MSC SUSTAINABLE FISHERIES CERTIFICATION

New Zealand Ling Longline Fishery

Final Report

August 2018

Prepared for: Deepwater Group Limited

Prepared by: Acoura Marine Ltd

Authors: Robert O'Boyle, Rob Blyth-Skyrme, Jo Akroyd and Paul Knapman

Contents

Contents 2
Table of tables 6
Table of figures 8
Glossary 10
1 Executive Summary 12
2 Authorship and Peer Reviewers 14
2.1 Assessment Team 14
2.1.1 Peer Reviewers 16
2.1.2 Risk Based Framework (RBF) 17
2.1.3 Introduced Species Based Fishery (ISBF) 17
3 Description of the Fishery 18
3.1 Unit of Certification (UoC) and Scope of Certification Sought 18
3.1.1 Target Species and Stocks 18
3.1.2 Fishing Method 18
3.1.3 Client Group 19
3.1.4 Other Eligible Fishers 19
3.1.5 The UoCs 19
3.2 Final UoC(s) 22
3.2.1 Total Allowable Commercial Catch (TACC) and Catch Data 22
3.3 Overview of the fishery 23
4 Changes Since Initial Assessment 25
4.1 Overview 25
4.2 Specific Changes Since Initial Assessment 25
4.2.1 Principle 1 25
4.2.2 Reference Points 34
4.2.3 Harvest Strategy 35
4.2.4 Harvest Control Rules 36
4.2.5 Information & Monitoring 41
4.2.6 Stock Assessment 47
Peer Review 49
4.3 Principle 2 51
4.3.1 Background 51
4.3.2 Retained and bycatch species 51
4.3.3 Endangered, threatened or protected (ETP) species 54
4.3.4 Habitats 62
4.3.5 Ecosystem 64
4.4 Principle 3 66
4.4.1 Management System 66

4.4.2 Consultation ... 67
4.4.3 Objectives for the fishery ... 67
4.4.4 Decision making process ... 68
4.4.5 Management Plans ... 69
4.4.6 Research Plan ... 70
4.4.7 Compliance and Enforcement ... 70
4.4.8 Monitoring of Performance ... 72
5 Evaluation Procedure ... 73
5.1 Harmonised fishery assessment ... 73
5.2 Previous assessments ... 74
5.3 Assessment Methodologies ... 78
5.4 Evaluation Processes & Techniques ... 78
5.4.1 Site Visit ... 78
5.4.2 Consultations ... 80
5.4.3 Evaluation Techniques ... 80
6 Traceability ... 82
6.1 Eligibility Date ... 82
6.2 Traceability Within the Fishery ... 82
6.2.1 Tracking and Tracing ... 82
6.2.2 Vessels Fishing Outside the UoCs ... 83
6.2.3 At Sea Processing ... 83
6.2.4 Transhipping ... 83
6.2.5 Eligibility to Enter Further Chains of Custody ... 84
6.3 Eligibility of Inseparable or Practicably Inseparable (IPI) stock(s) to Enter Further Chains of Custody ... 85
7 Evaluation Results ... 86
7.1 Principle Level Scores ... 86
7.2 Summary of Scores ... 86
7.3 Summary of Conditions ... 86
7.4 Recommendations ... 87
7.5 Determination, Formal Conclusion and Agreement ... 87
8 References ... 88
Principle 1 ... 88
Principle 2 ... 89
Principle 3 ... 93
Appendix 1. Performance Indicator Scores and Rationales ... 95
Evaluation Table for PI 1.1.1 – Stock status ... 95
Evaluation Table for PI 1.1.2 – Reference Points ... 98
Evaluation Table for PI 1.1.3 – Stock rebuilding ... 100
Evaluation Table for PI 1.2.1 – Harvest strategy ... 101

Evaluation Table for PI 1.2.2 – Harvest control rules and tools 104
Evaluation Table for PI 1.2.3 – Information and monitoring 106
Evaluation Table for PI 1.2.4 – Assessment of stock status 109
Evaluation Table for PI 2.1.1 – Retained species outcome 112
UoCs 1 and 2 (LIN 3 and LIN 4) – PI 2.1.1 Scoring calculation 114
UoCs 3 and 4 (LIN 5 and LIN 6) – PI 2.1.1 Scoring calculation 114
UoC 5 (LIN 7) – PI 2.1.1 Scoring calculation 114
Evaluation Table for PI 2.1.2 – Retained species management 115
All UoCs – PI 2.1.2 Scoring calculation 117
Evaluation Table for PI 2.1.3 – Retained species information 118
All UoCs – PI 2.1.3 Scoring calculation 120
Evaluation Table for PI 2.2.1 – Bycatch species outcome 121
All UoCs – PI 2.2.1 Scoring calculation 122
Evaluation Table for PI 2.2.2 – Bycatch species management 123
PI 2.2.2 Scoring calculation 124
Evaluation Table for PI 2.2.3 – Bycatch species information 125
PI 2.2.3 Scoring calculation 127
Evaluation Table for PI 2.3.1 – ETP species outcome 128
PI 2.3.1 Scoring calculation 131
Evaluation Table for PI 2.3.2 Alternate – ETP species management 133
PI 2.3.2A Scoring calculation 136
Evaluation Table for PI 2.3.3 – ETP species information 137
PI 2.3.3 Scoring calculation 138
Evaluation Table for PI 2.4.1 – Habitat outcome 139
Evaluation Table for PI 2.4.2 – Habitat management 140
Evaluation Table for PI 2.4.3 – Habitat information 142
Evaluation Table for PI 2.5.1 – Ecosystem outcome 144
Evaluation Table for PI 2.5.2 – Ecosystem management 146
Evaluation Table for PI 2.5.3 – Ecosystem information 149
Evaluation Table for PI 3.1.1 - Legal and/or Customary Framework 152
Evaluation Table for PI 3.1.2 – Consultation, Roles and Responsibilties 155
Evaluation Table for PI 3.1.3 – Long Term Objectives 159
Evaluation Table for PI 3.1.4 – Incentives for Sustainable Fishing 161
Evaluation Table for PI 3.2.1 – Fishery Specific Objectives 162
Evaluation Table for PI 3.2.2 – Decision Making Processes 163
Evaluation Table for PI 3.2.3 – Compliance and Enforcement 168
Evaluation Table for PI 3.2.4 – Research Plan 171
Evaluation Table for PI 3.2.5 - Management Performance Evaluation 173
Appendix 2. Conditions 175

Appendix 3. Peer Review Reports 176
Appendix 4. Stakeholder Submissions 196
Stakeholder submission received at the site visit 196
Forest & Bird 196
Stakeholder submissions received at PCDR 201
Forest & Bird 201
NABU International Foundation for Nature 209
Greenpeace 240
WWF 251
Deepwater Group 258
MSC Technical Oversight 267
Appendix 5. Surveillance Frequency 268
Appendix 6. Objections Process 269

Table of tables

Table 1. The number of vessels by size, type and year operating in the ling longline fishery (Tiffany Bock, pers. comm.) 18
Table 2. UoC 1 -TACC and catch data: LIN 3 Chatham Rise (LIN 3 & 4) 22
Table 3: UoC 2 - TACC and catch data: LIN 4 Chatham Rise (LIN 3 & 4) 22
Table 4: UoC 3 - TACC and catch data: LIN 5 Sub-Antarctic (LIN 5 & 6) 22
Table 5: UoC 4 - TACC and catch data: LIN 6 Sub-Antarctic (LIN 5 & 6) 23
Table 6: UoC 5 - TACC and catch data: LIN 7 WCSI (LIN 7WC) 23
Table 7. Median B_0, B_{2014}, and B_{2014} as percentage of B_0 for the Chatham Rise (LIN 3 & 4) ling base model and sensitivity run; 95% credible intervals indicated; from MPI (2017a) 27
Table 8. Median projected biomass in 2019 (B_{2019}), B_{2019} as a percentage of B_0, and B_{2019}/B_{2014} (%) for the Chatham Rise (LIN 3 & 4) ling base model where future annual catches are assumed to be 6,200 or 3,564 t; 95% credible intervals indicated; from MPI (2017a) 28
Table 9. Median B_0, B_{2014}, and B_{2014} as percentage of B_0 for the Sub-Antarctic (LIN 5 & 6) ling base and reference models; 95% credible intervals indicated; from MPI (2017a) 30
Table 10. Median projected biomass in 2019 (B_{2019}), B_{2019} as a percentage of B_0, and B_{2019}/B_{2014} (%) for the Sub-Antarctic (LIN 5 & 6) ling base model where future annual catches are assumed to be 5,700 or 12,100 t; 95% credible intervals indicated; from MPI (2017a) .. 31
Table 11. Median B_0, B_{2017}, and B_{2017} as percentage of B_0 for the WCSI ling models; 95% credible intervals indicated; from MPI (2017a) 33
Table 12. Median projected biomass in 2022 (B_{2022}), B_{2022} as a percentage of B_0, and B_{2022}/B_{2016} (%) for the WCSI (LIN 7WC) ling models where future annual catches are assumed to be 2,980 or 3,300 t; 95% credible intervals indicated; from MPI (2017a) 34
Table 13. Comparison of ling advice from MPI and stakeholder consultation, TACC set by Minister and reported catch (t) by fishing year 40
Table 14. Bottom trawl survey biomass indices for ling (t) 45
Table 15. Commercial fishery CPUE indices and associated CVs; LIN-specific ling indices for trawl and longline where year = calendar year, sp=spawning fishery, nsp=non-spawning fishery; from MPI (2017a) 46
Table 16. Priors for key distributions (when estimated) for ling stock assessments; parameters are mean (in natural space) and CV for lognormal; from MPI (2017a) and McGregor (2015) 48
Table 17. Observer data adjusted to the whole fleet showing catches in the New Zealand ling longline fishery, 2008-2012 (MPI, pers. comm.) with estimated annual bait usage included (bait data from Tilney 2017) 52
Table 18. Number of observer reports of catches of protected corals (all species) in ling longline fisheries (adapted from Baird et al. 2013). 55
Table 19. 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 ling longline fishery and in all New Zealand trawl, longline (LL) and set net (SN) fisheries (adapted from Richard et al. 2017). 59
Table 20. Estimated Population Sustainability Threshold (PST) for Salvin's albatross, Chatham albatross and northern Buller's albatross, and annual potential fatalities (APFs) for each species associated with the components of the ling longline fishery 61
Table 21. Management objectives from the National Deepwater plan (MFish, 2010) 68
Table 22. Summary of Previous Assessment Conditions 75
Table 23. Site visit itinerary. 78
Table 24. Scoring elements for UoC 1 and UoC 2 80
Table 25. Scoring elements for UoC 3 and UoC 4 81
Table 26. Scoring elements for UoC 5 81
Table 27. The ports of landing where ling were landed in 2015/16. (pers. comm. T Bock, MPI) 82

Table 28. Traceability factors within the fishery: 84
Table 29. Principle scores for UoCs 1, 2, 3, 4, and 5..... 86
Table 30: Performance Indicator scores UoCs 1, 2, 3, 4 and 5 86
Table 1 For reports using one of the default assessment trees: 177

Table of figures

Figure 1. The management units for ling. The outer boundary represents the New Zealand 200 mile EEZ 21
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 (adapted from: Livingston and Sullivan, 2007). 24
Figure 3. Reported commercial landings and TACCs (t) by ling management area of the Chatham Rise (LIN 3 & 4) ling stock; from MPI (2017a) 26
Figure 4. Median exploitation rates (catch over vulnerable biomass) for the Chatham Rise (LIN 3 & 4) ling stock base case model; 95% credible intervals indicated as dotted lines; from MPI (2017a) 26
Figure 5. Trend in relative year-class strength of the Chatham Rise ling stock (LIN 3 & 4) for the base case model; dashed horizontal line indicates year-class strength of one; individual distributions show marginal posterior distribution, with horizontal lines indicating median; from MPI (2017a) 27
Figure 6. Trend in median stock status (% B_0) of the Chatham Rise (LIN 3 & 4) ling stock for the base case model; 95% credible intervals indicated as dashed lines; management target (40% B_0, solid horizontal line) and soft limit (20% B_0, dotted horizontal line) indicated; from MPI (2017a) 27
Figure 7. Reported commercial landings and TACCs (t) by ling management area of the Sub-Antarctic (LIN 5 & 6) ling stock; from MPI (2017a) 29
Figure 8. Median exploitation rates (catch over vulnerable biomass) for the Sub-Antarctic (LIN 5 & 6) ling stock base case model; 95% credible intervals indicated as dotted lines; from MPI (2017a) 29
Figure 9. Trend in relative year-class strength of the Sub-Antarctic (LIN 5 & 6) ling stock for the base case model; dashed horizontal line indicates year-class strength of one; individual distributions show marginal posterior distribution, with horizontal lines indicating median; from MPI (2017a) 30
Figure 10. Trend in median stock status (% B_0) of the Sub-Antarctic (LIN 5 & 6) ling stock for the base case model; 95% credible intervals indicated as dashed lines; from MPI (2017a) 30
Figure 11. Reported commercial landings and TACCs (t) of ling management area 7 in which the West Coast South Island (LIN 7WC) ling stock resides; from MPI (2017a)..... 31
Figure 12. Estimated posterior distributions of the exploitation rate of the trawl (left panel) and longline (right panel) fleets, for the Combined CPUE WCSI (LIN 7WC) ling model; median (solid horizontal line), inter-quartile range (box; half of the estimates were within this range), and overall range of estimates (broken vertical lines) indicated; from MPI (2017a). 32
Figure 13. Trend in relative year-class strength of the WCSI (LIN 7WC) ling stock for the Combined CPUE model; dashed horizontal line indicates year-class strength of one; median (solid horizontal line), inter-quartile range (box; half of the estimates were within this range), and overall range of estimates (broken vertical lines) indicated; from MPI (2017a) 32
Figure 14. Posterior distributions of the WCSI (LIN 7WC) spawning stock biomass (t) and % B_0 for the three models; solid lines are median values and the shaded area are 95% CIs; dashed and dotted horizontal lines are the target reference point and soft limit reference point respectively; from MPI (2017a) 33
Figure 15. Illustrative example of a harvest strategy control rule that would be in conformance with the Harvest Strategy Standard; *M* is natural mortality (from MPI, 2011) . 37
Figure 16. Probability of occurrence of suitable habitat for branching scleractinian coral species (*Solenosmilia variabilis*, *Goniocorella dumosa*, *Enallopsammia rostrata*, and *Madrepora oculata*) from BRT models (left panel – from Anderson et al. 2014), and density plot of the distribution of all commercial longline sets with recorded position data targeting ling for the 20 years 1992/93 – 2011/12 (right panel- from Anderson 2014). 56

Figure 17. 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). 57
Figure 18. For the ling longline fishery, effort (thousands of hooks deployed) 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/). 58
Figure 19. For the ling longline fishery, effort (thousands of hooks deployed) and observer coverage (top panel), observed captures and capture rate of Salvin's albatross (middle panel), and estimated total captures of Salvin's albatross (bottom panel) for 2003-2016 (Data downloaded from https://psc.dragonfly.co.nz/2017v1/). 60
Figure 20. Geographic distribution of groups defined by multivariate classification of environmental data (From Leathwick et al 2012). 63
Figure 21. Decision making process (MPI 2016) 69
Figure 22. 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) 69

Glossary

ACAP	Agreement on the Conservation of Albatrosses and Petrels
ACE	Annual Catch Entitlement
B_0	Virgin Biomass
BOMEC	Benthic-Optimised Marine Environmental Classification
BPA	Benthic Protection Area
CAY	Current Annual Yield
CI	Confidence interval
CITES	Convention on International Trade in Endangered Species
CPUE	Catch per Unit Effort
CR	(MSC) Certification Requirements
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 tonne
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
MEC	Marine environmental classification
MCS	Monitoring, Control and Surveillance
MCY	Maximum Constant Yield
MHR	Monthly Harvest Return
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
NIWA	National Institute of Water and Atmospheric Research Limited
NFPSCR	Non-fish/protected species catch return
PBR	Potential biological removal
PI	Performance Indicator
PVA	Population viability analysis
QMS	Quota Management System
SG	Scoring Guidepost
TAC	Total Allowable Catch
TACC	Total Allowable Commercial Catch
TCEPR	Trawl Catch, Effort and Processing Return
U_{max}	Maximum Exploitation Rate
UNCLOS	United Nations Convention on the Law of the Sea
VMP	Vessel Management Plan
VMS	Vessel Monitoring System
WCSI	West Coast South Island

1 Executive Summary

This report provides details of the MSC re-assessment of the New Zealand Ling Longline Fishery that operate in the New Zealand Exclusive Economic Zone (EEZ). Five Units of Certification (UoC) have been assessed:

1. LIN 3 Chatham Rise (LIN 3 & 4);
2. LIN 4 Chatham Rise (LIN 3 & 4);
3. LIN 5 Sub Antarctic (LIN 5 & 6);
4. LIN 6 Sub Antarctic (LIN 5 & 6);
5. LIN 7 West Coast South Island (WCSI) (LIN 7 WC).

The fishery was previously assessed against the MSC standard and certified in September 2014. In order to make cost and time efficiencies this fishery is being re-assessed at the same time as the New Zealand hoki, hake, ling and the southern blue whiting trawl fisheries.

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. ling 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 Rationales 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 well managed and this is characterised by the state of the stocks and the harvest strategies.

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 – all UoCs

No Performance Indicators scored <80 and so no conditions of certification were applied to the fishery. Two recommendations were made and relate to Principle 2:

1) It is recommended that a survey is conducted annually to determine the quantities and sources of bait species used in the fishery. Data should be retained and reported routinely at annual surveillance audits of the fishery.

2) It is recommended 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.

A recommendation is not the result of a failure to meet the unconditional pass mark, and so is not binding. However, in the opinion of the Assessment Team, action taken in response to a recommendation would make a positive contribution to on-going efforts to ensure long-term sustainability of the fishery:

Determination

On completion of the re-assessment and scoring process, the assessment team concluded 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.

UoCs 1-5	
Principle	**Score**
Principle 1 – Target Species	90.6
Principle 2 – Ecosystem	86.0
Principle 3 – Management System	97.3

Conditions
There were no conditions of certification for this fishery as all scores were above 80.

2 Authorship and Peer Reviewers

2.1 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 his 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 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, 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.

2.1.1 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 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-editor 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.

2.1.2 Risk Based Framework (RBF)

The RBF was not used for this fishery assessment.

2.1.3 Introduced Species Based Fishery (ISBF)

None of the target species are an introduced species.

3 Description of the Fishery

3.1 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:

3.1.1 Target Species and Stocks

Target Species	Stocks
Ling (*Genypterus blacodes*)	LIN 3 Chatham Rise (LIN 3 & 4)
	LIN 4 Chatham Rise (LIN 3 & 4)
	LIN 5 Sub-Antarctic (LIN 5 & 6)
	LIN 6 Sub-Antarctic (LIN 5 & 6)
	LIN 7 West Coast South Island (WCSI) (LIN 7WC)

3.1.2 Fishing Method

The Deepwater Group vessels use an "autoline system" to bottom-set longlines. The autoline system uses lines set on the bottom, predominantly from 5 to 15 km long. The main line can be 7 mm, 9 mm or 11.5 mm in diameter, and has swivels (where snood and hook attaches) at set spacing of 1.3 m to 1.5 m. The 11.5 mm line is often an integrated weighted line (IWL), which enables the line to sink faster, reducing bird bycatch risk. Most of the larger autoliners operate under CCAMLR (Commission for the Conservation of Antarctic Marine living Resources) conservation measures, which have various bird bycatch mitigation controls on the operation which. The smaller longline vessels, which do not at any time operate in the CCAMLR jurisdiction, do not necessarily have these measures but must meet the statutory operating requirements within the New Zealand EEZ which includes tori lines at all times, offal management, and night setting or line weighting for day setting.

Hook size to target for ling are generally 12/0s. Gear is deployed from the stern of the larger vessels with a float attached to a grapple to take the line to the bottom and anchor it in place. There is a float and grapple on each end. Some vessels use what are called "droppers", which is a line set so hooks are about 10 meters off the bottom, although this may be used more to target bluenose and hapuka groper or to avoid bycatch of sharks or bait depredation by starfish, etc.

Table 1. The number of vessels by size, type and year operating in the ling longline fishery (Tiffany Bock, pers. comm.)

	<28 m	28 – 43 m		>43 m
Year	Fresher	Fresher	Limited Processing	Fillet
2011/12	17	2	40	2
2012/13	20	5	0	1
2013/14	23	4	1	3
2014/15	22	2	1	2
2015/16	23	2	1	2

3.1.3 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 hoki, hake, ling, orange roughy, oreo dory, squid and jack mackerel.

3.1.4 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 have stated their willingness to enter into certificate sharing arrangements.

3.1.5 The UoCs

In summary, from the above, there are 5 UoCs:

UoC 1

Species:	Ling (*Genypterus blacodes*)
Stock:	LIN 3 Chatham Rise (LIN 3 & 4)
Geographical area:	New Zealand EEZ
Harvest method:	Longline
Client Group:	Deepwater Group Limited
Other Eligible Fishers:	New Zealand flagged vessels, licensed to fish for ling with longline and with access to quota for this species

UoC 2

Species:	Ling (*Genypterus blacodes*)
Stock:	LIN 4 Chatham Rise (LIN 3 & 4)
Geographical area:	New Zealand EEZ
Harvest method:	Longline
Client Group:	Deepwater Group Limited
Other Eligible Fishers:	New Zealand flagged vessels, licensed to fish for ling with longline and with access to quota for this species

UoC 3

Species:	Ling (*Genypterus blacodes*)
Stock:	LIN 5 Sub-Antarctic (LIN 5 & 6)
Geographical area:	New Zealand EEZ
Harvest method:	Longline
Client Group:	Deepwater Group Limited
Other Eligible Fishers:	New Zealand flagged vessels, licensed to fish for ling with longline

	and with access to quota for this species

UoC 4

Species:	Ling (*Genypterus blacodes*)
Stock:	LIN 6 Sub-Antarctic (LIN 5 & 6)
Geographical area:	New Zealand EEZ
Harvest method:	Longline
Client Group:	Deepwater Group Limited
Other Eligible Fishers:	New Zealand flagged vessels, licensed to fish for ling with longline and with access to quota for this species

UoC 5

Species:	Ling (*Genypterus blacodes*)
Stock:	LIN 7 WCSI (LIN 7WC)
Geographical area:	New Zealand EEZ
Harvest method:	Longline
Client Group:	Deepwater Group Limited
Other Eligible Fishers:	New Zealand flagged vessels, licensed to fish for ling with longline and with access to quota for this species

The following figure shows the geographic extent of the UoCs:

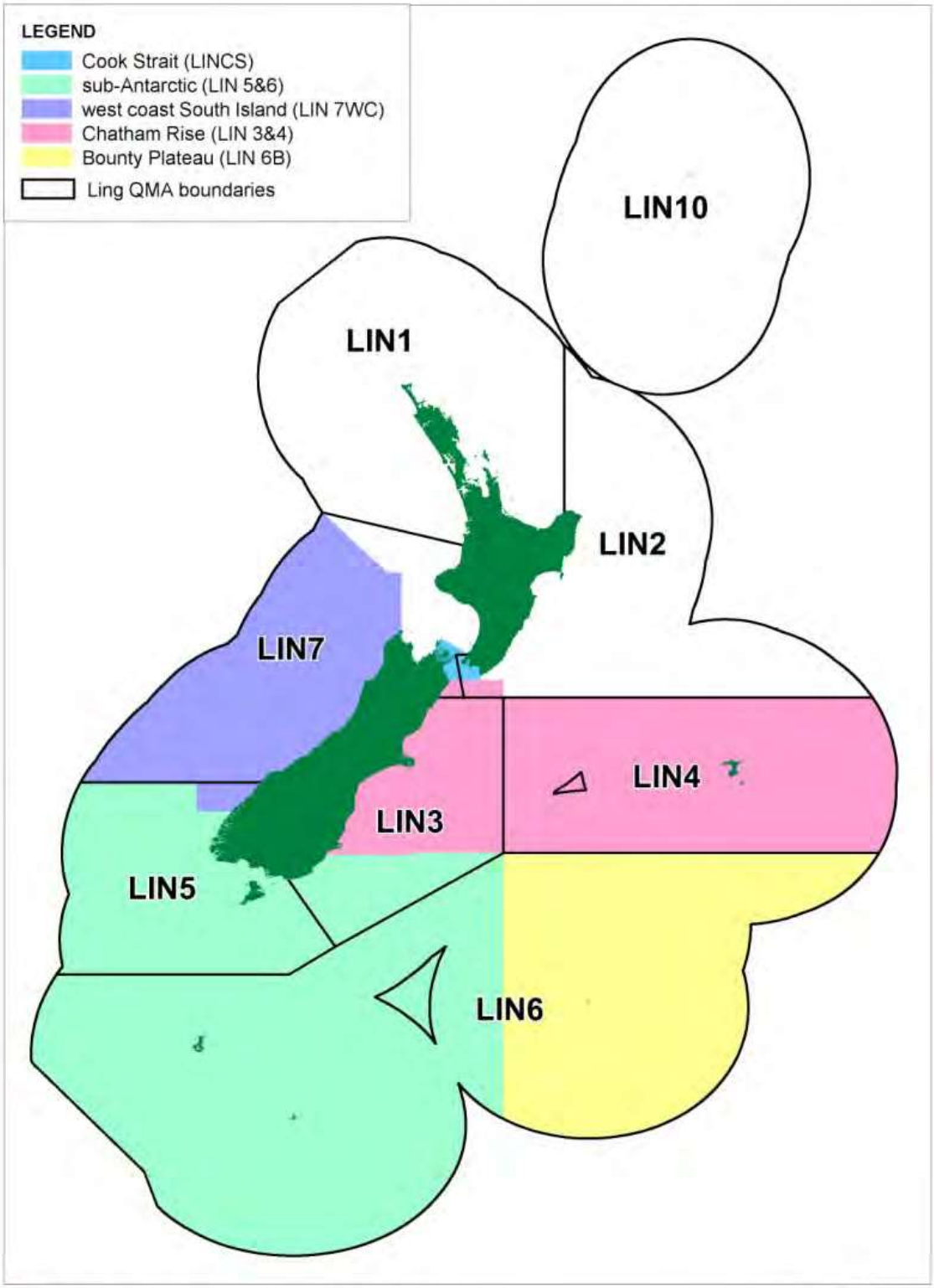


Figure 1. The management units for ling. The outer boundary represents the New Zealand 200 mile EEZ

3.2 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:	

3.2.1 Total Allowable Commercial Catch (TACC) and Catch Data

Table 2. UoC 1 -TACC and catch data: LIN 3 Chatham Rise (LIN 3 & 4)

TACC for LIN 3	**Year**	**2017**	**Amount**	**2,060 t**
UoA share of TACC	**Year**	**2017**	**Amount**	**2,060 t**
UoC share of TACC	**Year**	**2017**	**Amount**	**2,060 t**
Total green weight catch by UoC	**Year (most recent)**	**2016**	**Amount**	**507 t**
	Year (second most recent)	**2015**	**Amount**	**428 t**

Table 3: UoC 2 - TACC and catch data: LIN 4 Chatham Rise (LIN 3 & 4)

TACC	**Year**	**2017**	**Amount**	**4,200 t**
UoA share of TACC	**Year**	**2017**	**Amount**	**4,200 t**
UoC share of TACC	**Year**	**2017**	**Amount**	**4,200 t**
Total green weight catch by UoC	**Year (most recent)**	**2016**	**Amount**	**1,659 t**
	Year (second most recent)	**2015**	**Amount**	**1,120 t**

Table 4: UoC 3 - TACC and catch data: LIN 5 Sub-Antarctic (LIN 5 & 6)

TACC	**Year**	**2017**	**Amount**	**3,955 t**
UoA share of TACC	**Year**	**2017**	**Amount**	**3,955 t**
UoC share of TACC	**Year**	**2017**	**Amount**	**3,955 t**
Total green weight catch by UoC	**Year (most recent)**	**2016**	**Amount**	**453 t**
	Year (second most recent)	**2015**	**Amount**	**472 t**

Table 5: UoC 4 - TACC and catch data: LIN 6 Sub-Antarctic (LIN 5 & 6)

TACC	**Year**	**2017**	**Amount**	**8,505 t**
UoA share of TACC	**Year**	**2017**	**Amount**	**8,505 t**
UoC share of TACC	**Year**	**2017**	**Amount**	**8,505 t**
Total green weight catch by UoC	**Year (most recent)**	**2016**	**Amount**	**598 t**
	Year (second most recent)	**2015**	**Amount**	**588 t**

Table 6: UoC 5 - TACC and catch data: LIN 7 WCSI (LIN 7WC)

TACC	**Year**	**2017**	**Amount**	**3,080 t**
UoA share of TACC	**Year**	**2017**	**Amount**	**3,080 t**
UoC share of TACC	**Year**	**2017**	**Amount**	**3,080 t**
Total green weight catch by UoC	**Year (most recent)**	**2016**	**Amount**	**909 t**
	Year (second most recent)	**2015**	**Amount**	**552 t**

3.3 Overview of the fishery

Ling are widely distributed through 200-800 m within the New Zealand EEZ, particularly to the south of 40°S. They live to a maximum age of about 30 years; fewer than 0.2% of successfully aged ling have been older than 30 years. A growth study of ling from five areas (WCSI, Chatham Rise, Bounty Plateau, Campbell Plateau and Cook Strait) showed that females grew significantly faster and reached a greater size than males in all areas, and that growth rates were significantly different between areas. Ling grow fastest in Cook Strait and slowest on the Campbell Plateau (Horn 2005).

Although ling are targeted by a longline fleet, a significant proportion of ling catches are taken by large trawlers as a bycatch in fisheries targeting hoki. From 1975 to 1980 there was a substantial longline fishery on the Chatham Rise (and to a lesser extent in other areas), carried out by Japanese and Korean longliners. In the early 1990s, the domestic fleet was increased by the addition of several larger longliners fitted with autoline equipment. This caused a large increase in the catches of ling off the east and south of the South Island. However, since about 2000 there has been a declining trend in catches taken by line vessels in most areas, offset, to some extent, by increased trawl landings.

The main sources of ling are Puysegur Bank (LIN 5) (off the south west tip of South Island) and the slope of the Stewart-Snares Shelf (south east corner of LIN 5) and waters in the Auckland Islands area (LIN 6). The principal grounds for smaller vessels are WCSI and the east coast of both main islands south of East Cape (see Figure 2).

Ling in spawning condition have been reported in a number of localities throughout the EEZ (Horn 2005). Time of spawning appears to vary between areas: July to November on the Chatham Rise; September to December on Campbell Plateau and Puysegur Bank; September to February on the Bounty Plateau; July to September off west coast South Island and in Cook Strait. Little is known about the distribution of juveniles until they are about 40 cm total length, when they begin to appear in trawl samples over most of the adult range.

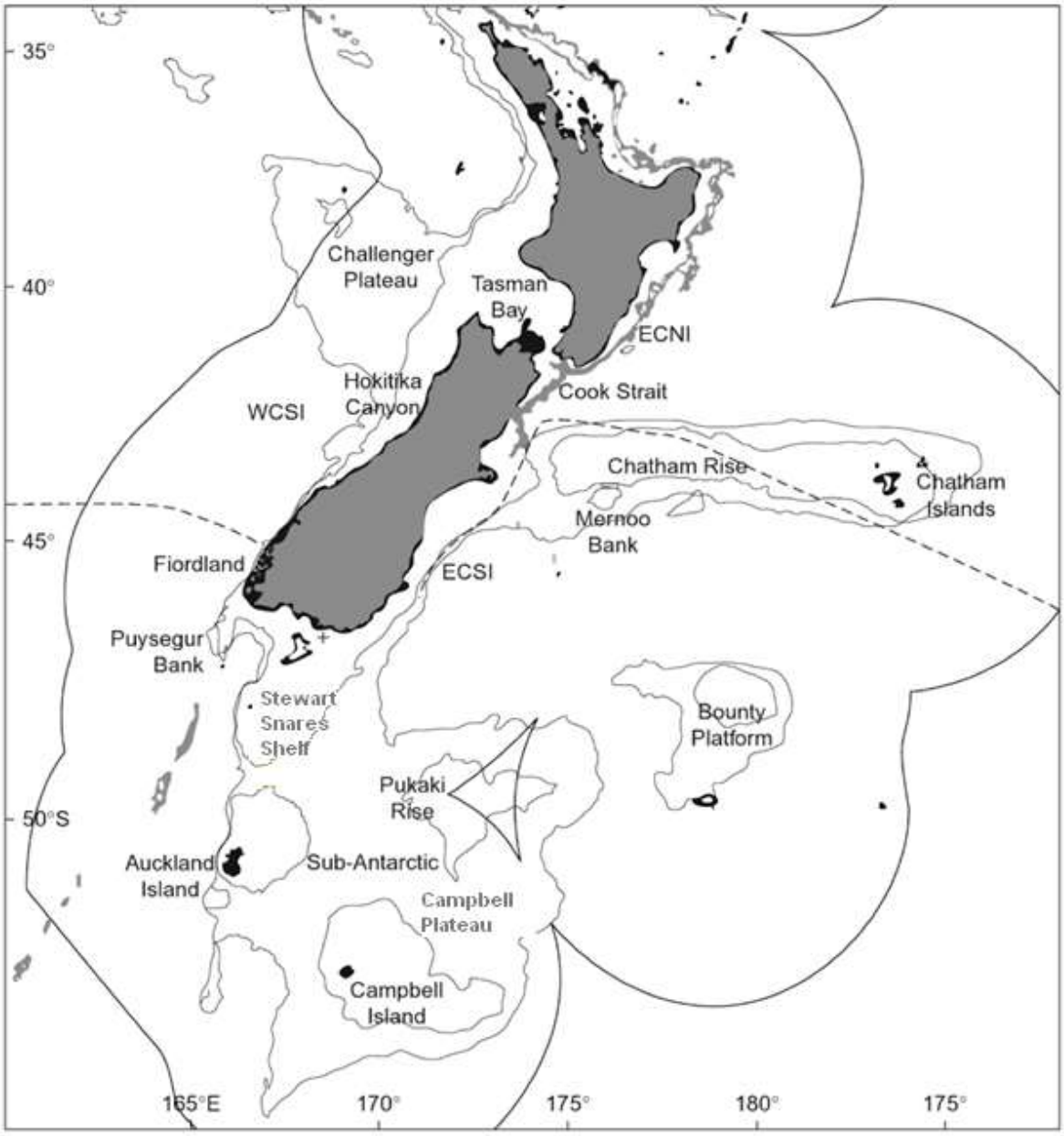


Figure 2. Oceanographic map showing some of the key features within New Zealand 200 mile EEZ (solid line) mentioned throughout the report. Bathymetry lines are 500 m and 1,000 m depths. The dashed line is the approximate position of the Subtropical Front with sub-tropical water to the north and sub-Antarctic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

4 Changes Since Initial Assessment

4.1 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 15th September 2014); all conditions of certification were closed by the third surveillance audit and, Acoura Marine has confirmed that all the standard related stakeholder comments were addressed by the third surveillance audit.

4.2 Specific Changes Since Initial Assessment

4.2.1 Principle 1

Stock Status

Ling: Chatham Rise (LIN 3 & 4)

Intertek (2014b) used the 2011 assessment of the Chatham Rise ling stock. The most recent (2015) assessment is reported here.

