



Review of Management Controls for Mid-East Coast Orange Roughy (ORH 2A, 2B, 3A)

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INTRODUCTION

- 1 This Discussion Paper provides the Ministry for Primary Industries' (MPI's) initial proposals relating to Total Allowable Catches (TACs) and other management controls for ORH 2A, 2B, and 3A. Any changes to the current management settings would apply from 1 October 2014.
- 2 MPI has developed this paper for the purpose of consultation as required under the Fisheries Act 1996 (the Act). The proposals outlined in the paper are preliminary and are provided as the basis for consultation with stakeholders.
- 3 In July 2014, MPI intends to provide a Final Advice Paper (FAP) to the Minister for Primary Industries. The FAP will summarise MPI's position and make recommendations to the Minister that incorporate the views of stakeholders resulting from the consultation. A copy of the FAP and the Minister's letter setting out his final decisions will be posted on the MPI website as soon as these become available.

DEADLINE FOR SUBMISSIONS

- 4 MPI welcomes written submissions on the proposals contained in the Discussion Paper. All written submissions must be received by MPI no later than 5pm on **Wednesday, 25 June 2014**.

Written submissions should be sent directly to:

Deepwater Fisheries Management
Ministry for Primary Industries
P O Box 2526
Wellington 6011

or emailed to fmsubmissions@mpi.govt.nz

Official Information Act 1982

- 5 All submissions are subject to the Official Information Act and can be released (along with the personal details of the submitter) under the Act. If you have specific reasons for wanting to have your submission or personal details withheld, please set out your reasons in the submission. MPI will consider those reasons when making any assessment for the release of submissions if requested under the Official Information Act.

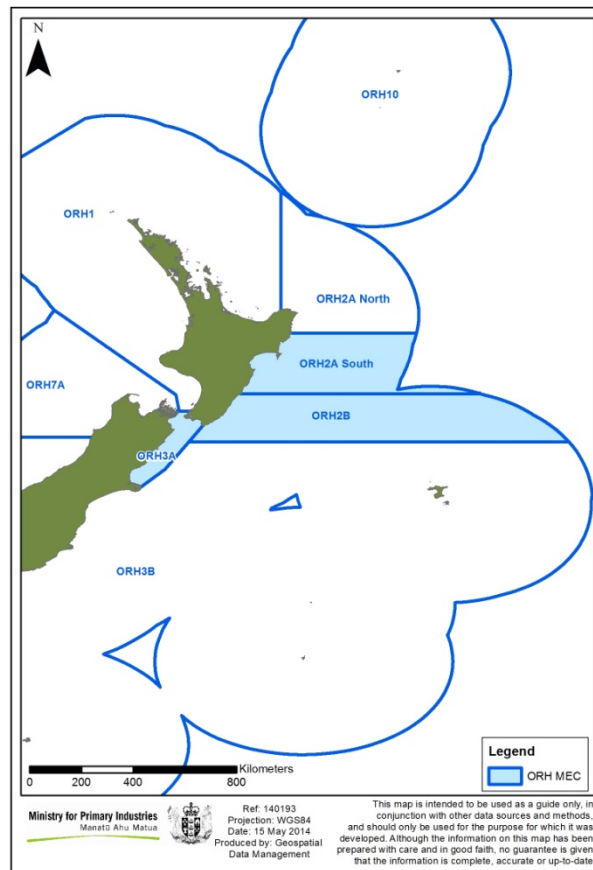


Figure 1: Quota Management Areas (QMAs) for orange roughy ORH 2A (North and South), ORH 2B and ORH 3A. The Mid-East Coast fishery comprises ORH 2A South, ORH 2B and ORH 3A.

