Marine Stewardship Council fisheries assessments

Lloyd's Register
6 Redheughs Rigg
South Gyle
Edinburgh, EH12 9DQ
United Kingdom
T +44 (0)131 619 2100
E fisheries-ca@lr.org
www.lr.org

New Zealand Hake, Hoki, Ling and Southern Blue Whiting

Surveillance Report

Conformity Assessment Body (CAB)	Lloyd's Register
Assessment team	Jo Akroyd and Andre Punt
Fishery client	Deepwater Group Limited
Assessment type	Second Surveillance
Date	June 2021

Assessment Data Sheet

CAB details		**Lloyd's Register**
	Address	6 Redheughs Rigg Edinburgh EH12 9DQ
	Phone/Fax	0131 616 2100
	Email	Fisheries-ca@lr.org
	Contact name(s)	Gillian Irvine
Client details		
	Address	Deepwater Group Limited Level 12 36 Kitchener Street Auckland Central Auckland, 1010 New Zealand
	Phone/Fax	+64 9 379 0556
	Email	george@deepwatergroup.org
	Contact name(s)	George Clement
Assessment Team	Team leader	Jo Akroyd
	Principle 1	Andre Punt
	Principle 2	Jo Akroyd
	Principle 3	Jo Akroyd

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1 Executive summary

In 2018, after an MSC reassessment process was undertaken for NZ Hoki, Hake, Ling and Southern Blue Whiting trawl fisheries and NZ Ling longline fisheries, using the MSC Certification Requirements (CR) version (v) 1.3 (MSC 2013) default assessment tree, these fisheries were MSC certified with no conditions.

In 2019 the first annual surveillance was conducted. This surveillance audit began as a review of information. On appraisal, it became apparent that re-scoring was necessary for the Hake 7 (UoC 5). As such, this became an offsite surveillance audit (FCP V2.1 7.28.17.1 'If the CAB has access to new information that may affect the scoring of any PI under a review of information audit, it shall undertake an off-site audit according to 7.28.15.'). HAK 7 was rescored and it did not meet SG60 at PI 1.1.1a and consequently it was recommended that this UOC (5) be suspended. In this case the client elected for self-suspension prior to LR issuing the suspension notice.

No Conditions were placed on these fisheries at recertification nor at the Year 1 audit. There were two recommendations for the ling longline fishery, both for Principle 2

This second offsite audit took place during the week of 3 May 2021 involving the CAB auditors, the client group, a National Institute of Water and Atmospheric Research (NIWA) scientist, and the Ministry for Primary Industries (MPI) staff. No stakeholders wished to be involved nor wrote any submissions.

The client provided excellent situation reports for all fisheries and delivered relevant papers and documents via Dropbox. These were discussed at the off-site Microsoft Teams Meeting.

As there were no Conditions on the fisheries there was no reporting for this. However, information and reports were provided for the two non – binding recommendations for the ling longline fishery, leading to one of these being closed.

No Conditions were placed on these fisheries at this Year 2 audit.

There were no material changes to the circumstances and practices affecting the original complying assessment of the fishery;

These fisheries continue to meet the MSC Standard and they remain certified.

2 Report details

2.1 Surveillance information

Table 1. Surveillance information

1	Fishery name
	New Zealand Hake, Hoki, Ling and Southern Blue Whiting
2	Unit(s) of Assessment (UoA)

New Zealand Hoki, Hake & Ling Trawl Fishery

Fishing Method	Species	Management Areas	Stock	UoC
Trawl	Hoki (*Macruronus novaezelandiae*)	HOK 1	Eastern	1
		HOK 1	Western	2
	Hake (*Merluccius australis*)	HAK 1	Sub-Antarctic	3
		HAK 4	Chatham Rise	4
	Ling (*Genypterus blacodes*)	LIN 3	Chatham Rise (LIN 3 & 4)	6
	Ling (*Genypterus blacodes*)	LIN 4	Chatham Rise (LIN 3 & 4)	7
		LIN 5	Sub-Antarctic (LIN 5 & 6)	8
		LIN 6	Sub-Antarctic (LIN 5 & 6)	9
		LIN 7	West Coast South Island (LIN 7WC)	10

New Zealand Southern Blue Whiting Trawl Fishery

Fishing Method	Species	Management Areas	Stock	UoC
Trawl	Southern blue whiting (*Micromesistius australis*)	SBW 6B	Bounty Platform	1
		SBW 6I	Campbell Rise	2

New Zealand Ling Longline Fishery

Fishing Method	Species	Management Areas	Stock	UoC
Longline	Ling (*Genypterus blacodes*)	LIN 3	Chatham Rise (LIN 3 & 4)	1
		LIN 4	Chatham Rise (LIN 3 & 4)	2
		LIN 5	Sub-Antarctic (LIN 5 & 6)	3
		LIN 6	Sub-Antarctic (LIN 5 & 6)	4
		LIN 7	West Coast South Island (LIN 7WC)	5

3	Date certified	Date of expiry
	Sept 2018	Feb 2024
4	Surveillance level and type	
	Level 1 - Review of information audit – off site due to COVID-19	
5	Surveillance number	
	2nd Surveillance	X
6	Surveillance team leader	
	Jo Akroyd Team Lead P2 & P3 Expert Jo has over 30 years' experience in marine fisheries policy, research, management and governance. She has extensive international and Pacific experience and has worked at senior levels in both the public and private sectors in these roles. Jo was with the Ministry of Agriculture and Fisheries in New Zealand for 20 years. Starting as a fisheries scientist, she was promoted to senior chief fisheries scientist, then Assistant Director, Marine Research. She was awarded a Commemoration Medal in 1990 in recognition of her pioneering work in establishing New Zealand's fisheries quota management system. As well as carrying out general fisheries consultancy since1994 she has undertaken all facets of MSC work as a lead assessor, expert team member and peer reviewer across a wide range of fisheries. Jo has completed the MSC v1.3, v2.0, v2.1 and v2.2 training modules including for enhanced fisheries, Risk based framework and traceability. She is a member of the MSC's Peer Review College, MSC projects include Team Leader and Fisheries Management expert for New Zealand fisheries, (hoki, hake, ling, southern blue whiting, albacore and skipjack), Fiji (albacore, yellowfin and bigeye tuna), Japan (scallops, skipjack and yellowfin), China (scallops, flounder and snowcrab), Maldives (skipjack), Ross Sea (toothfish), West Papua (skipjack and yellowfin). She has conducted multi species pre-assessments in Japan, China, Viet Nam and New Zealand and provided independent Peer review reports for tuna, scallops and prawn fisheries in various countries. Jo has passed MSC training and has no Conflict of Interest in relation to this fishery. Full CV available upon request	
Team Leader Experience	Jo has completed a number of MSC assessment as TL and meets all Fishery TL Qualification and Competency Criteria under MSC FCP v2.2 Table PC1 and MSC GCR v2.4.1 Table 1.	
7	Surveillance team members *[remove if not applicable]*	

	Andre Punt P1 Expert Dr. Andre Punt is a Professor in (and currently Director of) the School of Aquatic and Fishery Sciences at the University of Washington. He holds a PhD in Applied Mathematics from the University of Cape Town (South Africa). He has been involved in stock assessment and fisheries management for over 30 years and has been recognized for his contributions in this area with awards from CSIRO, the University of Washington, the Australian Society for Fish Biology, and the American Fisheries Society. His research relates broadly to the development and application of fisheries stock assessment techniques, bioeconomic modelling, and the evaluation of the performance of stock assessment methods and harvest control rules using the Management Strategy Evaluation approach. Dr. Punt has conducted stock assessments for a wide range of species, ranging from anchovies and sardines, to groundfish, tunas, and cetaceans. He has published over 380 papers in the peer-reviewed literature, along with over 400 technical reports. He was a member of a National Research Council panel on evaluating the effectiveness of fish stock rebuilding in the United States. Dr Punt is currently a member of the Scientific and Statistical Committee of the Pacific Fishery Management Council, the advisory committee for Center for the Advancement of Population Assessment Methodology, the Crab Plan Team of the North Pacific Fishery Management Council, and the Scientific Committee of the International Whaling Commission. He has been involved in MSC assessments, pre-assessments and surveillance audits for orange roughy, hoki, hake, and southern blue whiting in New Zealand. Dr. Punt has passed MSC training and has no Conflict of Interest in relation to this fishery. Full CV available upon request.
Local Context	English is widely spoken in New Zealand Both Jo and Andre have had assignments in the region in the last 10 years.
Traceability	Jo has completed the current MSC traceability module v 2.2
RBF	Jo has completed the RBF training.
8	Audit/review time and location
	Review of information took place week commencing the 3 May 2021. Offsite Audit (Due to COVID-19)
9	Assessment and review activities
	All relevant data

3 Background

The client group, Deepwater Group Limited (DWG) http://deepwatergroup.org, was established in September 2005. This non-profit organisation is an amalgamation of EEZ fisheries quota owners in New Zealand. Species targeted by DWG are usually fished at depths between 400 and 1,200 m within the New Zealand Exclusive Economic Zone (EEZ). These include hoki, hake, ling, southern blue whiting, orange roughy, oreo dory, squid and jack mackerel. The client group catches about 95% of the recorded hoki, hake, ling and southern blue whiting landings.

The NZ hoki, hake, ling and southern blue whiting trawl fisheries, along with the ling longline fishery were reassessed and recertified in 2018. These fisheries were previously assessed against the MSC standard and certified separately at different times. The re-assessment was conducted using the MSC Certification Requirements (CR) version (v) 1.3 (MSC 2013) default assessment tree with no changes made to the text of any default Performance Indicator (PI). The assessment followed CR v 2.0 process (MSC 2014). This second surveillance process followed MSC Fisheries certification process (FCP) v2.1 August 2018.

At reassessment, and at the first annual audit, no Performance Indicators scored < 80 and so no conditions of certification were applied to the fishery.

Two recommendations were made at the reassessment relating to the ling longline fishery and relate to Principle 2:

1. It is recommended that a survey is conducted annually to determine the quantities and sources of bait species used in the fishery. Data should be retained and reported routinely at annual surveillance audits of the fishery.
2. It is recommended that a review of the data available from the increased observer coverage of the 2016/17 season is conducted at the earliest possible opportunity, to update the understanding of the fishery with respect to ETP species interactions.

A recommendation is not the result of a failure to meet the unconditional pass mark, and so is not binding. However, in the opinion of the Assessment Team, action taken in response to a recommendation would make a positive contribution to on-going efforts to ensure long-term sustainability of the fishery.

The purpose of the surveillance audit is to ensure that the fishery continues to comply with the MSC standard since being certified. They are a required part of the MSC process. This surveillance audit also allows for key changes within the fishery to be captured and reported on with relevance to the MSC standards.

3.1 Changes in the management system and/or relevant regulations

Nil

3.2 Changes to personnel in science management of industry

Aaron Irving was appointed as Deputy Chief Executive of Deepwater Group in January 2021.

Dr Gretchen Skea was appointed as Senior Scientist during 2019 and chairs meetings of the Deep Water Working Group.

These changes are not anticipated to make any fundamental differences to the way in which the client operates or engages with the MSC certification of the fishery.

3.3 Developments or changes that impact on Traceability

Following the first surveillance audit, HAK7 was withdrawn from the UoC, thereby potentially introducing a risk that hake taken in this area may mistakenly be mixed with hake taken from the HAK1 and HAK4 UoCs.

All catches are required by law to be recorded and reported by catch weight, area of capture and capture method and this risk is managed by vessel operators through their protocols for separating these catches in the hold, as follows:

1 Factory vessels are equipped with fully integrated weighing and labelling systems in which every carton is barcoded on production and before storage in the ship's hold. This system allows non-certified product to be barcoded as non-certified and to be trackable and separable by scanning at any subsequent stage. In port these vessel product data are reconciled with landing figures to arrive at a final inventory.

2 Fresher vessels land their fish whole, and standard practice involves all fish bins being labelled as per MPI and NZFSA requirements. These outer markings are used to separate and inventory all product on landing.

Under MPI regulations every container in which fish is packaged on a licensed fish receiver's premise shall be marked with species name, date, licensed fish receiver's name, processed state and area fished. The situation is therefore considered to be well managed and risk negligible.

3.4 Total Allowable Catch (TAC) and catch data

UoC 1 & UoC 2 – HOK 1 East & HOK 1 West

TACC 2020-21	95,000 t (agreed catch limit split East 50,000 t; West 45,000 t)
TACC 2019-20	115,000 t (agreed catch limit split East 60,000 t; West 55,000 t)
TACC 2018-19	150,000 t (agreed catch limit split East 60,000 t; West 90,000 t) [1]
TACC 2017-18	150,000 t (agreed catch limit split East 60,000 t; West 90,000 t)
UoA share of TACC	100%
UoC share of TACC	93%
HOK 1 catch 2019-20	107,709 t (HOK 1 East 55,070 t, HOK 1 West 53,030 t)
HOK 1 catch 2018-19	122,460 t (HOK 1 East 63,524 t, HOK 1 West 56,953 t)
HOK 1 catch 2017-18	135,418 t (HOK 1 East 59,668 t, HOK 1 West 73,736 t)

UoC 3 – HAK 1

TACC 2020-21	3,701 t
TACC 2019-20	3,701 t
TACC 2018-19	3,701 t
TACC 2017-18	3,701 t
UoA share of TACC	100%
UoC share of TACC	94%
HAK 1 catch 2019-20	1,062 t
HAK 1 catch 2018-19	896 t
HAK 1 catch 2017-18	1,350 t

[1] 20,000t was shelved by the quota owners.

