



Review of Management Controls for Orange Roughy on the Southwest Challenger Plateau (ORH 7A)

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INTRODUCTION

- 1 This Discussion Paper provides the Ministry for Primary Industries' (MPI's) initial proposals relating to catch limits, allowances, and deemed value rates for ORH 7A. Any changes to the current 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.

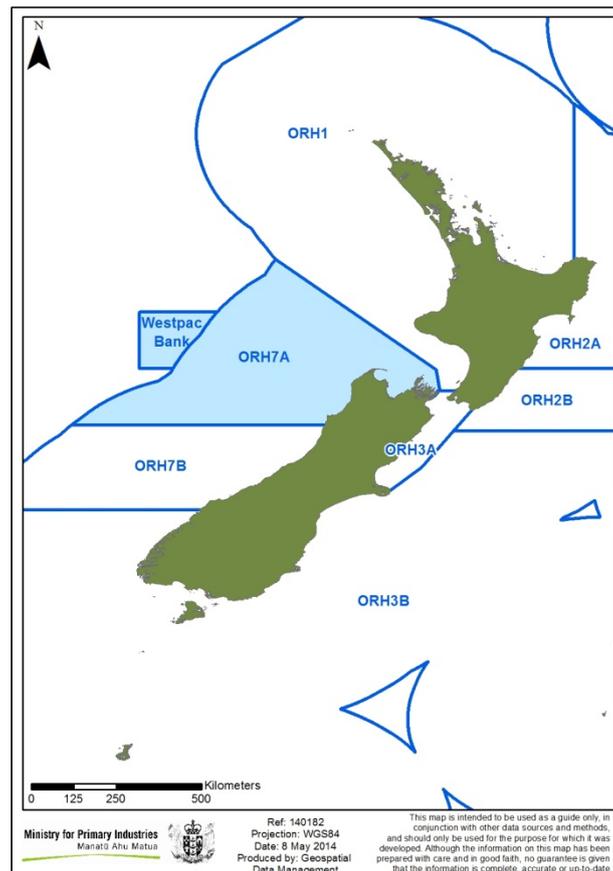


Figure 1: Map showing location and boundaries of ORH 7A

EXECUTIVE SUMMARY

- 6 The Ministry for Primary Industries (MPI) is seeking tangata whenua and stakeholder input to inform a review of the catch limits and other management controls for orange roughy on the Southwest Challenger Plateau (ORH 7A).
- 7 The ORH 7A fishery has historically occurred in the southwestern region of the Challenger Plateau both inside and outside of the New Zealand EEZ. Catches peaked in the late 1980s but dropped sharply in the early 1990s. The fishery was closed in 2000 on the basis of a biomass estimate indicating the stock was below 10% the unfished biomass (B_0). The fishery was re-opened in 2010 with a conservative TAC of 525 tonnes. This decision was informed by a biomass estimate from a 2009 survey that indicated the stock size had increased to be above the biomass that will produce the maximum sustainable yield (B_{MSY}).
- 8 The 2014 stock assessment of ORH 7A estimated the stock status as being above B_{MSY} and, at 42% B_0 , above the upper bound of the current management target range for this stock (30-40% B_0). Stock status is estimated to have been increasing since the late 1990s (Figure 2).
- 9 The stock assessment indicates that a TAC increase is likely to be sustainable. To test the stock's response to increased catch levels, a series of five year projections were run based on the assessment model. Projections indicate the expected biomass trajectory in relation to

the management reference points for orange roughy under different catch levels and form the basis for the options proposed in this paper.

10 MPI proposes three options (See Table 1) for catch limits in ORH 7A. The first option is the status quo, retaining the current TAC and allowances. Options 2 and 3 present TACs and allowances for two levels of increased catches.

Table 1: Current and proposed TACs and TACCs for ORH 7A (tonnes).

	TAC	TACC	Customary Maori Allowance	Recreational Allowance	Other sources of fishing-related mortality
Option 1 (status quo)	525	500	0	0	25
Option 2	945	900	0	0	45
Option 3	1680	1600	0	0	80

11 MPI has reviewed annual, interim and differential deemed value rates and is proposing to increase the interim deemed value rate from \$1.60 to \$2.50 and the annual deemed value rate from \$3.20 to \$5.00 to align deemed value rates in this stock with other orange roughy stocks throughout the EEZ.

CONTEXT

Biological characteristics

12 Orange roughy is a slow-growing, long-lived fish that inhabits depths between 700 and 1500 m. On the basis of otolith ring counts, it is estimated that orange roughy may live up to 120-130 years, and are thought to spawn at around 32-41 years of age.

