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Ministry for Primary Industries
Manatū Ahu Matua

Review of sustainability controls for southern blue whiting (SBW 6I)

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Requests for further copies should be directed to:

Publications Logistics Officer
Ministry for Primary Industries
PO Box 2526
WELLINGTON 6140

Email: brand@mpi.govt.nz
Telephone: 0800 00 83 33
Facsimile: 04-894 0300

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SUSTAINABILITY REVIEW OF FISH STOCKS 2014

This Initial Position Paper (IPP) provides the Ministry for Primary Industries' (MPI's) initial views on proposals for SBW 6I sustainability measures and other management controls for the 1 April 2014/15 fishing year.

MPI has developed this IPP for the purpose of consultation as required under the Fisheries Act 1996 (the Act). MPI emphasises the views and recommendations outlined in the paper are preliminary and are provided as a basis for consultation with stakeholders.

In March 2014, MPI will compile the Final Advice Paper (FAP) for the attached proposal. This document will summarise MPI's and stakeholder's views on the issues being reviewed, and provide final advice and recommendations to the Minister for Primary Industries. 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. Hard copies will be available on request.

DEADLINE FOR SUBMISSIONS

MPI welcomes written submissions on the proposals contained in the IPP. All written submissions must be received by MPI no later than 5pm on Friday, 28 February 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

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 under the Act

Review of sustainability controls for southern blue whiting at Campbell Island (SBW 6I)

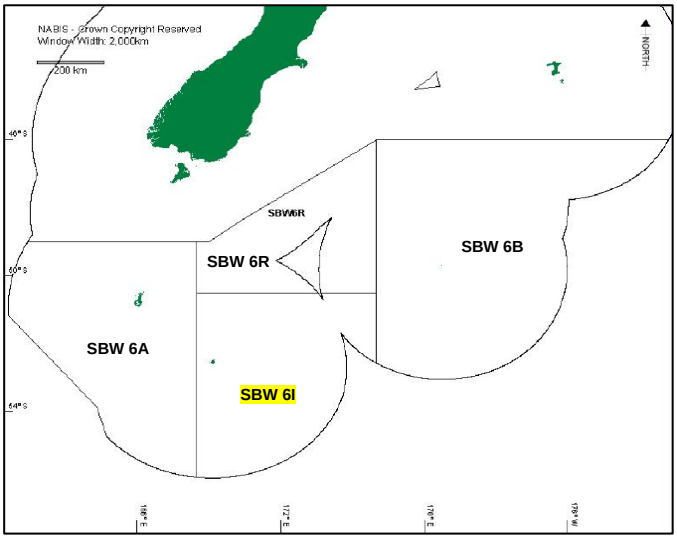

Figure 1: Quota Management Area (QMA) for SBW 6I

1 Introduction

1. The Ministry for Primary Industries (MPI) is seeking information and views from tangata whenua and stakeholders to inform a review of the management settings for southern blue whiting in the Campbell Island quota management area (QMA) SBW 6I (Figure 1).

2. The 2014 SBW 6I stock assessment estimates stock status to be 58%B_0 (B_0 is the unfished biomass). MPI has high confidence in this assessment and considers it highly likely that the stock is above the default management target of 40%B_0.

3. MPI proposes three options, two of which would increase the total allowable catch (TAC) and allowances in order to move SBW 6I biomass back towards, or above the management target. All options are considered consistent with section 13(2) of the Fisheries Act 1996 (the Act) and with the objectives within the National Fisheries Plan for Deepwater and Middle-depth Fisheries.

Table 1: Proposed TAC, TACC and allowance options for SBW 6I

Option			Allowances		
	TAC (t)	TACC (t)	Māori Customary (t)	Recreational (t)	Other sources of fishing-related mortality (t)
Option 1 (*Status Quo*)	30 000	29 400	0	0	600
Option 2	35 000	34 300	0	0	700
Option 3	40 000	39 200	0	0	800

4. As part of each option MPI proposes that a 2% allowance be made within the TAC for other sources of fishing related mortality and that the remaining 98% of the TAC is allocated as the total allowable commercial catch (TACC). There is no known customary Maori or recreational take of southern blue whiting and it is proposed to retain zero allowances for these sectors. MPI does not propose to review the current deemed value rates for southern blue whiting.

