number of other relevant regulations for example BPAs (Benthic Protection Areas) and 46 m exclusion zones. Again, there have been no changes since Intertek (2012).

The Customary Framework includes:

a) The Treaty of Waitangi (Fisheries Claims) Settlement Act 1992
b) The Maori Fisheries Act 2004

Non-legislative Policy/Standards includes

a) Research and Science Information Standard for New Zealand Fisheries (2011)
b) Harvest Strategy Standard for new Zealand fisheries (2008)
c) National Plan of Action – Seabirds (2013)
d) National Plan of Action – Sharks (2013)

3.2.12 Consultation

There has been no major change in the way the MPI consults since Intertek (2012, 2014). There have been changes to the names of the consultation documents (see Section 3.2.1.3, Harvest Strategy) but not to the substance of consultation.

Section 12 of the Fisheries Act 1996, includes a range of specific consultation obligations that are required of MPI including, who must be consulted.

It also requires that the Minister of Fisheries shall give consulted parties reasons in writing for his/her decision relating to fishing and the effects of fishing on the aquatic environment.

There are also a number of less formal consultation opportunities and mechanisms including:

- Environmental Engagement Forum/Fish Plan Advisory Group
- Seabird Advisory Group
- Shark Advisory Group

3.2.13 Objectives for the fishery

Long-term fishery and environmental objectives are included within both New Zealand fisheries and environmental legislation and thus guide decision-making. The long-term objectives for these fisheries have not changed since Intertek (2014).

Fisheries 2030, specifies an overarching goal for New Zealand's fisheries and two outcomes:

> ***Goal:*** New Zealanders maximising benefits from the use of fisheries within environmental limits.
>
> ***Use Outcome:*** Fisheries resources are used in a manner that provides greatest overall economic social and cultural benefit.
>
> ***Environment Outcome:*** The capacity and integrity of the aquatic environment, habitats and species are sustained at levels that provide for current and future use.

The National Deepwater Plan sets out high-level Management Objectives for all of New Zealand's deepwater fisheries. This is then supported by species-specific Fisheries Plans that describes Operational Objectives for the southern blue whiting fisheries in New Zealand.

The short-term objectives for the specific fishery are updated and reviewed annually.

These objectives drive annual work plans, which are set out in the Annual Operational Plan for the deepwater fisheries (e.g. MPI, 2016). The progress against the actions and objectives in the Annual Operational Plan are reviewed and presented in the Annual Review Report (e.g. MPI, 2017), produced at the end of each year.

The DWG-MPI Memorandum of Understanding (MOU) (DWG-MFish, 2010) further lays out specific objectives for implementing the National Deepwater Plan. These plans also link to the research plan.

Table 22. Management objectives from the National Deepwater plan (MFish, 2010)

Use Outcome	MO 1.1	Enable economically viable deepwater and middle-depth fisheries in New Zealand over the long-term
	MO 1.2	Ensure there is consistency and certainty of management measures and processes in the deepwater and middle depths fisheries
	MO 1.3	Ensure the deepwater and middle-depths fisheries resources are managed so as to provide for the reasonably foreseeable needs of future generations
	MO 1.4	Ensure effective management of deepwater and middle-depth fisheries is achieved through the availability of appropriate, accurate and robust information
	MO 1.5	Ensure the management of New Zealand's deepwater and middle-depth fisheries are recognised as being consistent with or exceeding national and international best practice
	MO 1.6	Ensure New Zealand's deepwater and middle-depth fisheries are transparently managed
	MO 1.7	Ensure the management of New Zealand's deepwater and middle-depth fisheries meets the Crown's obligations to Maori.
Environmental Outcome	MO 2.1	Ensure deepwater and middle-depth fish stocks and key bycatch fish stocks are managed to an agreed harvest strategy
	MO 2.2	Maintain the genetic diversity of deepwater and middle-depth target and bycatch species
	MO 2.3	Protect habitats of particular significance for fisheries management
	MO 2.4	Identify and avoid or minimise adverse effects of deepwater and middle-depth fisheries on incidental bycatch species
	MO 2.5	Manage deepwater and middle-depth fisheries to avoid or minimise adverse effects on the long- term viability of endangered, threatened and protected species
	MO 2.6	Manage deepwater and middle-depth fisheries to avoid or minimise adverse effects on biological diversity
	MO 2.7	Identify and avoid or minimise adverse effects of deepwater and middle-depths fishing activity on the benthic habitat.

3.2.14 Decision making process

There has been no change in decision-making processes since Intertek (2012). Decision making processes are continuously reviewed to ensure that the "best" and precautionary decisions are made by MPI with input and participation from stakeholders and interested parties.

The decision-making process which is undertaken to determine stock status, harvest strategies and annual TACs is shown below in Figure 20.

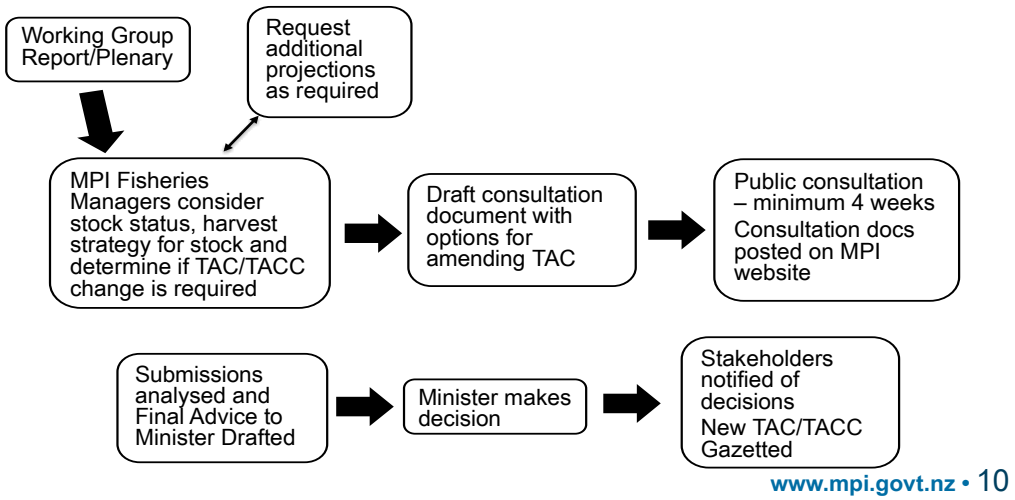


Figure 20. Decision making process (MPI 2016)

3.2.15 Management Plans

The Fisheries Planning process has not changed since 2010. The management of New Zealand's deepwater fisheries has been implemented through the National Fisheries Plan for Deepwater and Middle-depth Fisheries (National Deepwater Plan), which collectively consists of the three parts shown in Figure 21.

Part 1A was approved by the Minister of Fisheries in 2010. Public consultation on a revised Part 1 A closed in August 2017, and the feedback received is currently being reviewed by MPI before finalising the revised version. The fisheries specific chapters for southern blue whiting was completed in 2013.

The National Deepwater Plan (2010) was reviewed in 2016/17, culminating in a revised National Deepwater Plan being published in 2017. Implementation of the updated National Deepwater Plan for the 2017/18 fishing year will include the core activities listed below:

- Implement National Deepwater Plan including fisheries-specific plans
- Implement Management Objectives within the National Deepwater Plan
- Compile the Annual Review Report for 2017/18
- Develop the Annual Operational Plan for 2018/19

Figure 21. The National Deepwater Plan structure highlighting the long-term cycle of Part 1A and 1B, and the annual cycle of the operational plan and review report. This document relates to Part 2 highlighted in green. (MPI 2017)

3.2.16 Research Plan

MPI is no longer operating under the 10 Year Research Programme for Deepwater Fisheries. A Medium-Term Research Plan for deepwater fisheries is place (2018/19 – 2022/23) and MPI is in the process of forming a Research Panel of pre-qualified providers to deliver projects in five different categories:

- Surveys
- Stock Assessments & Monitoring
- Informing Management (e.g. Management Strategy Evaluations (MSEs) & survey design, etc…)
- Aquatic Environment research specific to Deepwater Fisheries
- Vessel platforms for surveys

3.2.17 Compliance and Enforcement

There have been a few changes to compliance and enforcement since Intertek (2012).

MPI Compliance has continued to monitor the southern blue whiting fisheries for a number of years and has undertaken detailed analysis of the fishing activity of vessels operating in the fisheries.

The analysis of the southern blue whiting fisheries has, in the past, identified areas of potential compliance risk and MPI Compliance has worked with MPI Fisheries Management and industry to address these risks and to apply appropriate interventions.

MPI Compliance and Fisheries Management meet with the Deepwater Compliance group and discuss any matters of interest or concern arising from the monitoring and analysis. A meeting then takes place with industry where MPI Compliance provides a brief on the issues or risks identified and, if necessary, makes it clear that certain practices need to be changed or eliminated where those practices create a real or perceived risk of non-compliant behaviour. There have been no major issues of non-compliance in the hake, hoki, ling and southern blue whiting fisheries in recent years (pers. comm. Gary Orr).

This approach has worked well with all companies actively engaged in the process and prepared to work with both MPI Compliance and Fisheries Management to achieve enhanced compliance.
A report by Simmons *et al*. (2016) (researchers associated with the University of Auckland), undertook a historical reconstruction of New Zealand catch statistics between 1950 and 2010 based on their view that the FAO records are incomplete due to the omission of significant amounts of 'invisible' (i.e. unreported) landings in industrial fisheries, of fish that are discarded at sea, and of fish taken by recreational and customary fishers.

Their report concludes the total catch from New Zealand waters to have been 2.1 times greater than that reported to FAO since 1986 (when the Quota Management System (QMS) was introduced). They allege that unreported industrial catch and discards account for the vast majority of the discrepancy that they estimate to have existed.

During the site visit, the Assessment Team discussed the findings of this report with MPI Compliance. MPI Compliance advised they are of the view that the Simmons *et al.* (2016) report considerably over-estimated the scale of historical under-reporting, which was felt to be more in the order of 5-10% in the MSC-certified fisheries and that these amounts have been

addressed within the official New Zealand catch statistics, stock assessments, and management decisions. The associated uncertainties between reported catches and estimated fishing mortalities is accounted for in stock assessments and in the setting of total allowable catches. MPI had contacted Dr. Simmons to discuss his team's catch reconstruction methodology but they had not responded and thus MPI could not determine the source, extent or reliability of the discrepancy estimated.

The Assessment Team were also informed that Seafood New Zealand (SNZ), acting on behalf of the New Zealand seafood industry (including DWG), had also contacted the authors requesting details on their methodologies and data. To date, the authors have declined to do so. SNZ has lodged a complaint with the Ombudsman on the basis that this information is subject to access under the Official Information Act. The Ombudsman is currently investigating the University of Auckland's apparent lack of compliance.

The client provided the Assessment Team with their own analysis of the dataset upon which Simmons *et al.* are understood to have based their report, and compared these data with MPI's official catch records for key deep water species. This report, Tilney *et al.* (2017), demonstrates that, since 1986, the catch reconstruction for the key deep water commercial species is, on average, 17% higher than MPI's official catch record and considers that the assertion by Simmons *et al*. that catches were 2.1 times greater than that reported to the FAO are incorrect do not reflect the true position or management of New Zealand deep water fisheries and, in particular the MSC certified fisheries.

The Tilney *et al.* report notes that, since 1986, catches of QMS species have been progressively more closely monitored and are considered to be substantially and increasingly reliable, due to the combination of MPI observers, robust documentation requirements and audit processes, along with a harsh penalty regime for non-compliance. The authors conclude that the proposition that large volumes of unreported catch might exist in the deep water fisheries is untenable and there have been relatively high levels of observer coverage independently monitoring catches since 1986; noting that, MPI has contracted NIWA to routinely analyse these records to estimate the levels of non-retained catch. For the trawl fisheries under consideration, this is assessed to have been between 0.6% and 5.5% of the total catch with much of the catch returned to sea being, reported, as is required by law.

Tilney *et al.* also notes that if catches from these fisheries had in fact been substantially higher in the early years than were reported, their stocks would have had to be more productive than is currently estimated. They conclude that this is not compatible with what is known about the population dynamics and productivity of these deep water stocks and is not consistent with the stock assessments based on fisheries-independent research data.

During the course of this re-assessment the MSC Assessment Team discussed the Simmons *et al*. (2016) and Tilney *et al.* (2017) report with the MRAG surveillance audit team, which conducted the first annual audit of MSC certified New Zealand Orange Roughy fishery. The teams noted and agreed that Simmons *et al.* (2016) has not been peer reviewed, reaches conclusions that do not appear to be supported by the data presented, and needs to be subjected to further scrutiny before the findings can be accepted as valid.

In the last few years MPI Compliance has undergone a significant refinement of its service delivery model and now has a dedicated Fisheries Compliance Manager so as to provide greater accountability, consistency of decision-making and management of risk in the fisheries sector. The MPI Compliance team is supported by the Compliance Investigations group who undertakes investigations where the non-compliance is significant and/or complex.

MPI is introducing a new digital system for tracking, monitoring and reporting of commercial fishing. It is made up of geospatial position reporting (GPR), electronic reporting through e-

logbooks, and electronic monitoring (cameras).

This Digital Monitoring program, electronic reporting has now been implemented on all trawl vessels >28m LOA. In late 2017, the Minister of Fisheries announced a delay in the introduction of cameras on commercial fishing vessels to allow for further consultation on the proposal to ensure effective implementation. No decision as yet has been made on the date of implementation of this video surveillance.

It should be noted that the deepwater fleet have already implemented position reporting since 1994 and electronic reporting since 2010. These data are transmitted to MPI to monitor fishing activity.

However, the new system will provide MPI faster (daily) access to catch and location data, coupled with electronic monitoring, which will provide greater opportunity to target compliance risk, and as a consequence further reduce the potential for unreported catch and area misreporting.

3.2.18 Monitoring of Performance

The Annual Review Report for Deepwater Fisheries provides a record of the annual reviews of the fisheries, including southern blue whiting.

Part 1 of the Annual Review Report describes the progress that has been made towards meeting the five-year management priorities set out in the Annual Operational Plan. Achievement of these annual management priorities aims to contribute towards meeting the five year, high level Management Objectives and Operational Objectives set out in Part 1 of the National Deepwater Plan.

Part 2 of the Annual Review Report provides detail on MPI work that is relevant to deepwater fisheries management and is planned by financial year. It includes the planning and contracting of fisheries and conservation research projects, planning observer coverage on the deepwater fleet and the cost recovery regime. Progress made during the financial year is detailed.

Part 3 of the Annual Review Report reports on the combined environmental impacts of deepwater fishing, and on the deepwater fleet's adherence to the non-regulatory management measures that were in place for the fishing year.

The Annual Operational Plan is reviewed annually and reported in the Annual Review Report. MPI conducts an extensive review of the performance of the deepwater fisheries that incorporates consultations with industry and other stakeholders. Parts of the management system, specifically science and enforcement, undergo external review.
MPI's Aquatic Environment Biodiversity Annual Review and Fisheries Assessment Plenary reports also provide comprehensive annual performance reports.

In 2018, MPI completed an external review of the Deepwater Fisheries Management conducted by Independent Quality Assurance New Zealand (IQANZ 2018). The review covered the relevant parts of fishery management described in CR v1.3 GCB4.11 and concluded that there was an appropriate management system in place for the ongoing sustainable management of the fisheries.

4 Evaluation Procedure

4.1 Harmonised fishery assessment

The MSC has detailed an approach to addressing the assessment of overlapping fisheries, where 'overlapping fisheries' are defined as "*Two or more fisheries which require assessment of some, or all, of the same aspects of MSC Principles 1, 2 and/or 3 within their respective units of certification*" (MSC 2013).

The MSC specifies the following (MSC 2013):

"CI3.2.3 CABs shall coordinate their assessments where a fishery under assessment overlaps with a certified fishery to make sure that key assessment products and outcomes are harmonised.

CI3.2.3.1 Where an assessment overlaps with a certified fishery or fishery in assessment that a CAB has already scored, the team shall base their assessment on the rationale and scores detailed for the previously scored fishery.

CI3.2.3.2 To achieve harmonisation, CABs shall undertake the following key activities:

a. The use of complementary assessment trees.
b. The sharing of fishery information.
c. The achievement of consistent conclusions with respect to evaluation, scoring and conditions.

CI3.2.3.3 The team shall explain and justify any difference in the scores in the scoring rationale for relevant PIs."

The New Zealand Southern Blue Whiting Trawl Fishery overlaps with three other MSC certified fishery in terms of:

- Principle 3 - The New Zealand Hoki, Hake and Ling Trawl Fishery[1]
  - New Zealand Ling Longline Fishery[2]
  - The New Zealand Orange Roughy Fisheries[3]

The New Zealand Hoki, Hake and Ling Trawl Fishery and the New Zealand Ling Longline Fishery are being re-assessed at the same time as the New Zealand Southern Blue Whiting Trawl Fishery and by the same assessment team. In so doing, the "Governance and Policy" component of Principle 3 (the PIs pre-fixed with 3.1), i.e. focusing on the high-level context of the fishery management system within the UoAs are the same for all the MSC certified and "in re-assessment" fisheries and have been harmonised. The "Fishery specific management system" (the PIs pre-fixed with 3.2) are not usually subject to harmonisation owing to their fishery specific nature. However, in this instance, as part of harmonizing their assessments and audits of the New Zealand MSC-certified deep water fisheries (hoki, hake, ling, and southern blue whiting – Acoura, and orange roughy – MRAG Americas) both CABs discussed the findings of the Independent Quality Assurance Review Report Deepwater Fisheries Management conducted by Independent Quality Assurance New Zealand for MPI. The teams agreed that the Review met the requirements of PI 3.2.5 scoring issue b (CR v1.3). The agreed scoring rationale is presented in Appendix 1.

[1] https://fisheries.msc.org/en/fisheries/new-zealand-eez-ling-trawl-and-longline/@@assessments
[2] https://fisheries.msc.org/en/fisheries/new-zealand-eez-ling-trawl-and-longline/@@assessments
[3] https://fisheries.msc.org/en/fisheries/new-zealand-orange-roughy/@@assessments

4.2 Previous assessments

The New Zealand Southern Blue Whiting Trawl Fishery has previously been assessed and was certified against the MSC standard on 25th April 2012.

Since 2012, there have been a number of improvements in the management of the fishery:

Monitoring, analysis and mitigation measures with respect to the interaction between the fishery and New Zealand sea lions (*Phocarctos hookeri*) (an ETP species) have been undertaken. The client and MPI committed to ensuring, to the greatest extent practicable, to minimize the interactions, particularly within SBW 6I.

The client group has appointed an Environmental Liaison Officer who has, among other things, conducted a programme of directed outreach and training and developed and implemented Vessel Management Plans. All vessels in SBW 6I have VMPs and are audited against these plans by MPI observers. The plans include minimizing the time fishing gear is on the surface during shooting and hauling and managing offal and whole fish discards to reduce the risk of incidental interactions. Pre-season briefings with vessel crews and pre-trip briefings with observers to ensure understanding of appropriate mitigation measures and monitoring of them have been implemented. High-risk vessels have received additional attention and support to help ensure reduced risk.

Data gathering and analysis of the Campbell Island sea lion population has enabled a Population Sustainability Threshold (PST) analysis and estimate to be developed that provides fishery managers guidance on mortality levels and inform appropriate management action.

In year 2 of the certification, an unprecedented number of New Zealand sea lions (approximately 13) were accidentally killed in a short period of time and the client requested an expedited audit to review the situation. The management response to the situation, which included: 100% observer coverage, the development and use of sea lion escape devices (SLED) (SLEDs are used in the squid fishery but needed to be configured with the southern blue whiting trawl) and, the avoidance, of areas where sea lions were interacting with fishing gear, was considered to be an appropriate management response and fulfilled MSC requirements. Further audits confirmed that including pre-agreed actions if similar circumstances arose in the future had augmented the management strategy.

The strong communication and ongoing liaison between the client, Deepwater Group (DWG), and their operators is an important factor.

There is a partnership approach to fisheries management between the DWG and the Ministry for Primary Industries (previously the Ministry of Fisheries), underpinned by a Memorandum of Understanding. The two parties have developed a single joint-management framework with agreed strategic and operational priorities and workplans.

The relationship between the DWG and eNGOs has improved during the period of certification. A key factor to this has been the improved transparency to information and management of the fishery by the DWG.

Through the Environmental Engagement Forum, MPI engages with stakeholders including eNGOs on environmental issues relating to management of deepwater fisheries.

Table 23. Summary of Previous Assessment Conditions

Condition	PI	Year closed	Justification[4]
Within three years of certification: i) Identify the level of ETP species interactions that would lead to adverse effects on population levels for sea lions, and, ii) where a problem is identified, develop and implement appropriate management approaches to achieve those national requirements and objectives.	2.3.2	Year 1	Monitoring, analysis and mitigation measures with respect to the interaction between the fishery and New Zealand sea lions (an ETP species) have been undertaken. The process involved compiling the information available on sea lion pup production on Campbell Island (and relevant information from other areas), considering the skewed sex ratio in reported sea lion captures in that area, identifying appropriate values (and ranges of values) to complete a Potential Biological Removal (PBR) analysis and estimate. This work concluded that the New Zealand sea lion population on Campbell Island is able to sustain low levels of fishery-induced mortalities (<8 or <16 animals per year, depending on the values used in the PBR formula). The client and MPI committed to ensuring, to the greatest extent practicable, to minimize the interactions, particularly within SBW 6I (Operational Objective 2.2 of the southern blue Whiting Fisheries Plan). To ensure levels of capture remained below the PBR, a series of management and monitoring measures were developed and implemented, these included: • Identification of where, and vessels for which, there may be higher risks of sea lion captures; • Brief all operators on issues related to sea lion captures and follow up with in-person briefings for higher risk vessels; • Increased monitoring of vessels by government observers. In the fishing year preceding the certification, the catch of sea lions in the Campbell southern blue whiting fishery was zero. Monitoring through the season by MPI (both fishery managers and observers at sea) confirmed that the management strategy to address sea lion bycatch was implemented in the majority of cases. ~76% of fishing effort was monitored by government observers in this (6I) fishery. While no animals were reported caught, sea lions were reported by observers to be present around vessels. MPI and the Client have committed to continuing to support the more intensive management approach described here on an ongoing basis through the Certification period and after that time. In year 2 of the certification, an unprecedented number of New Zealand sea lions (approximately 13) were accidentally killed in a short period of time and the client requested an expedited audit to review the situation. The management response to the situation, which included: 100% observer coverage, the development and use of sea lion escape devices (SLED) (SLEDs are used in the squid fishery but needed to be configured with the southern blue whiting trawl) and, the avoidance, of areas where sea lions were interacting with fishing gear, was considered to be an appropriate management response and fulfilled MSC requirements. Further audits confirmed that including pre-agreed actions if similar circumstances arose in the future had augmented the management strategy.

[4] Taken from second annual audit report: https://fisheries.msc.org/en/fisheries/new-zealand-eez-ling-trawl-and-longline/@@assessments

Condition	PI	Year closed	Justification[4]

4.3 Assessment Methodologies

This re-assessment of the New Zealand Southern Blue Whiting Trawl Fishery has been carried out using the MSC Certification Requirements version 1.3 and version 1 of the MSC Reduced Re-Assessment Reporting Template.

No changes were made to the Appendix 1 evaluation tables.

4.4 Evaluation Processes & Techniques

4.4.1 Site Visit

The site visit took place in Wellington, New Zealand, between 17th and 21st July 2017. Meetings were held at the Seafood New Zealand Offices, Eagle Technology House, 135 Victoria Street, Wellington.

The following tables provide the site visit itinerary:

Table 24. Site visit itinerary.

Assessment team meeting		
Date	**Participant**	**Organisation**
16th July 2016	Paul Knapman	Acoura
	Bob O'Boyle	Acoura
	Rob Blyth Skyrme	Acoura
	Jo Akroyd	Acoura

Opening meeting		
Date	**Participant**	**Organisation**
17th July 2016	Paul Knapman	Acoura
	Bob O'Boyle	Acoura
	Rob Blyth Skyrme	Acoura
	Jo Akroyd	Acoura
	George Clement	DWG
	Sharleen Gargiulo	DWG
	Geoff Tingley	Gingerfish - consultant to DWG
	Tiffany Bock	MPI
	Bill Holden	MSC

Meeting with NIWA & MPI		
Date	**Participant**	**Organisation**
18th July 2016	Paul Knapman	Acoura
	Bob O'Boyle	Acoura
	Rob Blyth Skyrme	Acoura
	Jo Akroyd	Acoura
	Rosemary Hurst	NIWA
	Andy McKenzie	NIWA
	Richard O'Driscoll	NIWA
	Peter Horn	NIWA
	Lyndsey Holland	MPI
	Tiffany Bock	MPI
	George Clement	DWG
	Sharleen Gargiulo	DWG
	Richard Wells	DWG
	Geoff Tingley	Gingerfish - consultant to DWG
	Bill Holden	MSC

Meeting with NIWA & MPI		
Date	**Participant**	**Organisation**
19th July 2016	Paul Knapman	Acoura

	Bob O'Boyle	Acoura
	Rob Blyth Skyrme	Acoura
	Jo Akroyd	Acoura
	Jim Roberts	NIWA
	Owen Anderson	NIWA
	Greg Lydon	MPI
	Ben Sharp	MPI
	Lyndsey Holland	MPI
	Jen Matthews	MPI
	Nathan Walker	MPI
	Tiffany Bock	MPI
	George Clement	DWG
	Sharleen Gargiulo	DWG
	Richard Wells	DWG
	Geoff Tingley	Gingerfish - consultant to DWG
	Bill Holden	MSC

Meeting with MPI		
Date	**Participant**	**Organisation**
20th July 2016	Paul Knapman	Acoura
	Bob O'Boyle	Acoura
	Rob Blyth Skyrme	Acoura
	Jo Akroyd	Acoura
	Lyndsey Holland	MPI
	Rob Tinkler	MPI
	Tiffany Bock	MPI
	George Clement	DWG
	Sharleen Gargiulo	DWG
	Geoff Tingley	Gingerfish - consultant to DWG
	Bill Holden	MSC

Meeting with MPI		
Date	**Participant**	**Organisation**
21st July 2016	Paul Knapman	Acoura
	Bob O'Boyle	Acoura
	Rob Blyth Skyrme	Acoura
	Jo Akroyd	Acoura
	Gary Orr	MPI
	Simon McDonald	MPI
	Tiffany Bock	MPI
	Sharleen Gargiulo	DWG
	Geoff Tingley	Gingerfish - consultant to DWG
	Bill Holden	MSC

Meeting with Forest & Bird – via Skype		
Date	**Participant**	**Organisation**
21st July 2016	Paul Knapman	Acoura
	Bob O'Boyle	Acoura
	Rob Blyth Skyrme	Acoura
	Jo Akroyd	Acoura
	Karen Baird	Forest & Bird

4.4.2 Consultations

A total of 21 stakeholder organisations and individuals having relevant interest in the assessment were identified and consulted during this re-assessment process. The interest of others was solicited through the postings on the MSC website.

Table 24 above shows the people that participated in the site visit. As well as speaking with the assessment team Forest and Bird followed up with a written submission. This is appended at

4.4.3 Evaluation Techniques

Several sources of information provided the basis of the conclusions of this assessment, including a review of information and references provided by the client prior to the site visit, information and data sourced during site visit meetings held with stakeholders involved with the fishery, and review of literature and information provided following site visit meetings.

The MSC Principles and Criteria set out the requirements for sustainable fishing. These Principles and Criteria have subsequently been used to develop a standardized, default assessment tree (within the MSC Certification Requirements), including Performance Indicators (PIs) and Scoring Issues (SIs), by the MSC and its advisory boards, which have been used in the assessment of this fishery.

Each SI may be scored at three scoring guideposts (SGs), which define the level of performance that is required to achieve 100, 80 (the passing score), and 60 scores; 100 represents a theoretically ideal level of performance and 60 a measurable shortfall. If a fishery does not meet the minimum SG 60 level of performance for any SI, the fishery would fail its assessment.

For each PI, the performance of the fishery is evaluated, and a score issued. In order for the fishery to achieve certification, an overall weighted average score of 80 is necessary for each of the three Principles and no SI should score less than 60. Scores are issued using a minimum increment of five. Average scores for each Principle are rounded to one decimal place.

Following the review and synthesis of information available, the assessment team discussed each individual SI to assess whether the evidence is present to assess the level of performance that the fishery achieved. Justification of the scoring is provided in the scoring table presented in Appendix 1. Scores were agreed by consensus between the assessment team.

The elements that were scored for each PI under Principle 1 and 2 are listed in the tables below. Scores allocated for each PI were entered into the MSC Fishery Assessment Scoring Worksheet in order to attain the overall Principle scores; these scores are shown in Section 6 of this report.

Table 25. Scoring elements for UoC 1 (SBW 6B)

Component	Scoring elements	Main / Minor	Data-deficient (Yes or No)
P1 – Target species	Southern blue whiting (*Micromesistius australis*)	N/A	No
P2 – Retained species	Ling (LIN 6B) (*Genypterus blacodes*)	Minor	No
P2 – By catch species	Porbeagle shark (*Lamna nasus*)	Minor	No
P2 – ETP species	Protected corals	N/A	No
	New Zealand sea lion (*Phocarctos hookeri*)	N/A	No
	New Zealand fur seal (*Arctocephalus forsteri*)	N/A	No
	Seabirds (various species)	N/A	No
P2 – Habitat	Upper slope benthic habitats (various)	Minor	No
P2 – Ecosystem	Trophic structure in the Southern Plateau region	Main	No

Table 26. Scoring elements for UoC 2 (SBW 6I)

Component	Scoring elements	Main / Minor	Data-deficient (Yes or No)
P1 – Target species	Southern blue whiting (*Micromesistius australis*)	N/A	No
P2 – Retained species	Ling (LIN 5 & 6) (*Genypterus blacodes*)	Minor	No
P2 – By catch species	Porbeagle shark (*Lamna nasus*)	Minor	No
P2 – ETP species	Protected corals	N/A	No
	New Zealand sea lion (*Phocarctos hookeri*)	N/A	No
	New Zealand fur seal (*Arctocephalus forsteri*)	N/A	No
	Seabirds (various species)	N/A	No
P2 – Habitat	Upper slope benthic habitats (various)	Minor	No
P2 – Ecosystem	Trophic structure in the Southern Plateau region	Main	No

5 Traceability

5.1 Eligibility Date

The fishery has a valid MSC certificate. The certificate expiry date for the fishery is 1st September 2019.

5.2 Traceability Within the Fishery

Existing fisheries management requirements include the clear identification of species, quantity, fishing method and area of capture by all vessels landing fish from the fishery. All catches are reported in logbooks and in catch and effort landing returns. On-board observer coverage also monitors, cross checks and verifies catches and landings with the vessels logbook.

Cross referencing of VMS data with logbooks, observer and aerial and at-sea surveillance reports also ensures that fish is reported from the correct area of capture. All landings are monitored by a dockside monitoring program. Vessels have to advise MPI before landing and maybe subject to monitoring by enforcement officers. The ports that were used in 2015/16 where more than 5 tonnes of southern blue whiting were landed are listed below.

Table 27. The ports of landing where southern blue whiting were landed in 2015/16. (pers. comm. T Bock, MPI)

Southern Blue Whiting
Lyttelton
Timaru
Dunedin
Nelson
Bluff
Port Chalmers

5.2.1 Tracking and Tracing

Clear traceability and tracking is already in place, there are procedures and audits are regularly carried out. Procedures that are in place include, “when fish product is brought on to a factory site that is not from an MSC fishery or not from a site with a chain of custody certification for (a) reprocessing, or (b) future sale, it must be brought on to inventory with the appropriate quality status and a logistic status. The narrative will read, “Not MSC certified”. This will prevent its movement without proper control.” (DWG, Quality Manual).

If a vessel were fishing outside the UoC there are systems in place to record that fact. All factory trawlers in New Zealand are operating under New Zealand Food Safety Authority (NZFSA) and New Zealand Fisheries Act rules and regulations. As such, they are required to both land all catch of QMS species (such as southern blue whiting) and ensure that any fish that will not be fit for human consumption, e.g. through damage or accidental contamination, is not able to be inadvertently sold into market. This drives the need for all vessels to be able to mark, ‘ring-fence’ and inventory product or products on a regular basis. This is coupled with the fact that all vessels produce a wide range of species and products, all of which need to be marked by date, area of capture and numerous other information, and able to be sorted on arrival in port and inventoried for market and export purposes. Both physical and electronic inventory management is inherent in the systems that these vessels operate.

5.2.2 Vessels Fishing Outside the UoCs

New Zealand vessels do not fish for southern blue whiting outside New Zealand’s EEZ. If they

were VMS would highlight this.

5.2.3 At Sea Processing

At-sea processing occurs on all the major factory ships participating in this fishery. At-sea processing includes the sorting, heading and gutting, filleting, freezing, reduction to surimi and packaging of southern blue whiting.

There are two levels of process technology in the fleet:

1. Fully integrated weighing labelling systems which barcode every carton on production and before storage in the ship's hold. This data is downloaded on arrival, reconciled on landing figures and thus final inventory is arrived at. This system allows the tagging of product lines which is non-certified so that it is barcoded as non-certified and trackable and separable ever after simply by scanning. Onshore systems in load-out audit exports.
2. The rest of the fleet practice standard practice where all product (by carton) is labelled as per MPI and NZFSA requirements. The outer markings are used to separate and inventory all product on landing.

Under MPI regulations every container in which fish is packaged on a licensed fish receiver's premise shall be marked with species name, date, licensed fish receivers name, processed state, area fished. Therefore, the risk of substitution is considered to be well managed and therefore negligible.

5.2.4 Transhipping

Transhipping is rare and has not occurred in the fishery in recent years (pers. comm. Richard Wells). However, if it did occur there is legislation in place to ensure the potential traceability risks associated with any transhipping are minimal.

Section 110, of the Fisheries Act states:
Fish taken in New Zealand fisheries waters must be landed in New Zealand—
(1) No person shall land, at any place outside New Zealand, any fish... taken in New Zealand fisheries waters unless... has the prior approval of the chief executive and is in accordance with any conditions imposed... .

(2) For the purposes of subsection (1) of this section, fish, aquatic life, or seaweed shall be deemed to have been landed at a place outside New Zealand if—

(a) It is transported beyond the outer limits of the exclusive economic zone by the vessel that took it; or

(b) It is taken... and transferred to a vessel and then transported... beyond the outer limits of the exclusive economic zone without having been lawfully purchased or acquired by a licensed fish receiver in New Zealand before transportation; or

(c) It is transhipped... to another vessel.

(3) The conditions that may be imposed on any approval granted under subsection (1) of this section include conditions relating to one or more of the following:

- *(a) The vessel that will take the fish, aquatic life, or seaweed:*
- *(b) Any vessel, which will receive the fish, aquatic life, or seaweed:*
- *(c) The manner and conditions under which the storage, transportation, transhipment, recording, reporting, landing, and disposal of the fish, aquatic life, or seaweed will take place.*

If transhipment were to take place then traceability is not compromised due to checks including

records and labelling, that is in place.

5.2.5 Eligibility to Enter Further Chains of Custody

The scope of this certification ends at the points of landing. Downstream certification of the product would require appropriate certification of storage and handling facilities at these locations.

In order for subsequent links in the distribution chain to be able to use the MSC logo, products must enter into a separate chain of custody certification from the point of landing forward.

The subsequent links must be able to prove that they can trace southern blue whiting products back to the permitted vessels which landed the product.

The main points of landing for this fishery are shown in Table 27, however, all New Zealand major ports could be used for landing.

The assessment team has determined that within the fishery the systems in place for tracking and tracing are sufficient and fish and fish products from the fishery may enter into further certified chains of custody and be eligible to carry the MSC ecolabel.

The eligible parties to use the fisheries certificate are shareholders of the Deepwater Group. Anyone who owns southern blue whiting quota has the opportunity to become a DWG shareholder. Those not a part of the DWG are required to have a certificate sharing agreement.

The following table summarises traceability factors within the fishery.

Table 28. Traceability factors within the fishery:

Traceability Factor	Description of risk factor, if present.
Potential for non-certified gear/s to be used within the fishery	There are no other fleets that target southern blue whiting. The at sea tracking and tracing systems described above ensure that the potential for non-certified gears to be used within the fishery to be negligible.
Potential for vessels from the UoC to fish outside the UoC or in different geographical areas (on the same trips or different trips)	All vessels are equipped with VMS, there is a high level of observer coverage, and there is extensive record keeping and cross checks with respect to compliance to verify this.
Potential for vessels outside of the UoC or client group fishing the same stock	DWG represents quota owners who own the majority (~90%) of the allowable catch for each of the UoCs. For those not a part of the DWG, they are required to have a certificate sharing agreement.
Risks of mixing between certified and non-certified catch during storage, transport, or handling activities (including transport at sea and on land, points of landing, and sales at auction)	Where there is potential for mixing, these risks are managed by the operators who have their own protocols in place to separate these catches. They are legally required to record in catch and effort logbooks catch weight by position, and method, as well as on the official catch landing form. Further, the operators have their own internal reporting systems that record the date and time of fishing activities against the packaged product (if processed).
Risks of mixing between certified and non-certified catch during processing activities (at-sea and/or before subsequent Chain of Custody)	See above.

Traceability Factor	Description of risk factor, if present.
Risks of mixing between certified and non-certified catch during transhipment	No transhipments have occurred in New Zealand waters in recent years and any transhipment requires the presence of fisheries officers or government observers.
Any other risks of substitution between fish from the UoC (certified catch) and fish from outside this unit (non-certified catch) before subsequent Chain of Custody is required	No additional risks have been identified. There are relatively small gains but big penalties, which provides sufficient incentive to comply with regulations. New Zealand's geographic isolation means all fish is New Zealand caught, and there is aerial surveillance to monitor that there is no unreported and unlicensed fishing (i.e. IUU incursions into the New Zealand EEZ) occurring.

5.3 Eligibility of Inseparable or Practicably Inseparable (IPI) stock(s) to Enter Further Chains of Custody

There are no IPI stocks in the fishery.

6 Evaluation Results

6.1 Principle Level and Performance Indicator Scores

For each UoC (1: Bounty Platform SBW6B and 2: Campbell Rise SBW6I), the preliminary scores for each Principle and each of the thirty-one Performance Indicators are provided in Table 29 and Table 30, below:

Table 29. Principle-level scores for each UoC

	UoC 1	UoC 2
Principle	**Score**	**Score**
Principle 1 – Target Species	85.6	90.6
Principle 2 – Ecosystem	90.0	92.7
Principle 3 – Management System	97.3	97.3

Table 30: Performance Indicator scores for each UoC

				UoC 1	UoC 2
Principle	**Component**	**Performance Indicator (PI)**		**Score**	**Score**
1	Outcome	1.1.1	Stock status	80	100
		1.1.2	Reference points	80	80
		1.1.3	Stock rebuilding	n/a	n/a
	Management	1.2.1	Harvest strategy	95	95
		1.2.2	Harvest control rules & tools	90	90
		1.2.3	Information & monitoring	90	90
		1.2.4	Assessment of stock status	90	90
2	Retained species	2.1.1	Outcome	90	100
		2.1.2	Management	80	100
		2.1.3	Information	90	100
	Bycatch species	2.2.1	Outcome	100	100
		2.2.2	Management	95	95
		2.2.3	Information	100	100
	ETP species	2.3.1	Outcome	85	85
		2.3.2	Management	95	95
		2.3.3	Information	85	85
	Habitats	2.4.1	Outcome	100	100
		2.4.2	Management	95	95
		2.4.3	Information	80	80
	Ecosystem	2.5.1	Outcome	80	80
		2.5.2	Management	85	85
		2.5.3	Information	85	85
3	Governance and policy	3.1.1	Legal & customary framework	100	100
		3.1.2	Consultation, roles & responsibilities	100	100
		3.1.3	Long term objectives	100	100
		3.1.4	Incentives for sustainable fishing	90	90
	Fishery specific management system	3.2.1	Fishery specific objectives	100	100
		3.2.2	Decision making processes	95	95
		3.2.3	Compliance & enforcement	100	100
		3.2.4	Research plan	100	100
		3.2.5	Management performance evaluation	90	90

6.2 Summary of Conditions

No conditions of certification have been set for this fishery.

6.3 Recommendations

No Recommendations were made for the New Zealand southern blue whiting fishery.

6.4 Determination, Formal Conclusion and Agreement

Following this assessment team's work, and review by stakeholders and peer-reviewers, the determination will be presented to Acoura's decision making entity that this fishery has passed its assessment and should be certified.

(REQUIRED FOR PCR)

1.	**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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Principle One

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Appendices

Appendix 1 - Performance Indicator Scores and Rationale

Evaluation Table for PI 1.1.1 – Stock status

(6B: Bounty Platform; 6I: Campbell Island Rise)

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	Stock status relative to recruitment impairment			
	Guide post	It is **likely** that the stock is above the point where recruitment would be impaired (PRI)	It is **highly likely** that the stock is above the PRI.	There is a **high degree of certainty** that the stock is above the PRI.
	6B Met?	Y	Y	N
	6I Met?	Y	Y	Y
	Justification	6B: An update of the 2010 assessment provides a relatively pessimistic view of current stock status. Under average recruitment and an annual catch of 15,000 t, four models predicted that biomass is expected to decrease after 2011 with three of the four models indicating that biomass would be below 20% B_0 by 2015. Based upon consideration of the uncertainty in the acoustic survey catchability (q), %B_0 in 2015 is about 32.5% with Pr (B> 20% B_0) = 0.72. In contrast, the 2014 assessment model provides a relatively optimistic view of current stock status. Projected biomass (base case) during 2014 – 2016 across a range of annual catch (6,860 t – 10,000 t) indicated that the probability of biomass being below 20% B_0 was zero. In both cases, projected catch during 2014 – 2016 was above that reported (4,579 t) suggesting that the projections are overly pessimistic. While these assessments were not used as the basis of TACCs, they indicate that it is highly likely but not with a high degree of certainty that biomass is currently above the soft limit (20% B_0), which is reflected in the current management actions of MPI. SIa meets SG60 & 80 but not SG100. 6I: The most recent assessment (2017) estimates that 2015 spawning stock biomass is well above the limit reference point (soft limit of 20% B_0) with the lower 95% credible interval for the most pessimistic model (2.1) exceeding the limit reference point by a significant margin (95% CI 32 - 58% B_0). Projections of the base case model to 2020 based on catch similar to recent levels (23,000 t) indicate that the probability of biomass dropping below the limit reference point by 2020 is 3%. SIa meets SG100.		
b	Stock status in relation to achievement of MSY			
	Guide post		The stock is at or fluctuating around a level consistent with MSY.	There is a **high degree of certainty** that the stock has been fluctuating around a level consistent with MSY or has been above this level over recent years.
	6B Met?		Y	N
	6I Met?		Y	Y
	Justification	6B: An update of the 2010 assessment provides a relatively pessimistic view of current stock status. Under average recruitment and an annual catch of 15,000 t, four models predicted that biomass is expected to decrease after 2011 and based		

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
		upon consideration of the uncertainty in the acoustic survey q, %B in 2015 is about 32.5% and thus below the biomass target. The 2014 assessment model provides a more optimistic view of current stock status. Projected biomass (base case) during 2014 – 2016 across a range of annual catch (6,860 t – 10,000 t) indicated that by 2015, status was expected to range 42 – 44% although it was declining. In both cases, projected catch during 2014 – 2016 was above that reported (4,579 t) suggesting that the projections are overly pessimistic. Notwithstanding this, local aggregation acoustic survey biomass has been continuously declining since 2013 with that in 2016 (6,201 t) being the lowest in the time series (since 2004). While these assessments were not used as the basis of TACCs, they suggest that due to strong recruitment in the 2000s, biomass was likely higher than 40% B_0 and has declined since then to likely below the 40% B_0 target in recent years, an interpretation consistent with that of MPI and which prompted implementation of update to the HCR. It is evident that biomass has fluctuated around the 40% B_0 target in response to recruitment pulses rather than due to fluctuations in fishing mortality which has been controlled consistent with management targets over the long-term. Under the updated HCR, biomass should increase towards and above the 40% B_0 target. It is thus possible to conclude that stock biomass is fluctuating around the target but not with a high degree of certainty. SIb meets SG80 but not SG100. 6I: The fishery is managed so that projections based on a fixed TACC indicate a low probability of stock biomass falling below limit reference point (20% B_0) and fluctuating around the target reference point (40% B_0). The stock has experienced strong 2006, 2009 and 2011 year-classes. Consequently, after a large biomass in the 1990s, it has fluctuated at or above the 40% B_0 target since then. The most recent assessment (2017) estimates that the lower 95% credible interval of 2015 biomass for the base case model exceeds the target reference point (95% CI 46 - 79% B_0). Projections of the base case model to 2020 based on catch similar to recent levels (23,000 t) indicate that biomass will likely decline by 2020 assuming average recruitment although it will remain above the target reference point with a high degree of certainty (95%) until at least 2017. SIb meets SG100.		
References		Dunn and Hanchet (2017); MPI (2014a; 2017)		

Stock Status relative to Reference Points

	Type of reference point	Value of reference point	Current stock status relative to reference point
Reference point used in scoring stock relative to PRI (SIa)	Spawning Biomass Soft Limit	20% B_0	6B: B_{2015} (Base); >32.5% B_0 (>1.6 x soft limit) 6I: B_{2015} (Base); 62.0% B_0 (3.1 x soft limit)
Reference point used in scoring stock relative to MSY (SIb)	Spawning Biomass Target (proxy B_{MSY})	40% B_0	6B: B_{2015} (Base); < 40.0% - >40.0% B_0 (~ 0.8 – 1.1 x target) 6I: B_{2015} (Base); 62.0% B_0 (1.6 x target)

OVERALL PERFORMANCE INDICATOR SCORE	**UoC 1 – 6B**	**80**
OVERALL PERFORMANCE INDICATOR SCORE	**UoC 2 – 6I**	**100**
CONDITION NUMBER (if relevant):		**N/A**

Evaluation Table for PI 1.1.2 – Reference Points

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.	
	6B Met?	Y	Y	
	6I Met?	Y	Y	
	Justification	All Stocks: All reference points are based on estimates of the unexploited biomass (B_0) and are based on review and consideration of the estimation of proxy reference points elsewhere in the world. The New Zealand Harvest Strategy Standard (HSS) outlines the theoretical and biological basis of the reference points. The limit reference point on which this assessment is based (the soft limit of 20% B_0) is 50% of the Management Target (40% B_0). Both the limit and the target are consistent with the MSC defaults. SIa meets SG60. All Stocks: As per the HSS, there are a hard and soft limit reference points at 10% and 20% respectively of the unexploited biomass, and a target reference point set at the HSS B_{MSY} proxy default of 40% B_0. The target exploitation is that to achieve the target biomass over the long-term. Stock assessments are used to estimate the unexploited biomass using statistical catch-at-age models, available information on the population dynamics and biomass surveys. Thus, these reference points can be estimated and are updated as new information becomes available. SIa meets SG80.		
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.
	6B Met?		Y	N
	6I Met?		Y	N

	Justification	All Stocks: The soft rather than hard limit reference point is treated in scoring this PI, consistent with the MSC CR and the interpretation of previous MSC assessment teams of NZ deepwater fisheries. The soft limit reference point is set by the New Zealand management system at a level above the point where reproductive capacity is impaired, based on population dynamics; it is consistent with MSC guidance (default 20% B_0). The Campbell Island stock assessment is the only one of the southern blue whiting stocks that uses a stock-recruitment relationship with an assumed steepness = 0.9, implying that expected biomass at the soft limit (20%B_0) will maintain recruitment at 90% of that at virgin levels. Research on B_{MSY} and related proxy RPs (e.g. Punt et al, 2014) indicates that at steepness of 0.9, B_{MSY}/B_0 ratios can be expected to be less than 0.4, implying that southern blue whiting reference points based upon the HSS defaults are conservative. SIb meets SG80. All Stocks: While well justified, the soft limit (20% B_0) is a proxy that is applied to all stocks in lieu of stock-specific analyses supporting an alternative limit. There is no evidence that they were selected to be deliberately precautionary; the limit reference point does not take account of the uncertainty in estimating B_0 or current biomass. Stock assessments indicate that recruitment to the stock exhibits very high variability. There have been no recent studies on the abiotic factors influencing recruitment strength. Research would be required on factors affecting recruitment before this or an alternative limit reference point might be justified based on relevant precautionary issues. SIb does not meet SG100.		
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.
	6B Met?		Y	N
	6I Met?		Y	N
	Justification	All Stocks: The target reference point is defined as 40% B_0, based on the HSS and is consistent with MSC CR v1.3 guidance for a B_{MSY} proxy. The risk that the stock would fall below the limit reference point if the stock is kept around this target is low. At steepness equal to 0.9, it is expected that B_{MSY} would be a lower fraction of B_0 (25% B_0), than the HSS target default of 40% B_0. The intent of management is to maintain the stock at high productive levels, which is consistent with targets at or above B_{MSY}. SIc meets SG80. All Stocks: While well justified, the target (40% B_0) is a proxy that is applied to all stocks in lieu of stock-specific analyses supporting an alternative target. There is no evidence that the target was selected to be deliberately precautionary; the target reference point does not take account of the uncertainty in estimating B_0 or current biomass. The population dynamics include infrequent very large recruitments, as appears to be occurring currently for SBW 6I and somewhat for SBW 6B, which cause large, natural fluctuations in biomass. Further justification for a target reference point based on a defined level of precaution and the ecological role of the stocks is required. SIc does not meet SG100.		
d	**Guidepost**		For key low trophic level stocks, the target reference point takes into account the ecological role of the stock.	
	6B Met?		NA	

	6I Met?		NA	
	Justification	Southern blue whiting is not a low trophic species. It is a member of family Gadidae of the genus *Micromesistius* and is not in MSC CR v1.3, Box CB1. Predation by marine mammals and large teleosts is probably the main source of mortality for adults, and juveniles are frequently taken by seabirds (does not meet MSC CB2.3.13ai), crustaceans and teleosts are the dominant prey groups for southern blue whiting, its mean age of maturity is 3.5 years, and its maximum age is in the order of 25 years (does not meet MSC CB2.3.13bi).		
References		Haddon (2001), Intertek (2012a; 2012b; 2014a; 2014b); MPI (2008; 2011); Punt et al (2014)		
OVERALL PERFORMANCE INDICATOR SCORE			**UoC 1 – 6B**	**80**
OVERALL PERFORMANCE INDICATOR SCORE			**UoC 2 – 6I**	**80**
CONDITION NUMBER (if relevant)				**n/a**

Evaluation Table for PI 1.1.3 – Stock rebuilding

Not scored as PI 1.1.1 SG80 is met.