UoC 4 – HAK 4

TACC 2020-21 TACC 2019-20 TACC 2018-19 TACC 2017-18	1,800 t 1,800 t 1,800 t 1,800 t
UoA share of TACC UoC share of TACC	100% 94%
HAK 4 catch 2019-20 HAK 4 catch 2018-19 HAK 4 catch 2017-18	137 t 183 t 267 t

UoC 5 – HAK 7
Withdrawn from certification

UoC 6 – LIN 3 Trawl and Longline

TACC 2020-21 TACC 2019-20 TACC 2018-19 TACC 2017-18	2,060 t 2,060 t 2,060 t 2,060 t
LIN 3 catch 2019-20	1,684 t (Total reported catch) 912 t (Estimated catch trawl) 554 t (Estimated catch bottom longline) 218 t (Estimated catch other methods)
LIN 3 catch 2018-29	2,016 t (Total reported catch) 1,255 t (Estimated catch trawl) 634 t (Estimated catch bottom longline) 127 t (Estimated catch other methods)
LIN 3 catch 2017-18	2,171 t (Total reported catch) 621 t (Estimated catch trawl) 676 t (Estimated catch bottom longline) 764 t (Estimated catch other methods)
UoA share of TACC and total LIN catch	100% of TACC and 59% of total LIN catch (based on average estimated trawl catch over the last two years)
UoC share of TACC and total LIN catch	93% of TACC and 54% of total LIN catch (based on average estimated trawl catch over the last two years)

UoC 7 – LIN 4

TACC 2020-21 TACC 2019-20 TACC 2018-19 TACC 2017-18	4,000 t 4,200 t 4,200 t 4,200 t
UoA share of TACC and total LIN catch UoC share of TACC and total LIN catch	100% of TACC and 32% of total LIN catch (based on average estimated trawl catch over the last two years) 94% of TACC and 30% of total LIN catch (based on average estimated trawl catch over the last two years)
LIN 4 catch 2019-20	1,778 t (Total reported catch) 571 t (Estimated catch for all target trawl) 1,048 t (Estimated catch for bottom longline) 159 t (Estimated catch other methods).
LIN 4 catch 2018-19	2,044 t (Total reported catch) 677 t (Estimated catch for all target trawl) 1,106 t (Estimated catch for bottom longline) 271 t (Estimated catch other methods).
LIN 4 catch 2017-18	2,636 t (Total reported catch) 698 t (Estimated catch for all target trawl) 1,603 t (Estimated catch for bottom longline) 73 t (Estimated catch other methods).

UoC 8 – LIN 5 Trawl and Longline

TACC 2020-21 TACC 2019-20 TACC 2018-19 TACC 2017-18	4,735 t 4,735 t 4,735 t 3,955 t
UoA share of TACC and total LIN catch UoC share of TACC and total LIN catch	100% of TACC and 92% of total LIN catch (based on average estimated trawl catch over the last two years) 95% of TACC and 87% of total LIN catch (based on average estimated trawl catch over the last two years)
LIN 5 catch 2019-20	4,662 t (Total reported catch) 4,264 t (Estimated catch for all target trawl) 387 t (Estimated catch for bottom longline) 11 t (Estimated catch for other methods)
LIN 5 catch 2018-19	4,596 t (Total reported catch) 4,228 t (Estimated catch trawl)

LIN 5 catch 2017-18	336 t (Estimated catch bottom longline) 32 t (Estimated catch other methods) 4,034 t (Total reported catch) 3,421 t (Estimated catch for all target trawl) 502 t (Estimated catch for bottom longline) 21 t (Estimated catch for other methods)

UoC 9 – LIN 6 Trawl and Longline

TACC 2020-21 TACC 2019-20 TACC 2018-19 TACC 2017-18	8,505 t 8,505 t 8,505 t 8,505 t
UoA share of TACC and total LIN catch UoC share of TACC and total LIN catch	100% of TACC and 60% of total LIN catch (based on average estimated trawl catch over the last two years) 61% of TACC and 56% of total LIN catch (based on average estimated trawl catch over the last two years)
LIN 6 catch 2020-21	3,967 t (Total reported catch) 2,234 t (Estimated catch trawl) 1,733 t (Estimated catch bottom longline) 0 t (Estimated catch other methods 209 t (Estimated catch LIN 6B bottom longline)
LIN 6 catch 2019-20	3,706 t (Total reported catch) 2,372 t (Estimated catch trawl) 1,334 t (Estimated catch bottom longline) 0 t (Estimated catch other methods) 200 t (Estimated catch for LIN 6B bottom longline)
LIN 6 catch 2018-19	4,845 t (Total reported catch) 3,656 t (Estimated catch trawl) 545 t (Estimated catch bottom longline) 2 t (Estimated catch other methods. 228 t (Estimated catch LIN 6B bottom longline)[2]

[2] LIN 6B catches are included in the reported and estimated totals for LIN 6, but have also been separated out here for ease of assessing the LIN 6B fishery.

UoC 10 – LIN 7 Trawl and Longline

TACC 2020-21	3,387 t
TACC 2019-20	3,287 t
TACC 2018-19	3,080 t
TACC 2017-18	3,080 t
UoA share of TACC and total LIN catch	100% of TACC and 62% of total LIN catch (based on average estimated trawl catch over the last two years)
UoC share of TACC and total LIN catch	73% of TACC and 45% of total LIN catch (based on average estimated trawl catch over the last two years)
LIN 7 catch 2020-21	3,215 t (Total reported catch) 1,877 t (Estimated catch trawl) 1,313 t (Estimated catch bottom longline) 25 t (Estimated catch other methods)
LIN 7 catch 2019-20	3,059 t (Total reported catch) 2,015 t (Estimated catch trawl) 1,044 t (Estimated catch bottom longline) 0 t (Estimated catch other methods)
LIN 7 catch 2018-19	3,487 t (Total reported catch) 1,732 t (Estimated catch trawl) 822 t (Estimated catch bottom longline) 117 t (Estimated catch other methods)

UoC 11 – SBW 6B Trawl

TACC 2020-21	2,830 t
TACC 2019-20	3,145 t
TACC 2018-19	3,145 t
TACC 2017-18	2,377 t
UoA share of TACC	100%
UoC share of TACC	87%
SBW 6B catch 2019-20	788 t
SBW 6B catch 2018-19	1,101 t
SBW 6B catch 2018-19	2,423 t

UoC 12– SBW 6I Trawl

TACC 2020-21	39,200 t
TACC 2019-20	39,200 t
TACC 2018-19	39,200 t
TACC 2017-18	39,200 t
UoA share of TACC	100%
UoC share of TACC	87%
SBW 6I catch 2019-20	26,517 t
SBW 6I catch 2018-19	15,147 t
SBW 6I catch 2017-18	18,334 t

4 Principle 1: Changes to scientific base of information including stock assessment

4.1 Management strategies, reference points, and management changes

4.1.1 Management strategies and reference points

There were no changes to the management strategies and reference points for the New Zealand hoki, hake, ling, and southern blue whiting.

4.1.2 Management changes

4.1.2.1. HOK1

The Minister of Fisheries was provided with options for TACC reductions of 20,000t or 30,000t for the 2019-20 fishing year (FNZ, 2019). The options were consulted on and submissions were received from a broad range of stakeholders. The industry suggested an effective reduction in TACC of 35,000t through shelving for a HOK 1 West catch limit of 55,000t. The Minister decided to reduce the TACC to 115,000t (a reduction in TAC from 151,540t to 116,190t), with catch limits for HOK 1 West and HOK 2 West of 55,000t and 60,000t, respectively (FNZ, 2019, Minister of Fisheries, 2019).

4.1.2.2 HAK7

The Minister of Fisheries was provided with three options for reducing the TACC for HAK7 for the 2019-20 fishing year (by 38%, 55%, and 73%). The base model for HAK 7 indicated a biomass of 0.17B_0, and hence the need for a formal time-constrained rebuilding plan under the Harvest Strategy Standard. The three options are the second step of a rebuilding plan for HAK 7. FNZ (2019) reported the rebuilding time to 0.4B_0 under the three options and two scenarios regarding future recruitment (*average* and *below average*). These options were consulted on and submissions were received from several stakeholders. The Minister agreed with option 2 (a reduction in TACC of 55% from 5,064 to 2,272t), which was the option recommended by Fisheries New Zealand (FNZ, 2019, Minister of Fisheries, 2019).

4.1.2.3 LIN 7

The Minister of Fisheries was provided with two options for increasing the TACC for LIN 7 WC for the 2019-20 fishing year (increases of 10% and 20%) given that 2017 assessment indicated that the biomass is very likely to be at or above the management target (FNZ, 2019). The options were consulted on. The Minister agreed with the recommendation of Fisheries New Zealand to increase the TACC from 3,080 to 3,387t (FNZ, 2019, Minister of Fisheries, 2019).

4.1.2.4 SBW 6B

The TACC for the SBW 6B is intended to be based on a harvest control rule (Doonan, 2017). However, no acoustic surveys have been conducted of the Bounty Platform in the last two years due to weather and other operational constraints. Therefore, the harvest control rule has not been applied in 2018 or 2019. The TACC for SBW 6B was increased from 2,960t to 3,145t in 2017-18 based on the application of the HCR (Doonan, 2018), but catches have been well below the TACC since the 2017-18 fishing year. Fisheries New Zealand proposed reducing the TACC for SBW 6B given evidence for poor recruitment. Two options were proposed: (a) a 10% reduction in TACC, and (b) a 20% reduction in TACC, and made available for comment (two comments were received) (FNZ, 2020a). Fisheries New Zealand recommended reducing the SBW 6B TACC from 3,145t to 2,830t for the 2020-21 fishing year, and the Minister of Fisheries agreed with this recommendation (Minister of Fisheries, 2020).

4.2 Stock status and projections

Table 2 summaries stock status (biomass relative to B_0) and the probability of being below the limit and target reference points.

Table 2 Summary of the stock status of the 10 UoC based on the base model runs

Stock	Most recent assessment	Depletion [Year]	P < Limit	P < Target
HOK 1 East*	2021A	48 (35-64)	<1%	<10%+
	2021B	49 (35-64)	<1%	<10%+
HOK 1 West*	2021A	35 (27-44)	<1%	40-60%+
	2021B	32 (24-39)	<1%	<90%+
HOK 1 Total*	2021C	38 (29-45)	<1%	<10%+
HAK 1*	2021	62 (50-75) [2021]	< 1%	< 1%
HAK 4	2020	55 (46-66) [2020]	< 1%	< 10%
HAK 7	Withdrawn			
LIN 3 & 4	2019	57 (48-66) [2019]	< 1%	< 1%
LIN 5 & 6*	2021	71 (63-79) [2021]	< 1%	< 1%
LIN 6B	2007	61 (45-79) [2006]	<10%	<10%
LIN 7WC	2020	47 (35-60) [2020]	<1%	0.13
SBW 6B	Managed using an HCR			
SBW 6I	2020	58 (42-76) [2019]	< 1%	<10%

* Detailed assessment documents not currently available
+ Lower limit of the target range

4.2.1 Hoki

4.2.1.1 Catches

The TACC for the 2018-19 fishing year was 150,000t, with 20,000t shelved by industry, for an effective TACC of 130,000t. The quota owners agreed to voluntarily reduce the catch limit for HOK 1 West in 2018-19 from 90,000t to 70,000t owing to industry concerns about fishery performance, particularly the lack of abundance of hoki in the West Coast South Island (WCSI) fishery outside the 25 nm management line[3]. The 2018-19 catch was 122,405, 12,500t lower than the 2017-18 catch, and 27,565t less than the TACC of 150,000t, with most of the reduction in the WCSI spawning fishery, and the Sub-Antarctic non-spawning fishery (FNZ, 2020b).

The TACC for the 2019-20 fishing year was 115,000t. The 2019-20 catch was 107,709t, about 14,800 less than during the 2018-19 fishery. The reduction in catch was mainly attributable to reductions of 2,500t for the WCSI, of 3,560t for Cook Strait, of 1,000t for the Sub-Antarctic, and of 7,450t for the Chatham Rise and East Coast South Island (ECSI) (FNZ, in-press-a).

The TACC for the 2020-21 fishing year was retained at 115,000t but the hoki quota owners agreed to voluntarily reduce the HOK 1 catch limit, by reducing the HOK 1 West catch limit from 55,000t to 45,000t and the HOK 1 East catch limit from 60,000t to 50,000t, for an effective TACC of 95,000t.

4.2.1.2 Stock assessment

No stock assessment was undertaken during 2020. Rather, reviews of the stock assessment were undertaken given the deficiencies in the assessment (Mace and Skea, 2020; Langley, 2020). Mace and Skea (2020) report on the results of an external review (with international participants) of the May 2019 assessment of hoki.

The known deficiencies of the May 2019 (and earlier) assessments include a poor fit to trends in recent abundance indices for the trawl survey in the Sub-Antarctic area, and the most recent indices from the WCSI and Cook Strait acoustics surveys. Moreover, there was also a poor fit to some key sets of age-composition data. Langley (2020) conducted an examination of the age and index data for hoki, and provided a series of recommendations regarding possible modifications to the stock assessment, including changes in fishery configuration, more flexible trawl survey selectivity patterns, alternative assumptions about age-specificity of natural mortality, and alternative parameterizations for the distribution and movement between the Chatham Rise and Sub-Antarctic regions. Langley (2020) constructed

[3] vessels larger than 46m overall length are prohibited from fishing inside the 25 n.mile management line to reduce the catch of spawning fish in the Hokitika Canyon and most of the Cook Canyon

exploratory models for hoki using Stock Synthesis. These models led to results that appeared more consistent with the available data.

The 2021 assessment was again based on CASAL (Bull et al., 2012) and incorporated many of the suggestions of Langley (2020). The assessment involved a major reconfiguration to the fishery structure in the earlier assessment (e.g., McKenzie, 2019) (Table 3). The 2019 and earlier assessments were based on four region-specific fisheries (WCSI, Chatham Rise, Sub-Antarctic, and Cook Strait) with time-invariant selectivity. The WCSI fishery was split into three fisheries (WC_north, WC_south, and WC_inside, where 'inside' refers to inside the 25 n.mile limit), the Sub-Antarctic fishery was split into three fisheries (Auckland Islands, Snares Shelf, and the rest of the Sub-Antarctic region), and the Chatham Rise fishery was split into two fisheries (deep and shallow, with a break at 475 m). A new spawning fishery at Puysegur (June-September) was added.

Table 3 The division of annual catches by area and months into the 10 model fisheries. (Source: FNZ, in-press-a).

