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National Plan of Action - Seabirds 2020

Seabird Annual Report 2020/21

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Foreword

The National Plan of Action for Seabirds 2020 (NPOA Seabirds 2020) was approved by the Ministers of Fisheries and Conservation in May 2020. It sets out the vision, goals and objectives that guide the management of interactions between New Zealand seabirds and fisheries.

Progress towards meeting the objectives of the NPOA Seabirds 2020 is measured using 36 performance measures. This Annual Report is structured around the goals and objectives of the NPOA Seabirds 2020, with quantitative information provided (where possible) on the status of each performance measure as at the end of the 2020/21 fishing year.[1]

The report also contains appendices that provide other information pertinent to the management of interactions between seabirds and fisheries, such as fisher and observer-reported seabird captures and observed mitigation use.

This report represents year one of the NPOA as 2020/21 was the first fishing year that the NPOA Seabirds 2020 was operational for the whole year.

Annual actions to meet the goals and objectives of the NPOA Seabirds 2020 are set out in the Seabird Implementation Plan, which is updated at least annually.[2] This Annual Report also includes updates on progress towards meeting management actions set out in the version of the Seabird Implementation Plan that was published in October 2020.

This Annual Report highlights once again the significant amount of work that took place during 2020/21, despite the ongoing disruptions caused by COVID-19 in the latter part of the year. Particular highlights identified this report include:

- An increase in the number of vessels for which Protected Species Risk Management Plans (PSRMPs) have been developed, particularly the under 28 metre trawl fleet.
- Review of mandatory mitigation measures for bottom longline fishers.
- Amendments to commercial fishers' electronic reporting requirements, which focused on supporting implementation of the NPOA Seabirds 2020
- Finalising the set net Mitigation Standards
- Reviewing observer PSRMP audit forms to align them with Mitigation Standards
- Ongoing work to try and mitigate the risk of seabird net captures by the deepwater trawl fleet
- The high level of voluntary reporting of mitigation use by the >28m trawl fleet, the scampi trawl fleet, the autoline fleet and the surface longline fleet
- The amount of work undertaken in relation to Goal 6 (international Engagement) despite the ongoing requirements for all work to be undertaken on line
- The sustained decrease over several years in the estimated seabird capture rate in the squid target fishery

Additionally, quarterly release of commercial fisher-reported protected species captures, including seabirds, began in December 2020. [3]

[1] 1 October 2020 – 30 September 2021

[2] The current version of the Seabird Implementation Plan is available here

[3] That information is available here

1. Introduction

The National Plan of Action for Seabirds (NPOA Seabirds 2020) sets out the vision, goals and objectives that guide the management of interactions between New Zealand seabirds and fisheries (Figure 1). The NPOA Seabirds 2020 is New Zealand's third iteration of the NPOA, and builds on the achievements of the 2004 and 2013 documents, whilst responding to lessons learned from implementing these plans. More information on the NPOA Seabirds 2020 can be found in its accompanying supporting document.

Figure 1 – Vision and goals of the NPOA Seabirds 2020.

The primary purpose of this Seabird Annual Report is to provide an update for the 2020/21 fishing year on the status of the performance measures used to measure progress towards meeting the objectives of the NPOA Seabirds 2020.

The status of each performance measure as of the end of 2018/19 was reported in the prototype Seabird Annual Report. Data in the 2018/19 report is also used as the baseline by which progress towards meeting the objectives of the NPOA Seabirds 2020 is be measured.

The 2020/21 fishing year is termed year one for the purposes of the NPOA Seabirds 2020 and the Seabird Implementation Plan. It represents the first year that the NPOA Seabirds 2020 was operational for a full fishing year.

Throughout this report all information on fishing effort, observer coverage, observed, and fisher-reported seabird captures for the 2020/21 fishing year is ungroomed and may be subject to change.[4]

Activities that contribute towards the goals and objectives of the NPOA Seabirds 2020 are specified in the Seabird Implementation Plan, a living document that is updated at least once a year and operates on a financial year basis.[5] As well as reporting on the status of performance measures, this Annual Report also provides updates on the activities set out in version of the Seabird Implementation Plan that was published in October 2020 for the 2020/21 financial year (1 July 2020 – 30 June 2021).

Reporting on activities in the Seabird Implementation Plan uses a 'traffic light' system to indicate progress.

Indicates the activity has been achieved	Indicates the activity has partially been achieved	Indicates activity has not been achieved

[4] To be consistent between years, the intention is that where possible, information on fishing effort and observer coverage is obtained from the protected species capture website. Issues with the timely availability of this information means that data from the 2020/21 fishing year was not available to inform this report. For this fishing year, Fisheries New Zealand obtained the observer and fisher-reported data used in this report directly from the databases that store that information. The data has not been subject to the same checking processes that it would undergo prior to being made available on the protected species capture website.

[5] The current version is available here.

2. Governance and management

This section summarises progress on the cross-objective work activities set out in the October 2020 version of the Seabird Implementation Plan.

Activity 1	**Publish Seabird Annual Report (reporting on 2019/20 Implementation Plan)**
	The 2019/20 Seabird Annual Report was published in October 2021. Additionally, a shorter and less technical 2019/20 Progress Summary was published at the same time. The Progress Summary was developed as an additional means of presenting progress on implementing the NPOA Seabirds 2020.

Activity 2	**Finalise Annual Reporting template in consultation with Seabird Advisory Group**
	The 2019/20 Seabird Annual Report was developed following feedback from the Group on two iterations of the 2018/19 report. Following feedback from the Group at the July 2020 meeting, it was agreed the 2018/19 Seabird Annual Report should be used as the template for future reports.

Activity 3	**Use the Annual Report for 2019/20 to update the Seabird Implementation Plan for 2021/22**
	Updated versions of the Seabird Implementation Plan were published in October 2020 and July 2021. The updates were not made as a direct response to the 2019/20 Seabird Annual Report, which was published in October 2021.

Activity 4	**Hold Seabird Advisory Group meetings at least twice each year to monitor the implementation of NPOA Seabirds 2020 and to update the implementation and monitoring plans**
	Three Seabird Advisory Group meetings were held during the 2020/21 financial year (21 July 2020, 5 November 2020, and 22 April 2021).

Activity 5	**Workshop on Seabird Risk Assessment to increase stakeholder understanding, explicitly agree population stabilisation or recovery objectives, and update implementation plan as required**
	Three separate workshops were held. A Seabird Risk Assessment refresher was held on 24 August 2020. A workshop on population outcomes was held on 5 November 2020, and another on capture rate reduction targets was held on 22 June 2021.

3. Avoiding Bycatch

Goal 1 of the NPOA Seabirds 2020 is that ***effective bycatch mitigation practices are implemented in New Zealand fisheries***.

Goal 1 will be achieved through two measurable objectives; Objective 1, which relates to the use of effective mitigation practices in commercial fisheries, and Objective 2, which relates to the provision of information regarding seabird mitigation measures to non-commercial fishers.

This section of the report provides an update on the status, as at the end of the 2020/21 fishing year, of the eleven performance measures used to track progress towards meeting Goal 1 of the NPOA Seabirds 2020. It also includes an update on the activities specified in the Seabird Implementation Plan under Objective 1 and 2 respectively for the 2020/21 financial year.

