

1. Condition

1.1: Habitats Outcome (Performance Indicator 2.4.1) and the Condition of Certification

Component	PI Category	PI	SG60	SG80	SG100
Habitat	Outcome Status 2.4.1	The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis, and function.	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.
DAR Score	CAB Rationale for Score				
75	<p><i>"Given that the hoki fishery operates in part through demersal trawling, impacts on benthic habitats are inevitable. Spatial overlays of trawl tracks and habitat classes are a highly informative way to start identifying these impacts. The 20-year spatial extent of the hoki fishery does not reflect the present fishery. However, the ERA considered the risks of hoki fishery activity on some habitat classes (BOMECS 7, 8, 9; Boyd 2011a, b) could be "major", highlighting the need for further work to ensure that the fishery is highly unlikely to cause serious or irreversible harm to the structure and function of the habitats it affects, at the regional and bioregional scales.</i></p> <p><i>Further, due to the sensitivity, lack of resilience, and required regeneration times for some habitat-forming organisms when disturbed, the effects of the current fishery are cumulative and require consideration over a greater than annual timescale to increase the confidence that the fishery is achieving this outcome."</i></p> <p><i>"The fishery satisfies the scoring issues for the 60 scoring guidepost, the scoring issues of the 80 scoring guidepost for several habitat types, but not the 100 scoring guidepost. Consequently, a score of 75 is assigned, and Condition 1 is raised."</i></p>				

PI	Proposed Condition	Milestones	Timescale
2.4.1 Habitats Outcome: The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis and function	To improve consideration and management of habitat impacts of the hoki fishery Improve management of habitat impacts of the hoki fishery, such that by the end of third surveillance audit, it can be shown that the fishery is highly unlikely (i.e. there should be no more than a 30% probability) to further reduce habitat structure and function to a point where there would be serious or irreversible harm.	<p>Year 1: By the first annual surveillance audit the client must provide evidence of a programme of work that will manage fishery impacts on habitat structure and function across the hoki fishery.</p> <p>Year 2: By the second annual audit, the client will have developed a strategy to avoid/reduce impacts, linking objectives, impacts, and actions.</p> <p>Year 3: By the third annual audit, the client will have implemented actions as identified in the strategy, such that that the fishery is highly unlikely (i.e. there should be no more than a 30% probability) to reduce habitat structure and function to a point where there would be serious or irreversible harm, and this can be demonstrated on an on-going basis.</p>	3 years

2.2: Agreed Action Plan to Address the Proposed Condition of Certification

The New Zealand Hoki fisheries were certified to the MSC’s environmental standard in August 2012. One condition of certification was placed on the New Zealand hoki fisheries as a result of the score of 75 for Performance Indicator 2.4.1 (Habitats Outcome). This condition requires DWG to: *“improve consideration and management of habitat impacts of the hoki fishery”*.

As is required by the MSC Standards, an Action Plan was produced by DWG. This has the objectives:

“Conduct an information review that summarises existing research to ascertain whether or not the fishery does not cause serious or irreversible harm to habitat structure.

If research shows impacts are not reversible (linking objectives, impacts, and actions, relating to biomass and fishing mortality), for the hoki fisheries, develop and adopt an agreed strategy to avoid/reduce adverse effects on habitat structure.”

The Action Plan was accepted by the CAB as a requirement of this Condition of Certification and is detailed below:

AGREED ACTION PLAN TO ADDRESS CONDITION OF CERTIFICATION:	
Management Objective	Operational Tasks for Year 1
<p>Conduct an information review that summarises existing research to ascertain whether or not the fishery does not cause serious or irreversible harm to habitat structure.</p> <p>If research shows impacts are not reversible (linking objectives, impacts, and actions, relating to biomass and fishing mortality), for the hoki fisheries, develop and adopt an agreed strategy to avoid/reduce adverse effects on habitat structure.</p>	<p>DWG, in collaboration with MPI, will undertake a review of the existing research on the key benthic biota within BOMECE Categories 7, 8 and 9 that are susceptible to risks of bottom trawl impacts and of the studies on regeneration times for these (or comparable) species and habitats. The purpose is to ascertain the probability that the hoki fishery could be causing serious or irreversible harm to the structures of these habitats.</p> <p>Should this review show that the impacts are sufficiently serious and are not reversible as is defined within the MSC methodology, an agreed strategy to avoid or to mitigate further adverse effects on these habitats will be developed and adopted in Year 2, and implemented in Year 3</p> <ul style="list-style-type: none"> ● Undertake a review of existing information to ascertain the probability that the hoki fishery could cause serious or irreversible harm to benthic habitat structure and function in the context of BOMECE Categories 7, 8 and 9. This review will include standard diagnostic analyses for bottom trawls targeting hoki across the NZ EEZ over appropriate timeframes, along with an assessment of the distribution and composition of key benthic species that have been identified as being at high risk to bottom trawls in order to determine the likely sensitivity of these species to impacts from hoki fishing. ● Continue to monitor the location and extent of bottom trawl grounds in accordance with MO 2.7 of the National Fisheries Plan (MFish, 2010a, pp 38-39) which requires the management of the <i>“effects from the impact of hoki fishing activity on the benthic habitat using a spatial management approach”</i>. Monitoring of the bottom trawl grounds: <ul style="list-style-type: none"> – takes into account the starting position that <i>“Benthic Protection Areas and Seamount Closures are in place and protect 11% of the hoki habitat based on depth range”</i> and provides important base data by which impacts of the hoki fisheries on benthic habitat can be assessed, – has an express 5 year target status that is consistent with the requirements of this Condition (MFish 2010b, OO 2.15, p44). ● Continue investigation into ‘habitats of particular significance for fisheries management’ in accordance with MO 2.3 of the National Fisheries Plan (MFish 2010a, pp 34-35), and continue developing programmes that ensure the suitability and effectiveness of protection measures including: <ul style="list-style-type: none"> – <i>“Identify what further levels of habitat protection are required to be implemented by 2013”</i> (MFish 2010b, OO 2.9, p41). – <i>“Define what is meant by ‘habitats of particular significance for fisheries management purposes’ for the hoki fishery; identify the range of habitats that are significant, and review current levels of protection by 2013”</i> (MFish 2010b, OO2.8, p 41). – <i>“Ensure that all research used to inform the management of the hoki fishery continues to be peer reviewed and meets the requirement of the research standard”</i> (MFish 2010b, OO1.5, p 42). – This work has an express 5 year target status that is consistent with the requirement of this Condition (MFish 2010b, OO1.5, p 42), where: <ul style="list-style-type: none"> ▪ A policy definition detailing what is <i>“meant by habitats of particular significance”</i> and; ▪ Report on the nature and extent of habitats of particular significance for hoki fisheries management purposes by 2013; and

- The development and implementation of management measures as may be required.

Operational Tasks for Year 2:

- If the additional analyses undertaken during Year 1 show that hoki trawl impacts are likely to cause serious or irreversible harm in any of BOMECE categories 7, 8 or 9, an agreed strategy will be developed that will avoid or mitigate adverse effects on habitat structure to the a level at which serious harm is highly unlikely (i.e. a 30% probability) to occur by:
 - "...appropriate spatial management measures to address the impact that hoki bottom trawl fishing activity has on the benthic habitat, post 2013" (MFish 2010b. OO 2.15. p44).
 - Development of other additional management programmes (if the assessment deems necessary).
- The SG100 rationale for PI 2.4.1 states that "a cohesive spatial management approach is best practice for reducing fishery impacts on habitat structure and function."
 - In order to be consistent with this PI a review on what constitutes best practice and the establishment of the extent to which international *spatial management approaches* are "cohesive." To be "cohesive", management approaches need to be widely known internationally and have some evidence of uniform application.
 - This review will also take into account the context in which these 'best practice measures' were applied and their relevance to New Zealand.

Operational Tasks for Year 3:

- Implement and adopt further agreed management measures, where these have been determined to be required, that will avoid, or mitigate adverse effects on habitat structure.
 - Include habitat as a component of the planned Ecological Risk Assessment (ERA) for deepwater fisheries, which are scheduled to be progressed within the next 3 years.

2.3: Progress with Action Plan

This progress report details the work that has been completed within the first 5 months of certification to address the agreed Operational Tasks for Year 1 to meet the terms for the Condition of Certification for PI 2.4.1 (Habitats Outcome).

