Ministry for Primary Industries
Manatū Ahu Matua

Review of Sustainability Measures for Southern Blue Whiting for 1 April 2017

Decision Document

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Prepared for Minister of Primary Industries
By Ministry for Primary Industries

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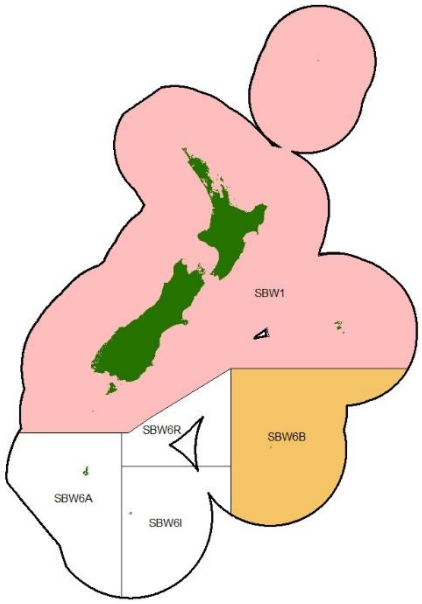

Figure 1: Quota Management Area (QMAs) for southern blue whiting with SBW1 (pink) and SBW6B (orange) highlighted

You are being asked to make decisions on sustainability measures for two southern blue whiting stocks for the fishing year beginning 1 April 2017. The total allowable catch (TAC), allowances and total allowable commercial catch (TACC) options presented in this paper for your decision are guided by the best available scientific information.

These decisions relate to two southern blue whiting quota management areas, the first around New Zealand excluding the sub-Antarctic (SBW1) and the second on the Bounty Platform (SBW6B)(Figure 1).

For the purpose of fisheries management, SBW1 is a stock with a nominal catch limit set on introduction of SBW into the quota management system (QMS) in 1999. MPI consulted on two options for catch limits for SBW1 that are considered to better reflect the abundance of southern blue whiting in the quota management area.

SBW6B is the second largest southern blue whiting fishery. The best available information indicates that the stock biomass is likely to be below the management target of 40% of unfished biomass (B_0) and below the level that can produce the maximum sustainable yield (B_{MSY}). MPI consulted on three options to decrease catch limits to allow the stock to return to the management target.

Tables 1 and 2 provide a summary of the options consulted on for each southern blue whiting stock.

Table 1: TACs, TACCs and allowance options consulted on for SBW1 (all values in tonnes)

			Allowances		
	TAC	**TACC**	**Māori customary**	**Recreational**	**Other sources of fishing-related mortality**
Current Settings	8	8	0	0	0
Option 1	32	31.5	0	0	0.5
Option 2	100	98	0	0	2

Table 2: TACs, TACCs and allowance options consulted on for SBW6B (all values in tonnes)

			Allowances		
	TAC	TACC	Māori customary	Recreational	Other sources of fishing-related mortality
Current Settings	3,000	2,940	0	0	60
Option 1	2,022	1,982	0	0	40
Option 2	2,426	2,377	0	0	49
Option 3	2,628	2,575	0	0	53

Two substantive submissions were received during consultation on the SBW1 and SBW6B proposals both of which supported Option 2 for SBW1 (increase of TAC to 100 tonnes) and Option 3 for SBW6B (decrease of TAC to 2,628 tonnes).

After consideration of submissions, MPI recommends that the TAC for SBW1 be increased to 100 tonnes (Option 2), the TACC increased to 98 tonnes, and the allowance for other sources of fishing related mortality be set at 2% of the TAC.

MPI recommends that the TAC for SBW6B be reduced from 3,000 tonnes to 2,426 tonnes, the TACC to 2,377 tonnes, and the allowance for other sources of mortality to 49 tonnes (Option 2). MPI considers that this option best supports the objective of maintaining the stock at or above the management target.

MPI is not proposing any changes to SBW6B deemed values.

2 Purpose

The purpose of this decision document is to detail the information, management rationale and MPI's recommended option for amending the TAC and allowances for SBW1 and SBW6B. A summary of submissions received during consultation and an outline of the legal considerations you must take into account when making your decisions are also included.

2.1 BACKGROUND

2.1.1 Biology

Southern blue whiting (*Micromesistius australis*) is a benthopelagic species, generally confined to sub-Antarctic waters to the south of New Zealand. During the juvenile life stage, southern blue whiting exhibits fast growth, slowing down thereafter. The maximum age of southern blue whiting is thought to be 25 years, and the maximum length 55-58 centimetres.