Evaluation Table for PI 1.2.1 – Harvest strategy

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.
	6B Met?	Y	Y	Y
	6I Met?	Y	Y	Y
	Justification	All Stocks: The harvest strategy is guided by the New Zealand HSS and is consistent with the MSC standard. The strategy aims to "provide a consistent and transparent framework for setting fishery and stock targets and limits and associated fisheries management measures, so that there is a high probability of achieving targets, a very low probability of breaching limits, and acceptable probabilities of rebuilding stocks that nevertheless become depleted, in a timely manner". The HSS specifies probabilities for each of these outcomes and includes the definition of (a) a target level about which a fishery or stock should fluctuate, (b) a soft limit that triggers a requirement for a formal, time-constrained rebuilding plan, and (c) a hard limit below which fisheries should be considered for closure. The harvest strategy involves collecting fishery-dependent and –independent data, analysing those data using a stock assessment model, assessing stock status relative to agreed reference points, conducting projections under alternative TACCs, and setting a TACC (and other regulations) which is consistent with the Fisheries Act 1996. The strategy has all the characteristics of a system which is expected to achieve stock management objectives as reflected in the target and limit reference points. SIa meets SG60. All Stocks: The four elements of the harvest strategy (monitoring, assessment, projections, and decision making consistent with the Fisheries Act 1996) are integrated and linked. The harvest control rule provides the Minister with flexibility on how best to satisfy the requirements of the Act. The harvest strategy is responsive to the state of the stock, can respond to the variable recruitment characteristic of the southern blue whiting stocks and the elements of the harvest strategy work together towards achieving management objectives, as reflected in the target and limit reference points. SIa meets SG80 All Stocks: The harvest strategy, which is guided by the HSS, requires the definition of (a) a target level about which a fishery or stock should fluctuate, (b) a soft limit that triggers a requirement for a formal, time-constrained rebuilding plan, and (c) a hard limit below which fisheries should be considered for closure. When a stock is depleted to be below the soft limit, a formal rebuilding plan is required stipulating the actions for stock recovery to the target. It a stock is below the hard limit, one of these actions is fishery closure. When stock status is between the target and soft limit, the HCR defines the actions to be taken to both recover the stock to the target and maintain it at this level. Management decisions on the Campbell Island Rise stock, as summarized by the Kobe plot, illustrate the management actions taken when the stock was projected to drop below the soft limit, indicating that the harvest strategy will react before a stock drops below this limit reference point. Stock assessments report stock status relative to the reference points and quantify the implications of future TACC levels. The harvest strategy is therefore responsive to the state of the stock and is designed to achieve stock management objectives, as reflected by the target and limit reference points. SIa meets SG100		

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.
	6B Met?	Y	Y	N
	6I Met?	Y	Y	N
	Justification	All Stocks: The harvest strategy is based upon the HSS which in turn was formulated based on international best practice and articulates successful implementations of management systems. It is published and is in the public domain. The HSS provides plausible argument that the strategy is likely to work. The time series of biomass and exploitation rate of the Campbell Island stock, as illustrated by the Kobe plot, provides experience that the strategy is likely to work. SIb meets SG60. 6B: In response to assessment modeling issues and based upon an MSE, the harvest strategy was updated in 2017 with analytically determined estimates of the TACC as a function of acceptable risk (Pr (Biomass < 20% B_0) <10%), local aggregation acoustic biomass, natural mortality and target exploitation. The MSE fully evaluated the uncertainties in the HCR, on which the target exploitation (U = 0.24) was now based. Thus, it is evident that the strategy has been tested (MSE). Evidence from assessments suggests that the strategy is achieving its objective of controlling fishing mortality. Fishing mortality has likely been below that consistent with maintenance of biomass at the target (40% B_0) since the mid-1990s or about 2.6 generations. The TACs for 2008 – 2017 were all based upon a fishing mortality-based calculation of yield (F=M) using the local aggregation acoustic biomass. In April 2018, the Minister of MPI set the 2018 TAC based upon the application of the updated HCR (incl. U = 0.24) to the most recent (September 2017) local aggregation acoustic biomass (7,719 t). The latter indicated an increase in stock biomass due to recruitment of a relatively strong 2012 year-class. Thus, evidence exists that the strategy is achieving its objectives of controlling fishing mortality to ensure sustainability harvesting. SIb meets SG80. 6B: Recruitment variation has resulted in both large fluctuations in biomass around the 40% B_0 target and high uncertainty in the stock assessment. Current biomass is likely below the 40% B_0 target; the updated strategy is designed to recover and maintain the stock at this target. Thus, while the updated strategy has been tested (MSE), it is not yet evident that it will be clearly able to maintain the stock at the target level. SIb does not meet SG100. 6I: An industry-funded MSE was conducted in 2015 which considered four HCR scenarios with associated variations in acoustic survey and assessment frequency. All HCR scenarios displayed acceptable risk profiles and would very likely meet MSC requirements and the requirements of the HSS. The MSE is currently scheduled to be updated in 2021/2022. Evidence for the effectiveness of the harvest strategy is also provided by the stock assessments. Stock assessments are conducted on a three-year (formally two) cycle and provide management with 5-year projections guided by the requirements of the HSS. Between assessments, fishery and survey data are updated and if issues arise, management responds to these. The strategy allows management to respond to both rare recruitment events as well as changes in the fishery. The Kobe plot provides evidence which indicates that the strategy is achieving its objectives. In the early 1990s, there was a dramatic decline in fishing mortality (F) which allowed biomass to grow. Biomass went through a decline in the mid-2000s which was arrested by management intervention before it had dropped below 40% B_0. Since then, biomass has been maintained above the management target through the control of exploitation via changes in the TACCs. SIb meets SG80.		

		6I: While there is evidence that the strategy is achieving its objectives, the formal testing conducted as part of the MSE is still underway. The implications of uncertainty on the performance of the harvest strategy have not been fully evaluated, the focus of initial work being the impact of two sources of uncertainty in the assessment model (acoustic q and M). The MSE is currently scheduled to be updated in 2021/2022. SIb does not meet SG100.		
c	**Guidepost**	Monitoring is in place that is expected to determine whether the harvest strategy is working.		
	6B Met?	Y		
	6I Met?	Y		
	Justification	6B: Fishery-dependent and – independent data are available to monitor trends in abundance as well as the age - and sex-structure of the stocks and their removals. These data are included in full stock assessments, which are conducted on a multi-annual cycle based upon perceived harvesting risks to each stock. Between these full assessments, fishery and survey indices and other monitoring data are evaluated and, if deemed necessary, changes made (e.g. TACC reduction) to management actions. Considerable planning of data collection (e.g. fishery and surveys) and assessment activity is undertaken to determine the appropriate level of monitoring given the risks to each stock. SIc meets SG60. 6I: Fishery-dependent and – independent data are available to monitor trends in abundance as well as the age - and sex-structure of the stocks and their removals. These data are included in full stock assessments, which are conducted on a multi-annual cycle based upon perceived harvesting risks to each stock. Between these full assessments, fishery and survey indices and other monitoring data are evaluated and, if deemed necessary, changes made (e.g. TACC reduction) to management actions. Considerable planning of data collection (e.g. fishery and surveys) and assessment activity is undertaken to determine the appropriate level of monitoring given the risks to each stock. SIc meets SG60.		
d	**Guidepost**			The harvest strategy is periodically reviewed and improved as necessary.
	6B Met?			Y
	6I Met?			Y
	Justification	All stocks: The HSS was published in 2008, and represents the current configuration of the harvest strategy. There is a process of strategy review through the sustainability round, the results of which appear in MPI and other reports. The guidelines for applying the HSS were revised in 2011. The major changes relate to metrics for quantifying fishing intensity as well as to the roles and responsibilities of science working groups and fisheries managers. Stock-specific harvest strategies evolve over time (i.e. development of MSY-based target reference points rather than the HSS default proxies for hoki), demonstrating that harvest strategies are reviewed periodically and revised. The HSS recognizes the value of MSE to evaluate harvest strategies, and one is currently underway for the Campbell Island stock and may lead to an update of the harvest strategy. In response to assessment modelling issues, an MSE of the Bounty Platform stock was completed in 2017 and, based upon this, the harvest strategy was updated. SId meets SG100.		

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?	NA	NA	NA
	Justification	Southern blue whiting is not a shark species.		
References		Cordue (2017), Doonan (2017), Intertek (2012a; 2012b; 2014a; 2014b), 1996 NZ Fisheries Act, MPI (2008; 2011; 2016; 2017a; 2017b)		
OVERALL PERFORMANCE INDICATOR SCORE			**UoC 1 – 6B**	**95**
OVERALL PERFORMANCE INDICATOR SCORE			**UoC 2 – 6I**	**95**
CONDITION NUMBER (if relevant):				**N/A**

Evaluation Table for PI 1.2.2 – Harvest control rules and tools

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.	
	6B Met?	Y	Y	
	6I Met?	Y	Y	
	Justification	6B: The HCR was updated in 2017 to add a formal mathematical algorithm to determine TACCs as a function of stock status relative to limit and target reference points) as per the requirements of the Fisheries Act 1996 and Harvest Strategy Standard, HSS (Ministry of Fisheries 2008). The impetus for this change was issues with the stock assessments and declining stock biomass as evidenced in local aggregation acoustic surveys. The updated HCR was designed as a consequence of an MSE which explored its robustness to avoid the soft limit and rebuild biomass to the target in the face of the main uncertainties identified in the assessments. Thus, the harvest control rule is generally understood and consistent with the harvest strategy and will act to reduce the exploitation rate as the limit reference point is approached. SIa meets SG60. 6B: The HSS states that the probability of breaching the soft limit should not exceed 10% and that the probability of achieving the MSY-compatible target or better should be no less than 50%. It stipulates that below the soft limit, a formal rebuilding plan to achieve target biomass within a specified period is required. The HSS thus states the need for action to reduce exploitation when stock status is below the target. A mathematical algorithm is used to estimates catch designed to keep the stock above the limit and attempts to maintain the stock at the target, consistent with MSC1.3 GCB2.6. A "well-defined" harvest control rule should be transparent and testable. The harvest control rule is transparent, in that it will be clear whether it is being observed or not. Scientific advice is clearly stated in relation to the requirements of the HSS and therefore it is possible to determine whether or not this advice is being taken and adequate reason given for alternative actions. Any reason for not adhering to the harvest control rule can be readily evaluated against the HSS and MSC requirements. The harvest control rule is testable and has been tested in an MSE with careful consideration of how the rule will work in the NZ management system and agreement that its will enable the fishery to maintain stock size at acceptable levels, consistent with the HSS and MSC principles. SIa meets SG80. 6I: The harvest control rule (HCR) emerges from the management actions and responses determined by the results of a series of stock projections under a range of catch assumptions, guided by the biological reference points. The harvest control rule is not a mathematical algorithm which determines TACCs as a function of stock status relative to limit and target reference points but rather is a consequence of the requirements of the Fisheries Act 1996 and Harvest Strategy Standard, HSS (Ministry of Fisheries 2008). The harvest control rule is thus composed of comparing estimated stock status with the soft limit and target reference points, implementing a rebuilding plan if the stock is assessed to be below the soft limit, considering the fishery for closure if the stock is below the hard limit, and implementing management actions based on five-year projections which assess future stock status in relation to the limit and target reference points given assumptions regarding future recruitment, TACCs and catch limits. Thus, the harvest control rule is generally understood and consistent with the harvest strategy and will act to reduce the exploitation rate as the limit reference point is approached. SIa meets SG60. 6I: The HSS states that the probability of breaching the soft limit should not exceed 10% and that the probability of achieving the MSY-compatible target or better should be no less than 50%. It stipulates that below the soft limit, a formal rebuilding plan to achieve		

		target biomass within a specified period is required. The HSS thus states the need for action to reduce exploitation when stock status is below the target and although a mathematical algorithm is not specified on how precisely the exploitation rate is to be reduced below the target, an exploitation rate function emerges from implementation of the HSS which acts to keep the stock above the limit and attempts to maintain the stock at the target, consistent with MSC CR v1.3 GCB2.6. A "well-defined" harvest control rule should be transparent and testable. The harvest control rule is transparent, in that it will be clear whether it is being observed or not. Scientific advice is clearly stated in relation to the requirements of the HSS and therefore it is possible to determine whether or not this advice is being taken and adequate reason given for alternative actions. Any reason for not adhering to the harvest control rule can be readily evaluated against the HSS and MSC requirements. The harvest control rule is testable and is being tested (in the case of 6I) with careful consideration of how the rule will work in the NZ management system and agreement that it will enable the fishery to maintain stock size at acceptable levels, consistent with the HSS and MSC Principles. SIa meets SG80.		
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.
	6B Met?		Y	N
	6I Met?		Y	N
	Justification	6B: The uncertainties have been identified in the assessments and their impact on the short-term projections examined as scenarios for future catch in the sensitivity analyses. Issues with these uncertainties prompted an MSE during which the robustness of management actions (i.e. TACC setting) to achieve strategy objectives in the face of these uncertainties was explored. Uncertainty in natural mortality, recruitment and stock monitoring (catchability of local aggregation acoustic survey) was examined. The harvest control rule has been modified to account for these uncertainties and is designed to achieve the objectives of the strategy. SIb meets SG80. 6B: The design of the harvest control rule can accommodate a wide range of uncertainties and many have indeed been examined in past projections through the sensitivity analyses. A systematic examination of the main uncertainties highlighted in past assessments was undertaken in the 2017 MSE, the design of which is consistent with international best practice. This considered process (recruitment, natural mortality, acoustic survey catchability) and observation (acoustic survey sampling) error. Other sources of error (e.g. size of virgin stock, growth, maturity, catch monitoring) were not considered. Thus, while the MSE has met the immediate demands of management, the examination of the uncertainties was not comprehensive. SIb does not meet SG100. 6I: The uncertainties are identified in the assessments and their impact on the short-term projections examined as scenarios for future catch in the sensitivity analyses. Management decisions on quotas and other actions take account of these uncertainties. Uncertainties which have been accounted for and/or explored include: the unfished average biomass level (B_0), natural mortality rate, selectivity, recruitment (e.g. source of infrequently occurring strong year-classes), age composition, and acoustic survey catchability and observation error. Stock assessments also take account of sample error and a "process error", which is added to weight the stock abundance indices more appropriately and thus account for errors that cannot be estimated. The results of the projections are expressed in terms of probabilities of failing to achieve the strategic objectives of the HSS. SIb meets SG80. 6I: The design of the harvest control rule can accommodate a wide range of uncertainties and many have indeed been examined in the projections through the sensitivity analyses. A systematic examination of the spectrum of uncertainties is currently underway in an MSE for 6I. This would ensure that the examination of the uncertainties is comprehensive. SIb does not meet SG100.		

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.
	6B Met?	Y	Y	Y
	6I Met?	Y	Y	Y
	Justification	All Stocks: The main tools used to implement the harvest control rules are the TACC and ACE of the QMS. The estimated catch is frequently less than the TACC, although overruns can occur. Discarding can occur but only to a limited degree as discarding is legal but needs to be recorded by a scientific observer and counted against the vessel quota. Catch overages can also occur when a species is a bycatch to the main targeted species. The QMS is an incentive-based system designed to encourage good behavior (i.e. maintaining catch within the TACC) and penalizing bad behavior (i.e. penalizing catch above the TACC through an additional tax or deemed value). Quota holders can address catch over their allotted ACE through purchasing unfished ACE from other quota holders. Further, allowance for 'other sources of mortality' including catch misreporting is included in the TACC-setting process. All stocks meet SG60 and 80. 6B: Catch of the stock has been constrained by the TACCs since 2011/12, including more recently when it dramatically reduced as a consequence of stock decline. There is sufficient variation in the catch and TACCs to indicate that the latter is an effective constraint in the former. SIc meets SG100. 6I: Catch of the stock has been constrained by the TACCs until 2011/12, at which time they started to decline while the TACCs were being increased. The stock assessment indicates growing biomass and modestly declining exploitation since 2011/12, consistent with this trend. Notwithstanding this, there is sufficient variation in the catch and TACCs to indicate that the latter is an effective constraint in the former. SIc meets SG100.		
References		Cordue (2015), Doonan (2017), Intertek (2012a), Mangel et al, 2013), Dunn and Hanchet (2015), MPI (2008; 2011; 2014b; 2017a; 2017b), Robert and Dunn (2017)		
OVERALL PERFORMANCE INDICATOR SCORE			**UoC 1 – 6B**	**90**
OVERALL PERFORMANCE INDICATOR SCORE			**UoC 2 – 6I**	**90**
CONDITION NUMBER (if relevant):				**N/A**

Evaluation Table for PI 1.2.3 – Information and monitoring

PI 1.2.3		Relevant information is collected to support the harvest strategy		
Scoring Issue		SG 60	SG 80	SG 100
a	Range of information			
	Guide post	**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, UoA removals and other information such as environmental information), including some that may not be directly related to the current harvest strategy, is available.
	6B Met?	Y	Y	N
	6I Met?	Y	Y	N
	Justification	All Stocks: The plenary and assessments reports of southern blue whiting summarize information on stock structure and biology, while the assessments estimates fleet selectivity patterns, natural mortality and other stock and fishery dynamical parameters. Thus, there is some relevant information related to stock structure, stock productivity and fleet composition available to support the harvest strategy. SIa meets SG60. All stocks: A review of the evidence on the southern blue whiting stock structure (Intertek, 2012a), based upon historical data on distribution and abundance, reproduction, growth, and morphometrics, supports the four stocks assumed in stock assessment and management. There have been no more recent studies. Stock assessments (e.g. Dunn and Hanchet, 2015; 2017) do not use a von Bertalanffy growth equation to determine the mean length at age of fish in the model, but rather use an empirical length-at-age matrix to take account of inter-annual changes in growth. Otolith ageing has been validated. Some adjustment for this is made in the Campbell Island stock projections. Recent Campbell Island Rise assessments have attempted to estimate natural mortality (*M*). Roberts and Dunn (2017) have recently published a report of southern blue whiting *M* which has implications for the starting population age structure of assessment models and which has been accepted for the Campbell Island base case. These observations have been used in the Bounty Platform 2017 MSE. Stock assessments and MSEs, which assume a Beverton and Holt stock-recruitment relationship with a steepness of 0.9, indicate that recruitment to the stock exhibits very high variability. There have been no recent studies on the abiotic factors influencing recruitment strength. There is good information on fleet composition and while there is fine-scale data on CPUE, it is generally not used in stock assessments due to the availability of what is believed to be better quality survey information. Sufficient data are available to obtain estimates of stock abundance for the assessments with considerable research on acoustic survey catchability. Information on all vessels is held through a registry and licence system. Vessel activity is monitored through VMS and an observer programme. A variety of other data sources (diet, environmental conditions etc.) is also available for use in assessments and other analyses. Thus, relevant information related to stock structure, productivity, abundance and fleet composition is available to support the harvest strategy. SIa meets SG80.		

PI 1.2.3		**Relevant information is collected to support the harvest strategy**		
		All stocks: While there is considerable information on the biology of southern blue whiting, data gaps remain. For all stocks, questions remain on the characterization of stock structure (e.g. genetic) and movements. The biotic and abiotic drivers of productivity, particularly recruitment, remain to be elucidated. It cannot be concluded that the range of information available is comprehensive. SIa does not meet SG100.		
b	Monitoring			
	Guide post	Stock abundance and UoA removals are monitored and at least one indicator is available and monitored with sufficient frequency to support the harvest control rule.	Stock abundance and UoA 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.
	6B Met?	Y	Y	Y
	6I Met?	Y	Y	Y
	Justification	All stocks: The monitoring of the blue whiting fishery has not changed since Intertek (2012a). Landing information is required from each registered fishing vessel once all fish and fish product has been landed following each fishing trip. A new initiative to develop enhanced surveillance capacity based upon the integration of information from multiple monitoring activities will be rolled out over a number of years, with the first stages of implementation to take place during 2017 – 2019. Renamed the 'Digital Monitoring' program, electronic reporting has now been implemented on all trawl vessels >28m LOA. In late 2017, the Minister of Fisheries announced a delay in the introduction of cameras on commercial fishing vessels to allow for further consultation on the proposal to ensure effective implementation. No decision as yet has been made on the date of implementation of this video surveillance. MPI (2017a) notes instances of illegal and unreported catch and where catch returns have been revised, the corrected totals by area are included in the assessments and provided in the plenary report. Observers provide information on the fishery's catch volume and composition on an on-going basis. During 2002/03 – 2010/11, observer coverage of the southern blue whiting trawl fishery ranged 25 – 41% and since 2012/13, has been 100%. The observers have occasionally reported discards of undersize fish and accidental loss from torn or burst codends with amounts reported in MPI (2017a). Total annual discard estimates (including estimates of fish lost from the net at the surface) range 0.4% - 2.0% of the estimated southern blue whiting catch over all the southern blue whiting fisheries. The low levels of discarding occur primarily because most catch comes from vessels that targeted spawning aggregations. Stock assessments typically do not include this source of mortality. The primary source of southern blue whiting abundance trends used in stock assessments and management advice continues to be acoustic surveys, which provide a direct estimate of the biomass of the aggregations which are fished. Wide-area stratified-random September acoustic surveys commenced in 1993 and have sampled the Campbell Island stock since then (biannually until recently and tri-annually as of 2019). These surveys sampled the Bounty Platform stock during 1993 – 2001 but were discontinued in favour of local aggregation acoustic surveys which have been conducted annually since then. The design and operation of these surveys is discussed in O'Driscoll et al (2016) and O'Driscoll and Ladroit (2017); the wide-area survey design has been consistent across years, with one vessel (R.V. Tangaroa) used. The local aggregation surveys use an adaptive design to cover all areas of high southern blue whiting density and have had mixed success. The		

PI 1.2.3		Relevant information is collected to support the harvest strategy		
		uncertainties in these surveys have been studied over a number of years and are well understood. The sampling CVs are considered low; during the stock assessment process, these are increased to better represent the contribution of these data to stock status determination. They are also examined in the MSEs. For the Bounty Platform stock, the absolute biomass estimates from the local aggregation acoustic surveys have been used to set the TACCs since 2011. While trawl survey and CPUE indices are available, they are not used as indices of abundance as they are considered less reliable. The accuracy and frequency of the monitoring are more than adequate to support the harvest control rules. SIb meets SG60 and 80. 6B: Uncertainties in the wide area and local aggregation acoustic surveys have been studied over a number of years and are generally well understood with the latter being the primary biomass index since 2004. The absorption coefficient and target strength relationship have recently been re-evaluated, which will improve the estimates of absolute biomass. The relatively low sampling CVs are adjusted upwards in stock assessment models to compensate for process error related to the observation methodology. During assessments, robustness to observation sources of error is explored through sensitivity runs. The 2017 MSE explored the robustness of achievement of management objectives via the updated HCR to error in acoustic survey catchability. 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 data and the robustness of the assessment and management to this uncertainty. SIb meets SG100. 6I: Uncertainties in the wide area acoustic surveys have been studied over a number of years and are generally well understood. Improvements are made to the survey as deemed necessary. For instance, the absorption coefficient and target strength relationship have recently been re-evaluated, which will improve the estimates of absolute biomass. The relatively low sampling CVs are adjusted upwards in stock assessment models to compensate for process error related to the observation methodology. During assessments, robustness to observation sources of error is explored through sensitivity runs. The 2015 MSE explored the robustness of achievement of management objectives via candidate HCRs to error in acoustic survey catchability. 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 data and the robustness of the assessment and management to this uncertainty. SIb meets SG100.		
c	Comprehensiveness of information			
	Guide post		There is good information on all other fishery removals from the stock.	
	6B Met?		Y	
	6I Met?		Y	
	Justification	All Stocks: There are no other vessels catching southern blue whiting. The landed catches by Maori for customary purposes and by recreational fishers are considered to be negligible. Catches by all commercial fishing sectors are counted against the TACC. The level of illegal and unreported catch is thought to be low. Corrections were applied to catches for this detected misreporting. Scientific observers have also reported discards of undersize fish and accidental loss from torn or burst codends. Overall, non-recorded mortality is very likely to be small compared to the reported catch and should not affect the stock assessment and scientific advice. Thus, there is good information on all fishery removals from the southern blue whiting stocks. SIc meets SG80.		

PI 1.2.3	Relevant information is collected to support the harvest strategy		
References	Dunn and Hanchet (2015; 2017), Intertek (2012a), Large and Hanchet (2017), MPI (2017a), O'Driscoll (2011), O"Driscoll and Ladroit (2017), O'Driscoll et al (2013), O'Driscoll et al (2016), Simmond et al (2016)		
OVERALL PERFORMANCE INDICATOR SCORE		**UoC 1 – 6B**	**90**
OVERALL PERFORMANCE INDICATOR SCORE		**UoC 2 – 6I**	**90**
CONDITION NUMBER (if relevant):			**N/A**

Evaluation Table for PI 1.2.4 – Assessment of stock status

PI 1.2.4		There is an adequate assessment of the stock status		
SI		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.
	6B Met?		Y	Y
	6I Met?		Y	Y
	Justification	6B: Since 2010, assessment modelling similar to that of the Campbell Rise stock has been undertaken on the Bounty Platform stock. These have endeavoured to best take account the major features of the stock`s biology, fishery and its monitoring. As with the Campbell Island stock, the consequences (i.e. stock status relative to reference points) of catch scenarios have been explored through five-year projections for both a base case and sensitivity runs which bracket the main uncertainties. The SCAA Bayesian modelling approach had difficulty reconciling biomass trends in the local aggregation acoustic survey and consequently, annual TACC advice has been based on CAYs using annual local aggregation acoustic biomass. Efforts to reconcile these assessment issues have continued until the present with Bayesian modelling undertaken as per the assessment schedule. In 2017, it was decided that until these issues could be resolved, an updated HCR with a mathematical algothrim based upon the local aggregation survey be used to inform TACC decisions. The updated harvest control rule was based upon an MSE which used the uncertainty identified in the Bayesian assessments to test the robustness of the updated HCR to achievement of management objectives. The updated HCR was adopted and informed TACC setting in 2017. SIa meets SG80. 6B: The fishery targets the stock during spawning and thus the local aggregation acoustic survey provides the key index of stock status. The MSE identified stock, fishery and survey features that needed to be recognized in the HCR and the assessment. This illustrates that the assessments have endeavoured to take account of the major features of stock and fishery biology. SIa meets SG100. 6I: The assessment modelling approach in the Campbell Island Southern blue whiting assessments has not changed significantly since Intertek (2012a). The assessments use catch history, proportion-at-age, and a variety of survey and CPUE data from the mid-1970s – present in a Bayesian Statistical Catch-At-Age (SCAA) modeling framework (implemented by the NIWA stock assessment program CASAL, Bull et al, 2012). The structure of the assessment has endeavoured to best take account the major features of the stock`s biology, fishery and its monitoring. Assessments are sexed and include two annual time steps (pre- and post-spawning) to account for migration. Recruitment is estimated as deviations around a Beverton and Holt stock-recruitment relationship with assumed steepness (0.9). Natural mortality is fixed although can be estimated in sensitivity runs. In common with stock assessments for most whitefish fisheries, the key outputs from the assessments are unfished spawning biomass, B_0, for each stock, current spawning biomass for each stock, the selectivity patterns for the fisheries and the surveys, and the time-trajectories of spawning stock biomass, fishing mortality and recruitment by stock. The consequences (i.e. stock status relative to reference points) of catch scenarios are explored through five-year projections for both a base case and sensitivity runs which bracket the main uncertainties. The model structure is fully described in MPI (2017a) with details also in Intertek (2012a). SIa meets SG80. 6I: Extending on the rationale of SG80, Campbell Island Rise assessment models take account of the important features including annual cycle of fishing, recruitment, spawning and natural mortality and sex-specific dimorphic growth. This illustrates that the assessments have endeavoured to take account of the major features of stock and fishery biology. SIa meets SG100.		

b	**Guidepost**	The assessment estimates stock status relative to reference points.		
	6B Met?	Y		
	6I Met?	Y		
	Justification	6B: The stock assessments provide estimates of spawning biomass relative to (a) the hard (10% B_0) and soft (20% B_0) limits, (b) where it has been estimated/reported (for some stocks) estimates of B_{MSY} under the assumption of deterministic dynamics, and (c) the Management Target (40%B_0). They also provide estimates of exploitation or fishing intensity relative to that corresponding to the Management Target. While the Bayesian stock assessment approach has been put aside in favour of an updated HCR based on local aggregation acoustic survey biomass, it continues to be used and gives indication of stock status relative to reference points. Further, the 2017 MSE identified a target exploitation rate which is used in the updated HCR to inform TACC setting. The updated HCR is designed to rebuild the stock to the 40% B_0 target and avoid going below the 20% B_0 soft limit. By inference, the updated HCR takes account of stock status relative to reference points. SIb meets SG60. 6I: The stock assessments provide estimates of spawning biomass relative to (a) the hard (10% B_0) and soft (20% B_0) limits, (b) where it has been estimated/reported (for some stocks) estimates of B_{MSY} under the assumption of deterministic dynamics, and (c) the Management Target (40%B_0). They also provide estimates of exploitation or fishing intensity relative to that corresponding to the Management Target. SIb meets SG60.		
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.
	6B Met?	Y	Y	Y
	6I Met?	Y	Y	Y
	Justification	6B: The stock assessments of the Bounty Platform stock have employed the same modelling approach as used for the Campbell Island Rise stock and consequently the scoring rationale below is applicable to this stock as well. One of the main differences between the two assessments is the reliance in the Bounty Platform stock on the local area aggregation acoustic survey since 2004. The Bayesian SCAA stock assessment has had difficulty resolving biomass trends in this survey and consequently, considerable effort has been focused on understanding the sources of error in this survey. These have not been successful to date and consequently an updated HCR with a mathematical algorithm to estimate catch has been designed based upon an MSE which has explored the robustness of the rule to the uncertainties highlighted in the earlier assessments (those associated with natural mortality, recruitment, acoustic survey catchability and sampling). SIc meets SG60 & 80. 6B: The stock assessments of the Bounty Platform stock have employed the same modelling approach as used for the Campbell Island Rise stock and consequently the scoring rationale below is applicable to this stock as well. Further, the issues with this approach have led to adoption of an updated HCR based on a catch algorithm. In the MSE that defined this updated HCR, the probability of biomass being maintained above the soft limit (20% B_0) was the primary criterion used to judge its performance. SIc meets SG100. 6I: Stock assessments use a Bayesian Statistical Catch-At-Age (SCAA) modeling framework (implemented by the NIWA stock assessment program CASAL, Bull et		

		al, 2012). Priors are defined for all model parameters which provide the expected uncertainty in each. Many of these are intentionally uninformative but those on survey catchability can be informative. The objective function also includes likelihoods for the catch proportions at age (multinomial) and abundance indices (lognormal), and penalty functions to constrain the model so that parameter combinations that don't allow historical catch to be taken are strongly penalised. Estimation of the parameters and associated uncertainty occurs in two phases. The first 'exploratory' phase is conducted on a range of candidate models as an optimization and is used to identify the mode of the joint posterior distribution (MPD). During this phase, additional 'process' error, assumed to arise from differences between model simplifications and real-world variation, is estimated separately for the catch proportions and survey data and added to their observation error. This provides a better weighting of the uncertainty in these datasets during the optimization. Model fit diagnostics (e.g. residual analyses) are examined and a base case model along with additional 'sensitivity' models which bracket the main uncertainties are identified. The uncertainties typically include whether or not to include particular datasets (e.g. specific years of survey), and whether or not fish are dying (e.g. higher M) or not available to fishery and / or survey (e.g. domed selectivity). Retrospective analyses are typically not undertaken given the diverse temporal range of input data used which can cause issues with this form of analysis. In the second phase, the full posterior distribution of the parameters of all models is characterized using Markov Chain Monte Carlo (MCMC) methods based upon the Metropolis-Hastings algorithm and tests for chain convergence. Thus, stock assessments identify major sources of uncertainty and take uncertainty into account. SIc meets SG60 & 80. 6I: The full posterior distribution of the parameters of all models characterized using MCMC allows interpretation of stock status indicators in probabilistic terms relative to hard, soft and target reference points e.g. $Pr(B_{current} > 40\% B_0)$. The base case and sensitivity models are brought through the projection process to inform management decisions on the impacts of the uncertainties. The projections include probability intervals for future stock size, and the probability of dropping below reference points for each catch scenario. Thus, stock assessments takes uncertainty into account and evaluate stock status relative to reference points in a probabilistic way. SIc meets SG100.	
d	**Guidepost**			The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.
	6B Met?			N
	6I Met?			N
	Justification	6B: The Bayesian SCAA stock assessment modelling approach is used to assessment stock status and short-term projections made based on the assessments to inform TACC decision-making. Alternate hypotheses of model parameters, through the use of priors, are a fundamental feature of the Bayesian approach. The model has to date not been able to reconcile trends in local area aggregation acoustic survey biomass and consequently, it cannot be said to be robust. Further, the treatment of process error is through the observation equations rather than being more formally investigated (e.g. state space models). An MSE was conducted in 2017 but this did not explore the extant assessment modeling approach per se. While it is clear that there has been considerable model exploration, it is within the SCAA context. SIa does not score SG100. 6I: The Bayesian SCAA stock assessment modelling approach is used to assessment stock status and short-term projections made based on the assessments to inform TACC decision-making. Alternate hypotheses of model parameters, through the use of priors, are a fundamental feature of the Bayesian		

		approach. In 2015, an industry-funded MSE was conducted to explore alternate model formulations which may be incorporated into future assessments. Notwithstanding this, the treatment of process error is through the observation equations rather than being more formally investigated (e.g. state space models). While it is clear that there has been considerable model exploration, it is within the SCAA context. SIa does not score SG100.		
e	**Guidepost**		The assessment of stock status is subject to peer review.	The assessment has been internally and externally peer reviewed.
	6B Met?		Y	N
	6I Met?		Y	N
	Justification	All Stocks: The stock assessment peer review process has not significantly changed since Intertek (2012a). The compilation of an assessment is contracted out by MPI and in recent years, a team of NIWA scientists has prepared most stock assessments, a review of which is initially conducted within NIWA. The assessment is then presented to MPI's Deepwater Working Group (DWFAWG), which reviews the draft assessment and provides observations and recommendations to the assessment team on its analysis. The DWFAWG is open to all participants. The consensus summary of the meeting is made publically available in a Plenary Report with more detailed technical descriptions subsequently published in a NZ Fisheries Assessment Report. SIe meets SG80. All Stocks: There has been no external review of the southern blue whiting assessments. SIe does not meet SG100.		
References		Bull et al (2012), Cordue (2015), Doonan (2017), Dunn and Hanchet (2015a; 2015b; 2017), Hanchet (1991), Intertek (2012a), Francis (2011), O'Driscoll et al (2013), MPI (2017a), Roberts and Dunn (2017)		

OVERALL PERFORMANCE INDICATOR SCORE	**UoC 1 – 6B**	**90**
OVERALL PERFORMANCE INDICATOR SCORE	**UoC 2 – 6I**	**90**
CONDITION NUMBER (if relevant):		**N/A**

Principle 2

Evaluation Table for PI 2.1.1 – Retained species outcome

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 (if not, go to scoring issue c below).	Main retained species are highly likely to be within biologically based limits (if not, go to scoring issue c below).	There is a high degree of certainty that retained species are within biologically based limits and fluctuating around their target reference points.
	Met?	Y – Minor species meet SG80 by default	Y – Minor species meet SG80 by default	N – UoC 1 Y – UoC 2
	Justification	With respect to retained species, MSC guidance states "*'Main' allows consideration of the weight, value or vulnerability of species caught. For instance, a retained species that comprises less than 5% of the total catch by weight may normally be considered to be a minor retained species (i.e., not 'main') in the catch, unless it is of high value to the fisher or of particular vulnerability*." (GCB3.5.2, MSC 2013b). There are no main retained species in the catch for any of the three southern blue whiting UoCs, and only ling is considered to be a minor retained species in the fishery. All retained species comprising <0.1% of the catch are considered to be negligible components and are not considered further (Table 15). Minor species are not scored until the SG100 level of performance, here, so SG60 and SG80 are met for minor species by default. <u>UoC 1 (SBW 6B)</u> Ling (LIN 6B) is considered as a minor retained species. Ling is managed as a Tier 1 species within the QMS, but the most recent assessment of LIN 6B was in 2007, (with a CPUE update in 2014), and the projections at that time were for the stock to decline but to still be above 50% of B_0 by 2011. MPI 2017a reported that estimates of current and virgin stock size are not well known, but current biomass of the LIN 6B stock is unlikely to be below 61%B_0. On a precautionary basis, this is insufficient evidence to meet the SG100 level of performance. <u>UoC 2 (SBW 6I)</u> Ling (LIN 5 & 6) is considered as a minor retained species. This stock was last assessed in 2015. MPI 2017a reported that B_{2014} was estimated to be 86% B_0 and virtually certain (> 99%) to be above the target, and exceptionally unlikely (< 1%) to be below either the soft or hard limit. Overfishing was exceptionally unlikely (< 1%) to be occurring. SG100 (*There is a high degree of certainty that retained species are within biologically based limits and fluctuating around their target reference points*) is met.		
b	**Guidepost**			Target reference points are defined for retained species.
	Met?			Y – UoCs 1 and 2
	Justification	Both LIN 6B (relevant to UoC 1) and LIN 5 & 6 (relevant to UoC 2) are managed under the QMS. For both stocks, the management target is 40% B_0, and the soft limit and hard limits are defined as 20% B_0 and 10% B_0, respectively (MPI 2017a). This SG100 requirement is met for all UoCs.		

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		
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?	N/A	N/A	
	Justification	There are no main retained species for the southern blue whiting fishery.		
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?	N/A		
	Justification	There are no main retained species, and as minor species the status of the LIN 6B and LIN 5 and 6 stocks is known in sufficient detail that this SI is not scored.		
References		MPI 2017a, MSC 2013b		

OVERALL PERFORMANCE INDICATOR SCORE	**UoC 1 – 6B**	**90**
OVERALL PERFORMANCE INDICATOR SCORE	**UoC 2 – 6I**	**100**
CONDITION NUMBER (if relevant):		**N/A**

UoC 1 (SBW 6B) – PI 2.1.1 Scoring calculation

Species	Main / Minor	SIa (60, 80, 100)	SIb (100 only)	SIc (60, 80 only)	SId (60 only)	Element score	PI Score
LIN6B	Minor	80	100	N/A	N/A	90	90

UoC 2 (SBW 6I) – PI 2.1.1 Scoring calculation

Species	Main / Minor	SIa (60, 80, 100)	SIb (100 only)	SIc (60, 80 only)	SId (60 only)	Element score	PI Score
LIN 5 and 6	Minor	100	100	N/A	N/A	100	100

Evaluation Table for PI 2.1.2 – Retained species management

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 – Minor species meet SG80 by default	Y – Minor species meet SG80 by default	N – UoC 1 Y – UoC 2
	Justification	There are no main retained species in the catch for any of the three southern blue whiting UoCs, and only ling is considered to be a minor retained species in the fishery. All retained species comprising <0.1% of the catch are considered to be negligible components and are not considered further (Table 15). In PI 2.1.2 SIa, minor species are not scored until the SG100 level of performance, and so both SG60 and SG80 are met for minor species by default. <u>UoC 1 (SBW 6B)</u> The TACC for LIN 6B forms part of the TACC for LIN 5 and 6, and the last assessment of the stock was completed in 2007 (although a CPUE update was provided in 2014) (MPI 2017a). It is considered that more recent information on the biological status of this stock would be needed in order to meet SG100. <u>UoC 2 (SBW 6I)</u> Similar to southern blue whiting (see scoring for PI 1.2.1), the harvest strategy for LIN 5 and 6 is guided by the HSS, which aims to "*provide a consistent and transparent framework for setting fishery and stock targets and limits and associated fisheries management measures, so that there is a high probability of achieving targets, a very low probability of breaching limits, and acceptable probabilities of rebuilding stocks that nevertheless become depleted, in a timely manner*". The HSS specifies probabilities for each of these outcomes and includes the definition of (a) a target level about which a fishery or stock should fluctuate, (b) a soft limit that triggers a requirement for a formal, time-constrained rebuilding plan, and (c) a hard limit below which fisheries should be considered for closure. The harvest strategy involves collecting fishery-dependent and independent data, analysing those data using a stock assessment model, assessing stock status relative to agreed reference points, conducting projections under alternative TACCs, and setting a TACC (and other regulations) which is consistent with the Fisheries Act 1996. The elements of the strategy work together towards achieving management objectives, as reflected in the target and limit reference points. SG100 is met because, together, the measures in place for LIN 5 and 5 are considered to comprise a strategy.		
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.