Fishery	Description	Areas/months
CR_deep	Chatham Rise deep (effort depth ≥475m), non-spawning	CR, CS (Oct-May), ECNI, ECSI (Oct-May)
CR_shallow	Chatham Rise shallow (effort depth <475m), non-spawning	CR, CS (Oct-May), ECNI, ECSI (Oct-May)
CS	Cook Strait spawning	CS (Jun-Sep), ECSI (Jun-Sep)
SA_auck	Sub-Antarctic Auckland Islands, non-spawning	Sub-Antarctic Auckland Islands
SA_snares	Sub-Antarctic Snares shelf, non-spawning	Sub-Antarctic Snares, Puysegur (Oct-May)
SA_suba	Sub-Antarctic excluding Auckland Islands and Snares shelf, non-spawning	Sub-Antarctic
PUY_spn	Puysegur spawning fishery	Puysegur (Jun-Sep)
WC_inside	West coast, spawning, inside 25nmile line	West coast
WC_north	West coast north spawning fishery, split temporally as pre 2000 and from 2000	West coast north
WC_south	West coast south fishery	West coast south

The 2021 assessment also differed from the 2019 assessment owing to changes to assumptions regarding the number of modelled age-classes (18 rather than 17), natural mortality, maturation, migration, and selectivity. Natural mortality was age-specific in the 2019 assessment but was sex-specific, age-independent and pre-specified for the 2021 assessment ($0.25yr^{-1}$ for males; $0.3yr^{-1}$ for females). The assessment was based on three model configurations:

- **2021A: Base2021 with Sub-Antarctic selectivity shifts**: Two spawning stocks, that spawn in Cook Strait and off the west coast. Recruits from both stocks reside on the Chatham Rise as juveniles. Western-spawned fish migrate to the Sub-Antarctic (estimated ogive). Mature west coast-stock fish migrate from the Sub-Antarctic to the west coast to spawn and mature Chatham Rise-stock fish migrate from the Chatham Rise to Cook Strait to spawn. After spawning, all mature fish return (west coast to the Sub-Antarctic and Cook Strait to the Chatham Rise). Allowance is made for time-varying selectivity for the Sub-Antarctic survey.
- **2021B: Base2021 without Sub-Antarctic selectivity shifts**: As for 2021A but selectivity for the Sub-Antarctic region is time-invariant.
- **2021C: 1 region 1 stock model**: No spatial structure, selectivity ogives applied to fisheries and surveys are hence may alias for all spatial dynamics.

The new data included in the 2021 assessment include new catches (2019 and 2020), survey index and age-composition data for the January 2020 trawl survey of the Chatham Rise and the December 2020 trawl survey of the Sub-Antarctic region. The age data used in the assessment were similar to those used in the 2019 assessment with two additional years of data, but were assigned to the new fisheries (see Table 16 of FNZ [in-press-a]).

Biomass and recruitment

The biomasses of both stocks were at their lowest points from about 2004 to 2006 (~0.3B_0 for the eastern stock in models 2021A and 2021B and ~0.2 B_0 for the western stock in model 2021B) (Figure 1), after the western stock experienced seven consecutive years of poor recruitment from 1995 to 2001 inclusive and the eastern stock had below average recruitment over the same period (Figure 2). Both stocks then increased to above the target range of 0.35-0.5 B_0, then declined, with the eastern stock now within the target range and the western stock towards the lower limit (model 2021A) or below (model 2021C) the target range. In general, model 2021C presented the same patterns as the western stock, although was slightly more optimistic. Recruitment to the western stock following the 1995–2001 period of poor recruitment remained low for two more years then was estimated to have been above average for about five years before dropping again, with recruitment below average for 2011-2019. The recruitment patterns were similar for the eastern stock over these years, except for two strong year classes in 2011 and 2015 (Figure 2).

The 2021 depletion (biomass relative to B_0) of the eastern stock is estimated to be 0.49 (95% credibility intervals 0.35-0.64) while the 2021 depletion of western stock is 0.35 (95% credibility interval 0.27-0.44; Model 2021A) or 0.32 (95% credibility interval 0.24-0.39; Model 2021B). The 2021 depletion of HOK1 in total is (0.4, 0.38 and 0.38 – models 2021A, 2021B, 2021C) (Table 4). Quantitative estimates of the probability of being below the lower limit of the management range (0.35B_0) are not available (see Table 2 for approximate values). The probability of either stock being below 0.2B_0 is <1%

Section 7 of FNZ (in-press-a) identifies a range of additional research tasks for the assessment of HOK1. In addition, the fits to the Cook Strait composition data remain poor (the dataset was consequently downweighted), and the assessment determined using retrospective analyses that the model may over-estimate biomass for the western stock.

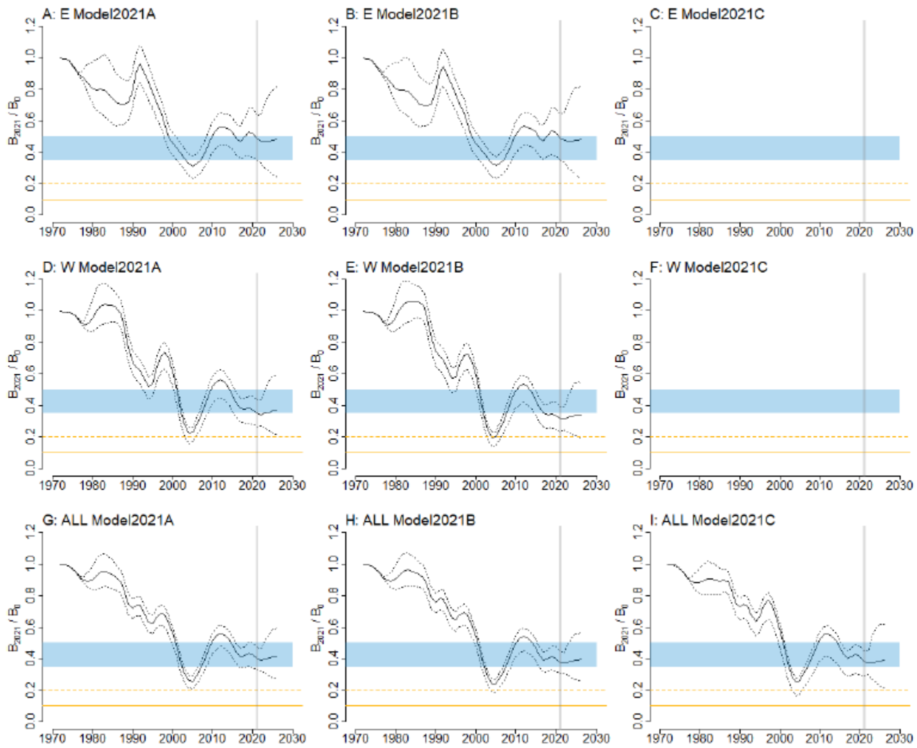

Figure 1 Scenario with random recruitment from 2008–2017. Projected spawning biomass (as % B0) for HOK 1: median (solid lines) and 95% credible intervals (dotted lines) for the three final model runs. The shaded blue region represents the target management range

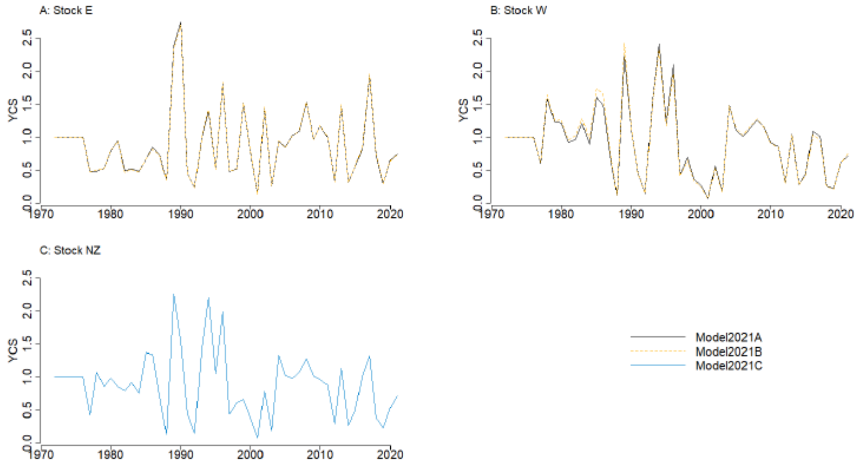

Figure 2 HOK 1 year-class strengths (YCS) for A: Eastern stock; B: Western stock; C: total stock, from models 2021A (black solid lines); 2021B (orange dashed lines); 2021C (blue solid line). Plotted values are medians of marginal posterior distributions. Years are model years (1990 = 1989–90). (Source: FNZ in-press-a).

Table 4 Bayesian median (95% credible intervals) (MCMC) of B0, B2021, B2021 as a percentage of B0 for three HOK 1 models. "E" denotes the east stock, "W" denotes the west stock, and "T" denotes the total. (Source: FNZ in-press-a).

Model	B_0 ('000t)			B_{2021} ('000t)			B_{2021}/B_0		
	E	W	T	E	W	T	E	W	T
2021A	661 (602-724)	1218 (1162-1285)	1880 (1796-1969)	320 (217-448)	426 (316-551)	749 (601-911)	48 (35-48)	35 (27-44)	40 (33-47)
2021B	661 (603-724)	1208 (1158-1267)	1870 (1791-1954)	323 (222,449)	381 (281-487)	707 (562-861)	49 (35-64)	32 (24-39)	38 (31-45)
2021C			1891 (1829-1961)			715 (546-870)			38 (29-45)

<u>Projections</u>
Five-year projections were carried out for the three model runs by randomly selecting future recruitments based on three scenarios: (i) recruitments estimated for 2008–2017 (recent recruitment), (ii) recruitments estimated for 1975–2019 (long-term recruitment), and (iii) recruitments estimated for 1995-2001 (low recruitment). Total future annual catches were assumed to be constant and equal to that in 2021 of 100,704 t. The projections indicated that the eastern biomass would remain fairly constant over the next five years, and above the target range providing recruitment was not low. Under the low recruitment projection, the eastern biomass would decrease (e.g. Figure 1). The western biomass would increase under long-term recruitment, remain constant under recent recruitment, and decline under low recruitment (FNZ, in-press-a).

4.2.2 Hake

4.2.2.1 HAK 1
A new stock assessment of the Sub-Antarctic stock (HAK 1) was conducted during 2021 (FNZ, in-press-b), which updated the stock assessment conducted in 2018 (Dunn, 2019). The assessment, which now includes data up to the 2019-20 fishing year, was again conducted using CASAL (Bull et al., 2012). Unlike the 2018 assessment, the 2021 assessment was based on a two-sex (rather than single sex) age-structured model. In addition, unlike the 2018 assessment the 2021 assessment corrected the time-series of survey biomass estimates and modified the annual cycle to more accurately align the observations with their timing in the model. The new data included in the assessment included commercial catches for 2018-2021, index and age-composition data from the trawl survey conducted in 2021, an updated CPUE index (used only in a sensitivity run) and fishery age-composition for 2018-2020. A base-case (reference) model and four sensitivity tests ("M=0.15yr^{-1}", "M=0.23yr^{-1}", inclusion of the CPUE index, and inclusion of incidental mortality and unreported catch prior to the introduction of the QMS) were conducted. As for the 2018

assessment the model fitted the biomass indices acceptably (Figure 3) and the fits to the research and fishery age-composition data were also acceptable.

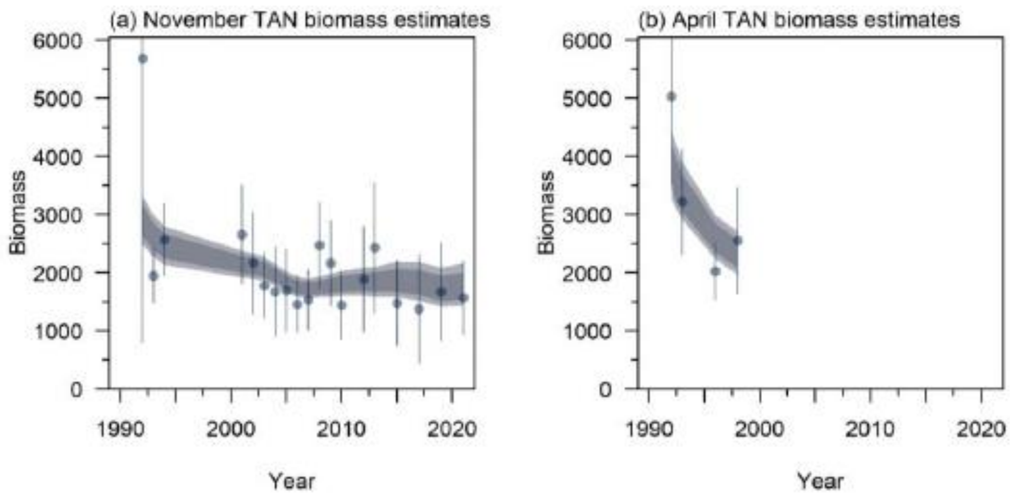

Figure 3 MCMC observed (points) and expected values for the reference model for the HAK 1 stock to the (a) November and (b) April research trawl biomass indices. Dark shaded areas represent the 80% CIs, and light shaded areas the 95% CIs. (Source: FNZ in-press-b).

Biomass and recruitment

Estimated recruitment to the HAK 1 stock is similar to that from the previous assessment, with a group of above average year class strengths in the late 1970s, a very strong year class in 1980, followed by a period of average to less than average recruitment through to 2016 (Figure 4). The biomass trajectory is similar to that from the 2018 assessment, with an increase (in response to the above recruitments in the 1970s) followed by a decline and then relative stability (Figure 5).

The base model estimate of B_0 is higher in the 2021 compared to the 2018 assessment (posterior median 59,000t compared to 54,600t), with a 2021 depletion (biomass relative to B_0) of 0.62 (95% credibility interval; 0.50-0.75) (Figure 6). The probability of being below 0.4 B_0 in 2021 is estimated to be less than 1%, with a negligible probability of being below 0.2 B_0. Exploitation rate has consistently been less than that corresponding to the target biomass of 0.4 B_0 since 2006 (Figure 6).

