Ministry for Primary Industries
Manatū Ahu Matua

# Southern Blue Whiting

## FISHERIES PLAN CHAPTER

September 2011

ISBN No: 978-0-478-42017-3 (online)

# Introduction

This chapter of the National Deepwater Plan sets the operational objectives and performance criteria for the southern blue whiting fisheries.

This chapter also addresses the management of any adverse environmental effects, where they exist, that are caused by southern blue whiting fishing activity.

This chapter consists of the following sections:

1. Overview of the southern blue whiting fisheries
2. Overview of non-target interactions
3. Operational objectives for the southern blue whiting fisheries
4. Measuring Performance

This chapter will direct the management of the southern blue whiting fisheries for the next five years, starting in the 2011/12 financial year and ending in 2015/16.

# 1. Overview of the southern blue whiting fisheries

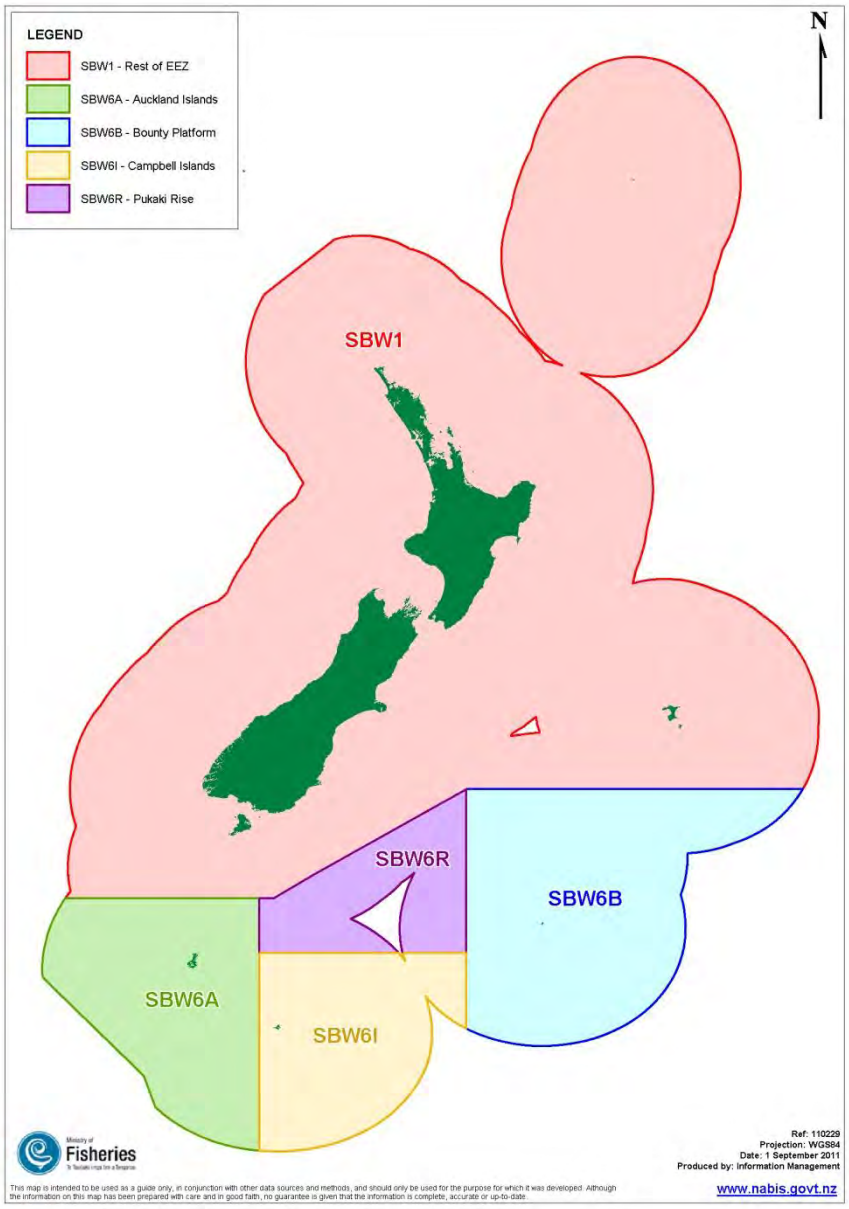


**Figure 1: Map of the southern blue whiting fisheries within the New Zealand EEZ**

## Biology Overview

Southern blue whiting (*Micromesistius australis*) is a benthopelagic 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. Fish reach a length of approximately 20cm within the first year and 30cm after 2 years. Growth then slows after 5 years and virtually ceases after 10 years. The maximum age of southern blue whiting is thought to be 25 years and the maximum recorded length is 55 - 58cm.

Throughout the year, southern blue whiting are dispersed across the Campbell Plateau and the Bounty Platform but during August and September dense spawning aggregations form at depths of 250-600m. Major spawning aggregations occur at three discrete locations across the sub-Antarctic:

1. Bounty Platform
2. Campbell Islands Rise
3. Pukaki Rise

Spawning also occurs at the Auckland Islands, but to a lesser extent. As a result, southern blue whiting is rarely targeted in this location.

The available information shows that these four spawning locations represent four distinct stocks and fish from each stock return to spawn on the grounds to which they first recruit. Consistent differences are found in the size and age distribution of fish, in the recruitment strength, and in the timing of spawning between the four stocks. Fish from the three larger stocks at the Bounty Platform, Campbell Islands and Pukaki Rise, can also be distinguished by their morphometric[1] measurements. Fidelity within these four spawning stocks is therefore assumed for the purposes of stock assessment.

Spawning occurs first at the Bounty Platform, from early to mid August and begins 3-4 weeks later in the other stocks. Individual fish join these spawning aggregations for the first time upon reaching sexual maturity. This occurs for the majority of individuals between 3-4 years of age, although a small proportion of male fish mature at age 2+.

In addition, recruitment occurs as newly mature fish join the spawning aggregations for the first time. All individuals born in the same year are referred to as a year class, or cohort, and recruitment strength is measured by year class and used as an indicator of future stock abundance.

Southern blue whiting are known to exhibit highly variable year class strength. The fisheries are characterised by episodic recruitment events which can substantially exceed the long-term average recruitment in each stock. These events have been observed in the Bounty Platform and Campbell Islands stocks approximately once a decade. Strong year classes have also been recorded as slow-growing relative to average year classes. It is unknown what the key factors are that contribute to these significant variations in year class strength, which can cause significant variations in the fishable biomass.

For more detailed information on the biology of southern blue whiting and the current status of the stocks see the latest Ministry of Fisheries Stock Assessment Plenary report, available at http://fs.fish.govt.nz/Page.aspx?pk=61&tk=212.

[1] Morphometrics refers to the quantitative analysis of form, a concept that encompasses size and shape

## Commercial fishery overview

The southern blue whiting fisheries are targeted by factory trawl vessels greater than 46m total length. Prior to 1986 the Soviet foreign licensed fleet was solely responsible for reported landings of southern blue whiting, with Japanese surimi vessels entering the fisheries in 1986. Currently, only one surimi vessel remains in the fishery and the majority of the catch is now taken by Ukrainian vessels that process fish to a dressed product.[2]

Catches have averaged 30,000 tonnes in the last 5 years, most of which is taken over the 2 month period when fish are spawning. Given the highly aggregated nature of the fish when they are targeted, catch rates are high. At peak spawning, the catch per day can reach 1500 tonnes across the fleet, although the average catch across the whole spawning season is approximately 500 tonnes per day.

Vessels generally target southern blue whiting using mid-water trawl gear, fished on or near the seabed where the fish aggregate. Table 1 (below) shows the proportion of effort over the last 7 fishing years made by bottom trawl vs. midwater trawl. In addition, Map 11 (page 31) shows the distribution of target trawls for the southern blue whiting fisheries.

**Table 1: Proportion of southern blue whiting fishing effort, by method and depth from the seabed, between 2004-05 and 2010-11**

| Fishing Method | Depth above seabed | Proportion of total effort |
|---|---|---|
| Bottom Trawl | 0m | 4% |
| Midwater trawl | 0m | 52% |
| | 1-50m | 13% |
| | >50m | 32% |

## Fisheries management overview

The four southern blue whiting stocks are managed separately within the quota management system (QMS) and are each assigned a quota management area (QMA). All four QMAs are located within the sub-Antarctic fisheries management area, FMA6 (see Figure 1). Table 2, below, details the fish stock code for each QMA, and their designation by management Tier.

All deepwater species in the QMS have been ranked into two tiers according to their commercial importance. Tier 1 fisheries are high volume and/or high value fisheries and are traditionally targeted. Tier 2 fisheries are typically less valuable bycatch fisheries or are only targeted at certain times of the year.

The remainder of the EEZ, outside FMA6, is managed under an administrative QMA, SBW1. This area is not part of the natural distribution of southern blue whiting in New Zealand, and no target southern blue whiting fishing takes place in this QMA. A nominal total allowable commercial catch

[2] The process state "Dressed" is described as: The state in which the head and gut have been removed with the anterior cut being a continuous straight line passing immediately behind the posterior insertions of both pectoral fins; and the forward angle of the anterior cut not less than 90 degrees in relation to the longitudinal axis of the fish; and whether or not the tail has been removed, no part of the tail cut shall be forward of the posterior base of either the hindmost anal fin, whichever is nearer the caudal fin; and the belly flap either intact or divided along the ventral midline.

(TACC) of 8 tonnes is set, to account for southern blue whiting taken as bycatch. On average, 7 tonnes of SBW1 is taken per year, the majority as bycatch in target hoki and silver warehou tows.

**Table 2: southern blue whiting fish stock codes and designation by Management Tier.**

| Stock | Code | Tier | Reasoning |
|---|---|---|---|
| Bounty Platform | SBW6B | Tier 1 | Commercial effort has historically concentrated on SBW6B and SBW6I, given the larger biomass available here. |
| Campbell Islands | SBW6I | Tier 1 | |
| Pukaki Rise | SBW6R | Tier 1 | Although a smaller biomass is available at SBW6R, an increasing level of effort has occurred here in recent years, indicating increasing commercial importance |
| Auckland Islands | SBW6A | Tier 2 | The smaller size and uncertainty of the spawning aggregations in SBW6A means target SBW fishing rarely takes place here |
| Rest of EEZ | SBW1 | Tier 2 | No target SBW fishing occurs in SBW1 |

Outside of the spawning season no target fishing for southern blue whiting occurs, although relatively small volumes are taken as bycatch in target fisheries for hoki, ling, squid and silver warehou. The level of bycatch averages 250 tonnes per year over the last 5 years. All bycatch of quota species is counted against the TACC for the QMA in which the fish was caught.

The location and timing of the southern blue whiting spawning aggregations ultimately dictates where and when these fisheries operate, and can affect whether vessels are able to access these fisheries. Spawning aggregations form over a short time period of 3-4 weeks at each location and occur almost simultaneously in three of the four stocks, preventing vessels from fishing all stocks each year. All four spawning sites are also located a significant distance from each other and the nearest landing sites, meaning a relatively high cost must be expended to enter and move between the fisheries.

In addition, southern blue whiting spawning directly follows, and can overlap with, the hoki and hake spawning seasons. If these spawning seasons occur later than usual, vessels may not reach the southern blue whiting spawning grounds at the Bounty Platform in time for peak spawning. This can impact vessel's opportunity to fish at the Bounty Platform, where spawning occurs first.

The factors described above generally prevent operators from harvesting the southern blue whiting TACC in all areas each year.

**Management approach**

***Stock management***

The southern blue whiting fisheries are managed by April fishing year (1 April – 31 March), due to the timing of the fishing season. The current management approach for the Tier 1 southern blue whiting stocks (SBW6I, SBW6B and SBW6R) is assessment based and leads to regular TAC/TACC reviews (Figure 2). These TAC/TACC reviews, or management responses, are implemented to ensure the stocks are managed within the default targets and limits set out by the Harvest Strategy Standard (HSS) and listed in Table 3.

