Ministry for Primary Industries
Manatū Ahu Matua

Review of sustainability controls for the Bounty Platform southern blue whiting fishery (SBW6B)

Consultation Document for the TAC, TACC, Allowance, and Deemed Values for SBW6B

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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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1 Submission Information

MPI welcomes written submissions on the proposals contained in the Consultation Document. All written submissions must be received by MPI no later than 5pm on Tuesday 17 February 2015.

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

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2 Executive Summary

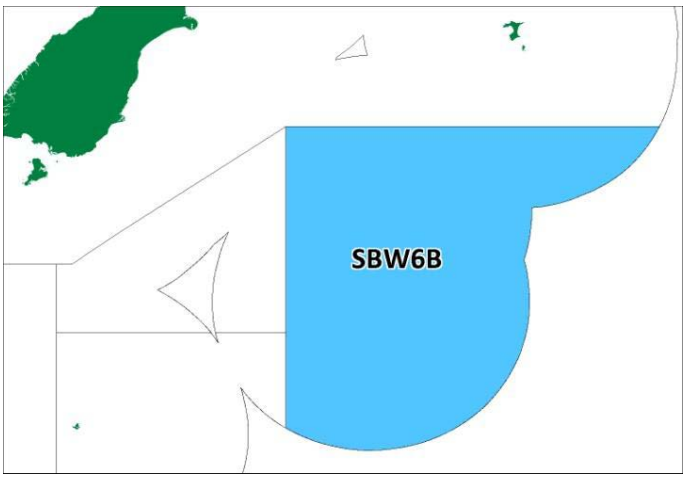

Figure 1: Quota Management Area (QMAs) for the southern blue whiting fishery at the Bounty Platform (SBW6B).

The Ministry for Primary Industries (MPI) is seeking information and views from tangata whenua and stakeholders to inform a review of catch limits for southern blue whiting in the Bounty Platform Quota Management Area SBW6B (see Figure 1).

The results of the 2014 acoustic survey of this stock indicate that SBW6B biomass has continued to decrease since the biomass peak in 2007 and 2008. MPI's Deepwater Fisheries Assessment Working Group (DWWG) did not accept the 2014 SBW6B stock assessment because of the high uncertainty associated with the stock status estimates. However, the DWWG agreed that the model, and the biomass estimates from the acoustic survey represent the best available information on the status of the stock.

This information indicates with sufficient confidence that stock biomass is likely to be below the management target of 40% B_0 (B_0 represents the stock biomass that exists in the absence of fishing). Consequently, MPI proposes that the total allowable catch (TAC) for SBW6B be reduced to a level that is sustainable given the current stock biomass. The specific options proposed for the TAC, total allowable commercial catch (TACC) and associated allowances are provided in Table 1.

Table 1: Proposed TACs, TACCs and allowance options for SBW6B

Option		Allowances			
	TAC (t)	TACC (t)	**Customary Māori** (t)	Recreational (t)	Other sources of fishing-related mortality (t)
Current Settings	7,000	6,860	0	0	140
Option 1	4,000	3,920	0	0	80
Option 2	3,000	2,940	0	0	60
Option 3	2,000	1,960	0	0	40

There is no known customary Maori or recreational take of southern blue whiting and it is proposed to retain zero allowances for these sectors. In addition, MPI proposes to maintain the allocation for other sources of fishing related mortality at 2% of the TACC. MPI is not proposing any changes to SBW6B deemed value rates.

3 Purpose

3.1 NEED FOR ACTION

Acoustic surveys are conducted in SBW6B annually in October to monitor spawning stock abundance. The 2014 acoustic survey indicates that biomass has continued to decline and is below the management target of 40% B_0 and below the level that can support the maximum sustainable yield. The 2014 survey also indicated that there has been very low recruitment to the fishery since 2007.

MPI considers it is necessary to reduce the TAC to ensure harvest levels remain sustainable given the lower stock biomass. This reduction will return the TAC closer to the level that it was set prior to the very large biomass increase in 2007. This increase was a result of recruitment of a single very strong year class.