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 – Minor species meet SG80 by default	Y – Minor species meet SG80 by default	N – UoC 1 Y – UoC 2
	Justification	For minor species, a partial strategy is not necessary (see SIa), so SG80 is met by default for this SI. <u>UoC 1 (SBW 6B)</u> In the absence of a strategy, SG100 cannot be met. <u>UoC 2 (SBW 6I)</u> The management strategy for LIN 5 and 6 has not undergone formal testing, for example through a management strategy evaluation (MSE). However, evidence for the effectiveness of the strategy is provided by the stock assessment for this stock (MPI 2017a). Stock assessments are conducted on a multi-annual cycle, and provide management with 5-year projections guided by the requirements of the HSS. Between assessments, fishery and survey data are updated and if issues arise, management responds to these. For a Principle 2 retained species, this is considered sufficient to determine that testing supports high confidence that the strategy will work, based on information directly about the fishery and/or species involved – SG100 is met for UoC 2.		
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 – Minor species meet SG80 by default	N – UoC 1 Y – UoC 2
	Justification	<u>UoC 1 (SBW 6B)</u> In the absence of a strategy, SG100 cannot be met. <u>UoC 2 (SBW 6I)</u> For LIN 5 and 6, there is clear evidence that the strategy is being implemented successfully – catch data are collected routinely, stock assessments are undertaken and assess the stock against reference points, and the TAC is set with regard to the reference points to maintain the stock at healthy levels; SG100 is met.		
d	**Guidepost**			There is some evidence that the strategy is achieving its overall objective.
	Met?			N – UoC 1 Y – UoCs 2 and 3
	Justification	<u>UoC 1 (SBW 6B)</u> In the absence of a strategy, SG100 cannot be met. <u>UoC 2 (SBW 6I)</u> For LIN 5 and 6, there is clear evidence that the strategy is achieving its overall objective, specifically through the consistent maintenance of the stock at a healthy level (MPI 2017a)		

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**		
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?	N/A	N/A	N/A
	Justification	Southern blue whiting is not a shark species and so this SI is not relevant.		
References		MPI 2017a		

OVERALL PERFORMANCE INDICATOR SCORE	**UoC 1 – 6B**	**80**
OVERALL PERFORMANCE INDICATOR SCORE	**UoC 2 – 6I**	**100**
CONDITION NUMBER (if relevant):		**N/A**

UoC 1 (SBW 6B) – PI 2.1.2 Scoring calculation

Species	Main / Minor	SIa (60, 80, 100)	SIb (60, 80, 100)	SIc (80, 100 only)	SId (100 only)	SIe (60, 80, 100)	Element score	PI Score
LIN 6B	Minor	80	80	80	80	N/A	80	80

UoC 2 (SBW 6I) – PI 2.1.2 Scoring calculation

Species	Main / Minor	SIa (60, 80, 100)	SIb (60, 80, 100)	SIc (80, 100 only)	SId (100 only)	SIe (60, 80, 100)	Element score	PI Score
LIN 6B	Minor	100	100	100	100	N/A	100	100

Evaluation Table for PI 2.1.3 – Retained species information

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 – Minor species meet SG80 by default	Y – Minor species meet SG80 by default	Y – UoC 1 Y – UoCs 2 and 3
	Justification	There are no main retained species in the catch for any of the three southern blue whiting UoCs, and only ling is considered to be a minor retained species in the fishery. All retained species comprising <0.1% of the catch are considered to be negligible components and are not considered further (Table 15). In PI 2.1.3 SIa, minor species are not scored until the SG100 level of performance, and so both SG60 and SG80 are met for minor species by default. <u>UoC 1 (SBW 6B)</u> For the southern blue whiting trawl fishery, catch data (including allowed discards) are required to be reported via trawl catch, effort and processing returns (TCEPRs), and catches are independently monitored through observer data. Since the 2012-13 season, very nearly 100% of all tows in the fishery have been observed (Figure 14). The catch data are quantitative, and accurate and verifiable; the first part of SG100 ("*Accurate and verifiable information is available on the catch of all retained species*") is met. With respect to the second part of SG100 ("*Accurate and verifiable information is available on ... the status of affected populations*"), it is noted that while an assessment of the LIN 6B stock has not been undertaken since 2007 (a CPUE update was provided in 2014 – MPI 2017a), catches of ling in the Southern blue whiting fishery are very small. MPI 2017a also noted that current biomass of the LIN 6B stock is very likely to be above 50% of B_0. It is considered that there is sufficient information to score UoC 1 as meeting SG100, here. <u>UoC 2 (SBW 6I)</u> The same considerations with respect to catch data apply for the LIN 5 and 6 stock as for the LIN 6B stock, above; as such, the first part of SG100 is met. There was a stock assessment conducted in 2015, which showed the LIN 5 and 6 stock to be in a very healthy condition. SG100 is clearly met in full for UoC 2.		
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 – All UoCs	Y – All UoCs	N – UoC 1 Y – UoC 2

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	UoC 1 (SBW 6B) An assessment of the LIN 6B stock has not been undertaken since 2007, but a CPUE update was provided in 2014. MPI 2017a stated that current biomass of the LIN 6B stock is very likely to be above 50% of B_0. This is sufficient to meet the SG60 and SG80 levels of performance. In the absence of a more recent assessment, though, the SG100 requirement that "*Information is sufficient to quantitatively estimate outcome status with a high degree of certainty*" is not met. UoC 2 (SBW 6I) An assessment of the LIN 5 and 6 stock was conducted in 2015. MPI 2017a reported that B_{2014} was estimated to be 86% B_0 and virtually certain (> 99%) to be above the target, and exceptionally unlikely (< 1%) to be below either the soft or hard limit. SG60, SG80 and SG100 are clearly met in full for UoC 2.		
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 – Minor species meet SG80 by default	Y – Minor species meet SG80 by default	N – UoC 1 Y – UoC 2
	Justification	UoC 1 (SBW 6B) For ling as a minor species, a partial strategy is not necessary (see PI 2.1.2, SIa), so SG60 and SG80 are met by default for this SI. While catch data are recorded at a high level of detail, there has been very nearly 100% observer coverage in the fishery since 2012/13, and it is known that ling comprise only a very small part of the southern blue whiting catch, in the absence of a recent stock assessment it is not possible to say that SG100 is 'fully met' (CR27.10.6, MSC 2013a), however. UoC 2 (SBW 6I) As noted for UoC 1, a partial strategy is not necessary for ling as a minor retained species (see PI 2.1.2, SIa), so SG60 and SG80 are met by default for this SI. With respect to SG100, it is noted that catch data (including allowed discards) are required to be reported via trawl catch, effort and processing returns (TCEPRs), and catches are independently monitored through a very high level of observer coverage. VMS data are also collected routinely and may be cross-validated against the TCEPRs, and fisher-independent acoustic stock surveys are undertaken in the Sub-Antarctic region (MPI 2017a). These catch, survey and VMS data are clearly adequate to support a strategy to manage retained species, so meeting the first part of SG100. Stock assessments are conducted routinely for LIN 5 and 6, so allowing the second part of SG100 ("*Information is adequate to .... evaluate with a high degree of certainty whether the strategy is achieving its objective*") to also be met. SG100 is therefore fully met for UoC 2.		
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.

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		
	Met?		Y – All UoCs	Y – All UoCs
	Justification	For all species, catch data (including allowed discards) are required to be reported via TCEPRs, and all vessels are monitored with VMS. Sufficient data continue to be collected to detect any increase in risk level, so SG80 is met for all UoCs. Catches of all species are also independently monitored by observers. Very nearly 100% of all tows in the southern blue whiting fishery have been observed since 2012/13. Monitoring is therefore conducted in sufficient detail to assess ongoing mortalities to all retained species – SG100 is also met for all UoCs.		
References		MPI 2017a, MSC 2013a		

OVERALL PERFORMANCE INDICATOR SCORE	**UoC 1 – 6B**	**90**
OVERALL PERFORMANCE INDICATOR SCORE	**UoC 2 – 6I**	**100**
CONDITION NUMBER (if relevant):		**N/A**

UoC 1 (SBW 6B) – PI 2.1.3 Scoring calculation

Species	Main / Minor	SIa (60, 80, 100)	SIb (60, 80, 100)	SIc (60, 80, 100)	SId (80, 100 only)	Element score	PI Score
LIN 6B	Minor	100	80	80	100	90	90

UoC 2 (SBW 6I) – PI 2.1.3 Scoring calculation

Species	Main / Minor	SIa (60, 80, 100)	SIb (60, 80, 100)	SIc (60, 80, 100)	SId (80, 100 only)	Element score	PI Score
LIN 5 and 6	Minor	100	100	100	100	100	100

Evaluation Table for PI 2.2.1 – Bycatch species outcome

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 (if not, go to scoring issue b below).	Main bycatch species are highly likely to be within biologically based limits (if not, go to scoring issue b below).	There is a high degree of certainty that bycatch species are within biologically based limits.
	Met?	Y – Minor species meet SG80 by default	Y – Minor species meet SG80 by default	Y- Porbeagle shark
	Justification	With respect to bycatch species, MSC guidance states "*'Main' for this PI allows consideration of the catch size or vulnerability of species caught. For instance, a species that comprises less than 5% of the total catch by weight may normally be considered to be a minor species (i.e., not 'main') in the catch, unless it is of particular vulnerability or if the total catch of the fishery is large, in which case even 5% may be a considerable catch.*" (GCB3.8.2, MSC 2013b). Based on these criteria, there are no main bycatch species in the southern blue whiting trawl fishery. Porbeagle shark is the only species assessed as a minor bycatch species, on the basis that it is a vulnerable species, and because it comprised 0.04% of the catch on average over the most recent five years, but 0.08% in the most recent year for which data are available (Table 15). Bycatch species comprising <0.1% of the catch are considered to be negligible components and are not considered further (Table 15). Minor species meet SG60 and SG80 by default for this SI. An assessment of Southern hemisphere porbeagle was undertaken for the first time by Hoyle et al. 2017. The results indicated that the annual upper 95% confidence interval for the ratio of F to F_{MSM} (the instantaneous fishing mortality rate that corresponds to the maximum number of fish in the population that can be killed by fishing in the long term) for the Western Pacific region has averaged just 0.62 for the 23 years (1992-2014) covered by the assessment. This indicates the stock has been fished sustainably over a long period of time and, overall, the impact of fishing was determined to be low across the entire Southern hemisphere range of the porbeagle shark population (Hoyle et al. 2017). This is adequate to determine that there is a high degree of certainty that bycatch species are within biologically based limits; SG100 is met.		
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 main bycatch species in the catch of the southern blue whiting trawl fishery. This SI is not relevant.		

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**		
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?	N/A – Porbeagle shark		
	Justification	A very recent stock assessment of porbeagle shark has been conducted (Hoyle et al. 2017). Status of porbeagle shark is considered to be sufficiently well known that this SI is not relevant.		
References		Hoyle et al. 2017. MSC 2013b		
OVERALL PERFORMANCE INDICATOR SCORE			**UoC 1 – 6B**	**100**
OVERALL PERFORMANCE INDICATOR SCORE			**UoC 2 – 6I**	**100**
CONDITION NUMBER (if relevant):				**N/A**

All UoCs – PI 2.2.1 Scoring calculation

Species	Main / Minor	SIa (60, 80, 100)	SIb (60, 80 only)	SIc (60 only)	Element score	PI Score
Porbeagle shark	Minor	100	N/A	N/A	100	100

Evaluation Table for PI 2.2.2 – Bycatch species management

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 – Minor species meet SG80 by default	Y – Minor species meet SG80 by default	Y – Porbeagle shark
	Justification	There are no main bycatch species in the southern blue whiting trawl fishery. Porbeagle shark is the only species assessed as minor bycatch species, comprising an average of 0.04% of the catch over the most recent five-year period for which data are available (Table 15). Minor species attain the SG80 level of performance by default for this SI, so the question is then whether or not porbeagle shark attains SG100. In this regard, and although porbeagle shark is very much a minor incidental catch in the southern blue whiting trawl fishery, there are some measures specific to porbeagle shark which are of relevance, specifically: • Porbeagle shark is a QMS species; • A TACC is set for porbeagle shark within New Zealand (110 t for 2017 and 2018), and there are full reporting requirements in place; • New Zealand participates in WCPFC data collection and collation processes for porbeagle shark, and produced the first stock assessment for the Southern hemisphere population (Hoyle et al. 2017); • Although it is a QMS species, under Schedule 6 of the Fisheries Act vessels are permitted to discard porbeagle shark alive or dead, with animals that are alive and likely to survive post release being allocated a specific code in the TCEPRs, and not counting against a vessel's annual catch entitlement (ACE) (MPI 2014a). • A National Plan of Action (NPOA) for sharks is in place, with the overarching objective, "*To maintain the biodiversity and the long-term viability of all New Zealand shark populations by recognising their role in marine ecosystems, ensuring that any utilisation of sharks is sustainable, and that New Zealand receives positive recognition internationally for its efforts in shark conservation and management.*" (MPI 2013a). • DWG has adopted Operational Procedures for sharks (DWG 2014a), consistent with the NPOA Sharks (MPI 2013a), that promotes the accurate identification and recording of shark bycatch and describes safe handling and release practices for sharks. Given the scale of the porbeagle shark catch in the southern blue whiting fishery, these measures are considered to comprise a strategy for porbeagle shark; SG100 is met.		

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		
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 – Minor species meet SG80 by default	Y – Minor species meet SG80 by default	N – Porbeagle shark
	Justification	For minor species, a partial strategy is not necessary (see SIa), so SG60 & 80 are met by default for this SI. The management strategy for porbeagle shark has not undergone formal testing. Some evidence for the effectiveness of the strategy is provided by the stock assessment for this stock (Hoyle et al. 2017). Nevertheless, this species is very wide ranging, and because the assessment is the first of its kind and may be subject to revision going forward, it is considered that there is insufficient evidence that testing supports high confidence that the strategy will work; SG100 is not met.		
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 – Minor species meet SG80 by default	Y – Porbeagle shark
	Justification	For minor species, a partial strategy is not necessary (see SIa), so SG80 is met by default for this SI. It is noted that there has been very close to 100% observer coverage in the southern blue whiting fishery since 2012/13, and the New Zealand catch of porbeagle shark has consistently been well below the 110 t TACC (mean for 2013-2016 = 73.3 t – MPI 2018). It is considered there is clear evidence that the strategy is being implemented successfully, so SG80 and SG100 are met.		
d	**Guidepost**			There is some evidence that the strategy is achieving its overall objective.
	Met?			Y – Porbeagle shark
	Justification	The strategy for porbeagle shark is captured within the NPOA Sharks as, "*To maintain the biodiversity and the long-term viability of all New Zealand shark populations by recognising their role in marine ecosystems, ensuring that any utilisation of sharks is sustainable, and that New Zealand receives positive recognition internationally for its efforts in shark conservation and management.*" (MPI 2013a). The key element of the strategy with regard to the southern blue whiting fishery is "*ensuring that any utilisation of sharks is sustainable"*, and in this regard the fishery is clearly achieving the overall objective – the New Zealand catch is well below the TACC and the stock is not being overfished (Hoyle et al. 2017). This SG100 requirement is met.		

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	Hoyle et al. 2017, MPI 2013a, MPI 2014a, MPI 2018	
OVERALL PERFORMANCE INDICATOR SCORE	**UoC 1 – 6B**	**95**
OVERALL PERFORMANCE INDICATOR SCORE	**UoC 2 – 6I**	**95**
CONDITION NUMBER (if relevant):		**N/A**

PI 2.2.2 Scoring calculation

Species	Main / Minor	SIa (60, 80, 100)	SIb (60, 80, 100)	SIc (80, 100 only)	SId (100 only)	Element score	PI Score
Porbeagle shark	Minor	100	80	100	100	95	95

Evaluation Table for PI 2.2.3 – Bycatch species information

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 – Minor species meet SG80 by default	Y – Minor species meet SG80 by default	Y – Porbeagle shark
	Justification	There are no main bycatch species in the southern blue whiting trawl fishery. Porbeagle shark is the only species assessed as a minor bycatch species, comprising 0.04% of the catch (Table 15). Minor species attain the SG80 level of performance by default for this SI, so the question is then whether or not porbeagle shark attains SG100. In this regard, catch data (including allowed discards of shark species) are required to be reported via TCEPRs, and catches are independently monitored through observer data. Very nearly 100% of all tows in the fishery have been observed since 2012/13 (Figure 14). The first part of SG100 ("*Accurate and verifiable information is available on the catch of all bycatch species*") is met. For porbeagle shark, there is also a very recent stock assessment; the New Zealand midwater trawl fleet was determined to account for around 10% of the fishing mortality on this stock component, but the assessment results indicated that the annual upper 95% confidence interval for the ratio of F to F_{MSM} (the instantaneous fishing mortality rate that corresponds to the maximum number of fish in the population that can be killed by fishing in the long term) for the Western Pacific region has averaged just 0.62 for the 23 years (1992-2014) covered by the assessment. This indicates the stock has been fished sustainably over a long period of time and, overall, the impact of fishing was determined to be low across the entire Southern hemisphere range of the porbeagle shark population (Hoyle et al. 2017). SG100 is met in full.		
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 – Porbeagle shark	Y – Porbeagle shark	Y – Porbeagle shark
	Justification	The typically low or very low catch levels of porbeagle shark in the fishery over time, in combination with the recent stock assessment for porbeagle (Hoyle et al. 2017), means that information is sufficient to quantitatively estimate outcome status with respect to biologically based limits with a high degree of certainty; SG60, SG80 and SG100 are met.		
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 species, and evaluate with a high degree of certainty whether the strategy is achieving its objective.
	Met?	Y – Minor species meet SG80 by default	Y – Minor species meet SG80 by default	Y – Porbeagle shark

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	For minor species, a partial strategy is not necessary (see PI 2.1.2, SIa), so SG80 is met by default for this SI. For porbeagle, there is considered to be a strategy in place (see scoring for PI 2.2.2, SIa), the key element of which is '*ensuring that any utilisation of sharks is sustainable*' (MPI 2013a). in this regard, for the southern blue whiting trawl fishery, catch data are available at a high level of detail, there is knowledge of the condition of the sharks upon release (through fish that are alive and likely to survive post release being allocated a specific code in the TCEPRs [MPI 2014a]), and there is a recent stock assessment available (Hoyle et al. 2017). The information is adequate to support a strategy to manage bycatch species, and evaluate with a high degree of certainty whether the strategy is achieving its objective. This SG100 requirement is met.		
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 – Porbeagle shark	Y – Porbeagle shark
	Justification	For all species, catch data (including allowed discards) are required to be reported via TCEPRs, and all vessels are monitored with VMS. Sufficient data continue to be collected to detect any increase in risk level, so SG80 is met. Catches of all species are also independently monitored by observers. Very nearly 100% of all tows in the southern blue whiting trawl fishery have been observed since 2012/13 (Figure 14), with information on condition provided upon release (MPI 2014a). Monitoring is therefore conducted in sufficient detail to assess ongoing mortalities to all bycatch species – SG100 is also met.		
References		Hoyle et al. 2017, MPI 2013a, MPI 2014a		

OVERALL PERFORMANCE INDICATOR SCORE	**UoC 1 – 6B**	**100**
OVERALL PERFORMANCE INDICATOR SCORE	**UoC 2 – 6I**	**100**
CONDITION NUMBER (if relevant):		**N/A**

PI 2.2.3 Scoring calculation

Species	Main / Minor	SIa (60, 80, 100)	SIb (60, 80, 100)	SIc (60, 80, 100)	SId (80, 100 only)	Element score	PI Score
Porbeagle shark	Minor	100	100	100	100	100	100

Evaluation Table for PI 2.3.1 – ETP species outcome

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?	N/A	N/A	N/A
	Justification	Under the CR v.1.3 (MSC 2013a), ETP species retained species are those that are, "*recognised by national legislation and/or binding international agreements to which the jurisdictions controlling the fishery under assessment are party. Species listed under Appendix I of CITES shall be considered ETP species for the purposes of the MSC assessment, unless it can be shown that the particular stock of the CITES listed species impacted by the fishery under assessment is not endangered*." For the southern blue whiting trawl fishery, relevant ETP species are those protected under the New Zealand Wildlife Act 1953, the Marine Mammals Protection Act 1978 and the Fisheries Act 1996. These are protected coral species (black corals, gorgonian corals, stony corals and hydrocorals), marine mammals (New Zealand sea lion and New Zealand fur seal) and seabirds. It is noted that there is a fisheries-related mortality limit that sets an upper limit for the number of New Zealand sea lions that could be incidentally killed each year in the SQU6T (squid) trawl fishery (MPI 2016). However, at this time, limits of this type apply to the SQU6T fishery, only. It is noted that the southern blue whiting trawl fishery Assessment Team did not score this SI because there are no limits set for the protection and rebuilding of ETP species (CB3.11.14, MSC 2013a). This is in contrast to the recently certified orange roughy fishery assessment, where this SI was scored (MRAG-Americas 2016). That report stated "*New Zealand does not set quantitative limits on the interactions of the orange roughy fisheries [with ETP species], but has strong policies and strategies for minimizing interactions with marine mammals and seabirds*." Therefore, this is not harmonised, but scoring here is considered correct with respect to MSC requirements on assessing 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 – Protected corals Y – NZ sea lion Y – NZ fur seal Y – Seabirds	Y – Protected corals Y – NZ sea lion Y – NZ fur seal Y – Seabirds	Y – Protected corals N – NZ sea lion N – NZ fur seal Y – Seabirds
	Justification	<u>Protected corals</u> Most corals in New Zealand waters are protected under the Wildlife Act 1953. This legislation means it is not illegal to incidentally catch corals, but any corals that are taken must be returned immediately and the capture reported. A considerable body of research has been amassed on the biology and distribution of deep-sea coral species around New Zealand, and the potential impact of fishing		

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
		activities on these species, including reports by Consalvey et al. 2006, Baird et al. 2013 and Anderson et al. 2014. Baird et al. (2013) used predictive models and coral occurrence data from research sampling and New Zealand commercial fishing trips where observers were carried to map the distribution of corals. Table 16 shows that only 2 out of the total of 3,141 records (i.e., 0.06%) were reported from the southern blue whiting fishery, or 2 out of the 828 records from Fishery Management Area (FMA) 6 (i.e., 0.24%). Anderson et al. (2014) looked at trawl footprints in total rather than for the individual fisheries, but these authors noted that while there was substantial overlap of fishing with the distribution of several protected coral species, across the study area as a whole (i.e., the majority of the area within the New Zealand EEZ), large areas of each species' predicted habitat distribution lies outside of the trawl footprint, especially around the Sub-Antarctic Plateau. Given the occurrence of suitable habitat outside the fished area, the use of midwater trawl gear, and the near absence of records of protected coral species in the observer data, it is considered that there is a high degree of confidence that there are no significant detrimental direct effects of the fishery on protected coral species. SG60, SG80 and SG100 are met. <u>New Zealand sea lion</u> The risk to New Zealand marine mammals from commercial fishing activities (trawl, longline, set-net and purse-seine fisheries within New Zealand's EEZ) was assessed recently (Abraham et al. 2017). Risk was defined by the ratio of Annual Potential Fatalities (APF – an estimate of the number of marine mammals killed in the fisheries each year) to the Population Sustainability Threshold (PST – a measure of the population productivity). The results indicate that the New Zealand sea lion has a mean risk of 0.10 (95% c.i. = 0.05-0.19) (Table 17), indicating that fisheries mortalities in total are below a level that may prevent the population increasing to, or remaining above, half the carrying capacity in the long term. The southern blue whiting fishery is responsible for the capture of an estimated annual average of nine New Zealand sea lions from 2002/03 – 2014/15, which equates to 27.7% of the total taken in New Zealand trawl fisheries over the period. The estimated average annual number of captures of New Zealand sea lions in the most recent five years is the same, at nine animals, but less have been taken in all trawl fisheries overall, so the number captured in recent years in the southern blue whiting fishery equates to 39.9% of the total (Table 19). It is noted that there has also been a very strong bias towards males in observed captures in the southern blue whiting fishery (31 out of 32 animals from 2002 – 2011 were male, Thompson et al 2013), and this is likely to reduce the overall impact of interactions on population sustainability. The data show that direct effects are highly unlikely to create unacceptable impacts to New Zealand sea lion, such that SG60 and SG80 are met. DOC & MPI 2017 noted pup counts at the Campbell Island/Motu Ihupuku breeding colony appear to have increased over time, and pup counts at the Auckland Islands appear to have stabilised around 1,600 to 1,700 pups per year since 2009, with the January 2017 count being 1,965 pups, a 14% increase on the previous year (1,727). While the pup counts suggest a potential stabilisation in the Auckland Islands breeding population, other demographic parameters such as adult female and pup survival are still lower than what would be expected for a growing population (DOC & MPI 2017). In this regard, there are still some questions over the amount of cryptic mortality that may occur in the southern blue whiting fishery, particularly associated with SLEDs used in the Campbell Rise (UoC 2 fishery) (i.e., mortality of sea lions that encounter the gear and do not survive, but are not captured). While cryptic mortality is considered within the risk assessment process (i.e., Abraham et al.

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
		2017), there is not a high degree of confidence that there are no significant detrimental direct effects of the fishery on New Zealand sea lions – SG100 is not met. <u>New Zealand fur seal</u> As noted for New Zealand sea lion, Abraham et al. 2017 recently reviewed the risk to New Zealand marine mammals from commercial fishing activities (trawl, longline, setnet and purse-seine fisheries within New Zealand's EEZ). The results indicate that the New Zealand fur seal has a mean risk of 0.31 (95% c.i. = 0.13-0.64) (Table 17), indicating that mortalities from all fisheries are at a level that will not prevent the population from increasing to, or remaining above, half the carrying capacity in the long term. The southern blue whiting fishery is responsible for the capture of an estimated annual average of 70 New Zealand fur seals from 2002/03 – 2014/15, which equates to 11.8% of the total taken in New Zealand trawl fisheries over the same period. The estimated average annual number of captures of New Zealand fur seals in the most recent five years for which data are available is similar, at 62 animals, which equates to 13.8% of the number taken in New Zealand trawl fisheries in total (Table 18). It is noted that the colony observations over recent years have generally indicated a trend of increasing population size, and the most recent threat assessment for New Zealand marine mammals (Baker et al. 2016) classified New Zealand fur seals as 'Not threatened', on the basis that it is a resident native species with a large, stable population. In this regard, it is considered that SG60 and SG80 are met for this species. Nevertheless, some of the population data are quite old and there may be differential effects of the fishery between colonies. As such, SG100 is not met. <u>Seabirds</u> A seabird risk assessment process has been undertaken to identify the risks posed to 70 seabird taxa by trawl, longline and set net fisheries within New Zealand's territorial Sea and EEZ (e.g., Richard & Abraham 2013, Richard & Abraham 2015, Richard et al. 2017). The risk assessment calculates a 'risk ratio', which is an estimate of the total fisheries-related mortality across New Zealand trawl, longline and set net fisheries relative to the Population Sustainability Threshold (PST), which is an adaptation of the Potential Biological Removals (PBR) metric developed for the US Marine Mammal Protection Act. PST is based on the total number of breeding pairs, and includes uncertainty in all demographic parameters explicitly; it estimates the level of human-induced mortality a population can incur while meeting the long-term goal for seabird populations of remaining above half their carrying capacity, in the presence of environmental variability (Richard et al. 2017). As noted by MPI 2016, the combination of the use of the total population size, the allometric modelling of adult survival and age at first reproduction, and the use of different corrections for the calculation of PST led to significant changes to the estimated risk ratio for each species between the 2015 and latest version (i.e., Richard et al. 2017). Results of the most recent iteration (Richard et al. 2017) show that only the black petrel was classified as 'very high risk', with a median risk ratio of greater than 1 (i.e., median catches exceeded the PST) or an upper 95% confidence limit greater than 2. Seven species were classified as 'high risk' because they have a risk ratio with a median above 0.3 or with the upper 95% confidence limit above 1, and four species were classified as 'medium risk' because they had a median risk above 0.1 or an upper confidence limit above 0.3 (Table 20).

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**		
		However, on examining the observed catches and estimated total catches, it can be seen that the southern blue whiting trawl fishery is responsible for very few captures of any seabird species classified as very high, high or medium risk (Table 20). Salvin's albatross is considered to be high risk (median risk ratio = 0.78, 95% CI = 0.51-1.09), but the fishery was estimated to be responsible for only 1.26% of the total captures of this species in New Zealand waters. Salvin's albatross is the most commonly encountered seabird in the southern blue whiting fishery (35 animals, annually), but the PST for this species is estimated to be 3,600 animals (95% confidence interval = 2,710 – 4,940, Richard et al. 2017), indicating the fishery is not putting this species at risk.		
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 – Protected corals Y – NZ sea lion Y – NZ fur seal Y – Seabirds	Y – Protected corals N – NZ sea lion N – NZ fur seal N – Seabirds
	Justification	Indirect effects are considered to be impacts on behaviours, feeding efficiency, essential habitats or other aspects of ETP species' life histories. Indirect effects of fishing on corals are likely negligible given the generally pelagic nature of the fishing operations. While impacts to corals from sediment plumes caused by trawling cannot be ruled out, the area over which the southern blue whiting trawl fishery occurs relative to the area over which protected corals occur within the New Zealand EEZ is very small; SG100 is met. For sea lions, MPI 2016 provides a review of indirect threats, and particularly competition for food with commercial fisheries. Arrow squid and hoki are important for sea lions, and are harvested in the Sub-Antarctic, but southern blue whiting is not thought to be a major prey item, although its importance to sea lions foraging around the Auckland Islands appears to have increased since 2010 (Roberts et al. 2017); SG80 is met, but the complexity of food web interactions mean that it is not possible to say that there is a high degree of confidence that there are no significant detrimental indirect effects on New Zealand sea lions; SG100 is not met. For fur seals, there are not thought to be indirect threat to survival due to resource competition with commercial fisheries (Baird 2011); SG80 is met, but a thorough examination of potential issues that would allow SG100 to be met has not been undertaken. For seabirds, Cherel et al. 1999 showed that 0+ southern blue whiting juveniles (4-5 months old) are an important prey item for black-browed albatross during the summer chick-rearing period, and that these fish are potential prey for a wide variety of flying and diving seabirds that breed in the New Zealand Sub Antarctic islands in summer. Competition between seabirds and the southern blue whiting fishery was considered, but juvenile southern blue whiting are not caught in the fishery, and the fishery does not occur in the region during the summer. Indirect effects have been considered and are thought to be unlikely to create unacceptable impacts, so meeting SG80. SG100 is not met because the potential indirect effects of the fishery on seabirds have not, to the knowledge of the Assessment Team, been reviewed thoroughly. It is noted that there is clearly an on-going interest in understanding the potential for indirect effects on ETP species; the issue is listed specifically in the DOC strategic		

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**	
	statement (DOC 2015), and in parts of the DOC Marine Conservation Services Programme for 2017-18 (DOC 2017).	
References	Abraham et al. 2017, Anderson et al. 2014, Baird 2011, Baird et al. 2013, Baker et al. 2016, Cherel et al. 1999, Consalvey et al. 2006, DOC 2015, DOC 2017, DOC & MPI 2017, MPI 2016, MSC 2013a, Richard & Abraham 2013, Richard & Abraham 2015, Richard et al. 2017, Roberts et al. 2017, Thompson et al 2013	
OVERALL PERFORMANCE INDICATOR SCORE	**UoC 1 – 6B**	**85**
OVERALL PERFORMANCE INDICATOR SCORE	**UoC 2 – 6I**	**85**
CONDITION NUMBER (if relevant):		**N/A**

PI 2.3.1 Scoring calculation

Element	SIa (60, 80, 100)	SIb (60, 80, 100)	SIc (80, 100 only)	Element score	PI Score
Protected corals	N/A	100	100	100	85
NZ sea lion	N/A	80	80	80	
NZ fur seal	N/A	80	80	80	
Seabirds	N/A	100	80	90	

Evaluation Table for PI 2.3.2 Alternate – ETP species management

PI 2.3.2A		There is a strategy in place for managing ETP species that is designed to ensure the fishery does not hinder the recovery of ETP species.		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place that are expected to ensure the fishery does not hinder the recovery of ETP species.	There is a partial strategy in place that is expected to ensure the fishery does not hinder the recovery of ETP species.	There is a strategy in place for managing ETP species, to ensure the fishery does not hinder the recovery of ETP species.
	Met?	Y – Protected corals Y – NZ sea lion Y – NZ fur seal Y – Seabirds	Y – Protected corals Y – NZ sea lion Y – NZ fur seal Y – Seabirds	Y – Protected corals Y – NZ sea lion Y – NZ fur seal Y – Seabirds
	Justification	Because there are no limits set for the protection and rebuilding of ETP species, PI 2.3.2 Alternate is scored. In all cases, strategic objectives for the monitoring, management and avoidance or minimisation of fisheries impacts on ETP species are established (DOC 2015), and a variety of research programmes have been put in place to deliver these objectives (e.g., DOC 2017), including through higher level plans such as National Plans of Action (e.g., MPI 2013a, MPI 2013b). <u>Protected corals</u> Most corals in New Zealand waters are protected under Wildlife Act 1953. This legislation means it is not illegal to incidentally catch corals, but any corals that are taken must be returned immediately and the capture reported through the NFPSCRs. A network of benthic protection areas (BPAs) was designated in 2007, protecting approximately 1.1 million square km (30%) of the seabed within the New Zealand EEZ to bottom trawling and dredging. These BPAs include 12 large seamounts more than 1,000 m high and covering 81,000 square km. Trawling within 100 m of the seabed is prohibited in these areas, and any vessel conducting midwater trawling in these areas must carry an approved net monitoring system and two observers, and notify the observers of the intention to midwater trawl prior to commencing operations (MPI 2016). MPI 2010b notes that the management approach to address effects of deepwater trawl activity on benthic habitats has "*focused on 'avoiding' effects, rather than remedying or mitigating them (as per the requirements under the Fisheries Act to avoid, remedy or mitigate).*" Vessel activity is also monitored closely, and reviews of the trawl footprint are conducted annually (MPI 2017e). Given the midwater gear type used in the southern blue whiting fishery, the mapping of benthic habitats, protection of large areas of habitat, and annual monitoring and review of the trawl footprint is considered to comprise a strategy for managing protected coral species, to ensure the fishery does not hinder their recovery. SG60, SG80 and SG100 are met for these species. <u>New Zealand sea lions and New Zealand fur seals</u> Under the National Deepwater Plan (Ministry of Fisheries 2010), the objective most relevant for management of New Zealand sea lions and New Zealand fur seals is Management Objective 2.5: "*Manage deepwater and middle-depth fisheries to avoid or minimise adverse effects on the long term viability of endangered, threatened and protected species.*" In this regard, Deepwater Group has issued Marine Mammal Operational Procedures (MMOPs – DWG 2014b) to reduce the risk of marine mammal captures. The MMOPs are currently applied to trawlers greater than 28 m LOA and		

PI 2.3.2A		There is a strategy in place for managing ETP species that is designed to ensure the fishery does not hinder the recovery of ETP species.
		are supported by annual training conducted by DWG. They include a number of mitigation measures, such as managing offal discharge, refraining from shooting the gear when New Zealand sea lions and New Zealand fur seals are congregating around the vessel and the introduction of 'trigger' points – if two fur seals are captured within 24 hours or five fur seals are captured over 7 days then the following procedure is triggered: 1. Advise vessel manager, 2. Record capture event including location of capture in ship's log, 3. Ensure gear failures are addressed with the gear either on board or at a depth >50m, 4. Report capture to Deepwater Group either directly or via shore management. For sea lions, the trigger point is the capture of a single animal, and the additional step of completing the 'sea lion capture questionnaire' is required. These reports are used to inform the development of changes and improvements to management and mitigation. MPI 2016 notes that the major focus of the MMOPs is to reduce the time that the gear is at or near the surface when it poses the greatest risk. MPI, via observers, monitors and audits vessel performance against this procedure. Research into methods to minimise or mitigate New Zealand sea lion or New Zealand fur seal captures in commercial fisheries has focused on fisheries in which the animals are more likely to be captured, but finding ways to mitigate captures has proved difficult; these pinnipeds are free swimming, can easily dive to the depths of the net when it is being deployed, hauled, or brought to the surface during a turn, and are known to actively and deliberately enter nets to feed. SLEDs have been used in the Campbell Island fishery since 2013 to minimise the risk to New Zealand sea lions in this part of the fishery. There is also a risk assessment and ongoing data collation and review process (e.g., Baker et al. 2016, Abraham & Berkenbusch 2017, Abraham et al. 2017), while marine mammal interactions are reported routinely through the Aquatic Environment and Biodiversity Annual Review Series (e.g., MPI 2016). In 2017, a new threat management plan was published for New Zealand sea lion (DOC & MPI 2017). This document replaces a previous 'species management plan' for 2009-2014, and describes the first five years of a 20 year programme of work, the objectives of which are: (1) To halt the decline of the New Zealand sea lion population within 5 years; and, (2) Ensure the New Zealand sea lion population is stable or increasing within 20 years, with the ultimate goal of achieving 'Not Threatened' status. DOC & MPI 2017 describes rookery-specific objectives (i.e., for the Auckland Islands, Campbell Island/Motu Ihupuku, Stewart Island/Rakiura and South Island/Te Waipounamu), as well as the basis for the community engagement, direct mitigation, research and evaluation that is planned in order to deliver the objectives. There is considered to be a strategy in place for managing both New Zealand sea lion and New Zealand fur seal, to ensure the fishery does not hinder the recovery of these species. SG60, SG80 and SG100 are met. <u>Seabirds</u> The long term objective of the National Plan of Action Seabirds (MPI 2013b) is that "*New Zealand seabirds thrive without pressure from fishing related mortalities, New Zealand fishers avoid or mitigate against seabird captures and New Zealand fisheries are globally recognised as seabird friendly*." Subsidiary objectives then include that fisheries implement best practice mitigation measures to reduce and where practicable eliminate the incidental mortality of seabirds, that incidental mortality of seabirds in New Zealand is at or below a level that allows for

PI 2.3.2A		There is a strategy in place for managing ETP species that is designed to ensure the fishery does not hinder the recovery of ETP species.		
		maintenance at a favourable status or recovery to a more favourable conservation status, and that research is undertaken to test and refine mitigation methods, and to improve understanding of seabird biology, demography and ecology. MPI 2017g details the approach taken to avoid or mitigate seabird interactions in deepwater fisheries; these include: • Mandatory use of seabird scaring devices (bird bafflers, paired streamer lines and/or warp deflectors – NZG 2010), and implementation of seabird mitigation measures • Implementation of best practice seabird mitigation measures through vessel-specific Vessel Management Plans (VMPs) for trawl vessels, including: ○ Adherence to the VMP and to the Deepwater Group Seabird Risk Mitigation Operational Procedure (DWG 2015), ○ Requirement to maintain a fish waste control system, with no continuous discharge while towing, and no discharge when shooting or hauling ○ Deployment of bafflers and/or tori lines ○ Removal of all stickers (fish trapped in net meshes) as practicable prior to shooting the gear, and minimising the time the gear is at the surface when shooting and hauling. ○ Requirement to report all captures of protected species via NFPSCRs, and to alert DWG if trigger points are hit within any 24 hour period (3 x large birds (albatross or mollymawk) or 5 x any bird within any 24 hour period or 10 birds alive and/or dead within any 7-day period). • An annual crew training and vessel outreach programme, • Ongoing exploration of new or improved mitigation methods, and • MPI observers monitoring vessel adherence to VMPs and reporting seabird interaction data. Also, DWG has an active role in briefing skippers, training crews and managing the trigger point alert system, and reviewing trigger alerts to identify issues that may have led to the trigger alert, and solutions to minimise the risk of the same issues arising again (DWG 2015). There is also a risk assessment and ongoing data collation and review process (e.g., Richard & Abraham 2015, Abraham & Richard 2017), while seabird interactions are also reported on routinely through the Aquatic Environment and Biodiversity Annual Review Series (e.g., MPI 2016). There is clearly a strategy in place for managing seabirds, to ensure the fishery does not hinder the recovery of ETP species. SG60, SG80 and SG100 are met.		
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.	The strategy is mainly based on information directly about the fishery and/or species involved, and testing supports high confidence that the strategy will work.
	Met?	Y – Protected corals Y – NZ sea lion Y – NZ fur seal	Y – Protected corals Y – NZ sea lion Y – NZ fur seal	Y – Protected corals Y – NZ sea lion Y – NZ fur seal

PI 2.3.2A		There is a strategy in place for managing ETP species that is designed to ensure the fishery does not hinder the recovery of ETP species.		
		Y – Seabirds	Y – Seabirds	Y – Seabirds
	Justification	For all species, there is some objective basis for confidence that the partial strategy in place will work, based on information directly about the fishery and/or species involved; this includes through review of evidence and risks (e.g., protected corals – Baird et al. 2013, Anderson et al. 2014, seabirds – Richard & Abraham 2015, Abraham & Richard 2017) and of operational performance (e.g., MPI 2016, MPI 2017e). SG60 and SG80 are met. For protected corals, the use of midwater trawls and the data on protected coral interactions showing the near absence of records for the southern blue whiting fishery (Baird et al. 2013) is adequate testing to supports high confidence that the strategy will work SG100 is also met. For marine mammals and seabirds, the strategies are based on information directly about the fishery and/or species involved, and testing supports high confidence that the strategies will work (e.g., MPI 2016, Baker et al. 2016, Abraham & Berkenbusch 2017, Abraham & Richard 2017, Abraham et al. 2017); SG100 is met.		
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, and intended changes are occurring.
	Met?		Y – Protected corals Y – NZ sea lion Y – NZ fur seal Y – Seabirds	N – Protected corals N – NZ sea lion N – NZ fur seal N – Seabirds
	Justification	For all species, there is clear evidence that the partial strategy or strategy is being implemented successfully, specifically through the monitoring and reporting (both from independent observers and through the requirement to notify catches on NFPSCRs), and through the review process that is undertaken routinely (e.g., MPI 2016, MPI 2017e, Richard & Abraham 2015, Abraham & Richard 2017); SG80 is met. For corals, there are insufficient data available to demonstrate that intended changes are occurring. SG100 is not met. For both New Zealand sea lions and New Zealand fur seals, there is 100% observer coverage and there is clear evidence that the strategy is being implemented successfully. However, the rate of capture for both species has not declined over time, and it is not clear therefore that intended changes are occurring; as such, SG100 is not met for either species. For seabirds, the data appear to show a decline in the rate of interaction with the southern blue whiting trawl fishery in the last two years for which data are available Figure 17), possibly reflecting a renewed focus on ensuring that effective mitigation is implemented (e.g., DWG 2015). While the number of seabirds the fishery interacts with is very low in any case, any decline in the number of captures overall is welcome. Nevertheless, it is not possible to say there is 'clear evidence' that '*intended changes are occurring*'. As such, SG100 is not met.		
References		Abraham & Berkenbusch 2017, Abraham & Richard 2017, Abraham et al. 2017, Anderson et al. 2014, Baird et al. 2013, Baker et al. 2016, DOC 2015, DOC 2017, DOC & MPI 2017, DWG 2014b, DWG 2015, Ministry of Fisheries 2010, MPI 2010b, MPI 2013a, MPI 2013b, MPI 2016, MPI 2017e, NZG 2010, Richard & Abraham 2015.		

PI 2.3.2A	There is a strategy in place for managing ETP species that is designed to ensure the fishery does not hinder the recovery of ETP species.	
OVERALL PERFORMANCE INDICATOR SCORE	**UoC 1 – 6B**	**95**
OVERALL PERFORMANCE INDICATOR SCORE	**UoC 2 – 6I**	**95**
CONDITION NUMBER (if relevant):		**N/A**

PI 2.3.2A Scoring calculation

Element	SIa (60, 80, 100)	SIb (60, 80, 100)	SIc (80,100 only)	Element score	PI Score
Protected corals	100	100	80	95	95
NZ sea lion	100	100	80	95	
NZ fur seal	100	100	80	95	
Seabirds	100	100	80	95	

Evaluation Table for PI 2.3.3 – ETP species information

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 – Protected corals Y – NZ sea lion Y – NZ fur seal Y – Seabirds	Y – Protected corals Y – NZ sea lion Y – NZ fur seal Y – Seabirds	Y – Protected corals N – NZ sea lion N – NZ fur seal Y – Seabirds
	Justification	New Zealand fisheries are required to report all captures of ETP species through the NFPSCRs, and these data may be verified through the observer programme (since 2012/13, observer coverage in the southern blue whiting fishery has been very nearly 100%: Figure 14). Data on protected species interactions are collated and reported routinely (e.g., MPI 2016), and research is undertaken to determine the fisheries impacts on ETP species based on these quantitative data (e.g., Baird et al. 2013, Abraham & Berkenbusch 2017, Abraham & Richard 2017, Abraham et al. 2017). SG60 and SG80 are met. Information on the operation of the midwater trawl gear used in the fishery, and on the very limited interactions with protected corals that result during the fishery (supported by very nearly 100% observer coverage since 2012/13) allow the Assessment Team to conclude that information is sufficient to quantitatively estimate outcome status of these ETP species with a high degree of certainty; SG100 is also met. For seabirds, the 100% observer coverage and the latest information from Richard et al. 2017 (Table 20) is considered sufficient to ensure that outcome status can be estimated with a high degree of certainty; SG100 is also met. For New Zealand sea lion and New Zealand fur seal, the data being collected from the fishery are of high quality, but uncertainties associated with cryptic mortality (sea lions) and population demography (sea lions and fur seals) remain, so that it is considered not possible to quantitatively estimate outcome status of these species with a high degree of certainty (MPI 2016). SG100 is not met for these 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 – Protected corals Y – NZ sea lion Y – NZ fur seal Y – Seabirds	Y – Protected corals Y – NZ sea lion Y – NZ fur seal Y – Seabirds	N – Protected corals N – NZ sea lion N – NZ fur seal Y – Seabirds
	Justification	For protected corals, reviews of evidence and risks have been undertaken (Baird et al. 2013, Anderson et al. 2014), and a continuing, annual review process is established to determine on-going performance (e.g. MPI 2017e). For New Zealand		

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.**		
		sea lion and New Zealand fur seal, there is an on-going threat assessment and capture review (e.g., Baker et al. 2016, MPI 2016, Abraham & Berkenbusch 2017, Abraham et al. 2017), while for seabirds, there is an on-going risk assessment and review process to determine impacts and effects (e.g., Richard & Abraham 2015, MPI 2016, Abraham & Richard 2017, Richard et al. 2017). In all cases therefore, information is sufficient to determine whether the fishery may be a threat to protection and recovery of the ETP species; SG60 and SG80 are met. For seabirds, there is 100% observer coverage on the fishery and the latest information from Richard et al. 2017 (Table 20) is considered sufficient to conclude that accurate and verifiable information is available on the magnitude of all impacts, mortalities and injuries and the consequences for the status of ETP species; SG100 is also met. However, SG100 is not met for other ETP species because it is not clear that accurate and verifiable information is available on the magnitude of all impacts, mortalities and injuries and the consequences for their status.		
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 – Protected corals Y – NZ sea lion Y – NZ fur seal Y – Seabirds	Y – Protected corals Y – NZ sea lion Y – NZ fur seal Y – Seabirds	N – Protected corals Y – NZ sea lion Y – NZ fur seal Y – Seabirds
	Justification	Data on vessel activity and captures of ETP species are collected and collated routinely for all vessels operating in the southern blue whiting trawl fishery through the submission of NFPSCRs and verified through the observer programme. This information is sufficient to measure trends and support a full strategy to manage impacts on all ETP species; SG60 and SG80 are met. For protected corals, there is insufficient information on current status to evaluate with a high degree of certainty whether a comprehensive strategy is achieving its objectives. SG100 is not met. For New Zealand sea lions, New Zealand fur seals and seabirds, there is very good information on interactions with trawl vessels, collected over a long time period which, together with information on demography that is available, is considered adequate to support comprehensive strategies to manage impacts, and evaluate whether the strategy (i.e., for marine mammals to "*Manage deepwater and middle-depth fisheries to avoid or minimise adverse effects on the long term viability of endangered, threatened and protected species.*" – Ministry of Fisheries 2010, and for seabirds that "*New Zealand seabirds thrive without pressure from fishing related mortalities, New Zealand fishers avoid or mitigate against seabird captures*" – MPI 2013b) are achieving their objectives. SG100 is met for New Zealand sea lions, New Zealand fur seals and seabirds.		