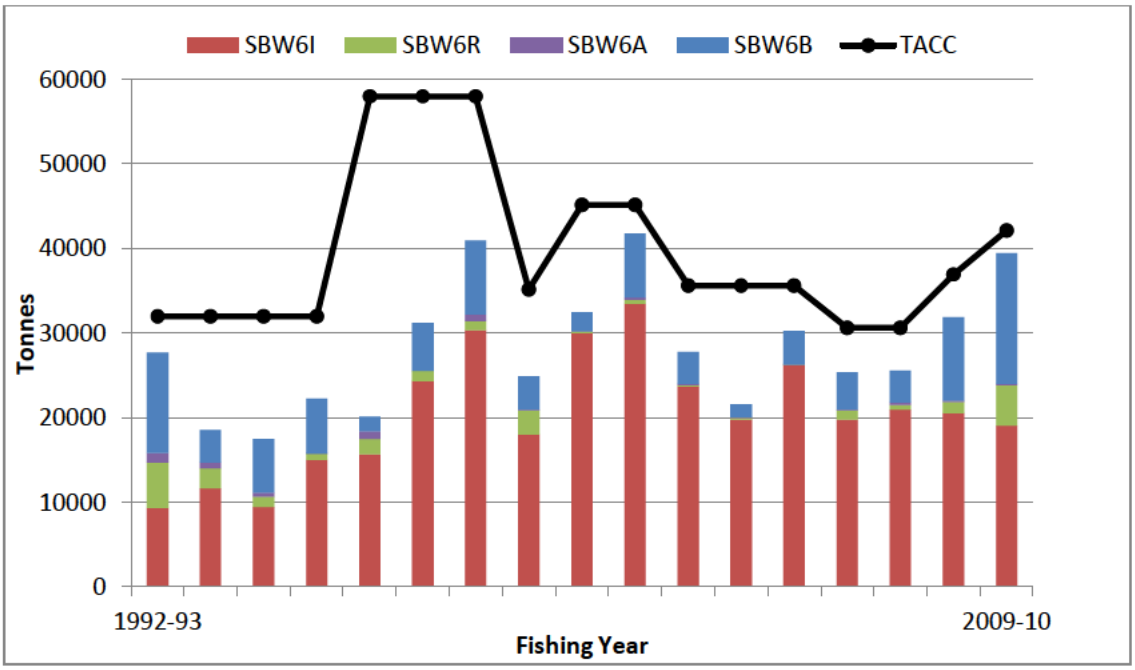


**Figure 2: Reported catch and TACC from 1992-93 to 2009-10, for all SBW stocks combined.**

The Tier 2 stock SBW6A has a TACC of 1 640 tonnes yet has not been a main target fishery. It will be managed using information from monitoring Observer sampling and catch at age data, and be subject to regular fishery characterisations. Although no evidence indicates an increase in fishing effort is likely at this time, effort in SBW6A will be monitored and if necessary, the stock will be elevated to Tier 1 status and this approach will be revised. A management approach for SBW1 is not proposed given this QMA is administrative only.

**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. |
| Rebuild strategy | To be determined. |
| 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 |

The three Tier 1 stocks are monitored regularly using acoustic survey techniques, which work well for assessing the biomass of single-species aggregations. Surveys are carried out regularly because significant biomass changes are characteristic of these fisheries. Stock specific information on these surveys is provided in the fishery overview section of this plan from page 11.

The three Tier 1 stocks are managed under a constant fishing mortality strategy, whereby TACs are reviewed regularly based on an estimate of the current annual yield (CAY).[3] This approach provides a dynamic interpretation of the maximum sustainable yield, as it explicitly recognises that these fish populations fluctuate in size from year to year.

Where possible, the CAY is generated through a stock assessment model, which combines all available information on each stock to assess its status. Stock assessment models have been developed for the SBW Tier 1 fisheries and at present have been accepted and utilised for the SBW6I stock. The SBW6B stock is scheduled for assessment in 2012 with a similar model using new catch at age and acoustic survey data.

In the absence of an accepted stock assessment model, an appropriate CAY can also be calculated using the most recent estimate of available biomass.

This method is less data inclusive than running a full stock assessment, so it is important that resulting management decisions remain conservative, which has been the case historically.

This model will also be used to for SBW6R when next assessed in 2012.

Although SBW is currently managed under default HSS target and limits, management recognizes the need for a stock specific harvest strategy. Additional detail on the expected high-level approach to developing a harvest strategy for southern blue whiting is provided in Operational Objective 2.1, on page 32.

**Management need:**
To develop and agree stock specific harvest strategies for each of the Tier 1 southern blue whiting fisheries.

***Collaborative management***

The majority (89%) of southern blue whiting quota is owned by members of the Deepwater Group Ltd (DWG). The DWG is the commercial stakeholder organisation representing the majority of deepwater and middle-depth fisheries, based on a mandate from the quota owners of the associated stocks.

The remaining 11% of quota is held by a number of different iwi groups who received quota allocations as part of their Treaty Settlement packages. These quota owners are generally represented through Te Ohu Kai Moana Ltd, whose role is to allocate fisheries assets to mandated iwi organisations and provide an advisory service to iwi constituents.

[3] The CAY is the one year catch calculated by applying a constant fishing mortality rate, or exploitation rate, to a current estimate of the vulnerable biomass.

In 2010 the Ministry of Fisheries and DWG signed a Memorandum of Understanding (MOU) that established a structured partnership for the Ministry and the deepwater fishing industry to collaborate in managing New Zealand's deepwater fisheries. This MOU updated and replaced the 2008 MOU and recognises the maturing relationship between both parties that has evolved since the first MOU was signed in 2006.

Areas where this collaborative partnership operates include:

- Ensuring industry support and commitment to management approaches even when management interventions result in reduced catch allocations or fishing restrictions
- Developing innovative solutions to fisheries management issues, such as catch spreading arrangements within quota management areas and mitigating risks to protected species
- Enabling industry to bring commercial acumen and expertise to the procurement of research and other services that will lead to better value for money.
- Providing more effective opportunities to implement the informed and assisted compliance model

Both parties consider that acting in isolation is ineffective and that ongoing benefits will be best achieved through continuing the partnership arrangement. The intention of the MOU is to capture those benefits in an explicit and transparent manner.

## Environmental overview

The southern blue whiting trawl fisheries interact with a range of protected species, including seabirds and some marine mammal species. Although seabird interactions occur in low numbers across all the southern blue whiting fisheries, New Zealand fur seal interactions predominantly occur at the Bounty Islands, and New Zealand sea lion interactions at the Campbell Islands. Limited fishing effort occurs in the Tier 2 stocks and therefore any environmental impacts of these fisheries are thought to be limited.

The relatively high level of pinniped interactions is likely due to the proximity of these two fisheries to the breeding populations of fur seals on the Bounty Islands and sea lions on the Campbell Islands.

SBW is harvested using mid water trawl gear, but there is some benthic interactions. However, research indicates that this impact is low with only 0.43% of the New Zealand Territorial Sea and EEZ between 1989 and 2009 being trawled, and 4.25% of the full habitat range of southern blue whiting.

Where interactions with protected species and the marine environment are determined to be adverse, management intervention is required to avoid, remedy or mitigate these effects. A key focus of this National Deepwater plan is to ensure that adverse effects are minimised and that the deepwater fisheries continue to improve performance in terms of interactions with protected species and the marine environment. This is currently being achieved both through regulations and the range of non-regulatory measures that are implemented by industry and monitored and audited by the Ministry of Fisheries.

Section 2 provides more detailed information on the nature and extent of environmental interactions in the southern blue whiting target trawl fishery.

**Management need:**
The environmental management needs are detailed in Section 2, with reference to each category of environmental interactions.

## Economic overview

65% of southern blue whiting quota is held by four seafood companies, all of which are active participants in the fishery and account for approximately 50% of the annual catch.

Southern blue whiting is a relatively low value fish, but still supports an important fishery in New Zealand as it can be caught in high volumes over its short spawning season.

In 2010, almost 17,000 tonnes (processed weight) of southern blue whiting catch was exported, realising a value of $26M. All southern blue whiting is exported as frozen product, the majority of it to Asia.

At the end of the 2008/09 fishing year, the value of southern blue whiting quota was $74 million and contributed 2% of the total asset value of New Zealand's commercial fisheries.[4]

The southern blue whiting fisheries are currently being assessed by the Marine Stewardship Council for certification as a sustainably managed fishery. Certification may likely lead to economic benefits, by providing access to markets that will only accept certified seafood and a possible increase in value of southern blue whiting products.

**Management need:**
To support the southern blue whiting fishery in achieving, and maintaining, certification as a sustainably managed fishery

To enable quota holders to develop and implement a harvest regime that will maximise the economic benefits returned from the fishery

## Compliance overview

The southern blue whiting fishery is subject to an extensive range of regulatory measures aimed at ensuring the fishery is managed to achieve long-term sustainability. Further work will be undertaken through the implementation of this Fisheries Plan chapter to identify and assess compliance risks in the fishery. However, the following compliance risks have already been identified as being of particular relevance to southern blue whiting fisheries and these are described in more detail below:

[4] Statistics New Zealand (2010). Fish monetary stock account 1996-2009. Wellington: Statistics New Zealand.

*Discarding*

Discarding has been known to occur in the southern blue whiting fisheries in the past. Fishers may be motivated to illegally dump quota species to avoid utilising or acquiring annual catch entitlement (ACE) or paying deemed value charges if ACE cannot be obtained.

Vessels are able to catch very large volumes of fish in a single tow, which may provide the following incentives to dump fish:

1. A vessel may not have the capacity to process all the fish before fish begin to spoil, so fish that cannot be processed may be dumped.
2. Large bag sizes can result in a large volume of damaged fish, which vessels may also choose to dump.
3. Near the end of the season when fishers are near their quota limit, catching a large bag can easily put them over this limit resulting in large deem value fines. To avoid these fines a vessel may choose to dump catch.

It is therefore important that vessels in these fisheries closely monitor and regulate their catch rates, so as to prevent wastage.

*Area Misreporting ("trucking")*

Area misreporting occurs when catch taken in one QMA is reported as caught in another. The primary motive behind this type of offence is to minimise the cost of acquiring ACE or payment of deemed value charges, by taking advantage of differential ACE prices or deemed value rates between QMAs. To reduce this incentive to misreport, the Ministry has implemented uniform deemed value rates across the four sub-Antarctic stocks.

*Deployment of seabird mitigation devices*

Regulations require that all deepwater trawl vessels operating in southern blue whiting fisheries deploy seabird mitigation devices to ensure that fishing activity does not pose an unnecessary risk to seabirds.

The Ministry of Fisheries strives to minimise the opportunity for these and other types of offending to occur through careful risk analysis of the southern blue whiting fishery with cooperative input from the industry. Information sharing with industry allows the Ministry to adapt compliance efforts to current risks.

**Management need:**
To ensure compliance with the range of regulatory and non-regulatory management measures in the southern blue whiting fisheries is satisfactory and to minimise the opportunities for offending to occur.

## Social and cultural overview

The Fisheries Act (1996) (The Act) requires that, prior to setting management measures for southern blue whiting stocks, the Minister of Fisheries shall consult with persons having an interest in the stock or the effects of fishing on the aquatic environment in the area in which the fishery takes place, including Maori, environmental, commercial and recreational interests. In addition the Act requires that in setting a total allowable catch (TAC) under section 13, the Minister shall have regard to such social, cultural and economic factors (s)he considers relevant.

Social and cultural factors include those related to the harvesting of southern blue whiting by all parties; commercial, recreational and customary. Currently, there is no known southern blue whiting take by recreational or customary fishers and no allowances for these sectors have been set. Future recreational interest is considered unlikely, given the offshore nature of the fisheries, but future Maori interest in the southern blue whiting fisheries could emerge through the development of Iwi and Forum Fisheries Plans. If future interests do emerge, the associated management objective will be addressed and prioritised through the Deepwater Annual Operational Plan.

Social and cultural factors also include the non-extractive value of healthy southern blue whiting stocks and the values associated with an aquatic environment that is not adversely impacted on by southern blue whiting fishing activity. These inherent values must also be considered when determining the appropriate management measures for a fishery.

The generic management objectives described in the National Deepwater Plan and the fishery specific objectives described in this chapter ensure that these social and cultural requirements also guide the management of the southern blue whiting fishery.

## Overview by fishery

The following sections provide a description of each of the southern blue whiting fisheries and an outline of their current status, as at 1 April 2011. A graph of catch over time is also included for each fishery.

*Historical fishery information*

Catch quotas were first introduced for the southern blue whiting fisheries in 1992-93, when a total catch limit of 32,000 tonnes was set across the three Tier 1 stocks. In 1997-98, a stock specific limit was set for the Auckland Islands stock, which in conjunction with increases in other stock catch limits raised the total catch limit to 58,000 tonnes.

Southern blue whiting was then introduced to the quota management system on 1 November 1999. Concurrently the fishing year was changed from 1 October – 30 September, to 1 April – 31 March, to better reflect the fishing season.

## *The Bounty Platform fishery - SBW 6B*

Prior to 1978 southern blue whiting catch was not recorded by stock. Therefore the proportion of the total catch taken from the Bounty Platform at this time is unknown, although spawning aggregations were recorded. Catches at the Bounties were sporadic until 1990, when a marked increase in catch occurred due to a large 1988 year class starting to enter the fishery. Landings peaked during the 1991 fishing year with estimated SBW6B catch at almost 59,000 tonnes, compared with 11,000 tonnes in 1990.