Commercial fishery

13 Historically, the Challenger fishery mainly occurred in the southwestern region of the Challenger Plateau, both inside and outside the EEZ. ORH 7A is a straddling stock¹ with the portion of the stock outside the EEZ² now managed by the South Pacific Regional Fisheries Management Organisation (SPRFMO). Catches peaked in the late 1980s at about 10,000-12,000 t but then dropped sharply in the early 1990s and the fishery remained at 1,000-2,000 t for much of that decade before the fishery was closed in 2000. The fishery was re-opened in 2010 with a TAC of 525 tonnes on the basis of a biomass estimate which indicated that the stock was above B_{MSY} .

Recreational and Māori Customary Interests

14 Recreational and customary fishers do not generally 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 0 tonnes. MPI is not proposing to change this allowance.

15 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 7A, the input and participation of tangata whenua is effected through MPI's

¹ A straddling stock is defined as one which occurs both within the EEZ of a country and in an area beyond and adjacent to it.

² The main area fished outside the EEZ is about 25 nautical miles outside the EEZ boundary. Fish here are considered to be from the same biological stock as those inside the EEZ.

relationship with Te Waka a Māui me ōna Toka Iwi Forum. Orange roughy is identified as a taonga species in the Forum's Fisheries Plan.

Other Sources of Fishing Related Mortality

16 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

17 The most recent stock assessment and subsequent change to the catch limit for Challenger Plateau orange roughy was in 2010 when the fishery was re-opened with a TACC of 500 tonnes.

18 This increase was based on a minimum biomass estimate from an acoustic survey in 2009 that indicated that the stock was above B_{MSY} and could sustainably support increased catch. The TACC of 500 tonnes was set at 50% of the sustainable yield estimate from the stock assessment. This was considered a conservative approach to utilising the available biomass that would allow the stock to continue to rebuild.

ORH 7A 2014 Stock Assessment

19 The 2014 Fisheries Assessment Plenary (the Plenary) agreed that the 2014 ORH 7A stock assessment was of high quality and met New Zealand's Science and Research Information Standard for New Zealand Fisheries.³ MPI is therefore confident that the results from the assessment can be accorded a high weight in fisheries management decisions.

20 The Plenary agreed on a base model which assumes natural mortality (M) at 0.045 and is single-sex and age-structured. The model includes the following data sources: biomass estimates from acoustic and trawl surveys (2006, 2009-2013); the trawl surveys from 1987-89; and age frequencies from the three trawl surveys. Catch history and survey information includes the Westpac Bank area (Figure 1) outside of the New Zealand EEZ.

21 The base model estimates current biomass to be 42% B_0 . The Plenary considered this to be Very Likely (> 90% probability) to be at or above the lower bound of the management target range (30% B_0) and About as Likely as Not (40-60% probability) to be at or above the upper bound of the management target range (40% B_0).

³ Available at: <http://www.fish.govt.nz/en-nz/Publications/Research+and+Science+Information+Standard.htm>

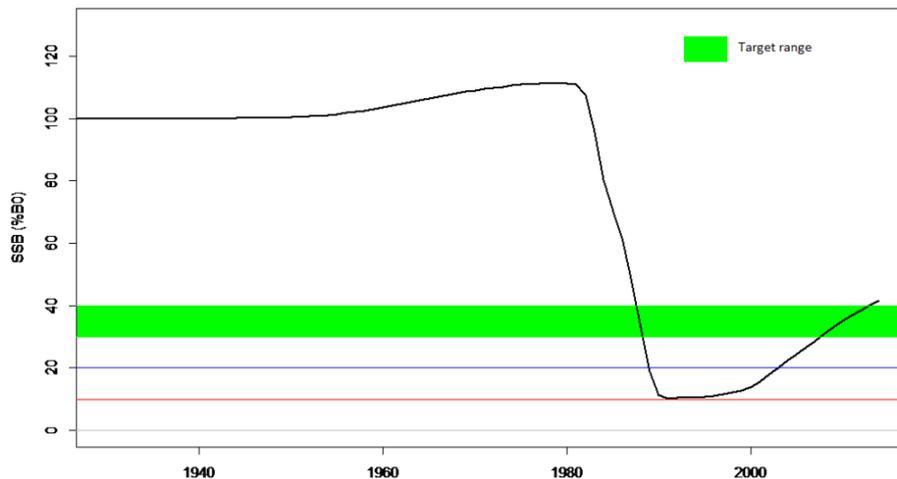


Figure 2: Estimated biomass trajectory for ORH 7A

22 Major sources of uncertainty associated with the stock assessment model include the proportion of the stock that is indexed by the combined acoustic and trawl survey and that the pattern of year class strengths which are based on only 3 years of age composition data.