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	Abraham & Berkenbusch 2017, Abraham & Richard 2017, Abraham et al. 2017, Baird et al. 2013, Baker et al. 2016, Ministry of Fisheries 2010, MPI 2013b, MPI 2016, MPI 2017e, Richard & Abraham 2015,		
OVERALL PERFORMANCE INDICATOR SCORE		**UoC 1 – 6B**	**85**
OVERALL PERFORMANCE INDICATOR SCORE		**UoC 2 – 6I**	**85**
CONDITION NUMBER (if relevant):			**N/A**

PI 2.3.3 Scoring calculation

Element	SIa (60, 80, 100)	SIb (60, 80, 100)	SIc (60, 80, 100)	Element score	PI Score
Protected corals	100	80	80	85	85
NZ Sea lion	80	80	100	85	
NZ fur seal	80	80	100	85	
Seabirds	100	100	100	100	

Evaluation Table for PI 2.4.1 – Habitat outcome

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 – All UoCs	Y – All UoCs	Y – All UoCs
	Justification	For the assessment of the southern blue whiting trawl fishery, there are considered to be no main benthic habitats as the fishery is prosecuted with midwater trawl gear. Upper slope habitats may be impacted incidentally during fishing operations, and pelagic habitats are not considered to be at risk (noting that protected corals are scored as ETP Species in PI 2.1.3 – 2.3.3). With respect to assessing habitat impacts from a fishery, the MSC provides the following normative text (MSC 2013a): CB3.14.3: *The team shall consider the full extent of the habitats when assessing the status of habitats and the impacts of fishing, and not just the part of the habitats that overlap with the fishery.*" In the period 2009/10-2013/14, the swept area of the southern blue whiting trawl fishery covered approximately <3% of the area of habitat within the 200-800 m depth band within SBW6B and SWB6I (Black 2016, and see Table 21 and Figure 18). Given that the fishery is prosecuted with a midwater trawl with minimal bottom contact, and there is much additional habitat area outwith the SBW FMAs, these swept area data alone are considered to provide ample evidence that the fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm. SG60, SG80 and SG100 are met.		
References		Black 2016, MSC 2013a		

OVERALL PERFORMANCE INDICATOR SCORE	**UoC 1 – 6B**	**100**
OVERALL PERFORMANCE INDICATOR SCORE	**UoC 2 – 6I**	**100**
CONDITION NUMBER (if relevant):		**N/A**

Evaluation Table for PI 2.4.2 – Habitat management

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 – All UoCs	Y – All UoCs	Y – All UoCs
	Justification	For the assessment of the southern blue whiting trawl fishery, there are considered to be no main benthic habitats as the fishery is prosecuted with midwater trawl gear. Upper slope habitats may be impacted incidentally during fishing operations, and pelagic habitats are not considered to be at risk (noting that protected corals are scored as ETP Species in PI 2.1.3 – 2.3.3). The approach to managing fishing impacts on New Zealand deep water benthic habitats is based on the following: • Preventing demersal fishing in a significant proportion (32%) of the New Zealand EEZ through the designation of benthic protection areas (BPAs) (MPI 2016), • Limiting fishing activity in areas that are fished by setting annual TACCs for individual species and bringing most bycatch species into the QMS, with steadily higher 'deemed values' for any fish caught in excess of an individual's ACE (Fishserve 2018), • Monitoring activity with a good level of observer coverage (very nearly 100% of all tows in the Southern blue whiting trawl fishery have been observed since 2012/13 (Figure 14).) • Requiring vessels to submit TCEPRs on a tow-by-tow basis, • Collating and reporting tow information annually to determine the footprint of the New Zealand deepwater fleet as a whole, and for fisheries targeting Tier 1 species (e.g., Black 2016, Black & Tilney 2017), and • Continuing to gather data on species and habitats across the New Zealand EEZ (e.g., Bowden et al. 2017) • Continuing to develop predictive models to map the benthic environment in areas that have not yet been surveyed (e.g., Leathwick et al. 2012, Baird et al. 2013, Ford et al. 2016). The southern blue whiting trawl fishery operates mainly in midwater, and within a very small footprint overall. At this level of intensity, then, it is considered that these components together comprise a strategy for managing the impact of the fishery on habitat types. SG60, SG80 and SG100 are 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.
	Met?	Y – All UoCs	Y – All UoCs	N – All UoCs

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**		
	Justification	The designation of protected areas to prevent fishing impacts in deep water sites is well established internationally (e.g., FAO 2009), while the economics of fishing invariably means that it is in the interest of the industry to be as efficient as possible by progressively minimising fishing time (and therefore the fishing footprint) in catching the allocated TACC. Detailed monitoring and review of spatial data is a feature of effective habitat management, while the ongoing collection and review of habitat data supports the overall management approach. There is clearly some objective basis for confidence that the strategy will work, based on information directly about the fishery and/or habitats involved; SG60 and SG80 are met. It is not clear that there has been any testing of the strategy, however and the incidental impact of the fishery on upper slope habitats has not been quantified. As such, SG100 is not met.		
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 – All UoCs	Y – All UoCs
	Justification	All of the measures that comprise the strategy as detailed in SIa are clearly being implemented successfully, SG100 is met.		
d	**Guidepost**			There is some evidence that the strategy is achieving its objective.
	Met?			Y – all UoCs
	Justification	In the period 2009/10-2013/14, the swept area of the southern blue whiting trawl fishery covered approximately <3% of the area of habitat within the 200-800 m depth band within SBW 6B and SBW 6I (Black 2016, and see Table 21 and Figure 18). The fishery is undertaken with a midwater trawl with minimal bottom contact, and these swept area data provide evidence that the strategy (to manage impacts on benthic habitats) is achieving its objective – this SG100 requirement is met.		
References		Baird et al. 2013, Black 2016, Black & Tilney 2017, Bowden et al. 2017, FAO 2009, Fishserve 2018, Ford et al. 2016 Leathwick et al. 2012, MPI 2016.		

OVERALL PERFORMANCE INDICATOR SCORE: (All UoCs)		**95**
CONDITION NUMBER (if relevant):		**N/A**
OVERALL PERFORMANCE INDICATOR SCORE	**UoC 1 – 6B**	**95**
OVERALL PERFORMANCE INDICATOR SCORE	**UoC 2 – 6I**	**95**
CONDITION NUMBER (if relevant):		**N/A**

Evaluation Table for PI 2.4.3 – Habitat information

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 – All UoCs	Y – All UoCs	N – All UoCs
	Justification	For the assessment of the southern blue whiting trawl fishery, there are considered to be no main benthic habitats as the fishery is prosecuted with midwater trawl gear. Upper slope habitats may be impacted incidentally during fishing operations, and pelagic habitats are not considered to be at risk (noting that protected corals are scored as ETP Species in PI 2.1.3 – 2.3.3). Increasingly complex habitat mapping based on modelling with ground-truthing has been undertaken in New Zealand waters (MPI 2016, and e.g., Snelder et al. 2006, Leathwick et al. 2012), and particular attention has been paid to the distribution of vulnerable species (e.g., Baird et al. 2013). Data on benthic habitats continue to be collected through observers and TCEPRs submitted from commercial fishing trips, but also through specific benthic surveys undertaken to improve the information underlying the habitat models (e.g., Bowden et al. 2017). Habitat and environmental information is also reviewed and consideration given to the best way to interpret and present the data, with specific focus on understanding benthic impacts from fishing (e.g., Ford et al. 2016). It is clear that 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; SG60 and SG80 are met. Predictive modelling with interpolation between survey points is a standard and well-accepted approach to mapping seabed habitats. The work undertaken to characterise New Zealand's deep sea marine habitats is commendable and of high quality, but it is apparent that there remain questions over the accuracy and/or reliability of some outputs (e.g., Ford et al. 2016), and so it is not clear that SG100 is 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 – All UoCs	Y – All UoCs	N – All UoCs

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	Studies have been undertaken to assess the impact of trawling on deepwater habitats (see Clark et al. 2015 and MPI 2016 for reviews), and a very considerable body of research on fishing impacts is available from shallower waters from which to draw inference. However, the midwater trawl gear used in the Southern blue whiting fishery is not intended to be used as a demersal gear, and thus the impacts will be much lower than demonstrated by many of the studies carried out. Information on all deep water trawling is reported on a tow-by-tow basis through the TCEPRs, and the trawl footprint of the New Zealand fleet, and of fisheries targeting Tier 1 species, is calculated and summarised annually (e.g., Black et al. 2013, Black & Tilney 2015, Black & Tilney 2017). It is clear that 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; SG60 and SG80 are met. SG100 requires that the physical impacts of the gear on the habitat types have been quantified fully. This is a very challenging requirement for deep water fisheries, in part because recovery of benthic communities can take a long time (so understanding and quantifying impacts may take a considerable period), but also because the deep sea is a difficult environment in which to conduct research and monitoring. This requirement is not met.		
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 – All UoCs	N – All UoCs
	Justification	All deepwater vessels are monitored through VMS, and tow-by-tow data, including on the start and finish location of each trawl, are submitted on TCEPRs. These tow location data are collated and analysed annually to produce the trawl footprints of each fishery and of the New Zealand deepwater fleet in total. It is clear that sufficient data continue to be collected to detect any increase in risk to habitat; SG80 is met. New data on the location of structure forming coral habitats are collected routinely, and there is an on-going programme to refine existing maps of the seabed (e.g., Ford et al. 2016, Bowden et al. 2017). However, it is not possible to conclude for the deepwater zone that changes in habitat distributions over time are measured. As such, SG100 is not met.		
References		Baird et al. 2013, Black et al. 2013, Black & Tilney 2015, Black & Tilney 2017, Bowden et al. 2017, Clark et al. 2015, Ford et al. 2016, Leathwick et al. 2012, MPI 2016, Snelder et al. 2006.		

OVERALL PERFORMANCE INDICATOR SCORE	**UoC 1 – 6B**	**80**
OVERALL PERFORMANCE INDICATOR SCORE	**UoC 2 – 6I**	**80**
CONDITION NUMBER (if relevant):		**N/A**

Evaluation Table for PI 2.5.1 – Ecosystem outcome

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 – All UoCs	Y – All UoCs	N – All UoCs
	Justification	When assessing the ecosystem component; normative text indicates the following (MSC 2013a): "CB3.17.3 *The team should note that "key" ecosystem elements are the features of an ecosystem considered as being most crucial to giving the ecosystem its characteristic nature and dynamics, and are considered relative to the scale and intensity of the fishery. They are features most crucial to maintaining the integrity of its structure and functions and the key determinants of the ecosystem resilience and productivity*." In the context of the southern blue whiting trawl fishery, and based on the available data showing the complexity of the foodweb and importance of primary production, it is trophic structure in the Southern Plateau region that is considered as the key ecosystem element for this new assessment. Tuck et al. 2009 provided a review of indicators and an indicator-focused review of data from the Sub-Antarctic trawl surveys from 1983-2005. Their analyses determined that there was no change in species richness in the Pukaki Rise and Campbell Shelf region, but there was evidence of a decline in the biomass ratio of piscivorous fish to demersally-feeding species, and the median length of fish species declined over time. However, these changes were not correlated with overall trawling intensity (all fisheries) and do not meet the MSC's definition of 'serious or irreversible' (CB3.17.2, MSC 2013a). An Ecopath model of the Southern Plateau was developed by Bradford-Grieve et al. 2003. Although the model was not designed to test how changes in abundance of different groups (e.g., more or less phytoplankton, more or less mesopelagic fish, etc.) would impact other groups, the model nevertheless confirmed that the Southern Plateau system is iron limited and driven by phytoplankton abundance. Given the status relative to ecosystem indicators, it is considered that the southern blue whiting trawl fishery is highly unlikely to disrupt trophic structure to a point where there would be a serious or irreversible harm; SG60 and SG80 are met. SG100 is not met at this time, because the Tuck et al. 2009 review is now a little dated (the most recent data used in their analyses are from 2007), and there remain unanswered questions over the cause of some changes in New Zealand's deepwater environments (MPI 2016).		
References		Bradford-Grieve et al. 2003, MSC 2013a, MPI 2016, Tuck et al. 2009.		

OVERALL PERFORMANCE INDICATOR SCORE	**UoC 1 – 6B**	**80**
OVERALL PERFORMANCE INDICATOR SCORE	**UoC 2 – 6I**	**80**
CONDITION NUMBER (if relevant):		**N/A**

Evaluation Table for PI 2.5.2 – Ecosystem management

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 – All UoCs	Y – All UoCs	N – All UoCs
	Justification	There are numerous measures in place to manage impacts of the southern blue whiting trawl fishery on individual ecosystem components (and thereby ecosystem structure and function), e.g., for southern blue whiting as a target species (as described in PI 1.2.1), retained and bycatch species (as described in PI 2.1.2 and PI 2.2.2), ETP species (as described in PI 2.3.2), and habitats (as described in PI 2.4.2). The management of ecosystem impacts is based around a well-structured, legislative, policy and operational framework. The overall structure includes at least the following: • The Fisheries Act • The Wildlife Act • The Marine Mammals Protection Act • Fisheries 2030 • The Harvest Strategy Standard for New Zealand Fisheries (Ministry of Fisheries 2008) • The National Fisheries Plan for Deepwater and Middle-depth Fisheries (Ministry of Fisheries 2010) • The Conservation Services Programme Strategic Statement (DOC 2015) • National Plans of Action for sharks, seabirds (MPI 2013a, MPI 2013b)), as well as the New Zealand Sea Lion Threat Management Plan (DOC & MPI 2017) Operational delivery plans are then set out, including those that are both statutory and non-statutory, for example: • The Annual Operational Plan for Deepwater Fisheries (MPI 2017g) • The Conservation Services Programme annual plan 2017/18 (DOC 2017) • Deepwater group operational procedures for marine mammals, sharks and seabirds (DWG 2014) And data are collected, collated and reviewed regularly to inform the ongoing delivery of sustainable fisheries. For example: • The Annual Review Report for Deepwater Fisheries for 2015/16 (MPI 2017e) • Fish species (e.g., MPI 2017a, Ballara 2015) • ETP species (e.g. Baird 2013, Anderson 2014) • Habitats (e.g., Black 2016, Black & Tilney 2017, Bowden et al. 2017) • Ecosystem considerations (e.g., Tuck et al. 2009, Stevens 2011, Ford et al. 2016, MPI 2016). In summary, the measures described above clearly come together to form a partial strategy to manage ecosystem impacts of the ling longline fishery; SG60 and SG80 are met. However, it is not clear that the individual measures are sufficiently well linked and developed in the Sub Antarctic region to be considered a strategy, so SG100 is not met.		

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		
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 – All UoCs	Y – All UoCs	N – All UoCs
	Justification	As noted in SIa, data are collected, collated and reviewed regularly to inform the ongoing delivery of sustainable fisheries. The partial strategy addresses the all of the main impacts of the fishery and is demonstrably achieving the ecosystem outcome 80 level of performance. SG60 and SG80 are met. In the absence of a 'strategy' (PI 2.5.2, SIa), SG 100 cannot be met. In any case, it is not clear that the overall focus on structure and function is particularly strong in the Sub-Antarctic regions, however, where ecosystem modelling is behind that of other regions, specifically, the Chatham Rise. There is also a question regarding the adequacy of information on the status of mid-trophic level species, which are important components of the food web (MPI 2016).		
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 – All UoCs	Y – All UoCs	N – All UoCs
	Justification	Strategic and operational measures that are in place are considered likely to work, based on information about the fishery and ecosystem components involved (i.e., target, retained and bycatch species, ETP species and habitats). These components are being actively managed (see PIs 2.1.2, PI 2.2.2, PI 2.3.2 and PI 2.4.2). The Aquatic Environment and Biodiversity Annual Review (MPI 2016) provides a comprehensive review of the efficacy of measures, and identification of ongoing and new issues. Detailed monitoring of many aspects of the fishery (e.g. catches of target, retained species, and bycatch) provides a rich source of information through which to investigate the efficacy of strategies and plans; SG60 and SG80 are met. In the absence of a 'strategy' (PI 2.5.2, SIa), SG100 cannot be met.		
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 – All UoCs	Y – All UoCs
	Justification	All of the measures that comprise the partial strategy as detailed in SIa are clearly being implemented successfully, SG80 and SG100 are met.		
References		Anderson 2014, Baird 2013, Ballara 2015, Black 2016, Black & Tilney 2017, Bowden et al. 2017, DOC (undated), DOC 2015, DOC 2017, DWG 2014a, DWG 2014b, Ministry of Fisheries 2008, Ministry of Fisheries 2010, Ford et al. 2016, MPI 2011b, MPI 2013a, MPI 2013b, MPI 2016, MPI 2017a, MPI 2017e, Stevens 2011, Tuck et al. 2009		

OVERALL PERFORMANCE INDICATOR SCORE	**UoC 1 – 6B**	**85**
OVERALL PERFORMANCE INDICATOR SCORE	**UoC 2 – 6I**	**85**
CONDITION NUMBER (if relevant):		**N/A**

Evaluation Table for PI 2.5.3 – Ecosystem information

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 – All UoCs	Y – All UoCs	
	Justification	In the context of the southern blue whiting trawl fishery, and based on the available data showing the complexity of the foodweb and importance of primary production, it is trophic structure in the Southern Plateau region that is considered as the key ecosystem element for this new assessment. An Ecopath model of the Southern Plateau was developed by Bradford-Grieve et al. 2003. Although the model was not designed to test how changes in abundance of different groups (e.g., more or less phytoplankton, more or less mesopelagic fish, etc.) would impact other groups, the model nevertheless confirmed that the Southern Plateau system is iron limited and driven by phytoplankton abundance; energy fluxes and, to a lesser extent, biomass, are concentrated in the pelagic environment. Fisheries (of all species) were estimated to account for around 32% of the fish production from the Southern Plateau. Information is adequate to broadly understand the key elements of the ecosystem – SG60 and SG80 are met.		
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 in detail.
	Met?	Y – All UoCs	Y – All Us	N – All UoCs
	Justification	With respect to trophic structure, the Bradford-Grieve et al. 2003 Ecopath model confirmed that the Southern Plateau system is iron limited and driven by phytoplankton abundance; the inference is that the southern blue whiting fishery cannot impact this fundamental driver of productivity. It is considered that main interactions between the fishery and trophic structure can be inferred from existing information, and some have been investigated in detail; SG60 and SG80 are met. SG100 is not met for this element, as the ecosystem-level research on the region (Bradford-Grieve et al. 2003, Tuck et al. 2009) is now a little dated.		
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 – All UoCs	Y – All UoCs

PI 2.5.3		There is adequate knowledge of the impacts of the fishery on the ecosystem		
	Justification	The main functions of southern blue whiting and minor retained and bycatch species as predators and prey species in the New Zealand deepwater ecosystem are considered to be understood, based on ecosystem modelling and associated research (e.g., Bradford-Grieve et al. 2003, Tuck et al 2009, Stevens et al. 2011). The main functions of the ETP species that are vulnerable to capture in the southern blue whiting trawl fishery are also considered to be understood. There is also increasing information available on the importance of structuring communities (e.g., corals, seafans and seapens), to deep water ecosystems (e.g., FAO 2009). Together, this information means that the fishery meets SG80 and the second part of SG100 ("the main functions of these Components in the ecosystem are understood") for this SI. There is also information on the impacts of the fishery on these components, with observer coverage at essentially 100% since 2012/13 (Figure 14), the submission of TCEPRs at a tow-by-tow basis, and the collation and presentation of trawl footprint data over time (e.g., Black & Tilney 2017). The first part of SG100 ("The impacts of the fishery on target, Bycatch, Retained and ETP species are identified") is also met for this SI.		
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 – All UoCs	N – All UoCs
	Justification	The stock assessments (MPI 2017a) provide an important insight to the impact of the fishery on southern blue whiting. Information is also collected and collated from observers and from TCEPRs that, with appropriate analyses, show the fishery is not significantly adversely impacting any other fish species, ETP species, or benthic structuring communities. Predictive models of the distribution of habitats and protected coral species have been constructed and compared with the trawl footprint of the fisheries (e.g., Leathwick 2012, Baird et al. 2013, Anderson et al. 2014, Black 2016). It is considered that sufficient information is available on the impacts of the fishery on the components of the New Zealand deepwater ecosystem to allow the main consequences to be inferred. As such, the fishery scores 80 for this SI. It is not clear that sufficient information is available on all elements, however, so SG100 is not met.		
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 – All Us	N – All UoCs

PI 2.5.3		There is adequate knowledge of the impacts of the fishery on the ecosystem
	Justification	There is an ongoing scientific survey programme for the Sub Antarctic region. The data collected are fishery independent and are considered "*crucial for understanding and monitoring for trophic and ecosystem level effects*" (MPI 2016). All deepwater vessels are also monitored through VMS, and tow-by-tow data, including on catches and the start and finish location of each trawl, are submitted on TCEPRs. These data are collated and analysed annually to produce catch summaries and the trawl footprints of each fishery and of the New Zealand deepwater fleet in total. It is clear that sufficient data continue to be collected to detect any increase in risk level; SG80 is met. With respect to whether information is sufficient to support the development of strategies to manage ecosystem impacts, it is noted that that the ecosystem-level research on the region (Bradford-Grieve et al. 2003, Tuck et al. 2009) is now a little dated.SG100 is not met.
References		Anderson et al. 2014, Baird et al. 2013, Black 2016, Black & Tilney 2017, Bradford-Grieve et al. 2003 FAO 2009, Leathwick 2012, MPI 2016, MPI 2017a, Stevens et al. 2011, Tuck et al 2009

OVERALL PERFORMANCE INDICATOR SCORE	**UoC 1 – 6B**	**85**
OVERALL PERFORMANCE INDICATOR SCORE	**UoC 2 – 6I**	**85**
CONDITION NUMBER (if relevant):		**N/A**

Evaluation Table for PI 3.1.1 - Legal and/or Customary Framework

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	MPI is responsible for the utilisation of New Zealand's fisheries resources while ensuring sustainability in accordance with its governing legislation - the Fisheries Act 1996. Under the Fisheries Act, sustainability means: (a) maintaining the potential of fisheries resources to meet the reasonably foreseeable needs of future generations (which addresses P1) and (b) avoiding, remedying, or mitigating any adverse effects of fishing on the aquatic environment (which addresses P2). Utilisation means conserving, using, enhancing, and developing fisheries resources to enable people to provide for their social, economic, and cultural well-being. The Fisheries Act binds the Crown. Decisions made under power given by the Act are judicially reviewable by the Courts in the event of disputes. Procedures and processes that apply to disputes about the effects of fishing on the fishing activities of any person that has a current fishing interest provided for under the Act, are set out under Part 7 of the Fisheries Act. MPI's fisheries management responsibilities extend to the 200 nautical mile limit of the New Zealand EEZ. MPI provides management, licensing (where applicable) research and compliance and education services for commercial, recreational and customary fishing. MPI assists the Minister for Primary Industries in the administration of the relevant Acts. The Government's commitment to wide consultation and engagement is set out in Section 12 of the Act. MPI is required to consult with those classes of persons having an interest (including, but not limited to, Maori, environmental, commercial and recreational interests) in the stock or the effects of fishing on the aquatic environment in the area concerned. MPI do this in a number of ways, e.g. through regular meetings of working groups. These meetings are open to everyone, and consider fish stocks and the effects of fishing on the aquatic environment. The New Zealand Department of Conservation (DoC) Conservation Services Programme (CSP) monitors the impact of commercial fishing on protected species, studies species populations and looks at ways to limit bycatch. Protected marine species include all marine mammals and reptiles; sea birds (except black backed gulls); seven species of fish; all black corals, gorgonian corals, stony corals and hydrocorals (DoC 2016). MPI and DWG coordinate with DoC in management of the fisheries.		

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.**		
		New Zealand is a member of the South Pacific Regional Fisheries Management Organization (SPRFMO), which has Conservation Management Measures (CMM) binding on members. CMM 2.03 specifically deals with international requirements for bottom fishing in the SPRFMO area. There is an effective national and international legal system and binding procedures governing cooperation with other parties that deliver management outcomes consistent with MSC Principles 1 and 2. This SI meets SG60, SG80 and SG100.		
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
	Justification	The Fisheries Act provides opportunities to negotiate and resolve disputes. The Minister may appoint a Dispute Commissioner to manage the process but the Minister makes the final determination. The consultation process attempts to avoid unresolved disputes by ensuring all interested parties have an opportunity to participate and have an input into decisions. There have been occasions when there has not been a satisfactory outcome and then the issue has gone to litigation and the Court has made a decision. The Memorandum of Understanding between DWG and MPI has encouraged better working relationships and avoided the need for litigation between the Ministry and the industry. The management system incorporates or is 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 be effective. This meets the SG60, SG80, and SG100.		
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	MPI is responsible for the administration of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992, which implements the 1992 Fisheries Deed of Settlement under which historical Treaty of Waitangi claims relating to commercial fisheries have been fully and finally settled. The Ministry is also responsible for the Maori Fisheries Act 2004, which provides that the Crown allocates 20% of quota for any new quota management stocks brought into the QMS to the Treaty of Waitangi Fisheries commission. For non-commercial fisheries, the Kaimoana Customary Fishing Regulations 1998 and the Fisheries (South Island Customary Fishing) Regulations 1998 strengthen some of the rights of Tangata Whenua to manage their fisheries. These regulations let iwi and hapü manage their non-commercial fishing in a way that best fits their local practices, without having a major effect on the fishing rights of others. When the government sets the total catch limits for fisheries each year, it allows for this customary use of fisheries before allocating commercial quotas. The management system therefore 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. This meets the SG60, SG80, and SG100.
References		Fisheries Act 1996 DWG Partnership MoU 2010 Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 Deed of Settlement 1992 Maori Fisheries Act 2004 Customary Fisheries Regulations 1998 Fisheries 2030 MRAG-Americas 2016 Intertek 2012 DOC 2017 SPRFMO 2016

OVERALL PERFORMANCE INDICATOR SCORE	**UoC 1 – 6B**	**100**
OVERALL PERFORMANCE INDICATOR SCORE	**UoC 2 – 6I**	**100**
CONDITION NUMBER (if relevant):		**N/A**

Evaluation Table for PI 3.1.2 – Consultation, Roles and Responsibilties

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	MPI is the Government agency responsible for the utilisation and sustainable management of the fisheries resources. The role of the MPI, working with other government agencies, is to advise on and implement government policy in the following areas of core responsibility: a) ensuring sustainability of fish stocks and the protection of the aquatic environment; b) meeting international and Deed of Settlement obligations; c) providing for maximum value to be realised; d) facilitating sustainable development; and e) ensuring integrity of management systems. MPI is charged with consistently monitoring the fishery resource, and making timely and appropriate policy advice on all aspects of fisheries management to the Government. The Ministry is also responsible for carrying out the Government's policies to manage and conserve fisheries, and to actively encourage compliance of fisheries regulations by all fishers. The Department of Conservation (DOC) is the central government organisation charged with conserving the natural and historical heritage of New Zealand. The department is responsible for marine reserves, seabirds, and for marine mammals such as dolphins, whales, sea lions and fur seals. DWG is a non-profit organisation, and is the commercial stakeholder organisation responsible for the majority of deepwater and middle-depth fisheries. It is working in partnership with the MPI and other interest groups to ensure New Zealand gains the maximum economic yields from its deepwater fisheries resources managed within a long-term, sustainable framework. The vast majority of quota owners are represented through the DWG. The MPI and DWG signed a Memorandum of Understanding (MOU) in 2006, which sets out how DWG and MPI are to work collaboratively to improve the management of deepwater fisheries. The MOU was updated in 2008 and 2010. ENGOs and other stakeholders have an important role in participating and contributing to management processes. Therefore, organisations and individuals involved in the management process have been identified and their functions, roles and responsibilities are explicitly defined and well understood for key areas of responsibility and interaction. This meets the SG60, SG80, and SG100.		

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**		
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
	Justification	Section 12 of the 1996 Act includes a range of specific consultation requirements. MPI is required to consult with those classes of persons having an interest (including, but not limited to, Maori, environmental, commercial and recreational interests) in the stock or the effects of fishing on the aquatic environment in the area concerned; Section 12 only relates to certain sections of the 1996 Act. However, there are other sections of the 1996 Act that require the Minister or MPI Chief Executive to consult with stakeholders before making a decision. MPI has a well-defined process for stakeholder consultation. The consultation process: • sets out best practice process for how MPI will meet its obligations under Section 12 of the Fisheries Act 1996 and for other decisions requiring consultation with fisheries stakeholders; • helps to ensure a consistent approach across all MPI business groups when consulting with fisheries stakeholders; and • sets out minimum performance measures where appropriate, e.g., a minimum period for stakeholder consultation. The consultation process standard includes the following: • identification of stakeholders “having an “interest” for consultation purposes; • a timeframe for consultation; • notification of decision to stakeholders; and • monitoring, review and oversight. Within this process, it is necessary to identify who has an interest; and who are representative of those having an interest. MPI must provide an initial consultation plan and the manner of consultation, including the timeframe for the consultation and the decision. MPI must distribute the decision, and subsequently review the process to assure that the consultation met all requirements. When management changes are proposed to meet sustainability requirements (such as a change to a TAC/TACC), MPI prepares a discussion document that provides the Ministry’s initial proposals for issues needing decision and a range of management options. These proposals occur on an annual basis. At a more general level, MPI works closely with other government agencies and in partnership with stakeholders in addressing complex resource management issues, including developing and implementing policy settings and regulatory regimes for fisheries, aquaculture and forestry to support increased sustainable resource use, which requires ongoing consultations. A record of all consultations is documented at http://www.mpi.govt.nz/news-and-resources/consultations/, which includes summaries of the basis for decisions, and comments from all participating stakeholders. Information in letters, emails, and in Final Advice papers for		

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**		
		management actions demonstrates the consideration of stakeholder input and use or non-use of that information. The letters, emails, and Final Advice address the issues raised by stakeholders. MPI has provided further information on consultation in a letter annexed to stakeholder comments, including planned consultation on the Deepwater Management Plan. Explanations on how information is used or not used are conveyed by letters, emails and in Final Advice papers is evidence that consultation occurs on a regular basis and that information provided by stakeholders is often taken into account. The management system therefore includes consultation processes that regularly seek and accept relevant information, including local knowledge and demonstrates consideration of the information and explains how it is used or not used. The SG100 is met.		
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
	Justification	MPI has a well-defined process for stakeholder consultation. The consultation process: • sets out best practice process for how MPI will meet its obligations under Section 12 of the Fisheries Act 1996 and for other decisions requiring consultation with fisheries stakeholders; • helps to ensure a consistent approach across all MPI business groups when consulting with fisheries stakeholders; and • sets out minimum performance measures where appropriate, e.g., a minimum period for stakeholder consultation. The consultation process standard includes the following: • identification of stakeholders having an “interest” for consultation purposes; • a time frame for consultation; • notification of decision to stakeholders; and • monitoring, review and oversight. There is evidence of the MPI seeking stakeholder views throughout the year using, for example, the Initial Position Paper process, the Working Group, and fisheries planning meetings. As part of the consultation process, stakeholders are given the opportunity to provide feedback on the delivery of the process itself. The feedback is evaluated and used to fine tune future consultation processes. Stakeholders are encouraged to be involved. MPI have also set up an Environmental Engagement forum. The consultation process provides opportunity and encouragement for all interested and affected parties to be involved, and facilitates their effective management. MPI have also set up an Environmental Engagement forum. This meets the SG80 and SG100.		
References		Fisheries Act 1996 DWG 2010 MFish 2010 MFish 2011 Statement of Intent MPI 2017f MRAG-Americas 2016		

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**		
	Intertek 2012		
OVERALL PERFORMANCE INDICATOR SCORE		**UoC 1 – 6B**	**100**
OVERALL PERFORMANCE INDICATOR SCORE		**UoC 2 – 6I**	**100**
CONDITION NUMBER (if relevant):			**N/A**

Evaluation Table for PI 3.1.3 – Long Term Objectives

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	**Guide post**	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
	Justification	Long-term fishery and environmental objectives are included within both New Zealand fisheries and environmental legislation and these guide decision-making. In regard to information principles, Section 10 of Fisheries Act states: "All persons exercising or performing functions, duties, or powers under this Act, in relation to the utilisation of fisheries resources or ensuring sustainability, shall take into account the following information principles: (a) Decisions should be based on the best available information; (b) Decision makers should consider any uncertainty in the information available in any case; (c) Decision makers should be cautious when information is uncertain, unreliable, or inadequate; (d) The absence of, or any uncertainty in, any information should not be used as a reason for postponing or failing to take any measure to achieve the purpose of this Act." Fisheries 2030 sets the strategic direction for the management and use of New Zealand's fisheries resources. One of the principles guiding Fisheries 2030 is the "Precautionary approach: particular care will be taken to ensure environmental sustainability where information is uncertain unreliable or inadequate." The National Fisheries Plan for Deepwater and Middle-depth Fisheries (the National Deepwater Plan) establishes the 5-year enabling framework for the management of New Zealand's deepwater fisheries. It is further divided into two parts. Part 1A details the overall strategic direction for New Zealand's deepwater fisheries. Specifically, it describes: (a) the wider strategic context that Fisheries Plans are part of, including Fisheries 2030 (b) the nature and status of the management objectives that will apply across all deepwater fisheries; and (c) how the National Deepwater Plan will be implemented and how stakeholders will be engaged during the implementation phase. Part 1A of the National Deepwater Plan has been approved by the Minister of Fisheries under Section 11A of the Fisheries Act 1996. This means that it must be considered each time the Minister makes decisions or recommendations concerning regulation or control of fishing or any sustainability measures relating to the stocks managed through this plan. Part 1B of the National Deepwater Plan comprises the fishery-specific chapters of the National Deepwater Plan that provides greater detail on how deepwater fisheries will be managed at the fishery level, in line with the management objectives. To date, fishery specific chapters have been completed for the hake, hoki, orange roughy, Southern blue whiting, and ling fisheries. The fishery-specific chapters describe the operational objectives for each target fishery and their key bycatch species, as well		

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
		as how performance against both the management and operational objectives will be assessed at the fishery level. These chapters also describe any agreed harvest strategy for the relevant species. On an annual basis, the National Deepwater Plan is implemented through the Annual Operational Plan that describes management actions to be taken during the financial year for which it applies, and the management services required to deliver the management actions. The Annual Operational Plan also clearly demonstrates how these management actions contribute to the long-term objectives in the National Deepwater Plan. The annual review of performance and delivery of objectives is provided in MPI's annual reports. Therefore, 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, thus, meeting the SG60, SG60, and SG100.
References		Fisheries Act 1996 MFish 2010 MPI 2011b MFish 2011c MFish 2011d MPI 2016 MRAG-Americas 2016 Intertek 2012
OVERALL PERFORMANCE INDICATOR SCORE		**UoC 1 – 6B**	**100**
OVERALL PERFORMANCE INDICATOR SCORE		**UoC 2 – 6I**	**100**
CONDITION NUMBER (if relevant):			**N/A**

Evaluation Table for PI 3.1.4 – Incentives for Sustainable Fishing

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	P
	Justification	Incentives: The QMS and the use of ITQs provides stability and security for quota owners and hence incentives for sustainable utilisation (Fisheries Act). The management system also includes customary provisions (e.g., Maori Fisheries Act 2004 and Treaty of Waitangi (Fisheries Claims) Settlement Act 1992). Subsidies: There are no subsidies in the New Zealand deepwater fishery. The management system has explicit mechanisms to facilitate regular review of management policy or procedures (Fisheries Act). Under Section 13 of the Fisheries Act 1996, the Minister of Fisheries is required to take social, cultural and economic factors into account as well as the status of the stocks and all environmental considerations when setting a TAC for a fishery. There are regular reviews of the QMS and MPI management policy and procedures to ensure they contribute to sustainable fishing. Other strategies that contribute to sustainable fishing are also regularly reviewed, e.g. deemed values and the harvest strategy. DWG uses a trigger level management approach – 12 seabird interactions in a week, for example, which requires reporting and then actions to be taken to mitigate risk. However, there do not appear to be explicit incentives and encouragement not to catch marine mammals and protected species, i.e. there is no positive feedback for those not catching these species. 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, thus meeting the SG 60 and 80. However, the management system does not explicitly consider incentives in a regular review of management policy or procedures to ensure they do not contribute to unsustainable fishing practices. As such, the fishery only partially meets the SG100 level of performance.		
References		Fisheries Act 1996 Maori Fisheries Act 2004 Treaty of Waitangi Settlement Act 1992 MRAG-Americas 2016 Intertek 2012		

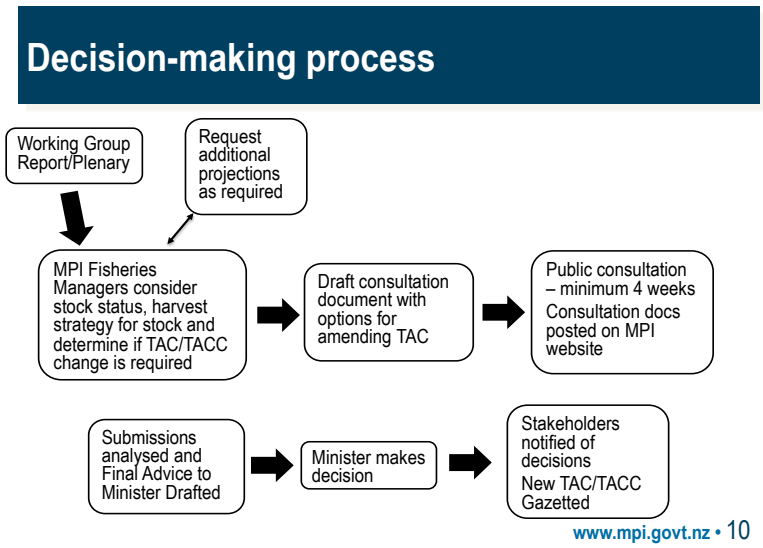
OVERALL PERFORMANCE INDICATOR SCORE	**UoC 1 – 6B**	**90**
OVERALL PERFORMANCE INDICATOR SCORE	**UoC 2 – 6I**	**90**
CONDITION NUMBER (if relevant):		**N/A**

Evaluation Table for PI 3.2.1 – Fishery Specific Objectives

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	Y
	Justification	Fisheries 2030, the National Fisheries Plan for Deepwater and Middle-depth Fisheries and the Annual Operational Plan set out explicit short and long-term objectives. The DWG MFish MoU commits the industry to align long-term objectives of the National Deepwater Plan with the specific fishery activities. The management system conducts annual review of objectives. The Southern Blue Whiting (SBW) Fisheries Plan Chapter of the National Fisheries Plan for Deepwater and Middle Depths sets the operational objectives and performance criteria for all SBW fisheries. Specifically, it addresses the management of the target and bycatch species and stocks. These are then specified within the annual Operating Plans for each fishery. These are fishery specific, subject to annual review and are measurable. The National Plans of Action for sharks and seabirds, both revised and published in 2013, provide additional examples of management objectives (relating to some ETP species) that are applicable to the assessed fisheries and consistent with MSC Principle 2. There is an Operational Plan to manage the incidental capture of New Zealand sea lions in the 2016 SBW fishery at Campbell Is. This is also consistent with MSC Principle 2. Therefore, well defined and measurable 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, meeting the SG100 and earlier SG 60 & 80.		
References		DWG 2010 MFish 2010 MPI 2011b MPI 2011c MPI 2011d MPI 2013 MPI 2013a MPI 2016 MPI 2016a MPI 2016b MPI 2017 MPI 2017ai		

OVERALL PERFORMANCE INDICATOR SCORE	**UoC 1 – 6B**	**100**
OVERALL PERFORMANCE INDICATOR SCORE	**UoC 2 – 6I**	**100**
CONDITION NUMBER (if relevant):		**N/A**

Evaluation Table for PI 3.2.2 – Decision Making Processes

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	
	Justification	The Fisheries Act (specifically Sections 10, 11, and 12) clearly lays out the requirements for decision-making, and requires that all decisions be based on the best available information (Section 10). The DWG-MFish MOU, the Annual Operations Plans, and the Review of Management Controls for Southern blue whiting implement the decisions made. MPI prepares an Initial Position Paper (IPP) that provides the Ministry's proposals for issues needing a decision. Subsequently, the Ministry will provide a Final Advice Paper (FAP) to the Minister for Primary Industries. The FAP summarizes the Ministry's and stakeholder's views on proposals and make recommendations to the Minister. A copy of the FAP and the Minister's letter setting out his final decisions are posted on the MPI website as soon as these become available.  Therefore, there are established decision-making processes that result in measures and strategies to achieve the fishery-specific objectives, meeting the SG60 and SG80.		

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	N
	Justification	Consultation is a central component of the management decision-making process (Fisheries Act Section 12, Stakeholder Consultation Process Standard). The Minister makes the final decision based on advice received from other parties (Section 12 – "the Minister shall consult with such persons or organisations as the Minister considers are representative of those classes of persons having an interest in the stock or the effects of fishing on the aquatic environment in the area concerned including Maori, environmental, commercial, and recreational interests"). The MPI ensures that the Minister is provided with analysed alternatives for consideration before making any decisions (information is both from within and outside the Ministry (stakeholders, science). The decision-making process is formalised, involving planning, consultation, project development, and scientific enquiry. The IPP/FAP process highlights the extent of consultation, engagement and transparency of the decision-making process. Submissions received on the Review of Sustainability Measures and other management Controls for Deepwater Fisheries are taken into account. Thus, 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. This meets the SG60 and SG80. Although management decision-making can be shown to respond to serious and important issues, a large number of 'issues' may be identified during research and monitoring. Management does not respond formally to all of these. However, responses may be informal or through discussion at various fora, such as working groups. All issues are addressed through such mechanisms, although this may not be to the satisfaction of all stakeholders. The Assessment Team does not have full evidence that 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. Therefore, the SG100 is not met.		
c	**Guidepost**		Decision-making processes use the precautionary approach and are based on best available information.	
	Met?		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	The Fisheries Act requires that MPI must follow the precautionary approach. Section 10 of the Fisheries Act Information principles states: "All persons exercising or performing functions, duties, or powers under this Act, in relation to the utilisation of fisheries resources or ensuring sustainability, shall take into account the following information principles: (a) Decisions should be based on the best available information: (b) Decision makers should consider any uncertainty in the information available in any case: (c) Decision makers should be cautious when information is uncertain, unreliable, or inadequate: (d) The absence of, or any uncertainty in, any information should not be used as a reason for postponing or failing to take any measure to achieve the purpose of this Act." An example of implementation of the precautionary approach for this fishery, is that following an unprecedented number of interactions with sea lions during the 2013 fishing year in SBW6I, additional operational measures were developed that the fleet has adhered to since then. These measures have been effective in reducing captures of sea lions in this fishery. Therefore, decision-making processes use the precautionary approach and are based on best available information. The SG80 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
	Justification	MPI and DWG provide a wide range of formal reporting that provides comprehensive information to stakeholders. For the purposes of this MSC assessment, the DWG has gathered a wide range of documents with links to the original reports which are all available on the DWG website. The documents ranging from the Fisheries Act, to plenary reports, to long and short-term goals and objectives are publicly available (e.g., National Fisheries Plan, Annual Operational Plan, Statements of Intent, Initial Position Papers, press releases and reports). MPI provides formal reports consistent with formalised reporting and consultation processes such as the IPP/FAP process, the Stakeholder Consultation Process Standard or the National Fisheries Plan for Deepwater and Middle-Depth Fisheries and the annual Operating Plan for Deepwater Fisheries that are always provided to stakeholders. Therefore, 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, thereby meeting the SG60, SG80, and SG100.		