2 Context

2.1 BIOLOGICAL CHARACTERISTICS OF SOUTHERN BLUE WHITING

5. Southern blue whiting (*Micromesistius australis*) is a relatively productive species that is generally confined to sub-Antarctic waters to the south of New Zealand. This species exhibits fast growth especially during the juvenile life stage.

6. Adult southern blue whiting form dense spawning aggregations at four known locations across the sub-Antarctic, at depths of 250-600 metres during July to September. The available scientific information shows that these four spawning locations represent four distinct stocks.

7. The stocks are characterised by highly variable year class strength. Very strong year classes are observed infrequently and are separated by longer periods of average or below average recruitment.

8. Southern blue whiting generally mature between the ages of 2 and 4, when they recruit to the spawning grounds (and the commercial fishery) for the first time. This age of first spawning is observed to increase in the strong year classes, which show signs of a density dependent response to high abundance through slower growth and a higher age at maturity.

2.2 SBW 6I FISHERY

9. Southern blue whiting was introduced to the quota management system (QMS) in 1999. Before this, harvests were managed via sub-area catch limits from 1992. Each of the four southern blue whiting stocks is managed separately.

10. SBW 6I is the largest of the four stocks and has supported a catch limit in excess of 20 000 tonnes for the last 15 years. Harvest levels have fluctuated over the course of the fishery in response to biomass fluctuations that result from variation in recruitment strength.

11. The fishery operates when the SBW 6I stock aggregates to spawn, during late August and September. The fishery is purely a commercial fishery with between 10 and 14 offshore trawl vessels participating each year.

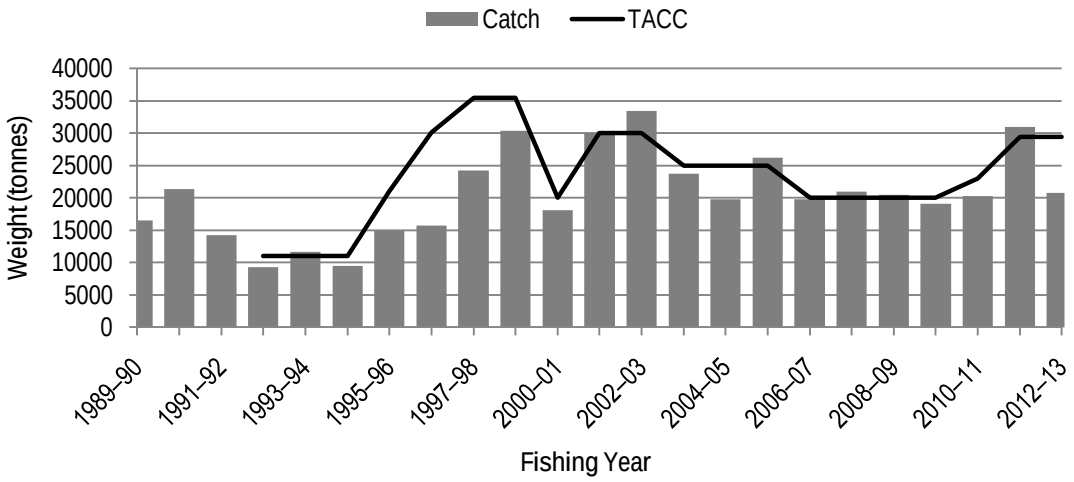

Figure 2: Estimated catch and TACC in SBW 6I 1989–2013.

2.3 MANAGEMENT APPROACH

12. SBW 6I is managed within the National Deepwater Plan as a Tier 1 stock. A fisheries-specific southern blue whiting chapter of the National Deepwater Plan was finalised in 2011. The chapter details the management approach and operational objectives for the fishery.

13. The management approach for SBW 6I is based on regular stock assessments, which lead to regular TAC and TACC reviews. Stock assessments incorporate all available data from the commercial catch history, from a stock specific research time series of acoustic surveys and from biological sampling of both the commercial and research catch, which provides proportion-at-age data.