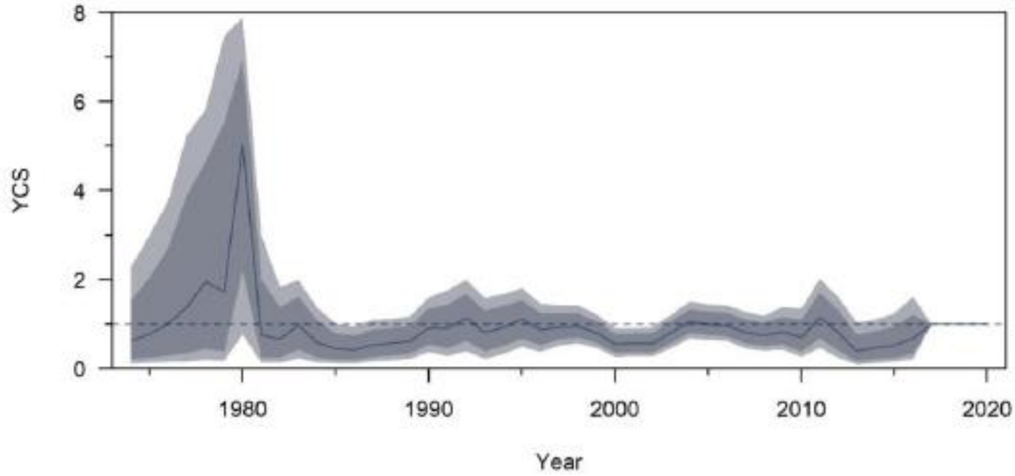

Figure 4 Estimated posterior distributions of year class strengths for the reference case for the HAK 1 stock. The dashed horizontal line indicates a year class strength of one. Dark shaded areas represent the 80% CIs, and light shaded areas the 95% CIs. (Source: FNZ in-press-b).

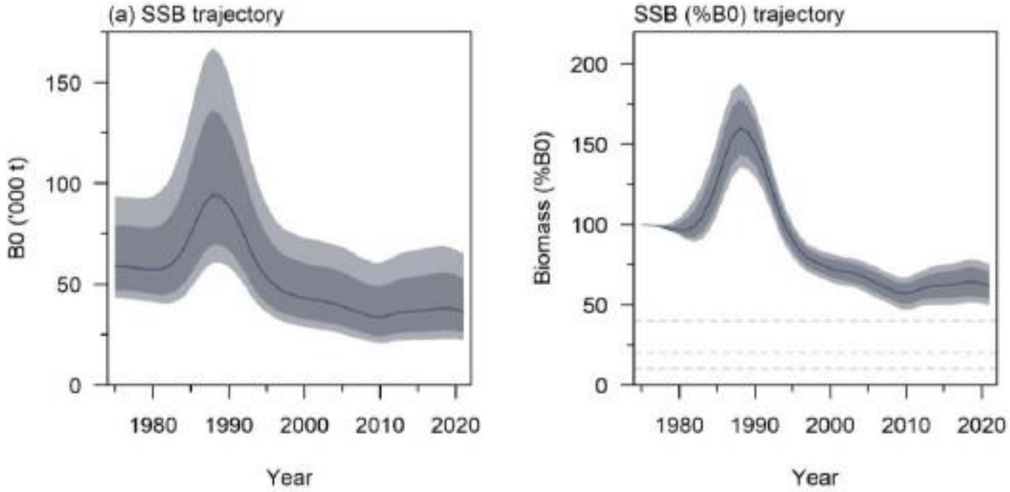

Figure 5 Reference model MCMC trajectories for absolute spawning stock biomass and spawning stock biomass as a percentage of B0 for the HAK1 stock. Dark shaded areas represent the 80% CIs, and light shaded areas the 95% CIs. The management target (0.4 B_0, solid horizontal line), soft limit (0.2 B_0, dotted horizontal line), and hard limit (0.1 B_0, dotted horizontal line) are shown on the right-hand panel. (Source: FNZ in-press-b).

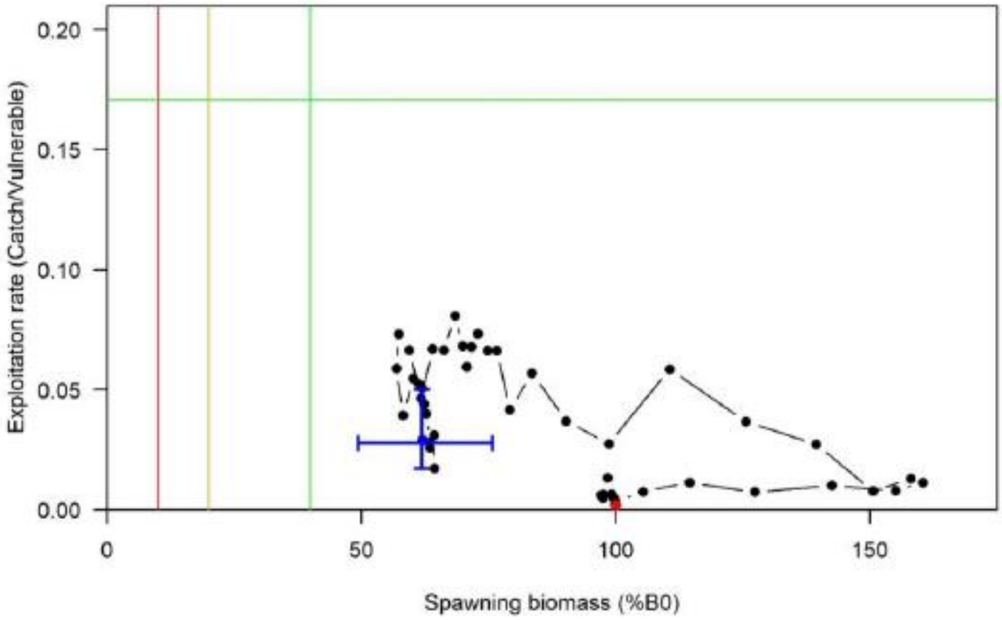

Figure 6 Trajectory over time of exploitation rate (*U*) and spawning biomass (%B_0), for the HAK 1 stock reference model from the start of the assessment period in 1974 (represented by a red point), to 2021 (blue cross). The red vertical line at 0.1 B_0 represents the hard limit, the orange line at 0.2 B_0 is the soft limit, and green lines are the % B_0 target (40% B_0) and the corresponding exploitation rate (U_{40}= 0.17 calculated using CASAL CAY calculation). Biomass and exploitation rate estimates are medians from MCMC results. (Source: FNZ in-press-b).

Table 5 Bayesian median (95% credible intervals) (MCMC) of B_0, B_{2021}, B_{2021} as a percentage of B_0, and the probability of B_{2021} being below the target (0.4B_0), for the HAK 1 base model and two sensitivity runs. (Source: FNZ in-press-b).

Case	B_0	B_{2021}	B_{2021} (%B_0)	P (B_{2021} < 0.4B_0)
Base	59,000 (43,220-93,600)	36,490 (22,250-65,510)	62 (50-75)	<0.01
M=0.15yr^{-1}	40,440 (36,050-46,170)	20,990 (14,970-28,760)	52 (41-64)	0.02
M=0.23yr^{-1}	75,130 (55,310-110,190)	51,700 (33,480-85,480)	68 (55-84)	<0.01

<u>Projections</u>
Projections were undertaken for the current catch (1,066t) and the TACC (3,701t). Spawning biomass is predicted to be stable under the current catch but to the decline under the TACC. However, the probability of spawning biomass dropping below 0.2 B_0 under the current TACC is less than 1% (FNZ, in-press-b).

4.2.2.2 HAK 4
A new stock assessment of the Chatham Rise stock (HAK 4 and HAK1 north of Otago peninsula) was conducted during 2020 (Holmes, in press; FNZ, 2020c), which updated the last assessment conducted in 2016. The assessment, which now includes data up to the 2018-19 fishing year, was again conducted using CASAL (Bull et al., 2012). This new assessment was based on a revised model year (September to August instead of October to September for the 2017 assessment) and updated catches from model year 2009. The structure of the 2020 assessment generally matched that of the 2017 assessment, except that the selectivity pattern for the east commercial fishery was assumed to be logistic instead of double-normal. This assessment included new indices of biomass (for 2018 and 2020). A base-case model and four sensitivity analyses were conducted ('High M", "Low M", "All double normal", and "with-east CPUE"), with the

results robust to changing *M*, assuming double normal instead of logistic selectivity for the east commercial fishery, and including a CPUE series for the east commercial fishery. The model fitted the data well (Figure 7).

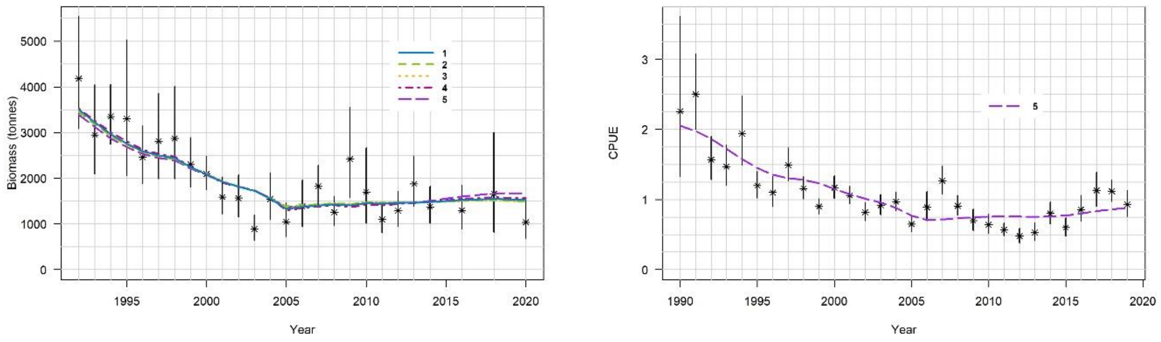

Figure 7 MPD fits to biomass indices for the trawl survey (left) and CPUE-east fishery (right) for the HAK 4 stock. (1) Base run, (2) Old base run, (3) High M run, (4) Low M run, (5) CPUE-east run. Vertical lines show the 95% confidence intervals. (Source: Holmes, in prep).

<u>Biomass and recruitment</u>

Estimated recruitment to the HAK 4 stock is similar to that from the previous assessment, with high values in the early 1990s, a very strong year class in 2002, and less than average recruitment from 2014 (Figure 8). The base model estimate of B_0 is lower in the 2020 compared to the 2017 assessment (posterior median 32,838t compared to 30,080t), with a 2020 depletion (biomass relative to B_0) of 0.55 (95% credibility interval; 0.46-0.66) (Figure 9). The probability of being below 0.4 B_0 in 2020 is estimated to be 0.01, with a negligible (<1%) probability of being below 0.2 B_0. Exploitation rate has consistently been less than that corresponding to the target biomass of 0.4 B_0 since 2006 (Figure 10).

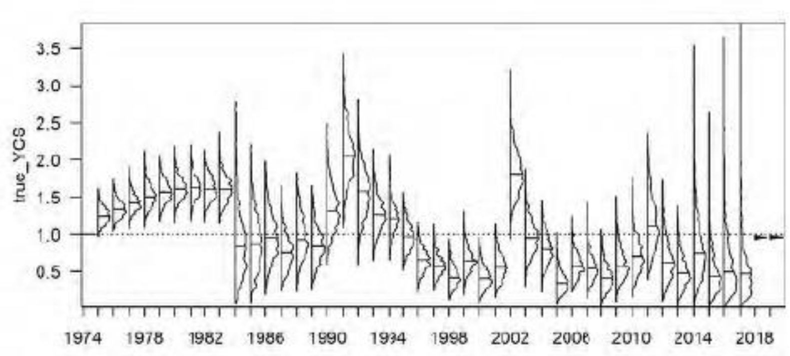

Figure 8 Estimated posterior distributions of year class strengths for the base case model for HAK 4. The dashed horizontal line indicates a year class strength of one. Individual distributions show the marginal posterior distribution, with horizontal lines indicating the median. (Source: FNZ, 2020c).

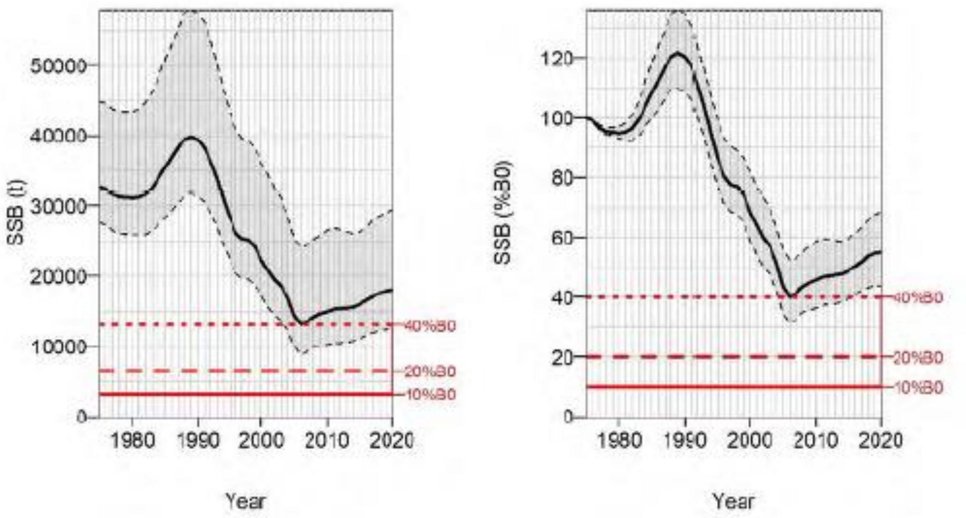

Figure 9 Estimated median trajectories (with 95% credible intervals shown as dashed lines) for the HAK 4 stock base model for absolute biomass and biomass as a percentage of B_0. The management target (0.4 B_0, solid horizontal line) and soft limit (0.2 B_0, dotted horizontal line) are shown on the right-hand panel. (Source: FNZ, 2020c).