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.**		
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	Section VII (Disputes Resolution) of the Fisheries Act states that the section, "(a) applies to disputes about the effects of fishing (excluding fish farming) on the fishing activities of any person who has a current fishing interest provided for or authorized by or under this Act; but (b) does not apply to disputes about ensuring sustainability or about the effects of any fishing authorised under Part 9." Section VII further requires that the Minister publicly set out an approved statement of procedure for the resolution of such disputes. In 1998, the Minister of Fisheries published the dispute resolution procedures. The Minister's approved statement of procedure for the resolution of disputes consists of four steps, with each step, in turn, involving specific actions to be undertaken by the parties to the dispute to give effect to the requirements of Section VII of the Act: • Dispute summary report by the party identifying the report • Production and Distribution of Initial Assessment Report demonstrating the dispute is about the effects of fishing, and does not involve issues associated with ensuring sustainability • Negotiation and attempts at resolution • Prepare an Outcome Report with conclusion of the process including resolution or not of the dispute. The parties to the dispute may make recommendations that involve sustainability or customary fishing that would require action beyond the authority of the Minister. The collaboration between the DWG and MPI works to avoid disputes, as the agreement of common goals and negotiations to achieve them occurs during the normal working relationship between the two parties. The principles in the Fisheries Act require decision-makers to act: in accordance with law; reasonably; and, fairly; in accordance with the principles of natural justice". Decisions that do not follow these requirements are open to legal challenge. However, legal challenges are uncommon in the fisheries, in part because of the collaborative decision-making. The management system proactively acts to avoid disputes. Lack of judicial decisions does not provide direct evidence of rapid implementation, but the requirements of the Fisheries Act and policies of DWG and MPI strongly suggest this would be the case. Therefore, the management system or fishery acts proactively to avoid legal disputes or rapidly implements judicial decisions arising from legal challenges, meeting the SG60, SG80, and SG100.		
References		Fisheries Act 1996 DWG 2010 MFish 2010		

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.**		
	MFish 2011 Statement of Intent MPI 2017 MPI 2017a www.mpi.govt.nz MPI Initial Position Papers 2017		
OVERALL PERFORMANCE INDICATOR SCORE		**UoC 1 – 6B**	**95**
OVERALL PERFORMANCE INDICATOR SCORE		**UoC 2 – 6I**	**95**
CONDITION NUMBER (if relevant):			**N/A**

Evaluation Table for PI 3.2.3 – Compliance and Enforcement

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
	Justification	The New Zealand deep-water management system has a documented, comprehensive and effective monitoring, control and surveillance system through: 1) A compulsory satellite Vessel Monitoring System (VMS) with an on-board automatic location communicator (ALC); 2) Government observers who may be placed on board to observe fishing, any transshipment/transportation, and collect any information on Southern blue whiting fisheries resources (including catch, effort and biological information) and the effects of fishing on the aquatic environment; and 3) Accurate record keeping and recording requirements to establish auditable and traceable records to ensure all catches are counted and do not exceed the ACE held by each operator. Other measures include: • fishing permit requirements; • requirement to hold ACE to cover all target and bycatch species caught, or alternatively, to pay deemed values; • fishing permit and fishing vessel registers; • vessel and gear marking requirements; • fishing gear and method restrictions; • vessel inspections; • control of landings (e.g. requirement to land only to licensed fish receivers); • auditing of licensed fish receivers; • control of transhipment; • monitored unloads of fish; • information management and intelligence analysis; • analysis of catch and effort reporting and comparison with VMS, observer, landing and trade data to confirm accuracy; • boarding and inspection by fishery officers at sea; and • aerial and surface surveillance. MPI has a sophisticated fishery outreach programme of informed and assisted compliance, in which Enforcement agents work with the industry in a proactive way to ensure understanding of regulations and to prevent infractions (Gary Orr, MPI Compliance Directorate, pers. comm. 2017). In combination, with at-sea and air surveillance supported by the New Zealand Defence Force vessel activity is monitored and verified to ensure compliance with regulations and industry-agreed codes of practice. The high level of surveillance is considered to contribute to a high level of compliance. A comprehensive monitoring, control and surveillance system has been implemented in the fishery and it has demonstrated a consistent ability to enforce		

PI 3.2.3		Monitoring, control and surveillance mechanisms ensure the fishery's management measures are enforced and complied with		
		relevant management measures, strategies and/or rules, thereby meeting the SG60, SG80, and SG100.		
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
	Justification	Under the Fisheries Act, in proceedings for an offence against this Act, it is not necessary for the prosecution to prove that the defendant intended to commit the offence; rather, the defendant must show the contravention was due to the act or default of another person, or to an accident or to some other cause beyond the defendant's control; and the defendant took reasonable precautions and exercised due diligence to avoid the contravention. Upon conviction, the Fisheries Act allows for sanctions that may include prison time, fines from $250 to $500,000, and forfeiture of quota, vessels, and other property. As only several major companies own quota, severe sanctions could put them out of business. The industry, with its investment in the fishery, has a strong incentive to maintain its cooperative role through compliance with legal requirements. MPI uses, 'informed and assisted compliance' to help minimize infractions. ACE and Deemed Value systems provide an incentive to stay within the TACs. While overruns are allowed, there are strong financial dis-incentives to avoid overruns. This is described in the Tools subsection of Harvest Strategy. Most fishermen follow the regulations; some engage in opportunistic non-compliance that is usually easily detected by enforcement agents, and a few will actively seek advantage with illegal fishing (Gary Orr, MPI Compliance Directorate, pers. comm. 2017). Checking and feedback of minor infractions hold the second group in line; but only severe sanctions, up to loss of fishing permits and vessels, will deter the last group. Enforcement personnel report that compliance is high in the deepwater fisheries. The southern blue whiting fishery is subject to an extensive range of regularity measures. Area misreporting and discarding have been known to occur in the past but there has been no recent concerns. The Ministry strives to minimise the opportunity for these and other types of offence through careful risk analysis of the southern blue whiting fisheries and with input from the industry. Information sharing with industry allows the Ministry to focus compliance efforts on current risks. These are thought to provide an effective deterrence. There have been no major non-compliances since the fishery has been MSC certified. Therefore, sanctions to deal with non-compliance exist, are consistently applied and demonstrably provide effective deterrence. The SG60, SG80 and SG100 are 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

PI 3.2.3		**Monitoring, control and surveillance mechanisms ensure the fishery's management measures are enforced and complied with**		
	Justification	The industry complies with reporting requirements, traceable documentation, effective surveillance, landing and reconciliation of catch against ACE, catch documentation audits, and checks against past catch. Kazmierow et al. (2010) surveyed fishermen on compliance decision-making, and found generally good compliance. The MPI has devolved responsibility for obtaining scientific information to the industry, as demonstrated in the operational plans, and the industry-ministry MOU. The DWG provides information necessary for the management of the fishery on the premise that better information can reduce uncertainty and improve fisheries management (Gary Orr, MPI Compliance Directorate, pers. comm. 2017). Together, these actions are considered to provide a high degree of confidence that the fishermen comply with the management system and provide substantial amounts of information of importance to the effective management of the fishery. The SG60, SG80 and SG 100 are met.		
d	**Guidepost**		There is no evidence of systematic non-compliance.	
	Met?		Y	
	Justification	The high level with which the southern blue whiting fishery meets its mandatory reporting requirements, combined with the 100% level of observer coverage, and on-going monitoring by enforcement agents, demonstrates no evidence of systematic non-compliance. This meets the SG80.		
References		Kazmierow et al. (2010) Fisheries Act 2016 www.mpi.govt.nz. Compliance Information MPI 2016b MPI 2017		

OVERALL PERFORMANCE INDICATOR SCORE	**UoC 1 – 6B**	**100**
OVERALL PERFORMANCE INDICATOR SCORE	**UoC 2 – 6I**	**100**
CONDITION NUMBER (if relevant):		**N/A**

Evaluation Table for PI 3.2.4 – Research Plan

<table>
<tr><td colspan="2">PI 3.2.4</td><td colspan="3">The fishery has a research plan that addresses the information needs of management</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>Research is undertaken, as required, to achieve the objectives consistent with MSC's Principles 1 and 2.</td><td>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.</td><td>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.</td></tr>
<tr><td>Met?</td><td>Y</td><td>Y</td><td>Y</td></tr>
<tr><td>Justification</td><td colspan="3">The National Fisheries Plan Parts 1A and 1B, MPI's annual operational plans for the deepwater fisheries, the Conservation Services Programme annual plans, and the fishery assessment plenaries provide documentation of a comprehensive research plan that provides reliable and timely information. Working groups with stakeholder membership contribute to the research plans.

The previously operating 10-year research plan for deepwater fisheries is no longer in place. A medium-term research plan for deepwater fisheries is in place. MPI is in the process of forming a research panel of pre-qualified providers to deliver projects in five different categories:

1. Surveys
2. Stock assessments and monitoring
3. Informing management (e.g. MSEs, survey design etc.)
4. Aquatic environment research specific to deepwater fisheries
5. Vessel platforms for surveys.

Wide-area trawl surveys are scheduled for the Chatham Rise (2019/20 and 2021/22), Sub Antarctic (2018/19 and 2020/21) and West Coast South Island (2018/19 and 2021/22). The schedule of acoustic surveys for SBW is shown below.

Southern blue whiting acoustic surveys

<table>
<tr><th></th><th>2018/19</th><th>2019/20</th><th>2020/21</th><th>2021/22</th><th>2022/23</th></tr>
<tr><td>SBW 1</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>SBW 6A</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>SBW 6B</td><td>Sept 2018</td><td>Sept 2019</td><td>Sept 2020</td><td>Sept 2021</td><td>Sept 2022</td></tr>
<tr><td>SBW 6I</td><td></td><td>Sept 2019</td><td></td><td></td><td>Sept 2022</td></tr>
<tr><td>SBW 6R</td><td></td><td></td><td></td><td></td><td></td></tr>
</table>

A research plan for stock assessments for southern blue whiting stocks is as below.

<table>
<tr><th></th><th>2018/19</th><th>2019/20</th><th>2020/21</th><th>2021/22</th><th>2022/23</th></tr>
<tr><td>SBW 1</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>SBW 6A</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>SBW 6B</td><td>HCR</td><td>HCR</td><td>HCR</td><td>HCR</td><td>HCR</td></tr>
<tr><td>SBW 6I</td><td></td><td>Full assessment</td><td></td><td></td><td>Full assessment</td></tr>
<tr><td>SBW 6R</td><td></td><td></td><td></td><td></td><td></td></tr>
</table>

The research plan identifies outstanding research issues for each of the species, including hoki, hake and ling, for consideration in the additional research component. The research plan identifies research for benthic environments, ETP species, bycatch and discards, and ecosystem functions and trophic interactions.</td></tr>
</table>

PI 3.2.4		**The fishery has a research plan that addresses the information needs of management**		
		DOC provides further research on protected species. . Therefore, a comprehensive research plan provides the management system with a coherent and strategic approach to research across Principles 1, 2, and 3 that provides reliable and timely information sufficient to meet the objectives consistent with MSC's Principles 1 and 2. This meets the SG60, SG80 and 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 public posting of plenaries and annual operations plans demonstrates the wide and timely distribution of information research results. Stakeholders participating in the research planning and review receive results of the research. For the purposes of this assessment, the DWG has gathered a wide range of documents with links to the original reports on its website. Therefore, a research plan and results are disseminated to all interested parties in a timely fashion and are widely and publicly available. This meets the SG60, SG80, and SG100.		
References		Fisheries 2030 National Fisheries Plan for Deepwater and Middle depth Fisheries 2010 DoC Conservation Services Programme 2016 DoC Conservation services Programme and Annual Plan 2016 MPI 2016b MPI 2017 MPI 2017a MPI 2017b		
OVERALL PERFORMANCE INDICATOR SCORE			**UoC 1 – 6B**	**100**
OVERALL PERFORMANCE INDICATOR SCORE			**UoC 2 – 6I**	**100**
CONDITION NUMBER (if relevant):				**N/A**

Evaluation Table for PI 3.2.5 - Management Performance Evaluation

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 Annual Review Report for Deepwater Fisheries 2015/2016 (MPI 2017) provides a record of the annual reviews of the fisheries, including for southern blue whiting. **Part 3A:** describes the progress made on management actions in 2015/16. **Part 3B:** reviews, observer coverage, deepwater research and compliance. **Part 3C:** reviews general environmental reporting and adherence to non-regulatory management measures, e.g., environmental reporting, seabirds, marine mammals, elasmobranchs, Tier 3 species and benthic interactions. **Appendix 1**: provides summaries of each of the NZ deepwater fisheries including sections on Southern blue whiting. Evaluations include landings, catch limits and allowances, reference points and current status, deemed value rates, environmental indicators, observer coverage, economic indicators, reporting procedures and operational procedures The annual review report evaluates the development and implementation of the Fisheries Plan framework, i.e. National Deepwater Plan with fishery specific chapters and Annual Operational Plan for the fisheries. This review encompasses all of the management system. Therefore, the fishery has in place mechanisms to evaluate all parts of the management system, meeting the SG60, SG80, and SG100.		
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	N
	Justification	Progress against the objectives in the National Fisheries Plan for Deepwater and the Annual Operational Plan is reviewed annually and reported in the Annual Review Report. MPI conducts an extensive review of performance of the deepwater fisheries that incorporates consultations with industry and other stakeholders. Parts of the management system, specifically science and enforcement, undergo external review. SG60 and SG80 are met. In 2018, MPI completed an external review of the Deepwater Fisheries Management conducted by Independent Quality Assurance New Zealand (IQANZ 2018). The review covered the relevant parts of fishery management described in CR v1.3 GCB4.11 and CR v2.0 GSA4.10. Therefore, this scoring issue meets the SG80. Evidence of regular external review has not been provided, thereby precluding the SG100.		
References		MFish 2010 MFish 2010a MFish 2011 MPI 2017 MPI 2017a IQANZ 2018		

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**		
	Fisheries Act 1996		
OVERALL PERFORMANCE INDICATOR SCORE		**UoC 1 – 6B**	**90**
OVERALL PERFRMANCE INDICATOR SCORE		**UoC 2 – 6I**	**90**

Appendix 1.3 Conditions

No conditions were set for this fishery.

Appendix 2. Peer Review Reports

Summary of Peer Reviewer Opinion

Has the assessment team arrived at an appropriate conclusion based on the evidence presented in the assessment report?	**Yes**	**CAB Response**
Justification: I believe that the team has reached a fair conclusion given the evidence presented. Southern blue whiting is a species trawled in midwater, and catches are so clean and off bottom as to render much of the MSC P2 considerations (though not all) virtually irrelevant. I am concerned that the site visit (in mid-2016) preceded the notification of recertification (in mid-2017) not the least because the report is based largely upon information received up to the time of the site visit, meaning it is now 3-4 years old! However, the assessment team, especially relating to P1, have been extremely careful in considering stock status in the two UoCs separately, and I am sure that the conclusions based on projections and harvest strategies (as opposed to direct assessments) are sound. It is a good report supported by a lot of evidence, and I see nothing that worries me about the fishery being recertified.		Thank you for this comment.

Do you think the condition(s) raised are appropriately written to achieve the SG80 outcome within the specified timeframe? [Reference: FCR 7.11.1 and sub-clauses]	**N/A**	**CAB Response**
Justification: No conditions have been raised by the assessors and I do not consider that any are necessary.		Thank you for this comment.

If included:

Do you think the client action plan is sufficient to close the conditions raised? [Reference FCR 7.11.2-7.11.3 and sub-clauses]	**Not included**	**CAB Response**
Justification: None needed.		Thank you for this comment.

Performance Indicator Review

Please complete the appropriate table(s) in relation to the CAB's Peer Review Draft Report:

Table 31 For reports using one of the default assessment trees:

Performance Indicator	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
1.1.1	Yes	Yes	N/A	In this case, the two fishery areas being considered (Bounty Platform and Campbell Island Rise) have to be scored differently because of the different model interpretations of stock health adjudged against PRI and fluctuating around a level consistent with MSY. In terms of the level of certainty, the former cannot score above SG80, whereas the latter does. I agree with the team's interpretations.	Thank you for this comment.
1.1.2	Yes	Yes	N/A	Reference points are appropriately set according to MSC standards, but because information on recruitment drivers is sparse and more research is needed on the (environmental) factors that might be influencing it, it becomes difficult inter alia to consider new precautionary reference points effectively. The species is not a key LTL as defined, but the limitations mentioned above have to make SG80 the highest score that can be given for this PI.	Thank you for this comment.

Performance Indicator	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	**Justification** Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
1.2.1	Yes	Partially	N/A	The harvest strategy is monitored and occasionally adjusted according to latest evidence, and being designed to achieve the stock management objectives reflected in target and limit reference points, it seems to be responsive to the state of the stock. However, from the MSEs conducted, it is not yet evident that the strategy will be able to maintain the stock at the target level (Bounty Platform) or that the implications of all relevant uncertainties on the performance of the harvest strategy have been fully evaluated (Chatham Island Rise). What is not clear from the written rationale is why both UoCs do not score 95, rather than one each at 95 and 90.	Thank you for this comment. The SI scores are correctly indicated but the overall PI score for Bounty Platform (6B) was incorrectly indicated as 90, not 95. The correct score is 95 as provided in Table 30. The edit has been made; both UoCs do score 95.
1.2.2	Yes	Yes	N/A	In terms of harvest control rules and associated tools, the justification is fair. Succinctly, only the fact that all uncertainties have not yet been taken into consideration in the MSE stops this PI from scoring at 100.	Thank you for this comment.

Performance Indicator	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	**Justification** Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
1.2.3	Yes	Yes	N/A	New Zealand fisheries research is ultra-comprehensive in world terms, and that statement applies too to associated research (abiotic, genetic in terms of stock structure, etc). Given that fact, and while I accept the scoring and the justification provided, one has to wonder whether this fishery or indeed any fishery under potential certification would ever be able to achieve an SG100 score for SIa!	Thank you for this comment. Re SIa, the characterization of stock structure and movement as well as the causes of recruitment fluctuations are particular challenges for southern blue whiting, justifying the SIa score.
1.2.4	Yes	Yes	N/A	This PI is particularly well justified, the report and scoring clearly showing that it is only the absence of a fully external review of the assessment (although external experts' opinions are sought on methodology in fisheries generally) and full evaluation of all input and assessment uncertainties that precludes the award of a higher (100) score for this PI.	Thank you for this comment.
2.1.1	Yes	Yes	N/A	There are no main retained species in this fishery, and only ling qualifies as a minor one (apart from several negligible catches); uncertainty over its stock status on the Bounty Platform precludes it scoring better than 80 for SIa – good justification generally.	Thank you – noted

Performance Indicator	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
2.1.2	Yes	Yes	N/A	Again, only ling is considered (as a minor retained species), and correctly the datedness of the assessment and the absence of a clear strategy preclude it being scored above 80 for UoC1 (Bounty Platform), whereas for UoC2 (Chatham Island Rise), the outcome results provide evidence that the strategy is working (even without a formal MSE having been underatken). Justification and scores are supported.	Thank you – noted
2.1.3	Yes	Yes	N/A	In terms of the information to support retained species management, scoring and justification is correct in stressing that data collection is appropriate and good, including recently enhanced (now 100%) observer coverage. Again, however, the datedness of the Bounty Platform (minor retained species) ling assessment precludes the full 100% being scored for that UoC.	Thank you – noted
2.2.1	Yes	Yes	N/A	There are no main bycatch species, and only porbeagle shark is assessed as a minor bycatch. Its status has been assessed recently, and stocks look healthy, so 2.2.1 is correctly scored at 100.	Thank you – noted

Performance Indicator	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
2.2.2	Yes	Yes	N/A	In terms of management, the only obstacle to the porbeagle shark (minor species bycatch) attaining a full SG 100 score is proof/testing that the strategy being applied in line with the recent assessment is working. That should come in time, but the lesser score (80 for SIb and overall 95 for the PI) is correct for now.	Thank you – noted
2.2.3	Yes	Yes	N/A	The information basis applying to porbeagle shark, and indeed to any minor bycatch species taken in negligible quantities, is good, enhanced by recent 100% coverage of the fishery. Score and justification are sound.	Thank you – noted
2.3.1	Yes	Yes	N/A	Of the ETP taxa identified, protected corals are not affected by the midwater fishery, but there is concern about the outcome status of fur seals and sealions (which are entrapped near the surface) as well as a lack of sufficient confidence that the same two species of sea mammal plus seabirds are not being detrimentally affected by the relatively very small catches in the UoC fisheries. Scoring is reasonable, as is the justification.	Thank you – noted

Performance Indicator	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	**Justification** Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
2.3.2	Yes	Partially	N/A	There is a clear (tested) strategy based on good information for all identified ETP species in the fishery. Implementation success is questioned for all four, however, and note that **the SIc summary incorrectly annotates Y to SG100 for seabirds (text says it should be N)**. Apart from that error, I agree with the justification and scoring.	Thank you. The scoring summary has now been corrected to 'N'.
2.3.3	Yes	Partially	N/A	**Another error for seabirds, in the summary. SIb text says correctly that SG100 is met, whereas the summary says it is not**! Please rectify. Generally, however, the data on marine mammal ETP species being collected from the fishery are of high quality, but uncertainties associated with cryptic mortality (sea lions) and population demography (sea lions and fur seals) remain, so it is not possible to quantitatively estimate outcome status of these species with a high degree of certainty. The scoring and justification (apart from the error) are supported.	Thank you. The scoring summary has now been corrected to a 'Y'

Performance Indicator	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	**Justification** Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
2.4.1	Yes	Yes	N/A	With any midwater trawl fishery, the possibility of seabed contact and hence habitat impact is small. Given also that such a relatively small spatial proportion of potential sea area is targeted by the fishery, SG100 is clearly the correct score for this PI.	Thank you – noted
2.4.2	Yes	Yes	N/A	Legislatively, New Zealand protects its marine habitats well, and there is plenty of evidence that that national strategy is working. Testing of the strategy is the only aspect of habitat management that is wanting, so the score for this PI of 95 overall is supported.	Thank you – noted
2.4.3	Yes	Yes	N/A	Although midwater trawling rarely has any impact on seabed habitats and New Zealand commendably has carried out a lot of work aimed at determining its offshore marine habitat, such work in deep water (where the SBW fishery operates) is challenging. Therefore, this PI is difficult to score above SG80 for any SIs (distribution, impact and changes over time). The score is supported.	Thank you – noted

Performance Indicator	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	**Justification** Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
2.5.1	Yes	Yes	N/A	Trophic structure of the fishing area is considered to be the key ecosystem component for this assessment. I agree, and also feel that the Ecopath and ecosystem indicator modelling on which the assessment is based is a little dated and not appropriate to confirm that the fishery is highly unlikely to disrupt trophic structure to a point where there could be serious or irreversible harm. SG80 is supported.	Thank you – noted
2.5.2	Yes	No	N/A	SIa and SIc justification correctly indicates SG scores of 80, yet they are scored at 100. I agree with what is said in the justification in terms of MSC requirements. If these two SI scores are changed, the overall score for this PI would be 85, NOT 95. I can agree with the former, but not the latter.	Thank you. The scoring summary for SIa and SIc have been corrected to read 'N'
2.5.3	Yes	Yes	N/A	The information base is good, but seemingly not adequate (or somewhat dated) to meet all requirements of ecosystem evaluation and management. The score for this PI is justified at 85 overall.	Thank you – noted

Performance Indicator	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	**Justification** Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
3.1.1	Yes	Yes	N/A	In terms of the legal and customary framework within which the fishery is operating, New Zealand has an exemplary system, well covered ion the justification text, so the score (100) and the evidence provided is supported fully.	Noted. Thank you
3.1.2	Yes	Yes	N/A	Similarly, the (opportunities for) consultation, the roles and the responsibilities are clear and exemplary in New Zealand, so the score of 100 is justified by the evidence provided.	Noted. Thank you
3.1.3	Yes	Yes	N/A	The long-term objectives that guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach, are clearly explicit within and required by New Zealand management policy, so it is unsurprising that the score and justification again support SG 100 being met.	Noted. Thank you

Performance Indicator	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
3.1.4	Yes	Yes	N/A	New Zealand's fisheries policy and strategy seem from the justification presented to provide economic and social incentives for sustainable fishing, although those incentives may not be stated explicitly. Further, there are no subsidies that could contribute to the development of unsustainable fishing practices. The SG100 score is not met apparently on the basis that the incentives are not stated explicitly. That is a fair conclusion, in my opinion.	Noted. Thank you
3.2.1	Yes	Yes	N/A	The report states that there are within the fishery's management system well-defined and measurable short- and long-term objectives that are demonstrably consistent with achieving the outcomes expressed by MSC's Principles 1 and 2. These are explicitly outlined, so the score for this can only be 100.	Noted. Thank you

Performance Indicator	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	**Justification** Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
3.2.2	Yes	Yes	N/A	As far as decision-making is concerned, the assessment team affirms that it could not find evidence that the decision-making processes associated with this fishery respond to all issues identified in appropriate research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and to take account of the wider implications of the decisions. That seems to me to be justified according to the evidence given, so the overall score of 95 is supported.	Noted. Thank you
3.2.3	Yes	Yes	N/A	Evidence is provided in the report of an exemplary compliance and enforcement system in place in New Zealand, with appropriate sanctions, such that there is confidence across the board that there is little or no non-compliance with regulations. Score and justification are supported.	Noted. Thank you

Performance Indicator	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	**Justification** Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
3.2.4	Yes	Partially	N/A	The written justification for this PI score (SIs a and b) in terms of a research plan focuses on fisheries (including assessments) and their operations. From what I can see it is the Conservation Programme that addresses other aspects of the ecosystem, i.e. the P2-supportive research, which is important in informing management about other aspects of the environment. Therefore, more needs to be described in the scoring justification about those aspects of the NZ research plan for the score of 100 to be fully warranted.	Thank you for this observation. Text has been added in the justification to explain MPI's research plan includes Principle 2 aspects eg benthic environments, ETP species, bycatch and discards, ecosystem functions and trophic interactions. The conservation programme provides further work on ETP species. This should justify a score of 100
3.2.5	Yes	Yes	N/A	The team could not find proof of regular external review of the NZ system of monitoring and evaluating the performance of the fishery-specific management system against its objectives. Therefore, SG100 could not be met for SIb. I agree with the team's view.	Noted. Thank you

General Comments on the Peer Review Draft Report:
Thank you for the opportunity to review this well-written and -supported certification assessment report. The report shows evidence of careful initial structuring and presentation and subsequent later preparation for review. I do believe, however, that the whole text would benefit from being checked carefully prior to public release (I found several typographical [e.g. look at the odd sentence on the top of p. 66 considering Table 20] and formatting errors [tables and figures, and sometimes bits of paragraphs, are regularly split over pages]). I suspect that final care was not applied to this third of three recertification reports prepared by the same team as it had been for the first two supplied to me! Further, because this was a recertification report for a fishery assessed five years ago and found to be relatively "clean" (that had one condition, quickly met), I had to read a report produced as an update of material documented in full elsewhere, so I constantly had to search back through previous reports to obtain some of the background information I needed to review the report adequately. That added to my time needs for the exercise. I was also concerned that some of the scoring justification wording did not mirror the scores assigned in the summaries of each SI, even leading to incorrect assignment of PI score – notably for P2, but it worries me that I may have missed others. That is a very good reason for checking the whole report through thoroughly for mistakes introduced during final preparation.

All sections of the report read well, however, with only P1 background and scoring review proving overly challenging to me. I particularly like the P3 background and scoring text, though I am probably biased by my personal interest in that aspect. Overall, though, the whole report contains everything it needs to have in terms of being able to meet and support MSC standards. Well done to the assessment team for their efforts.

Appendix 3. Stakeholder Submissions

Stakeholder Comments received at Site visit

Forest & Bird

Royal Forest and Bird Protection Society of New Zealand Inc.
National Office:
Level One, 105 Victoria St
PO Box 631, Wellington 6140
New Zealand

P: +64 4 385 7374
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www.forestandbird.org.nz

MSC Assessment Team
NZ Deepwater Group - Hoki, Hake, Ling and Southern Blue Whiting; NZ-4-2R
29 July 2017

Introduction

In this submission, I will discuss our concerns about ongoing and increasing levels of bycatch in the Hoki fishery, in particular due to the high risk to the critically endangered Salvin's albatross. Also, the long line fishery for Ling for the same reasons.

Salvin's albatross.

Salvin's albatross (*Thalassarche salvini)*breed primarily on the Bounty Islands in the NZ subantarctic Islands and is endemic to NZ. It is our second most abundant albatross after the white –capped albatross. It migrates across the Pacific to the Humboldt Current off South America after breeding. The population size is around 40,000 breeding pairs on the Bounty Islands and Western Chain of the Snares Islands around 1100-1200 pairs. An estimated decline of 10% in the main population on the Bounty islands between 2004 and 2011 resulted in their designation as critically endangered in the NZ Threat Classification in 2013. It has retained this status in the most recent assessment in 2016, as overall population trend is still unknown. The small population on the Western Chain appears to be stable (Sagar et al 2014) The population trend on the main island is unknown. In addition, recent tracking data show that the two populations are segregated at sea during incubation and chick rearing (Thompson et al 2014). The Bounty Islands group appear to use the area around the Bounty Islands and to the north on the Chatham Rise, While Snares Islands birds occupy the southern area. (See Fig 3.). This may be important as the captures by both Hoki Trawl and Ling Longline are around the Bounty Islands and the Chatham Rise where these birds feed. (see Figures 1 and 2 below)

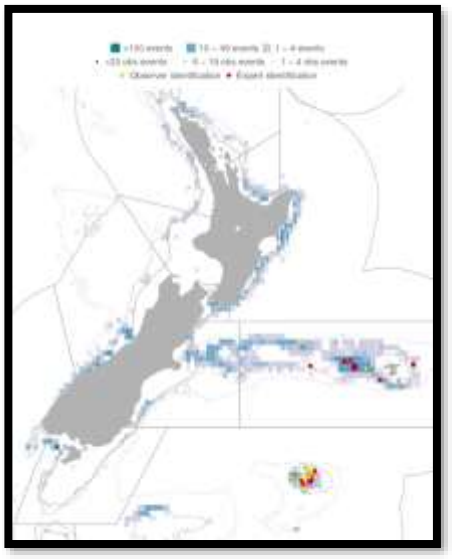


Fig 1. Ling longline bycatch of Salvin's albatross between 2002 and 2015 (from Dragonfly website) https://psc.dragonfly.co.nz/2016v1/draft/explore/

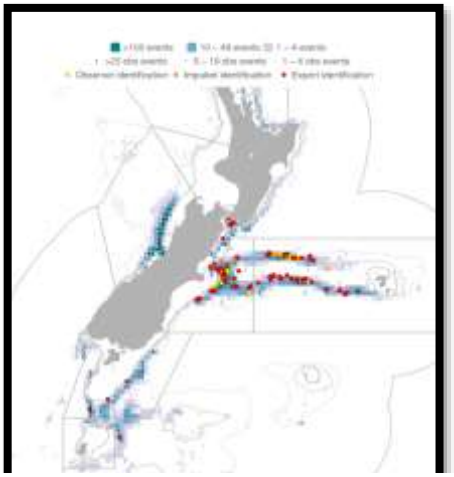


Fig 2. Hoki trawl bycatch of Salvin's albatross between 2002 and 2015

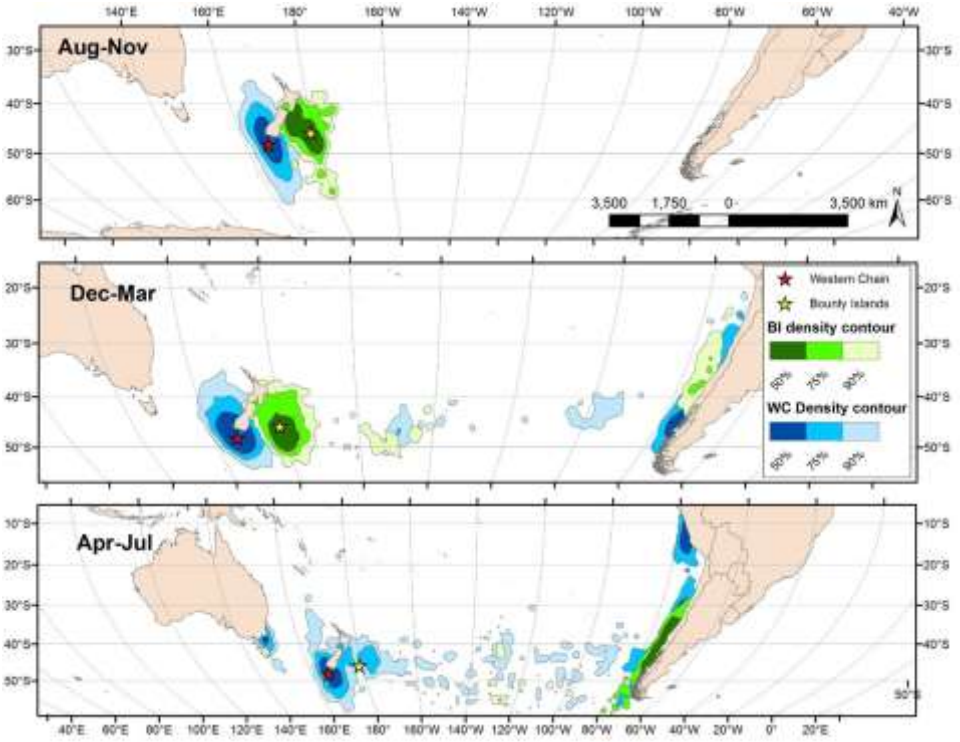


Fig 3 (after Thompson *et al* 2014, Fig 6) Comparison of kernel density plots, showing the 90, 75 and 50% probability contours, for Salvin's albatross at the Bounty Islands (BI) in green at the Western Chain (WC) in blue. Upper panel corresponds to 'incubation', middle panel to 'chick-rearing' and the lower panel to 'non-breeding' distributions

Risk Assessment

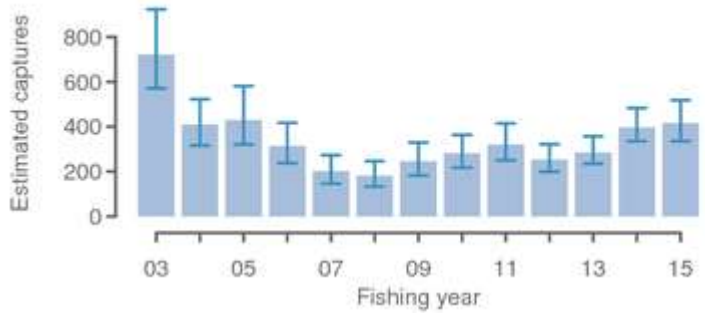
The most recent published risk assessment (Richards and Abraham 2015) shows that the estimated annual potential fatalities for trawl fisheries overall contributed to an assessment of very high risk for white –capped albatross, Salvin's albatross and southern Buller's albatross (Table 9, page 30). The latest Annual Operating Plan for Deepwater fisheries (page 19) says that Deepwater fisheries overall contribute 45% of the risk to Salvin's Albatrosses and 70% of the risk for Southern Buller's albatross. As Salvin's albatross has been assessed as critically endangered this submission focuses on this species, to assist the MSC assessment team in making a judgement on the requirement of outcome 2.1.1 of principle 2. I will return to this outcome later in these notes.

Within the overall trawl risk, the risk from hoki trawl on its own has been assessed as high to two species of albatross Salvin's and Buller's. (Appendix 5, page 59, Richards and Abrahams).

For small Ling long line the situation is the same with it alone having contributed high risk to Salvin's albatross, but also Chatham Island albatross. (NZ threat level, at risk, naturally uncommon)

Essentially these assessments suggest that the contribution to albatross deaths of Salvin's and Southern Buller's albatrosses by Hoki trawl and Ling longline fisheries is more that the population can sustain and is likely to be preventing their recovery to a better conservation status. For species that are already critically endangered such as the Salvin's albatross this situation requires urgent action.

The estimated capture of all birds from observed data in the hoki fishery as indicated on the Dragonfly web site, has continued to increase over the last few years, when it should be declining if effective management interventions were being implemented.



Estimated capture of all birds in hoki trawl fisheries (Dragonfly web site https://psc.dragonfly.co.nz/2016v1/released/birds/hoki-trawl/all-vessels/eez/2014-15/

Management Issues

There are significant problems with the implementation of the National Plan of Action for Seabirds 2013.

The planning system for the implementation was set out in paragraph 85, page 20. National Fisheries Plans were meant to be aligned to the 2013 NPOA-S setting out objectives and targets to address five year objectives. Then the Annual Operating Plans would set out actions and services that would meet these objectives. This has not happened and the

Deepwater Fish Plan has only just been produced and does not set specific actions and targets as required.

The Annual Operating Plan (AOP) 2016/17 for the first time has set some targets, see page 20-22 of the AOP. Table 6 shows the targets and for Hoki it is a 15% reduction over 3 years. This is disappointingly unambitious and indicates that the managers do not expect to be able to improve the situation for Hoki.

The VMP Operational Procedures (http://deepwatergroup.org/wp-content/uploads/2014/10/VMP-Operational-Procedures-2014-15.pdf) give some indications about some of the likely issues and recognises that there were marked increases in mollymawk bycatch in 2012 and 2013 (now extended to 2014/15)

Net captures in the hoki fishery may have increased over the years and become now the main cause of death for seabirds, although warp strikes are also still occurring.

Improvements are needed in:

- **Management of offal has been 'below par' although some vessels have meal plants, some do not. My view is that offal discharge should be discouraged at any time not just when setting and hauling, although is still the priority. Meal plans should become mandatory in trawl fisheries which pose high risks.**
- **Tori lines are not always used and bird bafflers may not be as effective as tori lines. Tori lines should be deployed at all times**
- **There may be options for limiting the fishery in areas of high risk when birds (Salvin's and Southern Buller's albatrosses) are breeding, something that should be investigated. (time/area closures)**

More effort is needed in characterising the nature of bycatch so that new mitigation ideas can be developed. This has not yet happened.

Salvin's albatross are especially at risk from Ling Longline fishing, although Chatham and Southern Bullers are also at risk. A wide range of albatrosses are caught in this fishery. Observer coverage is generally low and sometimes very low so that numerical targets for bycatch reduction are not set. However the target that has been set is very poor – for large vessels – no significant increase and for small vessels, no reduction target. There is nowhere that I can find an analysis of what the likely factors are that are continuing to contribute to unacceptable seabird bycatch risk in this fishery. For example is it poor implementation of existing mitigation or is the mitigation just not working? This is a key question of the problem is going to be addressed.

There is a lack of detail in the Fish Plan and in the AOP on mitigation requirements and areas that need to be improved. What improvements and what regulations are being considered and how is that expected to make improvements. Objectives and expected outcomes are unclear. For example how many more VMPs are required in these fisheries – what would be the target? 100 % of vessels?

Principle 2 outcomes and performance for MSC assessment.

To keep this analysis simple I want to focus on Salvin's albatross as the one that is critically endangered, but other albatrosses recovery are also potentially hindered by both fisheries. With critically endangered species you would want to ensure that bycatch was not causing irreversible harm or hindering the recovery of the retained species (Outcome 2.1.1). It is my contention based on the risk assessment bycatch rates are "not likely to be within biologically based limits" as per Outcome 2.1.1 and hence c. recovery and rebuilding is required. My assessment of the alternative scenarios in table CN3.5 is that there are not

measures in place that would be expected that either fishery would not continue to hinder recovery of the Salvin's albatross in particular. The targets in the AOP (2016/17) would not achieve that for either fishery and there are no long term – five year plans as you would expect to have in the five-year fish plan. I believe that there continues to be inadequate consideration of the situation and even scoring the fisheries at SG 60 would be a stretch.

A requirement for action plans for these two fisheries would be a suitable outcome of this MSC assessment process.

Karen Baird

References:

Sagar, Paul; Charteris, Matt and Scofield, Paul 2014. Salvin's albatross population size and survival at the Snares Western Chain. Department of Conservation report DOC15502

Thompson, D; Sagar, P; Torres, L and Charteris, M 2014. Salvin's albatrosses at the Bounty Islands: at-sea distribution. Department of Conservation report

Richard, Y and Abraham, E.R. 2015. Assessment of the risk from commercial fisheries to New Zealand seabirds, 2006-07 to 2012-13

National Plan of Action – 2013 to reduce the incidental catch of seabirds in New Zealand. Ministry of Primary Industry April 2013

Annual Operational Plan for Deepwater Fisheries for 2016/17. June 2016. MPI Technical Paper no 2016/46

Stakeholder submissions received at PCDR

Forest & Bird

Contact Information Make sure you submit your full contact details at the first phase you participate in within a specific assessment process. Subsequent participation will only require your name unless these details change.				
Contact Name	*First* Karen		*Last* Baird	
Title	Ms			
On behalf of (organisation, company, government agency, etc.) – *if applicable*				
Organisation	*Please enter the legal or registered name of your organisation or company.* Royal Forest & Bird Society of New Zealand			
Department	Conservation Advocacy			
Position	*Please indicate your position or function within your organisation or company.* Marine Advocate (Seabirds)			
Description	*Please provide a short description of your organisation.*			
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Assessment Details	
Fishery	New Zealand Deepwater Group hake, hoki, ling and southern blue whiting fishery
CAB	fisheries@acoura.com

• SECTION 4 • Return to Page 4

Assessment Stage	Fishery	Date	Name of Individual/Organisation Providing Comments
☐ Public review of the draft assessment report[4] Opportunity to review and comment on the draft report, including the draft scoring of the fishery.	New Zealand Deepwater Group hake, hoki, ling and southern blue whiting fishery	22/5/18	Karen Baird for Forest & Bird

☐ I wish to comment on the evaluation of the fishery against specific Performance Indicators.
A table with these indicators and the scores and rationales provided by CABs can be found in Appendix 1 of the draft assessment report.

Nature of comment *(Please insert one or more of these codes in the second column of the table below for each PI.)*

1. I do not believe all the relevant information[5] available has been used to score this performance indicator *(please provide details and rationale).*
2. I do not believe the information and/or rationale used to score this performance indicator is adequate to support the given score[7] *(please provide details and rationale).*
3. I do not believe the condition set for this performance indicator is adequate to improve the fishery's performance to the SG80 level[8] *(please provide details and rationale).*
4. Other *(please specify)*

Performance Indicator	Nature of Comment Indicate relevant code(s) from list above.	Justification Please support your comment by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.
PI2.3.2A *PI 2.3.3*	*1,2,3,4* *1.2.3.4*	*The CAB gave a score of 90 for 2.3.2A. The guidepost asks that there is evidence that a strategy is in place for managing ETP species that is designed to ensure the fishery does not hinder the recovery of ETP species. We do not believe this to be the case.* *1. The National Plan of Action for Seabirds itself is not a strategy for the recovery of seabirds in this fishery. The effectiveness of the plan over the 4 years of its existence has been very limited. One of the key issues discovered recently is that **best practice mitigation measures** have not been identified for any fishery including trawling. There are regulations, but no agreement about what constitutes best practice. This is critically important as one of the objectives requires for all vessels to be shown to be implementing current best practice mitigation measures relevant to their fishery.* *2. Aside from the risk assessment which itself has some key flaws, there are some key objectives in the plan which have been ignored by the CAB in pursuing only a risk based approach (which I will come back to later). The first practical objective 74(i) is to "where practicable **eliminate the incidental mortality of seabirds**" this is in direct conflict with the Risk Based approach, however the purpose of the risk assessment is not to set limits as the CAB seem to believe but to identify priorities. Fisheries should be demonstrating continuous improvement in bycatch rates e.g objective 75 (i) c "capture rates are reducing in all NZ fisheries in accordance with reduction targets in the relevant planning documents for those fisheries" Capture rates or targets have never been set in any planning documents as was required and without these there is no incentive.* *3. Despite the welcome decline in seabird bycatch rate in 2016 it has now gone up again this year (2017) according to preliminary Dragonfly data statistics (you will need to ask to see these, Fisheries NZ (MPI) can give you access to this data). This indicates an **ongoing increasing trend** as a result of the lack of effective measures in place, let alone a strategy. (ie Sg60,80 or 100). Given that best practice itself has not been established it is unclear how effective the VMPs are likely to be. The CAB does not appear to assess what the major drivers of bycatch in this fishery are, identifying bird baffilers, paired streamer lines and/or warp deflectors as sufficient. This shows a lack of understanding or inquiry into what the drivers towards increasing bycatch are. Looking at the Dragonfly data base it is clearly net captures. What best practice mitigation is being applied here to manage this issue? Poor management of offal is ongoing (does the CAB have good data from the fishing industry on how this is managed? How much offal goes over the side in total providing a huge incentive for seabirds? (See also recently published paper on the overlap of Westland petrels with the hoki fishery on the West Coast.) The Agreement for the Conservation of Albatrosses and Petrels (ACAP) provides advice on best practice in international fisheries. See attached latest advice. For pelagic trawl gear, net binding together with weights in the net belly are best practice.* *4. CAB gave a score of 85 under PI 2.3.3.However CAB should be asking why ACAP best practice is not being applied here. Until there is agreement on what constitutes best practice in NZ there is a question over whether it is being met and whether this fishery is meeting MSC requirements of any of the goalposts. **Our belief is that it doesn't meet any of these.***

Performance Indicator	Nature of Comment Indicate relevant code(s) from list above.	Justification Please support your comment by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.
		Cont'd
		5. *Returning to the issue of the Risk Assessment. We have two major concerns over the risk assessment process that has been adopted. The first is that instead of being a guide as to where the most effort should be placed it is being used as a limit, including in this case. Also, the risk assessment currently being used does not take into account the conservation status of the seabirds. This would require the inclusion of a 'recovery factor' to "allow" for the more rapid recovery of those species. The Risk Assessment deliberately excludes this and provides for a recovery factor of 1 to cover all species. It is disappointing that the CAB would consider that the ongoing contribution of deaths of Salvin's albatross a critically endangered species is insufficient to require any action. 11 of the 14 Salvin's albatrosses caught in 2016/17 (latest data) were caught in the net. Given there is no net mitigation being applied in the VMP's these captures will continue and we cannot expect the bycatch rates to come down continuously. If effort is made on net captures then all seabird captures would start to reduce.* 6. *I want to touch on the issue of offal and discards discharge again as this is a major driver of net captures. Forest & Bird has recently been made aware of the potential scale of illegal discarding in the hoki fishery. In 2005 a reliable estimate of the level of high grading was produced "A length based analysis of highgrading in the in the NZ WCSI hoki fishery" (unpublished MAF report) but the results were never incorporated into later stock assessments. For example in 2006 the stock assessment concluded "there may be some dumping of small fish" (Plenary Report) and then in 2011 the stock assessment stated that "no information is available about illegal catch," (Plenary Report) despite MAF investigations quantifying illegal discarding. This is all information held by MPI and may have been shared with the industry body seeking recertification: Forest & Bird requests that you seek documentation from Fisheries NZ on the risk and scale of illegal discarding in the hoki fishery, both of the target species and non-target species.*
	Lack of Conditions	7. *Finally, we are concerned that there are no conditions applied to provide increased incentives to protect seabirds. This appears to be a complete failure of the MSC process. As a minimum MSC should require an Action Plan to be produced to focus on bycatch reduction. It should require an assessment of ACAP Best Practice options for net capture mitigation and a requirement that these methods be trialled in the hoki fishery.*

CAB Response

F& B point*:* The CAB gave a score of 90 for 2.3.2A. The guidepost asks that there is evidence that a strategy is in place for managing ETP species that is designed to ensure the fishery does not hinder the recovery of ETP species. We do not believe this to be the case.