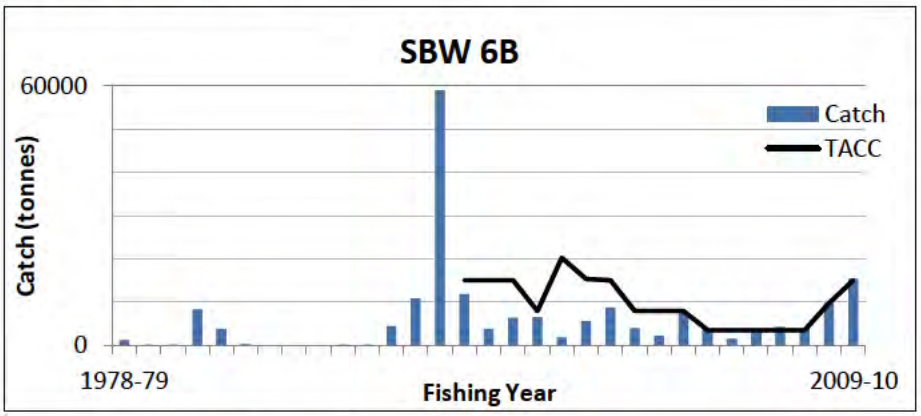


**Figure 3: Historic catch and TACC at the Bounty Islands**

In the 1992-93 fishing year, an initial stock specific catch limit of 15,000 tonnes was set. At the time, as noted above, the fishery was likely experiencing a period of high biomass due to the presence of the 1988 year class, which was approximately 3 times stronger than average year class strength. However a period of low recruitment followed, resulting in the TACC being reduced in three stages to 3,500 tonnes.

Since 2007-08, another pulse of strong recruitment was observed, resulting from the strong 2002 cohort. This cohort drove a seven-fold increase in biomass between 2006 and 2007, as it recruited to the fishery. To take advantage of this utilisation opportunity, The TACC was increased to 9,800 tonnes for the start of the 2008-09 fishing year and again to 15,000 tonnes for the 2009-10 fishing year.

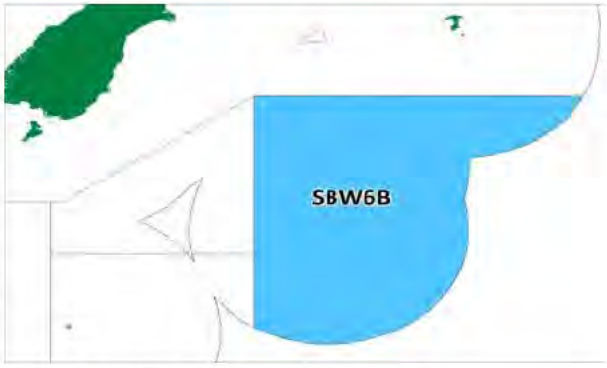


**Figure 4: Map of the Bounty Platform QMA**

The 2002 cohort was expected to remain in the fishery for several years. However, in 2009 and 2010 acoustic surveys showed a four-fold decrease in biomass. The advice paper to the Minister of Fisheries in 2010 placed this stock at or just below the level that produces the maximum sustainable yield. As a consequence the TACC was reduced from 15,000 tonnes to 6,860 tonnes for the start of the 2011-12 fishing year, in the first of a two year phased reduction. A further TAC review is planned for April 2012.

## *The Campbell Islands Rise Fishery – SBW 6I*

The Campbell Islands stock is the largest of the four southern blue whiting stocks. Two spawning aggregations occur at the Campbell Islands Rise, a northern and a southern aggregation. It is thought that fish recruit to the southern spawning aggregation when they first mature, but to the northern aggregation every subsequent year.

Fishing is likely to have occurred in this stock prior to 1978, but catch records were not reported by stock in this time. However, historical information suggests that from 1978-84 catches were reportedly taken year-round from the Campbell Islands, with the highest catches during the spawning season.

The initial stock specific catch limit was set at 11,000 tonnes in 1992-93. This was increased to 21,000 tonnes in 1995-96, and reached a maximum of 35,460 tonnes in 1997-98, just prior to the stock's QMS introduction. Since then the TAC has varied but remains in excess of 20,000 tonnes.

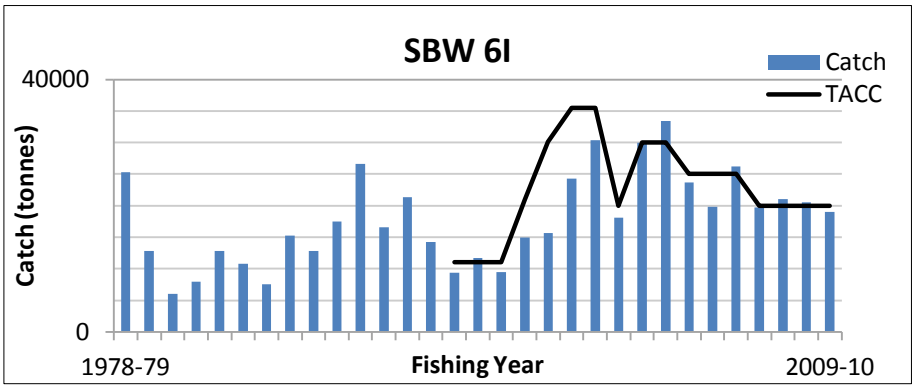


**Figure 5: Historic catch and TACC at the Campbell Islands**

SBW6I experienced the largest observed event of episodic recruitment of any southern blue whiting fishery, which was driven by recruitment of the 1991 year class. Recruitment of this cohort was seven times greater than the historical mean at the Campbell Islands, and the year class contributed significantly to catches taken between 1995 and 2001. In 2006 the 1991 year class still comprised 5% of the catch, but the lack of a significant recruitment event after 1991 meant that the stock was experiencing a period of decline.

The first wide area acoustic survey of SBW6I since 2005 took place in 2009. The results of this survey indicated that another large recruitment pulse was entering the fishery as 3 year olds. Further analysis showed that the strength of both the 2006 and 2007 year classes were significantly greater than the historical mean recruitment, and were likely driving this significant increase in biomass.

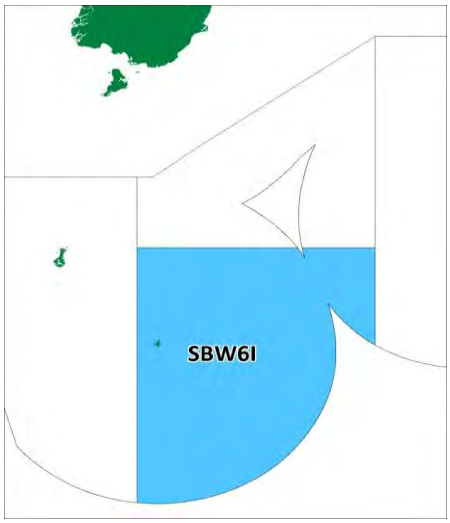


**Figure 6: Map of the Campbell Islands QMA**

When these strong year classes were first detected in 2009 they were already contributing to the commercial catch. However, fish in these year classes also appeared to be very slow growing, and would therefore take longer to reach a suitable size for commercial processing.

As a result, conservative management decisions followed the 2009 survey, to provide the majority of fish the time to grow to a larger size. Biological sampling of the 2006 and 2007 year classes indicated that it would take around 2-3 years for the fish to grow to a suitable size around 35cm.

A full stock assessment was completed in 2011, which estimated stock status to be between 68-70%$B_0$, above the level which produces the maximum sustainable yield. Consequently, the TACC was increased from 23,000 tonnes to 29,400 tonnes for the start of the 2011-12 fishing year.

## *The Pukaki Rise Fishery – SBW 6R*

The catch limit for this stock has been set at 5,500 tonnes since the 1997-98 fishing year, prior to which it was set at its highest level of 7,700 tonnes.

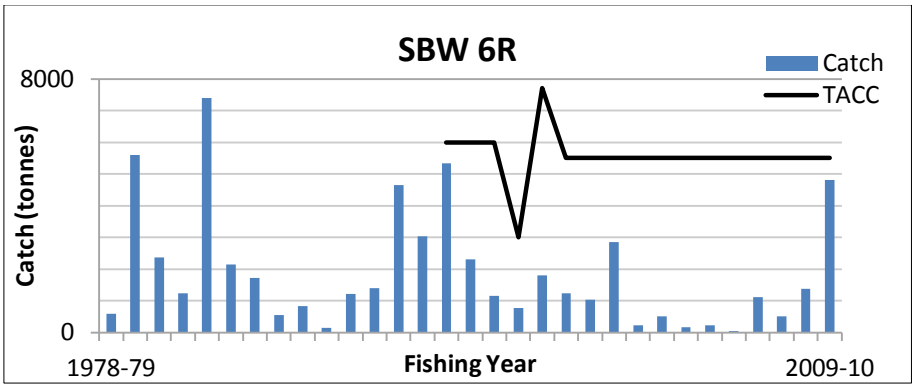


**Figure 7: Historical catch and TACC from the Pukaki Rise**

The SBW6R TACC is generally under-caught, with catches typically reaching approximately 2-3000 tonnes each year. This is due to a lack of fishing effort in this stock, rather than an indication of a stock sustainability issue. Spawning at Pukaki Rise occurs at the same time as spawning at the Campbell Islands, where catch rates are generally greater. Therefore for economic reasons, or for better catch, commercial operators often fish at the Campbell Islands in preference to Pukaki Rise.

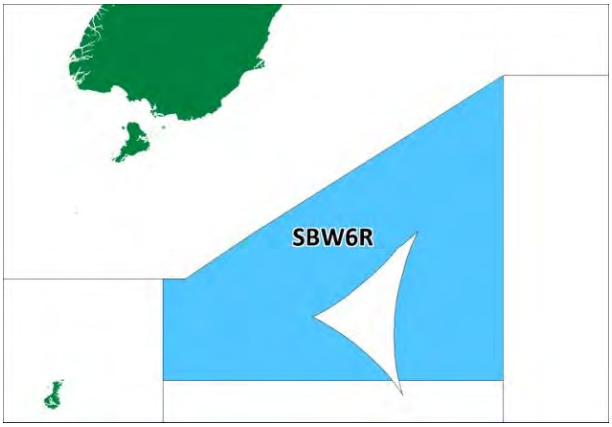


**Figure 8: Map of the Pukaki Rise QMA**

However, anecdotal evidence suggests that a strong year class may have recruited to this fishery in recent years. Acoustic data has been collected in this fishery during 2009 and 2010, although this data was of limited value as it was not collected during the peak spawning period. Further information on the available biomass is needed before a TAC review can occur. An acoustic survey is scheduled for the 2012-13 fishing year which will be delivered through the 10 Year Research Programme for Deepwater Fisheries.

## *The Auckland Islands Fishery – SBW 6A*

This fishery will be managed as a Tier 2 stock. This means the stock will not be monitored or assessed on such a frequent basis as the other three Tier 1 southern blue whiting stocks, but will be subject to regular fisheries characterisations. In place of a regular survey programme CPUE, Observer sampling, and catch at age data will be used to inform management of this fishery.

A separate catch limit was not introduced for this stock until the 1997-98 fishing year when it was brought into the QMS. The TACC was then set at 1,640 tonnes and has not been reviewed since the stocks introduction.

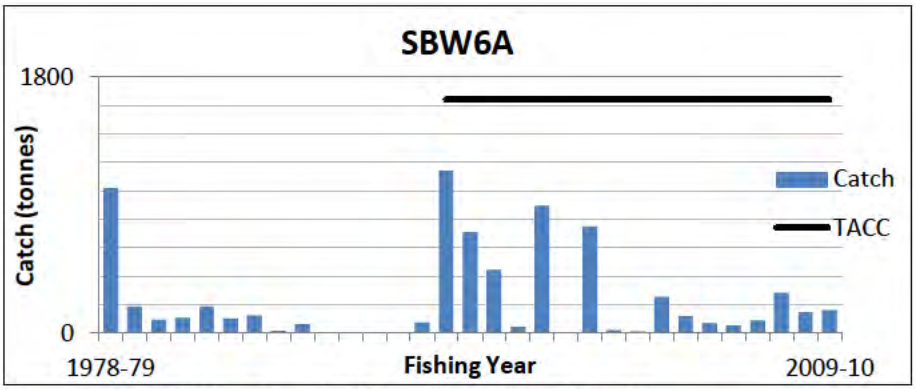


**Figure 9: Historical catch and TACC at the Auckland Islands**

Catches from this stock have remained at low levels, as minimal target southern blue whiting fishing occurs in this area. This is likely due to the smaller size of the spawning event in this stock, the isolation of the stock from the other southern blue whiting fisheries and the occurrence of peak spawning at the same time as the larger Campbell Island and Pukaki Rise stocks. Fishing effort is therefore directed preferentially at the larger stocks.


**Figure 10: Map of the Auckland Islands QMA**

## 2. Overview of non-target interactions

The purpose of the Act describes sustainability in part as avoiding, remedying or mitigating any adverse effects of fishing on the aquatic environment. This section describes in more detail the relevant non-target bycatch and incidental interactions and captures that occur in the southern blue whiting fisheries (Table 1) and also attempts to assess these effects in the context of the Act.