<u>Catch and Fishing Mortality</u>

Fishing for ling goes back as far as the 1930s in ling management area LIN 3. During 1975 - 1980, there was a substantial fishery on the Chatham Rise (and to a lesser extent in other areas) carried out by Japanese and Korean longliners. Since 1980, ling have been caught by large trawlers, both domestic and foreign owned, and by small domestic longliners and trawlers. Quota management was introduced in 1983/84 with the stock-specific quota allocated amongst ling management areas as a TACC based upon the biological distribution of the stock (see Harvest Strategy, Section 4.2.3). In the early 1990s, the domestic fleet was increased by the addition of several larger longliners with autoline equipment, resulting in a large increase in the catches of ling off the east and south of the South Island (LIN 3, 4, 5 and 6). However, since about 2000, there has been a declining trend in catches taken by line vessels in most areas, offset, to some extent, by increased trawl landings. Annual landings from the Chatham Rise stock have been less than 4,600 t since 2004, markedly lower than the 6,000–8,000 t taken annually between 1992 and 2003 and lower than the combined LIN3 and LIN4 TACC of 2,060 + 4,200 = 6,260 t (Figure 3), most probably the result of the substantial reduction in hoki fishing at this time.

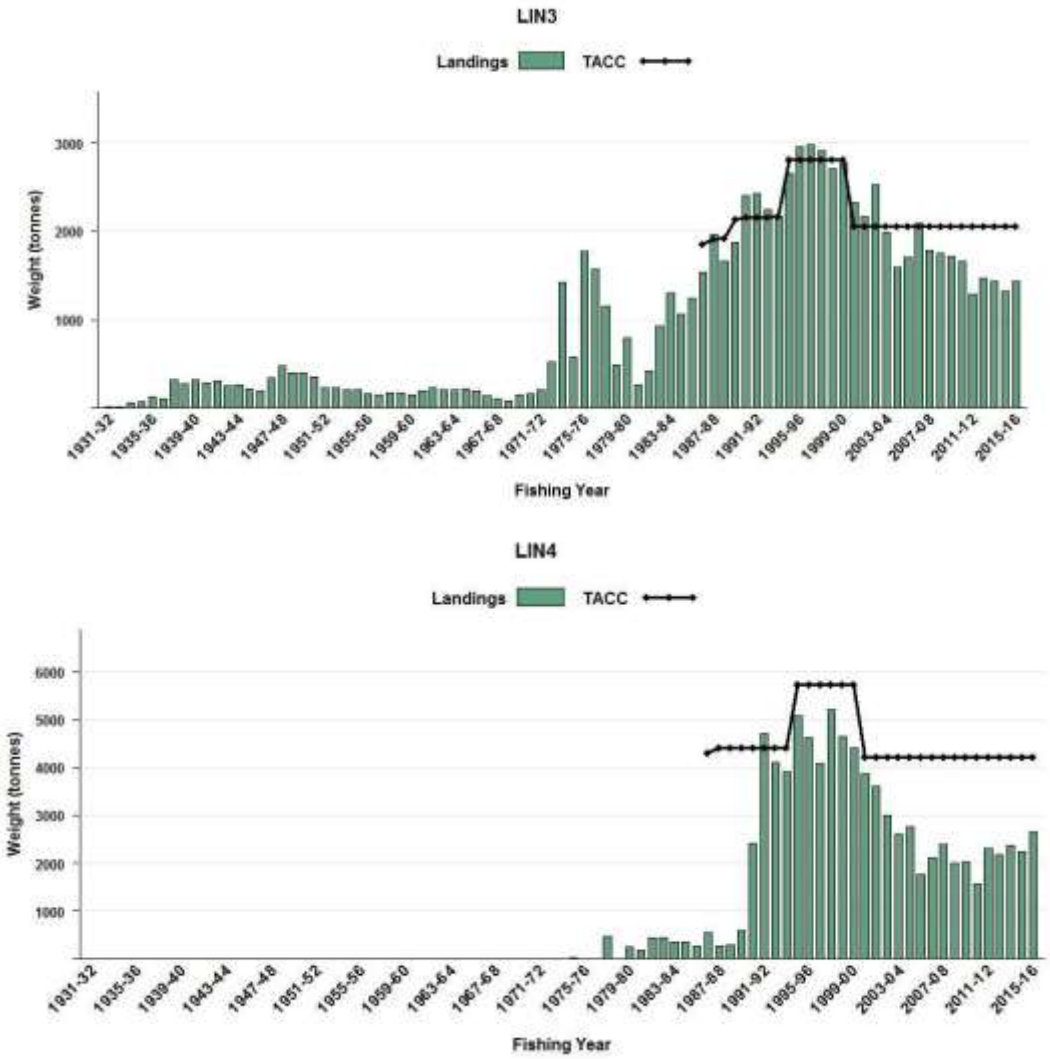


Figure 3. Reported commercial landings and TACCs (t) by ling management area of the Chatham Rise (LIN 3 & 4) ling stock; from MPI (2017a)

Annual exploitation rates (U) peaked in the late 1970s, and then declined to a low level (less than 0.1) up until 1993 when they rose to reach about 0.1 by 2000. Since then, they have undergone an overall declining trend (Figure 4).

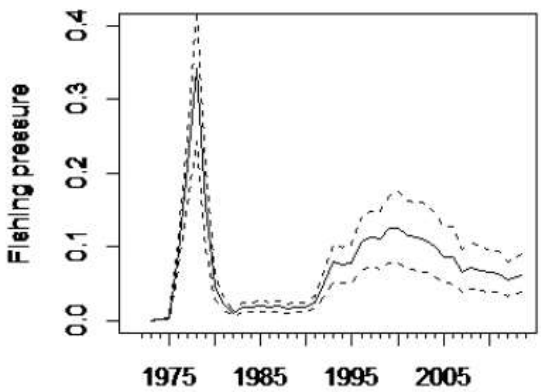


Figure 4. Median exploitation rates (catch over vulnerable biomass) for the Chatham Rise (LIN 3 & 4) ling stock base case model; 95% credible intervals indicated as dotted lines; from MPI (2017a)

Biomass and Recruitment

Since 1980, Chatham Rise relative year-class strengths have been below average except during 1994-1999, and in 2007 (Figure 5). Overall year-class strength variability is relatively low. Recruitment since the early 1990s is estimated to have been fluctuating slightly around the long-term average for this stock (MPI, 2017a).

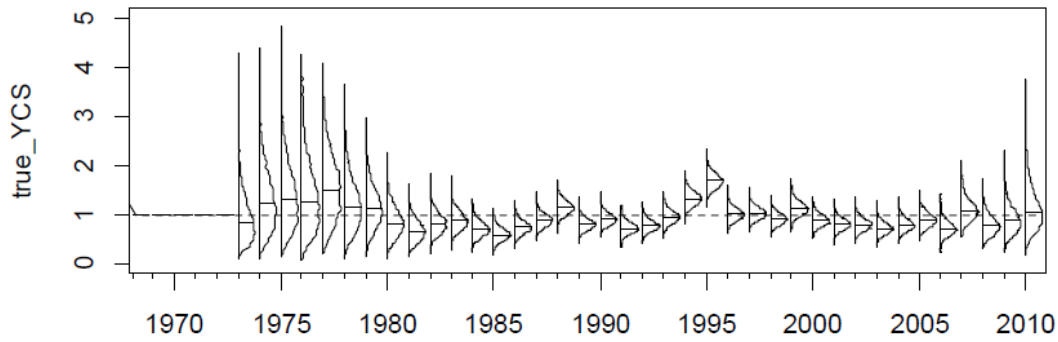


Figure 5. Trend in relative year-class strength of the Chatham Rise ling stock (LIN 3 & 4) for the base case model; dashed horizontal line indicates year-class strength of one; individual distributions show marginal posterior distribution, with horizontal lines indicating median; from MPI (2017a)

Although estimates of current and virgin stock size are imprecise, it is unlikely that B_0 is lower than 110,000 t for this stock, or that biomass in 2014 was less than 44% of B_0 (Figure 6, Table 7). B_{2014} was estimated to be about 57% B_0 and very likely (> 90%) to be above the target and exceptionally unlikely (< 1%) to be below either the soft or hard limit. Overfishing was very unlikely (<10%) to be occurring (MPI, 2017a).

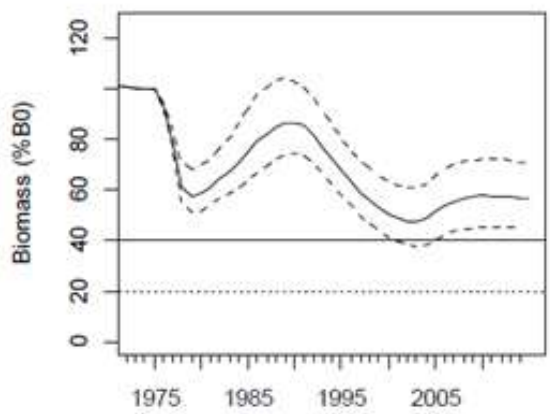


Figure 6. Trend in median stock status (% B_0) of the Chatham Rise (LIN 3 & 4) ling stock for the base case model; 95% credible intervals indicated as dashed lines; management target (40% B_0, solid horizontal line) and soft limit (20% B_0, dotted horizontal line) indicated; from MPI (2017a)

Table 7. Median B_0, B_{2014}, and B_{2014} as percentage of B_0 for the Chatham Rise (LIN 3 & 4) ling base model and sensitivity run; 95% credible intervals indicated; from MPI (2017a)

Model run	B_0		B_{2014}		B_{2014} (%B_0)		P(40% B_0)
Base	126 600	(110 700–165 100)	71 800	(50 500–115 200)	57	(45–71)	0.003
Longline	107 400	(98 700–122 700)	60 900	(42 000–85 600)	40	(30–51)	–

Projections using the base model until 2019 were performed assuming fixed catches of 6,260 or 3,564 t (Table 8). Chatham Rise stock status is likely to remain about the same assuming future catches equal to recent catch levels, or decrease to around 90% of the 2014 biomass by 2019 if catches reach the TACC. During 2013/14 – 2015/16, LIN 3 & 4 catch averaged 3,795 t, similar to the assumption of one of the projected catch scenarios. At catch close to current levels (3,564 t), B_{2019} for the base case model is expected to be 59% B_0 (95% CI 45 – 75% B_0).

Table 8. Median projected biomass in 2019 (B_{2019}), B_{2019} as a percentage of B_0, and B_{2019}/B_{2014} (%) for the Chatham Rise (LIN 3 & 4) ling base model where future annual catches are assumed to be 6,200 or 3,564 t; 95% credible intervals indicated; from MPI (2017a)

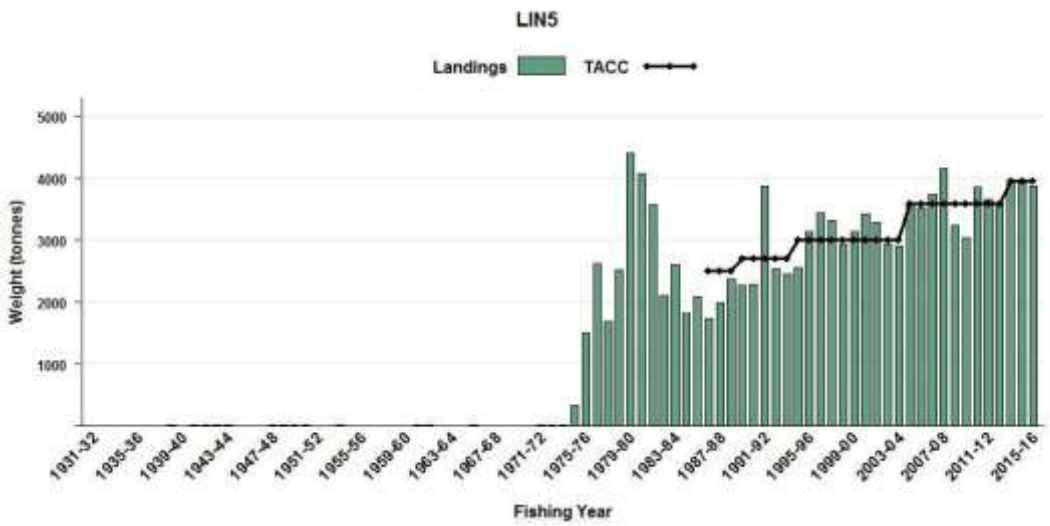
Stock and model run		Future catch (t)	B_{2019}		B_{2019} (%B_0)		B_{2019}/B_{2014} (%)	
LIN 3&4	Base	6 260	64 000	(38 900–112 100)	51	(35–69)	89	(73–106)
		3 564	75 200	(50 400–122 700)	59	(45–75)	104	(91–120)

Ling: Sub-Antarctic (LIN 5 & 6)

Intertek (2014b) used the 2011 assessment of the Sub-Antarctic ling stock. The most recent (2015) assessment is reported here.

Catch and Fishing Mortality

The fishery on the Sub-Antarctic ling stock commenced in the mid-1970s. Since 1980, ling have been caught by large trawlers, both domestic and foreign owned, and by small domestic longliners and trawlers. Quota management was introduced in 1986/87 with the stock-specific quota allocated amongst ling management areas as a TACC based upon the distribution of the stock (see Harvest Strategy, Section 4.2.3). In the early 1990s, the domestic fleet was increased by the addition of several larger longliners with autoline equipment, resulting in a large increase in the catches of ling off the east and south of the South Island (LIN 3, 4, 5 and 6). Since then, catch of the stock in LIN 5 has remained close to its TACC (3,595 t) while that in LIN 6 has declined significantly below its TACC (8,505 t) (Figure 7).



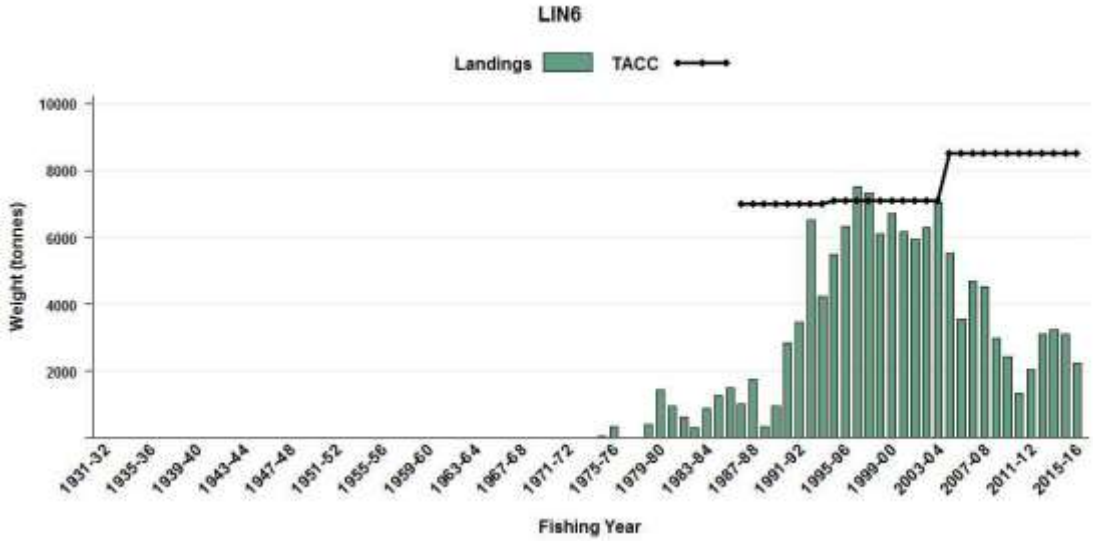


Figure 7. Reported commercial landings and TACCs (t) by ling management area of the Sub-Antarctic (LIN 5 & 6) ling stock; from MPI (2017a)

Annual exploitation rates (U) rose from vary low levels in the 1970s – 1980s to about 0.06 by 2000 and have since declined to about 0.02 (Figure 8).

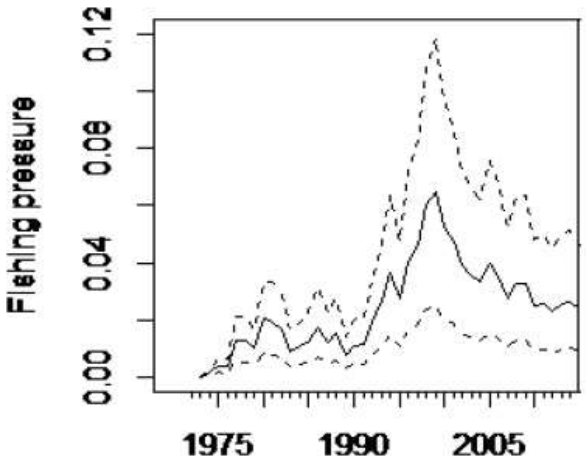


Figure 8. Median exploitation rates (catch over vulnerable biomass) for the Sub-Antarctic (LIN 5 & 6) ling stock base case model; 95% credible intervals indicated as dotted lines; from MPI (2017a)

Biomass and Recruitment

Relative year-class strength was generally weak during 1982 - 1992, strong during 1993 - 1996, and average since then, although that of 2005 may have been be strong. Overall year-class strength variability is relatively low (Figure 9).

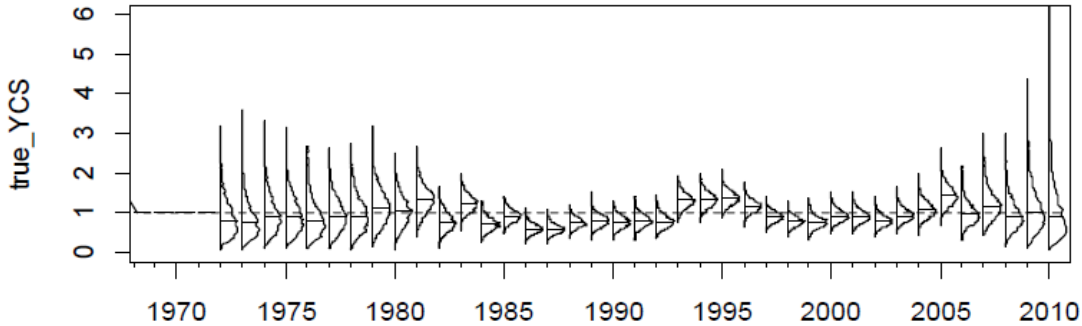


Figure 9. Trend in relative year-class strength of the Sub-Antarctic (LIN 5 & 6) ling stock for the base case model; dashed horizontal line indicates year-class strength of one; individual distributions show marginal posterior distribution, with horizontal lines indicating median; from MPI (2017a)

Stock status declined through the 1990s, but has exhibited an upturn during the last 15 years (Figure 10). The biomass trajectory from the base case model was little different to that derived from the reference model. MPI (2017a) states 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 (Table 9).

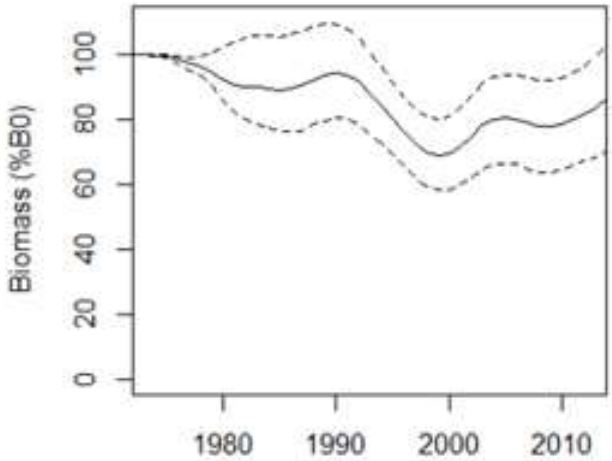


Figure 10. Trend in median stock status (% B_0) of the Sub-Antarctic (LIN 5 & 6) ling stock for the base case model; 95% credible intervals indicated as dashed lines; from MPI (2017a)

Table 9. Median B_0, B_{2014}, and B_{2014} as percentage of B_0 for the Sub-Antarctic (LIN 5 & 6) ling base and reference models; 95% credible intervals indicated; from MPI (2017a)

Model run	B_0		B_{2014}		B_{2014} (%B_0)		P(40% B_0)
Reference model	354 000	(204 000–673 000)	317 000	(155 000–655 000)	89	(72–104)	–
Base case model	289 000	(179 000–665 000)	251 000	(127 000–651 000)	86	(69–103)	0.000

Projections to 2019 were performed assuming fixed catches of 5,700 or 12,100 t. The probability of B_{2019} being below 40% of B_0 is very small when assuming either one of two future annual catch scenarios (the recent catch level of 5,700 t or the TACC of 12,100 t). Stock status is unlikely to change over the next five years at recent catch levels or the level of the TACC (i.e., 12,100 t). It is exceptionally unlikely (< 1%) that biomass will fall below limit and target reference points under either catch scenario, and those catch levels are very unlikely (<10%) to cause overfishing by 2019 (Table 10).

Table 10. Median projected biomass in 2019 (B_{2019}), B_{2019} as a percentage of B_0, and B_{2019}/B_{2014} (%) for the Sub-Antarctic (LIN 5 & 6) ling base model where future annual catches are assumed to be 5,700 or 12,100 t; 95% credible intervals indicated; from MPI (2017a)

Stock and model run		Future catch (t)	B_{2019}		B_{2019} (%B_0)		B_{2019}/B_{2014} (%)	
LIN 5&6	Base	5 700	265 500	(129 100–714 800)	91	(69–118)	104	(86–136)
		12 100	240 300	(104 000–697 300)	82	(56–113)	94	(73–127)

Ling: West Coast South Island (LIN 7WC)

Intertek (2014b) used the 2013 assessment of the West Coast South Island Ling stock. The most recent (2017) assessment is reported here.

Catch and Fishing Mortality

The fishery on the WCSI ling stock commenced in the mid-1970s. Quota management was introduced in 1986/87 with the LIN 7 TACC based upon the WCSI assessment (see Harvest Strategy, Section 4.2.3). Catches rose during the 1980s and surpassed the TACC in the 1990s but more recent catches have been in line with the TACCs, which have seen an increase since the late 2000s (Figure 11).

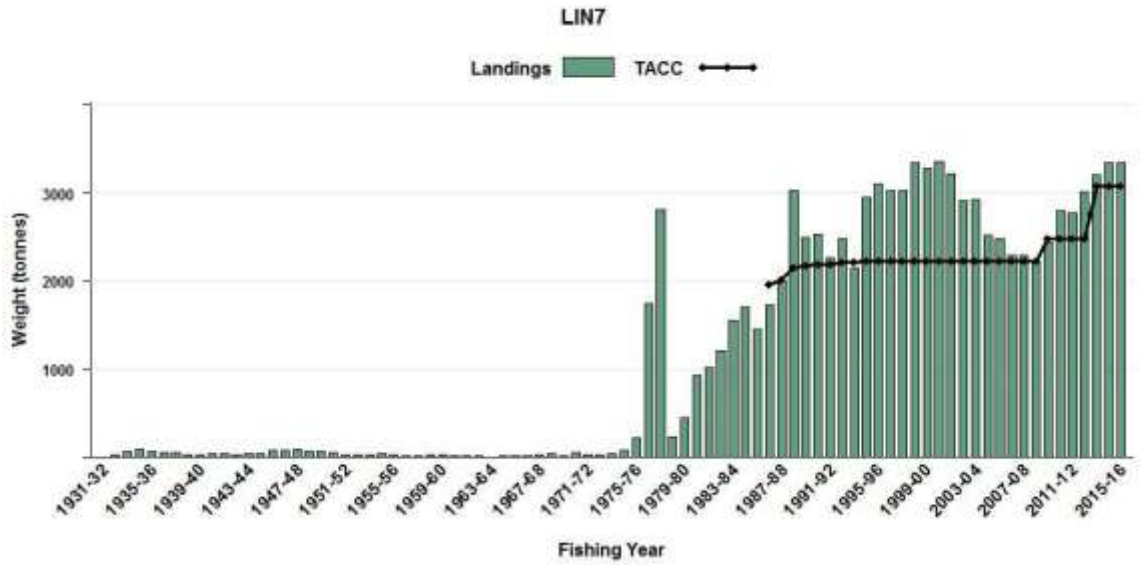


Figure 11. Reported commercial landings and TACCs (t) of ling management area 7 in which the West Coast South Island (LIN 7WC) ling stock resides; from MPI (2017a)

Annual exploitation rates (U) by both the trawl and longline fleets rose during the 1980s to about 0.05 and have fluctuated without trend since then (Figure 12).

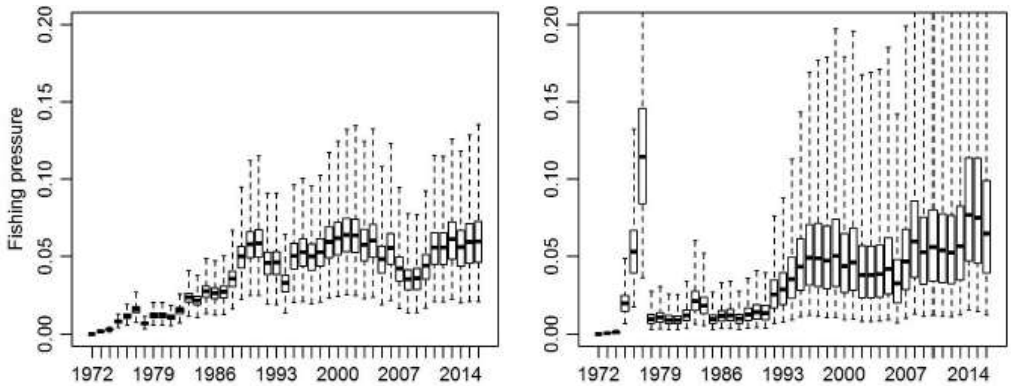


Figure 12. Estimated posterior distributions of the exploitation rate of the trawl (left panel) and longline (right panel) fleets, for the Combined CPUE WCSI (LIN 7WC) ling model; median (solid horizontal line), inter-quartile range (box; half of the estimates were within this range), and overall range of estimates (broken vertical lines) indicated; from MPI (2017a).

Biomass and Recruitment

Relative year-class strength of the WCSI Combined CPUE model run (other models were not visually different) estimated a period of high recruitment around 1990, and in several years since 2001 (Figure 13). Relatively strong year-classes since 2001 have started recruiting to the fishery from around 2010 (at age nine).

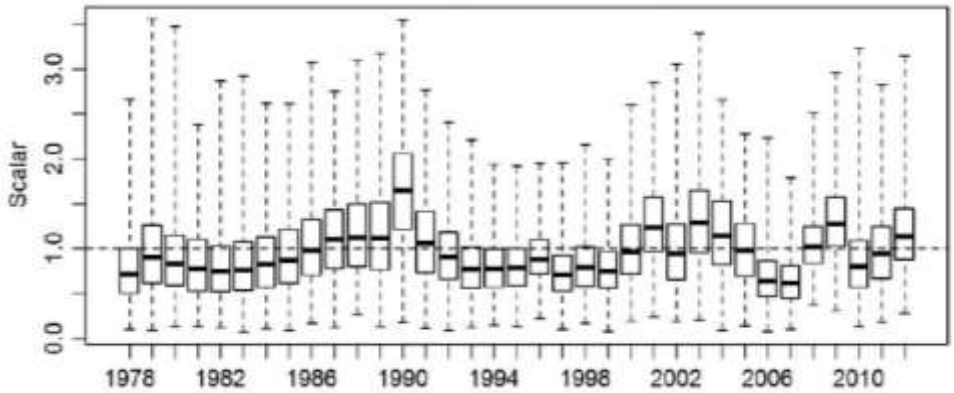


Figure 13. Trend in relative year-class strength of the WCSI (LIN 7WC) ling stock for the Combined CPUE model; dashed horizontal line indicates year-class strength of one; median (solid horizontal line), inter-quartile range (box; half of the estimates were within this range), and overall range of estimates (broken vertical lines) indicated; from MPI (2017a)

The Combined CPUE model indicates that biomass and stock status declined until 1992, followed by fluctuating but stable biomass until 2016, whereas both the Lognormal CPUE models indicate slow overall biomass declines (Figure 14). For the three models, B_{2017} ranges 54 – 79% B_0 with the lower 95% CI ranging 39 – 61% B_0 (Table 11) and very likely (Pr>90%) to be at or above the target.

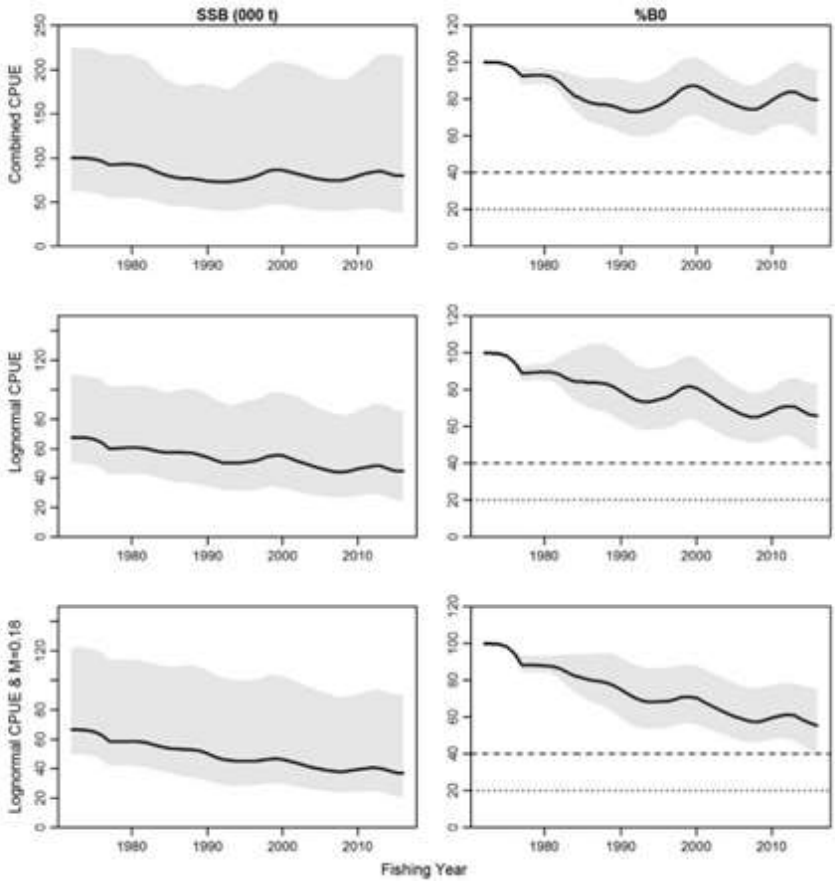


Figure 14. Posterior distributions of the WCSI (LIN 7WC) spawning stock biomass (t) and % B_0 for the three models; solid lines are median values and the shaded area are 95% CIs; dashed and dotted horizontal lines are the target reference point and soft limit reference point respectively; from MPI (2017a)

Table 11. Median B_0, B_{2017}, and B_{2017} as percentage of B_0 for the WCSI ling models; 95% credible intervals indicated; from MPI (2017a)

Model run	B_0		B_{2017}		B_{2017} (%B_0)	
Combined CPUE	99 300	(63 500–198 200)	77 400	(39 600–183 000)	79	(61–96)
Lognormal CPUE	69 300	(51 600–122 000)	46 300	(26 100–98 000)	66	(50–83)
Lognormal CPUE and M = 0.18	62 800	(48 900–114 500)	34 000	(19 500–84 100)	54	(39–74)

Projections to 2022 for WCSI stock indicate that biomass was likely to remain about the same with future catches equal to the average of catch between 2012 - 2016 (2,980 t), or if catches were to increase modestly (by around 10% to 3,300 t) (Table 12). During 2013/14 – 2015/16, LIN 7 catch averaged 3,294 t, increasing in response to a TACC increase.

Table 12. Median projected biomass in 2022 (B_{2022}), B_{2022} as a percentage of B_0, and B_{2022}/B_{2016} (%) for the WCSI (LIN 7WC) ling models where future annual catches are assumed to be 2,980 or 3,300 t; 95% credible intervals indicated; from MPI (2017a)

Stock and model run		Future catch (t)	B_{2022}		B_{2022} (%B_0)		B_{2022}/B_{2016} (%)	
LIN 7WC	Combined CPUE	2980	77 300	(37 800-185 500)	79	(56–106)	100	(83–126)
		3300	76 600	(35 500-183 700)	78	(54–104)	98	(80–123)
	Lognormal CPUE	2980	47 400	(21 600–97 300)	70	(41–100)	104	(81–134)
		3300	45 900	(20 700–96 900)	68	(37–97)	102	(77–133)
	Lognormal CPUE & M = 0.18	2980	38 100	(17 300–97 900)	57	(33–85)	100	(76–126)
		3300	36 400	(15 900–95 900)	54	(32–82)	97	(73–124)

4.2.2 Reference Points

The basis of the ling reference points (RPs) has not changed since Intertek (2014b). 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 4.2.3) 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 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 that 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 hard and soft biomass limit reference points for ling are based upon the defaults in the HSS standard and thus, are a percent of the virgin biomass (B_0), as estimated in the stock assessments using statistical catch-at-age models, available information on the population dynamics and biomass surveys (see Stock Assessment, Section 4.2.6). As per the HSS defaults, the SSB hard and soft limit reference points are set at 10% and 20% of unexploited biomass respectively, the latter based upon the low productivity of these species. 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. This interpretation is consistent with 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 ling stock assessments use a Beverton and Holt stock-recruitment relationship with an assumed value of 0.84 for steepness. This implies that expected biomass at the soft limit (20%B_0) will maintain recruitment at 84% of that

at virgin levels. Further, research on B_{MSY} and related proxy RPs (e.g. Punt et al, 2014) indicates that at steepness in the range of 0.84, 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 of these fisheries.

The SSB target RP for ling are the HSS default of 40% B_0. This is supported by the higher steepness value (0.84) assumed for this species.

Ling is not low trophic level species. It does not appear in MSC CR v1.3 Box CB1. The diet of the species is not predominantly plankton and ling do not have the biological characteristics of Low Trophic Level (LTL) species identified in MSC CR v1.3.

4.2.3 Harvest Strategy

The harvest strategy for ling has not changed since Intertek (2014b). Intertek (2014b) 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 ling (Intertek, 2014b) fishery.

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 the Act. The Annual Operational Plan for Deepwater Fisheries (MPI, 2016) provides the management objectives guiding the deepwater fishery which follow from the 1996 Fisheries Act.

The conceptual sustainability objectives of the Fisheries Act are operationalized through the 2008 Harvest Strategy Standard (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.

4.2.4 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—
  ii. 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
  iii. within a period appropriate to the stock, having regard to the biological characteristics of the stock and any environmental conditions affecting the stock; or
(c) 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. 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 15) 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 15 is primarily for illustrative purposes, to provide an example of one type of control rule that is likely to achieve the requirements of the HSS.

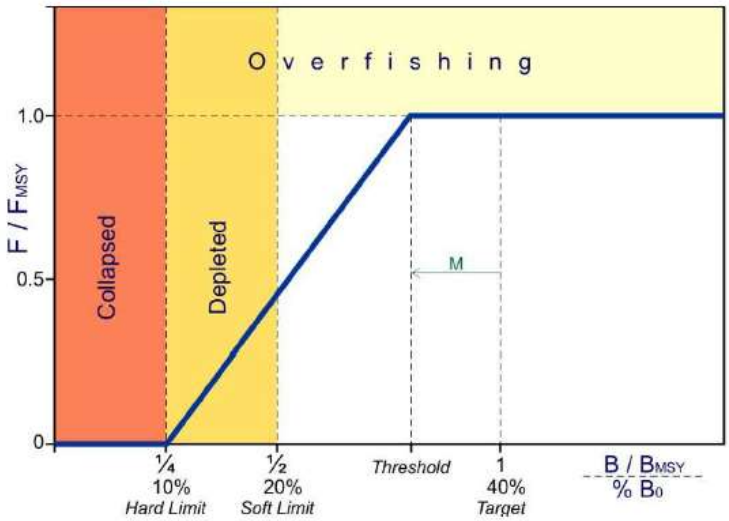


Figure 15. Illustrative example of a harvest strategy control rule that would be in conformance with the Harvest Strategy Standard; *M* is natural mortality (from MPI, 2011)

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 and there is at least a 50% probability that the stock is above the soft limit.