During August and September, adult southern blue whiting form dense spawning aggregations at depths of 250-600 meters at four known locations in sub-Antarctic waters (Auckland Islands, Campbell Island, Pukaki Rise, and Bounty Platform). The available scientific information shows that these four spawning locations represent four distinct biological stocks. SBW 1 does not contain a spawning stock and fish found in the area are near the edge of their normal distribution.

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 not understood, but it is recognised that the strong year classes can produce very large spikes in available biomass, which provide short term utilisation

opportunities. A challenge associated with these short term opportunities is increasing and subsequently decreasing harvest levels quickly in response to the changing biomass.

Southern blue whiting generally mature between two and four years of age, 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.

2.1.2 SBW1 Fishery

Southern blue whiting is not targeted in the SBW 1 area and is caught only as incidental bycatch of other target fisheries including hoki and warehou fisheries. It is not apparent that there has been a change in the nature of the target fisheries that explains the increase in SBW1 bycatch in recent years. The original TAC for SBW1 was a nominal limit set on the basis of reported catch information prior to the introduction of the species into the QMS and has not been adjusted since (Figure 2). It is likely that catch reporting has improved since then and MPI considers it is also likely that there has been increased abundance of southern blue whiting in SBW1.

The increase in SBW1 catch in recent years relative to catch in the main spawning areas in the context of southern blue whiting fisheries is very small. For example, in 2015/16, catches from SBW1 made up 0.1% of the total SBW landings. In terms of export earnings, in the 2015 calendar year, southern blue whiting provided around $23.5 million, of which SBW1 contributed around $8,000 (based on a proportion of landings).

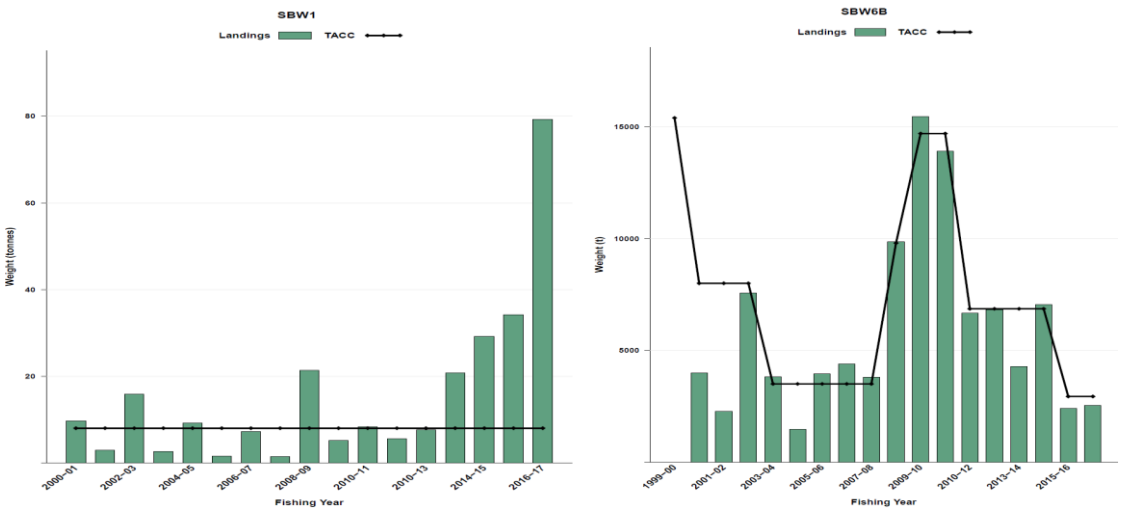

Figure 2: Landings at the TACC for SBW1 and SBW6B from 199-00 to 2016-17

2.1.3 SBW6B Fishery

The SBW6B fishery operates when the stock aggregates to spawn during mid to late August. The fishery is purely a commercial fishery, given the distances involved and often harsh weather conditions experienced at the fishing grounds.

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 (Figure 2).

Of the four main fisheries, only two (SBW6B and SBW6I) are regularly fished, those by only two to five vessels each year. The total catch for SBW6B in 2015/16 (April – March) was 2,361 tonnes and in 2016/17 to date, 2,569 tonnes

The main southern blue whiting fisheries (Campbell Rise, Auckland Island, Pukaki Rise, and Bounty Platform) have been certified as sustainable by the Marine Stewardship Council since April 2012.