Information on observed and fisher-reported seabird captures, and mitigation use, is also provided in Appendices 1, 2 and 3 respectively.

Information on trigger events in deepwater fisheries can be found in Annual Review Reports for Deepwater fisheries, which are available here. Information on trigger events for inshore and surface longline fisheries can be found in Liaison Programme Annual Reports; the 2019/20 Annual Report is available here and a report from the first few months of the 2020/21 fishing year is available here.

3.1. Objective 1

Objective 1	**Ensure all New Zealand commercial fishers are using practices that best avoid the risk of seabird bycatch, enabled by appropriate regulations[6]**

Seven performance measures are used to track progress towards meeting Objective 1.

3.1.1. Protected species risk management plans

Performance measure 1	**Proportion of each relevant fishing fleet with vessel-specific protected species risk management plans for seabird capture mitigation**
Target	100%

This performance measure relates to the process of developing a protected species risk management plan (PSRMP) for relevant fishing fleets. In this context '*relevant fishing fleet*' refers to a fleet to which a Mitigation Standard applies.[7] The intent of this performance measure is that all vessels in a fleet to which a Mitigation Standard applies should have a PSRMP.[8]

The status of performance measure 1 for the 2018/19 to 2020/21 fishing years is shown in Table 1. Fishing fleet groupings for trawl and longline fisheries are those used for the Mitigation Standards. The set net fleet is further broken down into those vessels <7 m in length, and those >7 m in length, as smaller set net vessels tend to exclusively fish in enclosed waters such as estuaries or harbours where there may be a lower risk of seabird capture.

[6] '*Enabled by appropriate regulations*' means that any seabird-related legislative requirements that apply to commercial fishers should support the relevant Mitigation Standard.

[7] Mitigation Standards are developed on a fishing method / vessel size basis. Their key purposes are to ensure consistency in application of bycatch mitigation practices and to help the development of PRSMPs. More detail on Mitigation Standards is available in the NPOA Seabirds 2020 Supporting Document.

[8] On trawl vessels >28 m in length, and scampi trawl vessels, PSRMPs are known as vessel management plans (VMPs).

Rather than PSRMPs, bottom longline vessels used to target ling in quota management areas (QMAs) LIN 2 – LIN 7 are subject to the fleet wide Ling Bottom Longline – Operational Procedures (BLL-OPs).

During the 2018/19 to 2020/21 fishing years, the Deepwater Group Environmental Liaison Officer programme has focused on bottom longline vessels that target ling in QMAs LIN 2-LIN 7 and catch more than two tonnes during a year. For the purposes of Table 1b below, a manual bottom longline vessel was included in the 'vessels with PSRMP' category if either it had a PSRMP or targeted ling in QMAs 2-7.

The intention is that the ling bottom longline fleet will transition to PSRMPs over the life of the NPOA Seabirds 2020 as PSRMPs can be tailored to better reflect individual vessel operations than the more generic OPs.

Several inshore vessels use multiple fishing methods during the course of a fishing year. Such vessels were only included as having a PSRMP if one had been developed for that specific method. Some vessels therefore have multiple PSRMPs and may be included in more than one fleet.

Table 1a – Proportion of trawl fleets with PSRMPs. Effort is measured as number of tows.

Trawl vessel category	Fishing year	# of vessels that fished	Vessels with PSRMP	% with PSRMP	% effort conducted by vessels with PSRMP
>28 metre	2018/19	35	35	100%	100%
	2019/20	34	34	100%	100%
	2020/21	34	34	100%	100%
<28 metre	2018/19	133	99	74%	83%
	2019/20	123	102	83%	86%
	2020/21	120	114	95%	97%
Scampi	2018/19	11	11	100%	100%
	2019/20	11[9]	11	100%	100%
	2020/21	10	10	100%	100%

Table 1b – Proportion of longline fleets with PSRMPs. Effort is measured as number of hooks set.

Longline vessel category	Fishing year	# of vessels that fished	Vessels with PSRMP	% with PSRMP	% effort conducted by vessels with PSRMP
Autoline bottom longline	2018/19	7	7	100%	100%
	2019/20	7	7	100%	100%
	2020/21	7	7[10]	100%	100%
Manual bottom longline	2018/19	92	67[11]	73%	96%
	2019/20	81	65[12]	80%	98%
	2020/21	95	74[13]	78%	99%
Surface longline	2018/19	30	30	100%	100%
	2019/20	28	28	100%	100%
	2020/21	28	28	100%	100%

[9] An additional vessel conducted seven scampi target tows during 2019/20. The vessel, and its associated effort, are not included in data for 2019/20. The vessel also did not have a PSRMP.

[10] As noted earlier, vessels subject to the LIN BLL OP are included in the 'vessels with a PSRMP' category. This includes all autoliners

[11] This total includes vessels subject to the LIN BLL OP

[12] As above

[13] As above

Table 1c – Proportion of set net fleets with PSRMPs. Effort is measured as metres of net set.

Set net vessel category	Fishing year	# of vessels that fished	Vessels with PSRMP	% with PSRMP	% effort conducted by vessels with PSRMP
>7 metre	2018/19	72	19	25%	48%
	2019/20	64	21	33%	58%
	2020/21	51	19	37%	69%
<7 metre	2018/19	156	-	-	-
	2019/20	130	-	-	-
	2020/21	134	-	-	-

PSRMPs can also be developed for vessels in fleets that do not have an agreed Mitigation Standard. As of the end of the 2020/21 fishing year, PSRMPs had been developed for five Danish seiners and one purse seiner. However, until a Mitigation Standard is agreed, there is no specific target to develop PSRMPs for such vessels or fleets.

Performance measure 2	**Proportion of vessel-specific protected species risk management plans that meet the Mitigation Standards and regulations for the relevant fishery**
Target	100%

Mitigation Standards incorporate regulatory requirements and other agreed (but non-mandatory) mitigation practices. They set out the regulatory measures (minimum requirements) as well as the additional options that are available to vessel operators to reduce the risk to seabirds.

As a minimum, PSRMPs must contain the applicable regulatory requirements. Over time, they should evolve such that they also contain the majority of the non-regulatory practices set out in the relevant Mitigation Standards. This approach is summarised in Figure 2.

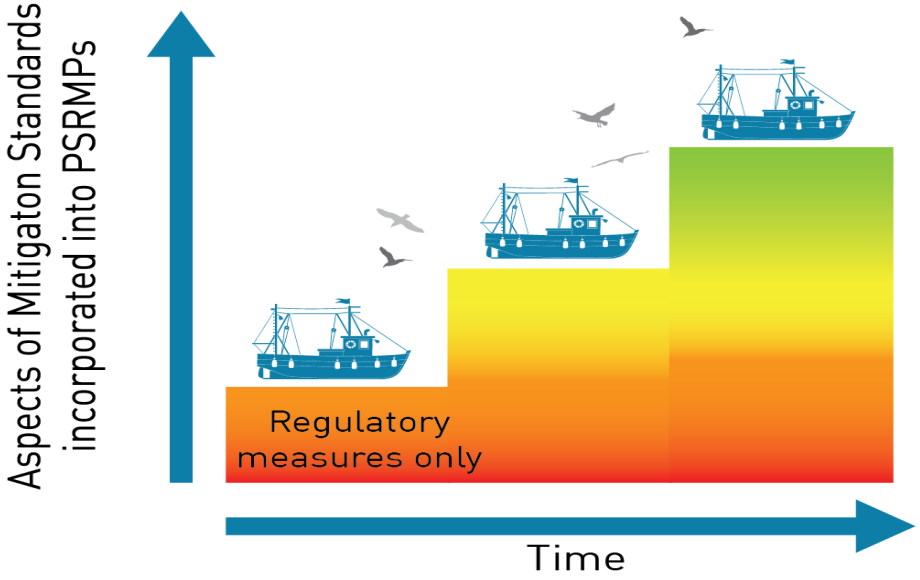


Figure 2. Diagram showing relationship between Mitigation Standards, PSRMPs and regulatory measures

PSRMPs are developed using templates in order to ensure consistency. For vessels that come under the Deepwater Group liaison programme, the current PSRMP templates for >28m trawl and scampi trawl vessels are available here and here respectively. The current PSRMP template for the coastal trawl hoki fleet is available here with further details on what PSRMPs for this fleet should include available in the Coastal Trawler Fisheries - Hoki - Operational Procedures (page 7).