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 CRv1.3. 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 TACC options, it follows the HSS.

The HCR for ling is consistent with the HSS and associated Operational Guidelines and consists of the following:

- Assessment by the DWFAWG every 1-3 years to estimate probability of current biomass and/or fishing mortality relative to limit and target reference points (see Stock Assessment, Section 4.2.6).
- Conduct of 5-year projections to evaluate Pr(SSB<20% 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 Markov Chain Monte Carlo (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 the 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

The status of the three ling stocks has been well above the 40% B_0 target for much of the assessment time series and thus Kobe plots (relationship between fishing intensity (U) and relative spawning stock biomass (B/B_0) are not informative of the experience with the ling HCRs. However, it is expected that these would display the same properties as the HCRs for hake and hoki (see hoki, hake, ling trawl fishery report) if status were to decline towards 20% B_0.

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%

An MSE for ling is included in the five-year (medium term) research plan of MPI (MPI, 2017c).

Tools

The tools to control fishing to achieve the objectives of the harvest strategy have not changed since Intertek (2014b). 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 4.4.7 on Compliance and Enforcement). Recent decisions on ling TACCs illustrate the approach. For ling (LIN5, LIN6 and LIN7), during the 2013 TACC consultations, potential drivers for misreporting and non-reporting had been identified and thus

the allowance for other sources of mortality (i.e. misreporting and non-reporting) was raised from 1% to 2% of the TACC (MPI, 2013).

Each license 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 licensee'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 on an increasing scale above the ACE. Thus, while TACC overruns can occur, 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 boundaries for some of the stocks do not conform to the management boundaries used by MPI for catch control. In the case of the Chatham Rise ling stock, the TACCs are apportioned to areas LIN 3 and LIN 4 based upon an analysis of the biological distribution of the stock in survey data (T. Bock, pers. comm.). In the case of the Sub-Antarctic ling stock, the TACCs are again apportioned to areas LIN 5 and LIN 4, again based upon an analysis of the biological distribution of the stock in survey data (T. Bock, pers. comm.). For LIN 7, MPI uses the results of the West Coast South Island (LIN 7WC) stock assessment as the basis of the TACC.

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.

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 publicly available in an MPI Consultation Document (formally termed Initial Position Paper or IPP) which outline the management options and this 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 provides 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 ling stocks, the comparisons of advice, TACCs and landings are complicated by the bycatch nature of species in the hoki fishery (Table 13). Also, the generally good status of the three stocks has afforded management and stakeholders scope to explore catch options additional to those conducted by the DWFAWG but consistent with the HSS. Generally, TACCs have been set consistent with the advice and catch has been within the TACCs.

Table 13. Comparison of ling advice from MPI and stakeholder consultation, TACC set by Minister and reported catch (t) by fishing year

Fishing Year	Chatham Rise LIN 3 & 4			Sub-Antarctic LIN 5 & 6			WCSI LIN 7		
	Advice	TACC	Catch	Advice	TACC	Catch	Advice	TACC	Catch
2007/08	6,260	6,260	4,616	12,100	12,100	8647	2,225	2,225	2,282
2008/09	6,260	6,260	3,751	12,100	12,100	6209	2,225	2,225	2,223
2009/10	6,260	6,260	3,744	12,100	12,100	5448	2,474	2,474	2,446
2010/11	6,260	6,260	3,237	12,100	12,100	5191	2,474	2,474	2,800
2011/12	6,260	6,260	3,597	12,100	12,100	5696	2,474	2,474	2,771
2012/13	6,260	6,260	3,656	12,100	12,100	6712	2,474	2,474	3,010
2013/14	6,260	6,260	3,815	12,460	12,460	7156	3,080	3,080	3,200
2014/15	6,260	6,260	3,571	12,460	12,460	7039	3,080	3,080	3,343
2015/16	6,260	6,260	3,999	12,460	12,460	6090	3,080	3,080	3,340
2016/17	6,260	6,260		12,460	12,460		3,080	3,080	

4.2.5 Information & Monitoring

This section describes information and monitoring activities conducted on ling, summarizing those presented in Intertek (2014b) 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) will be replaced by a new plan although the planning process per se (scientific prioritization, stakeholder engagement, budgeting, etc.) has not changed. These plans include specific information on, for instance, assessment schedules, fishery and observer sampling, survey activities and upcoming Management Strategy Evaluations (MPI, 2017c). Also, the annual Plenary Reports of the ling stocks provides not only information on monitoring and assessment activities but also recommendations for future research.

Stock Structure & Distribution

A review of ling stock structure (reported in Intertek, 2014b) examined a wide range of information from studies of morphometrics, genetics, growth, population age structures, and reproductive biology and behaviour, and indicated that there are at least five ling stocks around New Zealand (see Figure 2):

- Chatham Rise (LIN 3 & 4)
- Southern Plateau (Sub-Antarctic stock including the Stewart-Snares shelf and Puysegur Bank) (LIN 5 & 6)
- Bounty Plateau (LIN 6B)
- West Coast South Island (LIN 7WC)
- Cook Strait (LIN 7CK)

Ling in spawning condition have been reported in a number of localities throughout the New Zealand EEZ with the time of spawning varying by area:

- July to November on the Chatham Rise;
- September to December on Campbell Plateau and Puysegur Bank;
- September to February on the Bounty Plateau;
- July to September off west coast South Island and in Cook Strait.

Little is known about the distribution of juveniles until they are about 40 cm total length, when they begin to appear in trawl samples over most of the adult range.

During the site visit, NIWA scientists confirmed that the only significant stock structure work on ling since that reported in Intertek (2014b) was an otolith contour shape analysis (Ladroit et al, 2017). The study undertook two comparisons of otolith shape: one between LIN 4 (Chatham Rise) and the presumed Sub-Antarctic biological stock (LIN 5 and LIN 6 combined), the other between southern (LIN 6) and northern (LIN 5) parts of the Sub-Antarctic area. For the Chatham Rise vs. Sub-Antarctic comparison the average success rate was 77.4%, a level

indicative of a differentiation between ling from these two areas. For the north-south Sub-Antarctic comparison, the success rate was 50–55%, strongly indicative of no differentiation. The stock structure indicated by this study is the same as that derived from other sets of biological characteristics and corroborates the stock structure which is the basis of the MPI stock assessments.

There was a study of the temporal and spatial distribution of ling on the Chatham Rise and off the WCSI (Horn, 2015a) examining sex ratios in the ling longline fishery and summer research vessel trawl surveys during 1993 – 2013. The population sex ratio of Chatham Rise ling, both juvenile and adult, as indicated by the survey data, was skewed consistently towards males. There was a marked decline throughout the 1990s in the numbers of large female ling on Chatham Rise which probably contributed to the steep decline in commercial catch rates (CPUE) apparent in the first seven - nine years of the time series. The preferred selectivity of the line fishery for large (and, therefore, often female) fish likely resulted in an increase in the proportion of males in the catch over time as the large females were fished down. Off the WCSI, the trend in the proportion of male ling in trawl fishery targeting hoki was likely due to different levels of fishing in the three strata used to scale sampled length data up to the length distribution for the fishery each year, and inter-annual differences in the temporal and depth distribution of samples. It is suggested that this may have implications for the some of the stock and fishery structural assumptions of the WCSI stock assessment.

Stock Productivity

Intertek (2014b) and MPI (2017a) summarize information on ling growth and maturity. Ling live to a maximum age of about 30 years; fewer than 0.2% of successfully aged ling have been older than 30 years. A growth study of ling from five areas (West Coast South Island, Chatham Rise, Bounty Plateau, Campbell Plateau and Cook Strait) showed that females grew significantly faster and reached a greater size than males in all areas, and that growth rates were significantly different between areas. Ling grow fastest in Cook Strait and slowest on the Campbell Plateau (MPI, 2017a).

The 50% age of maturity varies by stock, being about age 12, 8 and 8.5 for female ling in LIN 3 & 4, LIN 5 & 6 and LIN 7WC respectively (MPI, 2017a). Age-specific maturity ogives are an input to the stock assessments. During the site visit, it was indicated that there have been no more recent growth and maturity studies.

Natural mortality (*M*) has initially been estimated as 0.18 from the equation $M = \log_e 100/\text{maximum age}$, where maximum age is the age to which 1% of the population survives in an unexploited stock (MPI, 2017a). Age-invariant natural mortality is estimated in the stock assessments and varies between stocks. The *M* for Chatham Rise ling appears to be lower than 0.18, while for Cook Strait and west coast South Island the value may be higher than 0.18.

The above estimates of ling *M* and 50% age of maturity imply generation times (T_{GEN}) of 12, 8 and 8.5 + 1/0.18 = 17.6, 13.6 and 14.1 years for the Chatham Rise, Sub-Antarctic and WCSI ling stocks respectively.

The ling stock assessments have assumed a Beverton and Holt stock-recruitment relationship with steepness dependent on the stock, these being 0.84 for the three stocks (LIN 3 & 4, LIN 5 & 6 and LIN 7WC) considered in this assessment (MPI, 2017a). There have been no more recent studies on factors influencing recruitment success.

Fleet composition and Fishery Removals

MPI maintains a registry of all licence holders and associated vessel and operational characteristics. The monitoring of the longline fishery has not changed significantly since Intertek (2014b). 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. The reporting regime also requires LFRs to report monthly to MPI all fish species received during that month from each fisher. 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 be 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. 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.

MPI (2017a) notes instances of illegal and unreported catch of hoki, hake and ling. For instance, in the years just prior to the introduction of the EEZ, when large catches of hoki were first reported, and following the increases of the TACC in the mid-1980s, it is likely that high catch rates of hoki on the WCSI resulted in burst bags, loss of catch and some mortality, and were of a sufficient level to result in the introduction of a code of practice to minimise losses in this way. Observer observations during 2000/01 – 2006/07 indicates that fish lost during landing accounted for only a small fraction (0–14.5%) of the total fish discards each year in the hoki, hake and ling trawl fishery.

The catch data inputs to the stock assessments have often, but not always, been adjusted to address under-reporting but this has mostly been done for hoki and hake rather than ling. It is believed that up to the mid-1990s, some ling bycatch (in the order of 250 – 400 t) from the west coast hoki fishery was not reported. Overall, these levels of illegal and unreported catch have not been considered significant (but see recent adjustment in TACC; section 4.2.4 on Harvest Control Rules).

The MPI scientific observer programme provides information on the fisheries' catch volumes and age/size compositions on an on-going basis and represents a significant component of the management of the fisheries and assessments of the stocks. During 2002/03 – 2014/15, observer coverage of ling longline directed fishing ranged 3 – 55%(https://psc.dragonfly.co.nz/2017v1/released/birds/ling-longline/all-vessels/eez/2014-15/), averaging 15%.Observer coverage in hoki, hake and ling trawl directed fishing (relevant to P1 assessment) ranged 9 – 30%, 5 - 77% and 3 – 23% respectively (see Figure 37 of hoki, hake, ling assessment).

Recreational fishing for ling is negligible and quantitative estimates of the level of customary non-commercial take are not available but are thought to be low or nil.

Stock Abundance

Stratified-random bottom trawl–acoustic surveys have been conducted on the Chatham Rise (January), in the Sub-Antarctic area (April-May and Nov-Dec) and on the West Coast South

Island (March-April and August) since 1988 and provide the main age and size-specific abundance indices for the ling stock assessments (Table 14). The sampling design and operation of these surveys is described in reports produced for each survey (e.g. Stevens et al, 2017 for Chatham Rise, Bagley et al, 2014 for Sub-Antarctic and O'Driscoll et al, 2014a for WCSI). For ling, the trawl component of these surveys provides the indices of abundance.

Table 14. Bottom trawl survey biomass indices for ling (t)

Fishstock	Area	Vessel	Trip code	Date	Biomass	
LIN 3	ECSI (winter)	*Kaharoa*	KAH9105*	May–Jun 1991	1 009	35
			KAH9205*	May–Jun 1992	525	17
			KAH9306*	May–Jun 1993	651	27
			KAH9406*	May–Jun 1994	488	19
			KAH9606*	May–Jun 1996	488	21
			KAH0705*	May–Jun 2007	283	17
			KAH0806*	May–Jun 2008	351	22
			KAH0905*	May–Jun 2009	262	19
			KAH1207*	May–Jun 2012	265	21
LIN 3 & 4	Chatham Rise	*Tangaroa*	TAN9106	Jan–Feb 1992	8 930	5.8
			TAN9212	Jan–Feb 1993	9 360	7.9
			TAN9401	Jan 1994	10 130	6.5
			TAN9501	Jan 1995	7 360	7.9
			TAN9601	Jan 1996	8 420	8.2
			TAN9701	Jan 1997	8 540	9.8
			TAN9801	Jan 1998	7 310	8.0
			TAN9901	Jan 1999	10 310	16.1
			TAN0001	Jan 2000	8 350	7.8
			TAN0101	Jan 2001	9 350	7.5
			TAN0201	Jan 2002	9 440	7.8
			TAN0301	Jan 2003	7 260	9.9
			TAN0401	Jan 2004	8 250	6.0
			TAN0501	Jan 2005	8 930	9.4
			TAN0601	Jan 2006	9 300	7.4
			TAN0701	Jan 2007	7 800	7.2
			TAN0801	Jan 2008	7 500	6.8
			TAN0901	Jan 2009	10 620	11.5
			TAN1001	Jan 2010	8 850	10.0
			TAN1101	Jan 2011	7 030	13.8
			TAN1201	Jan 2012	8 098	7.4
			TAN1301	Jan 2013	8 714	10.1
			TAN1401	Jan 2014	7 489	7.2
			TAN1601	Jan 2016	10 201	7.2
LIN 5 & 6	Southern Plateau	*Amaltal Explorer*	AEX8902*	Oct–Nov 1989	17 490	14.2
			AEX9002*	Nov–Dec 1990	15 850	7.5
LIN 5 & 6	Southern Plateau (summer)	*Tangaroa*	TAN9105	Nov–Dec 1991	24 090	6.8
			TAN9211	Nov–Dec 1992	21 370	6.2
			TAN9310	Nov–Dec 1993	29 750	11.5
			TAN0012	Dec 2000	33 020	6.9
			TAN0118	Dec 2001	25 060	6.5
			TAN0219	Dec 2002	25 630	10.0
			TAN0317	Nov–Dec 2003	22 170	9.7
			TAN0414	Nov–Dec 2004	23 770	12.2
			TAN0515	Nov–Dec 2005	19 700	9.0
			TAN0617	Nov–Dec 2006	19 640	12.0
			TAN0714	Nov–Dec 2007	26 492	8.0
			TAN0813	Nov–Dec 2008	22 840	9.5
			TAN0911	Nov–Dec 2009	22 710	9.6
			TAN1117	Nov–Dec 2011	23 178	11.8
			TAN1215	Nov–Dec 2012	27 010	11.3
			TAN1412*	Nov–Dec 2014	30 010	7.7
			TAN1614*	Nov–Dec 2016	26 656	16.0
LIN 5 & 6	Southern Plateau (autumn)	*Tangaroa*	TAN9204	Mar–Apr 1992	42 330	5.8
			TAN9304	Apr–May 1993	37 550	5.4
			TAN9605	Mar–Apr 1996	32 130	7.8
			TAN9805	Apr–May 1998	30 780	8.8
LIN 7WC	WCSI	*Tangaroa*	TAN0007	Aug 2000	1 861	17.3
			TAN1210	Aug 2012	2 169	14.8
			TAN1308	Aug 2013	2 000	18.4
			TAN1608	Aug 2016	1 635	12.7
LIN 7WC	WCSI	*Kaharoa*	KAH9204*	Mar–Apr 1992	280	19
			KAH9404*	Mar–Apr 1994	261	20
			KAH9504*	Mar–Apr 1995	373	16
			KAH9701*	Mar–Apr 1997	151	30
			KAH0004*	Mar–Apr 2000	95	46
			KAH0304*	Mar–Apr 2003	150	33
			KAH0503*	Mar–Apr 2005	274	37
			KAH0704*	Mar–Apr 2007	180	27
			KAH0904*	Mar–Apr 2009	291	37
			KAH1104*	Mar–Apr 2011	234	43
			KAH1305*	Mar–Apr 2013	405	44
			KAH1503*	Mar–Apr 2015	472	53

* Not used in the reported assessment.

Since Intertek (2014b), the overall intensity of the survey programme has reduced due to a perceived need by MPI to reallocate resources to less well understood fisheries, which has increased the uncertainty in these abundance indices. The Chatham Rise (January) and Sub-Antarctic (Nov-Dec) surveys have been conducted biannually since 2014 and 2011 respectively while WCSI survey (trawl component) has been conducted tri-annually since 2013.

Reviews are conducted to improve survey performance as required. For instance, in 2014, there was a review of the trawl and acoustic components of the WCSI survey to inform future survey design (O'Driscoll et al, 2014b). A recommendation was made to increase the level of sample trawling in the southern areas to allow for more detailed species identification by survey stratum. The trawl abundance estimates of ling appear to be of high quality, with relatively good precision (CVs less than 20%) (see Table 29D of hoki, hake, ling trawl report). Standardized commercial catch rate (CPUE) indices are also used in the ling stock assessments (Table 15). Issues with each of these indices are discussed by the DWFAWG and noted as appropriate in the plenary reports. As with the survey indices, the CVs of these indices are considered low and during the stock assessment process are increased to better represent the contribution of these data to stock status determination (see Stock Assessment section).

Table 15. Commercial fishery CPUE indices and associated CVs; LIN-specific ling indices for trawl and longline where year = calendar year, sp=spawning fishery, nsp=non-spawning fishery; from MPI (2017a)

	LIN 2 line		LIN 3&4 line		LIN 5&6 line (sp)		LIN 5&6 line (nsp)	
Year	CPUE	CV	CPUE	CV	CPUE	CV	CPUE	CV
1991	–	–	1.67	0.06	1.39	0.17	0.67	0.12
1992	1.64	0.09	2.43	0.06	1.81	0.14	1.07	0.09
1993	1.40	0.08	1.73	0.05	1.78	0.11	1	0.10
1994	1.55	0.09	1.65	0.05	1.48	0.11	0.76	0.09
1995	1.54	0.07	1.68	0.05	1.48	0.17	1.10	0.08
1996	1.34	0.07	1.31	0.05	1.40	0.11	0.85	0.09
1997	1.29	0.07	0.88	0.04	1.22	0.11	0.96	0.06
1998	1.27	0.07	0.90	0.05	1.10	0.11	0.90	0.07
1999	1.13	0.07	0.80	0.04	1.25	0.10	0.64	0.05
2000	0.80	0.07	0.93	0.05	1.32	0.10	0.74	0.07
2001	0.60	0.08	0.93	0.04	1.27	0.09	0.90	0.08
2002	0.97	0.08	0.77	0.04	1.58	0.10	0.77	0.10
2003	0.88	0.07	0.85	0.05	1.14	0.12	0.60	0.12
2004	1.07	0.07	0.81	0.04	1.04	0.09	0.57	0.09
2005	1.00	0.08	0.85	0.04	1.47	0.12	0.52	0.13
2006	0.88	0.07	0.74	0.05	1.30	0.12	0.60	0.14
2007	0.95	0.07	0.81	0.04	1.39	0.11	0.74	0.26
2008	0.85	0.07	1.04	0.04	1.05	0.14	0.87	0.13
2009	0.89	0.08	0.73	0.04	2.09	0.19	0.76	0.13
2010	0.90	0.07	0.84	0.04	0.69	0.19	0.91	0.09
2011	0.82	0.06	0.65	0.04	1.04	0.15	0.58	0.09
2012	0.56	0.07	0.79	0.05	1.13	0.15	0.73	0.08
2013	0.65	0.08	0.80	0.07	–	–	–	–

	LIN 7WC line		LIN 7CK line		LIN 7CK trawl		LIN 7WC trawl	
Year	CPUE	CV	–	–	CPUE	CV	CPUE	CV
1987	–	–	–	–	–	–	0.58	0.07
1988	–	–	–	–	–	–	1.01	0.06
1989	–	–			–	–	1.43	0.07
1990	0.87	0.07	1.29	0.15	–	–	1.37	0.06
1991	1.04	0.06	1.44	0.13	–	–	0.88	0.07
1992	1.23	0.05	1.43	0.11	–	–	0.95	0.08
1993	0.88	0.05	1.11	0.11	–	–	1.10	0.07
1994	0.86	0.05	0.90	0.11	1.25	0.05	0.94	0.06
1995	0.87	0.05	0.83	0.12	1.16	0.04	1.29	0.07
1996	0.65	0.04	0.97	0.13	1.12	0.04	1.71	0.05
1997	0.77	0.05	1.32	0.18	1.00	0.04	1.62	0.06

1998	0.89	0.04	0.83	0.15	1.01	0.04	1.32	0.05
1999	0.92	0.05	1.54	0.18	1.02	0.03	1.60	0.04
2000	0.94	0.05	1.45	0.19	1.27	0.04	1.22	0.04
2001	1.09	0.05	1.27	0.18	1.46	0.04	0.98	0.04
2002	1.02	0.05	2.04	0.11	1.27	0.05	1.22	0.04
2003	1.08	0.04	1.66	0.10	1.27	0.04	0.70	0.05
2004	1.08	0.05	1.45	0.09	1.13	0.04	1.21	0.04
2005	0.81	0.04	1.16	0.10	1.18	0.04	0.83	0.04
2006	0.81	0.05	0.97	0.15	1.10	0.05	0.77	0.04
2007	1.08	0.04	0.70	0.12	0.73	0.06	0.57	0.06
2008	1.10	0.05	0.82	0.22	0.90	0.06	0.57	0.06
2009	1.09	0.05	0.60	0.28	0.44	0.07	0.54	0.06
2010	1.33	0.04	0.35	0.30	0.44	0.07	0.75	0.06
2011	1.15	0.05	0.22	0.30	0.23	0.09	1.10	0.05
2012	1.18	0.05					0.88	0.05
2013	1.32	0.05					0.98	0.03
2014	1.23	0.05					0.94	0.03
2015	1.06	0.05					1.09	0.03
2016	1.03	0.06					1.32	0.03

4.2.6 Stock Assessment

The most recent stock assessments of the Chatham Rise (LIN 3 & 4) and Sub-Antarctic (LIN 5 & 6) ling stocks were conducted in 2015. Intertek (2014b) used the previous assessments (2012) of both stocks. The most recent assessment of the West Coast South Island (LIN 7WC) stock was conducted in 2017, with the previous one (2013) used by Intertek (2014b). The assessment modelling approach (Bayesian SCAA in two phases – MPD and MCMC) in all ling assessments has not changed significantly since Intertek (2014b). These assessments use catch history, proportion-at-age, and a variety of survey data from the 1970s – present (see Information and Monitoring section) in a sexed, 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 general, the ling base case models includes:

- 3 to 25 or 28 (LIN 7WC) age groups with the last a plus group
- Recruitment estimated as deviations around assumed Beverton and Holt stock-recruitment relationship (steepness assumed as 0.84) with sex ratio assumed as 0.5
- Starting population numbers at age estimated
- Annual cycle of fishing, recruitment, spawning and natural mortality
- Cohort equation to estimate population numbers by year-class
- Growth model input
- Ageing error included
- Sex-specific but age-invariant natural mortality estimated; LIN 7WC not by sex
- Maximum exploitation rate assumed (0.6)
- Year-invariant trawl survey sex-specific selectivity-at-age (double-normal) estimated; LIN 7WC not by sex
- Year-invariant fishery selectivity at age (double-normal or logistic) for trawl (by sex) and line fisheries separately estimated; LIN 7WC not by sex

The objective function consists of priors on all (fixed) parameters, likelihood functions for the catch proportions at age (multinomial) and abundance indices (lognormal), and penalty functions to constrain the model so that parameter combinations that did not allow historical catch to be taken are strongly penalised. Additional ‘process’ error, assumed to arise from differences between model simplifications and real world variation, is estimated separately for the catch proportions (as per Francis (2011) and survey data and added to their observation error. MPI (2017a) discusses this process error in detail, the treatment of which has not changed since Intertek (2014b).

For all ling stock models, most priors (

Table 16) were intended to be uninformative, and were specified with wide bounds. One exception was an informative prior for the trawl survey *q* (see MPI, 2017 for derivation). The other exception was the normal prior on proportions male (p_male) in the Chatham Rise and Sub-Antarctic models. Priors for all selectivity parameters were assumed to be uniform. Penalty functions were used to constrain the model so that any combination of parameters that did not allow the historical catch to be taken was strongly penalised. A penalty was applied to the estimates of year-class strengths to encourage estimates that averaged to one. The derivation of these has not changed since the assessments used by Intertek (2014b).

Table 16. Priors for key distributions (when estimated) for ling stock assessments; parameters are mean (in natural space) and CV for lognormal; from MPI (2017a) and McGregor (2015)

A. Chatham Rise (LIN 3 & 4) stock

Parameter description	Distribution	Parameters		Bounds	
B_0	Uniform-log	–	–	30 000	500 000
Year class strengths	Lognormal	1.0	0.70	0.01	100
Trawl survey *q*	Lognormal	0.13	0.70	0.02	0.3
CPUE *q*	Uniform-log	–	–	1e-8	1e-3
Selectivities	Uniform	–	–	0	20–200
M	Uniform	–	–	0.01	0.6
p_male	Normal	0.5	0.15	0.1	0.9

B. Sub-Antarctic (LIN 5 & 6) stock

Parameter description	Distribution	Parameters		Bounds	
B_0	Uniform-log	–	–	50 000	800 000
Year class strengths	Lognormal	1.0	0.70	0.01	100
Trawl survey *q*	Lognormal	0.13	0.70	0.02	0.3
CPUE *q*	Uniform-log	–	–	1e-8	1e-3
Selectivities	Uniform	–	–	0	20–200*
M (x_0, y_0, y_1, y_2)	Uniform	–	–	3, 0.01, 0.01, 0.01	15, 0.6, 1.0, 1.0

* A range of maximum values were used for the upper bound

C. WCSI (LIN 7WC) stock

Parameter description	Distribution	Parameters		Bounds	
B_0	uniform-log	–	–	10 000	500 000
Year class strengths	lognormal	1.0	0.7	0.01	100
Tangaroa survey *q*	lognormal	0.043	0.70	0.01	0.2
CPUE *q*	uniform-log	–	–	1e-8	1e-3
Selectivities	uniform	–	–	0	30–200*
M	normal	0.20	0.025	0.1	0.3

* A range of maximum values was used for the upper bound.

In the Chatham Rise (LIN 3 & 4) assessment (McGregor, 2015), while the fits to the biomass indices, catch-at-age and catch-at-length data, were all fairly good, and almost indistinguishable between model runs, the models that included the longline CPUE had difficulty converging. There was a conflict between the line fishery CPUE and the trawl survey biomass index, where the line fishery biomass index declined between 1991 and 1997, but the trawl survey index remained relatively flat throughout. To remove this conflict, the base

case model used all the observational data except the line fishery CPUE. The trawl survey biomass index was preferred in the base case as these data were fishery independent, and there was evidence that the longline fishery *q* had changed over time as very large fish were selectively removed from the population. Sensitivity runs (Longline) included the line fishery CPUE, excluded the trawl survey biomass series, included both biomass indices (All), tested logistic, rather than double normal, selectivity ogives for trawl survey and fishery (Selectivity), and estimated a separate natural mortality for each sex (*M*).

Roberts (2016) provides the model fits to the Sub-Antarctic (LIN 5&6) data, indicating that the fits the compositional data were reasonably good, as were the fits to the summer and autumn trawl indices. A reference model was produced in addition to the base case to test the impact of nuisance survey qs in the former (free qs used in base model). Four other sensitivities were investigated: (1) estimating constant *M* with respect to age, (2) logistic selectivity ogive for longline spawn, (3) halved multinomial weightings associated with age composition estimates, and (4) fitted to spawning and non-spawning longline fishery CPUE. These models all produced estimates of stock status that were little different to those from the reported models.

For the WCSI (LIN 7WC) assessment, three alternative models were conducted, assuming different CPUE indices and *M* assumptions (MPI, 2017a). There was no accepted 'base' case; rather the three model runs were chosen to represent the key alternative assumptions, and the range of model outcomes. The alternative CPUE indices were a 'combined' index, where CPUE was estimated as the product of the probability of catching ling and, when ling were caught, the catch, or a 'lognormal' index, in which only the positive ling catch data were used. In the case of the lognormal CPUE index, the runs either estimated *M*, or assumed it to be fixed at 0.18. The model fit to the trawl survey biomass series was good, but to the CPUE series (both lognormal and combined indices) was poor. Notwithstanding this, all models estimated recent trawl and longline fishing pressure to be stable and a period of higher recruitment around 1990, and in several years since 2001. The Combined CPUE model run indicated a biomass decline until 1992, followed by fluctuating but stable biomass until 2016, whereas the Lognormal CPUE model runs both indicated slow overall biomass declines. While all runs were indicative of a B_0 greater than about 60,000 t, the upper bound on B_0 was highly uncertain and largely dependent on the weight assigned to the trawl survey proportions-at-age, and the prior on *M*.

Peer Review

The stock assessment peer review process has not significantly changed since Intertek (2014b) 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 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 interested stakeholders and regularly attended by NGOs, recreational sector, industry etc. Meeting proceedings and working papers are made available on MPI's website to those who have registered as members to the group. although meeting proceedings and working papers are not publicly available. The DWFAWG meets during Jan – May to review hoki, hake, and ling assessments, which include fishery and survey data up to the end of the previous year. The Plenary meeting is held in June, the consensus summary of which is made publicly available in a Plenary Report (e.g. MPI, 2017a), which provides the key findings of the assessment. The more detailed technical descriptions of the assessments are subsequently published (September) in a NZ Fisheries Assessment Report (FAR).

The Plenary Report is considered by MPI in its development of harvest options for the Minister of Fisheries (see Section 3). 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 interacts closely with the relevant NIWA scientists to undertake the appropriate stock projections and related analyses.

The schedule of stock assessments varies by species. Ling assessments are conducted on a roughly three-year cycle with those of the Chatham Rise (LIN 3 & 4) and Sub-Antarctic (LIN 5 & 6) stocks conducted in the same year while that of the WCSI (LIN 7WC) stock conducted two years later. The most recent ling assessments were conducted in 2015 (LIN 3 & 4 and LIN 5 & 6) and 2017 (LIN 7WC) (see Table 36 of the hoki, hake, ling report for full schedule of all assessments).

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, MPI can initiate a full analysis (T. Bock, pers. Comm.).

While reviews in which assessments scientists from outside New Zealand are engaged have been conducted, for hoki (e.g. Butterworth et al, 2014), no formal external reviews have been conducted of the ling 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 who have been influential in assessment and related improvements. The Plenary Meetings also frequently include international experts.

4.3 Principle 2

4.3.1 Background

It is noted that an introduction to the New Zealand marine environment is provided in the previous certification report for the New Zealand ling fishery (Intertek 2014b). Readers are encouraged to refer to that report (specifically Section 3.4) for additional background information.

4.3.2 Retained and bycatch species

Under the CRv.1.3 (MSC 2013a), retained species are defined as 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 defined as "*Organisms that have been taken incidentally and are not retained (usually because they have no commercial value)*". However, in common with most other fisheries, it is not necessarily the case in the New Zealand ling longline fishery that all individuals of a particular species are either retained or discarded – some individuals of each species may be retained, while others of the same species may be discarded. Therefore, while the classification of a species as 'retained' or 'discarded' may be somewhat arbitrary, for the purposes of the reassessment of the fishery it has been carried out on the basis of the observer data showing the most common fate for each species (as indicated by Ballara 2015).

For retained species, a 'main' designation may 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 CRv.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 FCR 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 ling longline fishery Reassessment Team was guided by this approach in determining 'main' or 'minor' species.

It is also noted that bait species are considered in the assessment process under Principle 2 and are subject to the same 'main' criteria (CB3.5.5, MSC 2013a). For this reassessment, annual bait usage and sources were determined through a survey, commissioned by DWG, of 18 ling longline vessels, which together accounted for 97% of the recent ling longline catch (Tilney 2017). Estimates of the quantities of different species used as bait were added to the fishery catch data (assuming bait was the same each year), and annual total catches calculated (Table 17).

On the basis of these criteria, only New Zealand jack mackerel (*Trachurus declivis / T. murphyi*) taken in trawls for bait, ribaldo (*Mora moro*) and shovelnose spiny dogfish (*Deania calcea*) qualified as main retained species, while only spiny dogfish (*Squalus acanthias*) qualified as a main bycatch species. There were no other main retained or main bycatch species in the catch, and species (other than ETP species) comprising ≤0.2% of the catch are considered to be negligible components and are not considered further, here or in scoring (Table 17).

Table 17. Observer data adjusted to the whole fleet showing catches in the New Zealand ling longline fishery, 2008-2012 (MPI, pers. comm.) with estimated annual bait usage included (bait data from Tilney 2017)

Species		QMS?	% discard (92-12)	2008 (t)	2009 (t)	2010 (t)	2011 (t)	2012 (t)	Mean 08-12 (t)	2008 (%)	2009 (%)	2010 (%)	2011 (%)	2012 (%)	Mean 08-12 (%)
Ling	*Genypterus blacodes*	Y	1	4834.0	4064.0	4521.0	3852.0	4235.0	4301.2	53.93	51.58	54.41	49.01	54.43	52.72
Spiny dogfish	*Squalus acanthias*	Y	88	1204.4	982.9	947.0	525.7	435.9	819.2	13.44	12.47	11.40	6.69	5.60	10.04
Jack mackerel (trawl)	*T. declivis / T. murphyi* (NZ)	Y	(Bait)	518.0	518.0	518.0	518.0	518.0	518.0	5.78	6.57	6.23	6.59	6.66	6.35
Ribaldo	*Mora moro*	Y	13	247.3	221.9	422.5	635.5	588.9	423.2	2.76	2.82	5.08	8.09	7.57	5.19
Jack mackerel (p. seine)	*T. novaezelandiae* (NZ)	Y	(Bait)	263.0	263.0	263.0	263.0	263.0	263.0	2.93	3.34	3.17	3.35	3.38	3.22
Hake	*Merluccius australis*	Y	11	112.1	199.1	246.4	283.0	251.4	218.4	1.25	2.53	2.97	3.60	3.23	2.68
Barracouta	*Thyrsites atun* (NZ)	Y	(Bait)	243.0	243.0	243.0	243.0	243.0	243.0	2.71	3.08	2.92	3.09	3.12	2.98
Shovelnose spiny dogfish	*Deania calcea*	No	24	121.9	96.7	134.2	269.6	224.0	169.3	1.36	1.23	1.62	3.43	2.88	2.07
Smooth skate	*Dipturus innominatus*	Y	34	133.1	132.4	126.1	108.3	88.8	117.7	1.48	1.68	1.52	1.38	1.14	1.44
Hairy conger	*Bassanago hirsutus*	No	86	73.8	35.5	74.7	178.8	160.3	104.6	0.82	0.45	0.90	2.27	2.06	1.28
Sea perch	*Helicolenus* spp.	Y	6	80.2	81.3	98.0	118.6	90.1	93.7	0.89	1.03	1.18	1.51	1.16	1.15
School shark	*Galeorhinus galeus*	Y	12	115.3	89.1	78.7	47.7	47.0	75.5	1.29	1.13	0.95	0.61	0.60	0.93
Northern spiny dogfish	*Squalus griffin*	No	100	62.6	63.6	69.2	83.1	72.7	70.2	0.70	0.81	0.83	1.06	0.93	0.86
Black cod	*Paranotothenia magellanica*	No	31	68.6	188.8	4.1	40.4	4.7	61.3	0.77	2.40	0.05	0.51	0.06	0.75
Pale ghost shark	*Hydrolagus bemisi*	Y	9	124.4	83.4	17.5	38.9	34.2	59.7	1.39	1.06	0.21	0.49	0.44	0.73
Bluenose	*Hyperoglyphe antarctica*	Y	3	60.3	59.9	60.3	66.1	51.2	59.6	0.67	0.76	0.73	0.84	0.66	0.73
Other sharks and dogs	Selachii	No	100	53.4	68.6	38.4	60.4	54.8	55.1	0.60	0.87	0.46	0.77	0.70	0.68
Leafscale gulper shark	*Centrophorus squamosus*	No	100	21.4	15.8	40.2	100.4	89.1	53.4	0.24	0.20	0.48	1.28	1.14	0.65
Rough skate	*Zearaja nasuta*	Y	4	149.1	55.0	8.7	23.5	12.1	49.7	1.66	0.70	0.11	0.30	0.16	0.61
Red cod	*Pseudophycis bachus*	Y	9	103.6	64.6	36.6	17.2	19.7	48.3	1.16	0.82	0.44	0.22	0.25	0.59
Seal shark	*Dalatias licha*	No	93	35.6	26.7	48.4	35.7	32.3	35.8	0.40	0.34	0.58	0.45	0.42	0.44
Squid (imported)	Not known	N/A	(Bait)	37.0	37.0	37.0	37.0	37.0	37.0	0.41	0.47	0.45	0.47	0.48	0.45
Squid (NZ)	Not known	Y	(Bait)	34.0	34.0	34.0	34.0	34.0	34.0	0.38	0.43	0.41	0.43	0.44	0.42
Bass groper	*Polyprion americanus*	No	1	26.3	21.0	30.3	46.4	31.6	31.1	0.29	0.27	0.36	0.59	0.41	0.38
Ghost shark	*Hydrolagus novaezealandiae*	Y	14	29.5	33.2	29.0	9.5	5.5	21.3	0.33	0.42	0.35	0.12	0.07	0.26
Hagfish	*Eptatretus cirrhatus*	No	100	20.2	15.5	20.2	27.0	17.4	20.1	0.23	0.20	0.24	0.34	0.22	0.25
Plunket's shark	*Proscymnodon plunketi*	No	100	0.4	0.8	17.7	53.4	26.5	19.8	0.00	0.01	0.21	0.68	0.34	0.24
Swollenhead conger	*Bassanago bulbiceps*	No	97	11.1	23.4	23.5	19.9	20.8	19.7	0.12	0.30	0.28	0.25	0.27	0.24
Jack mackerel (imported)	*Trachurus* spp.	N/A	(Bait)	18.0	18.0	18.0	18.0	18.0	18.0	0.20	0.23	0.22	0.23	0.23	0.22
Conger eel	*Conger* spp.	No	97	42.9	22.2	15.6	4.8	3.7	17.8	0.48	0.28	0.19	0.06	0.05	0.22
76 other species comprising ≤0.2%				118.8	121.0	87.1	101.5	70.3	99.7	1.33	1.54	1.05	1.29	0.90	1.22
Total				8963.3	7879.1	8308.4	7860.2	7780.7	8158.3	100.0	100.0	100.0	100.0	100.0	100.0

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

4.3.2.1 Main retained species

Unless otherwise indicated, for retained and bycatch species, the information summarised below is as reported by Ballara & O'Driscoll (2015). It is noted that these authors quoted O'Driscoll et al. 2014b for data from the West Coast South Island (WCSI), but the correct reference for this WCSI report is (now) O'Driscoll et al. 2015.