EXECUTIVE SUMMARY

- 6 The Ministry for Primary Industries (MPI) is seeking tangata whenua and stakeholder input to inform a review of the Total Allowable Catch (TAC) and other management controls for three quota management areas (QMAs) that comprise the Mid-East Coast orange roughy stocks (ORH 2A, 2B, and 3A).
- 7 ORH 2A, ORH 2B and ORH 3A are managed as two separate biological stocks:¹
 - ORH 2A North or East Cape Stock and
 - ORH MEC or Mid-East Coast (ORH 2A South, ORH 2B and ORH 3A).
- 8 The ORH 2A North sub-stock is thought to be rebuilding with the current catch limit of 200 tonnes. No management action is proposed for the ORH 2A North component of the ORH 2A QMA.
- 9 The most recent stock assessment for ORH MEC estimates the current biomass of the ORH MEC biological stock to be below a level that can produce the maximum sustainable yield (B_{MSY}). The stock assessment estimates the current biomass to be 14% of the unfished biomass (B_0) and projected the stock would increase slowly at the current catch level.

¹ Unless otherwise clarified in the text “stock” refers to the QMA management unit (per the definition of “stock” in section 2 of the Fisheries Act 1996) and “sub-stock” refers to a biologically or geographically distinct orange roughy population within a QMA.

10 The status of the stock at 14% B_0 is below the Soft Limit (20% B_0) which suggests a time-bound rebuilding plan be implemented. MPI proposes a range of catch limit options (Table 2) for catch limits for the ORH MEC stocks to implement a rebuilding plan.

11 MPI has reviewed annual, interim and differential deemed value rates and is not proposing that these be changed for the 2014/15 fishing year.

CONTEXT

Biological characteristics

12 Orange roughy is a slow-growing, long-lived fish that inhabits depths between 700 and 1,500 m within the New Zealand EEZ. On the basis of otolith ring counts, it is estimated that orange roughy may live up to 120-130 years, and begin spawning around 32-41 years of age.

Commercial fishery

13 Three orange roughy QMAs exist in the middle portion of New Zealand's east coast: ORH 2A, ORH 2B and ORH 3A (Figure 1). Latest information on biological stock structure indicates that two biological stocks exist in this region:

- ORH 2A North (East Cape) and
- ORH MEC (ORH 2A South, ORH 2B and ORH 3A).

14 To ensure fishery removals are managed by biological stock, separate catch limits are set for ORH 2A North and ORH MEC. The Minister for Primary Industries (the Minister) sets the TAC for ORH 2A as a whole. For the two sub-stocks, Deepwater Group Ltd (DWG), which represents orange roughy quota owners, agrees to adhere to sub-QMA catch limits for the individual sub-stocks (catch limits). Adherence to the sub-QMA catch limits are monitored throughout the fishing year by MPI and DWG.

15 The total catch limit for the ORH MEC stock is the sum of the ORH 2A South catch limit plus the TACCs for ORH 2B and ORH 3A.

16 The ORH 2A North area represents a separate biological stock for which a separate stock assessment is conducted. The current catch limit of 200 tonnes is thought to be sustainable and therefore no management action is proposed for the ORH 2A North component of the ORH 2A QMA.

17 There is no new information available that would change the accepted stock definition of ORH MEC stock which includes ORH 2A South, ORH 2B and ORH 3A.