2.1.4 Management Approach

As a high value and high volume species, southern blue whiting is generally managed within the National Fisheries Plan for Deepwater and Middle-Depth Fisheries (National Deepwater Plan) as a Tier 1 fishery. 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.

SBW1

SBW1 is a low volume fishery with stock boundaries established for administrative purposes and is therefore managed as a Tier 2 stock with no target fishery or specific research.

SBW6B

The management approach for SBW6B employs regular acoustic surveys as a key source of information for the estimation of stock status. From 2004 to 2016, a series of local area aggregation surveys have been carried out by each year by an industry vessel fishing at the Bounty Platform. These surveys enable regular biomass monitoring and TAC and TACC reviews.

The current reference points for SBW6B are the default targets and limits set out in the Harvest Strategy Standard for New Zealand Fisheries and described in Table 3.[1] The management target of 40%B_0 is understood to be a conservative proxy for the biomass that would support the maximum sustainable yield (B_{MSY}) for a species with the life history characteristics of southern blue whiting.

Table 3: 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

In past years when no stock assessment model was accepted by the Deepwater Fisheries Assessment Working Group (DWFAWG), an appropriate current annual yield (CAY) was instead calculated from the biomass estimate available at the time. The CAY is the estimate of one year of catch calculated by applying a fishing mortality level to an estimate of current fishable biomass.

In the past, the CAY was calculated as the fishing mortality (F) level that is equivalent to the natural mortality rate (M). F=M was considered to be a conservative proxy for the fishing mortality that would result in the stock biomass moving to B_{MSY}. For southern blue whiting, M is estimated to be 0.2. The CAY was therefore estimated to be approximately 20% of the

[1] The Harvest Strategy Standard can be found at http://fs.fish.govt.nz/Page.aspx?pk=104

available biomass estimated from the acoustic survey. Option 1 for SBW6B is based on this calculation.

A management strategy evaluation was completed for SBW6B in December 2016 which used simulation modelling to test the fishing mortality level that would be most appropriate to maintain (or recover) the stock to B_{MSY} and to maintain the stock above 20% B_0 for 90% of the time. The simulations tested a range of assumptions about the biology of the stock, including natural mortality rate and recruitment fluctuations. The management strategy evaluation suggested that a fishing mortality of 0.24 is appropriate to manage the SBW6B stock. Option 2 was based on this calculation.

An upper bound of M considered in the management strategy evaluation for SBW6B is M = 0.25. Assuming this level of M in the evaluation results in an estimate of appropriate fishing mortality of 0.26. Option 3 is presented on this basis.

2.2 RATIONALE FOR MANAGEMENT INTERVENTION

2.2.1 Previous Reviews

SBW1

The SBW1 TAC has not been reviewed since it was introduced into the QMS in 1999. At the time, the TAC was set at eight tonnes based on observed catches of southern blue whiting in this area since records began in 1986. These catch levels were small and varied greatly, ranging from five kilograms in 1991 to just over 20 tonnes in 1995. Total catches between 1986 and 1999 totalled 24 tonnes, with an average catch per annum of 1.7 tonnes. Setting a nominal catch limit of eight tonnes was considered appropriate at that time.

SBW6B

The TAC for SBW6B is regularly reviewed, most often based on CAY calculations. TACs can fluctuate significantly to take advantage of periods of high recruitment, or respond when aggregations of fish have disappeared, the reasons for which are unclear.

The most recent review was in 2015, when the SBW6B TAC was reduced from 7,000 tonnes to 3,000 tonnes in response to an observed decrease in stock biomass. The TACC was proportionality decreased to 2,940 tonnes, and the allowance for other sources of fishing-mortality was set at 60 tonnes (2% of the TAC). A stock assessment in 2015 was not accepted by the DWWG, however it was considered that two model runs were useful to provide upper and lower bounds of a plausible stock status. This indicated that the stock was likely to be below the management target of 40% B_0 and would continue to decline.

2.2.2 Current Status

SBW1

There is no spawning stock in SBW1, fish in this area are thought to be overspill from other southern blue whiting sub-Antarctic biological stocks. The recent increase in catch is considered largely the result of changes in distribution and abundance of southern blue whiting outside traditional stock boundaries, and a likely improvement in catch reporting rather than a result of any change in the nature of the target fisheries of which it is a bycatch.