3.2 MANAGEMENT APPROACH

SBW6B is managed within the National Fisheries Plan for Deepwater and Middle-Depth Fisheries (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.

The management approach for SBW6B employs regular acoustic surveys as a key source of information for the estimation of stock status. Between 1993 and 2001, a series of wide area acoustic surveys for southern blue whiting were carried out on the Bounty Platform using the research vessel *Tangaroa*. From 2004 to 2014, a series of local area aggregation surveys have been carried out by industry vessels fishing at the Bounty Platform. These surveys enable regular stock assessments and TAC and TACC reviews. Stock assessments incorporate all available data, which includes the commercial catch history, acoustic research surveys, and biological sampling which provides proportion-at-age data.

The TAC and TACC are set based on information on the status of the stock in relation to the current reference points for southern blue whiting. The current reference points for SBW6B are the default targets and limits set out within the Harvest Strategy Standard for New Zealand Fisheries as described in Table 2.[1] 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] The Harvest Strategy Standard can be found at http://fs.fish.govt.nz/Page.aspx?pk=104

In past years when the stock assessment model has not been accepted by the DWWG, an appropriate current annual yield (CAY) has instead been calculated from the current biomass estimate. The CAY is the one year catch calculated by applying a sustainable fishing mortality level to an estimate of current fishable biomass. For SBW6B the current biomass estimate is provided from the most recent acoustic survey and the fishing mortality that will provide the maximum sustainable yield (F_{MSY}) is applied. A common method used to estimate F_{MSY}, and the method used here, is to apply an F that is equivalent to the natural mortality rate (M). F=M is considered a conservative proxy for F_{MSY} and for southern blue whiting M is estimated to be 0.21. The CAY is therefore estimated to be approximately 20% of the available biomass.

4 Background Information

4.1 BIOLOGICAL CHARACTERISTICS OF SOUTHERN BLUE WHITING

Southern blue whiting (*Micromesistius australis*) is a relatively productive species that is generally confined to depths of 250-600 metres in sub-Antarctic waters to the south of New Zealand. This species exhibits fast growth especially during the juvenile life stage.

Adult southern blue whiting form dense spawning aggregations at four known locations across the sub-Antarctic. The available scientific information shows that these four spawning locations represent four distinct biological stocks.

New Zealand's southern blue whiting stocks are characterised by highly variable recruitment, often referred to as year class strength. Very strong year classes are observed infrequently and are separated by longer periods of average or below average recruitment. The variables that drive these fluctuations are poorly understood, but strong year classes can produce very large spikes in available biomass, providing short term utilisation opportunities. A challenge associated with these short term opportunities is increasing and subsequently decreasing harvest levels efficiently in response to the changing biomass.

Southern blue whiting generally mature between the ages of two and four, when they recruit to the spawning grounds (and the commercial fishery) for the first time. The 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.

4.2 SBW6B FISHERY

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. The fishery operates when the SBW6B stock aggregates to spawn, during late August and September. The fishery is purely a commercial fishery with between five and nine deepwater trawl vessels participating each year.

Landings from the four southern blue whiting stocks totalled over 33,000 tonnes in 2013/14 and provided export earnings of approximately $29 million in the 2013 calendar year. Roughly 13% of these landings came from SBW6B, leading to an estimated value of $3.8 million for the SBW6B fishery. The southern blue whiting fishery, including fish harvested from SBW6B, has been certified as sustainable by the Marine Stewardship Council since April 2012.

SBW6B is the second largest of the four stocks and has supported catch limits between 3,500 – 15,000 tonnes over the last 10 years. The wide variation in the catch limits is the result of changes in biomass caused by fluctuations in recruitment strength.

Annual surveys in recent years have monitored these changes in biomass and enabled provision of utilisation opportunities for industry. The 2007 survey identified a significant influx of recruitment associated with a very strong 2002 year class, which was very slow growing and late to mature. The 2007 year class was also estimated to be above average, which has also contributed to the available biomass.