Bycatch and incidental captures that occur in the southern blue whiting fisheries have been categorised as follows:

1. **Key bycatch species:** These are species which, while not specifically targeted by the fishery, are of economic value. They are predominantly QMS species and therefore will be managed through a fisheries plan chapter.

   As a rule, species that account for at least 1% of the total catch weight are managed as a key bycatch stock.

2. **Incidental bycatch species:** These are species with little or no commercial value that are rarely the focus of fishing effort and are usually discarded or rendered to fishmeal. They are typically non-QMS species.

3. **Incidental interactions of endangered, threatened and protected (ETP) species:** This category relates to the accidental capture, interaction and mortality of protected species such as seabirds, marine mammals, protected corals and protected shark species.

4. **Benthic interactions:** This category includes benthic invertebrate species that are captured by trawl gear, the mortality of bottom-dwelling animals not captured in nets, and overall damage to benthic habitats. This information is based on MFish observer reports and the assessment of the trawl footprint from this fishery.[5]

Fish and invertebrate species taken as bycatch or incidental catch in the southern blue whiting fishery for the last three complete fishing years are shown in Table 4 below. This information is based on observer data.

The table is coded as follows:

- Those species highlighted in orange, and labelled “D”, are species that will be managed through another chapter in the National Deepwater Plan
- Those species highlighted in yellow, and labelled “H” or “I”, are species managed through an Inshore or Highly-Migratory Species fisheries plan
- Remaining species are incidental bycatch species which will be monitored annually as part of the southern blue whiting plan

[5] The information in this report comes from: 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. However, regular assessments of this kind will be delivered through the 10 Year Research Programme for Deepwater Fisheries.

**Table 4: Catch weight by species name for the top 50 species caught as a bycatch in southern blue whiting trawls – from Observer data for the period 1 October 2005 to 30 September 2009. Observer coverage during this time period averaged 34.1%**

| Species | Common name | Sum of observed greenweight (kg) | Percentage of catch (%) | Code |
|---|---|---|---|---|
| **SBW** | **Southern blue whiting** | **71,797,564** | **99.7** | |
| LIN | Ling | 60,615 | 0.1 | D |
| HAK | Hake | 42,717 | 0.1 | D |
| SBI | Large scaled brown slickhead | 32,533 | <0.1 | |
| PAH | Opah | 12,718 | <0.1 | |
| HOK | Hoki | 12,237 | <0.1 | D |
| JAV | Javelinfish | 11,497 | <0.1 | |
| POS | Porbeagle shark | 10,915 | <0.1 | H |
| GSP | Pale ghost shark | 7,080 | <0.1 | D |
| MOO | Moonfish | 4,644 | <0.1 | H |
| RBM | Ray's bream | 3,747 | <0.1 | H |
| SSI | Silverside | 3,564 | <0.1 | |
| SPD | Spiny dogfish | 3,142 | <0.1 | D |
| RAT | Rattails | 2,447 | <0.1 | |
| WWA | White warehou | 2,437 | <0.1 | D |
| SQU | Squid | 1,765 | <0.1 | D |
| WSQ | Warty squid | 1,530 | <0.1 | |
| LCH | Long-nosed chimaera | 1,516 | <0.1 | |
| WIT | Witch | 1,006 | <0.1 | |
| ETB | Baxter's lantern dogfish | 817 | <0.1 | |
| LDO | Lookdown dory | 778 | <0.1 | D |
| GSH | Dark ghost shark | 724 | <0.1 | D |
| RCO | Red cod | 574 | <0.1 | I |
| ONG | Sponges | 418 | <0.1 | |
| ROK | Rocks / stones | 400 | <0.1 | |
| BSH | Seal shark | 305 | <0.1 | |
| POM | Pomfrets | 260 | <0.1 | |
| CON | Conger eel | 249 | <0.1 | |
| RSK | Rough skate | 240 | <0.1 | I |
| SFI | Starfish | 229 | <0.1 | |
| GLS | Glass sponges | 203 | <0.1 | |
| ZFO | Rubbish-fishing other | 200 | <0.1 | |
| TOA | Toadfish | 194 | <0.1 | |
| LAN | Lanternfish | 191 | <0.1 | |
| SSK | Smooth skate | 153 | <0.1 | I |
| RSQ | Red squid | 138 | <0.1 | |
| HOL | Tubeshoulder | 129 | <0.1 | |
| GSQ | Giant squid | 120 | <0.1 | |

| Species | Common name | Sum of observed greenweight (kg) | Percentage of catch (%) | Code |
|---|---|---|---|---|
| ANT | Anemones | 100 | <0.1 | |
| BBE | Banded bellowsfish | 92 | <0.1 | |
| MDO | Mirror dory | 76 | <0.1 | |
| STU | Slender tuna | 61 | <0.1 | |
| ZFT | Rubbish – fishing textiles | 50 | <0.1 | |
| PIG | Pigfish | 48 | <0.1 | |
| STA | Giant stargazer | 44 | <0.1 | D |
| MIQ | Warty squid | 42 | <0.1 | |
| OPI | Umbrella octopus | 40 | <0.1 | |
| SQX | Squid (unspecified) | 37 | <0.1 | |
| MAN | Finless flounder | 31 | <0.1 | |
| Others | | 544 | <0.1 | |

## Category 1: Key bycatch species

The southern blue whiting fisheries are highly species specific and more than 99% of the landed catch is southern blue whiting.

**Management need:**
No key bycatch stocks are considered to be associated with the southern blue whiting fisheries and none are managed through this chapter of the National Deepwater Plan.

## Category 2: Incidental bycatch species

These are typically species with little or no commercial value, which are not the focus of fishing effort and are frequently discarded or rendered to fishmeal. The bycatch discard rate in the southern blue whiting fisheries is very low. More than 99% of the greenweight catch in southern blue whiting target tows is retained on board[6].

The total quantity of incidental bycatch in the southern blue whiting fisheries is unlikely to adversely affect any of the species that are taken. The Ministry does not consider there to be sustainability concerns with any of the incidental bycatch species listed in table 3.

**Management need:**
To ensure that catch levels of the species that are caught as incidental bycatch are monitored annually by Observers.

To intervene if there are concerns that harvest levels are thought to be impacting on the sustainability of the species or if there are utilisation concerns. This could include section 11 measures or the species being assessed for possible QMS introduction, via the QMS introduction standard.

## Category 3: Incidental captures of ETP species

As described previously, the southern blue whiting trawl fishery interacts with a range of seabird species and two species of marine mammal. The Fisheries Act requires that when an environmental impact is adverse this effect should be avoided, remedied or mitigated.

A key focus of this National Deepwater Plan is to ensure that adverse effects on endangered, threatened, and protected species (ETP) populations are minimised and that the deepwater fisheries continue to improve performance in terms of captures of these species. If the extent of southern

[6] This is based on Observer data for the period 1 October 2005 to 30 September 2009. Observer coverage during this time period averaged 34.1%

blue whiting fishing activity is thought to be having an adverse impact on an ETP then further management intervention, including increased mitigation, will likely be required.

Table 5 below describes the extent of interactions with seabirds and marine mammals from Ministry of Fisheries observed vessels over the period 1 October 2005 – 30 September 2009. All the observed interactions with New Zealand sea lions occurred at the Campbell Islands fishery and the majority of New Zealand fur seal interactions occurred at the Bounty Islands fishery.

**Table 5: Extent of observed interactions with seabirds and marine mammals from the southern blue whiting trawl fisheries. Data from Abraham & Thompson (2011)**

| Year | No. Observed Captures | | | % tows observed |
|---|---|---|---|---|
| | Seabirds | Marine Mammals | | |
| | | Fur seal | Sea lion | |
| 2002/03 | 0 | 8 | 0 | 43.1 |
| 2003/04 | 0 | 13 | 1 | 32.6 |
| 2004/05 | 2 | 33 | 2 | 38.6 |
| 2005/06 | 2 | 52 | 3 | 34.8 |
| 2006/07 | 3 | 13 | 3 | 35.6 |
| 2007/08 | 3 | 24 | 5 | 40.6 |
| 2008/09 | 0 | 17 | 0 | 25.2 |

## Seabirds:

Seabirds are infrequently caught during trawling for southern blue whiting, as shown in Tables 5 and 6. This is thought to be because these fisheries operate during winter months, when many seabird species have moved out of the areas where southern blue whiting is targeted. The southern blue whiting fisheries are therefore considered to present a relatively low risk to seabirds.

This is confirmed by the recently completed sea bird risk assessment. The risk assessment takes into account the biology of the seabird species, their distribution, and the overlap with commercial fishing activity to determine the overall risk to each species from fishing. All known information regarding seabird populations is also included in the risk assessment. This risk assessment clearly identified that the SBW fisheries pose a low to negligible risk to the seabird species of potential concern.

Seabirds that are injured or killed by trawl gear either collide with the trawl warps or are caught in the net when the fishing gear is on the surface for shooting and hauling. Typically, it is the larger seabirds, such as albatrosses, which are struck by warps, and the smaller birds, such as petrels and shearwaters, which become caught in the net. The two seabird species that make up the majority of captures in the southern blue whiting fisheries are the grey petrel and the Campbell albatross.[7]

[7] Abraham, E.R.; Thompson, F.N. (2011). Summary of the capture of seabirds, marine mammals, and turtles in New Zealand commercial fisheries, 1998-99 to 2008-09. Final Research Report prepared for Ministry of Fisheries project PRO2007/01. 170 pages. (unpublished report held by the Ministry of Fisheries)

Regulations were passed in 2005 that require all trawl vessels over 28 metres in length to deploy seabird mitigation devices, such as tori lines, in order to scare birds away from the danger zone around the stern of the vessel. These mitigation measures have proved successful in reducing the number of warp interactions across the deepwater and middle-depth fleet generally. However, there is still the outstanding issue of incidental seabird mortalities through net captures and achieving a better understanding of the level of cryptic seabird mortalities[8] that occur in these fisheries.

**Table 6: Seabird interactions in the southern blue whiting trawl fisheries 2002/03-2008/09. Observed and estimated seabird captures shown, with 95% confidence intervals in parentheses. Data from Abraham & Thompson 2011**

| Year | Observed captures | % tows observed | Strike rate based on observer data | Model-based estimate of total captures |
|---|---|---|---|---|
| 2002/03 | 0 | 43.1 | 0 | 2 (0 - 6) |
| 2003/04 | 0 | 32.6 | 0 | 1 (0 - 4) |
| 2004/05 | 2 | 38.6 | 0.6 | 7 (7 - 18) |
| 2005/06 | 2 | 34.8 | 0.92 | 4 (2 - 9) |
| 2006/07 | 3 | 35.6 | 1.34 | 4 (3 - 8) |
| 2007/08 | 3 | 40.6 | 0.91 | 5 (3 - 9) |
| 2008/09 | 0 | 25.2 | 0 | 5 (0 - 16) |

In addition to these mandatory mitigation measures, industry and the Ministry work collaboratively to ensure all trawlers over 28 metres in length have, and follow, a Vessel Management Plan (VMP). VMPs specify measures that must be followed onboard the vessel to reduce the risk to seabirds of interacting with the fishing gear or the fishing vessel. These measures include storing offal while shooting and hauling the gear, and making sure all fish are removed from the net before it is redeployed. The Ministry monitors vessel performance against its VMP and if a vessel is not complying with the guidelines within its VMP the Chief Executive of the Ministry has the option of putting vessel-specific regulations in place to better control offal management practices. The Ministry can also use incentives such as the increased placement of observers to encourage operators to adhere to the guidelines in the VMPs.

**Management need:**
Given the low level of interactions that occur in these fisheries, the Ministry considers the current management measures to be sufficient but will continue regular monitoring to ensure this remains the case.

[8] Cryptic seabird mortalities refer to the unrecorded, unobserved, or unknown deaths that may have occurred to a seabird due to an interaction with a fishing vessel

## Marine Mammals:

New Zealand fur seals and New Zealand sea lions are the only marine mammals that are known to interact with the southern blue whiting fisheries. Breeding colonies of both these species are present on the sub-Antarctic Islands around which the two largest southern blue whiting fisheries operate.

A New Zealand fur seal colony exists at the Bounty Islands, and a New Zealand sea lion colony at the Campbell Islands. As such, interactions with each of these two species generally occur only in the fishery that takes place adjacent to each colony (ie: fur seal interactions generally occur only in the Bounty Islands fishery, and sea lion interactions occur only in the Campbell Islands fishery).

Marine mammal interactions, other than with fur seals or New Zealand sea lions, appear to be rare events and therefore the effects of southern blue whiting fishing activity on these species is unlikely to be adverse.

The industry-developed Marine Mammal Operating Procedure (MMOP) is the tool currently used to encourage changes in fishing practices across all deepwater and middle-depth fisheries. The MMOP is generic across all trawlers over 28m in length and describes a range of procedures that a vessel and crew should follow to reduce the risk of marine mammal captures. These measures include managing offal discharge and avoiding shooting and hauling the gear when marine mammals are congregating around the vessel. The Ministry monitors and audits vessel performance against the MMOP via the Observer Programme. The Ministry intends to report the results of these audits annually from 2011-12, via the Deepwater Annual Review Report (ARR).