The template approach also enables auditing against Mitigation Standards. However, it is important to note that PSRMP development began well before Mitigation Standards were agreed. Prior to the NPOA Seabirds 2020 being approved, PSRMPs had not been developed with the objective of consistency with Mitigation Standards in mind.

To set a baseline for this performance measure, PSRMPs for vessels operating under the DOC liaison programme were assessed against the Mitigation Standards during 2019/20. PSRMPs relating to all fishing methods apart from setnet were reviewed (set net did not have a finalised set of Mitigation Standards at the time of the assessment). The degree of alignment between PSRMPs and the relevant Mitigation Standard was reported in the 2019/20 Seabird Annual Report.

Following the review, and in order to better align PSRMPs with Mitigation Standards, PSRMP templates for <28 m trawl, surface longline, bottom longline vessels, and set net vessels were subsequently updated following approval of the NPOA Seabirds 2020. The new PSRMP templates, which were implemented during 2020/21, are available in Appendix 2 of the 2019/20 Liaison Programme Final Report.[14]

During the 2020/21 fishing year, a second assessment of PSRMPs for vessels operating under the DOC liaison programme against the Mitigation Standards was undertaken. The degree of alignment between PSRMPs and the relevant Mitigation Standard is detailed in Table 2 below. The corresponding information from the 2019/20 review is also included (set netting was not included in that review as finalised Mitigation Standard had not been agreed at the time the assessment was undertaken).

[14] The previous version of these PSRMP templates is available in Appendix 6 of the 2018/19 Liaison Programme Manual

Table 2: Alignment of DOC liaison programme PSRMPs with the Mitigation Standards. Year 2019-20 is a baseline and includes an assessment of all PSRMPs on file, while 2020-21 is only an assessment of PSRMPs for vessels that were active within that fishing year. Mitigation Standards with a dash (-) indicate those that could not be assessed due to the absence of specific criteria within the plan.

		2019-20 baseline			2020-21		
		Yes (%)	No (%)	Unclear (%)	Yes (%)	No (%)	Unclear (%)
Surface Longline Mitigation Standards		(n= 42)			(n= 28)		
MS 1.1	Fish waste is not discharged from the vessel immediately before or during setting	86	14	0	96	0	4
MS 1.2	Bait and fish waste is held on board during hauling, when possible; any discharge must be batched and meet mandatory requirements	90	10	0	100	0	0
MS 2.1	Effective tori line throughout setting (unless hook-shielding devices used)	100	0	0	100	0	0
MS 2.2	Either hook-shielding devices used OR hooks set at night and weighted in accordance with ACAP minimum standards	12	83	5	25	54	21
MS 2.3	Bait is sufficiently thawed	100	0	0	79	0	21
MS 3.1	Hook surface time is minimised	-	-	-	46	54	0
MS 3.2	Seabirds are actively deterred from approaching hooks during hauling	10	90	0	32	68	0
MS 3.3	Seabirds caught and released alive are handled to maximise their chance of survival	-	-	-	46	0	54
MS 4.1	Deck lighting does not unnecessarily attract or disorientate seabirds	95	5	0	100	0	0
MS 4.2	Seabirds are not induced to land on the deck due to the presence of fish waste	-	-	-	7	0	93
MS 4.3	Live birds that land on deck or impact with the vessel are handled in ways to maximise survival	-	-	-	46	0	54
Bottom Longline Mitigation Standards (hand-baiting)		(n= 55)			(n= 54)		
MS 1.1	Fish waste is not discharged from the vessel immediately before or during setting	98	2	0	100	0	0
MS 1.2	Bait and fish waste is held on board during hauling, when possible; any discharge must be batched and meet mandatory requirements	80	20	0	91	0	9
MS 2.1	A tori line effective at deterring birds from hooks is deployed throughout setting	-	-	-	98	0	2
MS 2.2	Hooks set during high-risk periods protected by the tori line until hooks 10m deep. Sink rate test records kept.	-	-	-	-	-	-
MS 2.3	Hooks set outside of high-risk periods protected by the tori line until hooks 5m deep. Sink rate test records kept.	-	-	-	-	-	-
MS 2.4	Bait is sufficiently thawed	9	91	0	67	0	33
MS 3.1	Hook surface time minimised	82	18	0	93	7	0
MS 3.2	Seabirds are actively deterred from hooks during hauling	85	15	0	76	7	17
MS 3.3	Seabirds caught and released alive are handled to maximise chance of survival	96	4	0	96	0	4
MS 4.1	Deck lighting does not unnecessarily attract or disorientate seabirds	93	7	0	98	0	2
MS 4.2	Seabirds are not induced to land on the deck due to the presence of fish waste	-	-	-	20	0	80
MS 4.3	Live birds that land on deck or impact with the vessel are handled in ways to maximise survival	96	4	0	96	0	4

		2019-20 baseline			2020-21		
		Yes (%)	No (%)	Unclear (%)	Yes (%)	No (%)	Unclear (%)
Under 28m Trawl Mitigation Standards		(n= 105)			(n= 111)		
MS 1.1	Fish waste is not discharged from the vessel immediately before or during shooting or hauling	97	1	2	98	1	1
MS 1.2	Fish waste discharged whilst the net is being towed is batch discharged	89	9	3	96	3	1
MS 2.1	Warp protection is located at the warp on the discharge side	54	44	2	71	28	1
MS 2.2	Condition of trawl warps does not increase the risk of seabird captures	-	-	-	55	0	45
MS 3.1	All practicable stickers are removed from the net before each shot	84	1	15	95	0	5
MS 3.2	Time gear is at the surface is minimised	77	0	23	95	0	5
MS 3.3	Gear maintenance and repairs is conducted in a way to minimise risk to seabirds	-	-	-	62	0	38
MS 3.4	Live birds caught in the net are handled in ways to maximise survival	72	0	28	92	0	8
MS 4.1	Deck lighting does not unnecessarily attract or disorientate seabirds	-	-	-	48	0	52
MS 4.2	Seabirds are not induced to land on the deck due to the presence of fish waste	-	-	-	4	0	96
MS 4.3	Live birds that land on deck or impact with the vessel are handled in ways to maximise survival	71	0	29	92	0	8
Set Net Mitigation Standards		n/a			(n= 19)		
MS 1.1	Fish waste is not discharged from the vessel immediately before or during setting	-	-	-	100	0	0
MS 1.2	Any fish waste discharged during hauling must be batch discharged	-	-	-	100	0	0
MS 2.1	Nets are not set in the vicinity of known or observed bird colonies or known foraging areas	-	-	-	89	0	11
MS 2.2	Nets are not set in an area when there is active bird activity, such as feeding/diving	-	-	-	21	0	79
MS 3.1	All practicable stickers are removed from the net before each shot	-	-	-	100	0	0
MS 3.2	Time gear is at the surface is minimised	-	-	-	100	0	0
MS 3.3	Nets are not stalled[15]	-	-	-	89	0	11
MS 3.4	Gear maintenance and repairs is conducted in a way to minimise risk to seabirds	-	-	-	84	0	16
MS 3.5	Live birds caught in the net are handled in ways to maximise survival	-	-	-	100	0	0
MS 4.1	Deck lighting does not unnecessarily attract or disorientate seabirds	-	-	-	79	0	21
MS 4.2	Seabirds are not induced to land on the deck due to the presence of fish waste	-	-	-	-	-	-
MS 4.3	Live birds that land on deck or impact with the vessel are handled in ways to maximise survival	-	-	-	100	0	0