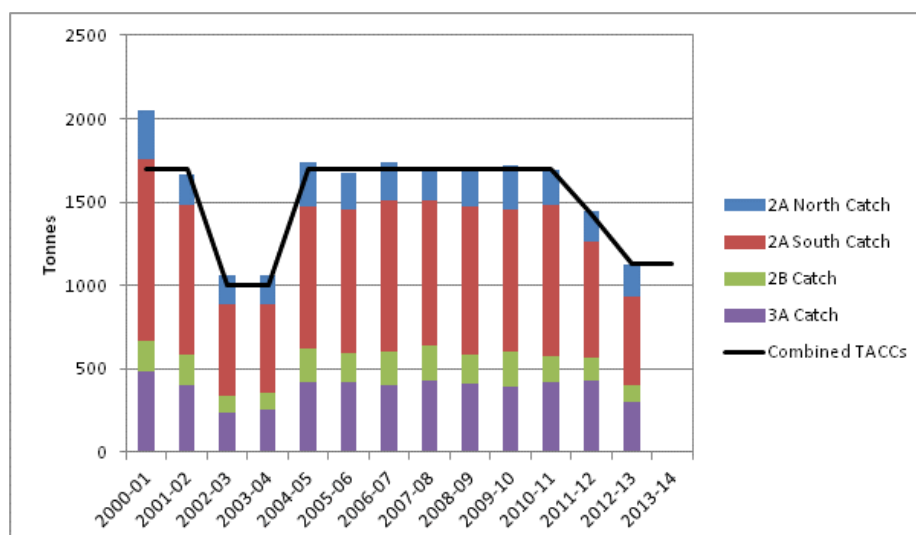


Figure 2: Catch limits and estimated catch reported from ORH MEC stocks (incl. 2A North) and areas from 2000-01 to 2013-14. Catch limit includes voluntary shelving arrangements.

Recreational and Māori Customary Interests

18 Recreational and customary fishers do not target or catch orange roughy due to the depths it is found. The current recreational and Māori customary allowance for all orange roughy stocks is zero (0) tonnes. MPI is not proposing to change this allowance.

19 The Minister must give particular regard to kaitiakitanga and take any relevant Iwi or Forum Fishplans into account when setting or varying the TAC for a stock. In respect to ORH MEC, the input and participation of tangata whenua is effected through MPI's relationship with Te Waka a Māui me ōna Toka Iwi Forum. Orange Roughy is identified as a taonga species in the Te Waipounamu Fisheries Plan, which covers ORH3A.

Other Sources of Fishing Related Mortality

20 MPI proposes to retain the current allowance for other sources of fishing-related mortality, set at 5% of the TACC. This allowance accounts for unreported orange roughy mortality, such as loss due to burst nets, or discarding of damaged orange roughy.

Previous Review

21 The most recent stock assessment and subsequent change to the catch limit for the MEC orange roughy stocks was in 2011. The catch limit was decreased from 1,500 tonnes to 1,230 tonnes on the basis of an uncertain stock assessment that indicated the stock status may have been decreasing. The advice in 2011 indicated that additional catch limit reductions were likely and that monitoring and research would be dedicated to the ORH MEC stock in order to more accurately determine stock status.

22 No further TAC reductions were implemented as a result of further consideration of the uncertainty in the model outputs and plans for future surveys, with industry instead shelving 300 tonnes of ORH 2A, 2B, and 3A Annual Catch Entitlement (ACE) for the 2012-13 and 2013-14 years awaiting results of additional surveys and a new stock assessment.

ORH MEC Stock Assessment

- 23 The 2014 Fisheries Assessment Plenary (the Plenary) agreed that the 2014 ORH MEC stock assessment was of high quality and met New Zealand's Science and Research Information Standard for New Zealand Fisheries². MPI is therefore confident that the results from the assessment can be accorded a high weight in fisheries management decisions.
- 24 The 2014 Plenary agreed on a base model which assumed natural mortality (M) at 0.045 and was single-sex and age-structured. The main data inputs to the model included: the acoustic biomass estimate from the 2013 survey; biomass estimates, length and age data from trawl surveys and; commercial length-frequencies. Additional data were available but were not considered to be of sufficient quality to be included in the model.
- 25 The main uncertainties associated with the ORH MEC stock assessment model were that patterns in year class strength are based on only five years of age composition data, and the proportion of the spawning stock biomass indexed by the 2013 acoustic survey. It was acknowledged that there has been much less survey effort in this area relative to other orange roughy spawning grounds.
- 26 Additional model runs investigated the sensitivity of the model to a variety of parameters including changes in M and the proportion of the stock assumed to be indexed by biomass surveys. None of the additional model runs was considered to make any substantive changes to the outcome of the assessment and demonstrate the robustness of the stock assessment model.
- 27 The base model estimates current biomass to be 14% B_0 . The Plenary considered that the stock is be Likely ($> 60\%$ probability) to be below the Soft Limit (20% B_0) and Unlikely ($< 40\%$ probability) to be below the Hard Limit (10% B_0). It is also Very Unlikely ($< 10\%$ probability) to be at or above the lower end of the management target range (30-40% B_0).