To understand the full impact of captures on a population it is important that marine mammal interactions in the southern blue whiting fisheries are assessed and managed in the context of the total number of interactions that occur within all fisheries. Key fisheries to consider include the hoki fishery on the WCSI and the squid fishery around the Auckland Islands.

**Management need:**
To ensure the level of New Zealand sea lion interactions at the Campbell Islands and New Zealand fur seal interactions at the Bounty Islands are not having an adverse impact on their populations.

To reduce mortality of sea lions and fur seals as far as practicably possible, having regard to operational, technological and financial matters.

**Bounty Platform – Fur seal interactions**

New Zealand fur seals are caught by southern blue whiting trawlers at the Bounty Platform. Although the New Zealand fur seal is a protected species under the Marine Mammal Protection Act 1978, the species status has been classified by the Department of Conservation as Not Threatened. New Zealand's fur seal population is thought to have been expanding in many areas over the last twenty to thirty years, particularly the east coast of the South Island[9] and at the Bounty Islands[10]. However this population has not been surveyed since 1996 and therefore the current state is unknown.

The rate of fur seal interactions at the Bounty Islands is the highest of any New Zealand fishery. The high rate of interaction can be attributed to the proximity of this fishery to the large fur seal colony located on the Bounty Islands. However, the estimated number of captures although significant, is thought unlikely to adversely impact the population's viability. The fur seal population at the Bounty Islands was last surveyed in 1996, when the population was considered to be increasing in size, although the rate of increase had slowed since the previous survey in 1982.

**Table 7: Fur seal interactions in the southern blue whiting trawl fisheries 2002-03 to 2008-09. Observed and estimated captures shown, with 95% confidence intervals in parentheses. Data from Abraham & Thompson 2011.**

| Year | Observed FUR captures | % tows observed | Strike rate based on observer data | Model-based estimate of total captures |
|---|---|---|---|---|
| 2002/03 | 8 | 43.1 | 2.91 | 20 (10 - 43) |
| 2003/04 | 13 | 32.6 | 5.39 | 33 (18 - 70) |
| 2004/05 | 33 | 38.6 | 9.85 | 75 (43 - 149) |
| 2005/06 | 52 | 34.8 | 23.96 | 67 (55 - 88) |
| 2006/07 | 13 | 35.6 | 5.80 | 22 (14 - 36) |
| 2007/08 | 24 | 40.6 | 7.25 | 76 (37 - 164) |
| 2008/09 | 17 | 25.2 | 5.69 | 106 (47 - 207) |

[9] Lalas, C & Harcourt, R (1995) Pup production of the New Zealand fur seal on Otago Peninsula, New Zealand. Journal of the Royal Society of New Zealand, 25: 1, 81-88
Lalas, C. (2008). Recolonisation of Otago, southern New Zealand, by fur seals and sea lions; unexpected patterns and consequences, 15p. *in* Clarkson, B.; Kurian, P.; Nachowitz, T.; Rennie, H. (Eds.), Proceedings of the Conserv-Vision Conference, University of Waikato, available at http://www.waikato.ac.nz/wfass/Conserv-Vision/proceedings/Lalas.pdf

[10] Taylor, Rowland H. Distribution, abundance and pup production of the New Zealand fur seal (*Arctocephalus fosteri*) at the Bounty Islands. Department of Conservation 1996.

**Campbell Islands – New Zealand sea lion interactions**

New Zealand sea lions are caught by southern blue whiting trawlers at the Campbell Islands. As of 2010 29% of the total population of New Zealand sea lions are estimated to breed on the Campbell Islands[11]. The proximity of the SBW6I fishery to this colony is a likely cause for SBW6I being the only southern blue whiting fishery in which sea lion captures are reported.

The sea lion capture rate has historically remained low in SBW6I. Although the latest data appears to show an increasing trend in the number of sea lions captured per year, the overall risk to the population on the Campbell Islands is considered to be low mainly because the captures are predominately males. The most recent assessment of the sea lion rookeries at the Campbell Islands (from 2010) indicates that sea lion pup production on Campbell Islands appears to have increased since the previous survey in 2009[12]. In addition, the majority (>90%) of sea lions captured in SBW6I are males, making the level of captures less likely to have an adverse impact on the population of this polygynous species.

Sea lion interactions in the squid fishery at the Auckland Islands are managed using a fishing related mortality limit (FRML) that is set each year as a using a sea lion population model. When calculating the FRML the population model takes into account sea lion mortalities that only occur in the squid fisheries. These populations are seen as somewhat separate and therefore it is unlikely that New Zealand sea lion mortalities will be included in future FRML calculations.

**Table 8: Sea lion interactions in the southern blue whiting trawl fisheries 2002-03 to 2008-09. Observed and estimated captures shown, with 95% confidence intervals in parentheses. Data from Abraham & Thompson 2011**

| Year | Observed sea lion captures | % tows observed | Strike rate based on observer data | Model-based estimate of total captures |
|---|---|---|---|---|
| 2002/03 | 0 | 43.1 | 0.00 | 0 (0 - 3) |
| 2003/04 | 1 | 32.6 | 0.41 | 3 (1 - 8) |
| 2004/05 | 2 | 38.6 | 0.60 | 5 (2 - 11) |
| 2005/06 | 3 | 34.8 | 1.38 | 7 (3 - 15) |
| 2006/07 | 3 | 35.6 | 1.34 | 13 (5 - 25) |
| 2007/08 | 5 | 40.6 | 1.51 | 7 (5 - 13) |
| 2008/09 | 0 | 25.2 | 0.00 | 1 (0 - 6) |

[11] Robertson, C. & Chilvers, L. (2011) The population decline of the New Zealand sea lion *Phocartos hookeri*: a review of possible causes. *Mammal Review* 2011.

[12] Maloney, A.; Chilvers, B.; Haley, M.; Muller C.; Roe, W.; Debski, I. (2009) Distribution, pup production and mortality of New Zealand sea lion (*Phocarctos Hookeri*) on Campbell Island/Motu Ihupuku, 2008. Available at: www.newxealandecology.org/nzje/

Childerhouse, S. Et al. (2005) Distribution, abundance and growth of New Zealand sea lion *Phocarctos hookeri* pups on Campbell Island. New Zealand Journal of Marine and Freshwater Research 39:889-898.

Prior to the 2010 season, interactions with New Zealand sea lions were infrequent in the Campbell Islands fishery, reaching a maximum of 5 observed captures since 1998-99. However, during 2010, an unprecedented capture event took place, where 11 sea lion captures occurred over a two week period, one of which was released alive.

The exact cause of these captures is not fully understood, although discussions between fisheries managers, vessel operators and Ministry Observers identified some factors which may have contributed. All the captures in the 2010-11 season occurred during a two week period of severe weather. Anecdotal reports suggest that the prevailing conditions may have caused behavioural changes which increased the risk of sea lion capture. There were reports of congregations of sea lions showing increased interest in the fishing gear than has been seen in this species previously. In addition, bad weather conditions caused a number of vessels to leave the fishing grounds. This may have concentrated sea lions around the few remaining vessels making it more difficult to avoid incidental captures.

**Management need:**
Better understand the factors contributing to sea lion mortality.

## Protected shark species:

There are no known interactions with protected shark species.

## Protected coral species:

The majority of hard coral species found in New Zealand are now protected under the Wildlife Act 1953.

Observer records from the last five fishing years (2006/07 to 2010/11) indicate that 2kg of protected coral (spp: bubblegum coral) has been incidentally taken by observed vessels targeting southern blue whiting.

**Management need:**
Given the low level of interactions with protected shark and coral species in the southern blue whiting fisheries, the Ministry considers the current management measures to be sufficient but will continue regular monitoring to ensure this remains the case.

## Category 4: Benthic interactions

The majority of southern blue whiting target fishing (approximately 95% of target tows) utilises mid-water trawl gear. Although this gear is fished close to or on the seafloor in approximately 70% of trawl tows, mid water gear is lighter and is not fished hard down against the seafloor. In addition, the fisheries operate over a small temporal and spatial scale when compared to other middle-depth fisheries. These factors combined limit the impacts of this fishery on the benthic environment.

Across all four southern blue whiting stocks, the trawl footprint has been calculated as 17,485km$^2$ between 1989-90 and 2008-09.[13] This figure includes the swept area of all target southern blue whiting bottom trawls and mid water trawls that were fished on the seafloor, and is shown in Map 11.

**Table 9: Benthic bycatch from southern blue whiting target tows, from Observer records for the 2006-07 to 2010-11 fishing years.**

| Category | Species code | Common name | Protected species (corals only) | Total amount recorded (kg) |
|---|---|---|---|---|
| Corals | PAB | Bubblegum coral | Yes | 2 |
| Sponges | GLS | Glass sponges | | 418 |
| | HMT | Warty deepsea anemones | | 203 |
| | ANT | Anemones | | 144 |
| | HYA | Floppy tubular sponge | | 100 |
| | PHW | Rubber sponge | | 60 |
| | ACS | Smooth deepsea anemone | | 20 |
| | ONG | Sponges | | 13 |

In recent years the management measures to address the effects of deepwater trawl activity have focused on 'avoiding' these effects rather than remedying or mitigating them. This has been achieved by closing areas to bottom trawling; first with seamounts and then with Benthic Protection Areas (BPAs). The implementation of BPAs in 2007 effectively closed over 30% of the New Zealand EEZ to trawling. MFish also implemented a monitoring regime to ensure these closures were adhered to. The BPA closures were based on the best available marine classification and over 10% of each environment class was closed. [14]

The current BPAs will be reviewed after 2013 and if research suggests that the existing BPAs are not protecting a representative section of marine habitats then further closures will be considered. Figures 11 and 12, below, detail the BPAs and seamount closures, and the depth range of southern blue whiting.

[13] 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

[14] The exception was environmental class 55, where only 3% was closed, because a third of this area is included in the Territorial Sea and most bottom trawling in that area is for coastal rather than deepwater species.

The four southern blue whiting quota management areas in the sub-Antarctic contain parts of four different BPAs and four seamount closures. These closures are detailed below:

- The Antipodes Transect BPA and Bollons seamount closure are also found within SBW6B
- The Campbell East BPA is transects the northern boundary of SBW6I and the southern boundary of SBW6R
- Seamount 401 closure is also found within SBW6I
- The Sub-Antarctic Deep BPA, Christable and Seamount 375 closures are found within SBW6A

In addition, the Territorial Seas around the Bounty, Campbell and Auckland Islands are designated as Marine Reserves under the Marine Reserves Act 1971.

**Management need:**
To continue to monitor the extent of the trawl footprint each year to ensure the bottom trawl footprint is not having an adverse impact on the benthic habitat.