4.3 PREVIOUS REVIEWS

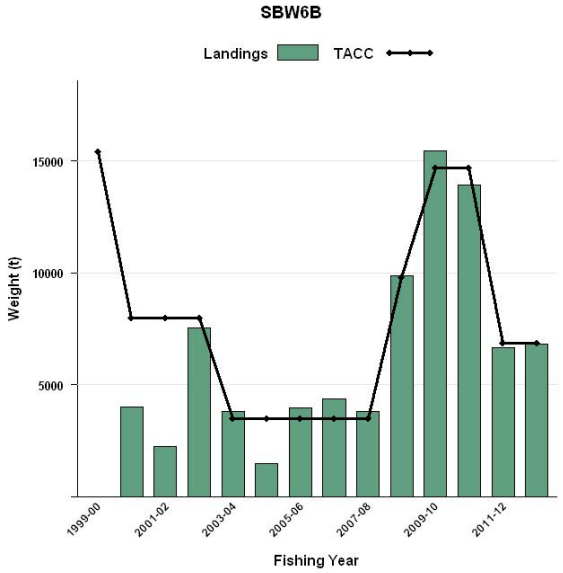

Figure 2: Landings and the TACC for SBW6B from 1999-00 to 2012-13

TAC reviews of SBW6B have previously occurred in 2008, 2009 and 2011. The reviews in 2008 and 2009 resulted in TAC changes that allowed the fishery to take advantage of the significant biomass increase that resulted from the recruitment of the very strong 2002 year class. The TACC was increased up to 14,700 tonnes, from 4,500 tonnes (Figure 2).

In 2011, the biomass estimate from the survey declined. It is unknown why stock biomass decreased but it is thought that either a large proportion of the strong 2002 year class died off naturally or moved to spawn elsewhere. In response, the TACC was decreased to 6,860 tonnes.

The 2012 survey also provided a low biomass estimate, but the TAC was not reviewed before the 2013 fishing year because of the wide uncertainty around survey estimates and concern that the low biomass estimate was the result of the survey vessel being unable to effectively survey the whole spawning aggregation. The fishing industry voluntarily shelved annual catch entitlement (ACE) to an effective catch limit of 4,028 tonnes to ensure that the stock was not overfished.

All reviews prior to 2014 were informed by a CAY calculation as the DWWG did not accept the SBW6B stock assessments as providing an estimate of stock status with sufficient confidence. The models did not provide satisfactory fit to the local area aggregation surveys estimates and also struggled to fit the large biomass increase from 2007 and the subsequent decrease.

In 2014, The DWWG accepted an updated stock assessment model with a base case that gave less weight to the biomass estimates from the 2009-2012 acoustic surveys. The biomass estimate from the survey in 2013 was 12,200 tonnes higher than the previous year, supporting the view that the 2009-2012 surveys may not have sampled the entire spawning aggregation.

The 2014 stock assessment model estimated stock status to be between 40%B_0 and 50% B_0, above the management target. It was projected that biomass would decrease over the following three years as the 2002 and 2007 year classes were fished out.

The TAC was not reviewed in 2014 in response to the assessment. The shelving arrangement from 2013 was not continued as the stock assessment indicated that harvest levels of up to 10,000 tonnes would not cause the stock to decrease below the management target of 40% B_0.

4.4 2015 STOCK ASSESSMENT

The 2014 acoustic aggregation survey estimates current spawning stock biomass is around 11,830 tonnes. The survey confirmed that stock biomass has continued to decline and also showed that there has been no significant new recruitment into the fishery.

The 2015 stock assessment has not been accepted by the DWWG as a sufficiently accurate estimate of current stock status. Similar to the previous assessment the model estimates did not suitably fit the observed biomass estimates from the aggregation surveys, particularly since 2010.

Although the assessment was not accepted, the DWWG considered two model runs (model 2.3 and 3.11) to be useful for informing management on the upper and lower bounds of plausible stock status. Both model runs suggest that the stock is likely to be below the management target of 40%B_0. These model runs were used to conduct projections that would provide information on the biomass trajectory of the stock under a range of catch scenarios.