Management Approach

- 28 Orange roughy stocks are managed under section 13 of the Act, with TAC setting also guided by the agreed orange roughy harvest strategy, which requires stocks to fluctuate within the target range of 30-40% B_0 . This target was set above an estimate of deterministic B_{MSY} for orange roughy (22-23% B_0)³ to provide greater certainty that orange roughy stocks will remain at or above B_{MSY} and can sustain the fishery in the long term. The Soft and Hard Limit reference points in the agreed orange roughy harvest strategy are set at 20% and 10% B_0 , respectively.
- 29 The HSS indicates that stocks estimated to below the Soft Limit should be subject to a formal, time-constrained rebuilding plan. The stock should be rebuilt to at least the target

² Available at: <http://www.fish.govt.nz/en-nz/Publications/Research+and+Science+Information+Standard.htm>

³ It is important to note that deterministic estimates of B_{MSY} are not considered to be appropriate as management targets as they rely on perfect information, which is unrealistic

level in a time frame between T_{\min} and $2 * T_{\min}$. ‘Rebuilt’ is defined in the HSS as the stock status that provides at least a 70% probability that the target has been achieved and at least a 50% probability that the stock is above the Soft Limit.

30 ORH MEC has been assessed to be below the Soft Limit, and as a result MPI is proposing options to implement a time-constrained rebuilding plan for this stock. The base model in the assessment was used to estimate T_{\min} (21 years) and the catch level at which the stock would rebuild to the lower bound of the target range (30% B_0) in $2 * T_{\min}$ (42 years).

31 The assessment model was also used to estimate the level of catch that would allow the ORH MEC stock to rebuild at a faster rate than the minimum requirements of in the HSS ($2 * T_{\min}$). The catch level that would rebuild the stock within 25 years and 32 years were also estimated (Table 1). Estimates of rebuild time were based on an assumption that recruitment will continue at near-average levels into the future. It is possible that recruitment will be lower than estimated, which may result in a slower rebuilding rate.

Table 1: Estimated rebuild times for a range of catch levels

Catch level	Timeframe	Reference
840 t	42 years	$2 * T_{\min}$
525t	32 years	$1.5 * T_{\min}$
200t	25 years	$1.2 * T_{\min}$
0t	21 years	T_{\min}

32 MPI considers that any catch level up to a maximum of 840 tonnes will meet the minimum requirements of the HSS. The catch limit that is set will drive the way and rate at which the stock rebuilds to the management target. MPI seeks input from stakeholders on the most appropriate way and rate at which to rebuild the ORH MEC stock.

PROPOSED RESPONSE

33 MPI is consulting on the following management options for setting TACs, TACCs and allowances for ORH 2A, ORH 2B, and ORH 3A.

Table 2: Current and proposed TACs, TACCs, and catch limits (tonnes) for the stocks that make up the ORH MEC fishery. Shaded cells contribute to the ORH MEC commercial catch limit.

	ORH 2A		ORH 2B		ORH 3A		ORH MEC	Estimated rebuild time
	TAC	TACC	TAC	TACC	TAC	TACC	Catch limit	
Option 1	693	660	100	95	300	285	840	42 years
		2A North						
		200						
Option 2	512	488	63	60	186	177	525	32 years
		2A North						
		200						
Option 3	326	310	27	25	68	65	200	25 years
		2A North						
		200						

34 The selection of these options was informed by the results of the 2014 ORH MEC stock assessment, the guidelines in the HSS, and the projections that investigate the effect of a range of future catch scenarios. MPI considers all options are consistent with the objective of implementing a rebuilding plan for ORH MEC and rebuilding the stock to the target within $2 \times T_{\min}$ with variations in the way and rate in which the stock would rebuild.