14. The TAC reviews are guided by the stock's status in relation to the current reference points for southern blue whiting. The reference points specified in the southern blue whiting fisheries plan chapter are the default targets and limits set out within the Harvest Strategy Standard for New Zealand Fisheries, [1] listed in Table 2. The management target of 40%B_0 is understood to be a conservative proxy for B_{MSY} for a species with the life history characteristics of southern blue whiting.

Table 2: Southern blue whiting default reference points, and the associated management response.

Reference point	Management response
Management target of 40% B_0	Stock permitted to fluctuate around this management target. TAC changes will be employed to move stock toward or above target.
Soft limit of 20% B_0	A formal time constrained rebuilding plan will be implemented if this limit is reached.
Hard limit of 10% B_0	The limit below which fisheries will be considered for closure.
Harvest control rule	Management actions determined by the results of a series of forward projections under a range of catch assumptions, guided by the biological reference points

[1] http://fs.fish.govt.nz/Page.aspx?pk=104

2.4 PREVIOUS REVIEW

15. Previous reviews of the SBW 6I TAC took place before the start of the 1 April fishing years in 2010 and 2011. The TAC was increased from 20 000 to 23 000 tonnes in 2010 and to 30 000 tonnes in 2011.

16. Those reviews were informed by the 2010 SBW 6I stock assessment, which determined stock status to be 41%B_0. The assessment incorporated all available datasets up to the end of the 2009 fishing season, including the results from the 2009 research survey. At that time, a strong year class (the 2006 year class), and an average strength year class (the 2007 year class) were recruiting to the adult stock. Biomass was projected to increase as these year classes fully recruited.

17. Following public consultation in 2010, a phased approach to increasing the TAC was taken during 2010 and 2011. This allowed for further growth of a higher proportion of the strong year classes before harvesting. Fish size is an important economic consideration for quota holders. Delaying harvests until the fish size has increased allows greater value to be derived from the stock.

18. The SBW 6I stock assessment was also updated in 2012, following the next research survey in 2011. That assessment provided evidence that a second strong year class (the 2009 year class) had started to recruit to the adult stock.

19. The assessment in 2012 determined that stock status was above the management target at 50%B_0 and could likely sustain a further TAC increase. However, preliminary consultation with quota holders provided agreement that the status quo TAC be retained for 2012-13 and 2013-14.

20. This decision was influenced by the relatively small size of fish within the 2009 year class at that time. Also, this year class had only been observed once, during the 2009 survey, so it was uncertain whether the year class would prove to be as strong as estimated in the assessment model.

2.5 CURRENT STOCK STATUS

21. The most recent acoustic research survey of the SBW 6I stock was undertaken by the *R. V. Tangaroa* during late 2013. Following the survey, all datasets in the SBW 6I stock assessment were updated to include data to the end of the 2013 fishing season.

22. The 2014 assessment was finalised and accepted by MPI's Deepwater Fisheries Assessment Working Group on 30 January 2014. The results are consistent with the expected stock status that was projected using the previous stock assessment in 2012.

23. SBW 6I stock status is now estimated to be 58%B_0. The 2009 year class that was first observed in 2011 has continued to recruit to the adult stock. The recent survey confirmed the earlier evidence that this is another very strong year class, which has driven an increase in stock biomass over the past two years.

24. At age 4, the 2009 year class is now expected to be near-fully recruited to the adult stock. Stock biomass is therefore unlikely to increase far beyond the current level, unless a further strong year class enters the fishery. However, the 2009 year class has now grown to a good size for harvesting being on average >35cm and has had the opportunity to contribute to the adult spawning population.

3 Proposed Management Response

25. In response to the 2014 SBW 6I stock assessment results, MPI is consulting on the following management options for the Minister to set the TAC, TACC and allowances for SBW 6I (Table 3).

Table 3: Proposed TAC, TACC and allowance options for SBW 6I

Option	TAC (t)	TACC (t)	Allowances		
			Māori Customary (t)	Recreational (t)	Other sources of fishing-related mortality (t)
Option 1 (*Status Quo*)	30 000	29 400	0	0	600
Option 2	35 000	34 300	0	0	700
Option 3	40 000	39 200	0	0	800

26. SBW 6I is currently estimated to be well above the management target of 40%B_0. The TAC would therefore be set under section 13(2)(c) of the Act, such that it will move the stock back towards or above the level that can produce the maximum sustainable yield, having regard to the interdependence of stocks.