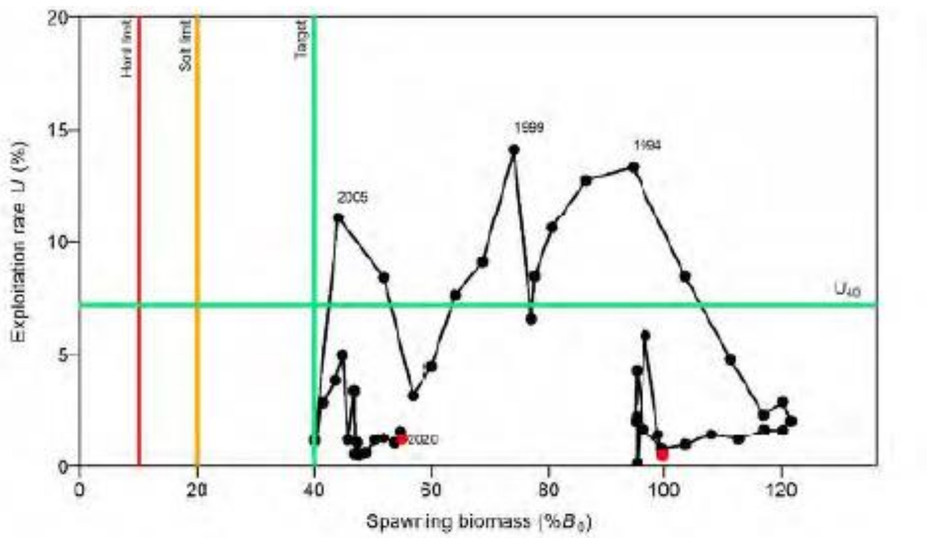

Figure 10 Trajectory over time of exploitation rate (U) and spawning biomass (% B_0), for the HAK 4 base model from the start of the assessment period in 1975 (represented by a red point), to 2020. The red vertical line at 0.1 B_0 represents the hard limit, the orange line at 0.2 B_0 is the soft limit, and green lines are the %B_0 target (0.4 B_0) and the corresponding exploitation rate (U_{40}). Biomass and exploitation rate estimates are medians from MCMC results. (Source: FNZ, 2020c).

Table 6 Bayesian median (95% credible intervals) (MCMC) of B_0, B_{2020}, B_{2020} as a percentage of B_0, and the probability of B_{2020} being below the target (0.4B_0), for the HAK 4 base model and the sensitivity runs. (Source: FNZ, 2020c).

Case	B_0	B_{2020}	B_{2020} (%B_0)	P (B_{2020} < 0.4B_0)
Base	32,838 (28,280-42,721)	18,150 (12,204-27,258)	55 (46-66)	0.01

Double normal	32,859 (27,998-43,444)	18,237 (13,175-27,659)	55 (45-67)	<0.01
CPUE	34,367 (29,504-44,113)	20,035 (15,096-28,979)	58 (50-68)	<0.01

Projections
Catches from HAK 4 have been consistently much less than the TACC. Five-year projections were based on the base model and a catch equal to the current TACC (1,800t) or the average catch over the last six years (362t). The stock will rebuild further under catches of 362t while it will decline under a catch of 1,800t, but the probability of dropping between 0.2 B_0 by 2025 is less than 1%.

4.2.3 Ling

4.2.3.1 LIN 3 & LIN 4 (Chatham Rise)
The assessment of ling on the Chatham Rise was updated during 2019 (Holmes, 2019; FNZ, 2020a). At the time of the last surveillance audit full details of the 2019 assessment were not available. The specifications of the 2019 assessment were generally the same as the previous (2015) assessment but natural mortality was assumed to be sex-specific and the model was fitted to sexed rather than unsexed catch-at-age and catch-at-length data from the line fishery. The 2019 assessment included new (2016 and 2018) trawl survey biomass data (index and age-composition) as well as additional trawl and line fishery catch-at-age data (2014-2018) and an updated CPUE index. The additional process error for the trawl survey index and line fishery CPUE were estimated instead of being pre-specified.

The conflict between the line fishery CPUE and the trawl survey index, in which the line fishery biomass index declined between 1991 and 1997, but the trawl survey index remained relatively flat throughout (Figure 11), remained. The base model consequently ignored the line fishery CPUE and the longline catch-at-length data were excluded. The assessment is based on a base-case run (for which MCMC-based posteriors were computed) and five sensitivity analyses (“Old base case run”, “Longline run”, “Longline proportions at length retained”, “Longline proportions at length – high q”, and “high q”)

The fits to the biomass indices and longline CPUE and catch-at-age data were all reasonable (see Figure 11 for the trawl survey and CPUE indices).

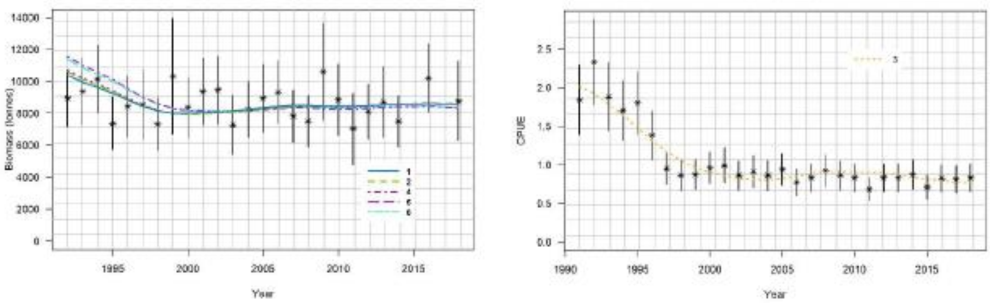

Figure 11 Model fits to biomass indices for the trawl survey (left) and longline CPUE (right) for LIN 3 & 4. (1) Base run, (2) Old base run, (3) Longline run, (4) Prop. at length run, (5) Prop. at length, high q, run and (6) high q run. Vertical lines show the 95% confidence intervals. (Source: Holmes, 2019).

Biomass and recruitment
The trends in recruitment were very similar to those from the 2015 assessment, although the posterior median for recent recruitment was below the long-term average (Figure 12). The biomass is estimated to have varied over time but to have consistently been larger than 0.4B_0 (Figure 13) The probability of being below 0.4 B_0 in 2019 is estimated to be 0.01, with a negligible (<1%) probability of being below 0.2B_0. Exploitation rate has consistently been less than 0.1 since the mid-2000s (Figure 14).

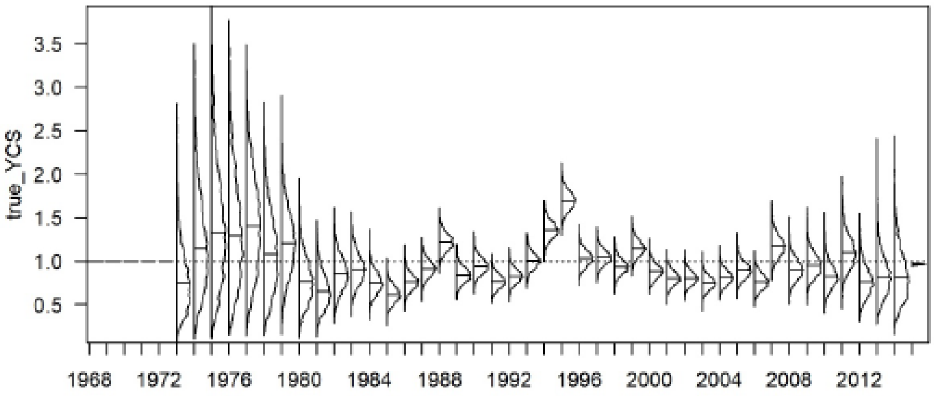

Figure 12 Estimated posterior distributions of year class strengths for the LIN 3 & 4 base model. The dashed horizontal line indicates a year class strength of one. Individual distributions show the marginal posterior distribution, with horizontal lines indicating the median. (Source: FNZ, 2020a).

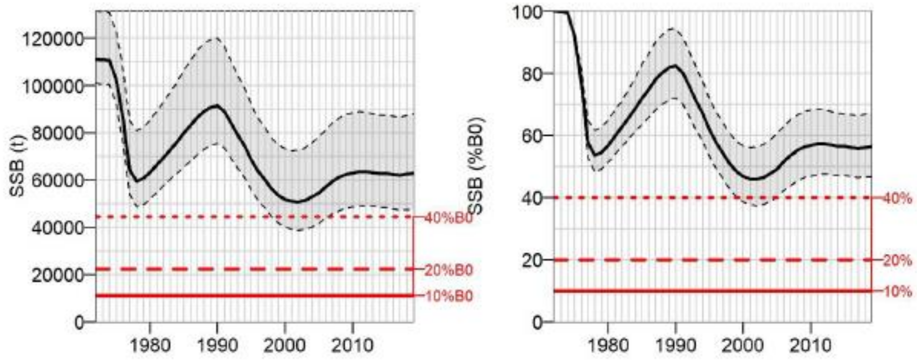

Figure 13 Estimated median trajectories for the LIN 3 & 4 base model (with 95% credible intervals shown as dashed lines) for absolute biomass and biomass as a percentage of B0. (Source: FNZ, 2020a).

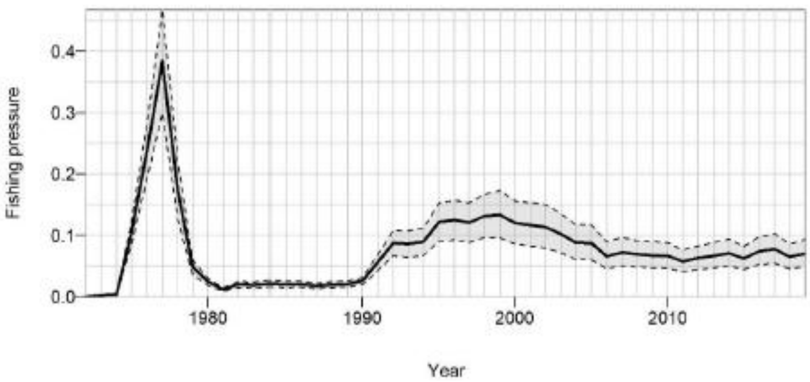

Figure 14 Exploitation rates (catch over vulnerable biomass) with 95% credible intervals shown as dashed lines for the LIN 3 & 4 base model. (Source: FNZ, 2020a).

The base model estimate of B_0 is lower in the 2020 compared to the 2015 assessment (posterior median 111,067t compared to 126,600t), with a 2020 depletion (biomass relative to B_0) of 0.57 (95% credibility interval: 0.48-0.66) (Figure 13). The 2014 depletion from the 2015 assessment was 0.57 (95% credibility interval: 0.45-0.71).

Table 7 Bayesian median (95% credible intervals) (MCMC) of B0, B2019, B2019 as a percentage of B0, and the probability of B2019 being below the target (0.4 B0) for the LIN3 & 4 base model and sensitivity runs. (Source: Holmes, 2019).

Model	B_0	B_{2019}	B_{2019} (% B_0)	P (B_{2019} < 0.4 B_0)
Base	111,067 (102,260-126,828)	62,800 (49,641-82.913)	57 (48-66)	0.0001
Longline	92,630 (87,605-100,986)		35 (27-47)	

Projections
Holmes (2019) conduced projections under catches that are the average for the last five years (3,883t) and for the TACC (6,260t) for two models (base and longline) and two scenarios regarding future recruitment (sampled from the entire time-series and from those for the most recent 10 years). The biomass in 2024 was estimated to be 0.49 B_0 or higher (posterior median) for all scenarios under the base model, but to drop to 0.38 B_0 (average catches) or 0.28 B_0 (TACC) under the longline model (which was not recommended for management purposes).

4.2.3.2 LIN 5 & LIN 6 (Sub-Antarctic excluding the Bounty Plateau)
The 2018 assessment of LIN 5 & 6 (Masi, 2019) was updated during 2021 (FNZ, in-press-c). The 2021 assessment differed from the 2018 assessment in that the annual cycle was modified to better match the spawning season, which also resulted in changes to the proportion of each period during which fisheries and surveys took place (Table 13 of FNZ [in-press-c]). The 2021 assessment also fixed the right-hand limb of the trawl fishery selectivity pattern, fixed instead of estimating the value of *M* (based on Horn [2005]), modelled fewer fisheries (two instead of three), included the longline CPUE index, and treated the survey *q*s as "nuisance parameters". The working group included the longline CPUE index (previously excluded from the assessment) because it considered that this index a suitable measure of abundance and because the CPUE index provided a bounding index of stock size (FNZ, in-press-c). The 2021 assessment included new trawl survey biomass data (index [2019 and 2021] and age-composition [2019]) as well as additional trawl and line fishery catch-at-age data and an updated CPUE index. The additional process error variances for the trawl survey index and line fishery CPUE were estimated instead of being pre-specified.

The assessment involved a base (reference) model and sensitivity tests ("M=0.16yr^{-1}", "M=0.2yr^{-1}", and "Ignore CPUE").

Biomass and recruitment
Recruitment was generally weak from 1985 to 1992, strong from 1994 to 1996, 2005 to 2010, and average thereafter (Figure 15). The biomass trajectory is slightly declining but well above the target level (Figure 16) while exploitation rates have remained largely constant since the early 2000s (Figure 17).

The estimate of B_0 (187,350t) is markedly lower than that from the 2018 assessment (305,306t) but also much more precise. The probability of being below 0.4 B_0 in 2021 is estimated to be <0.01, with a negligible probability of being below 0.2 B_0 (Table 7). Exploitation rates have consistency been lower than those corresponding to 0.4 B_0 (Figure 18).