At the end of the 2020/21 fishing year, the most recent PSRMPs for all active vessels operating under the DOC liaison programme were assessed for alignment to the relevant Mitigation Standards. Overall, there was a high degree of alignment, with a few areas in need of improvement.

[15] As defined by the Fisheries (Commercial Fishing) Regulations 2001, stalling is the process of setting a net so that fish enclosed or entangled by the net are left stranded by the falling tide or are enclosed or entangled so that, at any stage of the tide, there is an insufficient depth of water at either end of the net to enable the fish to pass from the waters above the net to the waters below the net.

Across the board, all PSRMPs could still be improved by clarifying procedures to minimise the presence of fish waste on deck.

Surface longline plans need to work on implementing hauling mitigation, applying three out of three mitigation during setting (i.e. simultaneous use of tori line, line weighting and night setting), clarifying handling and release procedures, and clarifying how hooks will be kept below the surface during a haul break.

Bottom longline plans primarily need to address hook depth at the end of the tori line. Most of the 2020/21 fishing year was spent getting fishers familiar with sink rate tests and preparing them for requirements set out in the new Bottom Longline Circular. More work needs to be done before details regarding depth at the end of a tori line can be reliably added to a PSRMP with confidence.

Trawl vessels under 28m were mostly aligned with the Mitigation Standards. However, plans could work on clarifying light management protocols and how the vessel ensures the warp condition does not increase the risk of seabird captures.

Set net vessels were also mostly aligned with the Mitigation Standards. Plans could just work on clarifying protocols for vessels not setting in an area when there is high bird activity (i.e. feeding and diving).

Performance measure 3	**Rate of adherence to vessel-specific protected species risk management plans (based on available monitoring data)**
Target	100%

At-sea observer auditing is currently the primary source of information on vessel adherence to PSRMPs. Observers audit adherence to PSRMPs at the level of the trip, rather than the individual fishing event.

Most of the PSRMP audit forms that observers used for the majority of 2020/21 are available online. This includes ling bottom longline (page 19 of the ling bottom longline operational procedures[16]), surface longline, inshore bottom longline, set net (page 22 in this package of Liaison Programme documents), and <28m trawl (page 17 in this package of Liaison Programme documents). The audit form used for >28m trawl and scampi was updated during 2020/21 but at the time of publishing was not available online. The previous version, used at the start of 2020/21, is available on page 18 of deepwater trawl seabirds operational procedures).

The number, and outcome, of observer audits of PSRMPs for the three years between 2018/19 and 2020/21 is shown in Table 3. Bottom longline vessels that primarily targeted ling in QMAs LIN 2 – LIN 7 during this period generally operated under fleet-wide operational procedures (OPs), rather than vessel-specific plans. For such vessels, Table 3 shows the number, and outcome, of observer audits relative to the BLL-OPs.

Observer trips sometimes straddle fishing years. In this scenario, information is included in the table below regardless of when the observer trip ends. This may lead to some information being duplicated between different fishing years.

[16] The ling bottom longline operational procedures have recently been updated. The new version can be found here.

Table 3a – The number, and outcome, of observer PSRMP audits of trawl vessels for the three years between 2018/19 and 2020/21.

Trawl vessel category	Fishing year	# of vessels audited	% of fleet audited during year	% of effort conducted by audited vessels	# of PSRMP audits	% of audits adhering to PSRMP
>28 metre	2018/19	34	97%	97%	162	91%
	2019/20	32[17]	94%	97%	142	87%
	2020/21	30	88%	93%	130	93%
<28 metre	2018/19	16	12%	21%	16	88%
	2019/20	29	24%	33%	49	67%
	2020/21	41	34%	46%	54	76%
Scampi	2018/19	10	91%	99%	12	92%
	2019/20	9	75%	82%	9	90%
	2020/21	6	60%	64%	6	100%

Table 3b – The number, and outcome, of observer PSRMP audits of longline vessels for the three years between 2018/19 and 2020/21. One audit corresponds to an observer's trip on a vessel.

Longline vessel category	Fishing year	# of vessels audited	% of fleet audited during year	% of effort conducted by audited vessels	# of PSRMP audits	% of audits adhering to PSRMP
Autoline bottom longline	2018/19	3	43%	56%	3	67%
	2019/20	4	57%	77%	4	75%
	2020/21	2	29%	27%	2	50%
Manual bottom longline	2018/19	25	27%	54%	25	48%
	2019/20	28	35%	63%	35	49%
	2020/21	20	21%	49%	23	70%[18]
Surface longline	2018/19	14	46%	52%	18	50%
	2019/20	13	46%	59%	13	31%
	2020/21	13	46%	68%	14	29%[19]

[17] One >28m trawl vessel operates as both a scampi trawler and a fresh fish trawler and is included in both vessel categories. It was audited by an observer after a scampi trip in 2019/20 but was not audited as a fresh fish trawler.

[18] This includes five audits where the observer noted one or more specific aspects of the PSRMP audit as being 'unknown'. The 'unknowns' related to aspects of tori lines (e.g. whether spare parts were carried, whether the attachment point could be adjusted or whether the aerial extent was sufficient to reduce access to hooks. There were no issues with other all aspects of the audit. Eleven audits were recorded as adhering to a PSRMP.

[19] Over half the vessels recorded as 'not adhering to PSRMP' in the SLL fleet were because of offal management and continuous discarding of baits.

Table 3c – The number, and outcome, of observer PSRMP audits of set net vessels for the three years between 2018/19 and 2020/21. One audit corresponds to an observer's trip on a vessel.

Set net vessel category	Fishing year	# of vessels audited	% of fleet audited during year	% of effort conducted by audited vessels	# of PSRMP audits	% of audits adhering to PSRMP
>7 metre	2018/19	-	-	-	-	-
	2019/20	6	9%	19%	7	100%
	2020/21	11	22%	62%	20	85%[20]
<7 metre	2018/19	-	-	-	-	-
	2019/20	-	-	-	-	-
	2020/21	-	-	-	-	-

Further information on the outcome of observer audits of PSRMPs can be found in Fisheries New Zealand's deepwater fisheries annual review reports (available here) and in DOC liaison programme reports (available here).