These projections assumed no future recruitment and suggested that the biomass of the SBW6B stock is likely to continue to decrease even in the absence of fishing (Table 3). These projections can be used to suggest a plausible trajectory of the stock, with an understanding that such results are inherently uncertain given that the assessment was not accepted by the DWWG.

In the absence of an accepted assessment model, the biomass estimate from the most recent survey is also used to determine an appropriate harvest level for the next fishing year, using the CAY approach. A 2015 CAY of 3,452 tonnes is calculated, using the survey estimate of mid-year spawning biomass in 2014, adjusting for acoustic target strength and the harvest taken after the mid-point of the season, then applying a constant fishing mortality of 0.2 (F=M).

All options presented in this paper would move harvest levels to within the bounds of the estimated CAY for 2015. Option one would set a TACC slightly higher than the CAY estimate while the other two options would set a TACC lower than the CAY estimate, one being further below and therefore more conservative.

5 Legal Considerations

5.1 SETTING MANAGEMENT MEASURES

The TAC for SBW6B is set under section 13(2) of the Fisheries Act 1996 (the Act). This section requires the Minister for Primary Industries (the Minister) to set a TAC that maintains the stock at or above a level that can produce the maximum sustainable yield (MSY), or if the stock is above or below that level, to move towards or above the level that can produce the maximum sustainable yield.

The best estimate of SBW6B vulnerable biomass is considered likely to be below $40\%B_0$. As mentioned previously, in the absence of a full stock assessment, stock status can only be approximately inferred. Using the southern blue whiting harvest strategy which notes that $40\%B_0$ is understood to be a conservative proxy for B_{MSY}, the current stock status is estimated as likely to be below this level.

MPI therefore considers that the TAC for SBW6B should be set under section 13(2A) of the Act, which requires the Minister to restore the stock to 'at or above' a level that will produce B_{MSY} even if the level of the stock that can produce the MSY is not able to be reliable estimated using the best available information. The options within this paper provide the Minister with a choice on how he fulfils his obligations under section 13(2A).
Under section 13(3) of the Act, relevant social, cultural and economic considerations must be considered by the Minister in determining an appropriate way and rate to move the stock towards or above a level that can produce the MSY.

The TAC must be apportioned between the relevant sectors and interests set out under the provisions of section 21 of the Act. Section 21 requires the Minister to allow for Maori customary non-commercial interests, recreational fishing interests, and for any other sources of fishing-related mortality, when setting or varying the TACC.

There is no known customary Maori or recreational take in SBW6B; and as such, MPI proposes retaining nil allowances for these sector groups.

Currently, an allowance of 2% of the TAC exists to account for other sources of fishing related mortality. MPI proposes to retain this allowance of 2% for the 2015-16 fishing year.

5.2 FURTHER CONSIDERATIONS

When making a decision concerning the TAC for a stock, the Minister [2] must have regard to interdependence of stocks, the biological characteristics (discussed above) and any environmental conditions affecting the stock.

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.

The key environmental interactions associated with the SBW6B fishery are discussed below with reference to the likely impacts of the proposed management options.

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

5.2.1 Marine Mammals

The SBW6B fishery overlaps somewhat with the foraging range of New Zealand fur seals which live on the Bounty Islands. Interactions between the SBW6B fishery and fur seals are known to occur, with the fishery being responsible for one of the highest rates of fur seal mortalities in New Zealand.

Despite this high capture rate it is thought that current rates are not having an adverse effect on the population, due to the most recent estimate of population size at the Bounty Islands. Work is needed however to improve these population estimates and assess the potential of the fur seal population at the Bounty Islands to sustain the present levels of bycatch.

It is MPIs intention that incidental fur seal interactions are minimised to the extent practicable, in accordance with Management Objective 2.5 of the National Deepwater Fisheries Plan and Operational Objective 2.3 and in the southern blue whiting fisheries-specific chapter within this Plan. These objectives state that MPI will work to ensure that incidental New Zealand fur sea mortalities do not impact the long term viability of the fur seal population and that captures are minimised through good operational practices.