27. Based on the results of the 2014 stock assessment, and projections that assume a range of catch levels (Figure 3), MPI considers that the proposed options are consistent with the objective of moving the SBW 6I stock size back towards or above the management target of 40%B_0. The proposed options would achieve this objective at different rates.

3.1 OPTION 1 (*STATUS QUO*)

28. Under Option 1, the existing TAC, TACC and allowances set in 2011 would be retained for the 2014/15 fishing year. Five year projections using the 2014 assessment model show that if this Option were implemented, stock biomass would be expected to decline gradually from its current peak above the management target, moving the stock towards the target.

29. However, the stock is projected to remain well above the management target over the next five years, with an expected stock status of 46%B_0 in 2018. This indicates that some additional utilisation could be provided for, whilst still ensuring the sustainability of the stock.

3.2 OPTION 2

30. Option 2 proposes:

- To increase the TAC from 30 000 tonnes to 35 000 tonnes.
- To increase the TACC from 29 400 tonnes to 34 300 tonnes.
- To increase the allowance for other sources of fishing-related mortality to 700 tonnes (2% of the proposed TAC)
- To retain the Mori customary and recreational allowance at 0 tonnes.

31. The SBW 6I stock is highly likely to sustain a higher level of utilisation over the short to medium term. Implementing Option 2 would move the stock back towards the management target at a faster rate than under Option 1, but the stock would be expected to remain at or above the target for at least the next five years even with this increased level of utilisation. Stock status in 2018 is projected to be 41%B_0 under this catch scenario.

32. Based on export figures from 2012 of $0.80/kg greenweight, A TACC increase of 4 900 tonnes could result in approximately $3.8 M in additional export revenue. [2]

3.3 OPTION 3

33. Option 3 proposes:

- To increase the TAC from 30 000 tonnes to 40 000 tonnes
- To increase the TACC from 29 400 tonnes to 39 200 tonnes
- To increase the allowance for other sources of fishing related mortality to 800 tonnes (2% of the proposed TAC)
- To retain the Māori customary and recreational allowance at 0 tonnes.

34. This Option would move the stock back towards the management target at the fastest rate. Projections indicate that stock status would remain above the management target, at 42%B_0 in 2017, but would have fallen to 35%B_0 by 2018.

35. The southern blue whiting harvest strategy intends for the stock status to fluctuate around the management target. Although Option 3 is the most aggressive of the three approaches to harvesting the available biomass presented in this paper, it is also unlikely to present a sustainability risk to the stock. A further research survey and stock assessment will take place before 2018, allowing the harvest level to be adjusted so that the stock size is maintained at about 40%B_0.

36. Based on export figures from 2012 of $0.80/kg greenweight, A TACC increase of 9 800 tonnes could result in approximately $7.8 M in additional export revenue. [3]

[2] This estimate is based on export figure of $0.80 / kg greenweight, from the 2012 calendar year. This uses frozen headed and gutted and frozen other form data to estimate the greenweight export price. These forms accounted for 90% of the total export volume of southern blue whiting during 2012. Precise revenue gain is difficult to estimate and will be influenced by factors such as commodity prices, exchange rate, catching costs and export state.
[3] ibid