SBW6B

The most recent survey (August/September 2016) estimated the 2016 mid-season spawning stock biomass was approximately 6,400 tonnes. Biological sampling carried out during the

fishery and the survey indicated that a new year class (2012) may be recruiting to the fishery but this is not certain. Recruitment is known to be highly variable and has not been detected in recent surveys of the SBW 6B stock.

The management strategy evaluation provided information on the level of fishing mortality that would be appropriate to maintain the stock at or above the management target and ensure the stock remained above the soft limit (20% B_0) 90% of the time.

3 Consultation

Decisions to vary TACs are made under section 13(4) of the Fisheries Act 1996 (the Act) requiring consultation under section 12(1). Decisions to vary TACCs are made under section 20(2) of the Act, to which the consultation requirements of section 21(2) apply. These provisions require consultation with such persons or organisations representative of those classes of persons having an interest in the stock or the effects of fishing on the aquatic environment in the area concerned, including Māori, environmental, commercial and recreational interests.

MPI consulted on the proposed sustainability measures for SBW1 and SBW6B on your behalf. MPI followed its standard consultation process of posting Discussion Documents on the MPI website on 26 January and alerting stakeholders to this through a letter sent to approximately 140 companies, organisations and individuals. Three weeks were provided for submissions to be made on the proposals.

There is also an obligation to provide for input and participation of tangata whenua and have particular regard to kaitiakitanga. MPI recognises that information on customary harvest of the SBW1 and SBW6B stocks is uncertain and invited iwi, Tangata Tiaki/Kaitiaki, and customary permit holders to submit information on this. Similarly, three weeks were provided for submissions to be made by tangata whenua on the proposals.

3.1 SUBMISSIONS RECEIVED

Submissions on the Discussion Documents were received from the following:

a) The Deepwater Group Limited (DWG)
b) Iwi Collective Partnership (ICP)
c) Te Ohu Kaimoana (TOKM), the trustee, chose not to make an individual submission but indicated by email that their position was covered by that of the DWG.

3.2 SUMMARY OF SUBMISSIONS

A brief summary of the submissions is provided below.[2] MPI's response to any issues raised in the submission can be found within the relevant sections of this Decision Document.

SBW1

DWG, which represents 85% of southern blue whiting quota holders, made a very brief submission that 'DWG shareholders who own quota for SBW1 support MPI's Option 2, which provides for the TACC to be increased from the nominal eight tonnes to a higher, but still nominal, 98 tonnes, effective from 1 April 2017.'

[2] A copy of the submission is available in Appendix 1

ICP is a limited partnership of 12 iwi that own both settlement and general southern blue whiting quota. ICP support Option 2. In their submission they state, that their support is 'principally because of industry feedback that bycatch has steadily increased over the past seven years with nil increase in effort.'

SBW6B

DWG, which represents 85% of SBW6B quota holders, submit that shareholders support Option 3, which provides for the TACC to be decreased 12%, from 2,940 tonnes to 2,575 tonnes, effective from 1 April 2017, at the start of the southern blue whiting fishing season.

DWG recognises that the fishery is supported by two year classes (2002 and 2007) and that the stock size will continue to decline irrespective of the fishery without further strong recruitment. They also note that the latest survey suggested that the 2012 year class is the strongest since 2007 and that information collected during the 2017 fishery will allow for better estimation of future stock status next year. Under Option 3, they also commit to undertaking a further biomass survey during the 2017 season which will allow for potential TACC changes for 2018-19.

In their submission, ICP also supports Option 3, the smallest reduction to the TACC of 365 tonnes to 2, 575 tonnes. ICP agrees it is likely that the fishery is below the 40% B0 management target, but also say it is a 'highly variable fishery anyway that goes up and down with year class recruitment.' ICP adds that management decisions can be reviewed again in the next year.

4 Legal Considerations

Relevant legal considerations in the the Act are discussed in the following paragraphs.

4.1 SECTION 8 – PURPOSE OF THE ACT

Section 8 of the Act says that the purpose of the Act is to provide for utilisation while ensuring sustainability:

> **ensuring sustainability** means—
>
> a. maintaining the potential of fisheries resources to meet the reasonably foreseeable needs of future generations; and
> b. avoiding, remedying, or mitigating any adverse effects of fishing on the aquatic environment
>
> **utilisation** means conserving, using, enhancing, and developing fisheries resources to enable people to provide for their social, economic, and cultural well-being

MPI considers that all options presented in this paper accord with the purpose of the Act. For SBW1, they provide for utilisation of fisheries while maintaining catches of southern blue whiting at a level that is not considered likely to adversely impact on the sustainability of the stock. For SBW6B, this is through setting a TAC that would maintain the stock above the soft limit of 20% B_0 and recover it to be at or above the management target while providing for some utilisation.