A review of the PSRMP observer audit forms was initiated in the 2019/20 fishing year. The purpose was to ensure all forms align with Mitigation Standards and the new PSRMP templates developed for vessels that come under the DOC Liaison Programme,[21] and that consistent and relevant information is captured. The review, which did not include the recently developed PSRMP audit form for purse seine vessels, was completed in the 2020/21 fishing year, with the amended forms rolled out at various times during 2020/21.

The observer Protected Species Interaction (PSI) form was amended during the 2019/20 fishing year.[22] The amendment involved adding an attribute (field) for observers to record whether a vessel was adhering to its PSRMP at the time of each observed protected species interaction. The amended form was rolled out towards the end of the 2019/20 fishing year, and this attribute was completed for 98% of observed seabird interactions recorded during the 2020/21 fishing year. The resulting information is summarised in Appendix 1.

3.1.2. Mitigation Standards and mandatory mitigation measures

Performance measure 4	**Regulations and Mitigation Standards are reviewed, updated and developed to reflect the best available information**
Target	Annual Review

A review of the mandatory mitigation measures for bottom longline vessels commenced in late 2020. The specifications of the bottom longline circular had remained essentially unchanged since 2008 and the review sought to better align mandatory mitigation measures with Mitigation Standards for bottom longline vessels.

The amended circular came into force on 1 October 2021 and aims to provide more flexibility to accommodate the diversity of New Zealand's bottom longline fleet, with the measures more outcome-based as opposed to prescriptive.

[20] This includes six audits where the observer noted one of more aspects of the PSRMP audit as being 'unknown'. The remainder of these audits were adherent to the PSRMP. Eleven audits did not have any 'unknowns' and were recorded as adhering to a PSRMP.

[21] The new PSRMP templates referred to are available in the 2019/20 Liaison Programme Final Report

[22] The PSI form is used by observers to record specific information on all protected species interactions

The draft set net Mitigation Standard was reviewed during 2020/21, with a final version published in April 2021.

3.1.3. Capture rate reduction targets

Performance measure 5	Number of fisheries that have enough information to set reduction targets
Target	Increasing

Performance measure 6	Rates of seabird capture relative to agreed reduction targets (where enough information is available)
Target	Decreasing in line with reduction targets

Fisheries New Zealand and DOC invited SAG members to a capture rate reduction targets workshop in June 2021. The purposes of the workshop were to:

- assess the current principles guiding the capture rate reduction targets[23]
- assess whether the current inputs for setting capture rate reduction targets needed amending

The intention was to hold a further meeting once the protected species capture website had been updated to incorporate data from recent fishing years. Delays with that data becoming available meant the planned meeting was deferred until 2021/22.

Broadly, it is envisaged that over the term of the NPOA Seabirds 2020, additional monitoring data is likely to become available to enable quantitative reduction targets to be developed for an increasing number of fisheries.

3.1.4. Compliance

Performance measure 7	Number, and proportion, of compliance inspections that assess compliance against the relevant regulations
Target	Increasing

This performance measure reflects the role of Fisheries Compliance in ensuring compliance with the relevant seabird mitigation regulations.

Table 4 summarises Fisheries Compliance inspections of seabird mitigation devices in relation to New Zealand flagged >28m trawl vessels and longlining vessels (all types) during the 2020/21 fishing year.

[23] 'Current principles' refer to capture reduction rate targets developed in 2015 for a limited number of fisheries under the previous NPOA Seabirds. Details of the targets, together with estimated capture rates, are presented in Appendix 9.

Table 4 – Summary of Fisheries Compliance inspections that incorporated seabird mitigation devices during the 2020/21 fishing year

Fleet	Number of vessels that fished	Number of inspections of SBM	Number of vessels covered by inspections of SBM	% of fleet inspected for SBM
Trawl				
>28 m trawl	34	0	0	0
Longline				
All types	118	32	24	20

Notes: Number of inspections of SBM includes both in port and at sea inspections (excludes aerial overflights). SBM = Sea Bird Mitigation.

Inspections of the >28 m trawl fleet: 34 vessels

No inspections of seabird mitigation devices were conducted on trawl vessels >28 m during the 2020/21 fishing year.

Inspections of the longline fleet: 118 vessels (all types)

A total of 32 inspections of seabird mitigation devices were conducted across 24 longlining vessels during the 2020/21 fishing year, which represented 20% of that fleet. Of these inspections, 22 were conducted in port and 10 were conducted at sea. Ten inspections identified non-compliant seabird mitigation devices. In most instances non-compliance was relatively minor and was remediated at the time of inspection. Two inspections of tori lines did not meet specifications for SLL fishing and instead were configured for BLL fishing (i.e. long streamers 5 m apart only). With the exception of one inspection where the fisher was warned, all other non-compliance detected resulted in either education or advice to improve compliance.

Domestic aerial flights conducted during the 2020/21 fishing year

Ministry for Primary Industries staff were present on 12 aerial flights that observed fishing activity in the EEZ during the 2020/21 fishing year. These flights are a highly visible overt monitoring tool utilised to gather basic information on obvious activity occurring at the time.

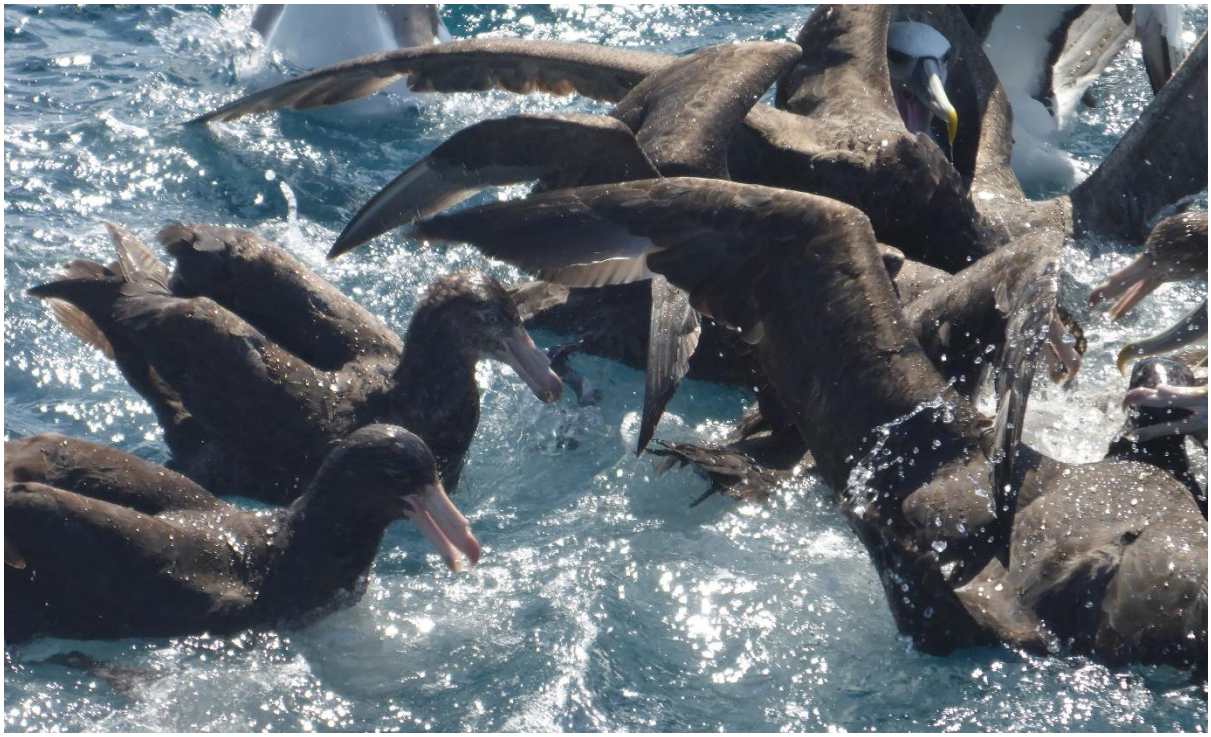
A total of 200 fishing vessels were detected during the surveillance, with 82 (41%) subject to regulatory requirements to have bird mitigation devices in place for certain fishing activities. Of those 82 a total of 80 (98%) were subsequently observed and imaged by the aircrew (Table 5).