Since the site visit (13-18 November 2011) and the re-certification of hoki (August 2012) as a direct result of work undertaken within the Operational Tasks for Year 1, a large amount of new information has become available that is relevant to the assessment of the hoki fisheries under PI 2.4.1.

In order to fully meet the requirements of the agreed Operational Tasks for Year 1, DWG and MPI have:

1. Undertaken a review of existing information to ascertain the probability that the hoki fishery could cause serious or irreversible harm to benthic habitat structure and function [on a regional or bioregional basis].

The following existing information has been reviewed:

- Baird, S., Tracey, D., Mormede, S. & Clark, M. (2012) The distribution of protected corals in New Zealand waters. NIWA Client Report No: WLG2012-43. Prepared for DOC. 95pp.
- Black, J (2013) Proportion of hoki target trawls on the Chatham Rise. Unpublished GNS Science Consultancy Excel Worksheets. Prepared for the Deepwater Group Ltd.
- Black, J (2013a-b). Analysis of New Zealand hoki trawl grounds against hoki fisheries regions (12 year and 5 year). Unpublished GNS Maps. Prepared for the Deepwater Group Ltd.
- Black, J. (2013c). Analysis of New Zealand hoki trawl grounds by Fisheries Region (1999-00 to 2010-11). Unpublished GNS Science Consultancy Excel Worksheets. Prepared for the Deepwater Group Ltd.
- Black, J., and Wood, R. (2011). Analysis of New Zealand's trawl grounds by the hoki fishery. Unpublished GNS Science Consultancy Excel Worksheets (2011a-o). Prepared for the Deepwater Group Ltd.
- Bowden, D., and Hewitt, J. (2012) Recommendations for surveys of marine benthic biodiversity: outcomes from the Chatham-Challenger Ocean Survey 20/20 Post-Voyage Analyses Project. *New Zealand Aquatic Environment and Biodiversity Report* No.91. 34p.