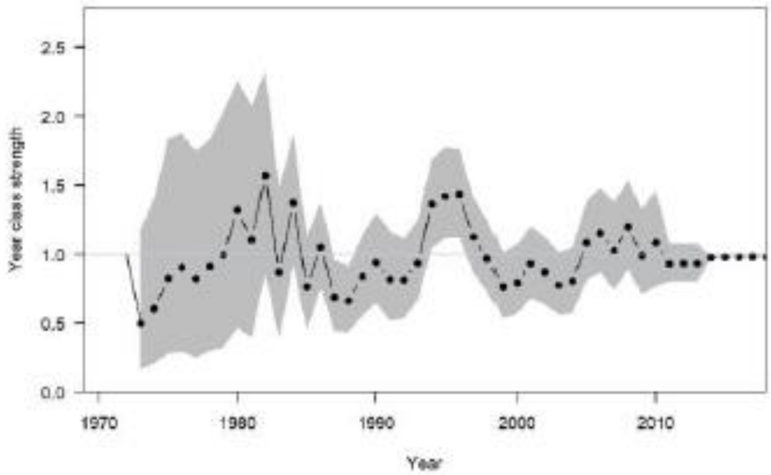

Figure 15 LIN 5&6. Estimated posterior distributions of year class strength from the base case run for the LIN 5 & 6 stock, with median (line and individual points) and 95% credible interval (grey band). The horizontal line indicates a year class strength of one. (Source: FNZ, in press-c).

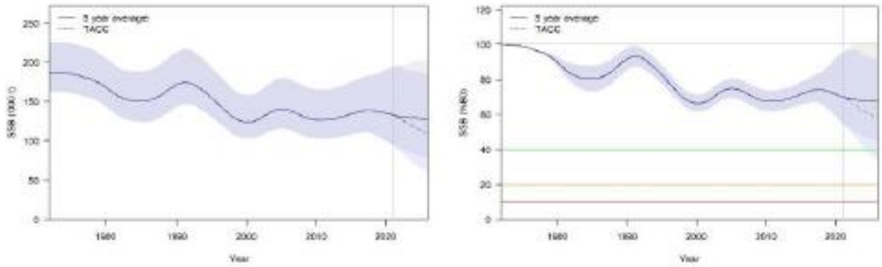

Figure 16 Trajectory over time of relative spawning biomass (with 95% credible intervals in grey or blue) for the base case model for the LIN 5 & 6 stock from the start of the assessment period in 1972 to the most recent assessment in 2021 (vertical grey line) and projected to 2026 with future catches as either the average of the last five years of catch (black) or TACC (blue). Years on the x-axis are model year with "1990" representing the 1989–90 model year from 1st September 1989 to 31st August 1990. Biomass estimates are based on MCMC results. The red horizontal line at 0.1 B_0 represents the hard limit, the orange line at 0.2 B_0 is the soft limit, and green line is the % B_0 target (0.4 B_0). (Source: FNZ, in press-c).

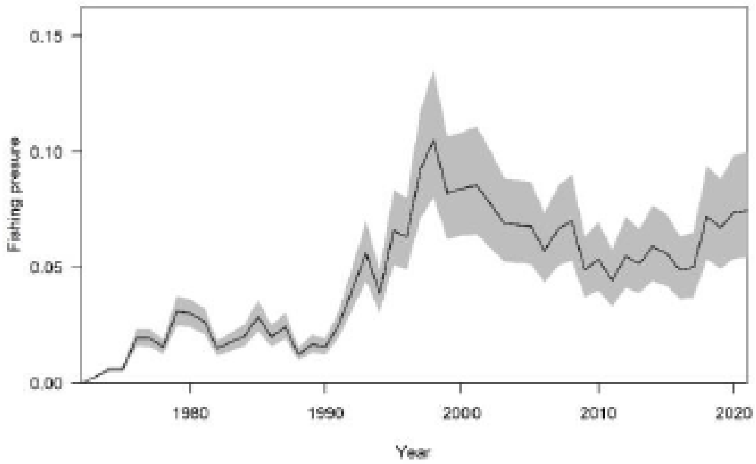

Figure 17 LIN 5 & 6 base model exploitation rate (catch over vulnerable biomass) with 95% credible intervals shown in grey. (Source: FNZ, in press-c).

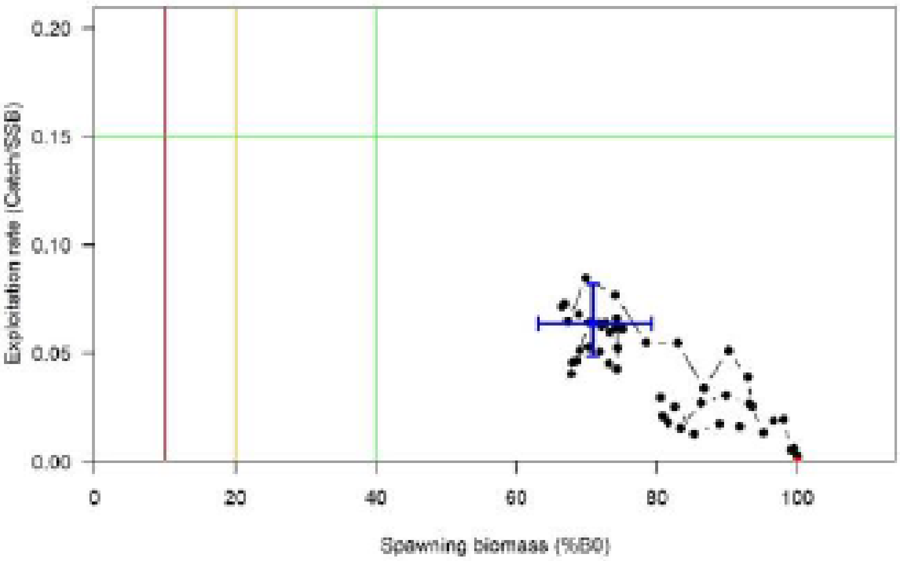

Figure 18 Trajectory over time of exploitation rate (U) and spawning biomass (% B_0), for the LIN 5 & 6 base model from the start of the assessment period in 1972 (represented by a red point), to 2021 (in blue). The red vertical line at 0.1 B_0 represents the hard limit, the orange line at 0.1 B_0 is the soft limit, and green lines are the % B_0 target (40% B_0) and the corresponding exploitation rate (U40 = 0.15 calculated using CASAL CAY calculation). Biomass and exploitation rate estimates are medians from MCMC results. The blue cross represents the limits of the 95% confidence intervals of estimated the ratio of the SSB to B_0 and exploitation rate in 2021.

Table 8 Bayesian median (95% credible intervals) (MCMC) of B_0, B_{2021}, B_{2021} as a percentage of B_0, and the probability of B_{2021} being below the target (0.4 B_0), for the LIN 5 & 6 base model and the sensitivity runs. (Source: FNZ in-press-c).

Case	B_0	B_{2021}	B_{2021} (%B_0)	P (B_{2021} < 0.4B_0)
Base	187,350 (163,190-226,090)	132,780 (104,630-177,230)	71 (63-79)	0.066
M=0.16yr^{-1}	137,800 (144,500-175,820)	96,520 (79,080-119,840)	61 (54-69)	0.329
M=0.20yr^{-1}	258,770 (203,270-361,080)	208,840 (150,460-318,790)	81 (72-90)	0.005
Ignore CPUE	197,130 (166,520-246,370)	147,690 (109,610-209,350)	75 (65-86)	0.038

Projections

Projections under current catches (7,690t) and the TACC (13,240t) indicate a low probability of the stock dropping below 0.4 B_0 by 2016 (FNZ, in-press-c).

4.2.3.3 LIN 7 (east coast South Island)

The stock assessment for the east coast South Island (LIN 7WC) conducted during 2017 was updated during 2020 (FNZ, 2020a; Kienzle, 2021). The major changes from the 2017 assessment included that trawl survey selectivity was assumed to be logistic rather than double-normal. New data in the 2020 assessment included new trawl survey index and catch-at-age data (2016 and 2018), trawl fishery catch-at-age data for 2016-2019 and a revised CPUE index. Models considered the effects of using different indices of abundance and different values for natural mortality. Some of the priors had to be adjusted to achieve convergence of the MCMC algorithm.

Biomass and recruitment

Recruitment for LIN 7WC increased from 1975 to 1990 and has generally varied without trend thereafter (Figure 19). The biomass of LIN 7WC exhibited a declining trend followed by relative stability after about 1990 (Figure 20). The current biomass (B_{2020}) is estimated to be 0.47 B_0 (95% credibility interval 0.35-0.60 B_0; Table 8). The results of the 2020 assessment are markedly different from the 2015 assessment (lower estimates of B_0 and current biomass) and much more precise model outcomes.

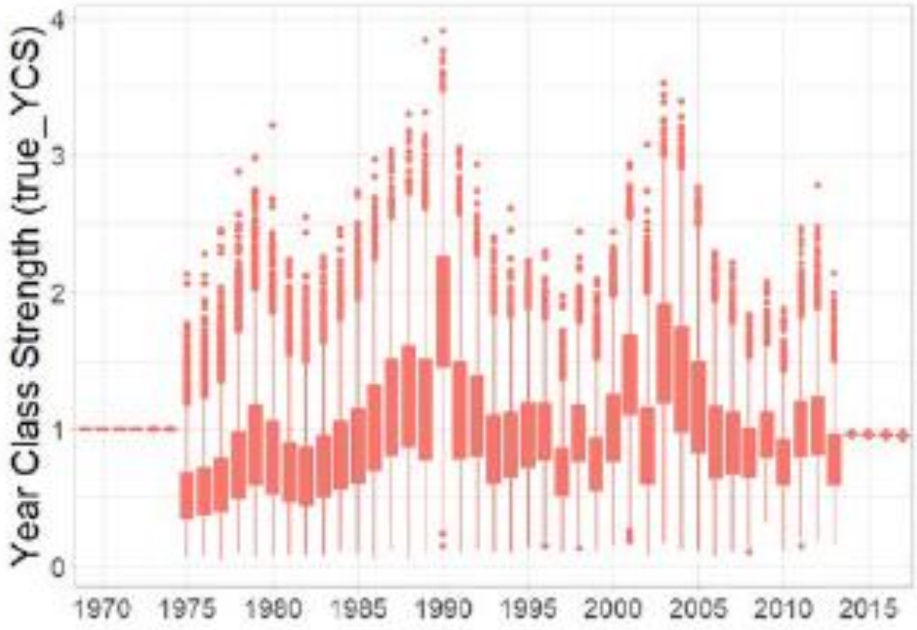

Figure 19 Estimated posterior distributions of year class strengths for the base case model for LIN 7WC. The dashed horizontal line indicates a year class strength of one. Individual distributions show the marginal posterior distribution, with horizontal lines indicating the median. (Source: Kienzle, 2021).

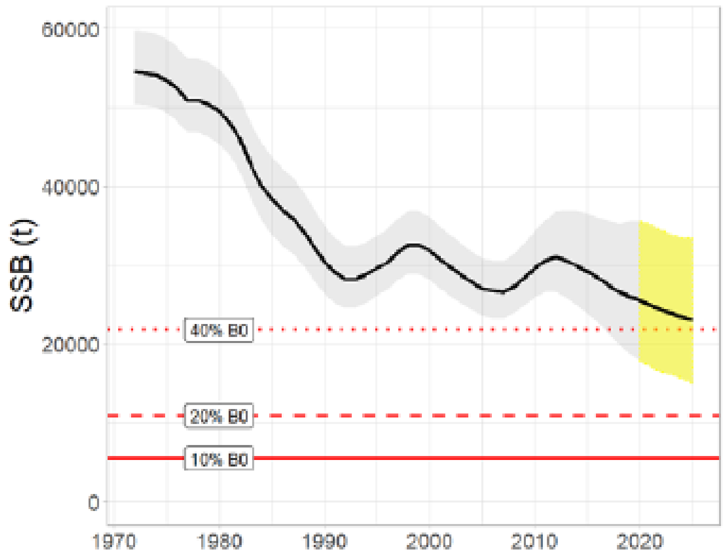

Figure 20 Trajectory over time of relative spawning biomass (with 95% credible intervals in grey) for the base case model for LIN 7WC from the start of the assessment period in 1972 to the most recent assessment in

2020 and projected to 2025 (in yellow). Years on the x-axis are fishing year with "1990" representing the 1989–90 fishing year. Biomass estimates are based on MCMC results. (Source: FNZ, 2020a).

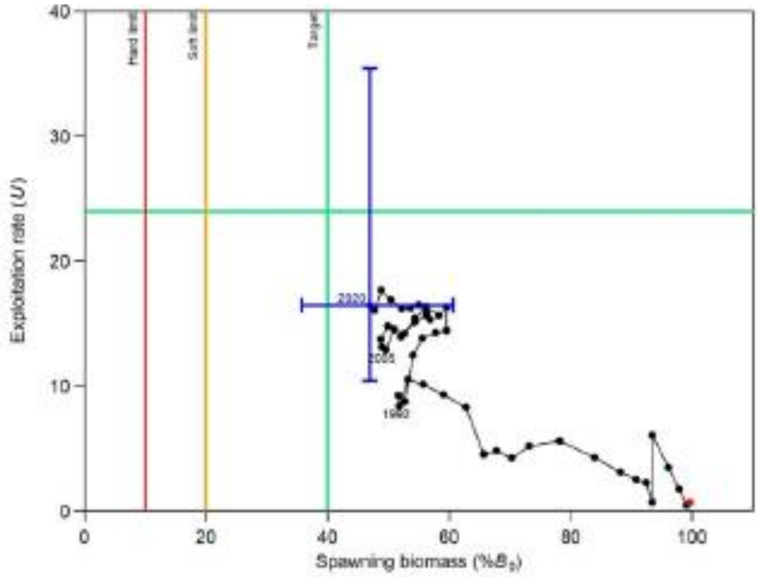

Figure 21 Trajectory over time of exploitation rate (U) and spawning biomass (% B_0), for the LIN 7WC stock base model from the start of the assessment period in 1974 (represented by a red point), to 2020 (in blue). The red vertical line at 0.1 B_0 represents the hard limit, the orange line at 0.2 B_0 is the soft limit, and green lines are the %B_0 target (40% B_0) and the corresponding exploitation rate (U_{40}). Biomass and exploitation rate estimates are medians from MCMC results. (Source: FNZ, 2020a).

Table 9 Bayesian median (95% credible intervals) (MCMC) of B_0, B_{2020}, B_{2020} as a percentage of B_0, and the probability of B_{2020} being below the target (0.4 B_0), for the LIN 7WC base model and the sensitivity runs. (Source: FNZ, 2020a).