1. The National Plan of Action for Seabirds itself is not a strategy for the recovery of seabirds in this fishery. The effectiveness of the plan over the 4 years of its existence has been very limited. One of the key issues discovered recently is that **best practice mitigation measures** have not been identified for any fishery including trawling. There are regulations, but no agreement about what constitutes best practice. This is critically important as one of the objectives requires for all vessels to be shown to be implementing current best practice mitigation measures relevant to their fishery.

CAB response: The requirements for PI 2.3.2 SIa at SG100 is that "There is a strategy in place for managing ETP species, to ensure the fishery does not hinder the recovery of ETP species." The requirement in this case is therefore not that ETP species are recovered, but that there is a strategy in place to avoid hindering recovery.

The MSC defines a strategy (MSC 2014, P.134) as:

"A **'strategy'** represents a cohesive and strategic arrangement which may comprise one or more measures, an understanding of how it/they work to achieve an outcome and which should be designed to manage impact on that component specifically. A strategy needs to be appropriate to the scale, intensity and cultural context of the fishery and should contain mechanisms for the modification fishing practices in the light of the identification of unacceptable impacts."

In this regard, while the NPOA for seabirds does not itself comprise the strategy for recovery of seabirds in the fishery, it does provide a structure for the overall strategy to ensure the hoki, hake and ling trawl fishery does not hinder recovery. The overall approach is detailed in the scoring text of PI 2.3.2 SIa at P. 200 of the assessment report. The Assessment Team believe that the fishery clearly meets the SG100 requirements of a 'strategy' as specified in the MSC Certification Requirements.

F&B Point:

2. Aside from the risk assessment which itself has some key flaws, there are some key objectives in the plan which have been ignored by the CAB in pursuing only a risk based approach (which I will come back to later). The first practical objective 74i) is to "where practicable eliminate the incidental mortality of seabirds" this is in direct conflict with the Risk Based approach, however the purpose of the risk assessment is not to set limits as the CAB seem to believe but to identify priorities. Fisheries should be demonstrating continuous improvement in bycatch rates e.g. objective 75 (i) c "capture rates are reducing in all NZ fisheries in accordance with reduction targets in the relevant planning documents for those fisheries" Capture rates or targets have never been set in any planning documents as was required and without these there is no incentive.

CAB Response: The CAB does not believe that the risk assessment is undertaken to set mortality limits; we state (e.g., P. 101 and P. 196 of the assessment report) that the seabird risk assessment has been undertaken to "identify the risks posed to 70 seabird taxa by trawl, longline and set net fisheries within New Zealand's territorial Sea and EEZ (e.g., Richard & Abraham 2013, Richard & Abraham 2015, Richard et al. 2017)."

We also note that the full text of NPOA objective 74i) states “All New Zealand fishers implement current best practice mitigation measures relevant to their fishery and aim through continuous improvement **to reduce and where practicable** [our emphasis] eliminate the incidental mortality of seabirds.” As noted in the assessment report, captures of seabirds in the hoki, hake and ling trawl fishery represent a small to negligible proportion of the total captures of any seabird species ranked as very high, high or medium risk. Nevertheless, representations provided to the team during the site visit by MPI scientists, as well as information that is publicly available and presented in the report, left the Assessment Team in no doubt that the efforts to minimise capture of seabirds in the fishery are strenuous and continuous improvement is being sought. Improvement (i.e., a decline) in the overall capture rate of seabirds has been observed in the fishery recently from 2014 to 2016, with the 2016 rate equivalent to the lowest in the time series.

F&B Point:

3. Despite the welcome decline in seabird bycatch rate in 2016 it has now gone up again this year (2017) according to preliminary Dragonfly data statistics (you will need to ask to see these, Fisheries NZ (MPI) can give you access to this data). This indicates an ongoing increasing trend as a result of the lack of effective measures in place, let alone a strategy. (i.e. Sg60,80 or 100). Given that best practice itself has not been established it is unclear how effective the VMPs are likely to be. The CAB does not appear to assess what the major drivers of bycatch in this fishery are, identifying bird bafflers, paired streamer lines and/or warp deflectors as sufficient. This shows a lack of understanding or inquiry into what the drivers towards increasing bycatch are. Looking at the Dragonfly data base it is clearly net captures. What best practice mitigation is being applied here to manage this issue? Poor management of offal is ongoing (does the CAB have good data from the fishing industry on how this is managed? How much offal goes over the side in total providing a huge incentive for seabirds? (See also recently published paper on the overlap of Westland petrels with the hoki fishery on the West Coast.) The Agreement for the Conservation of Albatrosses and Petrels (ACAP) provides advice on best practice in international fisheries. See attached latest advice. For pelagic trawl gear, net binding together with weights in the net belly are best practice.

CAB Response: We have not seen the preliminary 2017 data and typically cannot rely on preliminary data (which may be subject to revision) in any case to draw conclusions. The most recent data that are publicly available (i.e., Figure 43) show that there was an improvement (i.e., a decline) in the overall capture rate of seabirds in the fishery from 2014 to 2016, with the 2016 rate equivalent to the lowest in the time series. New data will be reviewed at the 1st surveillance audit subject to certification.

Information provided to the Assessment Team and presented in the scoring rationale for PI 2.3.2 SIa demonstrates that the approach to seabird impact mitigation fully meets the MSC’s definition of a strategy. The CAB heard during the site visit that there is an active, ongoing reporting process for seabird interactions, and that the data produced (including on the fishing scenarios that led to bird interactions) are reviewed continuously. The Assessment Team heard that during the site visit that there is concern about bird interactions at the surface, and that industry is working to develop approaches to mitigate risk.

In this regard, offal management is clearly a priority issue for the DWG, with the operational procedures requiring in particular that continuous discharge is eliminated, and that fish waste is not discharged during hauling and shooting of the gear (DWG 2015). As noted in the assessment report, DWG has an active role in briefing skippers and training crews in best practice, as well as managing the trigger point alert system and reviewing trigger alerts to both identify issues that may have led to the trigger alert and solutions to minimise the risk of the same issues arising again.

Overall, we see no option other than to score the fishery at 100, here, for having a strategy in place.

F&B Point:

4. CAB gave a score of 85 under PI 2.3.3.However CAB should be asking why ACAP best practice is not being applied here. Until there is agreement on what constitutes best practice in NZ there is a question over whether it is being met and whether this fishery is meeting MSC requirements of any of the goalposts. Our belief is that it doesn't meet any of these.

CAB Response: We note that the gear employed in the fishery is a demersal trawl or a semi-pelagic trawl. However, a review of the ACAP recommendations indicates that almost everything that is recommended is being done in the hoki, hake and ling trawl fishery, including offal management, net cleaning, no use of net monitoring cables, use of bird scaring devices, and minimising the time the gear is on the surface. There is also an ongoing effort to review the causes of interactions and investigate options to reduce impacts. Our belief is therefore that, with respect to seabird management, the fishery is operating at a level which clearly meets the MSC requirements.

F&B Point:

5. Returning to the issue of the Risk Assessment. We have two major concerns over the risk assessment process that has been adopted. The first is that instead of being a guide as to where the most effort should be placed it is being used as a limit, including in this case. Also, the risk assessment currently being used does not take into account the conservation status of the seabirds. This would require the inclusion of a 'recovery factor' to "allow" for the more rapid recovery of those species. The Risk Assessment deliberately excludes this and provides for a recovery factor of 1 to cover all species. It is disappointing that the CAB would consider that the ongoing contribution of deaths of Salvin's albatross a critically endangered species is insufficient to require any action. 11 of the 14 Salvin's albatrosses caught in 2016/17 (latest data) were caught in the net. Given there is no net mitigation being applied in the VMP's these captures will continue and we cannot expect the bycatch rates to come down continuously. If effort is made on net captures then all seabird captures would start to reduce.

CAB Response: Please note that Table 40 and Table 41 of the hoki, hake and ling trawl fishery assessment report has been updated with information from Richard et al. 2017. These data indicate that the hoki, hake and ling trawl fishery accounts for small or very small amounts of the total mortality of species other than Salvin's albatross (17.70%), Westland petrel (16.67%), southern Buller's albatross (39.58%), New Zealand white-capped albatross (14.67%), northern Buller's albatross (13.60%) and northern giant petrel (27.66%). However, these annual catches represent a small (maximum 15.3%) of the mean potential biological removals for each species (please see updated Table 41). The scoring text for PI 2.3.1 has also been updated to reflect these data.

The CAB understands that the risk assessment process is being used to direct attention to particular New Zealand fisheries and areas, and therefore to help focus management and mitigation efforts. Further, the information available to the team and presented in the report indicates that the hoki, hake and ling trawl fishery is working to minimise impacts using the best available information, with efforts ongoing currently to address net captures. While the bycatch data collected over years show that the hoki, hake and ling trawl fishery does impact individuals of some seabird populations, including Salvin's albatross, the most recent version of the seabird risk assessment (Richard et al. 2017) indicates that the fishery does not result in significant detrimental effects to the populations of these species. For Salvin albatross, for example, the relative risk from the fishery, calculated as annual potential fatalities (APF mean

= 437 animals) relative to the population sustainability threshold (PST mean = 3,600 animals) = 12.1%). For Salvin's albatross, therefore, the mean APF would have to increase by more than 8 times before it exceeded the mean PST. The upper 95% C.I. of the APF is also substantially less than the lower 95% C.I. of the PST (see Table 41 in the hake, hoki and ling fishery).

We note that Richard et al 2017 states:

"*Survey data of Salvin's albatross populations indicate different potential trends at different colonies. At Bounty Islands, where most of the population breeds, survey data indicate decreases in the annual number of breeding pairs, including a 30% decrease between 1997 and 2011 at Proclamation Island, and a 13% decrease between 2004 and 2011 at Depot Island (Sagar et al. 2015a). In contrast, recent aerial surveys across the Bounty Islands group indicated an increase from 31 786 to 39 995 annual breeding pairs between 2010 and 2013, including a doubling of the number of annual breeding pairs at Proclamation Island since the earlier survey (Baker et al. 2014). At Snares Islands (the Western Chain), ground counts indicated a stable population of Salvin's albatross between 2008 and 2014 (Sagar et al. 2015b)*."

F&B Point:

6. I want to touch on the issue of offal and discards discharge again as this is a major driver of net captures. Forest & Bird has recently been made aware of the potential scale of illegal discarding in the hoki fishery. In 2005 a reliable estimate of the level of high grading was produced "A length based analysis of highgrading in the in the NZ WCSI hoki fishery" (unpublished MAF report[5]) but the results were never incorporated into later stock assessments. For example in 2006 the stock assessment concluded "there may be some dumping of small fish" (Plenary Report) and then in 2011 the stock assessment stated that "no information is available about illegal catch," (Plenary Report) despite MAF investigations quantifying illegal discarding. This is all information held by MPI and may have been shared with the industry body seeking recertification: Forest & Bird requests that you seek documentation from Fisheries NZ on the risk and scale of illegal discarding in the hoki fishery, both of the target species and non-target species.

CAB Response: As part of NZ fisheries management, MPI Compliance regularly undertakes risk profiles to assess potential for misreporting and other inaccuracies and uses the findings to inform policy changes.
The law requires all vessel operators to self-report their catches. These reports are audited by MPI using a number of verification tools including at- sea observers, risk profiling and retrospective discrepancy analyses.

The assessors requested information from NZ Fisheries during the full assessment concerning estimates of the likely difference in the reported and actual catches of hoki, SBW and other quota and non-quota species for the period that was being profiled in 2011.

NZ Fisheries response was that the risk profile documents focus on possible areas and or mechanisms that can lead to under-reporting. The reports are intended to identify risk areas rather than quantify the possible under-reporting and therefore the differences in the report are indicative only.

MPI estimates total catch of non-quota species across the deepwater fleet annually through a research project. Data is taken from observed trips and is scaled up to reflect total catch. The reports also estimate discards of both quota and non-quota species.

[5]Official report available here.

The stock assessment for hoki is currently completed using commercial catch for the catch history and does not explicitly include any consideration of potential under-reporting resulting from the risks and issues identified in the risk profile reports. As with all NZ deepwater assessments, the catch history is taken as recorded, but with adjustments from time to time to address identified problems (documented in FDR).

MPI considers that the indicative volume of the potential under-reporting is negligible compared to the total volume of catch in the hoki fishery (maximum of 3% with 'pessimistic' assumptions), noting that over-reporting of catches also occurs, as well as subsequent redeclaration of catch records, and does not consider this would have any significant impact on the stock status or sustainability of the hoki fishery.

In addition, MPI recently completed a research project which explored effects on the stock assessments for hoki, hake, and ling of a range of catch history assumptions. The stock assessments were run using catch histories based on those derived from Sea Around Us databases, and found there to be little impact on the estimates of stock status. The final report can be found here: https://www.mpi.govt.nz/dmsdocument/29378-far-201814-stock-assessments-of-hoki-hake-and-ling-using-alterative-catch-histories, MPI is also intending to consider the implications of under-reporting in future stock assessments either directly or by sensitivity analysis noting that recent actions have reduced the potential for this to occur. This is not expected to change the outcomes of the stock assessments in terms of stock status.

It should be noted that when setting the TACC, an allowance is provided for "other sources of mortality". For hoki, the allowance for 'other sources of fishing mortality' in 2011 was set at 1,200 t, with the TACC set at 120,000 t. The risk profile estimated that up to 3,500 t might be at risk of being unreported. This estimate was not intended to quantify the actual amount of underreporting to rather to identify a potential risk. Further, it does not take into consideration any over-reported catch or any subsequent redeclared catch. Both hoki stock sizes are been estimated to have been well above their management target range since 2010. The quantities of hoki assessed to potentially be 'at risk' are, too small to materially affect the sustainability of either hoki stock (see FR for further details).

F&B Point:

7. **Finally, we are concerned that there are no conditions applied to provide increased incentives to protect seabirds. This appears to be a complete failure of the MSC process. As a minimum MSC should require an Action Plan to be produced to focus on bycatch reduction. It should require an assessment of ACAP Best Practice options for net capture mitigation and a requirement that these methods be trialled in the hoki fishery.**

CAB Response: A condition of certification can only be set where a score of ≥ 60 to < 80 is given for a Scoring Issue (SI); if a fishery meets SG80 or above then conditions cannot be set. No scores of < 80 were awarded in Principle 2, and so no conditions were set.

NABU International Foundation for Nature

Contact Information Make sure you submit your full contact details at the first phase you participate in within a specific assessment process. Subsequent participation will only require your name unless these details change.				
Contact Name	Barbara	Maas		
Title	Dr.			
On behalf of (organisation, company, government agency, etc.) – *if applicable*				
Organisation	NABU International Foundation for Nature			
Department	Species Conservation			
Position	Head of Species Conservation			
Description	NABU International is a non-profit NGO based in Germany. It is dedicated to nature and species conservation around the world. In New Zealand, NABU International lobbies for the endangered Maui's and hector's Dolphins. We have strong interest in participating in the process towards sustainable fishery practices and have also participated in stakeholder events based in Berlin, Germany			
Mailing Address, Country	Charitéstr. 3, 10117, Berlin, Germany			
Phone	Tel + 4930 2849841956		Mob	+ 447970987742
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Assessment Details	
Fishery	New Zealand Hoki
CAB	Acoura Marine

• SECTION 4 • RETURN TO PAGE 4

Assessment Stage		Fishery	Date	Name of Individual/Organisation Providing Comments
x	**Public review of the draft assessment report[5]** **Opportunity to review and comment on the draft report, including the draft scoring of the fishery.**	**New Zealand Hoki**	**26.05.2018**	**Barbara Maas / NABU International Foundation for Nature**

x I wish to comment on the evaluation of the fishery against specific Performance Indicators.
A table with these indicators and the scores and rationales provided by CABs can be found in Appendix 1 of the draft assessment report.

Nature of comment *(Please insert one or more of these codes in the second column of the table below for each PI.)*

1. I do not believe all the relevant information[6] available has been used to score this performance indicator *(please provide details and rationale).*
2. I do not believe the information and/or rationale used to score this performance indicator is adequate to support the given score[7] *(please provide details and rationale).*
3. I do not believe the condition set for this performance indicator is adequate to improve the fishery's performance to the SG80 level[8] *(please provide details and rationale).*
4. Other *(please specify)*

Performance Indicator	Nature of Comment Indicate relevant code(s) from list above.	Justification Please support your comment by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.
PI 1.1.1 - Stock status	1	Several reports provide information of massive underreporting and illegal catch in the Hoki fishery. Without reliable data, projections and indications in regard to the stock status are meaningless. (See attachment) The scoring should therefore be significantly reduced.
PI 1.2.1 – Harvest strategy	1	There is evidence of significant misreporting with regard to fish dumping, high-grading, under-reporting of catches and non-reporting of illegal catches. Without functional monitoring a harvest strategy is without effect. (See attachment) The scoring should therefore be significantly reduced.
PI 1.2.2 – Harvest control rules and tools	1	According to MPI's Bronto Report and other sources the harvest control rules and tools need to be reformed drastically to be effective. (See attachment) The scoring should therefore be significantly reduced.
PI 1.2.3 – Information and monitoring, page 166	1	"The draft report states that "Electronic reporting and video monitoring on small vessels (<28 m) will be gradually introduced over an extended period." Last year, the previous NZ government had announced plans to install video cameras on fishing vessels, saying it would protect the sustainability of fish stocks and act as a deterrent against illegal activity, like fish dumping. MPI Fisheries spokesman Gerry Brownlee had said that the rollout of cameras was needed to deal with well-publicised problems in the sector. However, earlier this year, news emerged that these plans may be abandoned as a result of industry opposition. There are therefore no current plans to install video monitoring across the NZ fleet, including hoki vessels to address these problems. The fishing industry subsequently petitioned the government to prevent public access to videos and images of fish being discarded and seabirds and marine mammals being caught by fishing boats. Amongst the reasons cited were commercial sensitivity, privacy and a reputational risk to the industry, MPI and New Zealand's clean, green image. In a letter to the Ministry for Primary Industries (MPI) the Deepwater Group, Fisheries Inshore New Zealand, the Paua Industry Council, Seafood New Zealand and the New Zealand Rock Lobster Industry Council on July 4, 2017 asked the government to change the law so that the Official Information Act could not be used by to make such information publicly available. One of the five industry heads who signed the letter said there needed to be an exemption so the footage was never made public. "Ensuring New Zealand had a good reputation for ethically caught fish was up to the industry, not the government," he said. In his response of 15th September 2017, the Minster's stated that "At this stage there is nothing to suggest that the risks associated with privacy or commercial sensitivity arising from GPR & ER are significantly different from those already being managed under the existing MPI data management processes. An initial consideration of the potential harms of releasing of GPR & ER data has not identified issues that cannot be addressed under the existing framework of the Official Information Act (OIA) and MPI's processes for handling OIA requests" When video monitoring was made compulsory in Australia, reported bycatch increased seven-fold. As of 26th May 2018, no formal decision on the matter has been communicated. (See: Attachment, page 1 ff.) The scoring should therefore be significantly reduced.

Performance Indicator	Nature of Comment Indicate relevant code(s) from list above.	Justification Please support your comment by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.
PI 1.2.4 – Assessment of stock status	1	Fundamental assumptions about the status of the stock are likely to be based on incorrect information as a result of misreported catch. (See attachment) The scoring should therefore be significantly reduced.
PI 2.2.1 – Bycatch species outcome	1,2	Illegal discarding (returning of fish to the sea) is of particular concern in the hoki fishery. Hoki fishery bycatch species are especially vulnerable to this type of offending. Fishers may also deliberately discard smaller, damaged or less valuable fish of a particular species to maximise their economic return. (See attachment) The scoring should therefore be significantly reduced.
PI 2.2.2 – Bycatch species management	1,2	Illegal discarding (returning of fish to the sea) is of particular concern in the hoki fishery. Hoki fishery bycatch species are especially vulnerable to this type of offending. Fishers may also deliberately discard smaller, damaged or less valuable fish of a particular species to maximise their economic return. (See Attachment) The scoring should therefore be significantly reduced.
PI 2.3.1 – ETP species outcome	1,2	The scoring for this indicator will have to be reduced to at least 60 requiring a condition aimed at improved monitoring and recording of bycatch rate and the impact on multiple vulnerable species. Observer coverage is universally inadequate, including for Hector's and Maui dolphins, basking sharks, fur seals, sea birds and other species. (See Attachment) The scoring should therefore be significantly reduced.
PI 2.3.2 Alternate – ETP species management	1, 2	The scoring for this indicator will have to be reduced to at least 60 requiring a condition aimed at improved monitoring and recording of bycatch rate and the impact on multiple vulnerable species. Observer coverage is universally inadequate, including for Hector's and Maui dolphins, basking sharks, fur seals, sea birds and other species) (See attachment) The scoring should therefore be significantly reduced.
PI 2.3.3 – ETP species information	1, 2	The scoring for this indicator will have to be reduced to at least 60 requiring a condition aimed at improved monitoring and recording of bycatch rate and the impact on multiple vulnerable species. Observer coverage is universally inadequate, including for Hector's and Maui dolphins, basking sharks, fur seals, sea birds and other species (See Attachment) The scoring should therefore be significantly reduced.
PI 2.3.3 – ETP species information, page 255	2	Reviewer: "The information level on ETP species is generally no more than just adequate to support a strategy of minimising negative impacts, although it is better for marine mammals and seabirds. I support the scoring and justification provided." We note that there is no strategy for minimizing negative impact on marine mammals in New Zealand. This is evidence by declining populations of marine mammals, including Hector's and Maui dolphins (e.g., Cook et al. 2018). Bycatch of some 200 fur seals per annum (MPI 2017), for example appears to be simply accepted as collateral. (See attachment) The scoring should therefore be significantly reduced.

Performance Indicator	Nature of Comment Indicate relevant code(s) from list above.	Justification Please support your comment by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.
PI 2.4.1 – Habitat outcome, page 255	2	Reviewer: "With any bottom trawl fishery, there is potential for seabed contact and hence impact on habitat function, but in New Zealand, such trawling is already banned in about one-third of potential seabed areas." Bottom-trawling is the most destructive fishing technique undertaken in the world's oceans. This assertion fails to take account of that some of the areas covered by the bottom trawl exclusion zones across the NZ EEZ are already fished out. These so-called Benthic Protected Areas also tend to coincide with areas that have never been subject to bottom trawling because they are too deep or the seabed is simply too rough (rocks, corals etc.) Furthermore, many sensitive and vulnerable areas are not included in the bottom trawl exclusion zones. The statement also fails to recognise that partial areal protection does not equate to ecosystem protection. Scientists have shown that some of the species affected are extremely slow growing and would take hundreds or even thousands of years to recover from the damage. (See attachment) The scoring should therefore be significantly reduced.
PI 2.4.1 – Habitat outcome, page 255	2	Reviewer: "Evidence is also provided that the hoki fishery only targets about 10% of the possible seabed (hake and ling much less), so the national strategy and operational activities already provide a lot of protection to the habitat. I therefore believe that the scoring of and justification for each SI as given is correct, with only hoki (because of the extent of the fishery) not definitely scoring a full SG100." Trawling for hoki takes is limited to 10% of New Zealand's EEZ because that is the area where hoki occurs. The remainder of the seabed is trawled for other species, including orange roughy, red cod, flatfish, etc, etc. The scoring should therefore be significantly reduced.
PI 3.1.3 – Long Term Objectives	1	The mentioned reports raise issues in regard to management policies in place. The lack information, due to misreporting and low observer coverage is not consistent with MSC principles and criteria. (See Attachment) The scoring should therefore be significantly reduced.
PI 3.1.4 – Incentives for Sustainable Fishing	1	Bremner et al. (2009) found clear evidence of violations of these legal requirements in the New Zealand's hoki fishery. They reported on unreported fish dumping (discards), high-grading and other forms of mis-reporting and under-reporting of catches in the hoki fishery and found that "the catches reported by unobserved vessels contain large elements of fiction" (Bremner et al. 2009). According to the mentioned reports the management system does not provide enough economic and social incentives for sustainable fishing. (See attachment) The scoring should therefore be significantly reduced.
PI 3.2.2 – Decision Making Processes	1	The information of the mentioned reports was accessible for decision makers for years. The management system's decision-making processes did not result in any measures or strategies to overcome misreporting, discarding, high-grading, etc. (See attachment) The scoring should therefore be significantly reduced.
PI 3.2.3 – Compliance and Enforcement	1,2	The information presented in our comment, including a series of MPI compliance reports highlight severe problems in this regard. A high rating of around 60 is far more realistic, taking into consideration the level of misinformation and misreporting. (See attachment) The scoring should therefore be significantly reduced.

Performance Indicator	Nature of Comment Indicate relevant code(s) from list above.	Justification Please support your comment by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.
PI 3.2.5 - Management Performance Evaluation	1,2	Considering the information provided in our comments, the effectiveness of the management system must be considered unreliable. (See attachment) The scoring should therefore be significantly reduced.

Comment	Nature of Comment	Justification Please attach additional pages if necessary.
☐ I wish to comment on the adequacy of the consultation process used to gather information about this fishery (e.g. related to the RBF process, selection of stakeholders consulted, etc.).		

Comment	Nature of Comment	Justification Please attach additional pages if necessary.
☐ I wish to comment on other portions of the report (e.g. background information, species biology, peer review reports and CAB responses, list of consultees, etc.).		

Comment	Nature of Comment	Justification Please attach additional pages if necessary.
x I wish to provide general comments about the assessment of this fishery against the MSC Fisheries Standard.	1, 2	Several reports should have been considered for the re-assessment of the hoki fishery, namely Bremner et al. 2009, Simmons et al 2016, Heron 2016, Simmons et al 2017, MPI Bronto Report. Please find our detailed stakeholder comments for the 2018 MSC Sustainable Fisheries Certification attached to this document. Please note, that the stakeholder template displays only a share of our remarks and comments. We kindly ask you to consult the attached document for further specification.

STAKEHOLDER COMMENTS

2018 MSC Sustainable Fisheries Certification

New Zealand Hoki, Hake & Ling Trawl Fishery

NABU International
Foundation for Nature

INTRODUCTION

The concerns and issues we raise are indicative of the poor quality of fisheries management in New Zealand in general and the hoki fishery in particular. Although most of our comments relate to the lack of sustainability in the latter, some of the observations presented also relate to the ling and hake fishery.

Data on ecological impacts are inadequate for most NZ fisheries (McKoy 2006). For decades, government reports recommending increased observer coverage have been disregarded. Current coverage is only 8.4% (Ministry of Primary Industries 2016) and <1% in most inshore fisheries (Clemens-Seely & Hjorvarsdottir 2016). An independent review of the MPI's handling of illegal fish dumping and dolphin by-catch (Heron 2016) demonstrated industry capture of the regulator and revealed other serious problems (see also Pala 2017). Widespread illegal dumping and misreporting have distorted catch statistics for decades. (Francis & Annala 1993, Simmons et al. 2016, Slooten et al. 2017) Mounting evidence on the environmental effects of the hoki fishery on biodiversity, endangered species, seafloor habitats (e.g., Clark & Rowden 2009) and the very ecosystem on which both fish and fisheries depend have been ignored. As a result, New Zealand's fishery is increasingly losing credibility in the light of revelation after revelation of systemic malpractice, which threatens to also cast a shadow over the MSC.

ILLEGAL AND UNSUSTAINABLE FISHING PRACTICES IN THE NZ HOKI FISHERY

PI 1.2.3 Relevant information is collected to support the harvest strategy (p 166)

"The draft assessment report states that "Overall, illegal and unreported catch are not considered significant. Observers provide information on the fishery's catch volume and composition on an ongoing basis. During 2002/03 – 2014/15, observer coverage of the hoki trawl fishery ranged 9.3 – 30.7%. During the same period, observer coverage of hake and ling directed fishing ranged 5.2 – 76.6% and 2.5 – 23.3% respectively."

According to new research published this May in the journal Fisheries Research, globally, industrial and artisanal fisheries caught 5.6 billion tonnes of fish in the past 65 years (Cashion et al. 2018). Industrial fishing vessels wasted more than 750 million tons of fish. Sixty percent of this waste was due to bottom trawlers and amounts to 437 million tons of seafood worth US$560 billion.

New Zealand legislation requires that all fish caught is reported and that all fish species subject to the Quota Management System (QMS), including hoki, is landed. If QMS fish are likely to survive, they can be returned to sea and do not need to be landed, but they must be reported. Documented misreporting in the country's fishery, however, go back to at least to 1996, when Annala noted that the ratio of bycatch to target catch landed by large NZ fishing vessels was higher when observers were on-board.

Anderson (2004) used observer data to estimate the total annual bycatch in the New Zealand scampi fishery from 1990 to 2001, which he compared to catch records from commercial fishing returns. The commercial catch records amounted to just 12-25% of the totals calculated from observer data. The total

annual bycatch estimates based on observer data ranged from about 3,200-6,800 tonnes. This compared to 511-1,475 tonnes from the commercial catch records.

Bremner et al. (2009) found clear evidence of violations of legal fishing regulations in the New Zealand hoki fishery. They reported on unreported fish dumping (discards), high-grading and other forms of mis-reporting and under-reporting of catches and concluded that "the catches reported by unobserved vessels contain large elements of fiction" (Bremner et al. 2009).

Bremner and colleagues used data from government-observed trawl vessels in the New Zealand hoki fishery to predict catches on unobserved vessels. They then compared these predictions with the catches reported by unobserved vessels, which revealed significant differences to the catches on vessels carrying observers. In doing so they uncovered clear evidence of quota-induced misreporting in the WCSI hoki fishery, which affected both quota and non-quota species. (Bremner 2009)

The authors emphasize the importance of effective enforcement and make reference to the success of the introduction of transferrable fishing quota in British Columbia groundfish fishery, which benefited from 100 percent observer coverage. "Where enforcement is not sufficiently effective to ensure over-quota fish are reported, the incentive is for the firm to misreport. Unreported discarding can be seen as a special case of misreporting. Undeclared landings or trans-shipments, under-reporting of landing weights and mislabelling of species may be profitable alternatives."

Bremner et al. agree with Rijnsdorp et al. (2007) conclusion that misreporting is greatly exacerbated by the introduction of quota management systems to mixed fisheries. The authors also identify differences in species reporting by hoki vessels with and without on-board fishmeal plants, and suggests that species misreporting is more widespread in the former and difficult to detect down to species level. This issue of filleting vessels disguising their catch raised by Bremner et al. in 2009 was highlighted again in 2012 in the Bronto Report (see below).

According to the authors, one of the serious effects of species misreporting is the distortion of catch statistics. Distorted catch statistics in turn generate inaccuracies in biological stock assessments [Chen 2007], and eventually result in unsustainable total allowable catch settings for the bycatch species. In some circumstances, this can become self-reinforcing. Over-reporting non-ITQ catch can lead to unrealistic allocation of quota, should these species be brought under ITQ management at a later date, because allocations are based on past catch history. Under-reporting ITQ catch will also lead to distorted market signals (Chavez & Salgado 2005), biased stock assessments and most significantly, inappropriate management actions. Both over- and under-reporting therefore undermine the legitimacy of the management system and the fishery's sustainability. In extreme cases, such as the Atlantic cod fishery in Canada, under-reporting and reliance on catch/effort data provided by the industry rather than fisheries-independent surveys, can result in fisheries collapse (Myers et al. 1997, Walters & McQuire 1996). Simmons et al. 2017 point out that in New Zealand, "There is money to be made or saved by dumping catches for which ACE is unavailable or too expensive, from poaching and falsifying catch returns. These behaviours have seriously distorted New Zealand's catch data for decades."

It is unfortunate that neither the hoki stock assessments (2011-2017), all post-2009 MSC hoki assessments reports, nor the current draft MSC public comment report take account of the information on unreported bycatch in the hoki fishery raised by Bremner and colleagues.

SIMMONS ET AL. 2016

In May 2016 the University of Auckland Business School announced the findings of research led by Dr Glenn Simmons into New Zealand fishery catches (Simmons et al. 2016). The findings suggested the total amount

of marine fish caught in New Zealand waters between 1950 and 2010 is 2.7 times greater than official statistics suggest. Unreported commercial catch and discarded fish account for most of this difference. Fish of little or no perceived economic value have been routinely dumped at sea and not reported. The reconstructed estimate for 1950-2013 revealed an estimated 24.7 million tonnes of unreported fish, compared to 15.3 million tonnes reported. Fish discards made up 57% of total unreported catches from foreign and New Zealand flagged vessels, with unreported landings of the recreational, industrial, artisanal and subsistence sectors contributing 2%, 25%, 16% and 0.1%, respectively.

Some of the findings of Simmons et al.'s study about illegal catches in the New Zealand fishery

- New Zealand's reconstructed marine catch totalled 38.1 million tonnes between 1950 and 2010, which is 2.7 times the 14 million tonnes reported to the FAO.
- Since the Quota Management System (QMS) was introduced in 1986, the total catch is conservatively estimated to be 2.1 times that reported to the FAO.
- Unreported commercial catch and discards account for the vast majority of the discrepancy.
- Recreational and customary catch was 0.51 million tonnes, or 1.3 percent
- Only an estimated 42.5 percent of industrial catch by New Zealand flagged vessels was reported.
- 42 percent of the industrial catch was caught by foreign-flagged vessels, which dominated the catching of hoki, squid, jack mackerels, barracoota and southern blue whiting – some of the most misreported and discarded species.
- The extended reconstructed estimate for 1950-2013 is 40 million tonnes, comprised of 19 million tonnes nationally reported, 5.8 million tonnes of invisible unreported landings, 14.7 million tonnes of unreported dumped commercial catch, and 549,000 tonnes of customary and recreational catches.

The authors identified a long list of compliance problems including fish dumping, under reporting, high grading, low grading, discrepancies in tray weights and conversion factors, invisible landings (not reported or underreported, documented but not reported to the FAO). Official data from 2004-2006 suggested that the problem was widespread, especially in the West Coast hoki fishery. With regard to hoki, the authors refer to plenary reports (Ministry for Primary Industries 2013c, 2013a, 2013b, 2013e, 2013d) which highlighted that the catches of a number of fish species, including hoki, had not been fully reported. Low value, damaged and under-size fish had also been dumped routinely and not reported. For example, FAO data show that 143,394 tonnes of hoki were landed in 1992, while national statistics show landings of 215,000 tonnes. We refer to Simmons et al. for further relevant examples.

The report presents compelling evidence from foreign charter vessels (FCVs) where crews were forced to engage in dumping or face severe punishment. Interviews with 200 crew from 19 vessels operating between 1998-2013 all confirmed that dumping was standard and daily practice on all vessels they had worked on. These activities were actively hidden from observers with a small number of sample bycatch baskets kept behind.

This is illustrated by some observer statements:

Foreign charter vessel observer statements from Simmons et al. 2016

"I witnessed major illegal dumping and told the observer manager. He said, if under 15 tonnes not much we can do about it. It just went into a black hole…you don't stick your head up above the parapet, definitely not. We're told what happens at sea stays at sea. We're told if we ever say anything we will never work in this country again (Interviewee, 1)."

"No-one wants to rock the boat (Interviewee, 9)."

"Misreporting goes in our diaries and reports. We are often interviewed by compliance officers which resulted in prosecutions, but they have barely scratched the surface of what really goes on across the industry (Interviewee, 59)."

"I was on many Korean and Ukrainians FCVs during the 2000s. The dumping was out of control and despite warning the officers they did not alter their practice."

"On the Chatham Rise fishing for orange roughy, after 10 minutes of towing we had caught about 70 tonnes, but not good to catch this much as by the time they got to the end of the bag, the fish had decomposed. Captain offered me money to look the other way. He said how much do you want, name your price? Wanted me to agree to changing the catch records (Interviewee, 202)."

New Zealand vessel observer statements from Simmons et al. 2016

"Have to dump as no quota. Can be half a tonne a day, that's crazy! If we landed it, it would be a disaster. We are dumping a lot, cause so much snapper out there. Catching a lot of small stuff. It all goes over the side. Big snapper put into a fish case and dumped at night so no one sees. The annoying part is the time it takes to knife the swim bladder so they don't float (Interviewee, 164)."

"Dumping is very bad, it's done under the radar, especially on trawlers. Ninety %t of the time we dumped (Interviewee, 193)."

"can be 100% of the catch" (Interviewee, 194)

"We landed a big bag of snapper and didn't know what to do with it as no quota. So got a relative to take it to sell it through the black market. Better than dumping it (Interviewee, 218)."

"The way the QMS operates we are criminals, even though we are just trying to make an honest living. There's a lot of dumping going on but what do they expect (Interviewee, 221)."

The authors explain how the Quota Management System (QMS), despite good intentions and its international reputation as a success story, undermines sustainable fisheries management by inadvertently incentivising misreporting and dumping. They conclude that "The future sustainability and certification of fisheries will depend on how the government addresses the under-reporting problems, which have long been a cause of concern."

We concur with Bremner et al. 2009, Simmons et al. 2016 and others that 24-hour surveillance and observer coverage provides the only intervention known to guard against these problems (see also Burns & Kerr 2009).

MPI COMPLIANCE REPORTS AND INDEPENDENT REVIEW

On 18 May 2016 a New Zealand news network reported obtaining information that New Zealand fishing boats had been illegally dumping quota fish. The revelations were based on official reports into MPI operations that had been carried out in 2012 and 2013. As a result of criticism of MPI's decisions not to prosecute offenders identified in the reports, the Ministry for Primary Industries (MPI) Director-General commissioned Queen's Counsel and former Solicitor General Michael Heron to carry out an independent review of these fisheries compliance operations (code named Hippocamp, Achilles and Overdue) and MPI's subsequent decisions. The issues raised in the three reports and the outcome of the independent review that followed are presented below because of their direct relevance to the assessment of the hoki fishery.

OPERATION HIPPOCAMP

In May 2011 MPI (then called MFish) planned Operation Hippocamp to investigate commercial inshore finfish dumping in the eastern and southern finfish fishery. The briefing paper records the investigator's summary of the current state of MFish's knowledge of the issue: "Observer information shows that when a MAF observer is on-board a commercial vessel it tends to report much more small fish and by-catch as taken in its returns. Observed vessels also tend to report much higher levels of non-fish by-catch than vessels without observers on-board. Direct evidence from crew on-board vessels suggests that when observers are on duty, unwanted and low value by-catch is retained and reported. They say this type of catch is often routinely dumped and not reported when there is no observer on-board. There has been limited observer coverage in the inshore fishery but when there has been it has confirmed dumping as an issue in this fishery." "Dumping and high-grading of quota species generally occurs when there are economic incentives to dispose of fish species with a low value compared with other catch. The value of a species can be affected by quality, size, market or association with overfishing penalty. If a fisher has limited ACE for a species, then small or damaged fish that fetches a low price may be dumped in favour of higher value fish of that species. If ACE has been exhausted and an over fishing penalty will be incurred, then a species may be dumped in favour of another species."

OPERATION OVERDUE

MFish conducted an operation in respect to four commercial fishing vessels in early 2003. Fish from two vessels was inspected and the investigation suggested that the catch landing record had understated the weight. Approximately 3,900 cartons of hake, hoki, ling and black oreo dory were seized. The weights showed underreporting in the catch landing return of between 0.6% to 1.93% depending on the species and the vessel. The investigator noted that this amount may seem "quite small" but if it extended across all vessels, annually it would amount to hundreds of tonnes of unreported hoki alone. The investigator noted that the problem had been around for a considerable period of time and dated back to 1996 with this particular company.

OPERATION ACHILLES

In November 2012 MPI installed monitoring cameras on commercial set net vessels as part of a programme designed to monitor and study the incidental capture of Hectors dolphins. Six vessels participated in the operation. When the resulting footage was reviewed, it revealed discarding of quota fish by five of the six vessels and of two endangered Hector's dolphins, only one of which had been reported. During the examination of footage from one boat, numerous quota species were also seen being discarded. A more extensive examination of the set net hauls between November 2012 and February 2013 was undertaken.

There appeared to be consistent and deliberate discard of quota fish, in particular elephant fish, red gurnard and rough skate. The investigator then commissioned the examination of the footage from the other five vessels and found that the same activities were identified on four of the five vessels.

A senior MPI fisheries manager stated during discussions of this matter to a colleague: "As you are aware discarding is a systemic failure of the current system and something we have not been able to get on top of from day 1 of the QMS. FM [Fisheries Management] can't quantify the tonnages involved but we suspect they are significant to the point that they are impacting on stocks. We estimate that if we found the golden bullet to stop discarding, we would probably put over half of the inshore fleet out of business overnight through lack of ACE availability to cover by-catch." "As you are aware I have spent the last 5 months considering discards and see this as the single biggest issue we face in our wild stock fisheries." (Heron 2016)

No prosecutions were brought, in part because the non-prosecution option would be "less damaging to MPI and more constructive in changing fishers' behaviours".

Queen's Counsel Michael Heron's comments about Operation Achilles

"My inquiries confirmed that there was a direction from senior management in 2009 to ignore discarding and misreporting of quota fish detected on one of the vessels involved in the summer dolphin observer programme. The direction was given by the then National Manager Fisheries Compliance and it resulted in no action being taken on any of the other 42 vessels involved in the programme despite discarding allegedly being witnessed in about half of them. This in turn had a flow on effect that resulted in offending that was detected by observers involved in inshore dolphin programmes not being followed up or actioned. The direction given was confirmed to me by a number of people"

"Notwithstanding the direction, an investigator was assigned the 2009 observer report of discarding and commenced an investigation of it. That investigation was later halted upon confirmation of the direction by the same person. Whatever the intention behind the direction, it created the impression in Compliance at least that they ought not investigate or prosecute in circumstances where observers were on-board vessels for the purpose of observing marine mammal interaction. This was at the same time as MPI was aware that gathering evidence in relation to discarding was difficult in the inshore fishery because of the limited observer coverage. MPI was also aware that there was a need to resolve the problem of discarding."

"In my view the lack of timely and accurate documentation of the prosecution decision was regrettable."

"The investigator and compliance personnel were correct to determine that there was sufficient evidence to prosecute. They were ultimately right to focus upon whether prosecution was in the public interest."

"In my view the decision and in particular the decision process was flawed primarily because it was influenced by factors which were not relevant."

"The prosecution decision was affected by considerations which were not relevant under the Guidelines. In particular, potential embarrassment to MPI or officials was an irrelevant consideration. Earlier conduct of MFish and MPI created hurdles to the prosecution which should not have been present. That conduct was inappropriate or at least unhelpful. The decision process was confused, not well documented and not well communicated. The follow-up actions do not seem to have been thoroughly completed. The decision to warn was meant to be combined with "drawing a clear line in the sand". That does not seem to have been achieved. Some steps have been taken but the situation as to discards remains confused."

"It is often referred to in MPI documents that the Ministry has been aware of the issue of discarding of quota fish since the commencement of the QMS. That appears correct to me. Support for that

comes from numerous sources within and outside MPI. One only needs to refer to the Simmons report and the Ministry's Plenary Report (and equivalents) for each year for evidence that the discarding issue features prominently in the Ministry's thinking. MFish and MPI have attempted to grapple with the issue but unsuccessfully."

"Both industry and MPI have repeatedly acknowledged the problem but have not been able to develop and implement a solution... For now, however, the law remains and appears to be regularly disobeyed."

Queen's Counsel Michael Heron's general comments about the three compliance reports

"The issue of discards was again highlighted by Operations Hippocamp and more clearly by Operation Achilles. It is a problem that has been recognised since the beginning of the QMS. MFish and MPI have not grappled effectively with aspects of the problem and either enforced the law or acted to change it. The non-enforcement of the law in a case such as Achilles is unsatisfactory but primarily due to conduct outside of the Compliance directorate. MPI may wish to consider a review of the relationship between Fisheries Management and Compliance in terms of the planning of Fisheries Management operations (such as observers or cameras) and the interrelationship with potential Compliance operations. In turn, review is required of follow-up from Compliance operations back to Fisheries Management efforts."

"The issues raised in the Simmons report have long been recognised by MFish/MPI and industry. A coherent rationale to the rules around discards is not obvious. The fisheries management system is under review at present and provides an opportunity examine this. In the meantime, it is incumbent on commercial fishing to improve their performance and comply with the current law."

In September 2016 Ministry for Primary Industries Director-General stated that he accepts the findings of the independent review conducted by Queen's Counsel Michael Heron.

QUALITY OF EVIDENCE

The most recent MSC hoki draft assessment report fails to recognise both the insights and wealth of data presented by Simmons and colleagues (2016) that has clear relevance for the sustainability of New Zealand fishery in general and the hoki fishery in particular. The assessors refer to the authors as "researchers associated with the University of Auckland" and cast doubt on the validity of Simmons et al.'s study by asserting that it has not been subject to peer-review and that its methodology is ambiguous (see page 212). They continue by referring to Tilney et al. (2017) who dismiss Simmons et al.'s study and findings as unsound.

We consider this presentation and assessment of Simmons et al.'s work both inaccurate and misleading. The study is co-authored by eight academics from three universities, including the University of Auckland in New Zealand, Oxford University in the UK, and the University of British Columbia in Canada. They were among 400 researchers from around the world who collaborated on a 15-year global project led by Prof Daniel Pauly, the world's foremost fishery scientists, at the Institute for the Oceans and Fisheries, University of British Columbia. The methodology employed by the international team of scientists, including Dr Simmons, is clearly set out in Pauly & Zeller (2015), The Catch Reconstruction: concepts, methods and data sources. The resulting findings were published in the prestigious and peer reviewed journal Nature Communications (Pauly & Zeller 2016) and found that global catches peaked at 130 million tonnes in 1996, which is 51 per cent higher than the FAO figure of 86 million tonnes. The study also identified a sharp decline from this peak at more than three times the rate suggested by FAO figures.