New Zealand trawl caught jack mackerel - Trachurus declivis / T. murphyi (Main retained – 6.35%) – Used as bait

An estimated 518 t of trawl caught jack mackerel (*T. declivis* and *T. murphyi*) were used as bait in the ling longline fishery. These two species are taken together mainly in JMA 3 and JMA 7, with the majority (87%) of the total annual mean catch (2011/12 – 2015/16 = 36,722 t) taken in JMA 7 (MPI 2017a). The bait used in the ling longline fishery therefore represents approximately 1.4% of the total *T. declivis* and *T. murphyi* annual catch.

Stock assessment data are limited, but the natural mortality rate (*M*) for *T. declivis* has been estimated at 0.18, and *F* was estimated at <0.05. More recent estimates of *F* in the main JMA 7 fishing area were also well below *M* for this species, such that it is unlikely that overfishing is occurring (MPI 2017a).

Ribaldo (Main retained – 5.19%)

Ribaldo is widespread in New Zealand waters, and has been caught by research trawl at depths from 200 to 1300 m. It appears to be most common at 500–1000 m (MPI 2017a).

There are considered to be 5 ribaldo stocks around New Zealand, of which three may be taken within the assessed ling longline fishery – the Chatham Rise and east coast South Island stock (RIB 3 and 4), Southland and Sub-Antarctic stock (RIB 5 and 6) and west coast of New Zealand stock (RIB 7, 8 and 9). Stocks in FMAs 1 and 2, and 10, are outside of the assessed ling longline fishery area.

Ribaldo was reported as being very well estimated in both the Sub-Antarctic survey and the Chatham Rise survey areas and relative biomass has showed no clear trend in either time-series, with the Chatham Rise trend matching well for both data sources. CPUE indices from the spawning hoki and hake target fisheries show a possible steady decline of ribaldo in RIB 7 (as part of RIB 7 8 & 9), but with just three data points in the corresponding trawl survey and a lack of any other information it is not possible to validate the indices (MPI 2017a).

The majority of the ribaldo catch is taken in FMAs 3–7. The RIB 3 and 4 and RIB 5 and 6 ribaldo stocks are unlikely to be below the soft limit (20%B_0) (MPI 2017a).

Shovelnose spiny dogfish (Main retained – 2.07%)

Ford et al. (2015) noted that this species is globally widespread, pregnant females were rarely caught, and it occurs in waters up to 1500m, at which depth there is very little fishing in New Zealand waters.

Shovelnose dogfish was reported as being well estimated in the Sub-Antarctic and Chatham Rise surveys; relative biomass has showed no clear trend in the Chatham Rise time-series, but decreased then increased in the Sub-Antarctic time-series (Ballara and O'Driscoll 2015). Shovelnose dogfish showed a decreasing biomass trend in the WCSI survey (O'Driscoll et al. 2015). Bycatch rates by fishing year and area were variable and showed higher bycatch rates on the Chatham Rise and in Puysegur in most years.

4.3.2.2 Minor retained species

A wide variety of species are taken in the ling longline fishery and retained (or used as bait) in small or very small quantities (Table 17). These include New Zealand purse seine caught jack mackerel and barracouta, which are used as bait, as well as hake, smooth skate, sea perch, school shark and black cod, all of which comprise >0.2% of the catch but do not meet the criteria for 'main' species. These species and stocks are not considered in detail here, but are considered minor species for scoring purposes. Species comprising <0.2% are deemed to be negligible and are not considered further.

4.3.2.3 Main bycatch species

Spiny dogfish (Main bycatch – 10.04%)

Spiny dogfish are found on the New Zealand continental shelf and upper slope down to a depth of at least 500 m, but are most common in depths of 50–150 m (MPI 2017a).

Spiny dogfish was reported as being well estimated in the survey area of the Sub-Antarctic survey and very well estimated in the Chatham Rise surveys; relative biomass showed no clear trend in the Sub-Antarctic survey time-series, but increased in the Chatham Rise surveys (Ballara and O'Drsicoll 2015). The WCSI trawl survey showed a variable trend in biomass with higher biomass in the 2012 and 2013 surveys (O'Driscoll et al. 2015). Bycatch rates by fishing year and area showed increasing then decreasing bycatch rates in Cook Strait. Higher bycatch rates were seen on the WCSI for both bottom and midwater tows during the 1990s, for WCSI bottom tows in 2012 and 2013, and for the Sub-Antarctic from 2002. MPI 2017a concluded that trawl survey estimates of abundance are all at or above the long-term average (1991–2011 for Chatham Rise and 1992–2011 for WCSI).

4.3.2.4 Minor bycatch species

A variety of species are taken in the ling longline fishery in small or very small quantities that are discarded (Table 17). These species include hairy conger, northern spiny dogfish, and leafscale gulper shark, all of which comprise >0.2% of the catch but do not meet the criteria for 'main' species. These species and stocks are not considered in detail, here, but are considered minor species for scoring purposes. As for retained species, discarded species comprising <0.2% are deemed to be negligible and are not considered further.

4.3.3 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 ling trawl and longline fishery (Intertek 2014b). Readers are encouraged to refer to that report (specifically Sections 3.4.2.2 to 3.4.3) for additional background information.

Under the CR v.1.3 (MSC 2013a), ETP 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*."

Protected corals
Most corals in New Zealand waters are protected under the Wildlife Act 1953. Under this legislation, 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 return (NFPSCR). DOC (undated-b) 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, Baird *et al*. 2013 and Anderson *et al*. 2014.

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 7,731 records, of which 10% were black corals, 33% were gorgonians, 46% were stony corals, and 11% were hydrocorals. Coral records from the four orders were distributed throughout New Zealand waters, although differences by area and depth were evident at the family and genus level. Only 13 of over 3,000 observer records were from the ling longline fishery.

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.*"

Table 18 (adapted from Baird et al. 2013) shows that relatively few observer reports of interactions with protected coral species have been generated from the ling longline fishery.

Table 18. Number of observer reports of catches of protected corals (all species) in ling longline fisheries (adapted from Baird et al. 2013).

Type	Species	LIN 3	LIN 4	LIN 6	Total all fisheries	LIN as % of all fisheries
Tree like	Isididae	1	1		517	0.39
	Paragorgiidae		1		175	0.57
	Primnoidae			1	210	0.48
Reef like	Caryophylliidae_br	2	4		784	0.77
Solitary small	Caryophylliidae_cup		1		251	0.40
	Stylasteridae			2	153	1.31
	All	3	7	3	3143	0.41

The estimated distribution of protected coral species within the New Zealand EEZ has been mapped, with the model of probability of occurrence refined recently by Anderson et al. 2014 to incorporate information on seafloor saturation levels of aragonite and calcite (Figure 16, left panel). The extent of ling longlining over the New Zealand EEZ has also been mapped, and because ling longlining may be undertaken in areas of harder substrate, there is clearly potential for the fishery to interact with protected coral species (Figure 16, right panel).

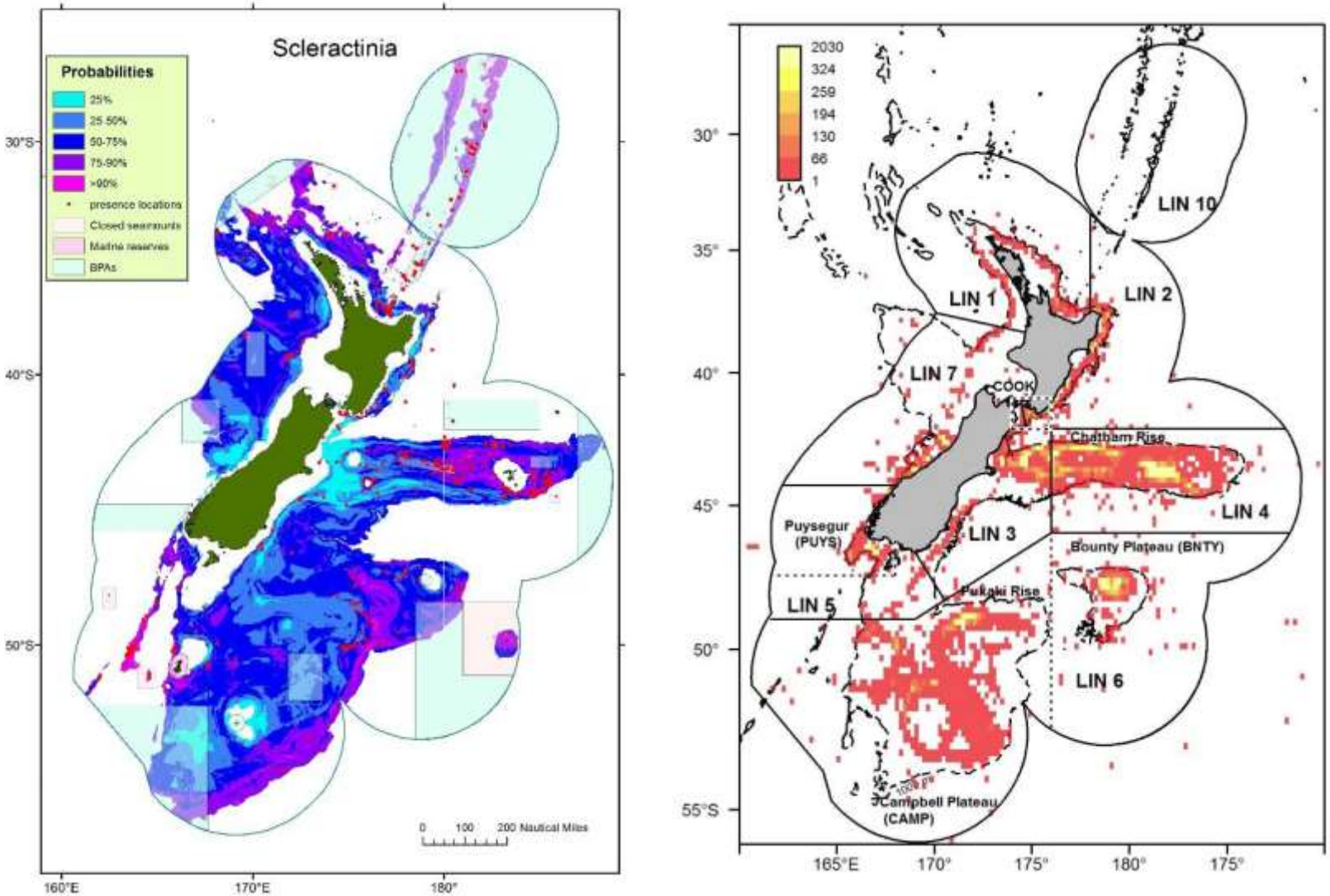


Figure 16. Probability of occurrence of suitable habitat for branching scleractinian coral species (*Solenosmilia variabilis*, *Goniocorella dumosa*, *Enallopsammia rostrata*, and *Madrepora oculata*) from BRT models (left panel – from Anderson et al. 2014), and density plot of the distribution of all commercial longline sets with recorded position data targeting ling for the 20 years 1992/93 – 2011/12 (right panel- from Anderson 2014).

Significant impacts from longlining can occur where, for example, upon retrieval a mainline is dragged across a hard substrate with attached benthos, or where a hook snags a coral colony. However, studies of the effects of longlining on benthic species in deep water have identified only limited impacts. For example, Fosså et al. 2002, concluded that passive gears ... 'impact [*Lophelia*] coral reefs but to a considerable lower extent than trawling', Orejas et al. 2009 found no clear relationship between longline use and cold water coral occurrence, and Pham et al. 2014 found slow-growing species were still common in areas subject to more than 20 years of longlining activity, and concluded that deep-sea bottom longline fishing has little impact on vulnerable marine ecosystems.

More generally, there is a network of benthic protection areas (BPAs) in place in the New Zealand EEZ, designated in 2007 and covering approximately 1.1 million square km (30%) of the seabed to bottom trawling and dredging. These include, 12 large seamounts more than 1,000 m high and covering 81,000 square km, where trawling within 100 m of the seabed is prohibited (MPI 2016). The BPAs comprise part of the approach to managing fishing impacts on benthic habitats in New Zealand waters.

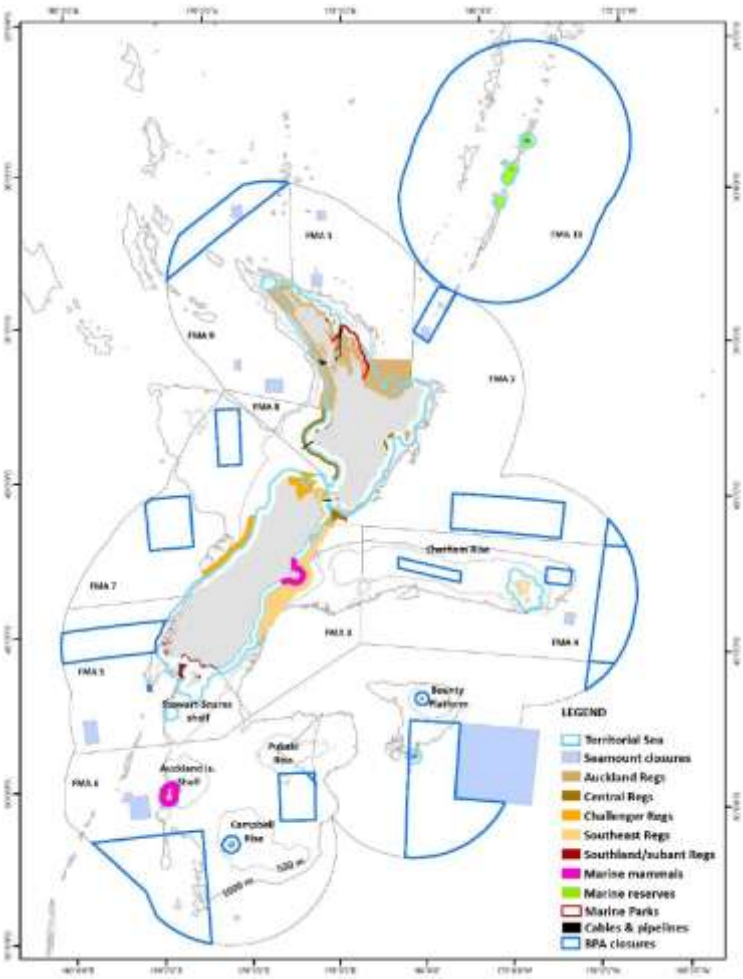


Figure 17. Map of the major spatial restrictions to trawling and the Fishery Management Areas (FMAs) within the New Zealand EEZ (from MPI 2016, adapted from Baird & Wood 2010).

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 ling longline fishery is known to interact rarely or never with most species, however, including New Zealand sea lion (zero (0) captures observed from 2002/03 –

2015/16) and New Zealand fur seal (one (1) capture observed from 2002/03 – 2015/16, in the 2002/03 fishery). Two pilot whales were observed caught in the fishery in 2002/03, one of which was released alive. No other marine mammal interactions have been observed in the fishery (data from https://psc.dragonfly.co.nz/2017v1/).

Seabirds

In assessing the impact of ling longline fishery on seabirds, the Assessment Team was cognizant of the stakeholder submission from Forest and Bird (see Appendix 4. 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, and carefully considered both the impact of the fishery and the approach taken to manage impacts.

Since the ling longline fishery was first certified in 2014, there has been further intensive focus on seabird research in New Zealand, including on interactions with New Zealand fisheries, and further efforts to avoid, remedy or minimise fishery impacts (e.g., Goad 2018). MPI 2016 provides a 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 ling longline fishery. Estimated captures of all seabirds (based on models using observer data) are presented for ling longline sets (Figure 18). The data are recorded at the species level, but are not presented in this way in this report (but see Abraham & Richard 2017).

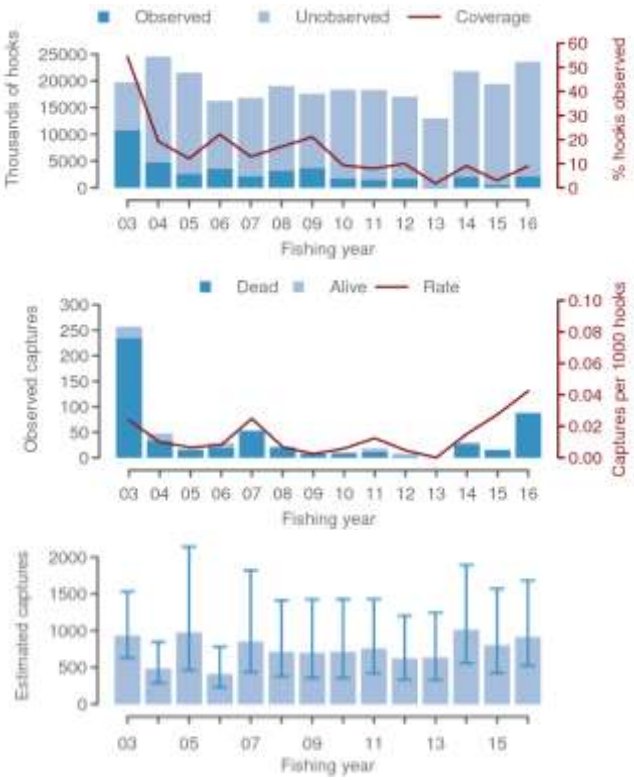


Figure 18. For the ling longline fishery, effort (thousands of hooks deployed) and observer coverage (top panel), observed captures and capture rate of all birds (middle panel), and estimated total captures of all birds (bottom panel) for 2003-2016 (Data downloaded from https://psc.dragonfly.co.nz/2017v1/).

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 to identify the risks posed to 70 seabird taxa by trawl, longline and set net fisheries within New Zealand's territorial sea and EEZ. Several iterations of the assessment have been undertaken, and 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 19. 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 ling longline 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 ling LL	Ling LL (%)
Black petrel	1.15	0.51 – 2.03	Very High	468	2	0.43
Salvin's albatross	0.78	0.51 – 1.09	High	2780	325	11.69
Flesh-footed shearwater	0.67	0.39 – 1.15	High	987	4	0.41
Westland petrel	0.48	0.18 – 1.19	High	180	11	6.11
Southern Buller's albatross	0.39	0.22 – 0.66	High	528	29	5.49
Chatham albatross	0.36	0.18 – 0.66	High	155	93	60.00
NZ white-capped albatross	0.35	0.21 – 0.58	High	3830	40	1.04
Gibson's albatross	0.34	0.19 – 0.59	High	166	1	0.60
Northern Buller's albatross	0.25	0.14 – 0.41	Medium	397	42	10.58
Antipodean albatross	0.20	0.11 – 0.36	Medium	74	1	1.35
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	1	2.13

On the basis of the latest risk assessment, only the black petrel was classified as 'very high risk', with a median risk ratio of greater than 1 (i.e., median captures 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 five 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 19).

Table 19 indicates that the ling longline fishery accounts for a small or very small percentage of the total mortality of most medium, high and very high risk seabirds except for Salvin's albatross (11.69%), Chatham albatross (60.00%) and northern Buller's albatross (10.58%). Data for estimated total captures over time in the ling longline fishery are available for Salvin's albatross (Figure 19).

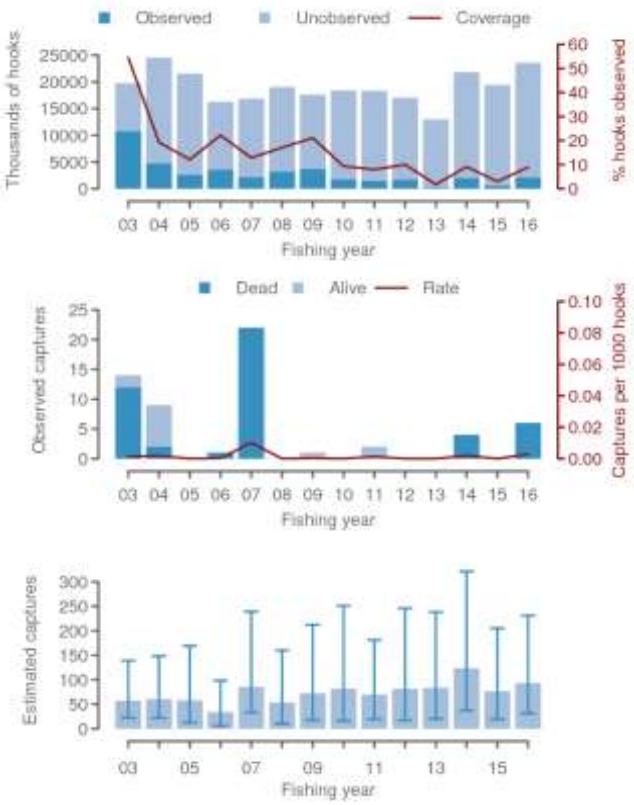


Figure 19. For the ling longline fishery, effort (thousands of hooks deployed) and observer coverage (top panel), observed captures and capture rate of Salvin's albatross (middle panel), and estimated total captures of Salvin's albatross (bottom panel) for 2003-2016 (Data downloaded from https://psc.dragonfly.co.nz/2017v1/).

The results of the latest risk assessment modelling undertaken by Richard et al. 2017 indicate that mean annual potential fatalities (APFs) for Salvin's, Chatham and northern Buller's albatrosses associated with the ling longline fishery is substantially below the estimated mean PST for these three populations. The highest relative mean APF is for Chatham albatross, calculated as an APF of 93 animals from a PST of 425 animals (= 21.9%). The upper 95% C.I. of the APFs are also less than the lower 95% C.I. of the PSTs (see Table 20, below).

It is noted that, for Chatham albatross, the <34 m ling bottom longline fishery is responsible for the majority of species-level risk, but the nesting population census in 2016 showed very similar results to those of identical censuses from 1999-2010 (Bell et al. 2017), and the species

is likely at the limit of available nesting habitat on the single island (Te Tara Koi Koia) where it nests.

Table 20. Estimated Population Sustainability Threshold (PST) for Salvin's albatross, Chatham albatross and northern Buller's albatross, and annual potential fatalities (APFs) for each species associated with the components of the ling longline fishery

Species	Estimated PST values (95 % C.I.) (From Table G32, Richard et al. 2017)	Mean APF for Small vessel ling BLL fisheries (95% C.I.) (From table G-28, Richard et al. 2017)	Mean APF for Large vessel ling BLL fisheries (95% C.I.) (From table G-28, Richard et al. 2017)	Mean APF for Small + Large vessel ling BLL fisheries (95% C.I.)
Salvin's albatross	3,600 (2,710 - 4,940)	317 (194 - 472)	8 (1 - 20)	325 (195 - 492)
Chatham albatross	425 (296 - 623)	88 (41 - 151)	5 (0 - 15)	93 (41 - 166)
Northern Buller's albatross	1,630 (1,050 - 2,570)	36 (10 - 77)	6 (0 - 16)	42 (10 - 93)

The Fisheries (Seabird Sustainability Measures – bottom longlines) Circular 2010 (NZG 2010) specifies legal requirements for bottom longliners with respect to seabird mitigation. The approach to managing and mitigating risk to seabirds on longline vessels is then operationalised through the Ling FMA 2-7 bottom longline operational procedures (DWG 2016), which includes best practice for seabird handling and release, and an updated '10 commandments for ling longliners' The following measures are specified:

1. Ensure your vessel has the DWG (BLL) Seabird Interim Code of Practice (COP) and a copy of the current bottom longline seabird regulations
2. Manage the discharge ('Batch/hold' i.e. no continuous discharge) of offal, fish waste, and used bait. You cannot discharge offal, fish while setting.
3. During hauling only discharge offal, fish and used 'waste-baits' from the opposite side of the vessel from the hauling station.
4. Set only at night (i.e. only set between nautical dusk and dawn) if not weighting line in accordance with line weighting legal standards.
5. Know the line weighting legal standards; use integrated lead weighted line (IWL) or add minimum 4 kg metal/lead weight every 60 m.
6. Ensure the tori line meets legal standard, deployed when fishing (day & night) and is adjustable over the fishing/setting line, carry ample spare parts onboard
7. Tori line is a minimum of 150 m long, well-constructed & when deployed has minimum of 50 m aerial extent, that area is fitted with 'decent set of brightly colourer streamers' spaced at 5 m intervals
8. Auto line vessels ensure the baiting machine is well maintained and achieving a high baiting percentage; the use of totally frozen bait is to be avoided. (ensure 'unhooked-bait' is retained and not lost overboard)
9. Record all seabird captures as legally required in the MPI – Non-fish/Protected Species Catch Return (NFPSCR) logbook and furnish to MPI
10. Advise DWG within 24 hrs when seabird captures reach 'Trigger-Point' levels of 5 small (e.g. petrel/shearwater) or 3 big (albatross/mollymawk) birds dead in 24 hr period, or 10 birds (dead or released alive) in a 7-day period

When observers are on ling longline vessels, adherence to the DWG operational procedures is assessed and reported on, as well as compliance with legal requirements for tori line deployment, line weighting, offal discharge and reporting of seabird interactions (DWG 2015).

It is noted that, during the previous certification of the ling longline fishery, there were conditions set related to seabird outcome, management and information. These were closed at the Year 2 audit (Acoura 2016), with the introduction of the revised operational procedures (DWG 2016), the appointment of a DWG Environmental Liaison Officer with responsibility to visit identified ling bottom longline vessels with documentation including MPI's bottom longline regulations, the operational procedures and the 'Ten Commandments', and to brief owners and operators on best practice for seabird impact mitigation, test tori line designs and materials, and provide samples of the latest materials. An increased level of observer coverage (target 450 days) were specified for the fishery from 2016/17, which is intended to ensure the coverage is more representative of the fishery, to achieve 25% coverage of the fishing effort in total, and 15% of the small vessel component (see Section 5.2, and Acoura 2017 for more details).

4.3.4 Habitats

An introduction to habitats, fishery impacts and habitat management is provided in the previous certification report for the New Zealand ling longline fishery (Intertek 2014b). Readers are encouraged to refer to that report (specifically Section 3.4.1) 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.

> 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.*"

On the basis of the information available to the Assessment Team, it is therefore the impact of the ling longline fishery on relevant benthic habitats within the New Zealand EEZ that has been considered in scoring.

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.*"

Habitat types within the New Zealand EEZ have been classified under the Marine Environment Classification (MEC) system (Snelder et al. 2006), and then more recently under the Benthic-Optimised Marine Environment Classification (BOMEC) system (Leathwick et al. 2012 – Figure 20).

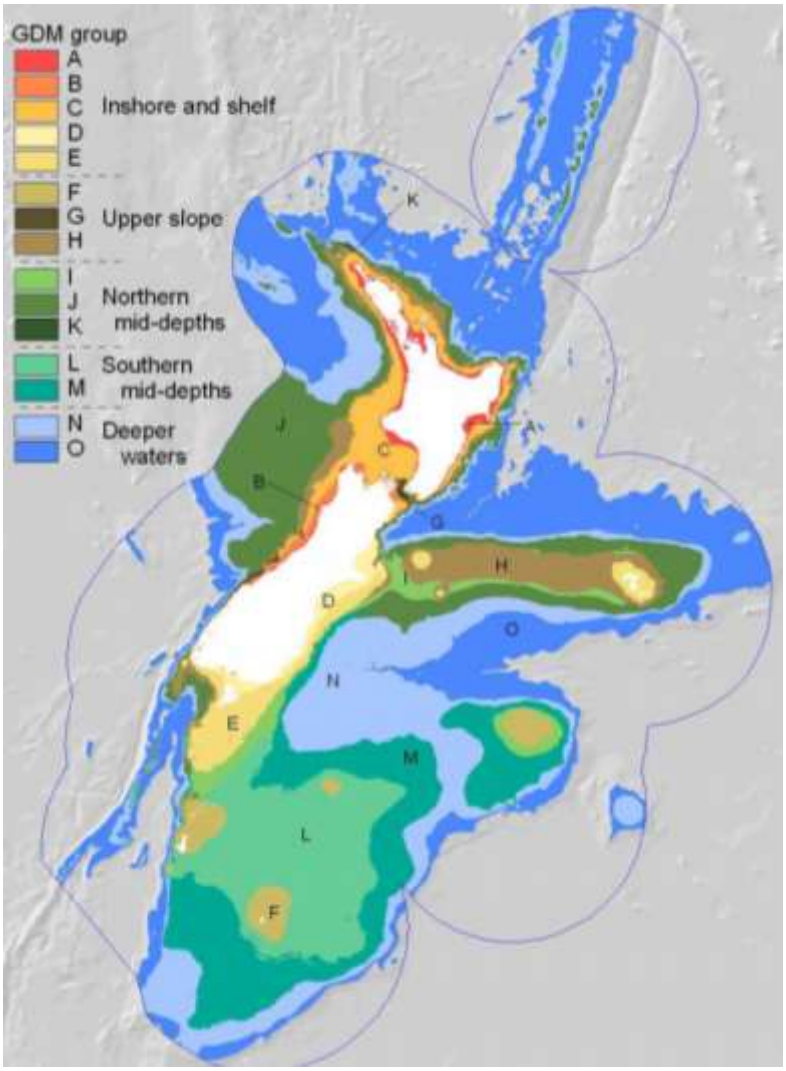


Figure 20. Geographic distribution of groups defined by multivariate classification of environmental data (From Leathwick et al 2012).

Both the MEC and BOMEC systems were developed in New Zealand specifically to enable the identification of broad-scale spatial patterns in marine ecosystems, but their use in assessing potential fishing impacts on benthic habitats has not been universally accepted (e.g., MPI 2016, Ford et al. 2016). Additional work has been undertaken subsequently 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. Updates on any new approach would be expected during the course of a further certification period for the ling longline fishery.

Density plots of ling longline activity have been produced (Anderson 2014, and see Figure 16, noting that this figure doesn't represent the actual 'footprint' of the fishery), and by comparing with the BOMEC classification (Figure 20) it is apparent that the majority of the effort is undertaken in the upper slope and mid-depths regions. The ling longline fishery will target the more structurally complex locations with these areas, although Bowden et al. 2017 demonstrated that the underlying sediment in the upper slope and mid-depths regions is overwhelmingly muddy.

The impacts of longlining on benthic habitats in deep water are limited and restricted mainly to the effects of anchors and intermediate weights dragging on the seabed during shooting and hauling processes, or as a result of bad weather and/or strong currents. However, even for vulnerable, habitat structuring species (e.g., the protected corals, addressed in Section 4.3.3, above), the impacts of longlining are considered to be very minor (e.g., Fosså et al. 2002, Orejas et al. 2009, Pham et al. 2014).

4.3.5 Ecosystem

An introduction to ecosystem features influencing or affected by the fishery is provided in the previous certification report for the New Zealand ling longline fishery (Intertek 2014b). Readers are encouraged to refer to that report (specifically Section 3.4.1) for additional background information. The scoring text for PI 2.5.1 also goes in to considerable detail which is not repeated here.

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*."

MPI (2016) provides a thorough review of the status of research into New Zealand deep water ecosystems. Research is reportedly most advanced in the Chatham Rise region, where modelling of the foodweb has been underway since 2006, the most recent version being Pinkerton (2013). Middle trophic level groups, especially small demersal fishes and mesozooplankton, were determined to have some of the highest trophic importance amongst consumers, but mesopelagic fishes, hoki, and arthropods (benthic prawns and shrimps) also had high trophic importance (Pinkerton 2013). These patterns of trophic importance were considered robust to uncertainties in the model parameterisation and balancing (Pinkerton 2014).

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.

MPI (2016) also noted that there has been much work on developing indicators for New Zealand's marine environment. Tuck et al. (2014) considered the utility of a suite of indicators relevant to deepwater fisheries. Food web indicators which would be useful to understand changes in deep water fish communities that arise from environmental/ecosystem forcing included the following:

- Mesopelagic fish biomass
- Crustacean zooplankton biomass and distribution
- Mesopelagic fish community

Deep water fishery-specific indicators were also considered, including the following:

- Total removals (nationally, by region or target fishery)
- Target species biomass
- Species distribution
- Total fish biomass
- Community diversity
- Proportion of large fish
- Mean trophic level.

With respect to ecosystem outcomes, Tuck et al. 2009 provided an ecosystem-focused review of data from the Chatham Rise and Sub-Antarctic trawl surveys. Their analyses showed some evidence of change in ecosystem indicators over time. For example, there was evidence of increasing evenness (reducing diversity) but no evidence that species were being lost from the food-web. Some size characteristics of fish in research trawls on the Chatham Rise had changed, with fewer fish longer than 30 cm or heavier than 750 g being taken by trawl gear, although the median length of the catch did not change. There was also evidence that the proportion of piscivorous fish and of true demersal (rather than bentho-pelagic) species declined over the studied period, but “low-resilience” species such as dogfish and rays had increased relative to other species on the Chatham Rise. There were also changes in the spatial distribution of fish species, with 16 out of 47 species showing changes (half declining and half increasing) in the proportion of the study area over which 90% of their abundance by weight was caught. Horn & Dunn 2010 examined whether there was evidence of change in the diet of hoki, hake or ling on the Chatham Rise between 1990 and 2009. They concluded that it appeared likely that the importance of fish (primarily myctophids) as a prey item for hoki had increased slightly but steadily between 1990 and 2009, while the importance of euphausiids had declined. In contrast, there were no obvious between-year trends in the diets of hake or ling over the same period.