4.2 SECTION 9 – ENVIRONMENTAL PRINCIPLES

Section 9 of the Act requires that you take the following environmental principles into account when exercising or performing functions, duties, or powers in relation to the utilisation of fisheries resources or ensuring sustainability:

a) Associated or dependent species should be maintained above a level that ensures their long-term viability;
b) biological diversity of the aquatic environment should be maintained;
c) habitat of particular of significance for fisheries management should be protected.

MPI considers that all options presented in this paper satisfy your obligations under section 9 of the Act. A summary of the interactions between the SBW1 and SBW6B fisheries and the aquatic environment, and how these are likely to be affected by the proposals in this paper are discussed below.

4.2.1 Fish bycatch

Southern blue whiting in SBW1 is itself a bycatch of hoki and warehou fisheries and is not targeted. It is not expected that fishing effort will increase as a result of any of the options in this paper and therefore will not impact any bycatch species.

Total fish bycatch in southern blue whiting target fisheries, including SBW6B 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 within this Discussion Document result in decreased fishing effort so it is likely that all of the options will result in a concurrent reduction in fish bycatch and will therefore reduce the impacts on any bycatch species.

4.2.2 Protected species interactions

SBW1

Any interactions with marine mammals, seabirds and the benthos in SBW1 are associated with the targeted species in that area, namely hoki, silver warehou and white warehou. The proposed changes to the TAC for SBW1 are unlikely to result in any changes in fishing effort and therefore are considered unlikely to increase impacts of the fishery.

SBW6B

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 (note all vessels operating in SBW6B are larger than 28 m in length). Non-regulatory management measures include

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

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 2017-18 fishing year.

All options proposed would result in decreased fishing effort in SBW6B and therefore would likely reduce impact on seabird populations.

Marine mammals

The SBW6B fishery overlaps with the foraging range of New Zealand fur seals which live on Bounty Islands. Interactions between the SBW6B fishery and fur seals are known to occur. However, it is not considered that the interactions of the SBW6B fishery with New Zealand fur seals is having an adverse effect on the population. In 2017, research is planned to estimate fur seal population sizes which will benefit understanding of any fisheries impacts on fur seals.

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. MPI works to ensure 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. These procedures aim 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 fish from the net before shooting the gear, steam away from any congregations of marine mammals before shooting the gear again and appoint 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 2017/18 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.

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 and does not generally use heavy rollers or bobbins on the nets, 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.

Management measures to address the effects of deepwater trawl activity have focused on avoiding these benthic effects. This has been achieved through closing areas to bottom trawling; first with seamount closures in 2001 and then with Benthic Protection Areas (BPAs). The implementation of BPAs in 2007 effectively closed approximately 30% of the New Zealand Exclusive Economic Zone to bottom trawling. A monitoring regime to ensure these closures are adhered to was also implemented.

All options would decrease fishing effort within SBW6B and would likely result in reduced benthic impact.

4.3 SECTION 10 – INFORMATION PRINCIPLES

Section 10 of the Act requires that you take the following information principles into account when exercising or performing functions, duties, or powers in relation to the utilisation of fisheries resources or ensuring sustainability:

a) Decisions should be based on the best available information;
b) Decision makers should take into account any uncertainty in the available information;
c) Decision makers should be cautious when information is uncertain, unreliable, or inadequate; and
d) The absence of, or any uncertainty in, any information should not be used as a reason for postponing or failing to take any measure to achieve the purpose of the Act.

MPI considers that the best available information has been used as the basis for the recommendations in this paper. All science information upon which the management options are based has been peer reviewed by MPI's Deepwater Fisheries Assessment Working Group.