An assessment of the 180 observed vessels by MPI Compliance determined that no instances of non-compliance with bird mitigation requirements had occurred. Fishing vessels were either in transit, dead in the water, hauling with appropriate mitigation, hauling with no required mitigation, or trawling with required mitigation in place. No surface longline vessels were observed during setting.

Table 5 – Summary of domestic aerial surveillance operational activity conducted during 2020/21

Month	Area of operation	Purpose for flight	All FVs Detected	Trawl (>28m) FVs observed	Surface longlining FVs observed	Bottom longlining FVs observed	Vessels Imaged	No BMD[24] when required
Oct-20	Kermadec EEZ	Compliance patrol	2	0	2	0	0	0
Nov-20	Auckland harbour	Routine helo flight	1	0	0	0	1	0
Nov-20	Northland	RNZAF Training flight	4	0	3	0	4	0
Dec-20	West Coast South Island	Compliance patrol	33	7	6	5	21	0
Dec-20	East Coast South Island	Compliance patrol	54	10	5	1	54	0
Feb-21	Wellington Coastal Helo	Compliance patrol	3	1	0	1	3	0
Feb-21	Campbell Island	Compliance patrol	18	4	1	0	15	0
Mar-21	Chatham Rise	Compliance patrol	18	10	1	1	17	0
Apr-21	West Coast NZ	Compliance patrol	39	3	3	3	37	0
Apr-21	Northland - Kermadecs	Compliance patrol	7	0	0	0	7	0
Jul-21	Waikato Coast	Compliance patrol	4	0	0	0	4	0
Aug-21	West Coast South Island	RNZAF Training flight	17	15	0	0	17	0
Total:			**200**	**50**	**21**	**11**	**180**	**0**

[24] BMD = bird mitigation devices



3.1.5. Progress against Seabird Implementation Plan

This section summarises progress on the Objective 1 work activities set out in the October 2020 version of the Seabird Implementation Plan.

Activity 1	**Update Bottom Longline Seabird Mitigation Circular (refer to existing circular)**
	This is reported in section 3.1.2.

Activity 2	**Review and update approach to setting bycatch rate reduction targets with input from the Seabird Advisory Group**
	This is reported in section 3.1.3.

Activity 3	**Audit existing Protected Species Risk Management Plans against Mitigation Standards**
	This is reported in section 3.1.1. under performance measure 2.

Activity 4	**Report on compliance inspections that assess compliance with mitigation requirements**
	This is reported in section 3.1.4.

Activity 5	**Report on at-sea audits of adherence to Protected Species Risk Management Plans**
	This is reported in section 3.1.1. under performance measure 3.

Activity 6	Finalise set net Mitigation Standard
	This is reported in section 3.1.2.

Activity 7	Review and update Mitigation Standards as required
	Aside from finalising the set net Mitigation Standard, no Mitigation Standards were reviewed during 2020/21.

Activity 8	Continue updating and rolling out of Protected Species Risk Management Plans
	This is reported in section 3.1.1. under performance measure 1.

Activity 9	Maintain and enhance deepwater fleet liaison programme for deepwater trawl, scampi and bottom longline
	The Deepwater Group fleet liaison programme continued during 2020/21. Details of fleet engagement are available in the deepwater fisheries Annual Review Report for 2020/21, which is available here.

Activity 10	Report capture and capture rate data for the previous year
	The 2019/20 Seabird Annual Report includes capture rate data. However, it only uses data up to 2018/19 as data for 2019/20 was not available when the report was being complied.

Activity 11	Review and update of bycatch trigger events and response strategies as appropriate
	Internal protocols have been developed that assign tasks and responsibilities to both FNZ and DOC for when protected species 'triggers' are reached.

Activity 12	Review and update mitigation regulations as appropriate
	Aside from reviewing the bottom longline seabird mitigation circular, no other mitigation regulations were reviewed.

Activity 13	Review inshore observer debrief process
	A new inshore debrief form has been created and phone debriefings have been initiated with observers.

3.2. Objective 2

Objective 2	Practices that effectively avoid the risk of seabird bycatch are supported and promoted to non-commercial fishers

The objective acknowledges that non-commercial fishers also interact with seabirds. Understanding more about these interactions and developing mitigation for non-commercial fisheries are focus areas for the NPOA Seabirds 2020.

Performance measures 8-11 of the NPOA Seabirds 2020 track progress towards meeting Objective 2. The four performance measures are outlined below.

3.2.1. Dissemination of seabird-awareness material

Performance measure 8	**Outreach is directed to non-commercial fishers and measured by:** 1. **The number of social media hits for seabird-related outreach campaigns** (target: increasing) 2. **The amount of seabird-awareness material and mitigation guidance that is distributed** (target: increasing) 3. **The proportion of registered amateur charter vessel operators who have been provided with material and mitigation guidance** (target: 100%) and 4. **New seabird-awareness material and mitigation guidance available in Te Reo Māori and other languages**.

Performance measure 9	The number of organisations involved in messaging and geographical areas covered
Target	Increasing

These performance measures are described in the 2019/20 Seabird Annual Report.

During 2020/21, amateur charter vessel (ACV) operators in the Hauraki Gulf were provided with guidance material and seabird release kits containing items to assist with the successful release of seabirds. The Hauraki Gulf was the focus of the initiative due to the number of ACV operators in that area together with the are being important for species such as black petrel and flesh-footed shearwater.

Fisheries New Zealand and DOC envisage that going forward, reporting on other elements of this performance measure will involve seeking input from SAG members.

3.2.2. Seabird interactions and mitigation use in non-commercial fisheries

Performance measure 10	Information that is available to understand seabird captures and the use of bycatch mitigation measures in non-commercial fisheries
Target	Increasing

Performance measure 11	Increased use of mitigation practices and safe handling techniques amongst non-commercial fishers (based on available data)
Target	Increasing

Performance measure 10 recognises that we need more information on how seabirds are captured by non-commercial fishers, as well as how these fishers can avoid catching seabirds. In 2020/21, the process of forming a steering group of recreational fishers and ACV operators continued for the

purpose of getting more information on these areas. A short list of potential members was developed along with draft Terms of Reference. The short list includes ACV operators as well as representatives from a number of recreational groups from around the country.