23 Additional model runs investigated the sensitivity of the model to different values for natural mortality and to changes in the assumption regarding the proportion of the stock indexed by the survey biomass estimates. None of these sensitivity runs was significantly different from the base model run which demonstrates the robustness of the assessment.

Management Approach

24 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 management target range of 30-40% B_0 . This target is set above the deterministic estimate of B_{MSY} for orange roughy (23-25% B_0)⁴ to provide greater certainty that orange roughy stocks will remain at or above B_{MSY} and sustain the fishery in the long term. The soft and hard limit reference points in the harvest strategy are set at 20% and 10% B_0 , respectively.

25 MPI is working with industry in a collaborative effort to investigate the appropriateness of the current management target range. This work is scheduled to follow the assessments and will not be available in time to inform TAC decisions for this year. Any changes made to the management target range as a result of this work will be incorporated in future TAC reviews.

26 Management actions are also informed by five-year projections using the assessment model to provide estimates of future stock status in relation to B_0 and the target and limit reference points. The projections were run at catch levels ranging from the current catch level (500 tonnes) to a maximum of 2,100 tonnes. All projections indicated the stock

⁴ 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.

would remain within or above the management target range over the next five years (Table 2).

27 Long term yield estimates provide further information to inform the selection of an appropriate catch level that is likely to allow the stock to reach and remain at or within the management target range. The model estimates that the long-term catch that would maintain the stock at 35% B_0 (the middle of the management target range) is 1,740 tonnes. The short term yield that is estimated to move the stock back to 35% B_0 and keep the stock within the target range in the next five years is 2,128 tonnes.

Table 2: Expected median status of ORH 7A and probabilities of being at or above reference points in 2019

	TACC	Projected stock status	Probability of being above 30% B_0	Probability of being above 40% B_0
Option 1 (status quo)	500	48% B_0	100%	92%
Option 2	900	46% B_0	100%	86%
Option 3	1,600	42% B_0	99%	66%
For information only	2,100	40% B_0	96%	48%

28 Five-year projections are based on an assumption that recruitment into the fishery will continue at near-average levels into the future. It is possible that recruitment will be lower than estimated, which may result in lower stock status than projected.

29 On the basis of the assessment model outputs, MPI has confidence that the stock could support catch removals of up to 2,100 tonnes, higher than the options proposed in this paper, without any significant risks of the stock falling below the lower bound of the management target range for the stock.

30 A further survey is proposed for the Westpac Bank area of ORH 7A in 2014. This survey is expected to inform future stock assessments and any subsequent management decisions.

PROPOSED RESPONSE

31 MPI is consulting on the following management options for setting TACs, TACCs and allowances for ORH 7A (Table 3). Allowances for recreational and customary fisheries are set at nil for all options.

Table 3: Proposed TACs, TACCs, and allowances for ORH 7A

	TAC	TACC	Customary Maori Allowance	Recreational Allowance	Other sources of fishing-related mortality
Option 1 (status quo)	525	500	0	0	25
Option 2	945	900	0	0	45
Option 3	1,680	1,600	0	0	80

32 Based on the results of the 2014 ORH 7A stock assessment, and the projections, MPI considers all the options proposed are consistent with the orange roughy harvest strategy and maintaining ORH 7A at or above B_{MSY} .

33 The projection for a catch level of 2,100 tonnes was not included as an option, despite also being projected to maintain the stock within the management target range.

Option 1 (Status Quo)

34 Under this option the TAC would remain at 525 tonnes and the TACC would remain at 500 tonnes.

35 This option will result in lost utilisation opportunities. The stock assessment results provide confidence that the stock is likely to be able to support a harvest level greater than 500 tonnes. This catch level was set in 2010 at a conservative value of 50% of the estimated sustainable yield from the stock of 1,050 tonnes.

36 The stock status has continued to increase since 2010, and the updated information shows a higher catch is sustainable.

Option 2

37 Option 2 proposes:

- To increase the TAC from 525 tonnes to 945 tonnes
- To increase the TACC from 500 tonnes to 900 tonnes
- To increase the allowance for other sources of fishing related mortality from 25 tonnes to 45 tonnes (maintaining it at 5% of the TACC)
- No changes to customary or recreational allowances.