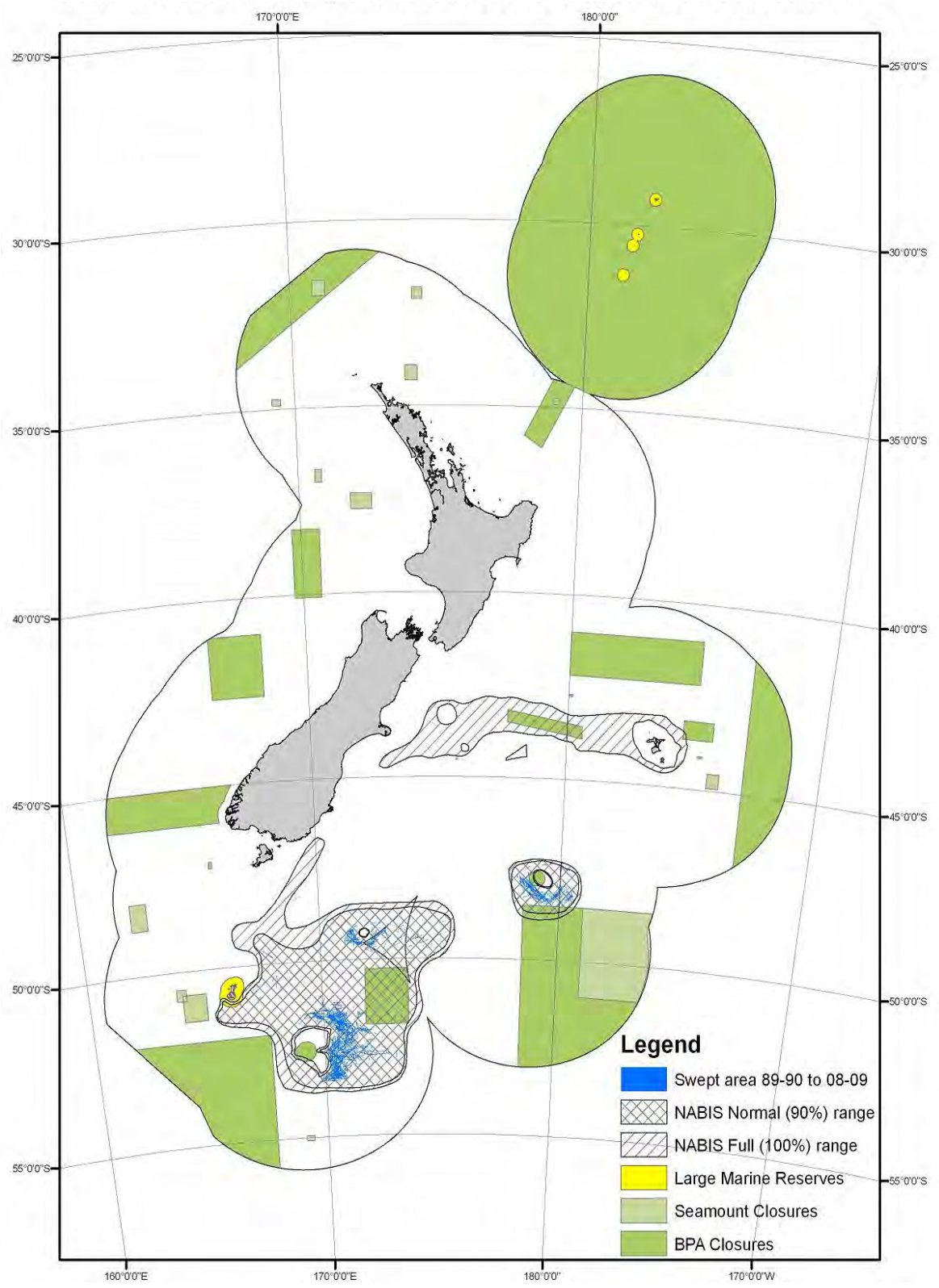


**Figure 11: Southern blue whiting bottom trawl footprint 1989-90 to 2008-09 (note trawl tracks are not to scale)**

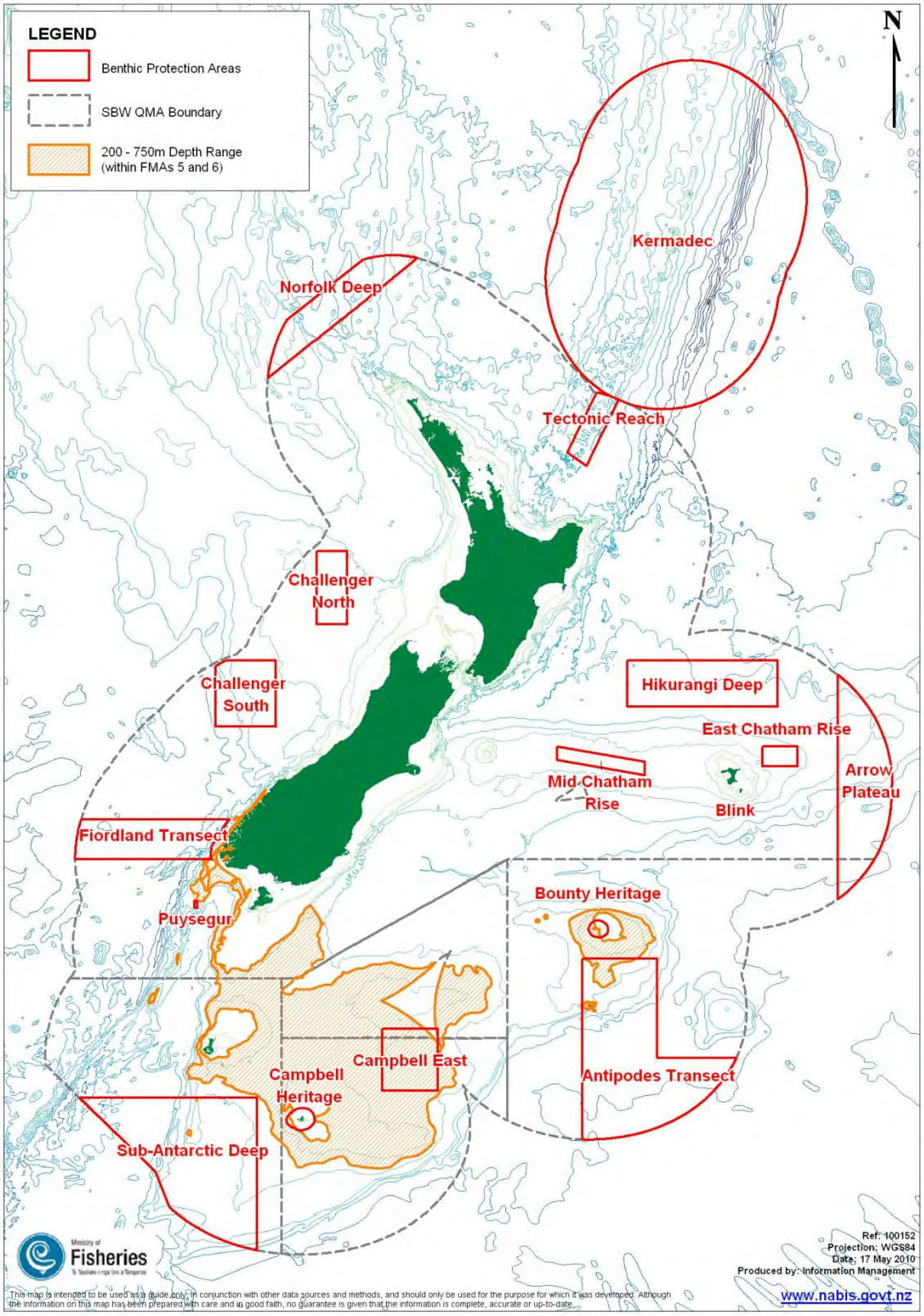


**Figure 12: The proportion of southern blue whiting habitat currently closed to bottom trawling activity through the BPAs**

# 3. Operational Objectives for the southern blue whiting fisheries

This part of the plan describes the operational objectives that will drive the management of the southern blue whiting fishery through the 5 year timeframe of the National Deepwater Plan. Each operational objective is described in terms of the high level management approach that will be taken to addressing these key issues (see Appendix 1 for overview).

This section also shows the expected timeframe for delivery of the work that will contribute to achievement of the stated Performance Indicators. Timeframes are presented by financial year (1 July – 30 June), and to enable readers to interpret these timeframes correctly, the following guidelines are included below:

1. Where the timeframe is "**by** 20xx/xx", it is expected that work will be **completed** by the **end** of the stated financial year.
2. Where the timeframe is "**from** 20xx/xx", it is expected that work will **commence** during the stated financial year, and will likely be ongoing across one or more financial years.
3. Where the timeframe is "**during** 20xx/xx", it is expected that work will be **completed** during the stated financial year.
4. "Annual delivery" requires work to be reported annually through the duration of this Plan

## Utilisation Operational Objectives

**OO1.1 Support the southern blue whiting fishery in achieving and maintaining credible third party certification and ensure any Conditions of Certification are met within the required timeframe**

The southern blue whiting fisheries are currently being assessed for certification by the Marine Stewardship Council (MSC)[15]. Operational Objective 1.1 aims to ensure the adequate and timely provision of documentation required for all steps in the MSC assessment process. This Objective also recognises that Conditions of Certification (Conditions) that may be placed on the southern blue whiting fisheries whi may require additional management that has not been specified in this Plan. Should any Conditions refer to issues not incorporated in the other Operational Objectives, completion of the Condition will be driven through this Operational Objective (1.1).

| Contributing to Management Objectives: | Performance Indicators: | Timeframe: |
|---|---|---|
| MO 1.1, MO1.2 MO 1.3, MO 1.5, MO 1.6, MO 2.1, MO 2.4, MO 2.5, MO 2.6, and MO 2.7 | 1. The SBW fisheries are successfully MSC certified by a credible independent third party[16]<br>2. Conditions of Certification are effectively incorporated into management actions through Annual Operational Plans<br>3. Maintain certification. | 1. By 2011/12<br>2. From 2012/13 |

[15] www.msc.org

[16] Assessment Study of On-pack, Wild capture Seafood Sustainability Certification Programmes and Seafood Ecolables. Accenture. WWF International. 2009

**OO1.2 Enable quota owners to develop and implement a harvest regime that will maximise the value obtained from the southern blue whiting fisheries, in line with the harvest strategy**

The relatively low value of southern blue whiting products together with the operational characteristics of these and related fisheries may limit the value that can be returned to quota owners each year. Operational Objective 1.2 recognises that, although ensuring biological sustainability is paramount to fisheries management decisions, economic decisions can also influence the value fish quota holders are able to realise each year.

Objective 1.2 aims to assist quota owners in developing a list of principles or guidelines that can inform fisheries management decisions provided stock sustainability is assured. These guidelines will help give effect to the economic considerations of quota holders when TAC reviews occur. Principles will likely address factors such as:

- Preferential targeting of larger fish (approximately ≥35cm)
- Consideration of the rate of change to the TAC, limiting changes to no more than 10-20% of the current TAC in any one year
- Maintaining the ability to vary the proportion of the catch limit between each of the three stocks, to maximise value while staying within the management limits

| **Contributing to Management Objectives:** | **Performance Indicators:** | **Timeframe** |
|---|---|---|
| MO 1.1, MO 1.2 MO 1.3, MO 1.5, and MO 2.1 | 1. Guidelines that maximise the value obtained from the southern blue whiting fisheries are agreed by quota owners<br>2. Such guidelines are an integral component of southern blue whiting management decisions, provided no sustainability concerns have been raised | 1. By 2012/13<br>2. From 2012/13 |

**OO1.3 Ensure satisfactory levels of compliance are achieved in the southern blue whiting fisheries**

Compliance indicators have been developed for the deepwater fisheries generally [17] to support the concept of "informed and assisted" compliance, but fishery specific compliance information is not readily available for southern blue whiting. Initially, the Ministry will profile the levels of fisher compliance with the range of regulatory and non-regulatory management measures currently in place in the fishery. A risk assessment will then be undertaken to identify compliance risks specific to the southern blue whiting fisheries and the Ministry will use this to develop a range of performance indicators that will assist in managing the emerging or newly identified risks.

Levels of compliance will then be assessed annually against the agreed performance indicators and reported to stakeholders and tangata whenua through the Annual Review Report.

| Contributing to Management Objectives: | Performance Indicators: | Timeframe |
|---|---|---|
| MO 1.2, MO 1.3, MO 1.5 | 1. The performance of the southern blue whiting fisheries are assessed against the specified performance indicators<br>2. The results of each annual assessment demonstrate high levels of compliance in all the southern blue whiting fisheries | 1. From 2012/13<br>2. From 2013/14 |

**OO1.4 Ensure all research planned under the 10 Year Research Programme and used to inform the management of the southern blue whiting fisheries continues to be peer reviewed, meets the requirements of the research standard and is delivered in time to inform management decisions before the start of each April fishing year**.

The 10 Year Research Programme for Deepwater Fisheries sets out the research and monitoring approach for southern blue whiting over the next 10 years. The Tier 1 fisheries will be monitored using acoustic survey techniques, carried out either from industry platforms or a dedicated research vessel. Within the timeframe of this National Deepwater Plan, the following research projects are scheduled for the three Tier 1 fisheries:

| Year | Acoustic survey | | | Stock Assessment | | |
|---|---|---|---|---|---|---|
| | SBW6B | SBW6I | SBW6R | SBW6B | SBW6I | SBW6R |
| 2011/12 | ✓ | ✓ | | ✓ | ✓ | |
| 2012/13 | ✓ | | ✓ | ✓ | | ✓ |
| 2013/14 | ✓ | ✓ | | ✓ | ✓ | |
| 2014/15 | ✓ | | ✓ | ✓ | | ✓ |

[17] The agreed compliance indicators are specified on the Compliance Information Sheet titled "Compliance Benchmarking", which can be found at the following link:
http://www.fish.govt.nz/en-nz/Commercial/Compliance+Information/default.htm

A characterisation of SBW6A will be undertaken in conjunction with the SBW6R assessment scheduled for 2012/13. This will assess the information currently available.

To ensure the robustness of the science research used in management decisions, all southern blue whiting research must be peer reviewed through the relevant Ministry process. This will determine whether the requirements of the Ministry's Research and Science Information Standard[18] are satisfied and will determine how research will be used to inform management.