- Bowden, D., Compton, T., Snelder, T., and Hewitt, J. (2011). Evaluation of the New Zealand Marine Environment Classifications using Ocean Survey 20/20 data from Chatham Rise and Challenger Plateau. *New Zealand Aquatic Environment and Biodiversity Report No. 77*.
- Boyd, R. (2012). New Zealand's Offshore Benthic Bioregions. Unpublished report for the Deepwater Group Ltd, Wellington
- Boyd, R. (2011b). Updated benthic risk assessment of the New Zealand hoki fisheries. Unpublished report for the Deepwater Group Ltd, Nelson.
- Foden, J., Rogers, S., & Jones, A. (2010). Recovery of UK seabed habitats from benthic fishing and aggregate extraction—towards a cumulative impact assessment. *Marine Ecology Progress Series* 411, 259-270.
- Hewitt, J., Lundquist, C. & Bowden, D. (2011a). Chatham-Challenger Ocean Survey 20/20 Post Voyage Analyses: Diversity Metrics. (Objective 6). *New Zealand Aquatic Environment and Biodiversity Report 83*.
- Hewitt, J., Julian, K., & Bone, E. (2011b). Chatham-Challenger Ocean Survey 20/20 Post Voyage Analyses: Objective 10 – Biotic habitats and their sensitivity to physical disturbance. *New Zealand Aquatic Environment and Biodiversity Report 81*.
- Kaiser, M., Clarke, K., Hinz, H., Austen, M., Somerfield, P., and Karakassis, I. (2006) Global analysis of response and recovery of benthic biota to fishing. *Marine Ecology Progress Series* 311: 1–14.
- Knox, M., Hogg, I., Pilditch, C., Lörz, A., & Nodder, S. (2012) Abundance and diversity of epibenthic amphipods (Crustacea) from contrasting bathyal habitats. *Deep Sea Research Part I: Oceanographic Research Papers*. Volume 62, April 2012, Pages 1–9. <http://www.sciencedirect.com/science/article/pii/S0967063711002433>
- Langley, A. (2012). Refining target catch levels for the hoki fishery. Unpublished Draft report held by DWG.
- Langley, A. (2011). Determining an Appropriate target Biomass Reference Point for the New Zealand Hoki Fishery – Supplementary Analysis. Unpublished report held by DWG.
- Leathwick, J., Dey, K., and Julian, K. (2006) Development of a marine environmental classification optimised for demersal fish. *NIWA Client Report: HAM2006-063* held by Department of Conservation.
- Leathwick, J., Rowden, A., Nodder, S., Gorman, R., Bardsley, S., Pinkerton, M., Baird, S., Hadfield, M., Currie, K., and Goh, A. (2009). Mapping the spatial and temporal extent of fishing in the New Zealand EEZ Benthic-optimised environmental classification for New Zealand waters. *NIWA Client Report: BEN200601*. held by Ministry for Primary Industries
- McKnight, D., and Probert, P. (1997). Epibenthic communities on the Chatham Rise, New Zealand. *New Zealand Journal of Marine and Freshwater Research*, Vol. 31: 505-513
- MPI. 2012. Aquatic Environment and Biodiversity Annual Review 2011. Ministry for Primary Industries. (December 2011).196pp.
- Nodder, S., Maas, E., Pilditch, C. (2011). Physical, biogeochemical, and microbial characteristics of sediment samples from the Chatham Rise and Challenger Plateau. *New Zealand Aquatic Environment and Biodiversity Report 70*
- Nodder, S., Duineveld, G., Pilditch, C., Sutton, P., Probert, P., Lavaleye, M., Witbaard, R., Chang, F., Hall, J. and Richardson, K. (2007). Focusing of phytodetritus deposition beneath a deep-ocean front Chatham Rise New Zealand. *Limnology and Oceanography*, 52(1): 299–314.
- O'Driscoll, R., MacGibbon, D., Fu, D., Lyon, W. & Stevens, D.W. (2011). A review of hoki and middle depth trawl surveys of the Chatham Rise, January 1992-2010. *Fisheries Assessment Report 2011/47*. 740pp.
- PFMC (2005). Pacific Coast Groundfish Fishery Management Plan for the California, Oregon, and Washington Groundfish Fishery Appendix C Parts 1 & 2 .The Effects of Fishing on Habitat: West Coast Perspective. Pacific Fishery Management Council (www.pcouncil.org).
- Prenski, L., Morales-Yokobori, M., Mente Vera, C., Bridi, J., Landa, P., Di Giacomo, E., & Perier, M. (2012). Public Final Report: Assessment against MSC Principles and Criteria for Argentine Hoki (*Macrurus magellanicus*). Organizacion Internacional Agropecuria (OIA). April 2012. 820pp.
- Snelder, T., Leathwick, J., Dey, K., Rowden, A., Weatherhead, M., Fenwick, G., Francis, M., Gorman, R., Grieve, J., Hadfield, M., Hewitt, J., Richardson, K., Uddstrom, M., and Zeldis, J. (2006). Development of an Ecologic Marine Classification in New Zealand. *Environmental Management* Vol. 39, No. 1, pp. 12–29
- Snelder, T., Leathwick, J., Dey, K., Weatherhead, M., Fenwick, G., Francis, M., Gorman, R., Grieve, J., Hadfield, M., Hewitt, J., Hume, T., Richardson, K., Rowden, A., Uddstrom, M., Wild, M., and Zeldis, J. (2005). The Marine Environment Classification. Unpublished report held by Ministry for the Environment. New Zealand. June 2005.
- Vincent, W., & Howard-Williams, C. . (1991). Distribution and biological properties of oceanic water masses around the South Island, New Zealand. *New Zealand Journal of Marine and Freshwater Research*, Vol. 25: 21-42.

2. Continued to monitor the location and extent of bottom trawl grounds in accordance with MO 2.7 of the National Fisheries Plan

The following studies and reports have been completed:

- Black, J (2013) Proportion of hoki target trawls on the Chatham Rise. Unpublished GNS Science Consultancy Excel Worksheets. Prepared for the Deepwater Group Ltd.
- Black, J (2013a-b). Analysis of New Zealand hoki trawl grounds against hoki fisheries regions (12 year and 5 year). Unpublished GNS Maps. Prepared for the Deepwater Group Ltd.
- Black, J. (2013c). Analysis of New Zealand hoki trawl grounds by Fisheries Region (1999-00 to 2010-11). Unpublished GNS Science Consultancy Excel Worksheets. Prepared for the Deepwater Group Ltd.
- Black, J., and Wood, R. (2011). Analysis of New Zealand's trawl grounds by the hoki fishery. Unpublished GNS Science Consultancy Excel Worksheets (2011a-o). Prepared for the Deepwater Group Ltd.
- Black, J. (2012a). Analysis of Hoki Trawl Footprint 2003-04 to 2009-10. Unpublished Report by GNS Science Consultancy, prepared for the Deepwater Group Ltd.
- Black, J. (2012). Analysis of New Zealand hoki 12 year and 5 year trawl ground footprints. Unpublished GNS Science Consultancy Excel Worksheets (2012a-b). Prepared for the Deepwater Group Ltd.
- MPI. 2012. Aquatic Environment and Biodiversity Annual Review 2011. Ministry for Primary Industries. (December 2011).196pp.

3. Continued the investigation into 'habitats of particular significance for fisheries management' in accordance with MO 2.3 of the National Fisheries Plan

This work has commenced and is in progress. However, given that we are currently only 5 months into the Certification period, no reports have yet been produced.

2.4: Summary of Findings in Year 1

The agreed Operational Tasks for Year 1 require:

"DWG, in collaboration with MPI, will undertake a review of the existing research on the key benthic biota within BOMECE Categories 7, 8 and 9 that are susceptible to risks of bottom trawl impacts and of the studies on regeneration times for these (or comparable) species and habitats. The purpose is to ascertain the probability that the hoki fishery could be causing serious or irreversible harm to the structures [and functions, sic] of these habitats.

Should this review show that the impacts are sufficiently serious and are not reversible as is defined within the MSC methodology, an agreed strategy to avoid or to mitigate further adverse effects on these habitats will be developed and adopted in Year 2, and implemented in Year 3."

The agreed Action Plan required two tasks to bring together the information for this review:

- Undertake a review of existing information to ascertain the probability that the hoki fishery could cause serious or irreversible harm to benthic habitat structure and function in the context of BOMECE Categories 7,8 and 9;
- Continue to monitor the location and extent of bottom trawl grounds in accordance with MO 2.7 of the National Fisheries Plan

It is our submission that we have completed all of the required tasks and have, therefore, fully met the agreed terms for Year 1.

In undertaking the review of all of the existing research and information, DWG has also reviewed the MSC Standard and the specific requirements for Performance Indicator 2.4.1. In doing so we have reached the conclusions that:

- We have been misapplying the requirements of PI 2.4.1.
- The test required by PI 2.4.1 is not to assess whether there have been impacts to benthic habitat types, but to ascertain whether or not these impacts have caused serious or irreversible harm to habitat structure and function, considered on a regional or bioregional basis.
- BOMECE shape files are outputs from probabilistic modelling, designed to provide a range of different environmental classifications that may be used as indicative benthic habitat classes. Because BOMECE outputs are scalable (i.e. the

boundaries are not set, they are dependent on the chosen hierarchical level), the boundaries of BOMECS shape files are entirely dependent on the assumptions and the parameters chosen for each model run. As such BOMECS shape files do not describe discrete, extant spatial 'habitat' types on either a regional or a bioregional basis (as is required by the MSC Standard).

- Furthermore, when 'ground truthed', BOMECS outputs have not proven to be reliable at the 15 class level (i.e. as used in the ERA and by IMM in their assessment).
- Because of the large uncertainties between BOMECS shape files and 'real-world' benthic habitats and the scalability of BOMECS outputs, we reached the conclusions that BOMECS categories (certainly at the 15 Class level) are neither 'regional' nor 'bioregional' constructs, as are required to inform PI 2.4.1 determinations.