38 The projections indicate that the status of ORH 7A would remain above the upper bound of the management target range for the next five years with a TACC increase of 400 tonnes. The projections also indicate that the stock could support a larger catch increase before it would be likely to decline below the upper bound of the management target range (Table 2). This option therefore presents a conservative approach to the current harvesting opportunity available in this stock.

39 Taking such a conservative approach recognises there is uncertainty associated with the stock assessment model and takes this into account. Under this option, the stock will be maintained at a higher level which would give greater certainty that the biomass would be within a higher target range if it was found to be more appropriate than the current range. However, this option would not take full advantage of the available utilisation opportunity indicated by the stock assessment and the current harvest strategy.

40 This option could be implemented as the first step up in a longer-term approach of incrementally increasing the TACC over time. Future increases would be considered based on this assessment and as new information was made available to further strengthen confidence in the results of the 2014 stock assessment.

41 Based on export figures from 2013 of \$4.31/kg greenweight, a 400 tonne increase in the TACC may result in an additional \$1.7 m in revenue.⁵

Option 3

42 Option 3 proposes:

- To increase the TAC from 525 tonnes to 1680 tonnes
- To increase the TACC from 500 tonnes to 1600 tonnes
- To increase the allowance for other sources of fishing related mortality from 25 tonnes to 80 tonnes (maintaining it at 5% of the TACC)
- No changes to customary or recreational allowances.

43 Option 3 is based on the estimate of yield that would cause the stock to fluctuate around the upper bound of the management target range (40% B_0). This option is less conservative than Option 2, but provides greater utilisation opportunities for industry. It also increases the risk of the stock declining in future years although stock status would remain at the upper end of the target range.

44 The five-year management projections indicate that the stock status would remain above the top end of the target range for the next five years with a catch level of 1,600 tonnes. Projections also indicate that the stock could likely support a larger increase (to 2,100 tonnes of catch) with a low probability of falling below the lower bound of the management target range in the next five years (Table 2).

45 Based on export figures from 2013 of \$4.31/kg greenweight, a 1,100 tonne increase in the TACC may result in an additional \$4.7 m in revenue.

Other Key Considerations

46 When making a decision concerning the TAC for a stock, the Minister for Primary Industries⁶ (the Minister) must have regard to the interdependence of stocks. Interdependent stocks and key environmental issues associated with the ORH 7A fishery and how they will be affected by the proposal to increase the TAC are discussed below.

Interdependence of stocks

47 Orange roughy fishing in ORH 7A is localised and specific to aggregations of orange roughy between 850-1,200 metre depths. Some bycatch of non-harvested species is expected, however 97.5% of the catch from orange roughy target trawls between 2008-09 and 2012-13 was orange roughy. The species caught in conjunction with orange roughy are largely QMS species that are actively managed (e.g. oreos and ribaldo). Fish bycatch will be monitored as part of the usual reporting process and managed accordingly.

⁵ Based on export figures for 2013 calendar year of \$4.31 / kg greenweight. This uses frozen fillets to estimate the greenweight export price as this product form accounted for 85% of export earnings and 72% of export volume for orange roughy in the 2013 calendar year. Precise value is difficult to estimate and is influenced by factors such as commodity prices, exchange rate, catching costs and export state.

⁶ The Minister for Primary Industries now exercises the powers and responsibilities of the Minister of Fisheries under the Fisheries Act 1996.

48 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 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.

49 As part of the implementation of the NPOA-Sharks 2013, a two-stage risk assessment is being completed for all sharks that will guide ongoing management. A preliminary, expert-based assessment should be available in late 2014 and a formal quantitative analysis will be available in 2015 to prioritise actions for species estimated to be at higher risk from fishing activities. Any additional catches of deepwater sharks will be taken into account through the risk assessment process.

50 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’. MPI is working with observers and the industry to increase species-specific reporting of these shark catches to better inform their management in conjunction with the risk assessment.

51 For these reasons, MPI is satisfied that any increase to the ORH 7A TAC is unlikely to have an unacceptable impact on the sustainability of the key species that are caught in conjunction with orange roughy. Fish bycatch levels in the fishery will continue to be monitored.

Protected species interactions

52 Options 2 or 3 would result in increased orange roughy fishing effort on the Southwest Challenger Plateau. This could result in increases to the known interactions with protected species, which are outlined below. However, MPI is comfortable that current management processes will ensure that the long-term viability of the affected protected species populations is not negatively impacted.