Simmons et al.'s results are published by the Institute for the Oceans and Fisheries on the University of British Columbia and are described by Prof Pauly as the best estimate to date. In contrast, the alleged rebuttal by Tilney et al. 2017, on which the assessors rely so heavily, is entitled "Briefing note to Acoura Marine MSC assessors", has not been subject to peer review and remains unpublished and therefore inaccessible. It's authors, Tilney, Clement and Gargiulo are listed as staff of the New Zealand based fisheries lobby group, Clement and Associates Ltd. According to its website, Clement and Associates Ltd. is focussed "on helping clients add value to their seafood and related businesses through innovative solutions and the creative use of information and technology." Because Tilney et al.'s work is not accessible, it is impossible to comment on the arguments it put forward. However, it lacks both independence and the academic pedigree of the study presented by Simmons and colleagues and therefore does not warrant such prominence in an MSC draft assessment.

OPERATION BRONTO

In 2004, the New Zealand ministry of fisheries embarked on series of investigations into compliance among the country's hoki fishery. The first, Operation Mini, was followed in 2005 by Operation Maxi, an extensive profiling of the New Zealand's West Coast South Island hoki fishery (WCSI), where the largest volume of hoki is caught. Operation Maxi was to quantify the amount of small and damaged hoki caught and establish whether vessel operators were illegally highgrading and discarding unwanted smaller fish and damaged hoki - least valuable part of the catch - to maximise profit.

In 2011, a task force was to develop a risk profile of the 2011 West Coast South Island (WCSI) and East Coast South Island (ECSI) hoki fisheries. "Operation Bronto" profiled the 2010- 2011 WCSI hoki fishery and involved gathering, examining and analysing data relevant to the hoki fishery and its associated bycatch species. Its findings were set out in a report in entitled '2011 Compliance Risk Profile of the West Coast/East Coast South Island Hoki Fisheries' (MPI 2012). Operation Bronto was carried out by fisheries officers during 43 in-port inspections, 20 at sea vessel inspections and 11 vessel trips carrying official observers. The results of the investigation were completed in 2012.

The Bronto Report was were made public in 2018 in response to Official Information Act requests in 2016 and 2017. Prior to that they had been shared with fishing industry representatives. In a news article that appeared on Radio New Zealand on 24th May 2018, MPI's head of compliance, Gary Orr, said that instead of prosecuting the offences, "We briefed quota holders and vessel captains and then we sat down with individual companies and said these are the behaviours we're seeing, these create a compliance risk, you need to change your behaviours, if you don't change those behaviours then you're going to attract greater attention from us." The fact that this information was intentionally withheld by the industry and so did not inform the MSC certification process earlier, is deeply disappointing and does nothing to advance either sustainability or consumer confidence.

The problems identified by the Bronto Report include fisheries reporting, fishing practices, vessel electronic weighing and recording systems, carton weights, reporting of fish meal, vessel specific conversion factors, vessel processing specifications and undefined states, additional states and products, highgrading of hoki in both the WCSI & ECSI hoki fisheries, misreporting of bycatch, misreporting of target species to circumvent the Deep Water Group Hoki Fishery Operational procedures for Hoki Management Areas (HMAs), set up to protect areas with high numbers of juvenile hoki. The report revealed that some of New Zealand's biggest fishing companies, including Sanford, Sealord and Tallyes, had been under-reporting their catch by hundreds of tonnes.

Discarding is of particular concern in the hoki fishery and is prohibited under s 72 of the Fisheries Act 1996. There is no legal size limit for hoki and as such it is not a species which can legally be returned to the sea. However, discarding allows fishers to increase their economic return by avoiding Quota Management

System related expenses such as purchase of annual catch entitlement (ACE) or payment of deemed values. Fishers can increase their financial return by deliberately discarding small, damaged or less valuable fish. This practice is known as highgrading. Hoki fishery bycatch species are especially vulnerable to this type of offending.

Discarding of hoki, bycatch species and misreported catch were two of the significant compliance issues identified in Operation Bronto. Total unreported hoki greenweight was estimated at between 3,414 and 3,555 tonnes – the equivalent of 5.6 to 5.9 percent of the HOK1W subarea TACC. Because not all compliance issues raised in Operation Bronto could be quantified, the authors consider this a conservative estimate.

Fishers were also found to report incorrect weights, quantities, species, or landed states. The main reason behind this type of offence is minimising ACE and related deemed value expenses.

The 2006 stock assessment states that there may be some dumping of small fish, but the level was unknown. In 2005 "A length-based analysis of highgrading in the NZ WCSI hoki fishery" (unpublished report), provided a reliable estimate of the level of discarding, but was never incorporated in later hoki stock assessments. The 2011 stock assessment simply states that "no information is available about illegal catch". It was noted that under "other sources of fishing mortality" there may have been some discarding of small fish due to the prevalence of small hoki on the west coast of the South Island in recent years.

Highgrading refers to sorting the catch of a marketable fish species by a desired attribute (usually length or weight) and discarding the unwanted or less profitable fish to maximize profit (Anderson, 1994).

Operation Maxi found evidence of vessels highgrading hoki. The amount of small hoki (<55 cm total length) illegally discarded during the 2005 WCSI hoki fishery is estimated at between 596 and 1806 tonnes. The estimated range reflects the difference between estimates based on vessels' processing specifications and estimates based on Fishery Officer landing observations. These weights equate to 1.8% and 5.6% of the total hoki catch taken by factory vessels larger than 46 metres.

Operation Bronto states that young fish aged 1-3 years old are most at risk of highgrading. The report emphasizes the added risk of removing young fish from the population as it can harm future recruitment and the sustainability of this fishery, which, after a period of overfishing, large annual changes in the numbers of juveniles and quota reductions is currently rebuilding.

Bronto report: The WCSI Hoki Fishery

Fishing practices & processes

- Fish lost from burst bags is either unreported or are under-estimated.
- Long tows or soaking the net can result in a large proportion of damaged fish that are unsuitable for processing. This hoki may be illegally discarded and/or mealed without being unreported.
- The disposal of large volumes of unwanted fish via a discard chute without being recorded. This practice also risks attracting seabirds and so raising the risk of incidental capture.
- Macerators shred whole fish and were introduced to help mitigate the killing of sea birds. Vessels fitted with macerators can discard fish with little risk of detection. It is impossible to determine if discharged macerated material contains illegally discarded whole fish.
- A number of vessels operating electronic weighing and labelling systems may not be reporting the net weight of fish accurately or have robust systems in place to determine greenweight. The report flags

some New Zealand's largest fishing companies, including [redacted] in connection with related compliance risks.

- In the 2010-11 fishing year [redacted]'s processed up to 78,000 tonnes of fish greenweight. If the average percentage difference was 1% across all product lines processed by [redacted] that fell below the 2.01% threshold, approximately 780 tonnes of fish greenweight would not have been reported during the 2010-11 fishing year.
- Catch greenweight should be reported accurately. "The methodology [redacted] uses to calculate and report greenweight is obscure."

Misreporting

- Vessels carried out and documented glaze weight tests at sea. Although the glaze test results indicated less than the two percent threshold, some vessels nevertheless deducted the full two percent glaze weight to reduce their reported catch. Additional concerns related to vessels deducting two percent for glaze even though no glaze had been applied.

- The total under-reported greenweight was estimated at 281,743 kg (132,245kg for fillet vessels and 149,498 kg for Limited Processing Fishing Vessels (LPFVs). Over-packing but underreporting catch is cited as an ongoing problem that will remain undetected in the absence of carton weight checks.

The Table below indicates total under-reported hoki catch permit holder and associated vessels.

Fishing Company	Vessel	Estimated under-reported Greenweight (kg)
[redacted]		37,699
		21,647
		59,346
		20,564
		28,602
		49,166
		8,199
		8,199
		15,340
		15,340
		7,891
		8,163
		1,023
		26,960
		45,939
		89,976
		12,456
		12,456
		13,998
		914
		23,521
		38,433
		8,827
		8,827
Grand Total		**281,743**

Table xxx: Summary of hoki under-reported by permit holder and vessel. Data from Operation Bronto 2011

- Some vessels are unable to achieve their Vessel Specific Conversion Factors (VSCFs), leading to inaccurate reporting of hoki catches, mostly but not only during the spawn time. Vessels may work harder to achieve lower VSCF during testing periods but then revert to 'normal' practice where the true Conversion Factor

(CF) may lie somewhere in-between the official CF and the VSCF. The total unreported hoki greenweight resulting from the use of VSCFs is estimated at 592,167 kg by three [redacted] fillet vessels; and between 202,369 kg and 343,635 kgsby two [redacted] fillet vessels. In one vessel, this resulted in a shortfall of 151,178kg in hoki greenweight between the amount reported and observer derived figures or a difference of 9% of hoki reported for the trip.

- Vessels reported 'B' grade hoki as a way of disguising that small and/or damaged fish had been illegally discarded and unreported. Product was subsequently relabelled as "A" grade after reprocessing offshore as it met the "A" grade rather than the "B" grade specification.

Highgrading

- The results of a hoki length-based analysis found that the landings of hoki reported by LPFVs contained an unexpectedly small proportion of small hoki, leading to an underreporting of at least 559 tonnes of small hoki – the equivalent of about 30% of the small fish they caught. The authors explain that due to the assumption that all the net damaged hoki that are turned into meal or green block are small, the true underreported amount is likely to be higher

- Comparing the amount of fish meal reported as produced from offal with the amount of offal available as a by-product of processing on fillet Vessels with meal plants revealed "unrealistically high" amounts of fish meal in most cases, indicating the mealing of unreported catch. Two vessels reported significantly less whole hoki to meal on non-observed trips than when carrying MAF observers, suggesting that in the absence of observers some hoki are mealed without being reported. The authors estimate that at least 1,541 tonnes of hoki catch were not reported during the 2011 season (At least 559 t for LPFVs and at least 982 t for fillet vessels).

- The authors explain that highgrading is most likely to occur in fisheries with a wide price difference between large and small fish; where the proportion of large fish expected in future catches is high; the cost of additional fishing effort is low; and the fishery is managed under a system of individual limits on landings. They conclude that the WCSI hoki fishery exhibits all these characteristics.

- The number of small hoki caught and seen by MAF observers does not match the number of small hoki being landed by the LPFVs and the amount of offal meal produced by most of the vessels filleting at sea is significantly higher than expected. This suggests that the greenweight of hoki being removed from this fishery is being systematically understated. The authors also draw attention to the fact that Operation Maxi, which looked at the prevalence of highgrading in this fishery in 2005, discovered the same result.

Bycatch

- A study of unreported bycatch in the WCSI hoki fishery conducted in 2005 by Bremner et al. (2009) showed that the reported catch of unobserved vessels was different to the observed catch of similar vessels in the fishery. For that season 18% of the catch by weight was related to incidental bycatch. The study provided evidence of the misreporting of both quota and non-quota species. Species misreporting was found to be widespread amongst the vessels with meal plants but was not solely limited to this group.

- For the 2011 season, many species that MAF observers recorded as being caught were quite different to what the fleet as a whole reported catching. Comparing ling heads to body ratios indicated greenweight underreporting, suggesting that unwanted ling bodies were discarded and/or mealed unreported, while the heads, for which there is a market, were retained.

- While factory vessels operating in the WCSI hoki fishery were good at reporting landings, they were poor at reporting catches. To improve fisheries management, the authors suggest the use of more reliable

observer data rather than data provided by the industry. "With respect to QMS species poor reporting of catches is more problematic. The catch limits and the economic instruments intended to ensure they are not exceeded are supposed to apply to catches and not landings and will be ineffective if catches are misreported. There are some major issues that need to be addressed – issues that in some cases have been evident for several decades."

- The poor reporting of shark bycatch which may in part be due to confusion over coding. According to Bronto, "Reporting of the various shark species seems to be chaotic, and we seem to have made little progress toward achieving the goals of the International Plan of Action. "

- Catches of less 40 kg (one carton weight) per day of marketable fish bycatch, including ling are routinely discarded when observers are not present.

- Hake and ribaldo are not reported correctly. In 1989, 1990 and 1991, hake catch was reported as a percentage of estimated catch as 78%, 56% and 75% respectively. The report explains that more recently, the level of such misreporting has not been estimated and is therefore unknown. Because the two species are not easily confused, this under-reporting is thought to be intentional. Hake is an inevitable and valuable bycatch in the hoki fishery. It is also a target species in its own right. The authors explain that in order for the QMS to work, vessels likely to catch hake as hoki bycatch should ensure they own sufficient quota to cover their expected catch. However, discarding hake catches becomes an attractive if illegal alternative in circumstances where enforcement is weak, when the likely availability or market price of hake is uncertain, or when the market price of ACE threatens the profit derived from landing bycaught hake. In these circumstances the Quota Management System fails to constrain catches and maximizes neither sustainability nor utilization.

- Many minor bycatch species are not accurately reported. Although the quantity of unreported fish on each tow is likely to be small, the collective impact is significant. Citing the Fisheries Assessment Plenary Document the report states that annual reported catch of Alfonsino (BYX7) is typically around 20 tonnes, so an under-reported bycatch of five tonnes by the factory vessels in the West Coast South Island hoki fishery is comparatively large.

- Results from Operation Maxi showed that some bycatch species outside the quota management system are over-reported. This over-reporting was characteristic of vessels with on-board fish meal plants and may be motivated by species misreporting.

- The Bronto report states that eels often go unreported even by vessels with observer presence. The report poignantly states that "It is as if the eels themselves and the regulatory requirement to report them are both invisible."

Bronto Report: ECSI Hoki Fishery

During the 2010/11 fishing year, 24,769 tonnes of hoki were caught in or adjacent to the ECSI Hoki Management Areas (HMAs). This represents 67.5% of the hoki caught in the entire ECSI hoki fishery. The majority of fishing effort occurred in areas where juvenile hoki abundance is high.

Highgrading

- Young hoki (defined here as less than or equal to 66 cm overall length) comprises a high proportion of hoki catch on the ECSI and Chatham Rise. Observer data indicate that it is not possible to consistently avoid catching small hoki in the western Rise statistical areas that encapsulate the Hoki Management Areas.

- Vessels consistently fish in areas where small hoki cannot be avoided.

- Some vessels are land less small hoki than expected.
- Significant quantities of small hoki are being illegally discarded.

Fishing in Hoki Management Areas

- Many vessels fishing for hoki on the east coast of the South Island preferentially exploit rather than avoid the Hoki Management Areas. Fishing trips which systematically concentrate on these areas occur repeatedly.

  Reporting other species such as Silver warehou (SWA) to cover targeting of hoki within Hoki Management Areas (HMAs) is common. Vessels "targeting" SWA in the Canterbury Banks HMA caught nearly as much hoki as vessels explicitly targeting HOK.

- Fishing patterns indicative of area misreporting or "trucking" were evident.

- Although the industry acknowledges the importance of Hoki Management Areas to the sustainability of the fishery, violations of the Hoki Fishery Operational Procedures are frequent, unrestrained and involve vessels operated by most of New Zealand's deepwater fishing companies, including [redacted]

  - An observer trip report from 2011 for S[redacted] states:

    "The vessel had a copy of the Deep Water Group Hoki Fishery Operational procedures on board. Key personnel were aware of its contents. The vessel completed 10 tows within the Mernoo and Canterbury Banks Hoki Management Areas. Whilst fishing within the HMA the vessel declared SWA as the target species. Catch composition from tows within the HMA was 85% HOK, 2% SWA and 13% other ITQ and non ITQ species. The percentage of HOK < 55cm from these tows averaged 23%. One tow caught within the HMA was 27t total green weight. The percentage of HOK< 55cm in this tow was 55%. From this tow 14.5t green weight of small and damaged HOK was processed into fish meal and 10t green weight of HOK was processed into frozen product.

    "Misreporting of target species.... In the observer's opinion the vessel was misreporting the target species to circumvent the Deep Water Group Hoki Fishery Operational procedures in order to target juvenile HOK. This practice is widespread throughout the domestic and foreign charter fleet".

  - Fisheries analyst [redacted] makes the following observations regarding [redacted] fishing vessel [redacted]

    "a preliminary examination of activity has shown that at least four tows (and very likely more) were conducted within the HOK management areas. Two days where these tows took place (were) the 6th and the 9th of December 2011. The four tows that have at this stage been identified as being inside the HOK Management areas list SWA as the target species for the activity, as the voluntary agreement prohibits vessels from directly targeting HOK in the HMA's. However on each of these tows HOK makes up between 86% and 96% of the estimated catch, and whilst WWA does appear in the estimated catch data in nominal quantities in three of these tows, SWA does not appear in the estimated catch data for any of these tows."

  - In 363 (84%) of 431 tows targeting either hoki or silver warehou, where some hoki catch was reported, the estimated catch of hoki exceeded the estimated catch of silver warehou - often by a substantial margin. According to Bronto, the common practice of reporting the target species as silver warehou provides a means of exploiting a loophole in the Hoki Fishery Operational Procedures.

- The requirements for vessels to indicate their intention to fish in the HMAs and to report both their entry and exit are frequently ignored. Many vessels fishing for hoki on the east coast of the South Island focus the majority of their fishing effort in the HMA and so are preferentially targeting rather than avoiding these areas. The authors therefore deem the effectiveness of the HMAs as a sustainability management tool questionable.

- Voluntary compliance and stakeholder administration appears to be ineffectual. Given appropriate regulation, the Ministry has the tools to monitor and if necessary enforce compliance in the Hoki Management Areas. The acknowledged risks to the sustainability of hoki fisheries due to uncontrolled fishing in these areas require effective action.

OTHER BYCATCH

Problems discussed thus far have dealt with undeclared catches and fish dumping. The following section will briefly touch on bycatch of marine mammals, seabirds and shark species, many of which are threatened with extinction. The decline of e.g., New Zealand sea lions, yellow-eyed penguins, Hector's and Maui dolphins and endangered seabirds such as albatrosses has been linked to commercial fisheries bycatch. The full extent of this bycatch in New Zealand waters is largely unknown due to a poor observer coverage.

It is not illegal to catch marine mammals and seabirds but failure to report a bycatch incident can result in a fine of up to $10,000. Since November 2015 only one prosecution involving the capture of a protected species has resulted in a penalty of 300 hours of community work.

DOLPHIN BYCATCH IN THE NEW ZEALAND HOKI TRAWL FISHERY

The section on marine mammal bycatch (starting on page 97 of the Acoura draft assessment report) omits any information on dusky dolphins. Information provided by MPI to the US National Oceanic and Atmospheric Administration indicates the incidental capture of one dusky dolphin in the east coast South Island hoki fishery in 2013. These data originate from a year with comparatively high observer coverage (26%). During most other years, observer coverage was well below 20% (5-17%), which is too low to obtain robust bycatch estimates.

The total number of dusky dolphins caught in trawling is listed as four. One in 2006 in a "Jack Mackerel" trawl. One in 2013 in a "hoki" trawl. Two in 2015 in a "barracouta" trawl. All individuals were caught in the same general area off Banks Peninsula, an area that coincides with the distribution of the endangered Hector's dolphin. Given this overlap and culture of misreporting in the fishery, it seems unlikely that Hector's dolphin deaths did not occur. Neither dusky nor Hector's dolphins have a beak, so it is even possible that Hector's dolphins are reported as duskies. The incentive to do so is considerable.

One reported dusky dolphin capture in a hoki trawl in 2013 was observed in one out of 712 observed tows. This equates to a capture rate of 0.14 dusky dolphins per tow. Multiplying the total number of tows that year (2737) with the 0.14 catch rate, provides an estimated total of 383 dusky dolphins killed in the hoki fishery in 2013. Existing data are therefore inadequate to even infer sustainable fishing with regard to dolphin and other marine mammals and bird bycatch.

Inadequate observer coverage for all except very common species

Observed bycatch for species like Hector's and dusky dolphins, for example, is either 0, 1 or 2 in any given year. This makes it impossible to estimate the total number of dolphins caught which is necessary to determine whether bycatch levels are sustainable. This is particularly important in the case of endangered species such as New Zealand sea lions and Hector's and Maui dolphins. Observer coverage needs to be substantially improved to obtain meaningful and reliable information about the sustainability of bycatch in these species. Keeping observer coverage low for most observer programmes inevitably results in poor bycatch records and estimates. As is demonstrated in the draft assessment report, this absence of this information is then used to demonstrate low levels of bycatch and inferred sustainability. However, the absence of evidence is not evidence for absence.

This relationship between observer coverage and bycatch level is well known. As observer coverage rises, so do bycatch levels. Figure 37 on page 69 in the Acoura draft assessment report illustrates this perfectly. The spike in observer coverage in 2013 corresponds with an observed dusky dolphin capture and the subsequent reduction in observer coverage after 2013.

In the Cook Strait, which separates New Zealand's North and South Islands, hoki nets risk killing Hector's and Maui dolphins. The latter have suffered a precipitous decline of more than 98 percent to some 50 individuals (Cooke et al. 2018) as a result of fishing-related mortality over the past 50 years (Currey 2012, Davies 2008). Of four common dolphins reported caught in hoki nets between 2013 and 2016 (1 in 2013, 1 in 2014 and 2 in 2016), three were caught in the Cook Strait. This area is also a high-risk area for Hector's & Maui dolphins. The maps shown on page 106 of the draft assessment report illustrate that hoki trawlers operate very close to shore in the north-eastern South Island Cook Strait and the south-eastern North Island, north of Banks Peninsula, Kaikoura and up the east coast of the North Island. They also fish very close to shore off the middle of the west coast of the South Island. Trawling on the east coast of the South Island is prohibited only to two nautical miles offshore. On the west coast of the North Island trawling is permitted right up to the coast without any geographical restrictions. Besides coinciding with their habitat of many other endangered marine mammals and birds, there is therefore a large areal overlap between the hoki and ling fisheries with the habitat of endangered Hector's and, in the Cook strait, the critically endangered Maui dolphins. This video of a hoki trawler operating in the Cook Strait in the very close to dusky dolphins, pinnipeds as well as scores of seabirds poignantly illustrates the risks (https://www.youtube.com/watch?v=6wGqLQndCH8&t=11s).

The Draft report claims „The size of the basking shark population in New Zealand waters is not known… Depending on the assumptions made regarding the relationship between effective population size and actual population size, the global population of basking sharks may be estimated at between about 18,200 and 82,000 individual basking sharks (DOC undated)." This is an incorrect citation of the referenced literature which states: "A genetic study has estimated the global effective population of size (an estimate of the number of reproductive individuals) of basking sharks at only 8,200. Research across a wide range of species suggests a median ratio of effective population size to actual (or census) population size of 0.1, this gives an estimate of global population size of about 82,000. However, recent research suggests that a ratio of 0.45 is more appropriate for large sharks, meaning the global population could be little more than 18,200 basking sharks."

Basking sharks are slow to reach late sexual maturity, have a long gestation and give birth to only a few young. Therefore, as noted in the referenced literature, the lower ratio needs to be applied when estimating population size. Hoelzel et al. (2006) examined the mitochondrial DNA of basking sharks and concluded that the estimate for the effective global population of basking sharks was very low with a population size of 8,200 individuals. A population numbering some 18,200 animals is also much more realistic in view of the decreased observations of basking sharks reported elsewhere and the lag of huge aggregations as had been reported before the 2000s.

The animals are a global migratory species, found in 47 range states across the world's temperate oceans. At such a small global population this species is at a heightened risk of extinction, and even the killing of a few animals per year by this fishery in NZ may have a negative impact on the global population of basking sharks or hinder their recovery.

In New Zealand incidental mortality of basking sharks occurs in gill net fisheries for rig and school shark, and in middle-depth and deepwater trawl fisheries for barracuda, squid and hoki. Reported sightings of basking sharks around New Zealand have been infrequent since the mid-1990s and few large aggregations have been seen over the same period. A summer aerial survey conducted around Banks Peninsula in 2009/10 and 2010/11 failed to find any basking sharks, whereas a similar survey conducted from 1990 to 1997 never went two years in a row without sighting basking sharks.

As with other species, the true number of basking sharks killed in the hoki fishery is highly uncertain due to low observer coverage (less than 20% over the last 10 years (see figure 42 of PCDR on page 98).

Low observer coverage has been shown to lead to significant underestimates of bycatch as a result of underreporting (e.g., Burns & Kerr 2016). The true extent of incidental take for marine mammals, seabirds, sharks and indeed fish species in this fishery is therefore likely to be much higher. A reliable assessment of the sustainability of New Zealand's hoki fishery will prove impossible until this lack of information has been addressed.

PI 2.3.1 - 2.3.3 ETP species outcome, ETP species management and ETP species information do not warrant the awarded scoring of 80 for basking sharks and other marine mammals listed in the report. They should be reduced at least to 60 and require a condition aimed at improved monitoring and recording of bycatch rate and the impact on the population of these vulnerable and decreasing species.

Performance indicator 2.3.3, page 255
Reviewer: The information level on ETP species is generally no more than just adequate to support a strategy of minimising negative impacts, although it is better for marine mammals and seabirds. I support the scoring and justification provided.

We note that there are no government policies or a strategy on how the environmental effects of fishing on the marine environment are to be managed or for minimizing the negative impact on marine mammals in New Zealand. This is evidence by declining populations of marine mammals, including Hector's and Maui dolphins (e.g., Cook et al. 2018). Bycatch of some 200 fur seals per annum (MPI communication to NOAA 2017), for example appears to be simply accepted as collateral.

Performance indicator 2.4.1, page 255
Reviewer : With any bottom trawl fishery, there is potential for seabed contact and hence impact on habitat function, but in New Zealand, such trawling is already banned in about one-third of potential seabed areas."

Bottom-trawling is the most destructive fishing technique undertaken in the world's oceans. The reviewer's assertion fails to recognize that some of the areas covered by the bottom trawl exclusion zones across the NZ EEZ are already fished out. Other so-called Benthic Protected Areas also tend to coincide with areas that have never been subject to bottom trawling because they are too deep or the seabed is simply too rough (rocks, corals etc.). Furthermore, many sensitive and vulnerable areas are not included in the bottom trawl exclusion zones. The statement also fails to recognise that partial areal protection does not equate to ecosystem protection. Scientists have shown that some of the species affected by this fishing method are extremely slow growing and can take hundreds or even thousands of years to recover from the damage.

Performance indicator 2.4.1, page 255
Reviewer: Evidence is also provided that the hoki fishery only targets about 10% of the possible seabed (hake and ling much less), so the national strategy and operational activities already provide a lot of protection to the habitat. I therefore beilieve that the scoring of and justification for each SI as given is correct, with only hoki (because of the extent of the fishery) not definitely scoring a full SG100.

Trawling for hoki takes is limited to 10% of New Zealand's EEZ because that is the area where hoki occurs. The remainder of the seabed is trawled for other species, including orange roughy, red cod, flatfish, etc, etc.

PI 1.2.3. Page 166
"The draft report states that "Electronic reporting and video monitoring on small vessels (<28 m) will be gradually introduced over an extended period."

Last year, the previous NZ government had announced plans to install video cameras on fishing vessels, stating this would protect the sustainability of fish stocks and act as a deterrent against illegal activity, such as fish dumping. MPI Fisheries spokesman Gerry Brownlee had said that the rollout of cameras was needed to deal with well-publicised problems in the sector. However, earlier this year, news emerged that these plans may be abandoned. There are therefore no current plans to install video monitoring across the NZ fleet, including hoki vessels to hep address illegal fishing practices.

CONTROL AND CONFLICT OF INTEREST

The company FishServe has been under contract with the Ministry for Primary Industries for 20 years. It provides quota management system data, collects revenue, issues permits, manages public registers, and responds to official information requests.

FishServe's website states "FishServe is the trading name of a privately owned company called Commercial Fisheries Services (CFS). CFS is a wholly owned subsidiary of Seafood New Zealand (SNZ). FishServe provides administrative services to the New Zealand commercial fishing industry to support the 1996 Fisheries Act."

FishServe contracted and devolved services
Allocation of new species into the QMS
Collection of Revenue on behalf of the Crown
Fishing Permit issue
Management of Permit and Vessel Registers
Management of ACE & Quota Share Registers
Processing of Fishing Returns
Registration of ACE Transfers
Registration of Caveats & Mortgages over Quota Shares
Registration of Quota Share Transfers
Vessel Registrations

Source: https://www.fishserve.co.nz/About

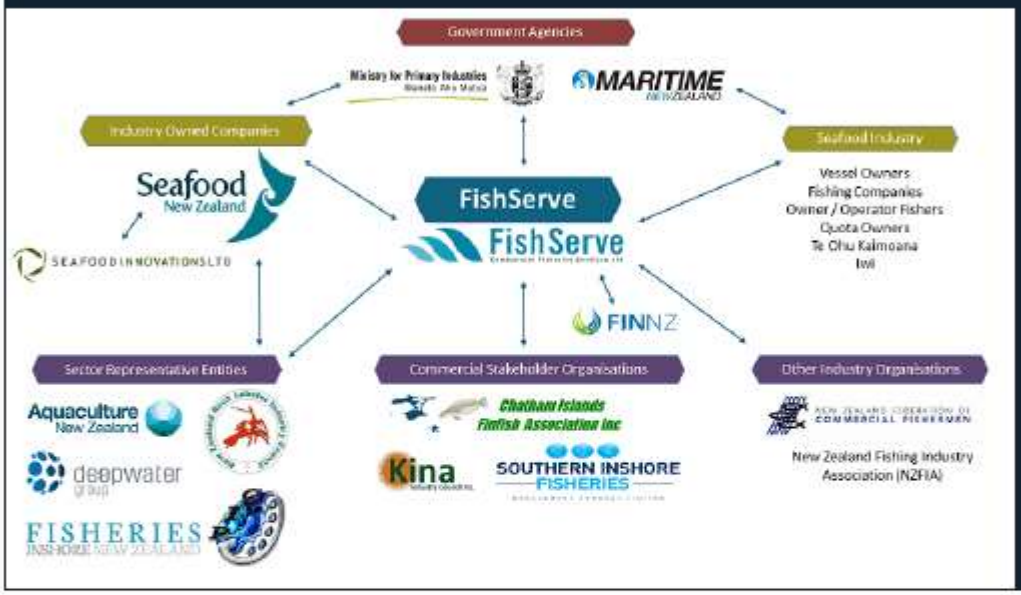
The website states that "Contracted services are services that FishServe has a contract with the Ministry for Primary Industries to deliver. The Crown maintains responsibility for these services, but does not need to

deliver the services themselves. Devolved services are services that the Crown has determined it does not need to be responsible for. The Minister has the authority to approve an approved service delivery organisation (ASDO) to deliver these services. FishServe has been appointed as the ASDO and is accountable for these services."

FishServe is linked with Trident, Seafood New Zealand, the Deepwater Group, Fisheries Inshore New Zealand and the New Zealand Federation of Commercial Fishermen and others.

Our Relationships

FishServe's relationship with the commercial fishing industry is illustrated in the following diagram:



Seafood New Zealand	**Seafood New Zealand works closely with the seafood industry primarily through five sector-specific entities: Aquaculture New Zealand, Deepwater Group, Fisheries Inshore NZ, NZ Rock Lobster Industry Council, and Paua Industry Council. It has a focus on key strategic initiatives and promotes sustainable, nutritious and responsibly-caught seafood.** **FishServe is a wholly owned subsidiary of Seafood New Zealand**
Seafood Innovations Ltd	**Seafood Innovations Ltd (SIL) is a subsidiary of Seafood New Zealand. SIL was established to encourage and provide funding support for research and development within the seafood industry, with the aim of adding value to the sector.**
FishServe Innovations New Zealand	**FishServe Innovations New Zealand (FINNZ), established in 2003, is an IT services company owned by FishServe. FINNZ provides a blend of business analysis, software development and business-process-outsourcing services to**

	organisations operating in the public sector For more information about FINNZ please click here.
Ministry for Primary Industries	The Ministry for Primary Industries (MPI) is tasked with maximising export opportunities for New Zealand's primary industries, improving sector productivity, increasing sustainability of resources, and protecting New Zealand from biological risk. FishServe provides both contracted and devolved services from MPI to the fishing industry.
Maritime NZ	Maritime NZ is the national regulatory, compliance and response agency for the safety, security and environmental protection of coastal and inland waterways. They are governed by a five-member board appointed by the Minister of Transport under the Maritime Transport Act 1994. FishServe uses Maritime NZ services to confirm MSA numbers for vessel registrations and shares information with Maritime NZ via the commercial fishing vessel register.
Seafood Industry	FishServe provides administrative services to the New Zealand commercial fishing industry. FishServe clients are the entities involved in the industry including vessel owners, fishing companies, owner/operator fishers, Quota owners, Te Ohu Kaimoana and Iwi.
Stakeholder Representative Entities (SREs)	Stakeholder Representative Entities are sector based organisations that represent and manage the specific affairs of a particular species. There are five main sector organisations: • Aquaculture New Zealand • Deepwater Group Limited • NZ Rock Lobster Industry Council Ltd • Paua Industry Council Ltd • Fisheries Inshore New Zealand FishServe provides company administrative services to SREs along with some value-add services such as ACE shelving, sub-area reporting and data collection.
Commercial Stakeholder Organisations (CSOs)	Commercial Stakeholder Organisations (CSOs) are companies or associations owned by rights-holders that represent the interests of those rights-holders. In effect, this means CSOs can represent and manage the specific affairs of a particular fishery, a geographic area, a specific fish stock or a group of stocks. FishServe provides company administrative services to CSOs.

Other Industry Organisations	**There are a number of other industry organisations that represent various fishing entities, such as;** • **New Zealand Federation of Commercial Fishermen** • **New Zealand Fishing Industry Association** **FishServe provides company administrative services to these other industry organisations.**

Source: https://www.fishserve.co.nz/About

This means that, in order to prosecute fishing companies for legal breaches, the government regulator, MPI, has to rely on data collected and provided by a company owned by the fishing companies themselves – clear conflict of interest.

PI 1.2.3. Page 166

"The draft report states that "Electronic reporting and video monitoring on small vessels (<28 m) will be gradually introduced over an extended period."

Last year, the previous NZ government had announced plans to install video cameras on fishing vessels, saying it would protect the sustainability of fish stocks and act as a deterrent against illegal activity, like fish dumping. MPI Fisheries spokesman Gerry Brownlee had said that the rollout of cameras was needed to deal with well-publicised problems in the sector. However, earlier this year, news emerged that these plans may be abandoned as a result of industry opposition. There are therefore no current plans to install video monitoring across the NZ fleet, including hoki vessels to address these problems.

The fishing industry subsequently petitioned the government to prevent public access to videos and images of fish being discarded and seabirds and marine mammals being caught by fishing boats. Amongst the reasons cited were commercial sensitivity, privacy and a reputational risk to the industry, MPI and New Zealand's clean, green image. In a letter to the Ministry for Primary Industries (MPI) the Deepwater Group, Fisheries Inshore New Zealand, the Paua Industry Council, Seafood New Zealand and the New Zealand Rock Lobster Industry Council on July 4, 2017 asked the government to change the law so that the Official Information Act could not be used by to make such information publicly available. One of the five industry heads who signed the letter said there needed to be an exemption so the footage was never made public. "Ensuring New Zealand had a good reputation for ethically caught fish was up to the industry, not the government," he said.

In his response of 15th September 2017, the Minster's stated that "At this stage there is nothing to suggest that the risks associated with privacy or commercial sensitivity arising from GPR & ER are significantly different from those already being managed under the existing MPI data management processes. An initial consideration of the potential harms of releasing of GPR & ER data has not identified issues that cannot be addressed under the existing framework of the Official Information Act (OIA) and MPI's processes for handling OIA requests"

When video monitoring was made compulsory in Australia, reported bycatch increased seven-fold. As of 26th May 2018, no formal decision on the matter has been communicated.

REVIEWER CONFLICT OF INTEREST

We would also like highlight a potential reviewer bias and lack of independence among at least one member of the Expert Team. Page 18 of the draft assessment report states that Jo Akroyd had been employed by the New Zealand Ministry of Fisheries (now MPI) for 20 years. During this time, she "was awarded a Commemoration Medal in 1990 in recognition of her pioneering work in establishing New Zealand's fisheries quota management system," QMS. It stands to reason that Ms Akroyd is therefore more invested in a positive evaluation of the New Zealand fishery under the QMS than an independent reviewer.

CONCLUSION

The New Zealand's hoki fishery is a far cry from being the posterchild for sustainable fisheries management it is portrait as. The issues raised in our comments and elsewhere indicate significant and longstanding illegal and unsustainable activities in the New Zealand hoki fishery.

To quote Metuzals et al. (2006), "If misreporting is ignored, and catch data are worthless, what you have is an uncontrolled fishery." The current system of fisheries management in New Zealand provides powerful incentives to misreport catches. Revising the QMS to remove these incentives and end the financial rewards of misreporting is a priority. Until this happens and observer coverage is raised to facilitate robust bycatch estimates, the current unsatisfactory state of affairs will continue.

It is of grave concern that the issues raised by Bremner 2009, Simmons et al. 2016, Slooten et al. 2017, MPI's compliance reports (Achilles, Hippocamp, Overdue and Bronto), as well as the recent independent review of MPI's conduct by Queen's Counsel Michael Heron's have been ignored or dismissed by the MSC assessors and so have not informed the certification process. In the case of the MSC hoki draft assessment report, failure to do so clearly undermines the robustness and credibility of its conclusions and the validity of the MSC hoki certification itself.

It is particularly damaging to the credibility and reputation of the New Zealand hoki fishery and by proxy, the MSC itself, that clear evidence of significant wrong-doing has been kept hidden for many years (e.g., Bronto report). Fish consumers around the world have been deliberately misled about the environmental credentials of the hoki on their plate, while being fed an illusion of beautiful fish harvested sustainably in a natural paradise. The bitter reality behind this curtain of duplicity is therefore all the harder to swallow.

The picture of fisheries and hoki management in New Zealand that emerges from the various strands of evidence presented here and elsewhere is less than complimentary. However, besides providing an uncomfortable reality check, it also has to potential to trigger a much-needed transformation towards genuine sustainability. Maintaining the defunct and destructive *status quo* does a disservice to New Zealand's marine environment, its citizens and future generations, and ultimately the fishing industry itself. It is our sincere hope that rather than reward lip service, the MSC will embrace its mandate and act as a catalyst for change.

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CAB Response

This comment is applicable to hoki only and we have responded to NABU's comments in the Hake, hoki and ling trawl Final Report available here.

Greenpeace

Contact Information Make sure you submit your full contact details at the first phase you participate in within a specific assessment process. Subsequent participation will only require your name unless these details change.				
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Assessment Details	
Fishery	New Zealand Deepwater Group Hake Hoki Ling and southern blue whiting
CAB	

Comment	Nature of Comment	Justification Please attach additional pages if necessary.
☒ I wish to provide general comments about the assessment of this fishery against the MSC Fisheries Standard.	The fishery fails principle 3, effective management	I have attached my comments at the end of the form

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25 May 2018

RE MSC certification of the New Zealand Hoki fishery

Dear Acoura,

Your organisation is currently assessing the NZ hoki fishery as part of an MSC approval process. This submission is opposing the re-certification of the fishery on the grounds that it is so poorly managed and regulated that it could not possibly meet the criteria for sustainability.

You should be aware that crucial information about the fishery provided by the fishing companies and the Ministry of Primary Industry (MPI) is untrue, and they are well aware that it is untrue.

The evidence for this is the leaked internal reports produced by the compliance division of MPI (into which the Ministry of Fisheries was merged). One of the most important of these internal reports, which we released yesterday, can be found here.

The report, "Compliance Risk Profile of West Coast/East Coast South Island Hoki fishery", published on 21 March 2012 by the Ministry of Fisheries compliance division, makes for sobering reading. It is based on a very large operation called Operation Bronto from 2011. It shows:

- widespread and systematic under-reporting of catch on a massive scale;
- routine fish dumping of juvenile hoki and other quota species;
- the targeting of zones with high concentrations of juvenile fish;
- systematic manipulation of declared carton weights;
- bycatch of sharks, eels, and other fish are routinely under reported or in other cases; fraudulently over reported to cover up the under reporting of quota species; and
- that these activities were carried out by the biggest fishing companies operating in New Zealand.

The report was hidden by MPI and the conclusions and 45 recommendations of the report were not known publicly until Greenpeace released it today. The report tells us the true state of the management and regulation of the New Zealand hoki fishery. It has unleashed a wave of controversy in New Zealand.

The senior officials at MPI are now attempting to defend the indefensible: why were there no enforcement actions in light of this mountain of evidence – no fines; no prosecutions. Their answers are effectively that they don't prosecute the big fishing fleets; they talk to them to attempt to make them change.

This approach is fundamentally unsound. The New Zealand QMS creates strong financial incentives to illegally under-report catch of quota species and to dump low value quota species. These incentives are well understood. The main disincentive to these behaviours is enforcement of the rules by the regulator, resulting in prosecutions with the risk of convictions, fines, jail time and forfeiture of vessels. The regulator, MPI, has now publicly stated that it will not prosecute illegal behaviour by the largest fishing fleets.

That means the under-reporting and dumping will continue because without real fines and punishments fishing companies have financial incentives to break the law and routinely do.

This is not a one-off occurrence. When Greenpeace leaked an earlier enforcement report, Operation Achilles, which showed widespread illegal dumping in the inshore fishery, MPI failed to prosecute in spite of video evidence. MPI argued that they had legal advice that they couldn't prosecute on the evidence available, however that claim turned out to be false: the legal advice never existed. The senior officials at MPI blocked the prosecution in spite of the evidence.

The fishing industry and MPI are now claiming that the under-reporting and dumping exposed in Operation Bronto seven years ago no longer exists. They have provided no evidence to back up this claim. The financial incentives for fishing companies to under-report and dump remain in place. And MPI have made it very clear that there are no serious enforcement disincentives to discourage this behaviour. Hence we can safely assume that things are the same in the New Zealand hoki fishery. And that is completely at odds with the principles of MSC and sustainability.

In closing, it is very clear that MSC Principle 3, Effective Management, can in no way be satisfied for hoki.

Please keep Greenpeace NZ as a stakeholder and an objector informed as to your next steps.

Yours sincerely

Dr Russel Norman

Greenpeace New Zealand Executive Director

Greenpeace also provided a version of the '2011 Compliance Risk Profile of the West Coast/East Coast South Island Hoki Fisheries' report (which they refer to in their submission). The final, official report can be read here.

CAB Response

The leaked reports only became available the day before Greenpeace submitted the comments to the PCDR. Acoura are very careful to verify verbal and documented information; we were not aware of this report's existence. The MSC process actively welcomes and is strengthened by stakeholder involvement – this is a good example. We've reviewed the information Greenpeace have brought to our attention. As noted above, the report provided by Greenpeace is not in it's final, official form.

In 2010, the then Ministry of Fisheries began a new approach to monitoring compliance in the deep-water and middle-depth fisheries. The approach was based on proactive profiling of specific fisheries rather than the reactive investigation-driven approach of the past.
The four components of profiling comprise i) an initial desktop exercise to compile available data, ii) a detailed data and information collection programme primarily involving observers and fishery officers, iii) an analytical phase which analyses all available data to inform the report and iv) an outcomes phase using the VADE model.[6]

The hoki fisheries on the West Coast of the South Island and Chatham Rise were the first to be profiled. The main focus of data collection related to issues that could impact the accuracy of reported greenweight.
The Risk Profile operations assess the likelihood and consequence of potentially non-compliant behaviours. Compliance Risk Profiles in themselves are non-evidential. They inform MPI and industry of potential risks and cue information needs to inform follow-up compliance investigations (e.g. by Fisheries Officers or at-sea observers). Risk Profiles can also identify issues that instead of enforcement action see changes to the policy settings (e.g. changes to the conversion factor or to product specifications/prescribed cuts).

The 2011 hoki risk profile identified compliance risks indicating potential issues regarding catch reporting, incorrect reporting of carton weights, incorrect application of conversion factors into fish meal and processed products, and incorrect reporting of target and bycatch species;44 recommendations were made. MPI Compliance has estimated that, if the purported non-compliance was systemic across the fishery, then potentially around 3,500 tonnes (3% of the TACC) of hoki might have been unreported. This estimate is indicative only and does not account for potential over-reported catches or subsequent redeclaration of catches.

Fisheries NZ have reported on the recommendations and subsequent actions.

The 44 recommendations were categorized into five groups

1. **On-board practices (14)**
2. **Suggestions for changes to reporting and recordkeeping obligations (6)**
3. **Fishing practices (3)**
4. **Fisheries management processes (13)**
5. **Compliance processes (8)**

1. Recommendations relating to on-board practices (14)

This group of recommendations related to a series of fleet-wide, on-board practices, most of which have the ability to impact the accuracy of greenweight reporting of all species, not just hoki. For this reason, this group of recommendations has been the subject of ongoing follow-up and monitoring ever since the report was completed.

[6] VADE means voluntary, assisted, directed, enforced

Some of this group of recommendations were generic while others related to how an individual vessel or company dealt with or approached specific issues. Follow-up activity took place either with individual companies or collectively with vessel operators.

Glaze deduction (recommendations 6 and 23)
Before frozen product is packed, it is frequently glazed to prevent freezer burn. The process involves applying water to product after the initial freezing process (e.g. plate freezers) but before the product is packed and stored in the hold. Some of the water freezes on contact with the frozen fish and acts as a protective layer.

The consequence of applying glaze is that it adds additional weight to the product. At the time the assessment report was written, it was common practice for companies to apply a standard 2% glaze deduction. That is, 2% was deducted from the average container weight regardless of how much glaze was actually applied.

Since 2012, MPI has worked with vessel operators to ensure that they have robust on-board practices for testing and documenting how much glaze is applied. MPI observers undertake independent glaze testing and monitor vessel's glaze testing processes. Glaze records are available to Fishery Officers on request.

A standard 2% deduction is no longer acceptable and any deduction from glaze must be evidence-based. For the vessels that have Compliance Plans (foreign-owned vessels), audits of those plans have confirmed that permit holders are maintaining records to support any glaze deduction.

Fish to meal quantification (recommendations 22 and 40)
Most factory vessels have on-board fish meal plants, which provide a means of obtaining value from both unwanted and damaged fish and the remaining parts of processed fish (heads, frames, skins etc). On these vessels, there are several different parts of the factory that can provide a source of fish that goes to meal.