4.4 SECTION 11 – SUSTAINABILITY MEASURES

Under section 11 of the Act, before setting or varying any sustainability measure for any stock, you must:

a) Section 11(1)(a): take into account any effects of fishing on any stock and the aquatic environment. All information relevant to your decision is discussed above under Section 9 - environmental principles (see Protected Species Interactions section).
b) Section 11(1)(b): take into account any existing controls under the Act that apply to the stock or area concerned. For SBW1 and SBW6B, the measures that apply currently are a TAC, TACC, and allowances for customary take, recreational take, and all other mortality to those stocks caused by fishing. No other controls under the Act specifically apply to these stocks.
c) Section 11(1)(c): take into account the natural variability of the stock. SBW1 is not considered a biological stock, however the increase is taking into account the natural variability of the stock. The management method used for SBW6B takes account of the biological characteristics of southern blue whiting and therefore takes into account the natural variability of the stock.
d) Sections 11(2)(a) and (b) require you to have regard to any provisions of any regional policy statement, regional plan, or proposed regional plan under the Resource Management Act 1991 and any management strategy or management plan under the Conservation Act 1987 that apply to the coastal marine area and that you consider relevant A proposed regional coastal plan exists for the Subantarctic Islands. MPI is satisfied that no provisions within this plan are relevant to your decision.
e) Section 11(2)(c): have regard to sections 7 and 8 of the Hauraki Gulf Marine Park Act 2000 that apply to the coastal marine area and you consider relevant. The boundaries of the SBW1 QMA do intersect with the Park, however there is no catch of SBW1 from within Park boundaries. The boundaries of the SBW6B QMA do not intersect with the Park boundaries.
f) Section 11(2)(d): have regard to any planning document lodged by a customary marine title group under section 91 of the Marine and Coastal Area (Takutai Moana) Act 2011. No planning documents applicable to these fisheries have been lodged.
g) Section 11(2A)(b): take into account any relevant fisheries plan approved under section 11A. The application of the National Fisheries Plan for Deepwater and Middle-depth Fisheries is discussed in the following section.

h) Sections 11(2A)(a) and (c): take into account any conservation or fisheries services, or any decision not to require such services. MPI does not consider that existing or proposed services materially affect the proposals for SBW1 or SBW6B. No decision has been made to not require a service in this fishery at this time.

4.4.1 Section 11A – Fisheries Plans

MPI, in collaboration with industry and environmental organisations, has developed the National Deepwater Plan which the Minister approved under section 11(2A)(b) of the Act in 2010. The National Deepwater Plan sets out the long-term goals and objectives for deepwater fisheries. Fishery-specific chapters set specific Operational Objectives that are delivered annually for each key deepwater species, and established performance indicators to assess if the management objectives have been delivered. The fishery-specific chapter of the National Deepwater Plan for southern blue whiting was completed in 2011.

As set out above, section 11(2A)(b) of the Act requires you to take the National Deepwater Plan into account when making a decision on the management options proposed in this paper. MPI considers the management options proposed are consistent with the dual Outcomes of the National Deepwater Plan:

a) the Use Outcome: Fisheries resources are used in a manner that provides greatest overall economic, social and cultural benefit;
b) the Environment Outcome: The capacity and integrity of the aquatic environment, habitats and species are sustained at levels that provide for current and future use.

These dual Outcomes are given effect to by a series of Management Objectives, the most relevant of those being:

a) Management Objective 1.1: Enable economically viable deepwater and middle-depth fisheries in New Zealand over the long-term;
b) Management Objective 2.5: Manage deepwater and middle-depth fisheries to avoid or minimise adverse effects on the long-term viability of endangered, threatened and protected species.

MPI considers the management options proposed in this paper will contribute to and not impede achieving these two Management Options.

4.5 SECTION 13 – SETTING THE TAC

TACs for southern blue whiting are set under section 13 of the Fisheries Act 1996 (the Act). Section 13(4) allows you to vary TACs for any stock, and requires you to have regard to the matters in section 13(2A).

Where reliable estimates of B_{MSY} are not available, section 13(2A) of the Act requires you to use the best available information to set a TAC that is not inconsistent with the objective of maintaining the stock at or above, or moving the stock towards or above, a level that can produce the maximum sustainable yield.

MPI considers that the current level of the SBW1 and SBW6B stocks and the level of the stock that can produce the maximum sustainable yield (MSY) cannot currently be estimated reliably. Section 13(2A) therefore applies when setting a TAC for these stocks. This paper provides you with options that MPI considers satisfy your obligations under section 13(2A). MPI considers that the proposed options are based on best available information and are not inconsistent with the objective of maintaining SBW1 and SBW6B stocks at or above, or moving the stocks towards or above, a level that can produce MSY.

For SBW6B, in the absence of a full stock assessment, stock status can only be approximately inferred. Using the southern blue whiting harvest strategy, which states that $40\%B_0$ is understood to be a conservative proxy for B_{MSY}, the best available information on current stock status indicates that it is below this level. The options for TAC reductions presented are likely to result in an increase in biomass but with variation in the rate of change.