The 10 Year Research Programme sets out the long term research schedule for all deepwater fisheries but also recognises that additional research may be required. One area which would benefit from investigation, and may therefore be considered in the future as part of this 'additional research' provision, would be determining the processes that drive the year class strength variation that is observed in the southern blue whiting fisheries.

| **Contributing to Management Objectives:** | **Performance Indicators:** | **Timeframe** |
|---|---|---|
| MO 1.3, MO 1.4, MO 1.5 (MO 1.6) | 1. All research projects scheduled through the 10 Year Research Programme are delivered in time to inform the annual management process for the start of the April fishing year. | 1. Annual delivery |
| | 2. All research delivered through the 10 Year Research Programme meets the agreed Ministry research standard and is independently peer reviewed through the Ministry Working Group process. | 2. Annual delivery |
| | 3. Any additional research requirements are contracted and delivered in a timely manner through the Additional Research component of the 10 Year Research Programme. | 3. Annual delivery |

[18] http://www.fish.govt.nz/en-nz/Publications/Research+and+Science+Information+Standard.htm

## Environmental Operational Objectives

**OO2.1 Develop an agreed harvest strategy for southern blue whiting including a stock rebuild strategy that is consistent with the Harvest Strategy Standard**

The southern blue whiting fisheries are currently managed using generic reference points specified in the Harvest Strategy Standard. As part of the development of a species specific harvest strategy, appropriate biological reference points for southern blue whiting will be agreed. Reference points will then be used to underpin the management of southern blue whiting. This work will also assess whether the current CAY approach is the most appropriate management approach for this species.

The southern blue whiting harvest strategy will incorporate all components detailed in the Harvest Strategy Standard, but will tailor the components specifically to the biological characteristics and productivity of southern blue whiting. The following components will therefore be developed and agreed: 1) a management target, 2) soft and hard limit reference points, 3) a formal, time constrained rebuilding strategy, and 4) a harvest control rule component that will guide management action.

| Contributing to Management Objectives: | Performance Indicators: | Timeframe |
|---|---|---|
| MO 1.3, MO 2.1, MO 2.2 | 1. An agreed harvest strategy for southern blue whiting is in place<br>2. Details of the harvest strategy, including a rebuild strategy, are publically available and understood<br>3. The agreed harvest strategy underpins management responses | 1. By 2011/12<br>2. By 2011/12<br>3. From 2012/13 |

**OO2.2 Ensure that incidental New Zealand sea lion mortalities, in the southern blue whiting fishery at the Campbell Islands (SBW6I), do not impact the long term viability of the sea lion population and that captures are minimised through good operational practices**

As discussed previously, interactions occur between New Zealand sea lions and the southern blue whiting fishery at the Campbell Islands. Current capture levels are seen as less likely to have an adverse impact on the population given that the majority of captures are males and the population is estimated to be increasing in size.

Through the course of this National Deepwater Plan, the Ministry will continue to monitor the level of interactions between sea lions and vessels operating in SBW6I. Observer coverage in this fishery has been relatively high in the past (30-40%) and will be increased during the course of this plan as part of the phased increase to full coverage across all deepwater fisheries. Better understanding is needed of the nature and extent of sea lion interactions (particularly those factors that contributed to recent high mortality), the specific sources of risk in this fishery and should the risk profile change ascertaining whether the risk is adversely affecting the sea lion population.

The Ministry will also continue to work with industry to drive continued education and awareness building across the deepwater fleet, with an emphasis on the risk of sea lion interactions in SBW6I. This will instil the importance of adhering to non-regulatory codes of practice (including the MMOP), minimising the environmental impacts of fishing activity and will also help ensure that good reporting and operational practices continue. The Ministry will continue to monitor overall adherence to the MMOP, and ensure that vessels are taking all available operational precautions to minimise future captures.

However, if any changes become apparent which are likely to alter the risk status of this issue, either in terms of an increase in the level of sea lion interactions or an observed decline in the sea lion population, the Ministry will develop and implement management measures that will aim to mitigate the risk. The high level of monitoring in this fishery will ensure that any changes in the level of interactions will be identified early, and the strong communication between the Ministry and the DeepWater Group will allow prompt identification of the possible causes for such change.

| **Contributing to Management Objectives:** | **Performance Indicators:** | **Timeframe** |
|---|---|---|
| MO 1.3, MO 2.5, MO2.6 | 1. A status update describing the nature and extent of New Zealand sea lion interactions and the population size at the Campbell Islands has been made available to all stakeholders | 1. By2012/13 |
| | 2. The comprehensive Observer monitoring programme provides high quality information on the nature and extent of sea lion interactions in SBW6I. | 2. Ongoing |
| | 3. All practicable operational steps have been taken to minimise the number of sea lion captures, and where appropriate the operational guidelines have been incorporated into the MMOP | 3. Ongoing |
| | 4. Good fishing practices are proven though adherence with the MMOP being achieved by all vessels, and performance is transparently reported annually to all stakeholders. | 4. Annual delivery |
| | 5. Any observed changes from the current level of interaction are addressed promptly, and the appropriate management action is taken | 5. As required |

**OO2.3 Ensure that incidental New Zealand fur seal mortalities, in the southern blue whiting fishery at the Bounty Islands (SBW6B), do not impact the long term viability of the fur seal population and captures are minimised through good operational practices**

As detailed in previous sections, interactions occur between New Zealand fur seals (fur seals) and the southern blue whiting fishery at the Bounty Islands. Although the fishery is responsible for one of the highest strike rates in New Zealand, at current levels interactions are not thought to have an adverse effect on the population. Research is currently underway to determine whether we can assess the potential biological removals (PBR) for this population.

Through the course of this National Deepwater Plan, the Ministry will continue to monitor the level of interactions between fur seals and vessels operating in SBW6B. As with the Campbell Islands fishery, observer coverage at the Bounties has been relatively high and will be increased over the next five years as part of the process to achieve full observer coverage across all deepwater fisheries. The Ministry will encourage the development and implementation of practices to minimise fur seal mortality from the Bounty Islands fishery having regard to safety, technological and financial factors.

The Ministry will also continue to work with industry to drive continued education and awareness building across the deepwater fleet, and will emphasise the risk of fur seal interactions at SBW6B. This will instil the importance of adhering to non-regulatory codes of practice (including the Marine Mammal Operating Procedure – the MMOP), minimising the environmental impacts of fishing activity and will also help ensure that good operational practices continue. The Ministry will also continue to monitor overall adherence to the MMOP, and ensure that vessels are taking all available operational precautions to minimise future captures.

If the number of interactions increases from current levels so that there is concern that mortalities are adversely affecting the fur seal population at the Bounty Islands, additional management measures will be considered and the appropriate action will be taken. If specific risks are identified, any available operational measures that reduce the risk of fur seal capture will be agreed and where necessary incorporated into the MMOP or regulatory measures.

| Contributing to Management Objectives: | Performance Indicators: | Timeframe |
|---|---|---|
| MO 1.3, MO 2.5, MO2.6 | 1. A status update describing the nature and extent of fur seal interactions and the population size at the Bounty Islands has been made available to all stakeholders | 1. By2012/13 |
| | 2. The comprehensive Observer monitoring programme continues to provide high quality information on the nature and extent of sea lion interactions in SBW6B. | 2. Ongoing |
| | 3. All practicable operational steps have been taken to minimise the number of fur seal captures, and where appropriate the operational guidelines have been incorporated into the MMOP | 3. Ongoing |
| | 4. Good fishing practices are proven through adherence with the MMOP being achieved by all vessels, and performance is transparently reported annually to all stakeholders. | 4. Annual delivery |
| | 5. Any observed changes from the current level of interaction are addressed promptly, and the appropriate management action is taken | 5. As required |

**OO2.4 Implement appropriate spatial management measures to address any adverse effects of southern blue whiting trawl fishing on benthic habitats.**

The management approach that the Ministry has taken, in part with industry, to address benthic interactions with deepwater fisheries focuses on avoiding the effects of bottom trawling by closing representative areas of the benthic habitat to this fishing method.

The management of benthic interactions across the three Tier 1 fisheries will focus on monitoring the extent of the bottom trawl component of the southern blue whiting fishery each year.[19] Ongoing monitoring of the southern blue whiting trawl footprint is scheduled under the 10 Year Research Programme, through project DAE 1010/04 "Monitoring the trawl footprint for deepwater fisheries". This project will update the trawl footprint annually, enabling the Ministry to assess any changes to the impacted area. The footprint will also be assessed against the best available marine habitat classification, which is currently the Benthic Optimised Marine Ecosystem Classification (BOMEC).

If significant changes in the patterns of fishing effort are observed, and these changes are considered to have an adverse impact on the benthic habitat, a transparent process will be implemented to develop and consider additional management measures.

| Contributing to Management Objectives: | Performance Indicators: | Timeframe |
|---|---|---|
| MO 1.2, MO 1.3, MO 2.3, MO 2.4, MO 2.7 (MO 2.6) | 1. Maps of the southern blue whiting bottom trawl footprint produced annually<br>2. The extent of the bottom trawl footprint is formally assessed against the BOMEC each year, to assess whether benthic interactions are considered to have an adverse impact.<br>3. A timely consideration and implementation of additional management measures, should the southern blue whiting bottom trawl footprint be considered to have an adverse impact on the benthic habitat. | 1. From 2011/12<br>2. During 2011/12<br>3. From 2012/13 |

[19] This analysis will include midwater trawl effort that takes place on the seabed.

# 4. Measuring performance

Monitoring and measuring performance is critical to ensure operational objectives are achieving the management objectives, the Fisheries 2030 supporting outcomes and in turn the overall strategic vision for the deepwater fisheries sector.

## Management Objectives: Review Criteria

Review criteria will enable the Ministry to measure where we are now, compared with where we expect to be in five years time. For example how the management of the southern blue whiting fisheries has improved over the five year duration of the National Deepwater Plan.

The nature of some of these management objectives means it may not be feasible to fully meet the targeted outcome within the five-year duration of this plan.

Each of the high level management objectives for the deepwater fisheries is assessed below in terms of its current status in the southern blue whiting (SBW) fishery and the target status after this plan has been in place for five years.

## Management Objectives – Utilisation

<table>
<tr><td>MO1.1</td><td colspan="7">Enable an economically viable southern blue whiting fishery in NZ over the long term</td></tr>
<tr><td colspan="4">Status at the start of plan</td><td colspan="4">Target status at 5 year review</td></tr>
<tr><td colspan="4">• Current southern blue whiting quota value of $74million (2009)<br>• Current southern blue whiting export earnings are $17 million (2010)</td><td colspan="4">• The real value of southern blue whiting quota is increased<br>• Management decisions are assessed in terms of their impacts on the economic yield from the southern blue whiting fisheries<br>• Information necessary to manage fisheries is transparently obtained on a cost effective basis</td></tr>
<tr><td colspan="8">Supporting Operational Objectives:</td></tr>
<tr><td>1.1</td><td>1.2</td><td>1.3</td><td>1.4</td><td>2.1</td><td>2.2</td><td>2.3</td><td>2.4</td></tr>
</table>

| MO1.2 | Ensure there is consistency and certainty of management measures and processes in the southern blue whiting fisheries |
|---|---|

| Status at the start of plan | Target status at 5 year review |
|---|---|
| • The southern blue whiting fisheries are managed through the collaborative partnership between the Ministry of Fisheries and the Deepwater Group Ltd (DWG)<br>• A fisheries plan is developed that sets out the management objectives for the southern blue whiting fisheries.<br>• Key management decisions are consulted on widely across all stakeholder groups with an interest in the fishery<br>• Catch is monitored annually against the TACC set for each stock<br>• Compliance information specific to the southern blue whiting fisheries is limited<br>• Ministry Observers achieve 30-40% coverage in the Tier 1 SBW fisheries | • Collaborative management relationship continues, with greater benefits realised<br>• The transparent objectives within this plan have driven the management of the southern blue whiting fisheries throughout its 5 year duration<br>• Evidence of high levels of compliance in the southern blue whiting fisheries is available<br>• There is wide support of, and high levels of adherence with, the non-regulatory management measures in place in the southern blue whiting fisheries<br>• Observer coverage has been increased towards full coverage |

| Supporting Operational Objectives: | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1.1 | **1.2** | **1.3** | 1.4 | **2.1** | **2.2** | **2.3** | **2.4** |

| MO1.3 | Ensure the southern blue whiting fisheries resources are managed so as to provide for the reasonably foreseeable needs of future generations |
|---|---|

| Status at the start of plan | Target status at 5 year review |
|---|---|
| • The foreseeable needs of future generations, including intrinsic and bequest values, have not specifically been identified in relation to southern blue whiting<br>• Current management focuses on retaining catch within the allocated catch limit, and avoiding, remedying or mitigating the adverse effects of fishing on the aquatic environment<br>• The Harvest Strategy Standard provides a generic management target of 40%$B_0$, although this target has not been assessed in terms of its appropriateness for the long term viability of southern blue whiting | • Awareness and understanding of how the southern blue whiting fisheries are managed has improved through delivery of the National Deepwater Plan<br>• The southern blue whiting fisheries are managed so that they are capable of achieving third party certification<br>• Stock specific harvest strategy ensures that the southern blue whiting stocks are managed at a level that ensures their long term sustainability<br>• Greater awareness of Maori and environmental needs is achieved |

| Supporting Operational Objectives | | | | | | | |
|---|---|---|---|---|---|---|---|
| **1.1** | **1.2** | **1.3** | **1.4** | **2.1** | **2.2** | **2.3** | **2.4** |