Case	B_0	B_{2020}	B_{2020} (%B_0)	P (B_{2020} < 0.4B_0)
Base	54,546 (50,463-59,833)	25,556 (17,877-35,527)	47 (35-60)	0.13
Adding CPUE index	56,159 (51,964-61,580)	21,393 (21,034-38,047)	50 (40-62)	0.13

Projections
The projections from the 2017 assessment were not updated for the 2020 assessment.

4.2.4 Southern blue whiting

4.2.4.1 SBW 6B (Bounty Platform)
No assessment of the Bounty Platform area has been undertaken since the 2017 recertification.

4.2.4.2 SBW 6I (Campbell Island Rise)
The stock assessment for the Campbell Island stock (SBW 6I) conducted during 2017 (Roberts and Hanchet, 2019) was updated during 2020 (FNZ, 2020d; Doonan, 2020). The assessment was again based on a two-sex, single stock and area Bayesian catch-at-age model implemented in CASAL. The new data in the assessment were catches, new estimates of immature and mature biomass from the wide-area acoustic survey of the Campbell Island Rise (Ladroit et al., 2020) as well as sexed catch-at-age data for 2017-2019 (FNZ, 2020d). The assessment was based on a base-case model and four sensitivities (M=0.15yr^{-1}, M=0.25yr^{-1}, M estimated, allowance made for time-varying maturity). MCMC was applied for the M estimated and time-varying maturation cases.

The fits were generally good for mature biomass indices (Figure 22), but the fits to the immature biomass indices were fairly poor (a process error CV of 0.66; Doonan, 2020).

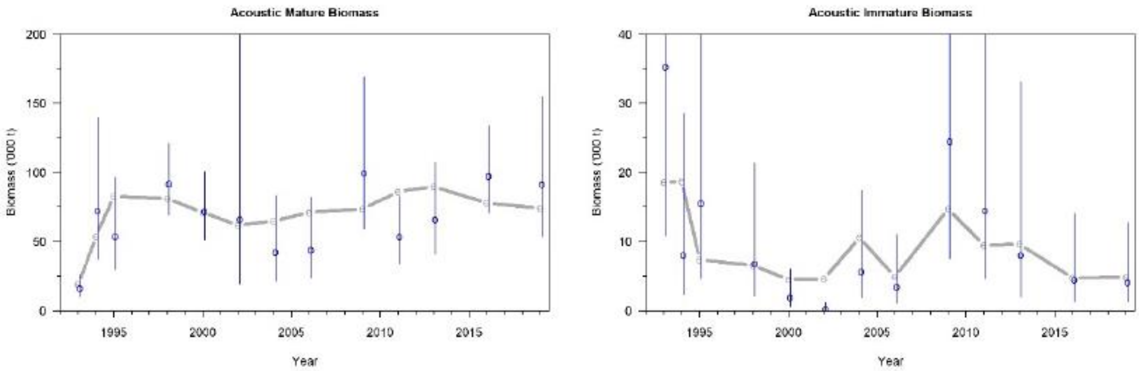

Figure 22 Observed (o) and expected (e) mature acoustic biomass index (±2 s.d.) (left panel) and immature acoustic observed (o) and expected (e) biomass indices (±2 s.d. including process error) (right panel) for the SBW 6I base model. (Source: Doonan, 2020).).

<u>Biomass and recruitment</u>

The spawning biomass increased from 1960 to 1970 (due to a strong year class) and subsequently declined due to low recruitment until 1993 after which it increased due to the very strong 1991 year-class (Figure 23). Spawning biomass declined again as the 1991 cohort died out before it starting to recover in 2008. In recent years spawning biomass has been flat but at new lower level than during 2011-2015 (Figure 24). Exploitation rate has been relatively constant over the last 20 years (Figure 25).

The base model estimate of B_0 is lower in the 2020 compared to the 2017 assessment (posterior median 392,000t compared to 345,000t), with a 2020 depletion (biomass relative to B_0) of 0.58 (95% credibility interval: 0.42-0.72) (Figure 24). The 2017 depletion from the 2015 assessment was 0.70 (95% credibility interval: 0.54-0.80). The results are not very sensitive to estimating natural mortality or allowing for time-varying maturity (Table 10).

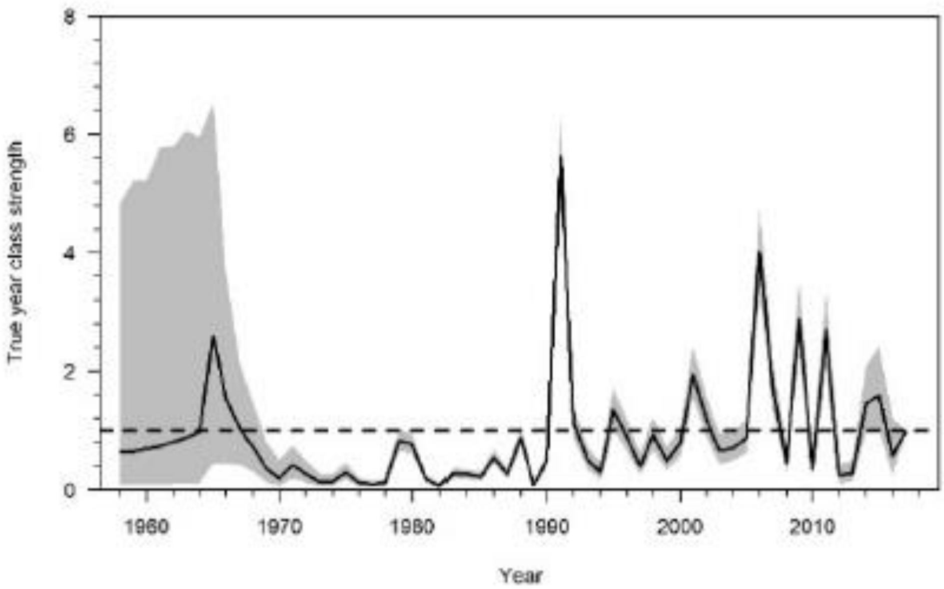

Figure 23 Estimated posterior distributions of relative year class strength for the SBW 6I base model. (Source: Doonan, 2020).

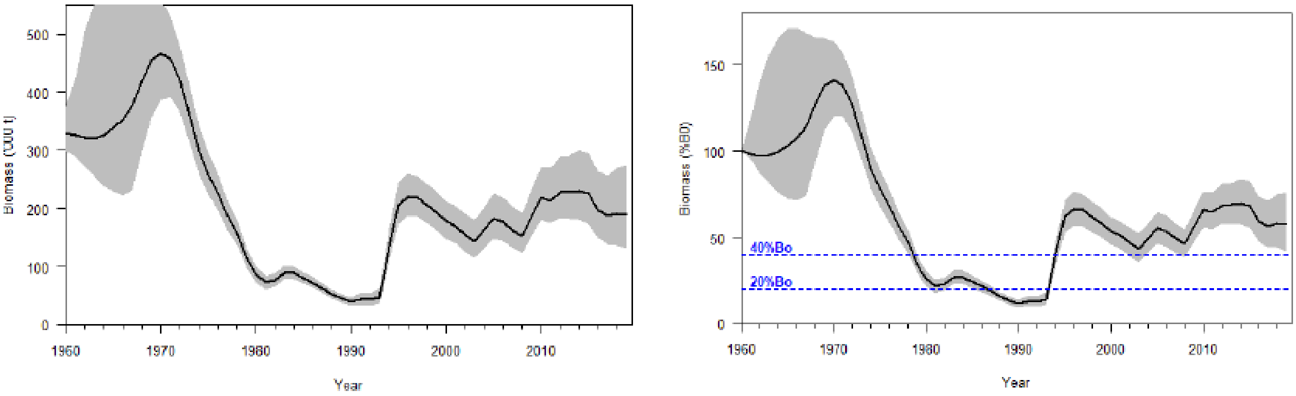

Figure 24 MCMC posterior plots of the trajectories of biomass (left) and current stock status (%B/B_0) (right) for the SBW 6I base model. The shaded regions are the 95% credible intervals. (Source: Doonan, 2020).

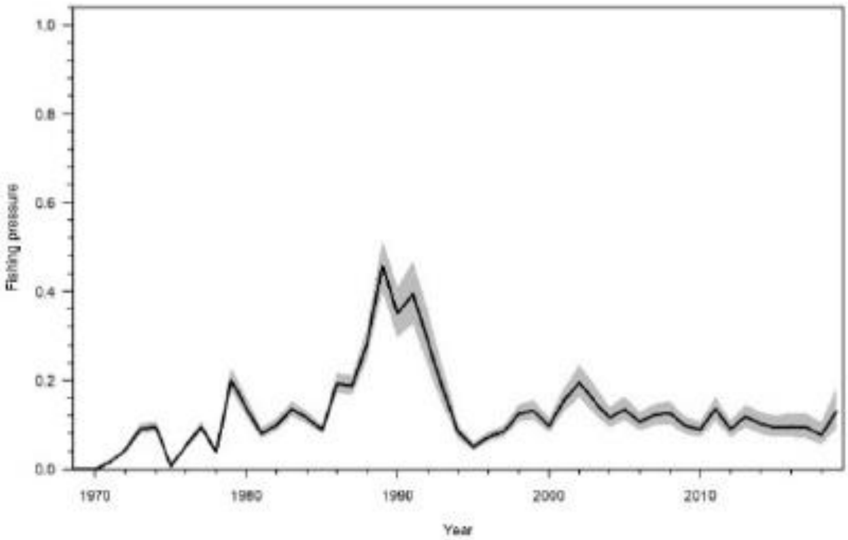

Figure 25 Estimated posterior distributions of exploitation rates for the SBW 6I base model. (Source: Doonan, 2020).

Table 10 Bayesian median (95% credible intervals) (MCMC) of B_0, B_{2019}, B_{2019} as a percentage of B_0, and the probability of B_{2019} being below the target (0.4 B_0), for the SBW 6I base model and the sensitivity runs. (Source: FNZ, 2020d).

Case	B_0 ('000t)	B_{2019}	B_{2019} (%B_0)	P (B_{2019} < 0.4B_0)
Base	329 (299-372)		58 (42-76)	
MFree	321 (294-360)		51 (35-71)	
Tvary	331 (300-373)		54 (40-72)	

<u>Projections</u>

Five-year projections were undertaken for fixed catch levels of 21,059t (average catch during 2015-16 to 2019-20) and 39,200t (TACC). Recruitment was either sampled from the entire time-series of estimated recruitments or from the recruitments for 2015-2019. The population was estimated to remain about 0.4 B_0 for the recent average catch with greater than 0.5 probability and the probability of dropping below 0.2 B_0 was low (<0.05). In contrast, catches of 39,200t annually will lead to decline in biomass, with the probability of the biomass in 2025 being below 0.2 B_0 being almost 0.5

when recruitment is selected from the entire time-series and a median biomass of ~0.25 B_0 when recruitment is generated from those for the most recent five years.

3.3 Future surveys and assessments

The following surveys are planned for the period May 2021 to December 2022:

- Trawl surveys
  - Chatham Rise: January 2022
  - Sub-Antarctic: December 2022
  - West Coast South Island: June/July 2021
- Acoustic surveys
  - Cook Strait: July/August 2021 (for hoki)
  - West Coast South Island: July/August 2021 (for hoki)
  - Bounty Platform: August 2021 and 2022 (for southern blue whiting)
  - Campbell Island: September 2022 (for southern blue whiting)

Table 15 of FNZ (2020e) outlines the planned data collection for hoki, hake, ling for southern blue whiting. Saunders et al. (2021) summarizes recent data collection for hake and ling. Assessments are planned for 2021/22 for HOK 1, HAK 7, and LIN 3 & 4. A data characterization (and possible stock assessment) is planned for LIN 6B for 2021/22. A genetic study is underway for hoki.

5 Principal 2: Overview

5.1 Observer coverage

Observer coverage of deepwater fisheries is planned by financial year and is based on biological information requirements, international requirements, percentage-level coverage targets and observer programme capacity.

Table 11 Observer coverage in the hoki mixed-species trawl fisheries. Coverage is presented as the percentage of tows observed (FNZ, pers. comm.)

	2015-16	2016-17	2017-18	2018-19	2019-20
HOK, HAK, LIN	28%	26%	37%	29%	44%

Table 12 Fishing effort and observer coverage in SBW 6B and SBW 6I fisheries in 2018-19 and 2019-20 (FNZ, pers. comm.).

Fishery	QMA	2018-19			2019-20		
		Observed tows	total tows	% tows observed	Observed tows	total tows	% tows observed
Southern blue whiting	SBW 6B	152	152	100%	14	14	100%
	SBW 6I	596	596	100%	334	334	100%

Table 13 Observer coverage in the ling longline fisheries (LIN 3, 4, 5, 6 & 7) as a percentage of hooks observed, 2015-16 to 2019-20.

	2015-16	2016-17	2017-18	2018-19	2019-20
Observer Coverage	9%	15%	23%	11%	17%

5.2 Retained and bycatch species

5.2.1 Hoki hake and ling trawl

The composition and quantity have not changed. Hoki, hake and ling have accounted for, on average, 91% of the total estimated catch weight recorded by observers in these target fisheries. The remainder of the observed catch has principally comprised two other QMS species, silver warehou (1.4% of the total catch) and spiny dogfish (0.9%), and two non-QMS species/groups javelin fish (1.4% of the total catch) and rattails (1.1%). Invertebrate species make up only a very small fraction of the overall catch, with squid (arrow and warty), comprising 0.1% of the total catch, being the main species group caught.

5.2.2 Southern blue whiting

The composition and quantity have not changed. The southern blue whiting fishery is characterised as a "clean" fishery with bycatch comprising less than 1% of the total catch, on average. Bycatch estimates over the most recent five-year period for which data are available (i.e. 2013-14 to 2016-17), reveal that between seven and 16 species have had catches of greater than one tonne per annum, of which 11 are managed within the Quota Management system. During this period, bycatch has been dominated by five species: ling (147 t), porbeagle shark (104 t), hoki (87 t), hake (80 t) and opah (55 t), with all but opah being QMS species (Finucci et al., 2019).