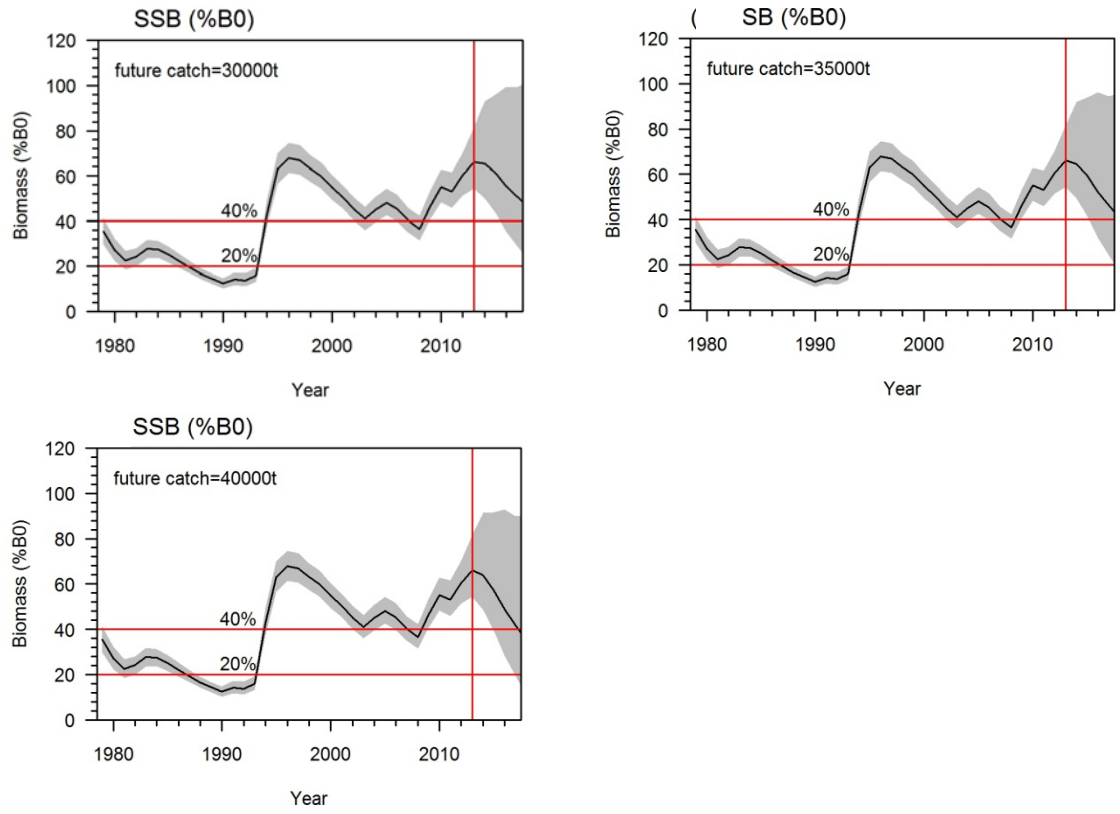

Figure 3: Projected SBW 6I spawning stock biomass (SSB) under a range of possible catch limits out to 2018 from the current status (vertical red line). Horizontal red lines represent the management target (40%B_0) and the soft limit (20%B_0)

3.4 SURVEY FREQUENCY

37. The five year projections shown in Figure 3 inform the determination of a suitable future yield from the stock. However, the current management approach includes more frequent surveys, assessments and TAC reviews than this five year horizon. These research surveys allows MPI to monitor the effects of the highly variable recruitment strength.

38. Frequent research surveys also allow the effects of any TAC changes to be observed, to help ensure biomass remains within the range anticipated by the previous stock assessment. The harvest level can be adjusted regularly to ensure the stock fluctuates around the management target.

39. It should be noted that under the current management approach, should any TAC increase be implemented following this review, the increase would most likely apply in the short term. The TAC will be reviewed again following the next research survey and stock assessment.

40. Options 1 and 2 do present a lower risk of the stock falling below 40%B_0 over the next two years (<5% probability). Should either of these options be implemented, it may be possible for the next research survey to occur at a later date. [4] However, if Option 3 were to be implemented, MPI would require that the next survey take place in 2015, given the increased risk of the stock dropping below the management target.

[4] In recent years MPI has contracted biennial research surveys of SBW 6I

4 Key Considerations

41. When making a decision concerning the TAC for a stock, the Minister for Primary Industries [5] (the Minister) must have regard to interdependence of stocks, the biological characteristics (discussed above) and any environmental conditions affecting the stock.

42. Sections 9(a) and (b) also require the Minister to take into account that associated or dependent species be maintained at or above a level that ensures their long-term viability, and that the biological diversity of the aquatic environment should be maintained

43. The key environmental interactions associated with the SBW 6I fishery are discussed below with reference to the likely impacts of the proposed management options.