| MO1.4 | Ensure effective management of the southern blue whiting fishery is achieved through the availability of appropriate, accurate and robust information |
|---|---|

| Status at the start of plan | Target status at 5 year review |
|---|---|
| • Management of southern blue whiting to date has been supported by regular surveys which monitor the available spawning biomass. A robust stock assessment is also available for SBW6I<br>• A programme of surveys, stock assessments and characterisations is planned through the 10 Year Research Programme for Deepwater Fisheries<br>• Further work is required to develop stock assessment models for SBW6B and SBW6R | • All surveys and stock assessments scheduled between 2011-12 and 2014-15 in the 10 Year Research Programme have been completed within the required timeframes<br>• All research delivered through the 10 Year Research Programme and used to inform management meets the Research and Science Information Standard for New Zealand Fisheries<br>• Robust stock assessment models are available for all three Tier 1 stocks |

| Supporting Operational Objectives | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1.1 | 1.2 | 1.3 | **1.4** | 2.1 | 2.2 | 2.3 | 2.4 |

| MO1.5 | Ensure that the management of NZ southern blue whiting is recognised as being consistent with or exceeding domestic and international best practice |
|---|---|

| Status at the start of plan | Target status at 5 year review |
|---|---|
| • The southern blue whiting fisheries are currently being assessed for certification by the Marine Stewardship Council<br>• The Tier 1 southern blue whiting stocks are monitored regularly and undergo regular TAC reviews<br>• The Harvest Strategy Standard provides generic target and limit reference points that are consistent with international best practice but no stock specific harvest strategies for southern blue whiting are available | • Credible independent third party certification of the southern blue whiting fisheries is achieved<br>• Available evidence shows that levels of compliance in the southern blue whiting fisheries is high<br>• The southern blue whiting fisheries are generally accepted as having minimal impacts on the marine environment<br>• Stock specific harvest strategies have been developed that are consistent with the Harvest Strategy Standard, and therefore with international best practice |

| Supporting Operational Objectives | | | | | | | |
|---|---|---|---|---|---|---|---|
| **1.1** | **1.2** | **1.3** | **1.4** | 2.1 | 2.2 | 2.3 | 2.4 |

| MO1.6 | Ensure New Zealand's southern blue whiting fisheries are transparently managed |
|---|---|
| Status at the start of plan | Target status at 5 year review |
| • The majority of information currently available on southern blue whiting consists of scientific technical reports and advice papers that are accessible to a small number of people only<br>• There is no primary information source that can be accessed by all people with an interest in the management of the southern blue whiting fisheries | • The Ministry of Fisheries website is acknowledged as a comprehensive source of information (both technical and "plain English") on the management of the southern blue whiting fisheries<br>• The Deepwater Annual Operational Plan (AOP) describes the Management Actions and Services relating to southern blue whiting that will be delivered each year through the duration of this plan<br>• The Deepwater Annual Review Report details the progress made in the previous year to deliver the Management Actions and Services specified in each AOP<br>• Clear processes have been established to enable engagement between the Ministry and key stakeholders and Treaty partners |
| **Supporting Operational Objectives** | |
| **1.1** 1.2 1.3 1.4 2.1 2.2 2.3 2.4 | |
| In addition, completion of Operational Objective 1.7 from the hoki chapter will support delivery of MO1.6 | |

| MO1.7 | Ensure the management of New Zealand's southern blue whiting fishery fully meets the Crown's obligations to Maori under the fisheries settlement Acts. |
|---|---|
| Status at the start of plan | Target status at 5 year review |
| • 12 iwi are currently members of the DeepWater Group Ltd<br>• All iwi that hold southern blue whiting quota are engaged on key management decisions through Te Ohu Kai Moana<br>• Other iwi quota owners are not actively represented in SBW management<br>• Non-commercial iwi interests are not represented in SBW management | • A clear process has been established that provides tangata whenua the opportunity to engage on southern blue whiting management decisions as required<br>• All iwi with southern blue whiting quota have the opportunity to engage through the Deepwater Group Ltd and/or Te Ohu Kai Moana<br>• The wider commercial and non commercial interests of tangata whenua that relate to southern blue whiting are taken into account through the relevant Iwi/Forum Fisheries Plans |
| **Supporting Operational Objectives** | |
| Operational Objectives 1.11 and 1.12 from the hoki chapter, and 1.9 and 1.10 from the orange roughy chapter of the National Deepwater Plan relate to facilitating increased iwi involvement with fisheries management decisions. The Ministry will use this work to ensure that obligations to Maori are met with regards to all the deepwater fisheries. | |

## Management Objectives - Environment

| MO2.1 | Ensure southern blue whiting is managed within an agreed harvest strategy |
|---|---|
| Status at the start of plan | Target status at 5 year review |
| • Southern blue whiting is managed using the generic target and limit reference points from the Ministry's Harvest Strategy Standard<br>• The necessary data and information is available to assess the status of SBW6I only in relation to reference points | • Stock specific harvest strategies for all the Tier 1 southern blue whiting stocks have been developed and agreed with southern blue whiting quota holders and in consultation with other stakeholders.<br>• The necessary information is available to assess the status of all Tier 1 southern blue whiting stocks against the stock specific harvest strategies<br>• Stock specific harvest strategies underpin the management of all Tier 1 southern blue whiting stocks and guide the sustainability advice for these stocks |

| Supporting Operational Objectives | | | | | | | |
|---|---|---|---|---|---|---|---|
| **1.1** | **1.2** | 1.3 | 1.4 | **2.1** | 2.2 | 2.3 | 2.4 |

| MO2.2 | Maintain the genetic diversity of southern blue whiting |
|---|---|
| Status at the start of plan | Target status at 5 year review |
| • The harvest strategy standard provides generic reference points, but no analysis has been undertaken to determine whether these target and limit reference points are appropriate for southern blue whiting | • Stock specific harvest strategies ensure that the SBW stocks are maintained at biomass levels that maintain genetic diversity |

| Supporting Operational Objectives | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1.1 | 1.2 | 1.3 | 1.4 | **2.1** | 2.2 | 2.3 | 2.4 |

| MO2.3 | Protect southern blue whiting habitats of particular significance for fisheries management |
|---|---|
| Status at the start of plan | Target status at 5 year review |
| • There is no comprehensive definition of what constitutes a habitat of particular significance for the management of southern blue whiting<br>• Little information is available on habitat types used by southern blue whiting outside of their spawning season, and whether any habitat types are of particular importance | • An agreed policy definition is available describing what is meant by 'habitats of particular significance for fisheries management'<br>• Southern blue whiting habitats of significance to fisheries management have been identified<br>• Where necessary, management measures to further protect these habitats have been developed and implemented |

| Supporting Operational Objectives | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1.1 | 1.2 | 1.3 | 1.4 | 2.1 | 2.2 | 2.3 | **2.4** |

| MO2.4 | Identify and avoid or minimise adverse effects of southern blue whiting fishing activity on incidental bycatch species |
|---|---|
| Status at the start of plan | Target status at 5 year review |
| • Incidental bycatch information, collected by Ministry Observers, show that the level of incidental bycatch is low in the southern blue whiting fisheries | • Incidental bycatch is monitored annually in the southern blue whiting fisheries and reported through the Deepwater Annual Review Reports<br>• The southern blue whiting fisheries continue to have a minimal impact on incidental bycatch species. |

| Supporting Operational Objectives | | | | | | | |
|---|---|---|---|---|---|---|---|
| **1.1** | 1.2 | 1.3 | 1.4 | 2.1 | 2.2 | 2.3 | **2.4** |

| MO2.5 | Manage the southern blue whiting fisheries so as to avoid or minimise adverse effects on the long-term viability of endangered, threatened and protected species |
|---|---|
| Status at the start of plan | Target status at 5 year review |
| • The southern blue whiting fishery at the Campbell Islands is known to interact with New Zealand sea lions, although the level of interactions is not thought to have an adverse effect on the sea lion population.<br>• The southern blue whiting fishery at the Bounty Islands is known to interact with New Zealand fur seals, although the level of interactions is not thought to have an adverse effect on the fur seal population | • Reliable information is available on the nature and extent of ETP species interactions and impacts on populations across all the southern blue whiting fisheries<br>• Incidental captures are reported annually<br>• All practicable steps have been taken to minimise the number of individual marine mammal and seabird captures that occur across all SBW fisheries |

| Supporting Operational Objectives | | | | | | | |
|---|---|---|---|---|---|---|---|
| **1.1** | 1.2 | 1.3 | 1.4 | 2.1 | **2.2** | **2.3** | 2.4 |

| MO2.6 | Manage the southern blue whiting fisheries to avoid or minimise adverse effects on biological diversity |
|---|---|
| Status at the start of plan | Target status at 5 year review |
| • Research and information on the full extent of the impacts of southern blue trawl fishing on biological diversity is limited | • An ecological risk assessment (ERA) has identified the main ecological risks. [20] and processes are underway to address unacceptable risks.<br>• Ecosystem and biological indicators have been identified and a data collection program is designed to enable future calculation of these indicators. |

| Supporting Operational Objectives | | | | | | | |
|---|---|---|---|---|---|---|---|
| **1.1** | 1.2 | **1.3** | 1.4 | **2.1** | **2.2** | **2.3** | **2.4** |

| MO2.7 | Manage effects from the impact of southern blue whiting fishing activity on the benthic habitat using a spatial management approach |
|---|---|
| Status at the start of plan | Target status at 5 year review |
| • Benthic Protected Areas and Seamount Closures are in place, protecting 11% of the normal range of southern blue whiting<br>• The southern blue whiting bottom trawl footprint covers 7% of the normal range southern blue whiting | • The bottom trawl component of the southern blue whiting trawl footprint has been assessed annually against the BOMEC<br>• A transparent programme is available to develop and implement additional management measures, should the impacts on benthic habitats become adverse. |

| Supporting Operational Objectives | | | | | | | |
|---|---|---|---|---|---|---|---|
| **1.1** | 1.2 | 1.3 | 1.4 | 2.1 | 2.2 | 2.3 | **2.4** |

[20] The southern blue whiting ERA is scheduled for 2015/16 under the 10 Year Research Programme

# Appendix 1:

**Details of the operational objectives (OO) for the southern blue whiting fishery and link with management objectives (MO)**

●● Denotes the primary management objective that each operational objective contributes to achieving

● Denotes additional management objectives that each operational objective contributes to achieving

| Utilisation focused Operational Objectives | MO 1.1 | MO 1.2 | MO 1.3 | MO 1.4 | MO 1.5 | MO 1.6 | MO 1.7 | MO 2.1 | MO 2.2 | MO 2.3 | MO 2.4 | MO 2.5 | MO 2.6 | MO 2.7 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **OO1.1** Support the southern blue whiting fishery in achieving and maintaining credible third party certification and ensure any Conditions of Certification are met within the required timeframe | ● | ● | ●● | | ● | ● | | ● | | | ● | ● | ● | ● |
| **OO1.2** Enable quota owners to develop and implement a harvest regime that will maximise the value obtained from the southern blue whiting fisheries, in line with the harvest strategy | ●● | ● | ● | | ● | | | ● | | | | | | |
| **OO 1.3** Ensure satisfactory levels of compliance are achieved in the southern blue whiting fisheries | | ●● | ● | | ● | | | | | | | | | |
| **OO1.4** Ensure all research planned under the 10 Year Research Programme and used to inform the management of the southern blue whiting fisheries continues to be peer reviewed, meets the requirements of the research standard and is delivered in time to inform management decisions before the start of each April fishing year. | | | ● | ●● | ● | ● | | | | | | | | |

| Environmental focused Operational Objectives | MO 1.1 | MO 1.2 | MO 1.3 | MO 1.4 | MO 1.5 | MO 1.6 | MO 1.7 | MO 2.1 | MO 2.2 | MO 2.3 | MO 2.4 | MO 2.5 | MO 2.6 | MO 2.7 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **OO2.1** Develop an agreed harvest strategy for southern blue whiting including a stock rebuild strategy that is consistent with the Harvest Strategy Standard | | ● | ● | | | | | ●● | ● | | | | | |
| **OO2.2** Ensure that incidental New Zealand sea lion mortalities, in the southern blue whiting fishery at the Campbell Islands (SBW6I), do not impact the long term viability of the sea lion population and captures are minimised through good operational practices | | ● | ● | | | | | | | | | ●● | ● | |
| **OO2.3** Ensure that incidental New Zealand fur seal mortalities, in the southern blue whiting fishery at the Bounty Islands (SBW6B), do not impact the long term viability of the fur seal population and captures are minimised through good operational practices | | ● | ● | | | | | | | | | ●● | ● | |
| **OO2.4** Implement appropriate spatial management measures to address any adverse effects of southern blue whiting trawl fishing on benthic habitats. | | ● | ● | | | | | | | ●● | ● | | ● | ● |