5.2.3 Ling longline

Ling accounts for around 66% of the total reported catch from ling-targeted longliners. The main non-target species, in decreasing order by weight, are QMS species spiny dogfish, ribaldo, rough skate, smooth skate, sea perch, pale ghost shark and red cod, followed by non-QMS species black cod and shovelnose dogfish (Finucci & Anderson, 2019).

5.3 ETP species

ETP species capture information, as reported by vessels and by MPI observers, is summarised in the Aquatic Environment and Biodiversity Annual Review report (FNZ, 2020a), and on the Protected Species Capture webpage, previously maintained under contract by Dragonfly Ltd (Dragonfly, 2019). The database provides open access to multi-year records of ETP species captures by fishery sector and fishing method, based on MPI observer data, and is updated annually through FNZ's Science Working Group process.

There have been no significant changes in capture mitigation since the previous audit

5.3.1 Seabirds

5.3.1.1 Hoki, Hake and Ling, trawl fisheries incidental captures.
All trawl vessels >28 m are required to notify DWG should they capture more than a given number of seabirds (or marine mammals) within a defined time period. These are known as trigger point notifications and are required to be reported to DWG within 24 hours. DWG's Environmental Liaison Officer (ELO) then contacts the vessel to determine the cause (e.g. mitigation measure failure, mechanical breakdown or weather conditions) and then determines what additional mitigation measures the vessel should take (if any). Between 2014-15 and 2018-19, approximately 88% of observed seabird captures on deepwater trawl vessels were classed as 'net captures', of which 37% were released alive. Smaller seabirds (e.g. petrels or shearwaters) may get trapped inside the net when they dive into its mouth, while other species (e.g. albatrosses) tend to get tangled in the net mesh from the outside when they try to seize fish (FNZ, 2020a).

5.3.1.2 Southern blue whiting incidental captures.
Very low numbers of seabirds are incidentally caught by southern blue whiting fisheries, averaging around 5 per year in recent years

5.3.1.3 Ling longline. Seabirds are subject to incidental capture by ling longline vessels during line setting and hauling when birds target baited hooks. The Ling Longline Operational Procedures prescribe a range of mitigation measures to be followed to mitigate seabird capture (e.g. use of tori lines, night-setting, line weighting, thawing of bait prior to deployment, dimmed deck lighting during setting, offal discharge restrictions). Measures relating to the capture-mitigation and monitoring of seabirds are described in DWG's Ling Longline Operational Procedures (DWG, 2021).

5.3.2 New Zealand fur seal

5.3.2.1 Hoki, hake and ling trawl fisheries
On average over the last five years, there have been around 40 observed and 290 estimated incidental captures of New Zealand (NZ) fur seals per year in the hoki trawl fishery, with a small fraction being released alive.NZ fur seal captures by the hake and ling trawl fisheries are negligible by comparison. During 2018-19 and 2019-20 there were 63 and 79 fur seal captures reported by vessels. The DOC threat classification status for fur seals is 'Not Threatened' and their population size is believed to be increasing (Baker et al., 2019).

5.3.2.2 Southern blue whiting
In the 2018-19 and 2019-20 fishing years there were 11 and 8 reported captures respectively of New Zealand fur seals in southern blue whiting trawl fisheries. Most captures were from the SBW 6B fishery, which is prosecuted within range of a large fur seal colony comprising approximately 20,000 animals (DOC, 2019), on the Bounty Islands.

5.3.2.3 Ling longline
No fur seals captured

5.3.3 New Zealand sea lion

5.3.3.1 Hoki, hake and ling trawl fisheries
There was one reported incidental capture of a New Zealand (NZ) sea lion in the hoki/hake/ling trawl fisheries in the five-year period from 2013-14 to 2017-18 (Dragonfly, 2019). One sea lion was captured in 2018-19, while none were captured in 2019-20. Sea lion captures by these fisheries were incorporated into the TMP (Threat Management Plan) and were not considered to pose a threat to the sea lion population (DOC, 2017).

5.3.3.2 Southern blue whiting
There were 12 reported incidental captures of New Zealand (NZ) sea lions in the southern blue whiting trawl fisheries in the five-year period from 2013-14 to 2017-18 (Dragonfly, 2019), zero captures in 2018-19 and one in 2019-20. All captures by these fisheries were incorporated into the TMP and were not considered to pose a threat to the sea lion population (DOC, 2017).

5.3.3.3 Ling longline
There were no sea lions caught

5.3.4 Dolphins/whales

5.3.4.1 Hoki, hake ling trawl
In 2018-19, there were two common dolphin captures involving a single incident, while in 2019-20 there were two common dolphin captures, one dusky dolphin (*Lagenorhynchus obscurus*) capture and one pilot whale capture, (FNZ, pers. comm.). The pilot whale was a retention of a previously dead animal as there was evidence of significant flesh loss to the head region (J. Cleal, ELO, pers. comm.).

5.3.4. Southern blue whiting
There have been no observed or reported whale or dolphin captures in the southern blue whiting fishery.

5.3.4.3 Ling longline
There have been no observed or reported whale or dolphin captures in the ling longline fishery.

5.4 Benthic interactions

The trawl footprint of New Zealand's trawl fisheries is assessed annually to monitor their interactions with the benthic habitat. The trawl footprint has been determined for each year commencing in 1989-90 for all the main deep-water target fisheries.

Bottom longline fishing has minimal interactions with the benthic habitat.

6 Principle 3: Overview of Management Information

New Zealand's fisheries management is centred on the Quota Management System (QMS), a system introduced in 1986 based on Individual Transferrable Quota (quota), Total Allowable Catch (TAC) limits and Total Allowable Commercial Catch (TACC) limits.

6.1 Compliance and enforcement

FNZ maintains a comprehensive compliance programme, which includes both encouraging compliance through support and creating effective deterrents.

Since 1994, all vessels over 28 m have been required by law to be part of the Vessel Monitoring System (VMS) which, through satellite telemetry, enables FNZ to monitor all hake/hoki/ling/southern blue whiting vessel locations at all times. Paper-based catch reporting was also required by all fishing vessels operating in NZ's EEZ. These systems have now been replaced by near-real-time Geospatial Position Reporting and daily Electronic Catch Reporting. FNZ still combines this functionality with at-sea and aerial surveillance, supported by the New Zealand Defence Force. This independently provides surveillance of activities of deep-water vessels through inspection and visual capability to ensure these vessels are fully monitored and verified to ensure compliance with both regulations and with industry-agreed Operational Procedures.

MPI Fishery Officers carried out a total of 99 in port/at sea inspections for the period 1 January 2019 to 31 December 2020. These inspections relate to both inshore and deep-water vessels that were engaged in the HOK, HAK, LIN and SBW trawl fisheries and the LIN longline fishery

There has been one prosecution relevant to the hoki fisheries since 2019:
The FV *Ocean Dawn*, operated by Sealord Group Limited, conducted a voyage starting on 22/09/2018 and finishing on 01/11/2018. Between 26 October 2018 and 28 October 2018, the vessel conducted 5 bottom trawl events in the Mid-Chatham Rise Benthic Protected Area (BPA). The vessel breached the lower buffer zone of 50m off the seabed or Regulation 8(3) of the Fisheries (Benthic Protection Areas) Regulations 2007. In Dec 2020 Sealord Group Ltd, the Skipper and First Mate were convicted and fined. As a result of the convictions, the vessel was forfeit to the Crown and redeemed for a payment. The catch was also forfeit.

There were no sustainability issues arising from the 35 t catch in the 150,000 t fishery and in a year when the TACC was not fully caught. We have been advised that the catch was fully documented, reported and landed against annual catch entitlement (ACE). The CAB investigated the situation to determine that the appropriate governance, management and enforcement provisions were in place at the time and remain in place. The performance of the fishery, the performance of the vessel owner, and the performance of the enforcement agency all met, or exceeded, each of the relevant P3 requirements. This is also evident by the skipper's error being discovered and self-reported by Sealord at the time, by MPI enforcement's response, by the subsequent prosecution and court proceedings, and by Sealord's subsequent remedial actions to ensure that such an error does not occur in the future.

The CAB established that all appropriate measures were taken and determined that the hoki fishery remains MSC Certified, without condition.

7 Version details

Table 14. Fisheries program documents versions

Document	Version number
MSC Fisheries Certification Process	**Version 2.1**
MSC Fisheries Standard	**Version 1.3***
MSC General Certification Requirements	**Version 2.4.1**
MSC Surveillance Reporting Template	**Version 2.01**

* default assessment tree

8 Results

8.1 Surveillance results overview

There were no material changes to the circumstances and practices affecting the original complying assessment of the fishery. It is recommended that these fisheries continue to meet the MSC Standard and they remain certified

8.2 Conditions

There are no conditions on these fisheries.

8.3 Recommendations

There are two recommendations

8.3.1 Progress against recommendations

Table 15. Recommendation 1

Performance Indicator	PI 2.1.3 SIa
Recommendation	A recommendation is set that information is collected annually to determine the quantities and sources of bait species used in this fishery. This information should be retained and reported routinely at annual surveillance audits of the fishery
Progress on Recommendation (Year 2)	Client response: The client has produced a report "Bait use by NZ Ling longline fisheries May 2021. This report provides a break-down of bait used by ling longline vessels representing over 91% of the effort during the 2019-20 fishing year and an evaluation of the status of bait 'bycatch' species in relation to the overall catch composition. A breakdown of average annual bait use by species and capture method illustrates that jack mackerel species, squid, barracouta and Atlantic mackerel comprise around 54%, 21%, 23% and 2% respectively, with around 90% being sourced locally. The conclusion was that, based on the defensible assumption that trawl-caught jack mackerel comprises two species, T. declivis & T. murphyi, and that purse seine-caught jack mackerel comprises T. novaezelandiae, none of the bycatch species is likely to exceed 5% of the total ling longline catch and none, therefore, is a 'main' species. This report meets the recommendation for this year. It is suggested that this information is collected annually and it consequently should be reviewed at the next annual surveillance audit, before being closed
Progress status	***On target/ongoing***
Additional information	

Recommendation 2

Performance Indicator	PI 2.3.2SIa

Recommendation	A recommendation is set that a review of the data available from the increased observer coverage of the 2016/17 season is conducted at the earliest possible opportunity, to update the understanding of the fishery with respect to ETP species interactions.
Progress on recommendation (Year 2)	A review of interactions by the ling longline fleet with ETP species is provided in the Ling Longline Situation Report. Note: Fisheries New Zealand publishes Annual Review Reports for the Deepwater Fisheries each financial year. These report on delivery of the year's Annual Operational Plan and the year's observer data for each deepwater fishery. These are publicly available on Fisheries New Zealand's dedicated deepwater fisheries webpage. The following review reports have been published since the re-certification in 2017: Annual Review Report for Deepwater Fisheries 2018/19 (refer pp 32-34 for a summary of LIN observer data) Annual Review Report for Deepwater Fisheries 2017/18 (refer pp 66-67 for a summary of LIN observer data) Annual Review Report for Deepwater Fisheries 2016/17 refer pp 72-73 for a summary of LIN observer data)
Progress status	***This recommendation has been met and it is now Closed***
Additional information	

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10 Appendices

10.1 Evaluation processes and techniques

10.1.1 Site visits

The offsite site visit took place during the week of 3rd May 2021. Microsoft teams was used and the CAB audit team initially "met" with members of the client group and members of the Deepwater Management Team from Fisheries New Zealand. A follow-up "meeting" took place on Friday 7th May with the CAB audit P1 expert, the client group and scientists from NIWA and Trophia.

The following is an attendance list

Online meeting held on 3 May, 2021 from 2.00 - 3.15 pm

<u>Attendees:</u>

Jo Akroyd	Team Leader, P2 & P3 MSC Assessor (Lloyd's Register)
Andre Punt	P1 MSC Assessor (Lloyd's Register)
Tiffany Bock	Manager, deepwater fisheries (Fisheries New Zealand (FNZ))
David Foster	Deepwater fisheries management team, FNZ
Greg Lydon	Deepwater fisheries management team, FNZ
Benjamin Steele-Mortimer	Deepwater fisheries management team, FNZ
George Clement	CEO, Deepwater Group Ltd (client fishery)
Aaron Irving	Deputy CEO, Deepwater Group Ltd (client fishery)
Geoff Tingley	Gingerfish Ltd (for client fishery)
Rob Tilney	Thalassa, MSC projects manager (for client fishery)

Online meeting held on 7 May 2021

<u>Attendees:</u>

Andre Punt	P1 MSC Assessor (Lloyd's Register)
Rob Tilney	Thalassa, MSC projects manager (for client fishery
Adam Langley	Trophia
Vidette McGregor	NIWA scientist

10.2 Stakeholder participation and input

All relevant stakeholders were contacted and made aware of the dates for this second annual surveillance. No stakeholders wished to participate nor provided any report.

11 Surveillance program

Table 16. Fishery surveillance program

Surveillance level	Year 1	Year 2	Year 3	Year 4
Level 1	Review of information audit	Review of information audit	Off-site surveillance audit	On-site surveillance audit & re-assessment site visit

Table 17. Timing of surveillance audit

Year	Anniversary date of certificate	Proposed date of surveillance audit	Justification
2	Feb 2024	W/C 3rd May	To line up with the anniversary date

Table 18. Surveillance level justification

Year	Surveillance activity	Number of auditors	Justification
2	Review of Information	2 Auditors, off-site	There are no conditions following the last Surveillance Assessment.

12 Harmonised fishery assessments

There are no MSC certified overlapping fisheries.

These fisheries are all fished in NZs EEZ.

The Australian hoki species is a separate stock and is genetically different

13 Template information and copyright

This document was drafted using the 'MSC Surveillance Reporting Template v2.1'.

Template version control		
Version	Date of publication	Description of amendment
1.0	08 October 2014	Date of issue
2.0	17 December 2018	Release alongside Fisheries Certification Process v2.1
2.01	28 March 2019	Minor document change for usability
2.1	25 March 2020	Minor document change for usability

A controlled document list of MSC program documents is available on the MSC website (msc.org).

Marine Stewardship Council
Marine House
1 Snow Hill
London EC1A 2DH
United Kingdom

Phone: + 44 (0) 20 7246 8900
Fax: + 44 (0) 20 7246 8901
Email: standards@msc.org