Under section 13(2A)(b), you are also required to have regard to the interdependence of stocks, the biological characteristics of the stock, and any environmental conditions affecting the stock. Information on the interdependence of stocks is included in the discussion on environmental principles earlier in the paper. The best available information used to develop the options takes into account biological characteristics of southern blue whiting and any known environmental conditions affecting the stock.

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 where applicable to limits set under section 13(2A). There are economic considerations in relation to the options proposed. Larger TAC reductions have a more significant economic impact on the fishing industry

Given the lack of recreational and customary catch from SBW1 and SBW6B and the retention of the current nil allowances, MPI considers amending the TACs under any options in this paper will not have an adverse impact on non-commercial fishers. The impact on commercial fishers is discussed under each of the options.

4.6 SECTIONS 20 & 21 – ALLOCATING THE TAC

The TAC must be apportioned among the relevant sectors and interests as required under sections 20 and 21 of the Act. Section 21 requires you to have regard to the TAC for the stock and allow for Māori customary non-commercial interests and recreational fishing interests in the stock, and for all other mortality to that stock caused by fishing, before setting the TACC.

There is limited information on Māori customary and recreational take of southern blue whiting. In any event, given the location and nature of these fisheries, MPI considers there is unlikely to be any such take in SBW1 or SBW6B. 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 SBW6B. MPI proposes to retain this allowance of 2% for SBW6B and to set an allowance of 2% of the TAC in SBW1 for the 2017-18 fishing year.

4.7 SECTION 75 – DEEMED VALUE RATES

Section 75 of the Act requires that you set deemed value rates for every stock in the QMS. Deemed values are an economic tool intended to constrain commercial catch to respective catch limits by encouraging fishers to balance catch with ACE while not discouraging them from landing and accurately reporting catch. Ensuring deemed value rates are appropriately set is a fundamental principle of the QMS.

MPI is not proposing any changes to deemed value rates for southern blue whiting (currently $0.46/kg). For SBW1 this is to ensure continued reporting of this bycatch fishery. MPI will continue to monitor the catch in both stocks and review deemed values if considered necessary.

5 Management Options

5.1 ANALYSIS OF OPTIONS

5.1.1 SBW1

Table 4: TACs, TACCs and allowance options consulted on for SBW1

			Allowances		
	TAC	**TACC**	**Māori customary**	**Recreational**	**Other sources of fishing-related mortality**
Current Settings	8	8	0	0	0
Option 1	32	31.5	0	0	0.5
Option 2	100	98	0	0	2

Option 1

Option 1 would set the TAC at 32 tonnes and is based on the average catch in SBW1 over the last five years. This option is more conservative than Option 2 and provides for a revised nominal catch level four times higher than the original limit set in 1999.

Based on export figures of an estimated green weight price of $1.00 per kg during 2015[4] the value of a TACC increase of 24 tonnes as proposed in this option is approximately $24,000 in export revenue.

No submissions were received in support of Option 1.

Option 2 (MPI Recommended)

Implementing Option 2 would allow an increase in harvest levels by from 8 tonnes to 98 tonnes, an overall increase on the original nominal catch limit by 1,250%. This would adjust the catch limit to more closely align with the current upward trend in incidental bycatch of southern blue whiting in SBW1. This increase is very small on the scale of the southern blue whiting fisheries and is not expected to impact on any biological stock.

This option would set the TAC at 100 tonnes and the TACC at 98 tonnes as the total catch of southern blue whiting has increased every year since 2011/12. This year to date (2016/17)[5] the TACC has already been exceeded by 79 tonnes.

Based on export figures from 2015 of $1.00 per kg SBW, the value of a TACC increase of 92 tonnes as proposed in this option is approximately $92,000 increase in expected export revenue.

This option was unanimously supported from by the SBW1 quota holders represented by DWG as well as TOKM and ICP. This is also the Ministry's preferred option in that it sets a new nominal TAC which will allow for some future proofing to increases in incidental bycatch of southern blue whiting which has not been the result of changes in fishing effort.

[4] This is an estimated green weight price per kg across all the product forms exported during Jan 2015- Dec 2015 of $0.98/kg for surimi and of $1.05/kg SBW dressed. Precise revenue gain is difficult to estimate and will be influenced by factors such as commodity prices, exchange rate, catching costs and export state.

[5] The fishing year for southern blue whiting is from 1 April to 30 March. The 2016/17 fishing year is not yet complete and more catch may be reported before the end of the year.