Option 1

35 Option 1 proposes:

- To decrease the ORH MEC catch limit from 1,230 tonnes to 840 tonnes
- To decrease the TACs for ORH 2A, 2B and 3A on a pro rata basis
- To decrease the allowances for other sources of fishing related mortality to maintain them at 5% of the TACC for each stock
- No change to customary or recreational allowances

36 Long term projections using the assessment model indicate that the stock would rebuild to the lower bound of the management target range (30% B_0) with a 70% probability in 42 years at this catch level.

37 This option has a reasonable chance of satisfying the minimum HSS rebuilding plan guidelines, so long as parameters estimated in the model are realised and recruitment over the next 21 years is average. It does not allow for the possible variations from the model assumptions. For example, the projections presented are based on recruitment sampled from all historical recruitment that has been estimated in the model. It is possible that recruitment will be lower than estimated which would result in a slower rebuild than predicted.

38 It should also be noted that there is ongoing work to determine the most appropriate management target reference point for orange roughy. This work may result in the target range being increased which would require the stock to rebuild to a higher level.

39 This option does not provide for this potential change in rebuild target, and catch limits may require further refinement in future in order to promote a timely rebuild to the new

target reference point. This option provides the upper limit on the volume of catch that could be harvested from the ORH MEC stock during the initial stage of the rebuild.

40 Option 1 provides more catch in the short-term and could be considered as a first step in a staged reduction over several years. This approach would provide additional time for industry to adjust to the reduced catch limit and shift fishing effort elsewhere.

Option 2

41 Option 2 proposes:

- To decrease the ORH MEC catch limit from 1,230 tonnes to 525 tonnes
- To decrease the TACs for ORH 2A, 2B and 3A on a pro rata basis to give effect to the total catch limit decrease
- To decrease the allowances for other sources of fishing related mortality to maintain them at 5% of the TACC for each stock
- No change to customary or recreational allowances.

42 Long term projections using the assessment model indicate that the stock would rebuild to the lower bound of the management target range with a 70% probability in 32 years under this option. As this option would implement a lower catch limit than option 1, it provides more certainty that the stock will rebuild more quickly than the minimum in the HSS guidelines.

43 A lower catch limit of 525 tonnes will allow some ongoing catch while still allowing the stock to rebuild. This option will also allow for ongoing research and monitoring of the stocks recovery to be undertaken as part of commercial fishing activity.

44 Option 2 also provides for some future movement of the management target reference point in response to the additional work being completed by the Deepwater Group Ltd. The rate of rebuild provided for by this option will be faster than in option 1, so if the target were to be moved upwards, the stock would be better placed to rebuild to a higher target within the suggested timeframe without further catch limit reviews.

Option 3

45 Option 3 proposes:

- To decrease the ORH MEC catch limit from 1,230 tonnes to 200 tonnes
- To decrease the TACs for ORH 2A, 2B and 3A on a pro rata basis to give effect to the total catch limit decrease
- To decrease the allowances for other sources of fishing related mortality to maintain them at 5% of the TACC for each stock
- No change to customary or recreational allowances.

- 46 Long term projections using the assessment model indicate that the stock would rebuild to the lower bound of the management target range with a 70% probability in 25 years under this option.
- 47 This option provides the most certainty that the rebuild will be completed well within the time frame suggested by the HSS while still allowing a small volume of ongoing catch in ORH MEC. This is the most conservative option proposed, allowing the stock to rebuild at a faster rate and providing the greatest probability that the rebuild will be successful in accordance with the HSS.
- 48 As the option with the lowest catch limit, it will also have the largest impact on industry operators who will be required to make significant business adjustments and reallocate fishing capacity in a short time period.
- 49 Option 3 also provides for any future movement of target reference points in response to the additional work being completed by the Deepwater Group Ltd. The rate of rebuild will be the highest of the proposed options, so if the target were to be moved upwards, the stock would be better placed to rebuild to a higher target without further catch limit reviews.
- 50 Future research surveys done in ORH MEC to monitor the rebuild may require special permits to allow for additional catch to be taken in some years in line with appropriate survey design.