MPI works closely with the industry to increase awareness amongst the fleet of the risk of interactions, and emphasises the importance of adherence to the current marine mammal operational procedures (MMOP). The MMOP aims to reduce the risk of interactions with marine mammals by requiring that vessels minimise the length of time the fishing gear is on the surface, remove all pieces of dead fish from the net before shooting the gear, steam away from any congregations of marine mammals before shooting the gear and appoints a crew member to watch for marine mammal interactions every time the gear is shot or hauled. Performance in relation to these procedures is audited by MPI, which will continue into the 2015/16 fishing year.

With the range of non-regulatory measures in place, the options should have no additional effects on fur seals as decreased catch limits are proposed.

5.2.2 Fish bycatch

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.

All of the options proposed result in decreased fishing effort so it is unlikely that any of the options will result in an increase of fish bycatch.

5.2.3 Seabirds

Management of seabird interactions with New Zealand's commercial fisheries is driven through the 2013 National Plan of Action to Reduce the Incidental Captures 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 as a priority but also aiming to minimise captures of all species to the extent practicable.

The level of risk from commercial fishing to individual seabird species has been identified through a comprehensive hierarchical risk assessment [3] that underpins the NPOA-Seabirds. Seabird interactions with SBW6B generally occur at low rates, although interactions are known to occur. The southern blue whiting fisheries overall were assessed to contribute very low levels of risk to a small number of seabird species.

Regulatory and non-regulatory management measures are in place to mitigate and manage interactions with seabirds. Mandatory measures include the requirement that all trawl vessels over 28 m in length deploy bird mitigation devices during fishing. Non-regulatory management measures include vessel-specific vessel management plans (VMPs). The VMPs describe onboard practices vessels must follow to reduce the risk of a seabird capture, including offal management and good factory cleanliness. MPI monitors each vessel's performance against its VMP and works with DWG to rectify any issues that arise during the fishing season. This practice will continue during the 2015-16 fishing year.

All options proposed would result in decreased fishing effort in SBW6B. With the range of regulatory and non-regulatory measures in place, the management proposals should have no additional effects on seabirds as no increases in catch limits or TACs are proposed.

5.2.4 Benthic impacts

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. SBW6B also operates over a relatively restricted area which changes very little from year to year.

Research has been reported to characterise both New Zealand's benthic environment and the level of benthic impact from fisheries activity. [4] This work, which produced a benthic-optimised marine environmental classification (BOMEC) of New Zealand's exclusive economic zone (EEZ), is not specific to SBW6B but identifies that all SBW6B fishing activity occurs over one of the 15 BOMEC habitat classes - 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 SBW6B.

The options proposed will decrease fishing effort within SBW6B so it is unlikely any options will result in an increased benthic impact. Furthermore it is highly likely that any future fishing effort will occur over ground that has been trawled previously.

[3] http://www.mpi.govt.nz/Default.aspx?TabId=126&id=1758

[4] 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.

6 Proposed Options

MPI is consulting on the following management options for the Minister to set the TAC, TACC and allowances for SBW6B (Table 3).

Table 3: Proposed TAC, TACC and allowance options for SBW6B

			Allowances		
	TAC (t)	TACC (t)	**Customary Māori (t)**	Recreational (t)	Other sources of fishing-related mortality (t)
Current Settings	7,000	6,860	0	0	140
Proposed Options					
Option 1	4,000	3,920	0	0	80
Option 2	3,000	2,940	0	0	60
Option 3	2,000	1,960	0	0	40

The options proposed progressively reduce the rate of decline and are close to, or more conservative than, the CAY estimated for 2015. The status quo is not considered to be an appropriate option given the reduction in available biomass. Annual monitoring of the SBW6B stock will also occur to ensure annual harvest levels are further dropped or increased in response to any future recruitment.

6.1 OPTION 1

SBW6B stock biomass is highly likely to decrease over the short to medium term. Implementing Option 1 would reduce harvest levels by over 40% and reduce fishing mortality to a level which projections suggest may maintain the stock around the soft limit of 20%B_0 in the short term.