DOC has been running a work programme to better understand the nature and extent of seabird interactions and mitigation use in recreational fisheries. This includes development of an app to allow users to investigate anonymously reported incidental catch of marine protected species, including seabirds, by recreational fishers. The app is available here.

Performance measure 11 recognises the need to consider how information could be collected to enable monitoring and reporting on mitigation and safe handling technique use by non-commercial fishers. This will be a function of the steering group referred to in the previous paragraph, in collaboration with external entities such as Southern Seabird Solutions.

The focus of the DOC work programme mentioned above has been on quantifying the issue. Work relating to mitigation use by recreational fishers is scheduled to begin in 2023.

3.2.3. Progress against Seabird Implementation Plan

Activity 1	**Develop a strategy for avoiding seabird bycatch in recreational fisheries, building on the recreational roadmap from 2019/20, and incorporate into Seabird Implementation Plan. Actions may include:** **1. Incorporating seabird capture and release advice on the Fisheries New Zealand fishing app.** **2. Adding a slogan and web link relating to seabird bycatch into new boat ramp signs.** **3. Establish a recreational steering group to assist delivery of the recreational strategy – focusing on FMA1.** **4. Pilot voluntary seabird bycatch data collection on amateur charter vessels.**
	As of February 2022, the incorporation of the seabird capture and release information into the fishing app is currently waiting on regulation changes to recreational bag limits so that the changes can be updated at the same time. This is also relevant for the new boat ramp signage. The process of establishing the recreational steering group continued during 2020/21 fishing year. The process of voluntary seabird data collection on amateur charter vessels did not eventuate during 2020/21.

Activity 2	**Distribute 5,000 bait buckets printed with key messages to recreational fishers in the Auckland region**
	This was undertaken during the previous year.

Activity 3	**Re-engage (post COVID) with Z Energy and boat retailers to enlist their support in distributing bait buckets**
	2,400 bait buckets with seabird bycatch messaging were provided to eight Auckland boat dealers and four gas stations in March 2021. The boat dealers gave away a bait bucket with each boat sold, and the gas stations gave away the buckets to people buying ice for fishing or fuel for their fishing boats.

Activity 4	**Use the results of the panel and boat ramp surveys to support fundraising efforts for printed carry bags for retail fishing stores**
	This was not progressed due to lack of available funding.

Activity 5	**Provide resources on seabird capture and release for FNZ personnel attending fishing show competitions**
	FNZ has received reprints of The Responsible Fishing Guidelines information booklet that includes the handling and safe releasing of seabirds. Personnel attending fishing competitions have been and are dependent on COVID responses and current fishing competition scheduling.

4. Healthy Seabird Populations

Goal 2 of the NPOA Seabirds 2020 is that the ***direct effects of New Zealand fishing do not threaten seabird populations or their recovery***.

Goal 2 will be achieved through two objectives; Objective 3 which relates to prioritising management actions, research and monitoring towards seabird populations of particular concern, and Objective 4 which relates to reducing the estimated number of fishing-related deaths.[25]

This section of the report provides an update on the status, as of the end of the 2020/21 fishing year, on the four performance measures used to track progress towards meeting Goal 2 of the NPOA Seabirds 2020. A summary of progress towards achieving the management actions specified in the Seabird Implementation Plan under Objectives 3 and 4 respectively is also included.

4.1. Objective 3

Objective 3	Research, monitoring and management actions are prioritised for seabird populations of particular concern, and their risk ratios reduce

There are two components to this objective. The first identifies that available resources should be directed towards those seabird populations where the need is greatest. The second component reflects the desire to see risk ratios reduce over time for populations of particular concern. Reduction in risk ratios reflects a reduction in estimated impacts of fishing on a given seabird population. Three performance measures will be used to track progress towards meeting Objective 3.

A key aspect of this objective is the '*populations of particular concern*' qualifier and its associated definition. Particular concern means those species considered to be at a '*High*' or '*Very High*' risk from fishing by the 2020 iteration of the seabird risk assessment, or those populations identified through some other process (e.g. population monitoring indicating a significant population decline), and taking into account threat status.

As at the end of the 2020/21 fishing year, eight seabird species or populations were considered to be of particular concern. These are black petrel, Salvin's albatross, Westland petrel, flesh-footed shearwater, southern Buller's albatross, Gibson's albatross, the mainland & Stewart Island population of hoiho (yellow-eyed penguin) and Antipodean albatross.

The proportion that different fisheries contribute towards the risk score for seabird populations of particular concern, and monitoring levels in these fisheries can be found in Appendices 4 and 5 respectively.

4.1.1. Research and management actions

Performance measure 12	Research and/or management actions are undertaken specifically for species or populations of particular concern
Target	100% of identified populations of particular concern

Management actions

There are currently species-specific management approaches in place for Antipodean albatross, black petrel, and mainland & Stewart Island hoiho.

[25] The number of fishing-related deaths that is used as the reference is the average between 2014/15 and 2016/7 as determined by the seabird risk assessment. Refer also to section 4.2

Antipodean albatross

Following a proposal from New Zealand, Chile and Australia, Antipodean albatross was listed on Appendix 1 of the Convention for the Conservation of Migratory Species (CMS) in February 2020, with a Concerted Plan of Action also adopted by the signatories of CMS. Year 1 implementation of the plan was impacted by COVID-19, both in relation to population research, and management actions at RFMOs. A report on implementation progress was provided to both CMS and ACAP (see ACAP paper PACSWG-06-Inf-12 for the most complete report).

Black petrel

The Black Petrel Working Group (BPWG) met once during the 2020/21 fishing year. Discussion focused on various research projects, including the black petrel electronic monitoring project and the black petrel population research project. Updates were given on progress made against the NPOA Seabirds milestones, the Protected Species Liaison Programme, recent capture events and trialling of Time Depth Recorders (TDRs).

Accomplishments from the 2020/21 year include the continuation of the black petrel electronic monitoring trial and review and cataloguing of footage collected.

Hoiho

In August 2020, the four Partners in the Hoiho Governance Group (Department of Conservation, Te Rūnanga o Ngāi Tahu, Yellow-eyed Penguin Trust, Fisheries New Zealand) released Te Kaweka Takohaka mō te Hoiho (a strategy to support the cultural and ecological health of hoiho) and Te Mahere Rima Tau, the accompanying five-year action plan, which supports the strategic aims of the strategy. 2020/21 represented year two of implementing actions in Te Mahere Rima Tau. The Hoiho Technical Group has reported back regarding progress made during the 2020/21 season as part of their 2021 Progress Report.

Research

Final research reports from previously contracted work that was published during the 2020/21 financial year, and the current status of research planned/undertaken during 2020/21 specifically focusing on seabird populations of particular concern, are shown in Tables 6 and 7 respectively.

Seabird research reports not specifically focused on seabird populations of particular concern that were published, planned, or undertaken during the 2020/21 financial year are listed in Appendix 6.

Table 6 – Research reports relevant to seabird populations of particular concern published during the 2020/21 financial year.