Since 2011, MPI has worked with vessel operators to ensure that they have identified all sources of fish to meal and that they have developed robust, auditable processes for documenting how fish to meal is quantified for each of those sources. MPI observers routinely monitor adherence to vessel processes.

Accuracy of product weight (recommendations 7, 9, 10, 11, 13)
All fishers are required to report the weight of fish as greenweight (the weight of fish before any processing commences and before any part is removed). Fishers are allowed to do this retrospectively by multiplying the weight of processed fish by a conversion factor.[7]

The issue of having strong product weight processes both at-sea and on land is critical as a small amount of under-reporting on a per-unit basis can translate to several tonnes per trip. This is particularly relevant in circumstances when a fishing vessel produces several thousand containers of a particular product type during a trip.

Since 2011, MPI has worked with vessel operators to ensure that both at-sea weighing systems and on-land quality control processes are such that product weights are determined as accurately as possible. Additionally, MPI observers routinely undertake independent

[7] A conversion factor is a number that a particular fish processed to a specific state must be multiplied by to derive greenweight.

product weight testing at sea, while Fishery Officers audit product weights during routine inspections.

Discarding (recommendations 8, 12, 38 and 42)
The recommendations relating to discarding primarily related to vessels that were foreign charter vessels. Since 2012, all such vessels have been subject to mandatory observer coverage requirements, and a high proportion of these foreign vessels have left New Zealand waters.[8]

One recommendation related to an incident on a specific vessel. The outcome of that recommendation was a change to a landing report to reflect an increased quantity of fish accidentally lost at sea.

Product labelling (recommendation 24)
This recommendation related to the accuracy of product labelling i.e. that product labelled as containing a particular grade must contain fish of that grade. Vessel operators have been reminded of this obligation regularly ever since the report was released.

2. Recommendations relating to reporting and recordkeeping obligations (6)
The 2011 report made several recommendations (numbers 1, 14, 15, 16, 18 and 26) relating to vessel operators' reporting and recordkeeping obligations. Most of these recommendations were not specific to the hoki fishery and reflected the desire of the report's authors for enhancements to the reporting and recordkeeping obligations that applied at the time. The recommendations did not highlight any areas where the information required to be recorded by fishers was inadequate for management purposes.
No changes to reporting or recordkeeping regulations were progressed as a direct result of the recommendations. However, some issues were followed up directly with vessel operators. Outcomes of the follow up included clarification of reporting obligations and arrangements to make additional information available to MPI on request.

3. Recommendations directed at fisheries management (13)
A number of recommendations were directed at fisheries management and covered a range of topics, many of which were not specific to the hoki fishery.

Hoki management areas (recommendations 3, 20, 21 and 44)
Hoki Management Areas (HMAs) are a Deepwater Group initiative to manage and monitor fishing effort in defined areas where there is a relatively high abundance of juvenile hoki. Within HMAs, operators of trawlers >28m in length are to refrain from targeting hoki. Since 2009, MPI has been auditing vessel performance against the HMA Operational Procedures and providing quarterly reports to the Deepwater Group.

The HMA Operational Procedures are a voluntary fishing industry initiative, as opposed to a regulatory measure under the Fisheries Act 1996. This means that although Compliance may choose to monitor adherence to the Operational Procedures, no directed or enforced action can be taken if fishers are found to be breaching the Operational Procedures.

At the time the report was released, Fisheries Management was satisfied that the existing processes relating to monitoring fishing effort in HMAs were fit for purpose. Quarterly reports continue to be provided to the Deepwater Group, which undertakes follow-up action if a vessel operator is behaving in a way that is inconsistent with the HMA Operational Procedures.

[8] In 2016 an amendment to the Fisheries Act 1996 came into force that required all foreign-charter vessels to become New Zealand flagged. As long as the vessels remained foreign-owned, the mandatory observer coverage requirement continues to apply.

Vessel specific conversion factors (recommendation 17)
The Fisheries Act 1996 provides for conversion factors to be issued on a vessel-specific basis. The provision is most often used by the hoki fillet vessel fleet.

Although not a direct outcome of the 2011 Hoki Risk Profile Report, the process by which vessel specific conversion factors are managed was amended in 2015. Key changes to the process include:

i) **MPI observers are tasked with undertaking conversion factor testing any time they are on a vessel for which the operator has been issued a vessel specific conversion factor certificate. Previously, testing was only carried out on dedicated conversion factor sampling trips, which may not have been representative of processing; and**
ii) **Vessel operators must account for all trimmings, which reduces the incentive to trim more lightly during conversion factor testing**

Other topics in this category of recommendations included:

- **Considering adding hoki to Schedule 5A of the Fisheries Act 1996 meaning that the provisions allowing annual catch entitlement (ACE) to effectively be carried forward from one fishing year to the next would not apply (*recommendation 25*).**

  This recommendation was not considered by Fisheries Management as hoki did not meet the policy criteria for addition to this schedule i.e. hoki is not a high-value, single-species fishery.

- **Species identification / use of generic shark codes (*recommendations 29 and 30*)**

  Vessel operators have been reminded by the vessel owners and fishing companies of the obligation to ensure accurate species reporting regularly ever since the report was released. The issue of reporting of shark species, and trying to reduce the use of generic species codes, has been included in the Deepwater Fisheries Management's Annual Operational Plan since 2011/12

- **Direct access to observer data (*recommendation 34*)**

  Observer data has always been available to staff within fisheries management and compliance on request or, more recently, directly via a database access tool.

- **Discrepancy reporting (*recommendation 35*)**

  Although not a direct outcome of the report, there has been ongoing development of automated discrepancy reports since a new reporting tool became available in 2012.

- **Mobile LFR status should not be applicable to fishing vessels (*recommendation 36*)**

  No action was taken to give effect to the recommendation that fishing vessels should not be given mobile Licensed Fish Receiver status. No vessels known to fish for hoki currently have mobile LFR status.

- **The allowance within the Total Allowable Catch for other sources of fishing-related mortality should be commensurate with estimates of highgrading for the West Coast South Island hoki fishery (*recommendation 37*)**

Within the Total Allowable Catch (TAC), the Minister of Fisheries includes an allowance for all other sources of fishing-related mortality (OSFRM). This allowance is intended to provide for fish mortality that is not reported including loss due to burst nets or intentional discarding.

For hoki, the approach taken since 2004 has been to set this allowance at 1% of the total allowable commercial catch (TACC). This means that under the TACC of 150,000 tonnes that was set on 1 October 2015, the OSFRM was set at 1,500 tonnes.

Fisheries Management accepts the desirability for a more informed OSFRM allowance to be included within the TAC and will be actively considering how best to give effect to this principle during future TAC reviews.

- **Develop fact sheet on highgrading (*recommendation 43*)**

Vessel operators have been regularly reminded of the obligation to report all fish they catch ever since the report was released.

4. Recommendations relating to fishing practices (3)

The report contained three recommendations regarding the development of codes of practice: development of a West Coast South Island (WCSI) HMA (*recommendation 2*); a reduction on long tows (*recommendation 4*); and reducing the practice of "soaking nets" (*recommendation 5*)[9].

The development of a WCSI HMA was never progressed as the area is generally a spawning area, and therefore is not recognised as being an area with high abundance of juvenile hoki.

Regarding the other two recommendations, these fishing practices are not, in themselves, inconsistent with regulations and are not a compliance risk. They may, however, lead to compliance risks as, for example, long tows may result in higher quantities of damaged fish and soaking nets implies that the vessel is catching fish at a higher rate than it can process. In both examples, the compliance risk is that damaged fish, or fish that is in poor condition after spending an extended period of time in the pounds, will be illegally discarded. Vessel operators have been regularly reminded of the need to ensure fishing strategies minimise damage to hoki ever since the report was released.

5. Recommendations relating to compliance processes

The report contained 8 recommendations (*numbers 19, 27, 28, 31, 32, 33, 39 and 41*) that related to business processes within MPI Compliance.

No specific training for Fishery Officers on identification of non-compliance with fillet state definitions was undertaken (*recommendation 19*). Although not a direct outcome of the 2011 Hoki Risk Profile Report, the changes to the vessel specific conversion factor process (as outlined in the earlier discussion on recommendation 17) meant that operators of fillet vessels could pack fillets in any form they wished, provided all parts of a fillet were accounted for.

[9] The term "soaking nets" refers to the practice of lifting the trawl net off the bottom and away from fish, and towing the net until such time as sufficient factory space becomes available to process the catch.

Recommendations 27 and 28 related to aspects of the functionality of an electronic catch effort reporting tool that was never developed.

Recommendation 31 related to accurate reporting of fish going to meal. One component of this recommendation, developing techniques for quantitative speciation of fish to meal, has been investigated but has proven problematic. The other component of the recommendation, engagement with vessel operators has been progressed, with operators being requested to document and submit vessel procedures relating to the quantification and reporting of whole and processed fish to meal. Currently, procedures are periodically verified and audited by Observers and Fishery Officers.

Inshore and "fresher" vessels have not been included in the hoki profiles (*recommendation 32*), however some monitoring of the inshore fleet has occurred since 2012 and future monitoring has been planned.

Vessel inspection templates continue to evolve (*recommendation 33*) to ensure information is gathered in a consistent manner and have been used as a guideline in subsequent hoki inspections since 2012.

Recommendations 39 and 41 related to HMAs and investigating non-compliance with fisheries legislation by vessels fishing in those areas. Any evidence of non-compliance with legislation, including the specific aspects of non-compliance identified in those recommendations, is investigated by MPI regardless of where a vessel is fishing and appropriate action taken where necessary.

In reference to Greenpeace's concerns over the lack of prosecutions, a ***summary of prosecutions*** (please see Table below) was provided to the assessment team. By MPI. In all cases the vessels were forfeited and none have returned to the fishery.

Vessel (x defendants)	Dates of offending (Year convicted)	Total Fines	Amount of fish illegally discarded **(as per Court's decision)**	Vessel forfeited
Vessel A (3 x defendants)	May to July 2007 (convicted 2009)	$147,500 + costs of $140,111.67	'At least 12 tonnes was discarded but likely much more than this. From the estimates given (and whether it was 12 or 50 tonnes) there was substantial quantities.' (primarily Hoki)	Yes.
Vessel B (5 x defendants)	March to June 2011 (convicted 2012)	$524,500	347 tonnes of ITQ fish species (including Hoki)	Yes…Vessel owner in memo to Court has agreed to pay $750,000 relief from forfeiture. This is delayed due to a third party currently taking action on behalf of Indonesian crew.

Vessel C (1 x defendant)	December 2010 to October 2011 (convicted 2014)	$127,500	74 tonnes ITQ fish (primarily Hoki)	Yes…Vessel owner in memo to Court has agreed to pay $525,000 relief from forfeiture.
Vessel D (2 x defendants)	June 2012 and January 2013 (convicted 2014)	$111,140	120 tonnes of hoki over seven trips	Yes…$145,428.41 paid by company as relief from forfeiture
Vessel E (3 x defendants)	2011 (convicted 2015)	$298,500	70-300 tonnes of Barracuda 200-500 tonnes Hoki	Yes…Company walked away from vessel. Vessel remained forfeited and was sold for scrap.
	TOTALS	**$1.349 million in fines**	**823,000kgs to 1,391,000kgs of ITQ fish**	

MPI is working with the New Zealand Defence Force to carry out a follow up exercise for the 2018 West Coast South Island hoki fishery. As of 30th June 2018, 11 vessels have been boarded at-sea and inspected.
Additionally, MPI observers on board hoki boats continue to collect data that supports ongoing analyses of conversion factors, adherence to processed state definitions, and adherence with the law.

Greenpeace were also concerned there were financial incentives to illegal under-report catch of quota species and to dump low value species. All catches of species managed under the QMS are required by law to be accurately recorded, reported and landed with a few prescribed exceptions for landings. Deemed values prevent an incentive for dumping. Deemed values are payable for
QMS species caught without balancing ACE (Annual Catch Entitlement). Where deemed values are payable for QMS species taken without balancing ACE, the deemed value is set at a level to remove any financial benefit to industry to catch but at a level that will not incentivise what would be illegal discarding. The penalties for discarding QMS species without authorisation are severe, further reducing the incentives to discard.]

Following a review in 2011 of the operation of foreign vessels operating under charter to New Zealand in 2011, at least one MPI observer was placed on all foreign-chartered vessels from 1 October 2012. From 1 May 2016, all vessels were required to re-flag to New Zealand, however MPI has continued to place at least one observer on board all foreign owned vessels operating in New Zealand waters. This has resulted in an increase in total coverage across a range of deep-water fisheries, in particular those with a high level of fishing effort by foreign owned vessels.
In general, this has resulted in an increase in observer coverage on trawl vessels >28m LOA from around 20% to around 45% of tows observed per year, with up to 100% coverage on vessels deemed to be “high risk”.
In conclusion, the assessment team have reviewed the issues raised by Greenpeace as a result of reading the leaked compliance report. MPI have provided evidence to support their stance that the issues raised by Operation Bronto have been addressed. The evidence above shows the report resulted in a number of recommendations, improvements and

prosecutions. The review of the present state of compliance within the fishery, show that P3 management requirements according to the MSC standard are met. No changes to the scores are required.

WWF

Contact Information Make sure you submit your full contact details at the first phase you participate in within a specific assessment process. Subsequent participation will only require your name unless these details change.				
Contact Name	Peter	Hardstaff		
Title				
On behalf of (organisation, company, government agency, etc.) – *if applicable*				
Organisation	WWF			
Department				
Position	Environmental Campaigns Manager, WWF New Zealand			
Description	WWF's mission is to stop the degradation of the planet's natural environment and to build a future in which people live in harmony with nature, by: • conserving the world's biological diversity • ensuring that the use of renewable natural resources is sustainable • promoting the reduction of pollution and wasteful consumption.			
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Assessment Details	
Fishery	New Zealand Deepwater Group hake, hoki, ling and southern blue whiting
CAB	Acoura

	Assessment Stage* Clicking on the section numbers will bring you to the appropriate section for providing input to the respective assessment stage. It is only necessary to complete those sections corresponding to stages where you wish to comment.
	Fishery announcement and stakeholder identification—go to section 1 Opportunity to indicate that you are a stakeholder and identify other stakeholders.
X	**Defining the assessment tree—go to section 2** Opportunity to review and comment on the assessment tree in relation to the fishery if a modified tree is used.
	Information gathering and stakeholder meetings—go to section 3 Opportunity to engage with and provide information to the CAB about the specific details and impacts of the fishery.
X	**Public review of the draft assessment report—go to section 4** Opportunity to review and comment on the draft report, including the CABs draft scoring of the fishery.
	Annual surveillance—go to section 5 Opportunity to provide information to the CAB about any changes in the fishery since certification and/or the achievements made towards conditions.
* Note, to register an objection following the publication of the Final Report and Determination, please see www.msc.org/get-certified/fisheries/assessment/objections.	

• SECTION 4 • Return to Page 4

Assessment Stage	Fishery	Date	Name of Individual/Organisation Providing Comments
☒ Public review of the draft assessment report[4] **Opportunity to review and comment on the draft report, including the draft scoring of the fishery.**	**New Zealand Deepwater Group hake, hoki, ling and southern blue whiting**	**25 May 2018**	**WWF**

☐ I wish to comment on the evaluation of the fishery against specific Performance Indicators.
A table with these indicators and the scores and rationales provided by CABs can be found in Appendix 1 of the draft assessment report.

Nature of comment *(Please insert one or more of these codes in the second column of the table below for each PI.)*

1. I do not believe all the relevant information[5] available has been used to score this performance indicator *(please provide details and rationale)*.
2. I do not believe the information and/or rationale used to score this performance indicator is adequate to support the given score[2] *(please provide details and rationale)*.
3. I do not believe the condition set for this performance indicator is adequate to improve the fishery's performance to the SG80 level[3] *(please provide details and rationale)*.
4. Other *(please specify)*

Performance Indicator	Nature of Comment Indicate relevant code(s) from list above.	Justification Please support your comment by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.
Example: PI 1.1.2, Stock Rebuilding	**2**	**The CAB gave a score of 80 for this PI. The 80 scoring guidepost asks that there is evidence that rebuilding strategies 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 the timeline specified. However, no timeline has been specified based on previous performance or simulation models.** *[add more rows as needed]*

Comment	Nature of Comment	Justification Please attach additional pages if necessary.
☒ I wish to provide general comments about the assessment of this fishery against the MSC Fisheries Standard.	Other (Process Issues): Fishery assessed against FCRv1.3; assessment delays	Please see attached.

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25 May 2018

WWF's concerns regarding the process for re-assessing hake, hoki and ling

Dear Acoura Assessment Team,

We are writing to express our serious concerns regarding potential procedural errors in the re-assessment of the New Zealand Deepwater Group Hake, Hoki, Ling and Southern Blue Whiting fisheries. These fisheries are significant not only for their economic importance but also because of the impacts they can have on the marine environment, in particular through the use of bottom trawling and through the bycatch of threatened species.

Of greatest concern is that we understand MSC actively intervened in order to enable two of the four fisheries to be re-assessed using the old MSC 1.3 requirements, and not the current, improved MSC 2.0 requirements that should be being applied to all fisheries.

WWF has, as much as possible, been an active stakeholder in the NZ fishery assessments since 2001 and in the early stages of development we invested major resources to constructively work on improvements in the hoki fishery and to uphold a rigorous interpretation and implementation of the MSC standard. We recognised the areas of good performance in these fisheries and welcomed their improvements in practice. However, we also identified limitations in the management and became increasingly frustrated that our comments, especially in relation to Principle 2, were mostly neglected during the last assessments.

We acknowledge that we are raising these concerns partway through the process, but it is not possible for WWF to fully engage in every MSC assessment, surveillance audit and re-assessment. However, ideally, clear procedures and robust systems should not need constant scrutiny. It is therefore both troubling and disappointing to find that the MSC's requirements are not being correctly applied and that the most up to date standard (MSC 2.0) is not being used to re-assess hake and ling.

As a result, necessary improvements in the environmental performance and the commitments of these fisheries will be postponed for another 5 years.

Several variation requests have been granted in regard to the re-assessment of these fisheries that we believe are not consistent with MSC requirements, and which could undermine the integrity of the MSC standard. MSC requirements should be met across all fisheries and only in exceptional and well-justified circumstances should be there any variations. However, we do not believe such exceptional circumstances existed in these recent re-assessment processes.

We provide more detail on these concerns below.

Variation requests Hake and Ling 03/04/2017: Fisheries entered re-assessment under FCR v1.3 and having had only two surveillance audits.

Two of the four fisheries in the combined re-assessment have certificates that are valid until 15th September 2019 (hake and ling) and therefore should be re-assessed applying the MSC 2.0 standard (v2.0 FCR-7.23.7). We therefore do not understand why MSC granted two standard variation requests allowing them to prematurely enter re-assessment shortly before the MSC 2.0 implementation timeframe ended. In order to allow four NZ certified fisheries to go through reassessment at the same time it would have been more consistent that all four fisheries had to apply the MSC 2.0 requirements and not to gift two fisheries additional years to be certified with the outdated standard. There are no exceptional, well-justified circumstances why the hake and ling fisheries should not progress with the same speed as the other fisheries that achieved certification in 2014.

The differences between the MSC 2.0 and MSC 1.3 requirements are not trivial. For example, a new requirement has been introduced for fisheries to regularly review bycatch mitigation measures, and implement them where appropriate, so as to minimise mortalities of unwanted catch or of ETP species (PI2.1.2e, PI 2.2.2 e, PI 2.3.2 e). Also habitat protection requirements were improved in FCRv2.0 and are now more in line with the FAO Guidelines, including definitions of vulnerable marine ecosystems (VMEs) and additional requirements for their protection (SA 3.13.3.2, PI 2.4.1 b, PI 2.4.2d).

MSC 2.0 also requires a cumulative impact analysis of all MSC certified fisheries in the area, including the habitat impacts. We understand that the client has, by bundling the four fisheries together, enabled the CAB to undertake such an analysis but we are concerned that this analysis will not take into account the impacts of the other MSC certified fishery – orange roughy – that crosses over some of the same fisheries management areas as hake, hoki and ling.

We would also like to highlight the non-transparency of the variation requests for hake and ling (variation request 03/04/2017). The CAB explicitly stated that this change (earlier re-assessment) doesn't impact the assessment while in reality it has major consequences for the assessment (i.e. which assessment tree is used). Stakeholders were not informed about this implication.

Variation request New Zealand Deepwater Group Hake, Hoki, Ling and Southern Blue Whiting 16/02/2018: Delay in PCDR

Acoura was not able to finalize the PCDR within the planned timeline. CR procedures relating to v2.0 FCR-7.3.4 state that if the period from full assessment announcement to the receipt of the Public Comment Draft Report by the MSC exceeds 9 months the CAB shall open a new consultation phase and review the outcomes of any scoring of the fishery previously undertaken against the most recent version of the MSC Certification Requirements (7.3.4.3 b). This would have been the correct procedure. However, a variation request was made and granted although there were no exceptional circumstances supporting such request. As justification for the variation request Acoura stated that the team leader had been absorbed into a separate fishery objection procedure that was unplanned and required a heavy burden in workload. And it was not considered appropriate to replace the team member given the expertise required for the reassessment of the Deepwater Fisheries.

Acoura is referring to the re-assessment and objection procedure of the PNA Western and Central Pacific skipjack and yellowfin, un-associated / non FAD set, tuna purse seine fishery. However, the heavy burden in workload and the objection in this certification process were definitely not unforeseeable or exceptional. On the contrary, an extensive and very critical stakeholder submission was provided to the PNA assessment

team as early as October 2016. The subsequent stakeholder input after the publication of the PCDR in June 2017 was again very critical, detailed and extensive and the stakeholder already complaint that the issues raised during site visit and the previous submission were not appropriately addressed by the assessment team. At this point in time it was already foreseeable that an objection would be raised if the CAB decided to certify this controversial fishery. Additionally, we cannot follow the rationale why the team member's special expertise was irreplaceable in both fisheries, given the fact that the two fisheries (PNA purse seine tuna and NZ deepwater) target different species, impact different ecosystems, utilize different gear types and operate under different management systems.

Insufficient personnel resources and time mismanagement by the CAB cannot be treated as exceptional circumstances.

We would also like to highlight that MSC set the following condition for granting the variation request: "The CAB can confirm the fishery remains in adherence to the MSC requirements". However, two months later the CAB had to acknowledge that one Unit of Assessment does not meet the MSC requirements (variation request 10/04/18).

Variation request New Zealand Deepwater Group Hake, Hoki, Ling and Southern Blue Whiting 10/04/18: Delay in PCDR

Again, Acoura was not able to finalize the PCDR within the planned timeline. The MSC standard dictates that in such a circumstance, the CAB should open a new stakeholder consultation phase and review the scoring outcomes against MSC 2.0.

However, the CAB explained that "due to other commitments the peer reviewer is currently unavailable". This raises the question why it was not possible for the CAB and peer reviewer to agree on a fixed "time window" for review. This should have happened two months ago before the first deadline variation request was submitted to MSC (16/02/2018). Again, insufficient personnel resources and time mismanagement by the CAB cannot be treated as exceptional circumstances.

We hope that you will be able to respond to these concerns, particularly in relation to the application of MSC 2.0, because although WWF may not be able to fully engage with these re-assessments it is vital that the correct standards and procedures are applied in order to maintain the integrity of the MSC.

Yours Sincerely,

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CAB Response

Variation requests Hake and Ling 03/04/2017

We accept that the WWF's suggestion to reassessment using 2.0 is a valid option, but we followed procedure according to the MSC implementation timelines and a variation request was given by the MSC. The CR is clear that fisheries entering assessment before the 1st October 2017 can continue to use V1.3.

The MSC process does not allow for consultation during the variation request process. Stakeholders were notified of the posting of the request and MSC's response, and if there are queries we welcome feedback at that point.

Variation request New Zealand Deepwater Group Hake, Hoki, Ling and Southern Blue Whiting 16/02/2018: Delay in PCDR

The objection to the PNA fishery was not upheld, and given the quality and quantity of the work put in we had every reason to believe the fishery would pass without an objection. Whether expected or not, the assessor's experience in both fisheries, regardless of whether they are different types of fisheries, meant removing them and replacing them would have has serious consequences for either fishery assessment. None of these decisions are taking lightly and without careful consideration of the consequences. We plan effectively, though we cannot foresee every situation and occasionally something has to give. Again, we followed procedure and requested a variation request which the MSC accepted.

At the time of the acceptance of this variation, with the information we had available we had no reason to believe the Southern Blue Whiting Unit of Certification (UoC) wasn't meeting the standard. As WWF correctly points out we withdrew the UoC as soon as we became aware of the change.

Variation request New Zealand Deepwater Group Hake, Hoki, Ling and Southern Blue Whiting 10/04/18: Delay in PCDR

It is impossible to agree on a 'fixed time window' for peer review, there are too many considerations for both the nominated peer reviewers and those responsible for the assessment to do so (NB. this should not be an issue in the future with the use of the Peer Review College). We strive to plan as much as possible but on this occasion, there was a clash of commitments and we dealt with this accordingly, again following procedure by submitting a variation which was accepted. We detailed the full circumstances and rationale in the request which were enough for the MSC to accept this as exceptional circumstances.

Deepwater Group

deepwater group

COMMITTED TO
HEALTHY OCEANS
SUSTAINABLE FISHERIES

26 May 2018

Public Comment Draft Reports for the New Zealand Hoki, Hake, Ling and Southern Blue Whiting Fisheries

Deepwater Group Ltd (DWG) would like to thank Acoura for their comprehensive re-assessments of New Zealand's hoki, hake, ling and southern blue whiting fisheries.

We offer some suggestions, corrections, and further information on these fisheries.

Ling longline recommendation

Acoura recommended for the ling longline fishery that:

"...a review of the data available from the increased observer coverage of the 2016/17 season is conducted at the earliest possible opportunity, to update the understanding of the fishery with respect to ETP species interactions."

While we support this being undertaken, this does not need to be included as a recommendation, as observer data are routinely reviewed by the Ministry for Primary Industries (MPI) and reported during their Environmental Engagement Forum meetings and in their Annual Review Reports.

Observer data from the 2016-17 season will be reported in MPI's Annual Review Report (ARR) for 2016-17. MPI have advised that this report has recently been completed and will be uploaded to their website in the near future.[1] Analyses of observer data from deep water fisheries are publicly available and are updated annually on the Dragonfly Data Science website.[2]

MPI advised at the Environmental Engagement Forum in April 2018 that they are planning 400 observer days in the ling longline fisheries (LIN3-7) during 2018-19.

Seabirds

Forest & Bird has expressed concerns with Salvin's albatross captures.

It is worth noting that the most recent risk assessment estimates that it would take more than 3,500 mortalities from fishing to adversely affect the Salvin's population. This number is well in excess of the estimated captures from the MSC Certified fisheries and is well in excess of the estimated captures from all New Zealand fisheries.

We understand that Forest & Bird has also raised concerns that best practice mitigation measures have not been identified or applied in New Zealand, that the NPOA-Seabirds has limited effectiveness and that fisheries are not demonstrating continuous improvement in bycatch rates.

New Zealand's NPOA-Seabirds is effective and includes all of the key components as outlined in the FAO Technical Guidelines for best practices to reduce incidental catch of seabirds.[3] These include:

- Mandatory mitigation measures

[1] https://www.mpi.govt.nz/growing-and-harvesting/fisheries/fisheries-management/deepwater-fisheries/
[2] https://data.dragonfly.co.nz/psc/
[3] http://www.fao.org/3/a-i1145e.html

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- Mitigation research, including the improved bird baffler design developed and tested for large trawlers in 2015 and a project which is assessing the factors contributing to net captures
- Education, training and outreach through the Environmental Liaison programme
- A comprehensive observer programme to assess bycatch and to collect data including reporting seabirds released alive, which no other country does
- Catch reduction objectives, including specific capture rate reduction targets developed and agreed for selected deepwater fisheries and included in the 2016-17 Annual Operational Plan (AOP, p.20-22 including Table 6 "Deepwater Capture Rate Reduction Targets")
- Monitoring and reporting of the implementation of the NPOA
- 5-yearly review of the NPOA, which is currently underway and should be completed this year, as well as annual reviews of capture estimates and observer data to assess whether further management or science is required when developing Annual Operational Plans.

The target seabird capture reduction rate for "Middle-depth trawl fisheries (>28m)", which includes hoki, hake, ling and some Tier 2 species, is 2.3 seabird captures per 100 tows (Table 6, p.22 of the AOP). The target is set for the end of the five-year period of the NPOA-Seabirds and based on a three-year rolling average. We don't have to hand the current rate for all "Middle-depth trawl fisheries (>28m)" as defined by this target. However, we can request this information from MPI and, meantime, can provide the rate for the hoki, hake and ling fisheries (>28m) which shows that the rate has been decreasing and averaged 2.48 captures per 100 tows over the last three years, despite an increase in observer coverage and an increase in birds released alive (Figures 1 and 2). Further, estimated captures for these fisheries has been reduced from 679 in 2002-03 to 250 in 2015-16, a 63% reduction. This was during a period of increased observer coverage, increasing the certainty of observation and increasing the focus on observing and on recording these occasional capture events.

The AOP also outlines the planned services for 2016-17 to continue to progress the five-year objectives of the NPOA-Seabirds and to reduce captures further (p.23).

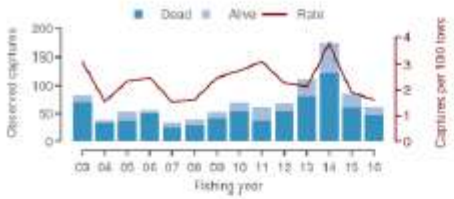

Figure 1 Observed captures of all birds by large (>28m) vessels in the hake, hoki and ling trawl fisheries

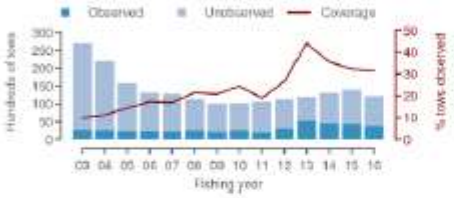

Figure 2 Fishing effort and observations on large (>28m) vessels in the hake, hoki and ling trawl fisheries

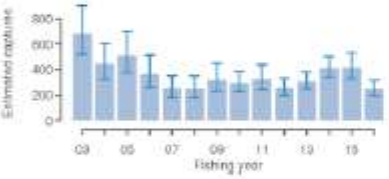

Figure 3 Estimated captures of all birds by large (>28m) vessels in the hake, hoki and ling trawl fisheries

While the AOP specifies plans to implement the NPOA-Seabirds, the ARR reviews progress and performance against the NPOA-Seabirds including in regard offal management and Vessel Management Plans (VMPs). Overall, 160 interim trip reports relating to observed trips on deepwater vessels were completed in the 2015-16 year. Of these 160 trip reports only 1 report gave a 'C' rating because "Offal management was inadequate" (Table 11, p.35 of the ARR). There were 12 trips that required follow up in relation to offal management related issues (Table 21, p.41 of the ARR). The number of trips that required VMP-related reviews has also decreased over time with 31 reviews in 2013-14, 25 in 2014-15 and 17 in 2015-16 (Table 20, p.41), again demonstrating continuous improvement. The amount of offal being released has been significantly curtailed as 66% of the trawl freezer fleet have fish meal plants, compared with only 30% in 2006. All but two of the remainder have offal mincers.

The above matters all serve to demonstrate that there has been continuous improvement in both effective mitigation and in reducing the numbers of seabird captures in these fisheries.

While net captures are proving to be more challenging to mitigate than warp captures, the risk assessment has assessed the levels of captures to not be adverse to seabird populations, using what are considered by experts to be very conservative assumptions (including those for cryptic mortality levels). Net capture records by observers include reports that a large proportion of these birds are now being released alive. In

2015-16 36% of the 53 observed seabird net captures in the hoki, hake and ling trawl fishery were released alive.

To our knowledge, New Zealand is the only country that reports captures and releases of live seabirds.

The suggested use of 'best practice' binding and weighting of nets are not relevant to captures on hauling gear. Neither are they utilised by any other fishery in the world as their efficacy is dubious, despite being reported as being best practice by parties who, presumably, are working off theory and not of real-world experiences with seabird interactions.

We offer the following comments on the observation on the overlap between the hoki fishery and the foraging range of Westland Petrels:

- The Westland Petrel population has continued to increase in size since the 1970s (Waugh *et al.* 2015 and Waugh *et al.* 2018).
- Fishery activity was strongly correlated with adult survival (Waugh *et al.* 2015 p.147) – 63% of food provided by adults to their chicks was identified as being sourced from fishing vessels (offal and the like) (Ibid p.151).
- There was a rapid increase in petrel numbers in the 1970s and 1980s as fishing activities offshore and adjacent to their nesting sites on the West Coast of the South Island increased (Ibid p.158).
- There are negligible captures of Westland Petrel in the hoki fishery (Waugh *et al.* 2015, p.151; Waugh *et al.* 2018, p. 381).
- There may be substantial benefits to seabirds from their access to near-surface food in close proximity to fishing vessels (Waugh *et al.* 2015, p.158).
- Fisheries observers have recorded very few Westland Petrels caught (Ibid, p.158).
- Since 1970, population growth of Westland Petrel has been most strongly related to the Southern Oscillation Index and not to fishery factors (Waugh *et al.* 2018, p.373).

We understand that ACAP is undertaking a global review of NPOAs for seabirds around the world and that New Zealand's NPOA-Seabirds ranks highly. DWG understands that this paper is not yet published. If you would like further information, we suggest that you discuss this directly with ACAP.

Compliance in the Hoki Fisheries

On 24 May 2018, a confidential internal MPI Compliance report on their 'Operation Bronto' was leaked to the media by Greenpeace. Operation Bronto was a compliance risk profiling exercise that was undertaken in relation to the West Coast South Island hoki fishery in 2011.

The contents of this report, which have not been made publicly available by MPI, need to be considered in the broader context, being but one of a number of processes employed by MPI Compliance to monitor activities and to ensure high levels of compliance in New Zealand's deep water fisheries, including those for hoki.

MPI Compliance has advised: *"The reason we haven't released the full document is because to do so, we would reveal our analytical techniques and compromise our ability to monitor compliance effectively in the future. It isn't a "secret document that was 'hidden' from the public" – it was, as above, a document that outlines a risk profiling exercise. We do not release these documents as a matter of course due to the above. The fact we did this exercise, demonstrates we are proactively monitoring and identifying potential compliance risks."*

MPI Compliance has previously discussed these matters with Acoura's assessors during past certification audits, advising that these risk profiles are common practice, that they form an integral part of good fisheries management, and that they are helping to deliver very high levels of compliance in the deep water fisheries.

In essence, the contents of the information in the leaked report is not new information to Acoura. The following is an excerpt from Acoura's 2016 Hoki Surveillance Report:

"The MPI compliance team completed a compliance risk assessment review in 2011 and updated this in 2012. Since then, there have been four prosecutions all relating to discarding. Senior officers and the company received fines and the vessels were seized. All the vessels involved have left New Zealand and ceased trading. The new foreign charter regulations make it more difficult for foreign vessels to operate, as they must be NZ flagged and subject to NZ legislation. The MPI Compliance Manager reported that the hoki fishery is compliant with fisheries law."

The National Deepwater Fisheries Plan requires regular risk assessments by MPI Compliance of the performance of each of the deepwater fisheries. As part of this, several risk assessments have been undertaken by MPI Compliance on the hoki fisheries including the one in 2011.

The risk assessment process is designed to inform compliance action and to support effective fisheries management. It forms an integral part of MPI's 'VADE' compliance approach, the objective of which is to deliver very high levels of compliance, using a range of effective monitoring and auditing techniques.

VADE stands for 'Voluntary, Assisted, Directed and Enforced'. Informed and assisted measures by MPI Compliance are the first stage of this sequential approach, which, if not effective are followed up by direction to operators on how to act/not act in certain ways. Should that not prove effective, MPI Compliance then collect information for use as an evidential basis for enforcement through prosecution in the Courts. The penalties upon conviction are severe, including automatic forfeiture of vessels.

Vessel operators are all mindful of their legal obligations and of the penalties and work assiduously to ensure that they do not intentionally breach the law and the very complex technical requirements required when processing fish at sea and accounting for product weight against GWT and ACE. There are many complex operational and interpretative challenges, and these are changed by MPI from time to time (e.g. application of the appropriate cuts and conversions of whole fish to products onboard factory trawlers, obtaining and applying Vessel Specific Conversion Factors on a year-round basis during which the condition of fish changes greatly, and assessing product weights when packed in cartons). It is primarily the potential risks in these areas that the 2011 hoki risk profiling exercise was focussed on assessing.

The methodologies used in these compliance risk profiling exercises are designed to identify risks of non-conformance. They do not affirm to an evidential standard non-compliance with legislation. The leaked internal report is not an evidential document. Where concerns of possible non-compliance behaviours are identified these are subsequently referred for corrective action by industry or formal investigation.

In 2012, MPI Compliance met and discussed the key findings from their 2011 hoki risk profile with vessel operators. Remedial actions were set in place by MPI and vessel operators in response, prior to the 2012 hoki season. MPI have advised that this risk profile found no evidence to contemplate prosecutions – but that they would have laid prosecutions if they had found evidence.

MPI Compliance work with a range of stakeholders, including industry, to ensure any potential risk behaviours are changed to give greater confidence that deepwater fishing activities remain fully compliant with the legislative requirements.

This particular risk assessment was undertaken nearly a decade ago – things have moved on a long way since then and many of the vessels identified as 'high risk' at that time no longer operate in New Zealand waters. There is now 45% observer coverage across the deepwater trawl fleet and up to 100% observer coverage in fisheries and on vessels considered to be high risk.

Since 2011, MPI Compliance has undertaken further risk profiles of the hoki fishery including one in 2012. MPI Compliance has advised that their subsequent assessments confirm that the remedial actions have been effective in changing behaviours and reducing the potential risks in the matters raised in the 2011 report.

MPI routinely provide reports on compliance performance to stakeholders through the Deepwater Compliance Group and the Annual Review Report. The most recent Annual Review Report for 2015-16 notes: *"The 2015 monitoring showed that compliance had continued to improve in both HOK and SBW fisheries"* (p.19).

In addition to these risk profiles, in 2013 MPI introduced 'interim observer trip reports'. These reports are sent to vessel operators within a few days of the completion of an observed trip. Fifteen questions are answered by the observer to provide more immediate feedback to vessel operators on a variety of factors. Questions are answered with a rating of A, B, C or N/A. It is considered that ratings of A and B are acceptable performance.

Overall, 160 interim trip reports relating to observed trips on deepwater vessels were completed in 2015-16. The majority of factors were rated A (81%) or B (7%). During 2015-16, only five C ratings were given by observers (i.e. less than 1%).

Table 1: Summary of 2015-16 interim trip reports where a 'C' rating was given (MPI Annual Review Report for 2015-16, p.35)

Factor	Number of 'C' ratings
Accurate identification of QMS species	1
Offal management was inadequate	1
Process for discarding QMS species	1
No valid system to quantify fish to meal	2

All of the above information demonstrates that appropriate and effective measures are in place to monitor, to detect and to respond to potential risks, to non-compliant activities, and to successfully prosecute where deliberate offending is detected.

The 2011 risk assessment did not determine the actual amounts of hoki that were not being reported, that was not the objective. In assessing the application of conversion factors and the processes then being used to determine carton weights, the exercise assessed the risk that there might be quantities of unreported hoki. The quantum of catch estimated in the report as potentially being at risk was between 3,414 t and 3,555 t. Clearly both MPI Compliance and vessel operators were focussed on changing operating procedures and policies to ensure the actual level was nowhere near this potential level and both moved quickly to ensure this would not be the case.

It is important to recognise, even if real, the quantities of hoki estimated to be at risk in 2011 did not cause any sustainability risk to the hoki stocks. The hoki TACC is set after MPI has included an allowance for "other sources of fishing mortality". In 2010-11 this allowance was set at 1,200 t. In 2010-11, the TACC was set at 120,000 t and the catch was 118,805, some 1,195 t less than the TACC. On this basis there was an inherent built in 'buffer' of some 2,385 t before the level of sustainable catch, as assessed by MPI, would have been reached.

In the event that all of the catch assessed in the 2011 audit as being at risk of not being reported is included, the quantity is too small to materially affect the status of either hoki stock. Both hoki stock sizes have been estimated to be above their management targets since 2010. In 2012 the Eastern and Western stock sizes were estimated to be 47% and 41% B_0 respectively and the 2018 assessment update estimated them to now be 54% and 64% B_0 (see 'Updated stock assessments' below).

We urge Acoura to obtain further information from MPI Compliance should you have any concerns about either the effectiveness of the current management regime, compliance by vessels operating in the hoki fishery or concerns about the sustainability of either hoki stock under the current fisheries performance.

Corrections

In the hoki, hake and ling trawl PCDR, arrow squid is noted as not being a QMS species (p.92). This is incorrect. Both species of squid (*N. sloanii* and *N. gouldii*) are managed under the QMS species. Information on the arrow squid stocks is outlined in Volume 1 of the Fisheries Assessment Plenary (p.59-73).

There are a few "Error! Reference source not found" within the report that need fixing (e.g. p.43 of the HHL PCDR).

In the hoki, hake and ling trawl compliance section, on p.113 you state *"there have been no major issues of non-compliance in the ling fisheries in recent years (pers. Comm. Garry Orr),"* do you mean for this to also include and refer to the hoki and hake fisheries? We note his name is "Gary" not "Garry".

Updated stock assessments

For your reference, updated stock assessments for hoki and ling have become available since your site visit. We understand that, while this may not need to be incorporated into the current MSC re-assessment, we are signalling this to you as information and may be considered as part of the next surveillance audit.

In 2018, a new stock assessment was undertaken by NIWA for the LIN 5 & 6 (Sub-Antarctic) stock. The base case model estimates the stock to be at 88% B_0 (75-101%). MPI has advised that they will consult on a review of the LIN5 TACC for 2018-19, possibly an increase of 10-20%.

In 2018, updated stock assessments were also undertaken by NIWA for both of the HOK 1 stocks. The base case model estimates the Eastern stock to be 54% B_0 (39-77%) and the Western stock to be 64% B_0 (44-86%). No review of the TACC, or of the catch limits for each stock, is being proposed for 2018-19.

Question on PI 2.5.2

As a matter of interest, we would like to know what further linkages would be required to satisfy SG 100 of PI 2.5.2. You note that the *"individual measures are not sufficiently linked to be considered a strategy"*. The National Deepwater Plan guides deepwater fisheries management with Part 1: the strategic direction, Part 2: the annual operational plans and Part 3: the annual review reports reporting progress and performance.

What further linkages would be required to satisfy SG100?

Regards,

Sharleen Gargiulo
Sustainable Fisheries Manager
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Deepwater Group also included a copy of Waugh et al., 2015 and the "MPI update to operators re HOK and SBW 2016", available:

CAB Response

Acoura appreciate the comments on the PCDR.

DWG Point: Ling Longline Recommendation:

While we support this being undertaken, this does not need to be included as a recommendation, as observer data are routinely reviewed by the Ministry for Primary industries (MPI) and reported during their Environmental Engagement Forum meetings and in their annual report.

CAB response. The assessment team contacted MPI asking if they have already or intend to conduct a review as part of a routine process. The following is their response:

> *The final 2016/17 Annual Review (attached) provides the most recent information on observer coverage in deepwater fisheries, including for ling bottom longline. As mentioned in previously emails, the statistics for observer coverage and seabird captures are available on the Protected Species Capture website, however at this stage these are only available to Aquatic Environment Working Group members. We are happy to provide access to that website if desired (noting the need to comply with the Terms of Reference of the Aquatic Environment Working Group).*
>
> *It has also been confirmed that we have planned 400 days for ling bottom longline observer coverage in the 2018/19 financial year. This is intended to provide an increase in coverage of ling bottom longline to approximately 25% of hooks.*

The Assessment Team notes that Recommendations are non-binding but subject to reporting in future audits. We believe that setting a Recommendation is a worthwhile and appropriate approach to facilitate tracking and following-up on important issues. For Recommendation 2, in essence the Assessment Team is keen to understand what the new data show and whether the enhanced coverage levels indicate any changes to risk levels for seabird species. Both Recommendations [1) PI 2.1.3, SIa – bait, and 2) PI 2.3.3 SIa – observer data] are therefore retained.

DWG Point: Seabirds:
CAB Response: The CAB's response to the Forest and Bird stakeholder submission fully addresses the concerns raised.

DWG Point: Compliance in the Hoki fisheries:
CAB Response: This information was provided to the assessment team and is reflected in our report. However it does provide additional useful information which can be incorporated into responses to stakeholders concerns about compliance. The CAB's response to the NABU stakeholder submission fully addresses the concerns raised.

DWG Point: Corrections
CAB Response: Thank you for these, the corrections have been made.

DWG Point: Updated Stock assessments
CAB Response: Thank you for the notification of the updated stock assessments. These will be considered at the 1st surveillance audit should the fishery be certified.

DWG Point: Question on PI 2.5.2
CAB Response Thank you for the question. As a CAB, we are not able to give consultation on what is required for a score to be made. Our justifications for the scores given are in the scoring table. Information on scoring justifications and guidance for scoring 2.5.2 are available in CR V1.3.

MSC Technical Oversight

Technical Oversight was not submitted for this report.

Appendix 4. Surveillance Frequency

Table 4.1: Surveillance level rationale

Year	Surveillance activity	Number of auditors	Rationale
1	Review of Information	1 auditor, off-site	There are no conditions following this re-assessment.

Table 4.2: Timing of surveillance audit

Year	Anniversary date of certificate	Proposed date of surveillance audit	Rationale
1	TBC	TBC	TBC

Table 4.3: Fishery Surveillance Program

Surveillance Level	Year 1	Year 2	Year 3	Year 4
Level 1	Review of information audit	Review of information audit	Off-site surveillance audit	On-site surveillance audit & re-assessment site visit

Appendix 5. 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.

(Reference: FCR 7.19.1)