In concluding the section on trophic and ecosystem-level effects, MPI 2016 stated: “*Time series monitoring of fish communities and middle trophic level species (mesozooplankton, mesopelagics, hyperbenthics) are crucial for understanding and monitoring for trophic and ecosystem level effects, and the best current sources of these data are trawl surveys to the Chatham Rise, and Subantarctic plateau.*”

As ling is not considered a key ecological component of the systems it inhabits (as reviewed in Pinkerton 2013), in the context of the assessed ling longline fishery, and on the basis of the relative scale of removals for the different species, it is considered appropriate to assess trophic structure as the key ecosystem elements within the New Zealand deepwater ecosystem.

4.4 Principle 3

4.4.1 Management System

The UoCs for the ling longline 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 (2014b).

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 46m exclusion zones. Again, there have been no changes since Intertek (2014b).

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)

4.4.2 Consultation

There has been no major change in the way the MPI consults since Intertek (2014b). There have been changes to the names of the consultation documents (see Harvest Strategy, Section 4.2.3) 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

4.4.3 Objectives for the fishery

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

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 ling 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 21. 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.

4.4.4 Decision making process

There has been no change in decision-making processes since Intertek (2014b). 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 21.

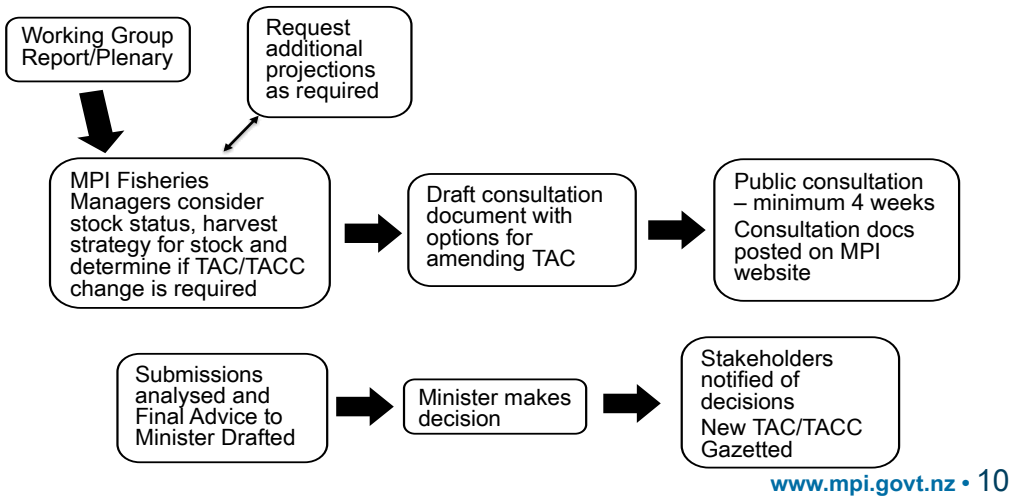


Figure 21. Decision making process (MPI 2016)

4.4.5 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 22.

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 ling were 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 22. 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)

4.4.6 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 in place (2018/19 – 2022/23) (MPI 2017c) 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

4.4.7 Compliance and Enforcement

There have been a few changes to compliance and enforcement since Intertek (2014b).

MPI Compliance has continued to monitor the ling 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 ling 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. 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.

4.4.8 Monitoring of Performance

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

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.

5 Evaluation Procedure

5.1 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 Ling Longline Fishery overlaps with other MSC certified fishery in terms of:

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

The New Zealand Hoki, Hake and Ling Trawl Fishery is being re-assessed at the same time as the New Zealand Ling Longline Fishery and by the same assessment team. In so doing, the Principle 1 ling component of both fisheries has been harmonised and so the outcomes are the same.

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 in the Evaluation Table for PI 3.2.5 - Management Performance Evaluation.

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

5.2 Previous assessments

The New Zealand Ling Longline Fishery has previously been assessed and was certified against the MSC standard on 16th September 2014.

Since 2014, there have been a number of improvements in the management of the fishery:

Monitoring of observed seabird interactions with the offshore (large vessels) and inshore (small vessels) ling longline fishery is now part of the MPI observer reporting protocol and produced a report on the nature and extent of seabird interactions in the longline fishery. Observer coverage in the offshore and inshore fleets has been increased with target levels for the two fleets (25% and 15% respectively). MPI have also developed and implemented a risk assessment modeling approach in order to understand seabird-fishery interactions when data are less than comprehensive.

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 operational plans and a code of conduct with respect to mitigating interactions with seabirds. The operational plans are audited and monitored by MPI.

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, 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 22. Summary of Previous Assessment Conditions

Condition	PI	Year closed	Justification[4]
The client is required to demonstrate that the direct effects of <34 m longline vessels (not targeting bluenose or snapper) are highly unlikely to create unacceptable impacts to ETP bird species.	2.3.1	Year 2	Additional observer days were allocated by MPI to the inshore fleet within the fishery. Deepwater Group (DWG) appointed an Environmental Liaison Officer who, among other things, conducted a programme of directed outreach and training and developed and implemented vessel management operational plans and a code of conduct with respect to mitigating interactions with seabirds. The operational plans are audited and monitored by MPI. A report was presented on the nature and extent of seabird interactions in the longline fisheries, including a time series of estimated annual captures by bird species and fishery (DWG 2015a). Baker & Hamilton (2016) conducted Population Viability Analyses (PVA) of the nine seabird species considered to be most at-risk from the <34 m ling longline fishery, modelling the total annual potential fatalities (APFs) from the fishery (aggregated) as 'incidental mortality' distributed equally between adult males and females. Their results showed: The risk posed by the <34 m fleet to the populations of seven of the nine seabird species considered was negligible. For Chatham albatross, the <34 m ling bottom longline fishery is responsible for the majority of species-level risk, but only a minor proportion of species-level risk (11%) is attributable to the <34m ling longline fishery. Taking the results from Baker & Hamilton (2016), the results of the risk assessment modeling undertaken by Richard & Abraham (2015a) were examined. Their results indicated that mean APFs for Salvin's and Chatham albatrosses associated with the combined small vessel and large vessel ling bottom longline fisheries are substantially below the estimated mean PBRs for these two populations and are less than the lower 95% CI of the PBRs. Overall, the evidence provided demonstrates that the ling bottom longline fishery is highly unlikely to create unacceptable impacts to ETP bird species. As such, the ling longline fishery now meets the SG80 level of performance.

[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]
The client is required to demonstrate that there is a strategy in place for managing the inshore longline fishery component's impact on ETP species, including measures to minimise mortality, which is designed to be highly likely to achieve national and international requirements for the protection of ETP species.	2.3.2	Year 2	The strategy developed by the client and MPI included: The development and publication of updated bottom longline operational procedures for seabirds and sharks (DWG 2016), which defines: ○ Purpose and objectives ○ Legislative framework ○ Vessel owner and operator responsibilities ○ Risks to seabirds associated with the fishery ○ Mandatory mitigation measures to minimise seabird interactions and best practice operational guidelines (i.e., tori line use, weighted line use, offal disposal requirements) ○ Additional mitigation measures (i.e., use of partially-thawed bait, reduced use of lights during shooting, use of mitigation during hauling) ○ Seabird handling and release recommendations ○ Statutory reporting requirements ○ Trigger thresholds for reporting unusual seabird capture events to DWG ○ 'Ten Commandments' for minimising interactions with seabirds (to be displayed on the bridge of every vessel) ○ Requirements for shark landing or release. • Appointment of a DWG Environmental Liaison Officer, with responsibility to: ○ Compile a comprehensive list of vessels, owners and operational parameters ○ Visit vessels in port to issue identified ling bottom longline vessels with documentation including MPI's bottom longline regulations, the operational procedures and the 'Ten Commandments' ○ Brief owners and operators on best practice for seabird impact mitigation ○ Test tori line designs and materials, and provide samples of the latest materials • Increased levels of observer coverage 2016/17 Overall, the approach taken to understand and manage the effect of the

Condition	PI	Year closed	Justification[4]
			ling bottom longline fishery on ETP species, and specifically seabirds, fully meets the MSC definition of a 'strategy' – the interactions have been characterised and quantified, impacts are being minimised, and review processes feed findings back in to the management of the fishery. In summary, the strategy is clearly designed to be highly likely to achieve national and international requirements for the protection of ETP species, and so the ling longline fishery now meets the SG80 level of performance.
The client is required to demonstrate that information is sufficient to measure trends and support a full strategy to manage impacts on ETP species.	2.3.3	Year 2	MPI has committed to this increased level of observer coverage until remote monitoring options (i.e., CCTV) have been trialed and demonstrated to be effective, with tests of cameras for monitoring seabird bycatch having started in the snapper bottom longline fishery. The increased level of observers is intended to ensure observer coverage is more representative of the fishery. Furthermore, in order to understand seabird-fishery interactions when data are less than comprehensive, MPI has developed and is using a risk assessment process to consider risk in a conservative way. This risk assessment process is detailed against Condition 1, but it is also noted that further work is being undertaken by MPI in collaboration with DOC to understand New Zealand fishery interactions with seabirds, using a new risk assessment modeling approach that will allow the impact of fisheries alone or in combination to be determined. This new model, based on several years of work and iterations through MPI Working Group reviews is in an advanced state of development, and should be operationalised in early 2017 (MPI, pers. comm., Nov 2016). Overall, and although the available information on seabird bycatch can always be improved when observer coverage is less than 100%, the information available is sufficient to measure trends and support a full strategy to manage impacts on ETP species. As such, the ling longline fishery now meets the SG80 level of performance.

5.3 Assessment Methodologies

This re-assessment of the New Zealand Ling Longline 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.

5.4 Evaluation Processes & Techniques

5.4.1 Site Visit

The site visit took place in Wellington, New Zealand, between 17th and 21st July 2016. 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 23. 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

5.4.2 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 23 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 Appendix 4. Stakeholder Submissions.

5.4.3 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 7 of this report.

With respect to scoring, it is noted that some ‘elements’ were assessed as comprising several species or groups. For example, ‘minor retained species’ were assessed as one group because it includes 15 species in 60 separate management units, and ‘protected corals’ contain four separate groups (black corals, Gorgonian corals, stony corals and hydro corals). Scoring was undertaken on this basis for these groups as it would be impractical to separate them for the purposes of the assessment. Scoring was based on the least well-performing part of the element where grouping was undertaken.

Table 24. Scoring elements for UoC 1 and UoC 2

Component	Scoring elements	Main / Minor	Data-deficient (Yes or No)
P1 – Target species	Ling (*Genypterus blacodes*)	N/A	N
P2 – Retained species	Jack mackerel (JMAs 3, 4) (*T. declivis / T.murphyi*)	Main	N
	Ribaldo (RIB 3 & 4) (*Mora moro*)	Main	N
	Shovelnose spiny dogfish (*Deania calcea*)	Main	N
	16 Minor species (various stocks)	Minor	N
P2 – By catch species	Spiny dogfish (*Squalus acanthias*)	Main	N
	9 Minor species (various stocks)	Minor	N
P2 – ETP species	Protected coral species	N/A	N
	Marine mammals	N/A	N
	Seabirds	N/A	N
P2 – Habitat	Upper slope and mid-depth muddy sediments	Main	N
P2 – Ecosystem	Trophic structure and function of the New Zealand deepwater ecosystem	Main	N

Table 25. Scoring elements for UoC 3 and UoC 4

Component	Scoring elements	Main / Minor	Data-deficient (Yes or No)
P1 – Target species	Ling (*Genypterus blacodes*)	N/A	N
P2 – Retained species	Jack mackerel (JMAs 3, 4) (*T. declivis / T.murphyi*)	Main	N
	Ribaldo (RIB 5 & 6) (*Mora moro*)	Main	N
	Shovelnose spiny dogfish (*Deania calcea*)	Main	N
	16 Minor species (various stocks)	Minor	N
P2 – By catch species	Spiny dogfish (*Squalus acanthias*)	Main	N
	9 Minor species (various stocks)	Minor	N
P2 – ETP species	Protected coral species	N/A	N
	Marine mammals	N/A	N
	Seabirds	N/A	N
P2 – Habitat	Upper slope and mid-depth muddy sediments	Main	N
P2 – Ecosystem	Trophic structure and function of the New Zealand deepwater ecosystem	Main	N

Table 26. Scoring elements for UoC 5

Component	Scoring elements	Main / Minor	Data-deficient (Yes or No)
P1 – Target species	Ling (*Genypterus blacodes*)	N/A	N
P2 – Retained species	Jack mackerel (JMAs 3, 4) (*T. declivis / T.murphyi*)	Main	N
	Ribaldo (RIB 7, 8 & 9) (*Mora moro*)	Main	N
	Shovelnose spiny dogfish (*Deania calcea*)	Main	N
	16 Minor species (various stocks)	Minor	N
P2 – By catch species	Spiny dogfish (*Squalus acanthias*)	Main	N
	9 Minor species (various stocks)	Minor	N
P2 – ETP species	Protected coral species	N/A	N
	Marine mammals	N/A	N
	Seabirds	N/A	N
P2 – Habitat	Upper slope and mid-depth muddy sediments	Main	N
P2 – Ecosystem	Trophic structure and function of the New Zealand deepwater ecosystem	Main	N

6 Traceability

6.1 Eligibility Date

The fishery has a valid MSC certificate. The certificate expiry date for the fishery is 15th September 2019.

6.2 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 programme. Vessels have to advise MPI before landing and maybe subject to monitoring by enforcement officers.

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

Ling
Nelson
Timaru
Dunedin
Bluff
Lyttelton
Greymouth
Napier
Jackson Bay
Picton
Wellington
Westport
Kaikoura
Careys Bay
Christchurch
Waitangi
South Bay

6.2.1 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 a 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 ling) 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 are needed 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

6.2.2 Vessels Fishing Outside the UoCs

New Zealand vessels do not fish for ling outside New Zealand's EEZ. The processes and procedures for reporting and landing fish in New Zealand will ensure that ling caught in geographic area LIN2 (lower east coast North Island and Cook Straight) are never sold as MSC-certified.

6.2.3 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, and packaging of ling.

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.

6.2.4 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.

6.2.5 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 longline ling 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 ling products back to the permitted vessels which landed the product.

The main points of landing for this fishery are all major New Zealand ports (see Table 27).

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. DWG represents quota owners who own the majority (~90%) of the allowable catch for each of the UoCs. Anyone who owns ling 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	The only other gear used to catch ling is trawl. The DWG ling trawl fishery is currently MSC certified and is subject to a separate MSC re-assessment. 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)	There is a possibility that vessels could fish in LIN 2 – an area not covered by this assessment, however, vessels are legally obliged to report which area the fish has been caught from. It is very unlikely in that fishing will take place in LIN 1 given geographical (i.e. distance) constraints. All vessels are equipped with VMS, there is a high level of observer coverage, and there is extensive record keeping required 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.

Traceability Factor	Description of risk factor, if present.
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.
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 were 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.

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

There are no IPI stocks in the fishery.

7 Evaluation Results

7.1 Principle Level Scores

The preliminary scores for the three Principles for each UoC and the scores for the thirty Performance Indicators that were scored are provided below:

Table 29. Principle scores for UoCs 1, 2, 3, 4, and 5

UoCs 1-5	
Principle	**Score**
Principle 1 – Target Species	90.6
Principle 2 – Ecosystem	86.0
Principle 3 – Management System	97.3

7.2 Summary of Scores

Table 30: Performance Indicator scores UoCs 1, 2, 3, 4 and 5

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

7.3 Summary of Conditions

All PIs scored ≥ 80 and so the fishery has no conditions of certification.

7.4 Recommendations

1) PI 2.1.3, SIa. A recommendation is set that information is collected annually to determine the quantities and sources of bait species used in the fishery. This information should be retained and reported routinely at annual surveillance audits of the fishery.

2) PI 2.3.3, SIa. A recommendation is set 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.

7.5 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)

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.

8 References

Principle 1

Bagley, N.W., R.L. O'Driscoll and J. Oeffner. 2014. Trawl survey of hoki and middle-depth species in the Southland and Sub-Antarctic areas, November–December 2012 (TAN1215).

Bull B, Francis RICC, Dunn A, McKenzie A, Gilbert DJ, Smith MH, Bian R. 2008. CASAL (C++ algorithmic stock assessment laboratory): CASAL User Manual v2.20-2008/02/14. NIWA Technical Report 120.

Butterworth, D., R. Hillary and J. Ianelli. 2014. Report on the review of the New Zealand hoki stock assessment model

Francis, R.I.C. 2011. Data weighting in statistical fisheries stock assessment models. Can. J. Fish. Aquat. Sci. 68: 1124 – 1138.

Horn, P.L. 2015a. Spatial and temporal changes in ling (*Genypterus blacodes*) population structure on the Chatham Rise and off West Coast South Island. New Zealand Fisheries Assessment Report 2015/03. 23 p.

Intertek. 2012a. New Zealand Hoki Fishery. 2nd Reassessment. Final Report. 16 August 2012.

Intertek. 2012b. New Zealand Southern Blue Whiting Trawl Fisheries, Deepwater Group. Public Certification Report. 1 May 2012.

Intertek. 2014a. New Zealand Hake Trawl Fishery. Public Certification Report. 16 Sept 2014.

Intertek. 2014b. New Zealand Ling Trawl and Longline Fishery. Public Certification Report. 16 Sept 2014.

Ladroit, Y., C. Ó Maolagáin and P.L. Horn. 2017. An investigation of otolith shape analysis as a tool to determine stock structure of ling (*Genypterus blacodes*). New Zealand Fisheries Assessment Report 2017/24. 16 p.

Haddon, M. 2001. Modelling and quantitative methods in fisheries. Chapman and Hall. London, UK. 406 pp.

O'Driscoll, R.L., S.L. Ballara and N.W. Bagley. 2014b. Review of performance of west coast South Island trawl/acoustic survey of deepwater stocks. MPI Final Research Report.

McGregor, V. 2015. Stock assessment of ling (*Genypterus blacodes*) on the Chatham Rise (LIN 3&4) for the 2014–15 fishing year. New Zealand Fisheries Assessment Report 2015/82. 50 p.

MPI. 2008. Harvest Strategy Standard for New Zealand Fisheries. October 2008. Ministry for Primary Industries. 30 pp.

MPI. 2011. Operational Guidelines for New Zealand's Harvest Strategy Standard. Revision 1. June 2011. Ministry of Fisheries. 80 pp.

MPI. 2013. Decision letter of the Office of Hon. Nathan Guy. Sustainability measures and other management controls for 1 October 2013. 9 pp.

MPI. 2015. Decision letter of the Office of Hon. Nathan Guy. Sustainability measures and other management controls for 1 October 2015. 7 pp.

MPI. 2017a. Fisheries Assessment Plenary, May 2017: stock assessments and stock status. Compiled by the Fisheries Science Group, Ministry for Primary Industries, Wellington, New Zealand.

MPI. 2017b. Review of Sustainability Controls for 1 October 2017. MPI Discussion Paper No. 2017/17.

MPI. 2017c. Medium Term Research Plan for Deepwater Fisheries. 2018/19 – 2022/23. September 2017. MPI Document.

Punt, A.E., A.D.M. Smith, D.C. Smith, G.N.Tuck and N.L. Klaer. 2014. Selecting relative abundance proxies for B_{MSY} and B_{MEY}. ICES Journal of Marine Science. 71: 469 – 483.

Roberts, J. 2016. Stock assessment of ling (*Genypterus blacodes*) in the Sub-Antarctic (LIN 5&6) for the 2014–15 fishing year. New Zealand Fisheries Assessment Report 2016/05. 35 p.

Simmonds, G., G. Bremner, H. Whittaker, P. Clarke, L. Teh, K. Zylich, D. Zeller, D. Pauly, C. Stringer, B. Torkington and. N. Haworth. 2016. Reconstruction of marine fisheries catches for New Zealand (1950-2010). Institute for the Oceans and Fisheries, UBC. Working Paper Series. #2015-87.

Stevens, D.W., R.L. O'Driscoll, S.L. Ballara and Y. Ladroit. 2017. Trawl survey of hoki and middle-depth species on the Chatham Rise, January 2016 (TAN1601). New Zealand Fisheries Assessment Report 2017/08. 131 p.

Tilney, R., I.T. Clement and S. Gargiulo. 2017. Why SAU's Reconstruction of New Zealand Deep Water Catches is Unreliable. Briefing note to Acoura Marine MSC assessors, July 2017.

Principle 2

Abraham, E.R. & Y. Richard 2017. Summary of the capture of seabirds in New Zealand commercial fisheries, 2002–03 to 2013–14. New Zealand Aquatic Environment and Biodiversity Report No. 184. 88 pp.

Abraham, E.R., Richard, Y., Bell, E. & T.J. Landers 2015. Overlap of the distribution of black petrel (*Procellaria parkinsoni*) with New Zealand trawl and longline fisheries. New Zealand Aquatic Environment and Biodiversity Report No. 161. 30 pp.

Abraham, E.R., Neubauer, P., Berkenbusch, K. & Y. Richard 2017. Assessment of the risk to New Zealand marine mammals from commercial fisheries. New Zealand Aquatic Environment and Biodiversity Report No. 189. 123 pp.

Abraham, E., Richard, Y. & K. Clements 2016. Evaluating threats to New Zealand seabirds, 19 pages. Report for the Department of Conservation. Dragonfly Data Sciences, New Zealand, 19 pp.

Acoura 2016. On-Site Surveillance Visit - Report for New Zealand Ling Trawl and Longline Fishery; 2nd Surveillance Audit. Acoura Marine Ltd., November 2016. 32 pp.

Anderson, O.F. 2014. Fish and invertebrate bycatch and discards in New Zealand ling longline fisheries from 1992–93 until 2011–12. New Zealand Aquatic Environment and Biodiversity Report No. 138. 66 pp.

Anderson, O.F. 2017. Fish and invertebrate bycatch in New Zealand deepwater fisheries from 1990–91 until 2013–14. New Zealand Aquatic Environment and Biodiversity Report No. 181. 75 pp.

Anderson, O., Tracey, D., Bostock, H., Williams, M. & M. Clark 2014. Refined habitat suitability modelling for protected coral species in the New Zealand EEZ. NIWA Client Report WLG2014-69, prepared for DOC, December 2014, 46 pp.

Baird, S.J., Tracey, D., Mormede, S. & M. Clark 2013. The distribution of protected corals in New Zealand waters. NIWA Client Report WLG2012-43, prepared for DOC, February 2013. 96 pp.

Baker, G.B & S. Hamilton 2016. Risk of Unacceptable Impacts to the Populations of Incidentally Caught Seabirds from Small Vessel (<34 m) Ling Bottom Longline Fisheries (QMAs 3-7). Prepared for Deepwater Group Ltd. by Latitude 42 Environmental Consultants Pty Ltd., October 2016. 49 pp.

Ballara, S.L. 2015. Fish and invertebrate bycatch in New Zealand deepwater fisheries from 1990–91 until 2012–13. New Zealand Aquatic Environment and Biodiversity Report No. 158. 79 pp.

Ballara, S.L. & R.L. O'Driscoll 2015. Fish and invertebrate bycatch and discards in New Zealand hoki, hake, and ling fisheries from 1990–91 until 2012–13. New Zealand Aquatic Environment and Biodiversity Report No. 163. Ministry for Primary Industries, Wellington. 120 pp.

Bell, M.D., Bell, D.J. & D.P. Boyle 2017. Chatham Island Mollymawk research on Te Tara Koi Koia: November 2016. Report prepared by Wildlife Management International Limited for the Department of Conservation, Wellington. 24 pp. Available online: http://www.doc.govt.nz/Documents/conservation/marine-and-coastal/marine-conservation-services/reports/chatham-island-mollymawk-te-tara-koi-koia-report-2016.pdf

Bowden, D.A., Davey, N., Fenwick, M., George, S., Macpherson, D., Ray, C., Stewart, R., Christensen-Field, C. & K. Gibson 2017. Quantifying benthic biodiversity: a factual voyage report from RV Tangaroa voyage TAN1701 to Chatham Rise, 4 January – 2 February 2017. New Zealand Aquatic Environment and Biodiversity Report No. 185. 98 p. + supplemental material.

Bradford-Grieve, J.M., Probert, P.K., Nodder, S.D., Thompson, D., Hall, J., Hanchet, S., Boyd, P., Zeldis, J., Baker, A.N., Best, H.A., Broekhuizen, N., Childerhouse, S., Clark, M., Hadfield, M., Safi, K. & I. Wilkinson 2003. Pilot trophic model for subantarctic water over the Southern Plateau, New Zealand: a low biomass, high transfer efficiency system. Journal of Experimental Marine Biology and Ecology, V. 289, pp. 223-262.

Consalvey, M., MacKay, K. & D. Tracey 2006. Information review for protected deep-sea coral species in the New Zealand region. NIWA Client Report WLG2006-85. Prepared for Department of Conservation, November 2006. 58pp.

DOC (undated-b). Protected coral species. Department of Conservation webpage: http://www.doc.govt.nz/nature/native-animals/invertebrates/protected-coral/

DOC 2015. Conservation Services Programme Strategic Statement 2015. Department of Conservation. Wellington. 33 pp.

DOC 2017. Conservation services programme annual plan 2017/18. Department of Conservation. Wellington. 75 pp.

DWG 2015. Ling bottom longlining crew training, version 2. Deepwater Group, 2015, 35 pp.

DWG 2016. Ling FMA 2-7 Bottom longline operational procedures. Deepwater Group, 1st October 2016. 20 pp.

FAO 2009. International Guidelines for the Management of Deep-sea Fisheries in the High Seas. http://www.fao.org/docrep/011/i0816t/i0816t00.htm

Fishserve 2018. Deemed values; catches in excess of your ACE holdings. Webpage: https://www.fishserve.co.nz/information/deemed-values

Ford, R.B., Galland, A. Clark, M.R., Crozier, P., Duffy, C.A.J., Dunn, M.R., Francis, M.P. & R. Wells 2015. Qualitative (Level 1) risk assessment of the impact of commercial fishing on New Zealand Chondrichthyans. New Zealand Aquatic Environment and Biodiversity Report No. 157. 111 pp.

Ford, R.B., Arlidge, W., Bowden, D., Clark, M., Cryer, M., Dunn, A., Hewitt, J., Leathwick, J., Livingston, M., Pitcher, R., Rowden, A., Thrush, S., Tingley, G.A. & I. Tuck 2016. Assessing the effects of mobile bottom fishing methods on benthic fauna and habitats. New Zealand Fisheries Science Review 2016/2. 47 pp.

Fosså, J.H., Mortensen P.B. & D.M. Furevik. 2002. The deep-water coral *Lophelia pertusa* in Norwegian waters: distribution and fishery impacts. Hydrobiologia, V. 471, pp. 1-12.

Goad, D. 2018. Small longline vessel hauling mitigation development. Report prepared by Vita Maris for the Department of Conservation. Contract reference: 4661 CSP seabird mitigation: 2107. 15 pp. Available online: http://www.doc.govt.nz/Documents/conservation/marine-and-coastal/marine-conservation-services/reports/hauling-mitigation-report-11Feb2018.pdf

Intertek. 2014b. New Zealand Ling Trawl and Longline Fishery. Public Certification Report. 16 Sept 2014.

Leathwick, J.R., Rowden, A., Nodder, S., Gorman, R., Bardsely, S., Pinkerton, M., Baird, S.J., Hadfield, M., Currie, K. & A. Goh (2012). A benthic-optimised marine environmental classification (BOMEC) for New Zealand waters. New Zealand Aquatic Environment and Biodiversity Report No. 88. 54 pp.

MoF 2010. National Fisheries Plan for Deepwater and Middle-depth Fisheries. Author: Ministry of Fisheries, Wellington.

MPI 2013b. National plan of action for the conservation and management of seabirds, 2013. Ministry for Primary Industries, Wellington, New Zealand, 36 pp.

MPI 2016. Aquatic Environment and Biodiversity Annual Review 2016. Compiled by the Fisheries Management Science Team, Ministry for Primary Industries, Wellington, New Zealand. 790 pp.

MPI. 2017a. Fisheries Assessment Plenary, May 2017: stock assessments and stock status. Compiled by the Fisheries Science Group, Ministry for Primary Industries, Wellington, New Zealand.

MPI 2017e. Annual Review Report for Deepwater Fisheries for 2015/16. MPI Technical Paper No: 2017/29. Ministry for Primary Industries, Wellington, 109 pp.

MSC 2013a. MSC certification requirements, Version 1.3, 14 January 2013. Marine Stewardship Council, London, 301 pp.

MSC 2013b. Guidance to the MSC certification requirements, Version 1.3. 14 January 2013. Marine Stewardship Council, London, 254 pp.

NZG 2010. Fisheries (Seabird Sustainability Measures—Bottom Longlines) Circular 2010 (No. F541). New Zealand Gazette, 1/7/2010, No. 76, p. 2120. Available online: http://fs.fish.govt.nz/NR/rdonlyres/11731511-BA6C-45EA-9EEB-B911B4397EA0/0/F541.pdf

O'Driscoll, R.L., Bagley, N.W., Ballara, S.L. & Y. Ladroit 2015. Trawl and acoustic survey of hoki and middle depth fish abundance on the west coast South Island, July–August 2013 (TAN1308). New Zealand Fisheries Assessment Report 2015/20. 104 pp.

Orejas, C., Gori, A., Iacono, C.L., Puig, P., Gili, J.-M. & M.R.T. Dale. 2009. Cold-water corals in the Cap de Creus canyon, northwestern Mediterranean: spatial distribution, density and anthropogenic impact. Marine Ecology Progress Series, V. 397, pp. 37-51.

Pham, C.K., Diogo, H., Menezes, G., Porteiro, F., Braga-Henriques, A., Vandeperre, F. & T. Morato 2014. Deep-water longline fishing has reduced impact on Vulnerable Marine Ecosystems. Scientific Reports, V. 4, Article Number 4837.

Pinkerton, M.H. 2013. Ecosystem modelling of the Chatham Rise. Research report prepared for Chatham Rock Phosphate, April 2013. NIWA Client Report No: WLG2013-17. 183 pp.

Pinkerton, M.H. 2014. Food-web modelling of the Chatham Rise: Additional work requested by the expert conference on ecosystem effects. Letter to CRP and DMC, 14 October 2014. 23 pp.

Richard, Y. & E.R. Abraham 2015. Assessment of the risk of commercial fisheries to New Zealand seabirds, 2006–07 to 2012–13. New Zealand Aquatic Environment and Biodiversity Report 162. 85 pp.

Sharp, B.R., Parker, S.J. & N. Smith 2009. An impact assessment framework for bottom fishing methods in the CAMLR Convention Area. CCAMLR Science, V. 16, pp. 195–210.

Snelder, T.H., Leathwick J.R., Dey, K.L., Rowden, A.A., Weatherhead, M.A., Fenwick, G.D., Francis, M.P., Gorman, R.M., Grieve, J.M., Hadfield, M.G., Hewitt, J.E., Richardson, K.M., Uddstrom, M.J. & J.R. Zeldis 2007. Development of an ecological marine classification in the New Zealand region. Environmental Management, V.39, pp. 12-29.

Tilney, R. 2017. Bait use by the New Zealand Ling Longline Fisheries. Report to the Deepwater Group, dated 28 August 2017. 6 pp.

Walker, N., Smith, N., Sharp, B. & M. Cryer 2015. A qualitative review of New Zealand's 2013 level two risk assessment for seabirds. New Zealand Fisheries Science Review 2015/1. 58 pp.

WGSE 2011. Report of the International Council for the Exploration of the Sea (ICES) Working Group on Seabird Ecology (WGSE), 1–4 November 2011, Madeira, Portugal. ICES CM 2011/SSGEF:07. 73 pp.

Wolfaardt, A. 2016. Data collection requirements for observer programmes to improve knowledge of fishery impacts on seabirds. ICCAT Collective Volume of Scientifics Papers, V.72, pp. 1975-1983.

Principle 3

DOC 2017. Conservation Services Programme. http://www.doc.govt.nz/our-work/conservation-services-programme/

DOC 2016. Conservation Services Programme Annual Plan 2015/16. Wellington: DOC.

Deepwater Group 2010. Memorandum of Understanding between the Ministry of Fisheries and the Deepwater Group. Deepwater Group Ltd. Nelson, New Zealand (December 2010). 12p.

DWG 2017a. Ling Longline Situation Report. 19p.

IQANZ. 2018. Deepwater Fisheries Management, Independent Quality Assurance Review Report. Report for MPI prepared by Independent Quality Assurance New Zealand. http://www.mpi.govt.nz/dmsdocument/27609-ministry-for-primary-industries-deepwater-fisheries-management-independent-quality-assurance-review-report-31-january-2018-signed.

Intertek 2014b. New Zealand Ling Trawl and Longline Fishery. Public Certification Report. 16 Sept 2014.

Kazmierow, B., K. Booth, and E Mossman. 2010. Experiences and factors influencing regulatory compliance. Report prepared for the Ministry of Fisheries by Lindis Consulting. Available online: http://www.fish.govt.nz/NR/rdonlyres/E028429E-8F77-4692-B58B-5A2BBD66848C/0/Compliance_research_report_2010.pdf

Ministry of Fisheries 2008. Harvest Strategy Standard for New Zealand fisheries. Author: Wellington. Available online: http://fs.fish.govt.nz/Doc/16543/harveststrategyfinal.pdf.ashx

Ministry of Fisheries 2009. Fisheries 2030: New Zealanders maximising the benefits from the use of fisheries within environmental limits. Author: Wellington. Available online: https://www.mpi.govt.nz/document-vault/5032

Ministry of Fisheries 2010. National Fisheries Plan for Deepwater and Middle-depth Fisheries. Author: Wellington. Available online: http://www.mpi.govt.nz/document-vault/3967

Ministry of Fisheries 2010a. Overview of New Zealand's Fisheries Science Peer Review Processes. Ministry of Fisheries, Wellington, New Zealand (10 June 2010)

Ministry of Fisheries 2011. Terms of Reference for Fisheries Assessment Working Groups (FAWGs) in 2011. Ministry of Fisheries, Wellington, New Zealand

MPI 2011a. Research and Science Information Standard for New Zealand fisheries. Author: Wellington. Available online: https://www.mpi.govt.nz/dmsdocument/3692-research-and-science-information-standard-for-new-zealand-fisheries

MPI 2011b. Hoki: National Deepwater Fisheries Plan. 51 p. Available online: http://www.mpi.govt.nz/document-vault/3974

MPI 2011c. Ling: National Deepwater Fisheries Plan. 50 p. Available online: http://www.mpi.govt.nz/document-vault/3973

MPI 2011d. Southern Blue Whiting Fisheries Plan. 48p.

MPI 2013. National Plan of Action to reduce the incidental catch of seabirds in New Zealand fisheries. 58 p. Available online: http://www.fish.govt.nz/en-nz/Environmental/Seabirds/default.htm

MPI 2013a. National Plan of Action for the Conservation and Management of Sharks. 36p. Available online: https://www.mpi.govt.nz/protection-and-response/sustainable-fisheries/managing-our-impact-on-marine-life/sharks/

MPI 2016. Annual Operational Plan for Deepwater Fisheries for 2016/17. MPI Technical Paper No. 2016/46. MPI: Wellington. Available online: http://www.fish.govt.nz/en-nz/Deepwater/Key+Documents.htm

MPI 2016a. Operational Plan to Manage the Incidental Capture of New Zealand Sea Lions in the 2016 Southern Blue Whiting Fishery at Campbell Island (SBW6I). 6 pp. Available online: http://deepwatergroup.org/wp-content/uploads/2017/06/MPI-SBW6I-2016-Operational-Plan.pdf

MPI 2016b. Performance of the 2016 southern blue whiting fishery and compliance with the SBW6I Operational Plan. MPI: Wellington. Available online: http://fs.fish.govt.nz/Page.aspx?pk=113&dk=23980

MPI 2017. Annual Review Report for Deepwater Fisheries for 2015/16. MPI Technical Paper No: 2017/29. MPI: Wellington.