5.1.2 SBW6B

Table 5: TACs, TACCs and allowance options consulted on for SBW6B (all values in tonnes)

			Allowances		
	TAC	TACC	Māori customary	Recreational	Other sources of fishing-related mortality
Current Settings	3,000	2,940	0	0	60
Option 1	2,022	1,982	0	0	40
Option 2	2,426	2,377	0	0	49
Option 3	2,628	2,575	0	0	53

Option 1

Option 1 is the most conservative option, and is based on the CAY calculation that was used in previous years (fishing mortality rate of 0.20). This option would recover the stock more quickly than Options 2 and 3, however it also has the most significant impact on commercial fishers, and would likely impede the completion of the planned acoustic survey in 2017 without additional investment from stakeholders.

Based on export figures from 2015 of approximately $1.00/kg,[6] the lost potential value from a TACC decrease of 958 tonnes as proposed in this option is approximately $960,000 in export revenue.

No submissions favoured Option 1.

Option 2 (MPI Recommended)

Option 2 is the output of the CAY calculation using the fishing mortality rate recommended by the management strategy evaluation and would be expected to return the stock to the management target level over time.

With the potential new recruitment entering the fishery, this option may result in some lost utilisation opportunities if the 2012 year class recruits strongly to the 2017 fishery. It is MPIs opinion that this Option provides sufficient levels of catch to enable the stock to be surveyed again in 2017 and the TAC and TACC may be adjusted if it is demonstrated that stock biomass has increased.

Option 2 is MPI's preferred option. This option is based on the outputs of the management strategy evaluation which indicated that an exploitation rate of 0.24 best meets the objective of maintaining the stock at or above the management target of 40% B_0 and ensuring that it does not decline below the soft limit.

Based on export figures from 2015 of approximately $1.00/kg SBW, the lost potential value from a TACC decrease of 563 tonnes as proposed in this option is approximately $560,000 in export revenue.

No submitters supported this option.

Option 3

Option 3 presents the least conservative option, based on a CAY calculation using the fishing mortality rate associated with the upper bound of natural mortality for the species (M = 0.25 instead of 0.2, resulting in a fishing mortality rate of 0.26).

[6] This is an estimated green weight price per kg across all the product forms exported during 2015 of $0.98/kg for surimi and of $1.05/kg dressed. Precise revenue gain is difficult to estimate and is influenced by a number of external factors.

This option potentially slows the recovery of the stock, but would provide the largest opportunity to take advantage of any recruitment that may result from the 2012 year class and has the least economic impact on the fishing industry.

Based on export figures from 2015 of approximately $1.00/kg SBW, the lost potential value from a TACC decrease of 365 tonnes is approximately $360,000 in annual export revenue.

The two substantive submissions received both supported this option. DWG indicated the commitment of the industry to carry out a biomass survey in 2017 to continue to monitor the stock. MPI notes that this survey is not likely contingent on Option 3 being your decision and would be feasible under Option 2. TOKM, the Māori Fisheries Trust, which did not make a formal submission, indicated via email that it also supported this option.

6 Conclusion

MPI consulted on options to amend the TAC, TACC and allowances for SBW1 and SBW6B.

For SBW1, better information is now considered to be available to set the TAC and TACC. Higher catches in the fishery are considered to be a result of both improved reporting since SBW 1 entered the QMS and an apparent increase in abundance resulting from migration from other southern blue whiting stock areas

Increases to the TAC and TACC are not considered likely to have any impact on the main commercial fisheries as the tonnages involved are very small by comparison with the overall southern blue whiting fishery. MPI recommends that the catch level be increased to 100 tonnes as it provides for the continued utilisation of southern blue whiting in SBW1.

For SBW6B, the stock is considered to be below the management target. A reduction in the current harvest level is required to ensure fishing mortality is consistent with maintaining the stock at or above the management target. The management strategy evaluation completed for SBW6B in 2016 indicated that the current TACC is too high and provided information on the most appropriate harvest rate for the fishery to ensure the stock remains at or above the management target and be certain that it remains above the soft limit.

All three options in this paper for SBW6B will reduce harvest levels. However, the extent of the reductions and the financial impact on the fishing industry varies with each option. MPI recommends Option 2 as this option will balance the economic impact on the SBW6B commercial fishery with ensuring that catch levels are kept within a sustainable limit.

It is recommended that recreational and Māori customary allowances, as well as the deemed value rates, remain the same for both stocks.