53 Orange roughy trawl fisheries rarely interact with marine mammals (Table 4). MPI considers that the management proposal is unlikely to have any additional effects on New Zealand fur seals, New Zealand sea lions, or any other marine mammals. However, MPI will continue ongoing monitoring of marine mammal interactions in all deepwater fisheries.

54 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 all 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

55 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.

56 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 (e.g. Salvin's albatross) and this will not be materially affected by the increase in fishing effort inherent in Options 2 and 3.

57 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.⁷

58 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.

Benthic impacts

59 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 more likely to continue in areas previously fished.

60 In recent years, 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 (none of these are within the ORH 7A QMA) and then with Benthic Protection Areas (two of these areas are within the ORH 7A area). The implementation of BPAs in 2007 effectively closed approximately 30% of the New Zealand EEZ to bottom trawling and established a monitoring regime to ensure these closures are adhered to.

⁷ More information on these projects can be found at the Department of Conservation's Conservation Services Programme website: www.doc.govt.nz/csp

61 The proposals to increase the TACC for orange roughy will result in an increase in fishing effort, and potentially additional areas being trawled.

62 The trawl footprint of the orange roughy fishery will continue to be mapped and monitored annually.

Other Management Measures

Sub-area catch limits

63 As indicated above, ORH 7A is a straddling stock, with a proportion of the fishing taking place outside New Zealand's EEZ on the Westpac Bank, an area now managed by the South Pacific Regional Fisheries Management Organisation (SPRFMO). The Westpac Bank area was closed to fishing in 2000 alongside the closure of ORH 7A. When ORH 7A was re-opened in 2010, industry requested that the Westpac Bank be re-opened as well under the same conditions that existed prior to the fisheries' closure.

64 The Westpac bank has been closed to bottom fishing by SPRFMO because it was not included in the 2002-06 SPRFMO bottom fishing footprint. The Westpac Bank has been re-examined as a result of the opening of ORH 7A. There were several trawl surveys during 2002-06 which have been included in New Zealand's bottom trawling footprint.

65 New Zealand is in the process of opening two areas of the Westpac Bank to fishing where they meet the definition of areas that should be open based on historic fishing activity as described in the NZ Bottom Fishing Impact⁸ assessment. There is a catch limit for orange roughy in the wider SPRFMO area of 1,852 tonnes.

66 For New Zealand vessels, orange roughy catches in the Westpac Bank area will be required to be reported against the ORH 7A TACC to ensure that total catches of the stock remain within the sustainable limit. The schedule of SPRFMO conditions for the 1 May 2014 fishing season (including the Westpac Bank) is being finalised.

67 To minimise risk of localised depletion caused by taking too large a proportion of the TACC from Westpac Bank, the fishery will be actively monitored. If it is considered that too large a proportion of the TACC is being caught on Westpac Bank, MPI will work with DWG to implement voluntary sub-area catch limits for this area.

Deemed values

68 The current interim and annual deemed value rates for ORH 7A were reviewed against current port prices, estimated export value, and deemed values for other orange roughy stocks. MPI proposes that the deemed value rates for ORH 7A be increased as follows:

- The annual deemed value rate would be \$5.00 per kg.
- The interim deemed value rate would be \$2.50 per kg.
- A differential deemed value rate of \$6.25 would apply to catch in excess of 110% of ACE holdings.

⁸ <http://www.southpacificfmo.org/assets/Science/Benthic-Impact-Assessments/New-Zealand/New-Zealand-Bottom-Fishery-Impact-Assessment-v1.3-2009-05-13.pdf>

69 These deemed value rates are consistent with the rates in place in other New Zealand orange roughy fisheries, and MPI considers the increased rates are appropriate to provide incentives for fishers to acquire or maintain sufficient ACE so the catch limits are not exceeded.

FUTURE CONSIDERATIONS

70 A multi-frequency acoustic survey is scheduled for the Westpac Bank portion of the ORH 7A stock in 2014. This survey may provide further information for an updated future stock assessment and subsequent management measures.

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

CONCLUSION

72 MPI is comfortable that a utilisation opportunity exists in the Southwest Challenger Plateau orange roughy fishery. Stock status and projections estimated from the 2014 assessment model indicate that a catch increase of up to 1,600 tonnes is likely to be sustainable while still retaining the stock within the management target range.

73 MPI has proposed two options for increases to the ORH 7A TAC and TACC. Option 2 is the more conservative of the two, however Option 3 is still considered to be conservative as it does not take the entire increase that the assessment indicates may be available and maintains stock status above the management target range.