MPI 2017a. Consultation on Draft National Fisheries Plan for Deepwater and Middle-depth Fisheries. Available online: https://www.mpi.govt.nz/news-and-resources/consultations/national-fisheries-plans-for-highly-migratory-species-and-deepwater-fisheries/

MPI 2017b. Medium Term Research Plan for Deepwater Fisheries. 2018/19 – 2022/23. September 2017. MPI Document.

MRAG-Americas 2016. Full MSC Assessment of the New Zealand Orange Roughy Fisheries. 232 pp.

New Zealand legislation

Fisheries Act 1996
Fisheries (Benthic Protection Areas) Regulations 2007 (SR 2007/308)
Fisheries (Commercial Fishing) Regulations 2001 (SR 2001/ 253)
Fisheries (Commercial Fishing Amendment) Regulations No 2. 2009
Fisheries (Reporting) Regulations 2001 (SR 2001/188)
Fisheries (Satellite Vessel Monitoring) Regulations 1993 (SR 193/354)
Maori Fisheries Act 2004
Marine Mammals Protection Act 1978
Marine Reserves Act 1971
Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 No 121
Wildlife Act 1953

Appendix 1. Performance Indicator Scores and Rationales

Evaluation Table for PI 1.1.1 – Stock status

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			
	Guidepost	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.
	LIN 3 & 4 Met?	Y	Y	Y
	LIN 5 & 6 Met?	Y	Y	Y
	LIN 7WC Met?	Y	Y	Y
	Justification	LIN 3 & 4: The most recent assessment (2015) estimates that 2014 spawning stock biomass is well above the limit reference point (20% B_0) with the lower 95% credible interval for the most pessimistic (longline) model exceeding the limit reference point (95% CI 30 - 51 B_0). Projections from the base case model suggest that biomass will remain the same at current catch levels until at least 2019. SIa meets SG60, 80 and 100. LIN 5 & 6: The most recent assessment (2015) estimates that 2014 spawning stock biomass is well above the limit reference point (20% B_0) with the lower 95% credible interval for the most pessimistic (base case) model exceeding the limit reference point (95% CI 69 – 103% B_0). Projections from the base case model suggest that biomass will remain the same at current catch levels until at least 2019. SIa meets SG60, 80 and SG100. LIN 7WC: The most recent assessment (2017) estimates that 2017 spawning stock biomass is well above the limit reference point (20% B_0) with the lower 95% credible interval for the most pessimistic (lognormal CPUE & M = 0.18) model exceeding the limit reference point (95% CI 39 - 74% B_0). Projections from all models at similar to recent catch suggest that biomass will remain the same at current catch levels until at least 2022. SIa meets SG60, 80 and SG100.		
b	Stock status in relation to achievement of MSY			
	Guidepost		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.
	LIN 3 & 4 Met?		Y	Y
	LIN 5 & 6 Met?		Y	Y
	LIN 7WC Met?		Y	Y
	Justification	LIN 3 & 4: 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).		

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
	Recruitment since the early 1990s has been fluctuating slightly around the long-term average. Biomass declined from virgin levels in the 1970s – 1980s but never dipped below the 40% B_0 target. Since the early 2000s, biomass has modestly increased and has remained above the target. The most recent assessment (2015) estimates that the lower 95% credible interval of 2014 biomass (57% B_0) for the base case model exceeds the target reference point (95% CI 45 - 71% B_0) and very likely (> 90%) to be above the target. Projections of the base case model to 2019 based on catch similar to recent levels (3,564 t) indicate that B_{2019} is expected to be 59% B_0 (95% CI 45 – 75% B_0). SIb meets SG60, SG80 and SG100. LIN 5 & 6: 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). Recruitment was generally weak during 1982 - 1992, strong during 1993 - 1996, and has been average since then. Biomass has declined modestly from virgin levels over the long-term but has never dropped below the 40% B_0 target. Since the early 2000s, biomass has modestly increased. The most recent assessment (2015) estimates that the lower 95% credible interval of 2014 biomass (86% B_0) for the base case model exceeds the target reference point (95% CI 69 - 103% B_0) and virtually certain (> 99%) to be above the target. Projections of the base case model to 2019 based on catch similar to recent levels (5,700 t) indicate that B_{2019} is expected to be 91% B_0 (95% CI 69-118% B_0). SIb meets SG60, SG80 and SG100. LIN 7WC: 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). Recruitment was strong in 1990 and for several years since 2001. Median biomass has declined from virgin levels over the long-term but has never dropped below the 40% B_0 target. The most recent assessment (2017) estimates that the lower 95% credible interval of 2017 biomass (79% B_0) for the Combined CPUE and sensitivity models generally exceeds is or is close to the target reference point (39 – 61% B_0) and very likely (Pr>90%) to be at or above the target. Projections of all models to 2022 based on catch similar to recent levels (about 3,000 t) indicate that biomass is likely to remain the same with B_{2022} expected to range 54 – 79% B_0. SIb meets SG60, SG80 and SG100.		
References	MPI (2017a)		

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	LIN 3 & 4: B_{2019} (Base); 51% B_0 (2.6 x soft limit) LIN 5 & 6: B_{2019} (Base); 91% B_0 (4.6 x soft limit) LIN 7WC: B_{2017} (COM); 79% B_0 (4 x soft limit)
Reference point used in scoring stock relative to MSY (SIb)	Spawning Biomass Target (proxy B_{MSY})	40% B_0	LIN 3 & 4: B_{2016} (Base); 51% B_0 (1.3 x target) LIN 5 & 6: B_{2016} (Base); 91% B_0 (2.3 x target) LIN 7WC B_{2017} (COM); 79% B_0 (2 x target)

LIN3 OVERALL PERFORMANCE INDICATOR SCORE:	**100**
LIN4 OVERALL PERFORMANCE INDICATOR SCORE:	**100**

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

LIN5 OVERALL PERFORMANCE INDICATOR SCORE:	**100**
LIN6 OVERALL PERFORMANCE INDICATOR SCORE:	**100**
LIN7 OVERALL PERFORMANCE INDICATOR SCORE:	**100**
CONDITION NUMBER (if relevant):	

Evaluation Table for PI 1.1.2 – Reference Points

PI 1.1.2		Limit and target reference points are appropriate for the stock		
SI		SG 60	SG 80	SG 100
a	Guidepost	Generic limit and target reference points are based on justifiable and reasonable practice appropriate for the species category.	Reference points are appropriate for the stock and can be estimated.	
	Met?	Y	Y	
	Justification	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 soft limit and the target are consistent with the MSC defaults. SIa meets SG60. As per the HSS, there is a soft limit reference point at 20% 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.
	LIN Met?		Y	N
	Justification	The soft rather than hard limit reference point is treated in scoring this PI. 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 ling assessments use a stock-recruitment relationship with an assumed steepness = 0.84, implying that expected biomass at the soft limit (20% B_0) will maintain recruitment at 84% of that at virgin levels. Research on B_{MSY} and related proxy RPs indicates that at steepness of 0.84, B_{MSY}/B_0 ratios can be expected to be less than 0.4, implying that limit RPs based upon the HSS defaults are conservative. SIb meets SG80. 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 stocks 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	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.	consistent with B_{MSY} or some measure or surrogate with similar intent or outcome, or a higher level, and takes into account relevant precautionary issues such as the ecological role of the stock with a high degree of certainty.
	Met?		Y	N
	Justification	The target reference point is defined as 40% B_0, based on the HSS and is consistent with CR1.3 guidance for a B_{MSY} proxy. The risk that the ling stocks would fall below the limit reference point if the stocks are kept around this target is low. At steepness of 0.84, it is expected that B_{MSY} would be a lower fraction of B_0 (25% - 30% 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}. The target biomass is achieved by applying a relatively constant exploitation rate (0.2) as a proxy for F_{MSY}, which has demonstrably been maintained. SIc meets SG80. 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. Also, there has been no explicit examination of the target reference point, taking into account the ecological role of ling in the ecosystem. While the current target is highly likely to be precautionary, this cannot be said with a high degree of certainty. 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.	
	Met?		NA	
	Justification	Ling is not low trophic level (LTL) species. It is not in MSC CR v1.3, Box CB1. The diet of the species is not predominantly plankton and does not have the biological characteristics of LTL species identified in CR1.3.		
References		Haddon (2001), MPI (2008; 2011), Langley, 2009; 2011), Punt et al (2014)		

LIN3 OVERALL PERFORMANCE INDICATOR SCORE	**80**
LIN4 OVERALL PERFORMANCE INDICATOR SCORE	**80**
LIN5 OVERALL PERFORMANCE INDICATOR SCORE	**80**
LIN6 OVERALL PERFORMANCE INDICATOR SCORE	**80**
LIN7 OVERALL PERFORMANCE INDICATOR SCORE	**80**
CONDITION NUMBER	

Evaluation Table for PI 1.1.3 – Stock rebuilding

Not scored as all stocks meet PI 1.1.1 SG80

Evaluation Table for PI 1.2.1 – Harvest strategy

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
SI		SG 60	SG 80	SG 100
a	Guidepost	The harvest strategy is expected to achieve stock management objectives reflected in the target and limit reference points.	The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy work together towards achieving management objectives reflected in the target and limit reference points.	The harvest strategy is responsive to the state of the stock and is designed to achieve stock management objectives reflected in the target and limit reference points.
	Met?	Y	Y	Y
	Justification	The harvest strategy is guided by the 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. 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 is an emergent property of strategy rather than being based on a mathematical algorithm, which 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 stocks of deepwater fishery 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 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. The formal rebuilding plan when a stock is depleted to be below the soft limit (or fishery closure if the stock is estimated to be below the hard limit) contrasts with the MSC guidelines for PI 1.1.3 which consider a stock to be depleted when it is consistently below the target reference point. Rather, under the HSS, management must implement controls to ensure that the stock attains and is maintained at its target and avoids its limit. How this is to be achieved for stocks between the target and soft limit is not explicitly prescribed by the HSS as an algorithm with flexibility to achieve strategic objectives. Management decisions on the ling stocks illustrate the management actions taken when the stock was projected to drop below the target and soft limit, indicating that the harvest strategy will react before a stock drops below the 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.
	Met?	Y	Y	N
	Justification	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 various stocks provide experience that the strategy is likely to work. SIb meets SG60. The harvest strategy has not undergone formal testing. Rather, evidence for the effectiveness of the harvest strategy is provided by the stock assessments. Stock assessments are conducted on a multi-annual cycle (three years) 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 of each stock allows management to respond to both rare recruitment events as well as changes in the fishery. Status has never dropped below the 40% B_0 target. SIb meets SG80. While there is evidence that the harvest strategy is achieving its objectives, it has not undergone formal testing. While the HSS recognizes the value of MSE to evaluate harvest strategies, no MSEs have been undertaken, although one for ling is included in the current five-year research plan for MPI. SIb does not meet SG100.		
c	**Guidepost**	Monitoring is in place that is expected to determine whether the harvest strategy is working.		
	Met?	Y		
	Justification	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 stock assessments, which are conducted on a multi-annual cycle. These assessments evaluate, in probabilistic terms, the degree to which strategic objectives are being achieved. Considerable planning on data collection (e.g. fishery and surveys) and assessment activity is undertaken to determine the appropriate level of monitoring given the risk of the stock. Between assessments, fishery and survey indices are updated each year and if issues arise, assessments can be conducted on an as-needed basis. SIc meets SG60.		
d	**Guidepost**			The harvest strategy is periodically reviewed and improved as necessary.
	Met?			Y
	Justification	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. Harvest strategies are reviewed periodically and revised. The HSS recognizes the value of MSE to evaluate harvest strategies and one is currently planned for ling. There is clear evidence that there is an intention to improve the harvest strategy and the decision-making process, and improvements from reviews are being implemented. 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	Ling is not a shark species.		
References		Intertek (2014b), MPI (2008; 2011; 2016; 2017a)		

LIN3 OVERALL PERFORMANCE INDICATOR SCORE	**95**
LIN4 OVERALL PERFORMANCE INDICATOR SCORE	**95**
LIN5 OVERALL PERFORMANCE INDICATOR SCORE	**95**
LIN6 OVERALL PERFORMANCE INDICATOR SCORE	**95**
LIN7 OVERALL PERFORMANCE INDICATOR SCORE	**95**

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		
SI		SG 60	SG 80	SG 100
a	**Guidepost**	Generally understood harvest rules are in place that are consistent with the harvest strategy and which act to reduce the exploitation rate as limit reference points are approached.	Well defined harvest control rules are in place that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached.	
	Met?	Y	Y	
	Justification	In the New Zealand management system, 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 the HSS (Ministry of Fisheries 2008). The harvest control rule is thus composed of comparing estimated stock status with the limit (i.e. 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 rules are 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. 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 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 with careful consideration of how the rules as outlined in the HSS will work in the New Zealand management system and agreement that these will enable the New Zealand fishery to maintain stock sizes at acceptable levels, consistent with 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.
	Met?		Y	N

	Justification	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. 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. However, a systematic examination of the spectrum of uncertainties would benefit from an MSE, for which one has not yet been conducted for the ling stocks. 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.
	Met?	Y	Y	Y
	Justification	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. SIc meets SG60 and 80. A complication with judging the effectiveness of the QMS for ling stocks is that they are caught as bycatch to the hoki fishery. Catch has been well below the TACCs and not acting as a constraint to fishing. This is the case with three of the five ling management areas. However, in LIN5 and LIN7, while there has been catch overages, catch since 2010/11 has largely been constrained by the TACCs, which indicates their effectiveness in controlling exploitation. Another issue with the ling stocks is the need to allocate stock-specific science advice to LIN management areas, which requires an analysis based upon the biological distribution of the stocks in the management area. Notwithstanding these issues, evidence indicates that the QMS is an effective control of catch. SIc meets SG100.		
References		Intertek (2014b), MPI (2008; 2011; 2016; 2017a)		

LIN3 OVERALL PERFORMANCE INDICATOR SCORE	**90**
LIN4 OVERALL PERFORMANCE INDICATOR SCORE	**90**
LIN5 OVERALL PERFORMANCE INDICATOR SCORE	**90**
LIN6 OVERALL PERFORMANCE INDICATOR SCORE	**90**
LIN7 OVERALL PERFORMANCE INDICATOR SCORE	**90**
CONDITION NUMBER	

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			
	Guidepost	**Some** relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy.	**Sufficient** relevant information related to stock structure, stock productivity, fleet composition and other data is available to support the harvest strategy.	A **comprehensive range** of information (on stock structure, stock productivity, fleet composition, stock abundance, UoA removals and other information such as environmental information), including some that may not be directly related to the current harvest strategy, is available.
	Met?	Y	Y	N
	Justification	The plenary and assessments reports for ling (e.g. MPI, 2017a) summarizes 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. Based on a wide array of information, there are at least five ling stocks around New Zealand, managed over eight management areas (LINs). Since Intertek (2014b), otolith contour shape analysis has confirmed this stock structure. Growth is described by von Bertalanffy models and input to the stock assessments. A growth study of ling from five areas has described growth patterns across the stocks. Otolith ageing has been validated. Age-invariant natural mortality is estimated in the stock assessments and varies amongst stocks. Ling stock assessments assume a Beverton and Holt stock-recruitment relationship with steepness dependent on the stock, these being 0.84 for the three stocks. There is good information on fleet composition and there is fine-scale data on CPUE which is used in some of the stock assessments. Sufficient data are all available to obtain good estimates of stock abundance from the assessment. 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, stock productivity and fleet composition is available to support the harvest strategy. SIa meets SG80. While there is considerable information on the biology of ling, data gaps remain. 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			
	Guidepost	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	**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

PI 1.2.3		Relevant information is collected to support the harvest strategy		
			and monitored with sufficient frequency to support the harvest control rule.	information [data] and the robustness of assessment and management to this uncertainty.
	LIN3&4 Met?	Y	Y	Y
	LIN5&6 Met?	Y	Y	Y
	LIN7WC Met?	Y	Y	Y
	Justification	The monitoring of the ling longline fishery has not changed significantly since Intertek (2014b). 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. Illegal and unreported catch are not considered significant. Observers provide information on the fishery's catch volume and composition on an on-going basis. There has been an increasing temporal trend in observer coverage. While there are some sampling issues (e.g. lack of observer sampling of WCSI ling during 2009-2011 and need for port sampling in Cook Strait), observer coverage of the ling longline fishery continues to be good. Stratified-random bottom trawl surveys have been conducted on the Chatham Rise (January), in the Sub-Antarctic area (April-May and Nov-Dec) and on the West Coast South Island (March-April and August) since 1988 and provide the main age and size-specific abundance indices for the ling stock assessments. The sampling design and operation of these surveys is described in reports produced for each survey. The trawl component of these surveys provides the indices of abundance. Since Intertek (2014b), the overall intensity of the survey programme has reduced due to a perceived need by MPI to reallocate resources to less well understood fisheries, which has increased the uncertainty in these abundance indices. The Chatham Rise (January) and Sub-Antarctic (Nov-Dec) surveys have been conducted biannually since 2014 and 2011 respectively, while the WCSI survey (trawl component) has been conducted tri-annually since 2013. The uncertainties in these surveys have been studied over a number of years and are generally well understood. Improvements are made to surveys as deemed necessary. The sampling CVs of these surveys are considered low (e.g. 10 – 25%) and during the stock assessment process are increased to better represent the contribution of these data to stock status determination. Standardized commercial catch rate (CPUE) indices are also used in the ling stock assessments. Issues with each of these indices are discussed by the DWFAWG and noted as appropriate in the plenary reports. As with the survey indices, the CVs of these indices are considered low and during the stock assessment process are increased to better represent the contribution of these data to stock status determination. SIb meets SG60 & 80.		

PI 1.2.3		Relevant information is collected to support the harvest strategy		
		The uncertainties in trawl surveys have been studied over a number of years and are generally well understood. The relatively low sampling CVs are adjusted upwards during the assessment process to compensate for process error related to the observation methodology. During assessments, robustness of the assessment to these indices (survey and CPUE) are explored through sensitivity runs. Thus, 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			
	Guidepost		There is good information on all other fishery removals from the stock.	
	Met?		Y	
	Justification	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. 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 ling stocks. SIc meets SG80		
References		Bagley et al, (2014), Horn (2015a); Intertek (2014b); Ladroit et al (2017); MPI (2017a; 2017c); O'Driscoll et al (2014b); Simmonds et al (2016); Stevens et al, 2017), Tilney et al (2017)		

LIN3 OVERALL PERFORMANCE INDICATOR SCORE:	**90**
LIN4 OVERALL PERFORMANCE INDICATOR SCORE:	**90**
LIN5 OVERALL PERFORMANCE INDICATOR SCORE:	**90**
LIN6 OVERALL PERFORMANCE INDICATOR SCORE:	**90**
LIN7 OVERALL PERFORMANCE INDICATOR SCORE:	**90**
CONDITION NUMBER (if relevant):	

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.
	LIN3&4 Met?		Y	Y
	LIN5&6 Met?		Y	Y
	LIN7WC Met?		Y	Y
	Justification	The assessment modelling approach in the ling assessment has not changed significantly since Intertek (2014b). These 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). The structure of each of the assessments has endeavored to best take account the major features of the stock`s biology and fishery. Assessments can be unsexed. Recruitment is estimated as deviations around an assumed Beverton and Holt stock-recruitment relationship with assumed steepness of 0.84. Natural mortality can either be fixed or estimated. 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. SIa meets SG80. The ling assessment models take account of the important features including annual cycle of fishing, recruitment, spawning and natural mortality and particularly 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.		
	Met?	Y		
	Justification	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.
	Met?	Y	Y	Y

	Justification	Stock assessments use a Bayesian Statistical Catch-At-Age (SCAA) modeling framework (implemented by the NIWA stock assessment program CASAL). 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 did not 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 (estimated to be zero) 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 vary by assessment but typically include whether or not to include particular datasets (e.g. survey vs CPUE) 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. 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 SG80. 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 take 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.
	Met?			N
	Justification	The Bayesian Statistical Catch-At-Age (SCAA) modeling framework has been applied extensively on the New Zealand stocks. Stock assessments involve a fair degree of exploration of alternative stock and fishery dynamical processes, which ultimately produce the base case and sensitivity models considered in the projections. However, all these explorations occur within the Bayesian SCAA framework. There has been little exploration of alternative approaches (e.g. State Space which consider process error more comprehensively). No MSEs have been conducted on the ling stocks. Simulation studies exploring estimation performance of the Bayesian SCAA approach as applied to ling, are not available. Thus, it cannot be concluded that the assessment has been fully tested and alternative assessment approaches are rigorously explored. SId does not meet SG100.		

e	Guidepost		The assessment of stock status is subject to peer review.	The assessment has been internally and externally peer reviewed.
	Met?		Y	N
	Justification	The stock assessment peer review process has not significantly changed since Intertek (2014b). 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 publicly available in a Plenary Report with more detailed technical descriptions subsequently published in a New Zealand Fisheries Assessment Report. SIe meets SG80. There has been no external review of ling assessments. SIe does not meet SG100.		
References		Bull et al (2012); Francis (2011); Intertek (2014b); MPI (2017a); McGregor (2015); Roberts (2015)		

LIN3 OVERALL PERFORMANCE INDICATOR SCORE	**90**
LIN4 OVERALL PERFORMANCE INDICATOR SCORE	**90**
LIN5 OVERALL PERFORMANCE INDICATOR SCORE	**90**
LIN6 OVERALL PERFORMANCE INDICATOR SCORE	**90**
LIN7 OVERALL PERFORMANCE INDICATOR SCORE	**90**

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 – all UoCs	Y – all UoCs	N – All UoCs
	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). Bait species are also considered in the assessment process under Principle 2, and are subject to the same 'main' criteria (CB3.5.5, MSC 2013a). For this reassessment, annual bait usage and sources were determined through a survey, commissioned by DWG, of 18 ling longline vessels, which together accounted for 97% of the recent ling longline catch (Tilney 2017). Estimates of the quantities of different species used as bait were added to the fishery catch data (assuming bait was the same each year), and annual total catches calculated (Table 17). For the ling longline fishery, main retained species are New Zealand trawl caught jack mackerel (*Trachurus declivis* and *T. murphyi*), used as bait, ribaldo and shovelnose spiny dogfish. A wide variety of species are then taken in the fishery and retained (or used as bait) in small or very small quantities (Table 17). These minor species are not considered in detail here, but are considered minor species for scoring purposes. Species comprising <0.2% are deemed to be negligible and are not considered further. The vast majority of the jack mackerel trawl catch is derived from JMA 7. Stock assessment data are limited, but the natural mortality rate (*M*) for *T. declivis* (which historically has made up the majority of the catch in this area) has been estimated at 0.18, and *F* was estimated at <0.05. More recent estimates of *F* in the main JMA 7 fishing area were also well below *M*, such that it is unlikely that overfishing is occurring (MPI 2017a). The RIB 3 and 4 and RIB 5 and 6 ribaldo stocks are unlikely to be below the soft limit (20%B0) (MPI 2017a). CPUE indices from the spawning hoki and hake target fisheries show a possible steady decline of ribaldo in RIB 7 (as part of RIB 7 8 & 9), but with just three data points in the corresponding trawl survey and a lack of any other information it is not possible to validate the indices (MPI 2017a). Shovelnose dogfish was reported as being well estimated Sub-Antarctic surveys and Chatham Rise surveys; relative biomass has showed no clear trend in the Chatham Rise time-series, but decreased then increased in the Sub-Antarctic time-series (Ballara & O'Driscoll 2015). Shovelnose dogfish showed a decreasing biomass trend in the WCSI survey (O'Driscoll et al. 2015), but no significant trend in the catch rate over time (based on regression analysis) for any of the eight main deepwater fisheries considered by Anderson 2017. For all main species, information on catch levels, stock status and/or biomass trends is sufficient to determine that the species are highly likely to be within biologically based limits; SG60 and SG80 are met for main species. Minor species meet SG60 and SG80 by default. There is not a high degree of certainty that any main or minor retained species are within biologically based limits and fluctuating around their target reference points. No species meets SG100.		

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		
b	Guidepost			Target reference points are defined for retained species.
	Met?			Y – Jack mackerel in JMA 3 and JMA 7, ribaldo in RIB 3 & 4 and RIB 5 & 6, and some minor species N – Ribaldo in RIB 7, 8 & 9, shovelnose spiny dogfish and some minor species
	Justification	Target reference points are defined for jack mackerel (JMA 3 and JMA 7) and some ribaldo stocks (RIB 3 & 4 and RIB 5 & 6) as main retained species, as well as for some minor retained species, but not for the other relevant ribaldo stock (RIB 7, 8 & 9) and shovelnose spiny dogfish as a main retained species, nor for other minor retained species. SG 100 is met for some retained species but not all.		
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	All main retained species are within biologically-based limits, so this SI is not scored.		
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	The status of main retained species is known in sufficient detail that this SI is not scored.		
References		Ballara & O'Driscoll 2015, MPI 2017a, MSC 2013a, MSC 2013b, O'Driscoll et al. 2015		

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
OVERALL PERFORMANCE INDICATOR SCORE (All UoCs):	**85**
CONDITION NUMBER (if relevant):	**N/A**

UoCs 1 and 2 (LIN 3 and LIN 4) – 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
Jack mackerel (JMAs 3 and 4)	Main	80	100	N/A	N/A	90	85
Ribaldo (RIB 3 & 4)	Main	80	100	N/A	N/A	90	
Shovelnose spiny dogfish	Main	80	Don't meet 100 so default 80	N/A	N/A	80	
16 Minor Species (various stocks)	Minor	80	Don't meet 100 so default 80	N/A	N/A	80	

UoCs 3 and 4 (LIN 5 and LIN 6) – 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
Jack mackerel (JMAs 3 and 4)	Main	80	100	N/A	N/A	90	85
Ribaldo (RIB 5 & 6)	Main	80	100	N/A	N/A	90	
Shovelnose spiny dogfish	Main	80	Don't meet 100 so default 80	N/A	N/A	80	
16 Minor Species (various stocks)	Minor	80	Don't meet 100 so default 80	N/A	N/A	80	

UoC 5 (LIN 7) – 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
Jack mackerel (JMAs 3 and 4)	Main	80	100	N/A	N/A	90	85
Ribaldo (RIB 7,8,9)	Main	80	Don't meet 100 so default 80	N/A	N/A	80	
Shovelnose spiny dogfish	Main	80	Don't meet 100 so default 80	N/A	N/A	80	
16 Minor Species (various stocks)	Minor	80	Don't meet 100 so default 80	N/A	N/A	80	

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 – Main species (Minor species meet SG80 by default)	Y – Main species (Minor species meet SG80 by default)	N – All UoCs
	Justification	For the ling longline fishery, main retained species are New Zealand trawl caught jack mackerel (*Trachurus declivis* and *T. murphyi*), used as bait, ribaldo and shovelnose spiny dogfish. A wide variety of species are then taken in the fishery and retained (or used as bait) in small or very small quantities (Table 17). These minor species are not considered in detail here, but 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. For all main species, there are considered to be measures in place which together comprise a partial strategy 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. These measures include the limiting of overall effort levels, setting of TACs for jack mackerel and ribaldo as QMS species, the routine monitoring of catches both in the ling fishery and other deepwater fisheries (e.g., Anderson 2017, Ballara & O'Driscoll 2015), regular fishery independent surveys of the main fishing grounds (e.g., O'Driscoll 2015), and the review of catch and survey biomass trends and the management approach (e.g., Anderson 2017, MPI 2017a). SG60 and SG80 are met for main species. More comprehensive observer data and detailed information on stock status for minor species would be needed for the fishery to meet SG100.		
b	**Guidepost**	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).	There is 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 – Main species (Minor species meet SG80 by default)	Y – Main species (Minor species meet SG80 by default)	N – All UoCs
	Justification	For minor species, a partial strategy is not necessary (see SIa), so SG80 is met by default for all minor species. For main species, there is some objective basis for confidence that the partial strategy as described in SIa will work, based on the information that is collected directly from the fishery and verified through fishery independent surveys, while there are routine reviews of management performance based on stock indicators (e.g., Anderson 2017, MPI 2017a). For a Principle 2 retained species, this is		

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		
		considered sufficient to determine that SG60 and SG80 are met. In the absence of a strategy, SG100 cannot be 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 – Main species (Minor species meet SG80 by default)	N – All UoCs
	Justification	For All UoCs, there is clear evidence that the partial strategy is being implemented successfully – catch data are collected routinely, information on catch and survey biomass trends is reviewed, and the TACCs are set to maintain stocks at healthy levels; SG80 is met. In the absence of a strategy, SG100 cannot be met.		
d	Guidepost			There is some evidence that the strategy is achieving its overall objective.
	Met?			N – All UoCs
	Justification	All UoCs. In the absence of a strategy, this SG100 requirement cannot be met.		
e	Guidepost	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
	Met?	Y – All UoCs	Y – All UoCs	Y – All UoCs
	Justification	Species in the catch including spiny dogfish, shovelnose spiny dogfish, school shark, pale ghost shark and ghost shark are chondrichthyan species taken in the ling longline fishery (Table 17). Since 1st October 2014, it has been illegal in New Zealand for commercial fishers to remove the fins from any shark and discard the body at sea (MPI 2014; this requirement is monitored by MPI Compliance and observers. The Assessment Team is not aware of any prosecutions for contraventions of this law in the ling longline fishery. SG100 is met for these species. For other minor retained species that are not sharks/chimaerids, this SI is not relevant.		
References		Anderson 2017, Ballara & O'Driscoll 2015, MPI 2014, MPI 2017a, O'Driscoll 2015.		
OVERALL PERFORMANCE INDICATOR SCORE (All UoCs):				85

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
CONDITION NUMBER (if relevant):	N/A

All UoCs – 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
All main	Main	80	80	80	Don't meet 100 so default 80	100	85	85
All minor	Minor	80	80	80	Don't meet 100 so default 80	100	85	

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 – Main species (Minor species meet SG80 by default)	Y – Main species (Minor species meet SG80 by default)	N – All UoCs
	Justification	For the ling longline fishery, main retained species are New Zealand trawl caught jack mackerel (*Trachurus declivis* and *T. murphyi*), used as bait, ribaldo and shovelnose spiny dogfish. A wide variety of species are then taken in the fishery and retained (or used as bait) in small or very small quantities (Table 17). These minor species are not considered in detail here, but 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. 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. For the ling longline fishery, catch data (including allowed discards) for the top five/eight species (depending on vessel size) are required to be reported via catch and effort logbooks, which provide green-weight catch totals for the top five/eight species (dependent on vessel size and fishing method) on a fishing-event basis, and daily summary of TACC species caught. Catches are also independently monitored through observer data, which provides accurate and verifiable information on the catch of all species. Over the period 2011/12 – 2015/16, observer coverage for the fishery overall (based on the number of hooks observed versus the number of hooks deployed) has varied between 10.0% in 2011/12 and 1.7% in 2012/13, with an average coverage of 5.2% over the time period (https://psc.dragonfly.co.nz/2017v1/). SG60 and SG80 are met. SG100 is not met as the observer coverage level is limited and variable in some areas. A recommendation is set (#1) with respect to the ling longline fishery, that information is collected annually to determine the quantities and sources of bait species used in the fishery. This information should be retained and reported routinely at annual surveillance audits of the fishery.		
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 – Main species (Minor species meet SG80 by default)	Y – Main species (Minor species meet SG80 by default)	N – All UoCs

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	For main (and many minor) retained species that are managed through the QMS, biological and population parameters are estimated and stock assessments and/or catch trend information is collated and reported routinely (e.g., MPI 2017a). This information is sufficient to meet the SG60 and SG80 levels of performance. For all species in the ling longline catch (as represented by Table 17), including minor species not managed through the QMS, catch trend information from the eight main deepwater fisheries is presented by Anderson 2017, providing information on change in status from 1992/93. Relative population trends are also available for a number of the species from the various inshore and offshore research survey series. However, in the absence of higher levels of observer coverage and analytical stock assessments for all minor as well as main species, the SG100 requirement that "*Information is sufficient to quantitatively estimate outcome status with a high degree of certainty*" is not met.		
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 – Main species (Minor species meet SG80 by default)	Y – Main species (Minor species meet SG80 by default)	N – All UoCs
	Justification	For 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 for these species. For main retained species, data are recorded routinely on a set by set basis, and reporting includes the number of hooks deployed and areas fished. Observer data are also collected routinely, with an average coverage of 5.2% over the 2011/12 – 2015/16 years (coverage was higher in previous years). Fishery-independent surveys of the main fishing grounds and reviews of catch trend information also provides early warning of changes in risk to different species, while stock assessments are undertaken periodically for main species. Information is clearly adequate to support a partial strategy to manage main retained species, and SG60 and SG80 are met. However, in the absence of higher levels of observer coverage and analytical stock assessments for all minor as well as main species, the SG100 requirement that "*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*" is not met.		
d	Guidepost		Sufficient data continue to be collected to detect any increase in risk level (e.g. due to changes in the outcome indicator score or the operation of the fishery or the effectiveness of the strategy)	Monitoring of retained species is conducted in sufficient detail to assess ongoing mortalities to all retained species.
	Met?		Y – All UoCs	N – All UoCs

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	Total effort (hooks deployed by area) and catch data (including allowed discards) for the top five/eight species (dependent on vessel size and fishing method) on a fishing-event basis are required to be reported via catch and effort logbooks. Sufficient data continue to be collected to detect any increase in risk level, so SG80 is met for all UoCs. Independent observer coverage (average 5.2% of hooks deployed for the 2011/12 – 2015/16 period) is also undertaken, but this is too low to be confident that SG100 is met.
References		MPI 2017a, MSC 2013a

OVERALL PERFORMANCE INDICATOR SCORE (All UoCs):	**80**
CONDITION NUMBER (if relevant):	**N/A**
RECOMMENDATION NUMBER	**1**

All UoCs – 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
All main	Main	80	80	80	80	80	80
All minor	Minor	80	80	80	80	80	

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 – Spiny dogfish (Minor species meet SG80 by default)	Y – Spiny dogfish (Minor species meet SG80 by default)	N – All UoCs
	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). Spiny dogfish is the only main bycatch species in the ling longline fishery, comprising 10% of the total catch (including bait) (Table 17). Spiny dogfish are widely distributed around the South Island and extend as far North as Manukau Harbour and East Cape on the West and East coasts of the North Island respectively. They are most abundant on the East coast of the South Island and the Stewart/Snares Shelf. They are found on the continental shelf and upper slope down to a depth of at least 500 m, but are most common in depths of 50–150 m (MPI 2017a). Spiny dogfish was reported as being well estimated in the survey area of the Sub-Antarctic survey and very well estimated in the Chatham Rise surveys; relative biomass showed no clear trend in the Sub-Antarctic survey time-series, but increased in the Chatham Rise surveys. The WCSI trawl survey showed a variable trend in biomass with higher biomass in the 2012 and 2013 surveys (O'Driscoll et al. 2015). MPI 2017a concluded that trawl survey estimates of abundance are all at or above the long term average (1991–2011 for Chatham Rise and 1992–2011 for WCSI. It is concluded that spiny dogfish is highly likely to be within biologically based limits. SG60 and SG80 are met for this species. Minor species meet SG60 and SG80 by default for this SI. SG100 is not met as there are not data available to confirm that there is a high degree of certainty that all bycatch species (main and minor) are within biologically based limits.		
b	**Guidepost**	If main bycatch species are outside biologically based limits there are mitigation measures in place that are expected to ensure that the fishery does not hinder recovery and rebuilding.	If main bycatch species are outside biologically based limits there is a partial strategy of demonstrably effective mitigation measures in place such that the fishery does not hinder recovery and rebuilding.	
	Met?	N/A	N/A	