Other Key Considerations

- 51 When making a decision concerning the TAC for a stock, the Minister for Primary Industries (the Minister)⁴ must have regard to interdependence of stocks. Interdependent stocks and key environmental issues associated with the ORH MEC fishery and how they will be affected by the proposal to decrease the catch limit and TACs are discussed below.

Interdependence of stocks

- 52 A number of deepwater species that share similar habitat to orange roughy are taken in the ORH MEC fishery including oreos, black cardinalfish, hoki and alfonsino. However, about 80% of the catch from orange roughy target trawls between 2008-09 and 2011-12 was orange roughy. The species caught in conjunction with orange roughy are largely QMS species that are actively managed. Fish bycatch will be monitored as part of the usual reporting process and managed accordingly
- 53 Management of shark species in New Zealand is now driven by the National Plan of Action for Sharks (NPOA-Sharks) 2013. Orange roughy fishing is also known to interact with several species of sharks, many reported using generic codes for ‘other sharks and dogfish’ and ‘deepwater dogfish’. It is considered that these species may have life history characteristics that make them vulnerable to overfishing.

⁴ The Minister for Primary Industries now exercises the powers and responsibilities of the Minister of Fisheries under the Fisheries Act 1996.

54 As part of the implementation of the NPOA-Sharks 2013, a risk assessment is being completed for all sharks that will guide ongoing management, prioritising species deemed to be at higher risk from fishing activities. Any additional catches of deepwater sharks will be taken into account through the risk assessment process.

55 Another work stream of the NPOA-Sharks 2013 is targeted at better identifying all sharks caught and reducing use of generic codes like ‘other sharks and dogfish’ and ‘deepwater dogfish’. Fisheries managers is working with MPI observers and the industry to increase species-specific reporting of these shark catches to better inform their management in conjunction with the risk assessment.

56 All proposed options would result in a decrease in orange roughy fishing effort and are therefore likely reduce impacts on all any bycatch species in these orange roughy fisheries.

Protected species interactions

57 Orange roughy trawl fisheries rarely interact with marine mammals (Table 4). MPI considers that all options proposed are unlikely to have any additional effects on New Zealand fur seals, New Zealand sea lions, or any other marine mammals and, should the catch limit be decreased, impacts on marine mammals will probably decline. However, MPI will continue ongoing monitoring of marine mammal interactions in all deepwater fisheries.

58 Management of seabird interactions with New Zealand’s commercial fisheries is now being driven through the 2013 National Plan of Action to reduce the incidental capture of seabirds in New Zealand fisheries (NPOA-Seabirds). The NPOA-Seabirds has established a risk-based approach to managing fishing interactions with seabirds, targeting management actions at the species most at risk.

Table 4: Observed and estimated total captures of seabirds and NZ fur seals in orange roughy trawl fisheries

	Seabirds		NZ fur seals		Total # of tows	Observed tows	% of tows observed
	Observed captures	Estimated total captures	Observed captures	Estimated total captures			
2011-12	0	6	0	0	1,588	437	27.5
2010-11	2	10	0	0	1,889	795	26.2
2009-10	13	27	0	0	2,922	1,139	39.0
2008-09	6	16	0	1	3,544	1,435	40.5
2007-08	2	12	0	0	3,689	1,618	43.9

59 The risk based approach that underpins the NPOA-Seabirds has identified the level of risk to individual seabird species, generated by different vessel classes within the commercial fishing fleet, via a comprehensive and hierarchical risk assessment and risk screening approach.