In brief, the outcomes of the review of the existing research information provide scientific evidence that:

- For the purposes of PI 2.4.1 there are four recognised fisheries 'regions' each with their own oceanographic and spatial characteristics: West Coast South Island, Sub-Antarctic, Cook Strait and the Chatham Rise
- In each of these four hoki fishery 'regions' only very small percentages of the range of hoki are currently being contacted by bottom trawl.
- No bioregions have been determined for depths of 200-800 m in New Zealand waters, the primary area where bottom trawling for hoki occurs.
- The recovery times for the habitat types characteristic of 200-800 m depths where the hoki fishery occurs are between 5-12 years and, for the Chatham Rise region, are likely to be in the vicinity of 8 years.
- As the Chatham Rise region continues to have the highest level of bottom trawling for hoki, any potential concerns that may exist for hoki fisheries causing serious or irreversible harm to habitat structure and function are more likely to be within this region rather than within any of the other three fishery regions.
- Scientific information is available for the Chatham Rise region in sufficient detail to enable an evidential assessment of the performance of the hoki fishery against the PI 2.4.1 standards.
- There is very high primary productivity and high heterogeneity of benthic assemblages across areas on the Chatham Rise where hoki fishing occurs.
- Results from the time series of research trawl surveys in the Chatham Rise region show positive or neutral trends in the biomass indices for hoki and other key species on the over the last 20 years, demonstrating sustained healthy ecosystem structure and function here.
- Given the lower level of bottom trawl effort in the other three hoki fisheries regions, this is likely to also be true for these areas
- The hoki harvest strategy provides certainty that the level of fishing effort will not increase to the high levels seen prior to 2004 during the period of Certification (i.e. during 2012-17).

Furthermore, in terms required by the MSC Standard, the review of the existing research information shows no evidence of any indicators of serious or irreversible harm to habitat structure and function on a regional basis attributable to the hoki fisheries, including no evidence of:

- Loss of habitat types,
- Degeneration of biogenic habitats,
- Any serious depletion or loss of habitat forming species,
- Ecosystem impairment for either pelagic or benthic species.

Our review of all of the available scientific information in the context of PI 2.4.1 has lead us to the conclusion that impacts by hoki fishing are not sufficiently serious and/or are reversible (or have been reversed) and are therefore not causing serious or irreversible harm to habitat structure and function, in terms of PI 2.4.1.

Consequently, we have concluded that there is no requirement to develop or to adopt an agreed strategy to further avoid/reduce adverse effects of the hoki fisheries on habitat structure and function in the context of PI 2.4.1.

We note that most of the information within this review was not available to IMM in November 2011, when the site visit for the re-assessment was undertaken. We therefore suggest that it may prove beneficial for IMM, after assessing all of this new information provided as a consequence of this review, to make a *de novo* determination of the performance of New Zealand hoki fisheries in terms of MSC Standard and of Performance Indicator 2.4.1 in particular.

2.5: Summary

The agreed Action Plan has the Objectives to:

“Conduct an information review that summarises existing research to ascertain whether or not the fishery does not cause serious or irreversible harm to habitat structure.

If research shows impacts are not reversible (linking objectives, impacts, and actions, relating to biomass and fishing mortality), for the hoki fisheries, develop and adopt an agreed strategy to avoid/reduce adverse effects on habitat structure.”

In accordance with the agreed Objectives and Operational Tasks for Year 1, DWG has:

- Undertaken a review of existing information to ascertain the probability that the hoki fishery could cause serious or irreversible harm to benthic habitat structure and function on a regional or bioregional basis.
- Continued to monitor the location and extent of bottom trawl grounds in accordance with MO 2.7 of the National Fisheries Plan
- Continued the investigation into ‘habitats of particular significance for fisheries management’ in accordance with MO 2.3 of the National Deepwater Fisheries Plan

It is our submission that, we have completed all of the required tasks and have therefore fully met the agreed terms for Year 1.

The review of existing research information in the context of PI 2.4.1 has lead DWG to the conclusions that:

- DWG have been misapplying the requirements of PI 2.4.1.
- As BOMECS are neither ‘regional’ nor ‘bioregional’ in context of MSC Standard, they are not relevant to inform this PI
- No ‘bioregions’ have been defined for the areas of 200-800 metres where hoki are found, but four ‘regions’ exist which could be used to inform assessment on PI 2.4.1
- Impacts by hoki fishing within each region are not sufficiently serious and/or are reversible (or have been reversed) and are therefore not causing serious or irreversible harm to habitat structure and function on a regional basis, in terms of PI 2.4.1 and of the MSC Standard.

DWG seeks IMM’s consideration of all of the information brought together from this review (as has been previously provided in our submission of 18 January 2013).