PI 2.2.1		The fishery does not pose a risk of serious or irreversible harm to the bycatch species or species groups and does not hinder recovery of depleted bycatch species or species groups		
	Justification	Spiny dogfish is not considered to be outside of biologically based limits, so this SI is not scored.		
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		
	Justification	Status of spiny dogfish is considered to be sufficiently well known that this SI is not scored.		
References		Hoyle et al. 2017. MSC 2013b		
OVERALL PERFORMANCE INDICATOR SCORE (All UoCs):				80
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
Spiny dogfish	Main	80	N/A	N/A	80	80
9 minor species (various stocks)	Minor	80	N/A	N/A	80	

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 – Spiny dogfish (Minor species meet SG80 by default)	Y – Spiny dogfish (Minor species meet SG80 by default)	N – All UoCs
	Justification	Spiny dogfish is the only main bycatch species in the ling longline fishery, comprising approximately 10% of the total catch (including bait). A variety of bycatch (i.e., discarded) species are then taken in the fishery in small or very small quantities (Table 17). These minor species are not considered in detail here, but in PI 2.2.2 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. There are considered to be measures in place which together comprise a partial strategy that is expected to maintain spiny dogfish at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder its recovery and rebuilding. These measures include the limiting of overall effort levels, setting of TACs, the routine monitoring of catches both in the ling fishery and other deepwater fisheries (e.g., Anderson 2017, Ballara & O'Driscoll 2015), regular fishery independent surveys of the main fishing grounds (e.g., O'Driscoll 2015), and the review of catch and survey biomass trends and the management approach (e.g., Anderson 2017, MPI 2017a). SG60 and SG80 are met for spiny dogfish. Without more comprehensive observer data and detailed information on stock status would be needed for spiny dogfish does not meet SG100.		
b	**Guidepost**	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/species).	There is 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 – Spiny dogfish (Minor species meet SG80 by default)	Y – Spiny dogfish (Minor species meet SG80 by default)	N – All UoCs
	Justification	For minor species, a partial strategy is not necessary (see SIa), so SG80 is met by default for this SI. For spiny dogfish as a main bycatch species, there is some objective basis for confidence that the partial strategy as described in SIa will work, based on the information that is collected directly from the fishery and verified through fishery independent surveys, while there are routine reviews of management performance based on stock indicators (e.g., Anderson 2017, MPI 2017a). For a Principle 2		

PI 2.2.2		There is a strategy in place for managing bycatch that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to bycatch populations		
		retained species, this is considered sufficient to determine that SG60 and SG80 are met. In the absence of a strategy, SG100 cannot be 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 – Spiny dogfish (Minor species meet SG80 by default)	N – All UoCs
	Justification	For minor species, a partial strategy is not necessary (see SIa), so SG80 is met by default for this SI. For All UoCs, there is clear evidence that the partial strategy for spiny dogfish is being implemented successfully – catch data are collected routinely, information on catch and survey biomass trends is reviewed, and the TACCs are set to maintain the stock at healthy levels; SG80 is met. In the absence of a strategy, SG100 cannot be met.		
d	Guidepost			There is some evidence that the strategy is achieving its overall objective.
	Met?			N – All UoCs
	Justification	In the absence of a strategy, this SG100 requirement cannot be met.		
References		Anderson 2017, Ballara & O'Driscoll 2015, MPI 2017a, O'Driscoll 2015		
OVERALL PERFORMANCE INDICATOR SCORE (All UoCs):				80
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
Spiny dogfish	Main	80	80	80	Don't meet 100 so default 80	80	80
9 minor species (various stocks)	Minor	80	80	80	Don't meet 100 so default 80	80	

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 – Spiny dogfish (Minor species meet SG80 by default)	Y – Spiny dogfish Minor species meet SG80 by default)	N – All UoCs
	Justification	Spiny dogfish is the only main bycatch species in the ling longline fishery, comprising 10% of the total catch (including bait). A variety of bycatch (i.e., discarded) species are then taken in the fishery in small or very small quantities (Table 17). These minor species are not considered in detail here, but in PI 2.2.3 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. For the ling longline fishery, catch data (including allowed discards) for the top five/eight species (depending on vessel size) are required to be reported via catch and effort logbooks, which provide green-weight catch totals for the top five/eight species (dependent on vessel size and fishing method) on a fishing-event basis, and daily summary of TACC species caught. Catches are also independently monitored through observer data, which provides accurate and verifiable information on the catch of all species. Over the period 2011/12 – 2015/16, observer coverage for the fishery overall (based on the number of hooks observed versus the number of hooks deployed) has varied between 10.0% in 2011/12 and 1.7% in 2012/13, with an average coverage of 5.2% over the time period (https://psc.dragonfly.co.nz/2017v1/). SG60 and SG80 are met. SG100 is not met as the observer coverage level is limited, particularly in the smaller vessel component of the fleet, and information on stock status is limited for minor bycatch species.		
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 – Spiny dogfish (Minor species meet SG80 by default)	Y – Spiny dogfish Minor species meet SG80 by default)	N – All UoCs
	Justification	For spiny dogfish managed through the QMS, biological and population parameters are estimated and stock assessments and/or catch trend information is collated and reported routinely (e.g., MPI 2017a). This information is sufficient to meet the SG60 and SG80 levels of performance. For all species in the ling longline catch (as represented by Table 17), including minor species not managed through the QMS, catch trend information from the eight main deepwater fisheries is presented by Anderson 2017, providing information on change in status from 1992/93. However, in the absence of higher levels of observer coverage and analytical stock assessments for all minor species as well as spiny dogfish, the SG100 requirement that, "*Information is sufficient to quantitatively estimate outcome status with a high degree of certainty*" is not met.		

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		
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 – Spiny dogfish (Minor species meet SG80 by default)	Y – Spiny dogfish Minor species meet SG80 by default)	N – All UoCs
	Justification	For minor species, a partial strategy is not necessary (see PI 2.2.2, SIa), so SG80 is met by default for this SI. For spiny dogfish as the main bycatch species, data are recorded routinely on a set by set basis, and reporting includes the number of hooks deployed and areas fished. Observer data are also collected routinely, with an average coverage of 5.2% over the 2011/12 – 2015/16 years (coverage was higher in previous years and higher in 2016-17). Fishery-independent surveys of the main fishing grounds and reviews of catch trend information also provides early warning of changes in risk to different species. Information is clearly adequate to support a partial strategy to manage spiny dogfish as a main bycatch species, and SG60 and SG80 are met. SG100 is not met as the observer coverage level is limited, particularly in the smaller vessel component of the fleet, and information on stock status is limited for minor bycatch species.		
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 – All UoCs	N – All UoCs
	Justification	Total effort (hooks deployed by area) and catch data (including allowed discards) for the top five/eight species (dependent on vessel size and fishing method) on a fishing-event basis are required to be reported via catch and effort logbooks. Sufficient data continue to be collected to detect any increase in risk level, so SG80 is met for all UoCs. Independent observer coverage (average 5.2% of hooks deployed for the 2011/12 – 2015/16 period) is also undertaken, but this is too low to be confident that SG100 is met.		
References		Anderson 2017, MPI 2017a		

OVERALL PERFORMANCE INDICATOR SCORE (All UoCs):	**80**
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
Spiny dogfish	Main	80	80	80	80	80	80
9 minor species (various stocks)	Minor	80	80	80	80	80	

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 ling longline 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 (including New Zealand sea lion, New Zealand fur seal and pilot whales) and seabirds. It is noted that the ling longline 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 last assessment of the fishery (Intertek 2014b) and the recently certified orange roughy fishery assessment (MRAG-Americas 2016), where this SI was scored. Intertek 2014b noted "*Through these approaches, the risk assessment for birds, existing population estimates for key ETP species allow the current interaction rates to be viewed in relation to national and international requirements with a high degree of certainty, and are highly likely to be within limits of national and international requirements.*" MRAG-Americas 2016 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 new report 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 – Marine mammals Y – Seabirds	Y – Protected corals Y – Marine mammals Y – Seabirds	Y – Protected corals Y – Marine mammals N – Seabirds
	Justification	<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. 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 (mainly bottom trawling) on these species, including reports by Consalvey et al. 2006, Baird et al. 2013 and Anderson et al. 2014.		

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
		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 18 shows that only 13 out of the total of 3141 records (i.e., 0.41%) were reported from the ling longline fishery. The impact of longlining on seabed habitats has been relatively little studied in comparison to the impact of towed gears, in part because of the much smaller footprint of longlining in comparison to trawling, but some work has been carried out in the deep sea. Significant impacts from longlining can occur where, for example, upon retrieval a mainline is dragged across a hard substrate with attached benthos, or where a hook snags a coral colony. However, studies of the effects of longlining on benthic species in deep water have identified only limited impacts. For example, Fosså et al. 2002 concluded that passive gears ... 'impact [*Lophelia*] coral reefs but to a considerable lower extent than trawling', Orejas et al. 2009 found no clear relationship between longline use and cold water coral occurrence, and Pham et al. 2014 found slow-growing species were still common in areas subject to more than 20 years of longlining activity, and concluded that deep-sea bottom longline fishing has little impact on vulnerable marine ecosystems. Given the occurrence of suitable habitat outside the fished area, the use of longline gear, and the very small number 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>Marine mammals</u> 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. Observer data indicate that the ling longline fishery interacts rarely or never with most species, however, including New Zealand sea lion (zero (0) captures observed from 2002/03 – 2015/16) and New Zealand fur seal (one (1) capture observed from 2002/03 – 2015/16, in the 2002/03 fishery). Two pilot whales were observed caught in the fishery in 2002/03, one of which was released alive. No other marine mammal interactions have been observed in the fishery (data from https://psc.dragonfly.co.nz/2017v1/). 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 potential impacts from the all bottom longline fisheries (of which the ling longline fishery forms a part) forms a small to negligible component of the fishing-related mortality of all New Zealand marine mammal populations. Together with the observer data, this provides a high degree of confidence that there are no significant detrimental direct effects of the fishery on ETP marine mammal species. SG60, SG80 and SG100 are 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

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
		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 for each species led to significant changes to the estimated risk ratio for each species between the 2015 and latest version (i.e., Richard et al. 2017). On the basis of the latest risk assessment (Richard et al. 2017), 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) and 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 five species were classified as 'medium risk' because they had a median risk above 0.1 or an upper confidence limit above 0.3 (Table 19). Table 19 indicates that the ling longline fishery accounts for a small or very small percentage of the total mortality of most medium, high and very high risk seabirds except for Salvin's albatross (11.69%), Chatham albatross (60.00%) and northern Buller's albatross (10.58%). The latest seabird risk assessment undertaken by Richard et al. 2017 also calculates a fishery-specific Annual Potential Fatality (APF) for each New Zealand fishery with sufficient observer data available (including the small vessel and large vessel ling longline fisheries). The modelling uses estimates of incidental capture derived from observer data and fishing effort data for the period 2006-07 to 2014-15, and incorporates cryptic multipliers to account for birds hooked at setting but not recovered. The results of the latest risk assessment modelling undertaken by Richard et al. 2017 indicate that mean annual potential fatalities (APFs) for Salvin's, Chatham and northern Buller's albatrosses associated with the ling longline fishery are substantially below the estimated mean PSTs for these three populations, with the highest relative mean APF for Chatham albatross, calculated as an APF of 93 animals from a PST of 425 animals (= 21.9%)while . The upper 95% C.I. of the APFs are also less than the lower 95% C.I. of the PBRs (Table 20). It is noted that, for Chatham albatross, the <34 m ling bottom longline fishery is responsible for the majority of species-level risk, but the nesting population census in 2016 showed very similar results to those of identical censuses from 1999-2010 (Bell et al. 2017), and the species is likely at the limit of available nesting habitat on the single island (Te Tara Koi Koia) where it nests. In essence, seabirds are taken in the fishery but the risk to any seabird population is low (e.g., for Chatham albatross, the mean APF would have to increase by almost 5 times before it exceeded the mean PST. It is concluded that direct effects are highly unlikely to create unacceptable impacts to ETP species, and SG60 and SG80 are met. Nevertheless, there are ongoing mortalities of seabirds in the fishery, some of which are considered to be at high or medium risk, and the low level of observer coverage in recent years in the small vessel component of the fishery means that the results of the risk assessment are not verified with a high degree of certainty. As such, SG100 is not met.

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		
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 – Marine mammals Y – Seabirds	Y – Protected corals N – Marine mammals N – Seabirds
	Justification	Indirect effects are considered to be impacts on behaviours, feeding efficiency, essential habitats or other aspects of ETP species' life histories. There are no plausible mechanisms through which indirect effects to corals are considered possible from longlining, so SG80 & 100 is met. For marine mammals, 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, but ling is not thought to be a major prey item; 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 marine mammals; SG100 is not met. MPI 2016 also considered indirect effects of fishing on seabirds, noting that the ICES Working Group on Seabird Ecology agreed (WGSE 2011) that the three most important indirect effects of fisheries on seabird populations were the harvesting of seabird food, discards as food subsidies, and modification of marine habitats by dredges and trawls. Ling is not an important food for any seabird species, and longlining does not result in significant modification of marine habitats. Discarding does occur in the ling longline fishery to a very limited degree, but the regulations on not discarding QMS species and the size-selective nature of the longline fishery means that this would comprises a small volume of food. Discarding of old bait also occurs, but the quantities are invariably very limited in comparison to the potential for seabirds to scavenge for fish that are released from trawls as they are brought to the surface, or are discarded subsequently; SG80 is met. SG100 is not met because the potential indirect effects of the ling longline fishery on seabirds have not, to the knowledge of the Assessment Team, been reviewed thoroughly. It is noted that there is clearly an ongoing interest in understanding the potential for indirect effects on ETP species; the issue is listed specifically in the DOC strategic 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 et al. 2013, Baker & Hamilton 2016, Bell et al. 2017, Consalvey et al. 2006, DOC 2015, DOC 2017, Fosså et al. 2002, MPI 2016, MSC 2013a, Orejas et al. 2009, Pham et al. 2014, Richard & Abraham 2013, Richard & Abraham 2015, WGSE 2011.		

OVERALL PERFORMANCE INDICATOR SCORE (All UoCs):	**90**
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	90
Marine mammals	N/A	100	80	90	
Seabirds	N/A	80	80	80	

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 – Marine mammals Y – Seabirds	Y – Protected corals Y – Marine mammals Y – Seabirds	Y – Protected corals Y – Marine mammals 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 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. The distribution of protected coral species has been modelled (e.g., Baird et al. 2013, Anderson et al. 2014), and work to groundtruth and better understand actual distribution continues (e.g., Bell et al. 2017). Data on the distribution of ling longlining fishing effort is collated and reported (e.g., Anderson 2014). MoF 2010 notes that the management approach to address effects of deepwater fishing 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).*" In this regard, it is noted that whilst longlining may damage protected coral species (e.g., 13 of over 3,000 reports of coral captures in the observer database were taken on ling longlines), the potential for impact in comparison to trawling is very low (e.g., Fosså et al. 2002, Orejas et al. 2009, Pham et al. 2014). A network of benthic protect protection areas (BPAs) was designated in 2007, protecting approximately 1.1 million square km (32%) 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 (MPI 2016). Given the relatively very low impact of long lining gear, the mapping of benthic habitats, protection of large areas of habitat, and monitoring of the longlining effort is together 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>Marine mammals</u> Under the National Deepwater Plan (MoF 2010), the objective most relevant for management of New Zealand marine mammals 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.*"		

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.
		Data on interactions with marine mammals are collected by observers, and any marine mammals that are taken must be returned immediately and the capture reported through the NFPSCRs. 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 on routinely through the Aquatic Environment and Biodiversity Annual Review Series (e.g., MPI 2016). However, the risk posed by the ling longline fishery is very low. Only one New Zealand fur seal and two pilot whales (one released alive) were observed caught in the fishery from 2002/03 to 2015/16 (data from https://psc.dragonfly.co.nz/2017v1/). Overall, then, the observer data and requirement to report interactions, together with the regular risk assessment and ongoing review process, are considered to comprise a strategy in place for managing marine mammal impacts in the ling longline fishery, 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 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. The Fisheries (Seabird Sustainability Measures – bottom longlines) Circular 2010 (NZG 2010) specifies legal requirements for bottom longliners with respect to seabird mitigation. The approach to managing and mitigating risk to seabirds on longline vessels is then operationalised through the Ling FMA 2-7 bottom longline operational procedures (DWG 2016), which includes best practice for seabird handling and release, and an updated "10 commandments for ling longliners" The following measures are specified: 1. Ensure your vessel has the DWG (BLL) Seabird Interim Code of Practice (COP) and a copy of the current bottom longline seabird regulations 2. Manage the discharge ('Batch/hold' i.e. no continuous discharge) of offal, fish waste, and used bait. You cannot discharge offal, fish while setting. 3. During hauling only discharge offal, fish and used 'waste-baits' from the opposite side of the vessel from the hauling station. 4. Set only at night (i.e. only set between nautical dusk and dawn) if not weighting line in accordance with line weighting legal standards. 5. Know the line weighting legal standards; use integrated lead weighted line (IWL) or add minimum 4 kg metal/lead weight every 60 m. 6. Ensure the tori line meets legal standard, deployed when fishing (day & night) and is adjustable over the fishing/setting line, carry ample spare parts onboard. 7. Tori line is a minimum of 150 m long, well-constructed & when deployed has minimum of 50 m aerial extent, that area is fitted with 'decent set of brightly colourer streamers' spaced at 5 m intervals. 8. Auto line vessels ensure the baiting machine is well maintained and achieving a high baiting percentage; the use of totally frozen bait is to be avoided. (ensure 'unhooked- bait' is retained and not lost overboard). 9. Record all seabird captures as legally required in the MPI – Non-fish/Protected Species Catch Return (NFPSCR) logbook and furnish to MPI.

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.		
		10. Advise DWG within 24 hrs when seabird captures reach 'Trigger-Point' levels (5 small (e.g. petrel/shearwater) or 3 big (albatross/mollymawk) birds dead in 24 hr period, or 10 birds, dead or released alive in a 7 day period. When observers are on ling longline vessels, adherence to the DWG operational procedures is assessed and reported on, as well as compliance with legal requirements for Tori line deployment, line weighting, offal discharge and reporting of seabird interactions (DWG 2015). DWG also 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, DWG 2016). From 2016, that role has increased and now covers all longline vessels that are identified as targeting ling, as well as testing and advising on tori line materials and deployment. From 2016/17, an increased level of observer coverage (target 450 days) has also been were specified, which is intended to ensure the coverage is more representative of the fishery, to achieve 25% coverage of the fishing effort in total, and 15% of the small vessel component. 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 considered to be 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 – Marine mammals Y – Seabirds	Y – Protected corals Y – Marine mammals Y – Seabirds	Y – Protected corals Y – Marine mammals 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 longline gear with limited impacts (e.g., Fosså et al. 2002, Orejas et al. 2009, Pham et al. 2014) and the designation of BPAs to protect a substantial part of the New Zealand EEZ from bottom trawling, as well as data on protected coral interactions showing very limited records for the ling longline fishery (Baird et al. 2013) comprises adequate testing to support high confidence that the strategy will work; SG100 is also met. For marine mammals and seabirds, the strategy is based on information directly about the fishery and/or species involved, and testing in the form of observer records and risk assessments showing that interactions with marine mammals and seabirds are very limited and well below the 95% confidence intervals for the PSTs supports high confidence that the strategies will work (e.g., MPI 2016, Baker et al.		

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.		
		2016, Abraham & Berkenbusch 2017, Abraham & Richard 2017, Abraham et al. 2017, Richard et al. 2017); SG100 is also 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 – Marine mammals Y – Seabirds	N – Protected corals N – Marine mammals 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 all species, the observer coverage has only recently been increased (from 2016/17, a target of 450 observer days has been specified, which is intended to ensure the coverage is more representative of the fishery, to achieve 25% coverage of the fishing effort in total, and 15% of the small vessel component). Until the results of this increase in coverage have been reviewed, it is not possible to state that there is clear evidence that the strategy (for each group) has been implemented successfully and intended changes are occurring; SG100 is not met.		
References		Abraham & Berkenbusch 2017, Abraham & Richard 2017, Abraham et al. 2017, Anderson 2014, Anderson et al. 2014, Baker et al. 2016, Baird et al. 2013, Bell et al. 2014, DOC 2015, DOC 2017, DWG 2015, DWG 2016, Fosså et al. 2002, MoF 2010, MPI 2013b, MPI 2016, MPI 2017e, NZG 2010, Orejas et al. 2009, Pham et al. 2014, Richard & Abraham 2015.		
OVERALL PERFORMANCE INDICATOR SCORE (All UoCs):				**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
Marine mammals	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 – Marine mammals Y – Seabirds	Y – Protected corals Y – Marine mammals Y – Seabirds	N – Protected corals N – Marine mammals N – 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. 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, Baker & Hamilton 2016, Abraham & Richard 2017, Abraham et al. 2017). SG60 and SG80 are met. For all groups, the data being collected from the fishery appear to have been insufficiently comprehensive to quantitatively estimate outcome status of ETP species with a high degree of certainty (e.g., Wolfaardt 2016). While this has been addressed from the 2016/17 season, with a significantly higher level of observer coverage (a target of 450 observer days has been specified, which is intended to ensure the coverage is more representative of the fishery, to achieve 25% coverage of the fishing effort in total, and 15% of the small vessel component), the results of this increase in coverage have not yet been reviewed; SG100 is not met for any group. A recommendation is set (#2) with respect to 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.		
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 – Marine mammals Y – Seabirds	Y – Protected corals Y – Marine mammals Y – Seabirds	N – Protected corals N – Marine mammals N – Seabirds
	Justification	For all groups, reviews of evidence and risks have been undertaken (e.g., Baird et al. 2013, Anderson et al. 2014, Abraham & Berkenbusch 2017, Abraham et al. 2017, Baker & Hamilton 2016, Richard & Abraham 2015, 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. However, SG100 is not met because it is not clear that accurate and verifiable		

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.**		
		information is available on the magnitude of all impacts consequences for the status of all ETP species.		
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 – Marine mammals Y – Seabirds	Y – Protected corals Y – Marine mammals Y – Seabirds	N – Protected corals N – Marine mammals N – Seabirds
	Justification	Data on vessel activity and captures of ETP species are collected and collated routinely for all vessels operating in the ling longline 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. While the level of observer coverage has recently been increased, there is currently insufficient information to support a comprehensive strategy or to evaluate with a high degree of certainty whether a strategy is achieving its objectives. SG100 is not met.		
References		Abraham & Berkenbusch 2017, Abraham & Richard 2017, Abraham et al. 2017, Baird et al. 2013, Baker et al. 2016, MoF 2010, MPI 2013b, MPI 2016, MPI 2017e, Richard & Abraham 2015, Wolfaardt 2016.		

OVERALL PERFORMANCE INDICATOR SCORE (All UoCs):	**80**
CONDITION NUMBER (if relevant):	**N/A**
RECOMMENDATION NUMBER	**2**

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	80	80	80	80	80
Marine mammals	80	80	80	80	
Seabirds	80	80	80	80	

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	Density plots of ling longline activity have been produced (Anderson 2014, and see Figure 16), and by comparing with the BOMEC classification (Figure 20) it is apparent that the majority of the effort is undertaken in the upper slope and mid-depths regions. The ling longline fishery will target the more structurally complex locations with these areas, although Bowden et al. 2017 demonstrated that the underlying sediment is overwhelmingly muddy (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.*" The impacts of longlining on benthic habitats in deep water are limited, and restricted mainly to the effects of anchors and intermediate weights dragging on the seabed during shooting and hauling processes, or as a result of bad weather and/or strong currents. However, even for vulnerable, habitat structuring species (e.g., the protected corals, addressed in Section 4.3.3, above), the impacts of longlining are considered to be very minor (e.g., Fosså et al. 2002, Orejas et al. 2009, Pham et al. 2014). Although, to the knowledge of the assessment team, there has not been a detailed review and assessment of benthic impacts from longlining in the New Zealand EEZ, the information on longlining impacts in other areas provides evidence that the fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm. SG60, SG80 and SG100 are met.		
References		Fosså et al. 2002, MSC 2013a, Orejas et al. 2009, Pham et al. 2014		
OVERALL PERFORMANCE INDICATOR SCORE: All UoCs				**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 ling longline fishery, the main habitat is considered to be muddy sediments in the upper slope and mid-depths regions. 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 annual catch entitlement (ACE) (Fishserve 2018), • Monitoring fishing activity (from 2016/17, observer coverage in the ling longline fishery has been increased to a target of 450 days, to achieve 25% coverage of the fishing effort in total, and 15% of the small vessel component), • Collating and reporting effort information annually, to determine the footprint of individual fisheries and the New Zealand deepwater fleet as a whole, • 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). The ling longline fishery operates across a wide area, but longlining is a static gear and the fishery's footprint is inevitably small in comparison to that of demersal trawling. 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 impact of the fishery on upper slope and mid-depth 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, SG80 and 100 are met.		
d	Guidepost			There is some evidence that the strategy is achieving its objective.
	Met?			Y – All UoCs
	Justification	Effort in the ling longline fishery has decreased in recent years (mean number of hooks set annually 1994/95-1998/99 = 29.59 Million, 2007/08-2011/12 = 18.04 Million – Anderson 2014), and a visual comparison of spatial extent suggests that the fishery is less extensive now than previously (Anderson 2014). The fishery is prosecuted with longline gear that is inherently low impact, and these effort data provide some evidence that the strategy (to manage impacts on benthic habitats) is achieving its objective – this SG100 requirement is met.		
References		Anderson 2014, Baird et al. 2013, Bowden et al. 2017, FAO 2009, Fishserve 2018, Leathwick et al. 2012, MPI 2016.		

OVERALL PERFORMANCE INDICATOR SCORE: (All UoCs)	**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 ling longline fishery, the main habitat is considered to be muddy sediments in the upper slope and mid-depths regions (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 NFPSRC 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., Anderson et al. 2016, 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
	Justification	Studies have been undertaken internationally to assess the impact of longlining on deepwater habitats (e.g., Fosså et al. 2002, Orejas et al. 2009, Pham et al. 2014) and also with respect to New Zealand fishing activities in Antarctic waters (Sharp et al. 2009). Information on long lining is reported on a set-by-set basis through the catch and effort logbooks, and the density plots showing the spatial extent of the ling-longline fishery over time have been produce (e.g., Anderson 2014).		

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		
		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, and whilst work has been undertaken internationally to understand the impact of longlining on vulnerable habitats, but impacts have not been '*quantified fully*', so SG100 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 set-by-set data, including on set locations, are submitted through longline catch and effort logbooks. These set location data are collated and analysed to produce density plots of activity. 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 ongoing 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		Anderson 2014, Baird et al. 2013, Bowden et al. 2017, Ford et al. 2016, Fosså et al. 2002, Leathwick et al. 2012, MPI 2016, Orejas et al. 2009, Pham et al. 2014, Sharp et al. 2009, Snelder et al. 2006.		

OVERALL PERFORMANCE INDICATOR SCORE: (All UoCs)	**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	P – 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 ling longline fishery, and based on the available data showing that ling is not a key component of the ecosystem, it is appropriate to consider trophic structure as the key ecosystem element within the New Zealand deepwater ecosystem. With respect to ecosystem outcomes, Tuck et al. 2009 provided an ecosystem-focused review of data from the Chatham Rise and Sub-Antarctic trawl surveys. Their analyses showed some evidence of change in ecosystem indicators over time. For example, there was evidence of increasing evenness (reducing diversity) but no evidence that species were being lost from the food-web. Some size characteristics of fish in research trawls on the Chatham Rise had changed, with fewer fish longer than 30 cm or heavier than 750 g being taken by trawl gear, although the median length of the catch did not change. There was also evidence that the proportion of piscivorous fish and of true demersal (rather than bentho-pelagic) species declined over the studied period, but "low-resilience" species such as dogfish and rays had increased relative to other species on the Chatham Rise. There were also changes in the spatial distribution of fish species, with 16 out of 47 species showing changes (half declining and half increasing) in the proportion of the study area over which 90% of their abundance by weight was caught. Horn & Dunn 2010 then examined whether there was evidence of change in the diet of hoki, hake or ling on the Chatham Rise between 1990 and 2009. They concluded that it appeared likely that the importance of fish (primarily myctophids) as a prey item for hoki had increased slightly but steadily between 1990 and 2009, while the importance of euphausiids had declined. In contrast, there were no obvious between-year trends in the diets of hake or ling over the same period. Given the scale of the fishery, and status of the system relative to ecosystem indicators, it is considered that the ling longline 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. 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). Nevertheless, the limited scale of the ling longline fishery in comparison to other deepwater fisheries provides some circumstantial 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. SG100 is considered partially met, and a score of 90 is awarded.		

PI 2.5.1	**The fishery does not cause serious or irreversible harm to the key elements of ecosystem structure and function**	
References	MSC 2013a, MPI 2016, Tuck et al. 2009.	
OVERALL PERFORMANCE INDICATOR SCORE: All UoCs		**90**
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	In the context of the ling longline fishery, and based on the available data showing that ling is not a key component of the ecosystem, it is appropriate to consider trophic structure as the key ecosystem element within the New Zealand deepwater ecosystem. There are numerous measures in place to manage impacts of the ling longline fishery on individual ecosystem components (and thereby ecosystem structure and function), e.g., for hake 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 seabirds (MPI 2013b) 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 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. 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). As such, it is not possible to state that the SG100 requirement that "*The plan and measures are based on well-understood functional relationships between the fishery and the Components and elements of the ecosystem*" is met.		
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	Y – 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 in place. SG60, SG80 and SG100 are 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		
d	Guidepost		There is some evidence that the measures comprising the partial strategy are being implemented successfully.	There is evidence that the measures are being implemented successfully.
	Met?		Y – 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 2015, DOC 2017, DWG 2014, Ministry of Fisheries 2008, Ministry of Fisheries 2010, Ford et al. 2016, MPI 2011b, MPI 2013b, MPI 2016, MPI 2017a, MPI 2017e, Stevens 2011, Tuck et al. 2009		
OVERALL PERFORMANCE INDICATOR SCORE:				90
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	For the ling longline fishery, based on the available data showing that ling is not a key component of the ecosystem, it is appropriate to consider trophic structure as the key ecosystem element within the New Zealand deepwater ecosystem. MPI (2016) provides a thorough review of the status of research into New Zealand deep water ecosystems; research is most advanced in the Chatham Rise region, where modelling of the foodweb has been underway since 2006, the most recent version being Pinkerton (2013). Middle trophic level groups, especially small demersal fishes and mesozooplankton, were determined to have some of the highest trophic importance amongst consumers, but mesopelagic fishes, hoki, and arthropods (benthic prawns and shrimps) also had high trophic importance (Pinkerton 2013). These patterns of trophic importance were robust to uncertainties in the model parameterisation and balancing (Pinkerton 2014). 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	Y – All UoCs
	Justification	Modelling of the foodweb in the Chatham Rise region has been underway since 2006, with Pinkerton (2013) being the most recent version. Modelling is not as advanced in other deep water regions. However, Tuck et al. 2009 provided an ecosystem-focused review of data from the Chatham Rise and Sub-Antarctic trawl surveys. Their analyses showed there was evidence of increasing evenness (reducing diversity) but no evidence that species were being lost from the food-web. Some size characteristics of fish in research trawls on the Chatham Rise had changed, with fewer fish longer than 30 cm or heavier than 750 g being taken by trawl gear, although the median length of the catch did not change. There was also evidence that the proportion of piscivorous fish and of true demersal (rather than bentho-pelagic) species declined over the studied period, but “low-resilience” species such as dogfish and rays had increased relative to other species on the		

PI 2.5.3		There is adequate knowledge of the impacts of the fishery on the ecosystem		
		Chatham Rise. There were also changes in the spatial distribution of fish species, with 16 out of 47 species showing changes (half declining and half increasing) in the proportion of the study area over which 90% of their abundance by weight was caught. Horn & Dunn 2010 concluded that there were no obvious between-year trends in the diet of ling over the 1990-2009 period. 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; energy fluxes and, to a lesser extent, biomass, are concentrated in the pelagic environment. It is considered that main interactions between the fishery and trophic structure can be inferred from existing information, and have been investigated in detail SG60, SG80 and SG100 are met for this element, also.		
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
	Justification	The main functions of ling and main 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., Tuck et al 2009, Pinkerton 2013, Stevens et al. 2011). The main functions of the ETP species that are vulnerable to capture in the ling longline 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 information on the impacts of the fishery on these components from observer data, the submission of catch and effort logbooks at a set-by-set basis, and the collation and presentation of effort 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	Stock assessments of QMS species, including ling (MPI 2017a), provide an important insight to the impact of the ling longline fishery. Information is also collected and collated from observers and from catch and effort logbooks that, with appropriate analyses allow the main consequences for the ecosystem to be inferred. As such, the fishery scores 80 for this SI. Until recently, observer coverage has been at a low level, so it is not clear that sufficient information is available on all elements, however. As such, SG100 is not met.		

PI 2.5.3		There is adequate knowledge of the impacts of the fishery on the ecosystem		
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
	Justification	There is an ongoing scientific survey programme for the three main areas covered by the ling longline fishery – Chatham Rise, Sub Antarctic and the WCSI. These data 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 set-by-set data, including on catches are submitted on catch and effort logbooks. These data are collated and analysed annually to produce catch summaries and density plots of activity (Anderson 2014). 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:	**90**
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 meeting 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.**		
		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 2014b DOC 2016

OVERALL PERFORMANCE INDICATOR SCORE:	**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. The management system demonstrates the consideration of the information and explains how it is used or not used.		
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 2017a 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 2014b Ling

OVERALL PERFORMANCE INDICATOR SCORE:	**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, SG80, and SG100.
References		Fisheries Act 1996 MFish 2010 MFish 2011b MFish 2011c MFish 2011d MPI 2016 MRAG-Americas 2016 Intertek 2014b Ling
OVERALL PERFORMANCE INDICATOR SCORE:		**100**
CONDITION NUMBER (if relevant):		**N/A**

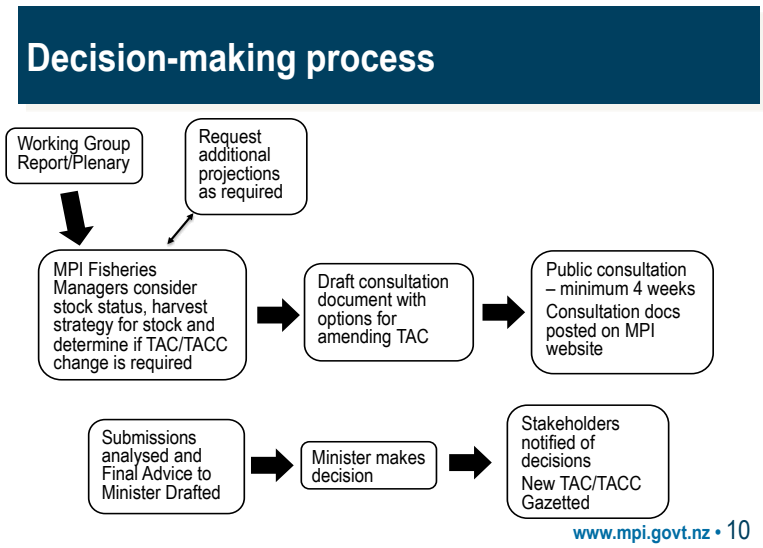
Evaluation Table for PI 3.1.4 – Incentives for Sustainable Fishing

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 2016 Intertek 2014b Ling		
OVERALL PERFORMANCE INDICATOR SCORE:				**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 National Fisheries Plan for Deepwater and Middle-depth Fisheries. The Plan's ling chapter sets the operational objectives and performance criteria for the ling fishery and key related 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. 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 lower levels of SG 60 and 80.		
References		DWG 2010 MFish 2010 MPI 2011c MPI 2016 MPI 2013 MPI 2013a MPI 2017		
OVERALL PERFORMANCE INDICATOR SCOR:				**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 hoki, hake and ling 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 very 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." As an example of implementation of the precautionary approach, the TACC for ling has been revised several times in recent years. In another deepwater fishery – orange roughy - areas have been completely closed to fishing to allow for rebuilding stocks. All deepwater fisheries are subject to no fishing in benthic-protected areas. 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 www.mpi.govt.nz MPI Initial Position Papers 2017	
OVERALL PERFORMANCE INDICATOR SCORE:		**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 hoki, hake and ling 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. In addition, the ling longline fishery, must comply with a range of options restricting longline setting time in conjunction with line weighting as well as offal management and longline vessels ≥ 7 m in length, must use a streamer line during the setting of bottom longlines. 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		

PI 3.2.3		Monitoring, control and surveillance mechanisms ensure the fishery's management measures are enforced and complied with		
		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 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 ling 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 ling 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.		