Option 1 would set the TAC above the 3,452 tonnes estimated CAY for 2015 by 548 tonnes. This option is less conservative than Options 2 and 3, but would minimise the immediate impacts on the fishing industry while maintaining the stock at or above the soft limit in the short term. Unless an increase in recruitment is detected, additional reductions to the TAC after 2015 may be required if Option 1 were implemented.

Based on export figures from 2014 of $1.42/kg greenweight, a TACC decrease of 2,940 tonnes as proposed in this option may result in approximately $4.1 million in export revenue loss. [5]

6.2 OPTION 2

Implementing Option 2 would decrease harvest levels by over 50%, and would reduce the rate at which the SBW6B biomass decreases compared to Option 1. Option 2 would move harvest levels closely in line with, but below, the 2015 CAY estimate of 3,452 tonnes and is considered likely to maintain the stock at or above the soft limit of 20% B_0 in the short term. Given the uncertainty in both the stock assessment and the available projections, it is likely to be appropriate to set a TAC that is below the CAY estimate.

[5] This estimate is based on export figure of $1.42 / kg greenweight, from Jan 2014- Oct 2014. This uses frozen headed and gutted, frozen fillets, frozen whole, and frozen 'other form' data to estimate the greenweight export price. Precise revenue gain is difficult to estimate and will be influenced by factors such as commodity prices, exchange rate, catching costs and export state.

This option would reduce the TAC to a similar level to that in place before the recruitment of the large 2002 and 2007 year classes. Based on export figures from 2012 of $1.42/kg greenweight, A TACC decrease of 3,920 tonnes could result in approximately $5.6 M in export revenue loss. [5]

6.3 OPTION 3

Option 3 presents the most conservative option, which would reduce the harvest levels by 70% would have the greatest financial impact on the fishing industry. Option 3 would set harvest levels below the CAY estimate for 2015 by more than 1,000 tonnes. The TAC for SBW6B has not been set this low in the past and SBW6B landings have only dropped below 1,900 tonnes twice in the last twenty years. Implementing this option would allow stock biomass to remain at or above the soft limit for longer than the other options in the absence of future recruitment, but could reduce the ability to monitor the stock by limiting the number of vessels that could access the fishery and carry out an acoustic survey.

Based on export figures from 2012 of $1.42/kg greenweight, A TACC decrease of 4,900 tonnes could result in approximately $7.0 M in export revenue loss. [5] This approximate loss is more than the overall estimated export value of the SBW6B fishery in 2013.

Table 4: Estimated mature (spawning stock) biomass for SBW6B, as a % B_0 for 2014–2016, from model runs 2.3 and 3.11 with assumed catch levels of nil and 3000 tonnes, with 90% confidence intervals in parentheses

MODEL RUN	Future Catch (tonnes)	Estimated Stock Status		
		Current - 2014	2015	2016
Model 2.3	0	32 (24-42)	28 (20-38)	29 (21-42)
	3000	32 (24-42)	27 (18-37)	26 (16-39)
Model 3.11	0	19 (18-22)	16 (14-18)	17 (15-23)
	3000	19 (18-22)	16 (13-17)	14 (11-19)

7 Other Matters

7.1 DEEMED VALUES

Deemed values are an economic tool that incentivises commercial fishers not to catch in excess of their individual annual catch entitlements. Ensuring deemed value rates are appropriately set is a fundamental principle of the Quota Management System.

Over the last 10 years the SBW6B TACC has been exceeded five times. MPI has reviewed the SBW6B deemed value rates each year since 2006.The TACC, however, has not been exceeded in the last three years and the port price for SBW has remained stable at $0.56 per kg over the last three years. MPI is therefore confident that the current deemed value rates are set appropriately and does not propose any further changes to the current regime.

8 Conclusion

The SBW6B stock is considered to be below the management target, and possibly around the soft limit. A reduction in the current harvest level is required to ensure fishing mortality decreases along with available biomass and to allow the stock to move back towards the management target if further recruitment is observed.

All three options proposed in this paper will reduce harvest levels to an acceptable annual yield. However the extent of the reductions and the financial impact increase with each option.

It is proposed that all other allowances as well as the deemed value rates remain the same.