4.1.1 Marine Mammals

44. One of the two stronghold breeding populations of New Zealand sea lions is on Campbell Island. Data collected during sea lion pup counts at Campbell Island in 2003, 2007 and 2009 indicates that pup production in this population could be increasing.

45. The SBW 6I fishery operates approximately 60 to 100 nautical miles offshore from Campbell Island, and overlaps somewhat with the foraging range of male New Zealand sea lions. Interactions between the SBW 6I fishery and New Zealand sea lions are known to occur, and these interactions have shown an increasing trend in recent years, shown in Table 5. During the most recent year a total of 21 incidental sea lion captures occurred. [6]All vessels in SBW 6I during 2013 had at least one MPI Observers on board.

46. Work is ongoing to determine whether these interactions are occurring at a frequency that would cause the New Zealand sea lion population at Campbell Island to decline below the level that ensures their long-term viability.

47. MPI is currently developing a semi-quantitative risk assessment approach for marine mammals that will assist with this determination. The first iteration of the outputs from this project is due to be reported in the second half of 2014. In the interim, a project to determine the potential biological removals (PBR) from the Campbell Island population has been progressed by the Deepwater Group Ltd (DWG). [7] This project has recently been peer reviewed by MPIs Aquatic Environment Working Group.

48. It is MPIs intention that incidental sea lion interactions will be minimised to the extent practicable, in accordance with Operational Objective 2.2 in the southern blue whiting fisheries-specific chapter of the National Deepwater Plan. This Objective states that MPI will work to ensure that incidental sea lion mortalities do not impact the long term viability of the sea lion population and that captures are minimised through good operational practices.

[5] The Minister for Primary Industries now exercises the powers and responsibilities of the Minister of Fisheries under the Fisheries Act 1996.
[6] These capture figures have not yet been officially collated and reported back to the Aquatic Environment Working Group
[7] The Deepwater Group Ltd is the commercial stakeholder group responsible for representing deepwater quota holders

Table 5: Effort, observed and estimated New Zealand sea lion captures in SBW 6I by fishing year [8]

Year	Total Tows	% tows Observed	Observed sea lion captures	Mean estimated sea lion captures
2004	690	34	1	3
2005	726	37	2	5
2006	521	28	3	9
2007	544	32	6	15
2008	557	41	2	5
2009	627	20	0	1
2010	550	43	11	24
2011	815	40	6	14
2012	591	76	0	1

49. DWG has also signalled its objective that sea lion captures in SBW 6I be reduced to zero. Following the apparent increasing trend in incidental sea lion captures in SBW 6I, further measures are needed to ensure that these objectives to minimise captures can be achieved.

50. Further work has therefore been initiated between DWG and MPI to develop additional mitigation approaches to reduce the risk of future interactions. The aim is for these measures to be finalised before the 2014 fishing season at SBW 6I commences, following further engagement with a wider group of stakeholders.

51. It is anticipated that the approach will incorporate an MPI Observer on every vessel in the fishery. MPI intends to work with a group of technical experts over the coming months to develop an agreed, standardised observation and sampling protocol specifically geared to collecting information that can assist with the future management of interactions with the fishery.

52. Following the high number of captures during 2013 a decision was taken to deploy sea lion exclusion devices (SLEDs) in the fishery for the first time. SLEDs were developed for use in the squid fishery at the Auckland Islands (SQU6T) and are designed to allow sea lions to escape and survive an interaction with a trawl net.

53. Recent research reported to MPI has shown that SLEDs are an effective mitigation tool that reduces the risk of a sea lion mortality resulting from an interaction with trawl gear. The Minister for Primary Industries and the Minister of Conservation both requested that the fleet at SBW 6I trial the use of SLEDS during 2013. The trials were deemed to be generally successful, in that the majority of the fleet was able to deploy SLEDs successfully without significant operational problems.

54. The specific details around SLED deployment in SBW 6I during 2014 have yet to be finalised, but MPI expects that at the least all vessels involved in the SBW 6I fishery during 2014 will have a SLED on board for the duration of their involvement in the fishery.