PI 3.2.3		Monitoring, control and surveillance mechanisms ensure the fishery's management measures are enforced and complied with		
c	Guidepost	Fishers are generally thought to comply with the management system for the fishery under assessment, including, when required, providing information of importance to the effective management of the fishery.	Some evidence exists to demonstrate fishers comply with the management system under assessment, including, when required, providing information of importance to the effective management of the fishery.	There is a high degree of confidence that fishers comply with the management system under assessment, including, providing information of importance to the effective management of the fishery.
	Met?	Y	Y	Y
	Justification	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 ling fisheries meet their mandatory reporting requirements and ongoing 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		
OVERALL PERFORMANCE INDICATOR SCORE:				100
CONDITION NUMBER (if relevant):				N/A

Evaluation Table for PI 3.2.4 – Research Plan

PI 3.2.4		**The fishery has a research plan that addresses the information needs of management**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Research is undertaken, as required, to achieve the objectives consistent with MSC's Principles 1 and 2.	A research plan provides the management system with a strategic approach to research and reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2.	A comprehensive research plan provides the management system with a coherent and strategic approach to research across P1, P2 and P3, and reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2.
	Met?	Y	Y	Y
	Justification	The National Fisheries Plan Parts 1A and 1B, MPI's annual operational plans for 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. A research plan for stock assessments for the three species is as below		

	2018/19	2019/20	2020/21	2021/22	2022/23
LIN 2					
LIN CS					
LIN 3/4	Full assessment			Full assessment	
LIN 5/6			Full assessment		
LIN 6B					
LIN 7		Full assessment			Full assessment

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. DOC provides further research on protected species.

Therefore, a comprehensive research plan exists 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 Principle 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.

PI 3.2.4		The fishery has a research plan that addresses the information needs of management		
	Met?	Y	Y	Y
	Justification	The public posting of plenaries and annual operational plans demonstrate 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 MFish 2010 DoC 2017 DoC 2016		
OVERALL PERFORMANCE INDICATOR SCORE:				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 ling. **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 ling. 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 (SG 60 is met). 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. Although the internal review is very comprehensive and parties external to MPI participate there is no explicit separate external review* reported for the management system. 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 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**	
OVERALL PERFORMANCE INDICATOR SCORE:		**90**
CONDITION NUMBER (if relevant):		**N/A**

Appendix 2. Conditions

There are no conditions of certification.

Appendix 3. 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: The background information sections of this report have been written, correctly, as updates to the previous certification reports of the fishery. This procedure is logical, even though it meant that as a peer-reviewer, I consistently had to back-refer to previous reports – a lot of reading and document searching! Taking all the previous assessments (and audit reports) mentioned in text into consideration in conducting this peer review, I could find nowhere where the required evidence for the current certification conclusions was wanting. I agree too with the evidence provided for the various elements applied to the overall fishery, as well as (generally) the overall conclusion of certification without conditions. The latter is adequately and fully supported by the contents of the report.		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]	**Yes/No**	**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]	**Yes/No**	**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:

- For reports using one of the default assessment trees (general, salmon or enhanced bivalves), please enter the details on the assessment outcome using Table 31.
- For reports using the Risk-Based Framework please enter the details on the assessment outcome
- For reports assessing enhanced fisheries please enter the further details required.

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	The current stock health of all three assessed components is good, and projections indicate that biomass will stay sound, with a high degree of certainty that it will stay above the point of potential recruitment impairment. The justifications provided are well constructed, clear, meeting MSC needs and fully support the score of 100 across the board.	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
1.1.2	Yes	Partially	N/A	The justification provided for SIa is plausible, as is that for SIb, where it is stated that there is insufficient evidence that uncertainty in estimating B_0 is being taken into account, so SG100 is not met. However, although I can understand why it is felt that the soft limit point (20% B_0) is only a proxy applied to stocks in lieu of stock-specific analyses supporting an alternative limit and hence may lack clear evidence of being deliberately precautionary, using the fact that there are occasional large recruitments as part of the justification for not meeting SG 100 is not convincing evidence. The recruitment levels of many fish stocks fluctuate widely and that is why **precautionary** proxies tend to be set in the absence of stock-specific analyses. I would suggest that the experts revisit this justification and strengthen the argument a little to supplement the justification for not scoring above SG80.	Re SIc, it is acknowledged that many stocks experience large fluctuations in recruitment and should not, in itself, prevent scoring at SG100. However, the main issue with the 40% B_0 target proxy is that there has been no explicit evaluation of its precautionary properties. Further, there has been no evaluation of the target reference point with regards to the ecological role of ling in the ecosystem. The text of the scoring rationale has been enhanced to better justify the scoring.

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	Yes	N/A	The score is fully justified for all SIs. However, as it is the lack of a formal MSE exploring possible uncertainties that is used to justify not awarding a score of 100 for SIb (and there are other means of testing strategies other than MSE), this may be an opportunity for drafting a non-binding recommendation that a form of formal evaluation be carried out during the period of this certification.	Thank for this comment. Re SIb, MPI uses five-year research plans to schedule projects such as MSEs, based upon examination of priorities and available resources. As noted in section 4.2.7, an MSE is currently planned for ling and will require significant effort to complete. A recommendation for an MSE on ling is thus not necessary.

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
1.2.2	Yes	Yes	N/A	The harvest control rule in this case is not a mathematical algorithm that determines TACCs as a function of stock status relative to limit and target reference points, but rather a consequence of the requirements of official legislation, and comparing stock status with target reference points. The scores provided for each scoring issue are justified, but the issue of a lack of formal testing and probing of uncertainties (e.g. MSE) again offers the opportunity to raise a recommendation (see 1.2.1 above) that such an exercise be carried out during the period of this certification.	RE SIb, the issue at SG100 is how comprehensive the examination of uncertainties has been. An MSE is currently planned for ling which will allow examination of a wide range of uncertainties. While stated in section 4.2.7, this may not have been clear in the scoring rationale of both PI 1.2.1 and 1.2.2. Edits have thus been made to the scoring rationales to make this clear. It is important to note that MPI uses its 5-year research plan to prioritize significant projects such as MSEs given priorities and available resources. Thus, a recommendation for a ling MSE is not required.

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	Although much is known about NZ ling biology, there remain gaps in knowledge, such as in clarity about the species' relationship with the abiotic environment and also the basic essential of clarity of stock structure/genetics. Given that, the maximum SG80 score for SIa is warranted and the scoring is supported.	Thank you for this comment.
1.2.4	Yes	Yes	N/A	The current formal assessment of ling stock health is as good as feasible given the current level of knowledge of the species and its stocks, but this PI cannot score (SG100) for external review of the assessment or for investigating other potential approaches to assessment, some of which are mooted by the expert team. I therefore support the scoring as given.	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
2.1.1	Yes	Yes	N/A	Bait species are accounted for correctly in this longline fishery analysis in terms of main retained species associated with the various UoCs of the fishery. The justifications that are provided meet formal reporting requirements and the scoring is well justified, several species not being managed according to target reference points. I agree with the scoring.	Thank you, noted.
2.1.2	Yes	Yes	N/A	There are meaures in place for managing retained species that are designed to ensure that the fishery does not pose a risk of serious or irreversible harm to retained species. The justification shows that there is a partial strategy in place for main retained species, and the minor ones default at SG80 anyway, so I agree with the scoring provided.	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
2.1.3	Yes	Yes	N/A	In the absence of greater levels of observer coverage (although it did increase in the most recent fishing season) and analytical stock assessments for all minor as well as some main species, this PI is not able to show performance above the SG80 level and a recommendation has been made to improve the situation: that information be collected annually to determine the quantities and sources of bait species used in the fishery. This information should be retained and reported routinely at annual surveillance audits of the fishery. This suggestion is fair, eminently achievable with little extra expense, and I support it.	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
2.2.1	Yes	Yes	N/A	The only main bycatch species in the fishery is spiny dogfish, and assessments show that it is highly likely to be within biologically acceptable limits. For other bycatch species, however, analyses are not so robust or available, so with even spiny dogfish not certain to be within limits, the maximum that this PI can score is 80.	Thank you, noted.
2.2.2	Yes	Yes	N/A	The (partial) strategy in place for managing bycatch is designed to ensure that the fishery does not pose a risk of serious or irreversible harm to bycatch populations, of which only spiny dogfish is a main bycatch species. Again, the score cannot exceed 80.	Thank you, noted.
2.2.3	Yes	Yes	N/A	In terms of information collection, the fishery is hampered because observer coverage level is limited (though it has been enhanced recently by independent observations), particularly in the smaller vessel component of the fleet, and information on stock status is limited for minor bycatch species. Again, SG80 is as high as can be justified under current circumstances.	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
2.3.1	Yes	Yes	N/A	Regarding ETP species (outcome), the justifications provided are sound and clearly note that seabirds (or at least some of the albatrosses) are a potential issue of concern. This issue cannot be addressed adequately at the current level of observer coverage, so SG 100 cannot be met for them. In similar vein, trophic structure is not so well known as to be able to state emphatically that removal of ling will not affect some of the higher predatory marine mammals, so SG100 cannot be met for some SIs in terms of mammals either. The team's conclusions are well evidenced and supported.	Thank you, noted.
2.3.2	Yes	Yes	N/A	Management strategy for ETP species (seabirds, mammals and corals) is well enshrined in operational activities, and it is only the relatively low level of observer coverage, and hence an inability to state emphatically that management is working, that precludes a full SG100 score from being achievable.	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
2.3.3	Yes	Yes	N/A	ETP data collection is legislatively mandatory. However, to attain a SG100 score of 100, observer coverage will have to increase. It is doing so, and the team raises a recommendation that a review of the data available from the increased observer coverage of the 2016/17 season be conducted at the earliest possible opportunity, to update understanding of the fishery with respect to ETP species interactions. Doing this (and also keeping observer coverage high) will help this PI considerably, and I agree totally.	Thank you, noted.
2.4.1	Yes	Yes	N/A	Longlining for ling (and other species) has little negative impact on habitat, so although no formal (or recent) review seems to have been made of NZ longlining impact, there is good justification for scoring this PI at SG100.	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
2.4.2	Yes	Yes	N/A	The ling longline fishery footprint is small and generally restricted to muddy seabed on the middle and upper slope. Further, New Zealand has a clear strategy for minimising any habitat impacts, including closure of large areas, ongoing rigorous monitoring of activities and information collection, and advanced modelling studies. Therefore, although it cannot be said that complete testing of the strategy has been carried out (including its effects), a score for this PI of just shy of 100 is fair.	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
2.4.3	Yes	Yes	N/A	The work undertaken to characterise New Zealand's deep sea marine habitats is internationally acknowledged as being of high quality, but there remain questions on the accuracy and/or reliability of some outputs. Further, the physical impacts of gear on habitat types, a challenging requirement in deep-water fisheries, have not been quantified fully, nor have changes over time (including while fisheries have been operating) been documented. Under this scenario, it is impossible to conclude that SG100 has been met in terms of habitat information collection and analysis. The lower score is well justified by the statements made.	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	Ling are not considered to be key members of the NZ deepsea ecosystem. Also, the limited scale of the ling longline fishery relative to other deepwater fisheries provides circumstantial evidence that the fishery is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be serious or irreversible harm. Given that, SG100 is considered by the assessment team to be partially met, and a score of 90 is awarded. I agree.	Thank you, noted.
2.5.2	Yes	Yes	N/A	According to legislated requirements, there are numerous measures in place to manage the impacts of the ling longline fishery on individual ecosystem components (and thereby on ecosystem structure and function), i.e. that a strategy and a plan are in place. However, it is impossible to say that the SG100 requirement for "plan and measures [to be] based on well-understood functional relationships between the fishery and the components and elements of the ecosystem" is met, so the slightly lower score overall is justified in this case.	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
2.5.3	Yes	Yes	N/A	Information on ecosystem interactions and fishery impacts is available, but not to a level (data collection) such that consequence of fishery activities or a proper management strategy can be said to be evaluated/possible. The datedness of some of the NZ ecosystem work is also hampering performance against this PI, so the score suggested by the assessment team is warranted.	Thank you, noted.
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, so the score (100) and the evidence provided is supported fully. The manner in which the justification for the full-house score is presented is good.	Thank you and noted
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.	Thank you and 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
3.1.3	Yes	Yes	N/A	The long-term objectives that guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach, are explicit within and required by New Zealand management policy, so it is unsurprising that the score and justification again support SG 100 being met.	Thank you and noted
3.1.4	Yes	Yes	N/A	New Zealand's fisheries policy and strategy seems 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.	Thank you and 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
3.2.1	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.	Thank you and noted
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.	Thank you and 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
3.2.3	Yes	Yes	N/A	Evidence is provided of exemplary compliance and enforcement 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 (100) and justification are supported.	Thank you and noted
3.2.4	Yes	Partially	N/A	The written justification for this PI score (SIs a and b) in terms of a research plan and its dissemination focuses on fisheries (including assessment) and their operations. From what I understand, 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 aspects of the environment. Hence, 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

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
3.2.5	Yes	Yes	N/A	Although there is robust internal review, the team could not find evidence 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.	Thank you and noted

General Comments on the Peer Review Draft Report (including comments on the adequacy of the background information if necessary):

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 a few typographical and formatting errors). Because this was a recertification report for a fishery assessed relatively recently, I was forced 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. One small issue does trouble me, as it does for other NZ assessments/fisheries related to this one: why do annual catches fall so regularly and by so much below the TACCs set? Is it simple economics, or is there some other reason?
CAB response – Thank you for your comments. On the annual catches falling, this occurred in LIN 3 & 4 and LIN 6. Ling is caught primarily as bycatch to the hoki fishery, although (as per this LL assessment), there is also directed longline fishing. The point is made on page 25 of the FR for LIN 3 & 4 that the catch being below the TACC is likely due to a substantial reduction in hoki fishing. Thus, changes in ling catch relative to the stock's TACC need to be considered in the context of the hoki fishery. This can be the response to this query.

The report has several elements and UoCs, as many MSC assessments seem to have these days, making reviewing that much more complicated than it should be. All sections do read very well, however, with only P1 background and scoring review proving overly challenging to me. Overall, though, the whole report contains everything it needs to have in terms of being able to meet and support MSC standards. Congratulations to the whole assessment team for their efforts.

Appendix 4. Stakeholder Submissions

Stakeholder submission received at the site visit

Forest & Bird

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
F: +64 4 385 7373
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)

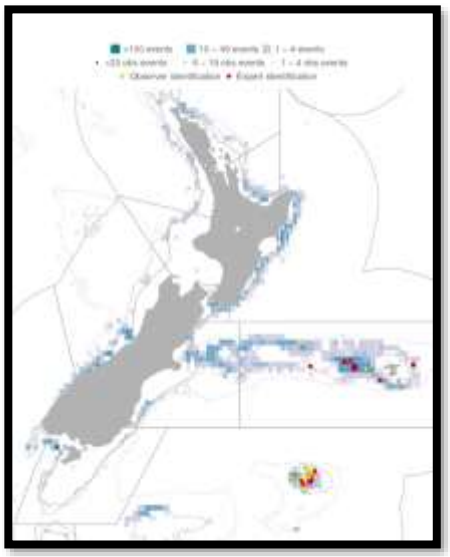


Fig 1. Ling longline bycatch of Salvin's albatross between 2002 and 2015 (from Dragonfly website) https://psc.dragonfly.co.nz/2016v1/draft/explore/

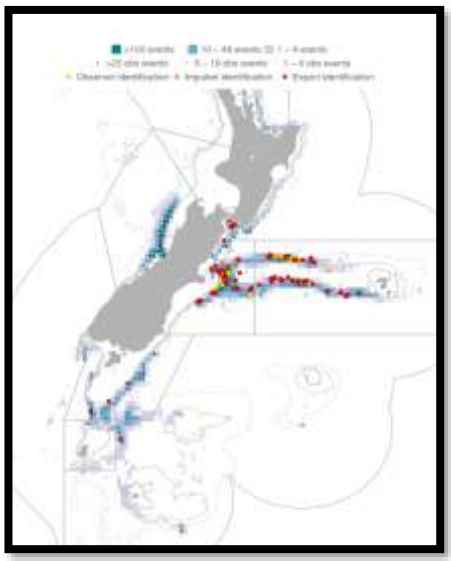


Fig 2. Hoki trawl bycatch of Salvin's albatross between 2002 and 2015

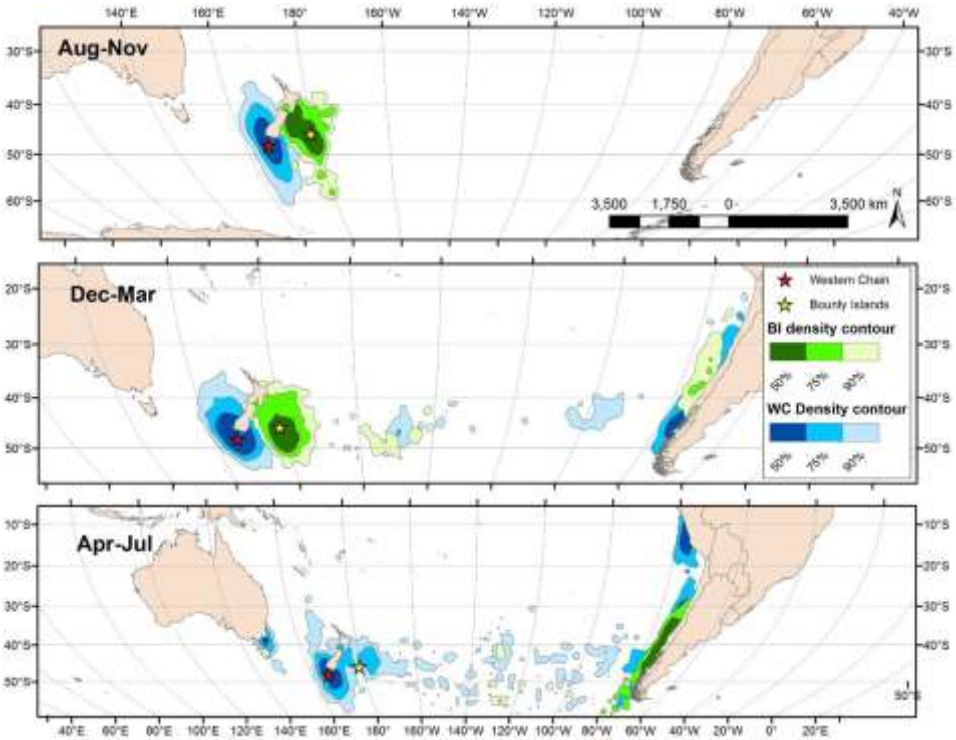


Fig 3 (after Thompson *et al* 2014, Fig 6) Comparison of kernel density plots, showing the 90, 75 and 50% probability contours, for Salvin's albatross at the Bounty Islands (BI) in green at the Western Chain (WC) in blue. Upper panel corresponds to 'incubation', middle panel to 'chick-rearing' and the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

Risk Assessment

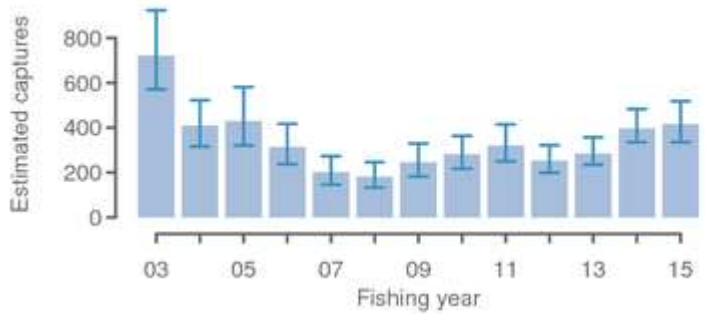
The most recent published risk assessment (Richards and Abraham 2015) shows that the estimated annual potential fatalities for trawl fisheries overall contributed to an assessment of very high risk for white –capped albatross, Salvin's albatross and southern Buller's albatross (Table 9, page 30). The 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.*			
Mailing Address, Country	400 Leigh Road RD 5 Warkworth			
Phone	**Tel**	+ 64 9 4226868	**Mob**	+ 64 21 911068
Email	**k.baird@forestandbird.org.nz**		**Web**	www.forestandbird.org.nz

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 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.* *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 baffiers, 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 Population Sustainability Threshold 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 report).

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.

[5]Official report available here.

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.

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
Email	bmaas@onetel.com		Web	www.nabu-international.de

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 [redacted] 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] processed up to 78,000 tonnes of fish greenweight. If the average percentage difference was 1% across all product lines processed by [redacted]'s 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 [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

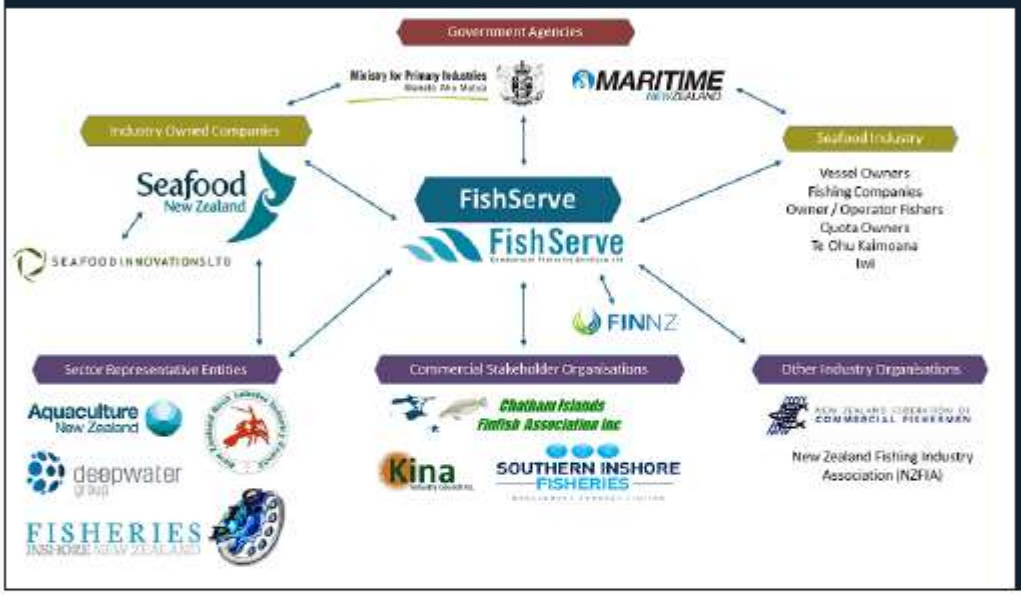
The website states that "Contracted services are services that FishServe has a contract with the Ministry for Primary Industries to deliver. The Crown maintains responsibility for these services, but does not need to

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.

Dr Barbara Maas
Head of Endangered Species Conservation
NABU International
barbara.maas@nabu.de

BIBLIOGRAPHY

Annala JH. 1996 New Zealand's ITQ system: have the first 8 years been a success or a failure? Reviews in Fish Biology and Fisheries; 6:43–62.

Bremner G, Johnstone P, Batson T, Clarke P. 2009. Unreported bycatch in the New Zealand West Coast South Island hoki fishery. Marine Policy 33: 504–12.

Burns, R,J. & Kerr, G.N. 2008 Observer effect on fisher bycatch reports in the New Zealand ling (Genypterus blacodes) bottom longlining fishery. New Zealand Journal of Marine and Freshwater Research [N. Z. J. Mar. Freshw. Res.]. Vol. 42, no. 1, pp. 23-32. Mar 2008.

Chavez C., Salgado H. 2005 Individual transferable quota markets under illegal fishing. Environmental and Resource Economics; 31:303–24.

Chen Y., Xu L., Chen X, Dai X. 2007 A simulation study of impacts of at-sea discarding and bycatch on the estimation of biological reference points F0.1 and Fmax. Fisheries Research; 85:14–22.

Clark, M.R. , Rowden, A.A. 2009 Effect of deepwater trawling on the macro-invertebrate assemblages of seamounts on the Chatham Rise, New Zealand. Comparative Evaluations of Innovative Fisheries Management, 19-41, DOI: 10.1007/978-90-481-2663-7_2.

Clemens-Seely, K., Hjorvarsdottir, F.O. 2016 Conservation Services Programme, Annual Research Summary 2013-14 (Department of Conservation, Wellington, New Zealand).

Cooke, J.G, Steel, D., Hamner, R., Constantine4 & Baker, S. C. 2018 Population estimates and projections of Māui dolphin (Cephalorhyncus hectori maui) based on genotype capture-recapture, with implications for management of mortality risk. International Whaling Commission SC/67B/ASI05

Currey RJC, Boren LJ, Sharp BR, Peterson D (2012) A risk assessment of threats to Maui's dolphins. Ministry for Primary Industries and Department of Conservation, www.doc.govt.nz/gettinginvolved/consultations/current/threat-management-plan-review-for-mauis-dolphin/

Davies NM, Bian R, Starr P, Lallemand P, Gilbert D, McKenzie J (2008) Risk analysis for Hector's dolphin and Maui's dolphin subpopulations to commercial set net fishing using a temporal-spatial age structured model. Wellington, Ministry of Fisheries. www.fish.govt.nz/NR /rdonlyres/B034115D-247A-42E5-B08FF5D267046C59/0/HectorNIWA/riskanalysis.pdf 113p.

Dulvy, N. K., Fowler, S.L., Musick, J.A., Cavanagh, R. D., Kyne, P. M., Harrison, L. R., Carlson, J. K., Davisdson, L. N. K., Fordham, S.V., Francis, M. P., Pollock, C. M., Simpfendorfer, C. A., Burgess, G. H., Carpenter, K. E., Compagno, L. V. J., Ebert, D. A., Gibson, C., Heupel, M. R., Livingstone, S. R., Sanciangco, J. C., Stevens, J. D., Valenti, S. and White, W. T. Extinction risk and conservation of the world's sharks and rays. eLIFE: eLife 2014;3:e00590.

Francis, R.I.C.C., Gilbert, D.J., Annala, J.H. 1993 Fishery management by individual quotas: Theory and practice. Mar Policy 17:63–65.

Heron, M. 2016 Independent Review of MPI/MFish Prosecution Decisions: Operations Achilles, Hippocamp and Overdue. https://mpi.govt.nz/protection-and-response/environment-and-natural-resources/sustainable-fisheries/independent-review-of-prosecution-decisions/

McKoy, J. 2006 Fisheries resource knowledge, management, and opportunities: Has the Emperor got no clothes? New Zealand's Ocean and its Future: Knowledge, Opportunities and Management. Proceedings of a Conference Organized by the Royal Society of New Zealand, Miscellaneous Series

70 (The Royal Society of New Zealand, Wellington, New Zealand), pp 35–44. docs.niwa.co.nz/library/public/1877264229C.pdf

Metuzals KI,Wernerheim CM, Haedrich RL, Copes P, Murrin A. 2005 Data fouling in marine fisheries: findings and a model for Newfoundland. In: Sumaila UR, Marsden AD, editors. North American Association of Fisheries Economists Forum proceedings, Fisheries Centre Reports 14–1, 2005. Fisheries Centre, The University of British Columbia, Vancouver, Canada. p. 87–104.

Ministry for Primary Industries 2016 Fisheries Assessment Plenary May 2016: Stock Assessments and Stock Status.

MPI (2012) Operation Bronto - Compliance Risk Profile of the West Coast/East Coast South Island Hoki Fisheries'. Ministery for Primary Industries. https://www.mpi.govt.nz/news-and-resources/resources/official-information-act-responses/fisheries-compliance-reports/

MPI (2016) MPI accepts findings of independent review into fisheries compliance operations. MPI media release, 16 Sep 2016. https://mpi.govt.nz/news-and-resources/media-releases/mpi-accepts-findings-of-independent-review-into-fisheries-compliance-operations/

Myers RA, Hutchings JA, Barrowman NJ. 1997 Why do fish stocks collapse? The example of cod in Atlantic Canada. Ecological Applications; 7:91–106.

Pala, C. 2017 New Zealand's Fisheries' Fraud. Ecologist Special Report. https://theecologist.org/2017/mar/15/ecologist-special-report-new-zealands-fisheries-fraud

Pauly, D. & Zeller, D. editors 2015 Catch Reconstruction: concepts, methods and data sources. Online Publication. Sea Around Us (www.seaaroundus.org). University of British Columbia. http://www.seaaroundus.org/catch-reconstruction-and-allocation-methods/#_Toc421534358

Pauly, D. & Zeller, K. 2016. Catch reconstructions reveal that global marine fisheries catches are higher than reported and declining. Nature Communications volume 7, Article number: 10244 (2016) doi:10.1038/ncomms10244 https://www.nature.com/articles/ncomms10244

Radio New Zealand (2018) MPI defends not prosecuting over hoki catch. 24 May 2018. https://www.radionz.co.nz/news/national/358144/mpi-defends-not-prosecuting-over-hoki-catch

Rijnsdorp AD, Daan N, Dekker W, Poos JJ, van Densen WLT. 2007 Sustainable use of flatfish resources: addressing the credibility crisis in mixed fisheries management. Journal of Sea Research; 57:114–25.

Rus Hoelzel A, Shivji MS, Magnussen J, Francis MP. Low worldwide genetic diversity in the basking shark (*Cetorhinus maximus*). *Biology Letters*. 2006;2(4):639-642. doi:10.1098/rsbl.2006.0513. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1833978/

Simmons, G.R, Whittaker, D.H., Slooten, S. McCormack, F., Bremner, G., Haworth, N., Thrush, S.F. & Dawson, S. 2017 New Zealand's fisheries quota management system: on an undeserved pedestal. The Conversation, New Zeland.

Simmons, G., et al. (2016) Reconstruction of marine fisheries catches for New Zealand (1950-2010). Working paper 2015-87 (Institute for the Oceans and Fisheries, University of British Columbia, Vancouver). www.seaaroundus.org/doc/PageContent/OtherWPContent/Simmons+et+al+2016+-+NZ+Catch+Reconstruction+-+May+11.pdf

Slooten, E., Simmons, G., Dawson, S.M., Bremner, G., Thrush, S.F., Whittaker, H., McCormack, F., Robertson, B.C., Haworth, N., Clarke, P.J., Pauly, D. & Zeller, D. 2017 Evidence of bias in assessment of fisheries management impacts. PNAS June 20, . 114 (25) E4901-E4902.

Tilney, R., I.T. Clement and S. Gargiulo. 2017. Why SAU's Reconstruction of New Zealand Deep Water Catches is Unreliable. Briefing note to Acoura Marine MSC assessors, July 2017.

Walters, C.J., Maguire, J.J. 1996 Lessons for stock assessments from the northern cod collapse. Rev Fish Biol Fish 6:125–137.

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.				
Contact Name	Russel		*Last*	Norman
Title	Dr			
On behalf of (organisation, company, government agency, etc.) – *if applicable*				
Organisation	Greenpeace New Zealand			
Department				
Position	Executive Director			
Description	*Please provide a short description of your organisation.* We campaign to protect the environment			
Mailing Address, Country	11 Akiraho St, Mt Eden, Auckland, New Zealand			
Phone	Tel	+ 64 274585181	Mob	+
Email	rnorman@greenpeace.org		Web	

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

Acoura Fisheries Department

6 Redheughs Rigg

South Gyle

Edinburgh

fisheries@acoura.com

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 have reviewed the information 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.

Recommendations 27 and 28 related to aspects of the functionality of an electronic catch effort reporting tool that was never developed.

[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.

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	$127,500	74 tonnes ITQ fish (primarily hoki)	Yes…Vessel owner in memo to Court has agreed

	October 2011 (convicted 2014)			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.			
Mailing Address, Country	L6, 49 Boulcott St, Wellington, 6011, New Zealand			
Phone	Tel	+64 (4) 499 2930	Mob	+
Email	phardstaff@wwf.org.nz		Web	

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.	
X	**Fishery announcement and stakeholder identification—go to section 1** Opportunity to indicate that you are a stakeholder and identify other stakeholders.
	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.

WWF Int
Rue Mau
1196 Gla
Switzerla

Direct: +41 22 364 AC
Fax: +41 22 364 0332
wwf.panda.org

Click on
PDF.

Fisheries Department
6 Redheughs Rigg
South Gyle
Edinburgh, EH12 9DQ
Scotland

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.

President: Pavan Sukhdev
Director General: Marco Lambertini
President Emeritus: HRH The Duke of Edinburgh
Founder President: HRH Prince Bernhard of the Netherlands

Registered as: WWF-World Wide Fund for Nature, WWF-Fondo Mondiale per la Natura
WWF-Fondo Mundial para la Naturaleza, WWF-Fonds Mondial pour la Nature
WWF-Welt Natur Fonds. Formerly World Wildlife Fund

100% recycled paper

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,

John Tanzer
WWF Oceans Practice Leader
WWF International

jtanzer@wwfint.org

Peter Hardstaff
Environmental Campaigns Manager
WWF-New Zealand

phardstaff@wwf.org.nz

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

Deepwater Group Ltd – PO Box 5872, Wellesley Street, Auckland 1141, New Zealand – +64 9 379 0556 – www.deepwatergroup.org

deepwater group

- 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).

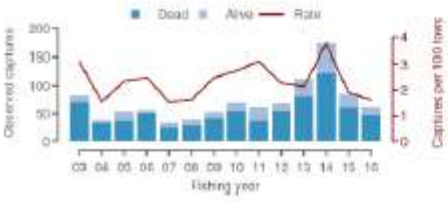


Figure 1 Observed captures of all birds by large (>28m) vessels in the hake, hoki and ling trawl fisheries

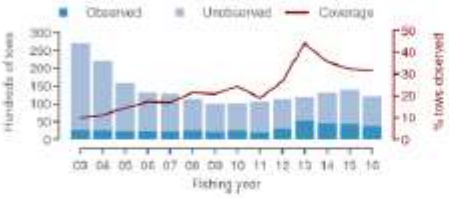


Figure 2 Fishing effort and observations on large (>28m) vessels in the hake, hoki and ling trawl fisheries

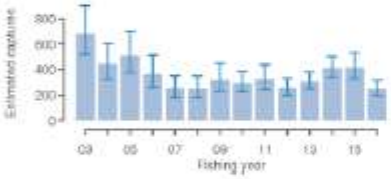


Figure 3 Estimated captures of all birds by large (>28m) vessels in the hake, hoki and ling trawl fisheries

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."*

deepwater group

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).

deepwater group

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
Deepwater Group Ltd

Deepwater Group Ltd – PO Box 5872, Wellesley Street, Auckland, New Zealand – +64 9 379 0556 – www.deepwatergroup.org

7 of 7

Deepwater Group also included a copy of Waugh et al., 2015 and the "MPI update to operators re HOK and SBW 2016", available here

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 5. 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 6. 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.