- 60 Orange roughy fishing effort generally contributes a very low proportion of the total risk score for those seabird species that have been found to be at high or very high risk.
- 61 MPI will continue to work with industry stakeholders to reduce the risk to key seabird species. A range of measures are currently in place or are under development. Mandatory seabird mitigation measures include the requirement that all trawlers over 28 m in length deploy bird mitigation devices during fishing. Research projects are currently underway that aim to improve the efficacy of these mitigation devices.⁵
- 62 Non-regulatory measures are also used to reduce the risk of seabird interactions with the orange roughy fleet including use of mitigation devices and offal management procedures. MPI monitors seabird captures and works with the Deepwater Group Ltd. (DWG) where necessary to minimise and mitigate captures. These practices will continue during 2014/15.
- 63 All options result in decreased orange roughy fishing effort in the ORH MEC area. MPI is satisfied that existing regulatory and non-regulatory measures are appropriate and that the management proposals should have no additional effects on seabirds as no increases in catch limits or TACs are proposed.

Benthic impacts

- 64 Bottom trawling can affect fragile benthic invertebrate communities but adverse effects may be reduced if vessels repeatedly trawl along the same towlines in a fishery. There are cost implications for the industry in terms of lost or damaged gear when fishing in new areas and as a result, fishing effort is likely to continue in areas previously fished.
- 65 Management measures to address the effects of deepwater trawl activity have focused on 'avoiding' these effects. This has been achieved through closing areas to bottom trawling; first with seamount closures in 2001 (two of these are within the ORH 2A QMA) and then with Benthic Protection Areas (three of these are within the MEC fishery area). The implementation of BPAs in 2007 effectively closed approximately 30% of the New Zealand EEZ to bottom trawling. A monitoring regime to ensure these closures are adhered to was also implemented.

Other Management Measures

- 66 Where two or more biological stocks exist in a single QMA, catch spreading arrangements ensure fishing effort is not concentrated in one or two areas which would increase fishing pressure on those biological stocks. To achieve this, catch limits for each sub-stock are put in place to reduce fishing pressure on individual biological stocks. These limits are monitored by MPI and DWG. MPI continues to support the following catch spreading in the ORH 2A fishery that requires DWG to:

⁵ More information on these projects can be found at the Department of Conservation's Conservation Services Programme website: www.doc.govt.nz/csp

- Submit monthly monitoring reports to MPI regarding catch levels in ORH 2A North and ORH 2A South
- To notify MPI when catch reaches 80% of the catch limit for either sub-stock and also notify MPI when any limit has been reached.

67 MPI undertakes to continue to monitor DWG reports and operators' fishing patterns to evaluate the effectiveness of these sub-stock catch limits. MPI will ensure that, through joint MPI-DWG communications, operators are fully informed as to the progress of catch taken against sub-stock limits.

68 MPI is proposing to retain the current interim and annual deemed value rates for ORH 2A, 2B and 3A of \$2.50 and \$5.00 respectively.

FUTURE CONSIDERATIONS

69 MPI will work with DWG to develop a monitoring plan for ORH MEC to cost-effectively track progress of the rebuild, and allow for continued robust assessments of the stock status throughout the process.

70 MPI will also continue to work with DWG on a collaborative effort to further investigate the appropriateness of the current agreed management target (30-40% B_0).

CONCLUSION

71 MPI considers that the status of the ORH MEC stock is below the Soft Limit, suggesting a time-bound rebuilding plan is required. Three options are proposed which give effect to a rebuilding plan consistent with the guidelines in the HSS, albeit with different rates of rebuild.

72 Option 1 sets out the maximum catch consistent with the minimum requirements of the HSS. Options 2 and 3 set out two additional catch levels that would lead to faster rebuild rates for the stock. MPI is seeking stakeholder views on the appropriate way and rate with which to implement the rebuilding plan for ORH MEC.