55. In conjunction, MPI has been working with the industry to increase awareness amongst the fleet of the increased risk of interactions, and re-emphasising the importance of adherence to the current marine mammal operational procedures (MMOP). The MMOP requires that vessels

[8] Taken from Thompson *et al* in prep

minimise the length of time the fishing gear is on the surface, remove all stickers from the net before shooting the gear, steam away from any congregations of marine mammals before shooting the gear and to appoint a crew member to watch for marine mammal interactions every time the gear is shot or hauled.

4.1.2 Fish bycatch

56. Total fish bycatch in the southern blue whiting fisheries is estimated to be <1% of the total catch from the fishery. The fishery targets single species schools of southern blue whiting and as a result takes minimal bycatch.

4.1.3 Seabirds

57. Seabird interactions with SBW 6I generally occurred at low rates, although a small number of interactions are known to occur. The population implications of these seabird interactions have recently been elucidated through MPIs comprehensive seabird risk assessment. [9] The risk from all New Zealand's commercial fisheries was assessed to 70 seabird species. The southern blue whiting fisheries overall were assessed to contribute very low levels of risk to a small number of seabird species.

58. Mandatory measures are in place across the deepwater fleet to address seabird captures, including the requirement that all trawlers deploy bird mitigation devices when fishing gear is in use. In addition, non-regulatory management includes vessel-specific measures known as vessel management plans (VMPs), which set out the onboard practices that vessels must follow to avoid seabird interactions, including offal management and good factory cleanliness. MPI currently monitors vessel performance against VMPs and works in collaboration with DWG to rectify any issues that arise during the fishing season. This practice will continue during the 2014-15 fishing year.

4.1.4 Benthic impacts

59. Southern blue whiting are generally fished using mid-water trawl gear near or on the seabed, as this is where the fish aggregate. The gear is generally not fished hard down on the seabed, which may reduce the severity of any benthic impact. SBW 6I also operates over a relatively short temporal scale, and the fished area is relatively restricted and changes very little from year to year.

60. Research has been reported to characterise both New Zealand's benthic environment and the level of benthic impact from fisheries activity. [10] This work, which produced a benthic-optimised marine environmental classification (BOMEC) of New Zealand's exclusive economic zone (EEZ), is not specific to SBW 6I but identifies that all SBW 6I fishing activity occurs over one of the 15 BOMEC habitat classes - BOMEC class L. The total area of the SBW 6I footprint is

[9] http://www.mpi.govt.nz/Default.aspx?TabId=126&id=1758
[10] Leathwick, J.R., Rowden, A., Nodder, S., Gorman, R., Bardsley, S., Pinkerton, M., Baird, S.J., Hadfield, M., Currie, K., Goh, A., 2010. Benthic-Optimised Marine Environment Classification (BOMEC) for New Zealand waters. Final Research Report for BEN2006-01 Objective 5. 52pp.

11,485km^2,[11] which equates to 6% of the total area of BOMEC class L. MPI acknowledges that the total trawl footprint on BOMEC class L is estimated at 24% of the total area. This includes trawl effort from all deepwater and middle-depth fisheries, not solely SBW 6I.

61. Although the options proposed may result in increased fishing effort within SBW 6I, the spawning aggregations generally occur in the same area, so any additional effort will likely occur over ground that has been trawled previously.

5 Initial Consultation

62. Given the short timeframe between the stock assessment being finalised and the start of the fishing year, MPI has not been able to undertake preliminary discussions with stakeholders regarding the options in this paper.

6 Conclusions

63. The SBW 6I stock has been assessed to be at a healthy level, well above the management target of 40%B_0. It is clear that the stock could sustain a higher harvest level over the short term. All three options will result in the stock being managed above or near the management target. Options 2 and 3 allow for greater economic return from the fishery.

64. There are known interactions between this fishery and New Zealand sea lions and work is ongoing to develop measures that will reduce the risk of further incidental captures during 2014. MPI will be engaging with stakeholders to develop and finalise these measures over the coming months.

[11] Black, J. & Wood, R. (2010) Analysis of New Zealand's Trawl Grounds for Key Middle Depths and Deepwater Tier 1 Fisheries. GNS Science Consultancy Report 2010/67