DOC bycatch programme reports	
BCBC2020-27	Salvin's albatross breeding success and phenology assessment
BCBC2929-09	Integrated population model of Antipodean albatross for simulating management scenarios
POP2018-02	Hoiho population and tracking project
POP2018-04	Flesh-footed shearwater population monitoring and estimates: 2020/21 season
POP2017-03	Salvin's albatross: Bounty Islands population project
Fisheries New Zealand Aquatic Environment and Biodiversity Reports (AEBRs)	
AEBR-2021-270 (PRO2019-04)	Population trends, at-sea distribution, and breeding population size of black petrels (*Procellaria parkinsoni*) on Great Barrier Island/Aotea: 2019–2020 operational report
AEBR-2021-268 (PRO2015-01)	Improving estimates of cryptic mortality for use in seabird risk assessments: loss of seabirds from longline hooks
AEBR-2021-266 (PSB2018-10)	Assessment of risk factors for seabird net captures in selected sub-Antarctic trawl fisheries
AEBR-2021-251 (PSB2018-09)	Seabird captures during the FMA 1 bottom longline fishery in the 2017/18 fishing year: comparison of electronic monitoring, observer, and audit data
AEBR-2020-249 (PRO2016-03)	Estimated capture of seabirds in New Zealand trawl and longline fisheries, to 2017–18
AEBR-2020-246 (PRO2017-01A)	Population trends, at-sea distribution, and breeding population size of black petrels (*Procellaria parkinsoni*) - 2018/19 operational report

Table 7 – Current status of research relevant to seabird populations of particular concern that was planned for or undertaken during the 2020/21 financial year.

DOC projects		
POP2020-05	Utilisation of the marine habitat of yellow-eyed penguins from Stewart Island / Rakiura	Ongoing
POP2019-04	Southern Buller's albatross population project, Snares/Tini Heke	Year 2 postponed to 2021/22
POP2020-01	Auckland Islands seabird population research	Cancelled (due to COVID-19)
POP2018-04	Flesh-footed shearwater: population monitoring	Complete
BCBC2020-06	Westland petrels - population work	Complete
BCBC2020-22	Black petrel - trial of at-sea captures to resight banded birds to estimate population size	Complete
BCBC2020-27	Salvin's albatross- full analysis of camera images	Complete
BCBC2020-09	Antipodean albatross (population modelling and satellite tracking). Note field research undertaken independently.	Complete (note: research rescoped due to COVID-19)
Fisheries New Zealand projects		
DAT2020-05	Risk atlas development for protected species risk models	Ongoing
ENV2020-21	Distributional study of Antipodean albatross using satellite reporting GPS tags	Ongoing
PSB2020-01	Black petrel continued population monitoring	Publishing
PSB2020-04	Spatial distribution modelling for hoiho	Ongoing
PSB2020-05	Grooming and preparation of the hoiho database	Ongoing
PSB2020-06	Characterisation of all fishing activity that overlaps with hoiho including fish bycatch	Ongoing
PSB2020-09	Southern hemisphere seabird risk assessment	Ongoing
PSB2020-10	Review and continuation of footage collection from the 2020/21 black petrel electronic monitoring project	Complete
PRO2021-03	Antipodean albatross multi-threat risk assessment	Ongoing
PRO2021-04	Comparing results of protected species captures using different data collection methods	Ongoing
PRO2021-06	Identification of seabird capture 'hotspots' in the Regional Fisheries Management Organisation CCSBT	Complete
PRO2021-07	Review and continuation of footage collection from the 2021/22 black petrel electronic monitoring project	Ongoing

4.1.2. Risk assessment outputs

Performance measure 13	Level of uncertainty in risk assessment outputs
Target	Decreasing

The seabird risk assessment was not updated during 2020/21. Refer to the 2019/20 Seabird Annual Report for a description of reporting against this performance measure.

Performance measure 14	Risk ratios for seabird populations of concern
Target	Decreasing

The seabird risk assessment was not updated during 2020/21. Refer to the 2019/20 Seabird Annual Report for a description of reporting against this performance measure.

4.1.3. Progress against Seabird Implementation Plan

Activity 1	Review seabird species of particular concern and report this in the Seabird Annual report for 2019/20
	At the SAG meeting of 5 November 2020, a paper was presented to the Group by DOC on the proposed method for defining species of concern. SAG endorsed the approach to identify candidate seabirds and identified the northern North Island population of spotted shag as being a candidate species of concern.

Activity 2	Report updated risk ratios for relevant seabird populations
	The seabird risk assessment was not updated during 2020/21

Activity 3	Clearly identify additional priority research or management action, including review of mitigation to prevent seabird deaths near breeding colonies, including important feeding estuaries
	DOC and Fisheries New Zealand have identified and are consulting on research priorities for delivery in 2022/23

Activity 4	Update Implementation and Monitoring Plans with planned research and monitoring activities
	The version of Seabird Implementation Plan published in July included research planned for the 2021/22 financial year and the observer sea day plan for 2021/22.

Activity 5	Update Conservation Services Programme Seabird Medium Term Research Plan
	A draft Plan was published in December 2020. The intention is for the draft plan to be updated during 2022.

Activity 6	Facilitate Black Petrel Working Group meetings
	One Black Petrel Working Group meeting was held during 2020/21.

Activity 7	Hold quarterly meetings of the Black Petrel Working Group (BPWG) and monitor progress of BPWG activity
	As noted above, only one Black Petrel Working Group meeting was held during 2020/21. Progress on relevant activity was presented at the meeting.

Activity 8	Use the BPWG to support fishers to implement the mitigation standards in FMA 1
	BPWG membership has been supportive of implementation of Mitigation Standards in FMA 1. This included providing useful feedback on the practicality of some measures. FMA 1 vessels also participated in sink rate testing associated with the new bottom longline circular and ongoing implementation of the manual bottom longline Mitigation Standard.

Activity 9	Develop a communications package for bottom longline fishers operating in FMA 1 with updates on the E-monitoring programme, information on key risk periods and areas, and capture information for black petrel and flesh-footed shearwater
	In the 2020/21 fishing year, information created by the Black Petrel Working Group was provided to fishers in FMA 1 and distributed through the DOC Liaison Officer Programme.

4.2. Objective 4

Objective 4	The estimated number of fishing-related mortalities is decreasing towards zero

Fishing-related mortalities is the estimated number of seabird deaths caused by fishing, including cryptic mortality. This is estimated in the seabird risk assessment, which uses the term '*fishery-related deaths*'

Performance measure 15	Estimated fishing-related deaths, from the seabird risk assessment, relative to the average number of fishing-related deaths between 2014/15 and 2016/17
Target	Decreasing for all species

The seabird risk assessment was not updated during 2020/21. Refer to the 2019/20 Seabird Annual Report for a description of reporting against this performance measure.

4.2.1. Progress against Seabird Implementation Plan

Activity 1	Report fishing-related deaths for each seabird population
	The seabird risk assessment was not updated during 2020/21

5. Research and Information

Goal 3 of the NPOA Seabirds 2020 is that ***information to effectively manage fisheries impacts on seabirds is continuously improved***.

Goal 3 will be achieved through four measurable objectives relating to improving mitigation measures, the monitoring of commercial fishing effort (including developing and improving monitoring methods) and reducing uncertainty in estimates of the risk fishing poses to seabirds.

This section of the report provides an update on the status, as of the end of the 2020/21 fishing year, on the 12 performance measures that will be used to track progress towards meeting Goal 3 of the NPOA Seabirds 2020. This section also summarises progress towards achieving the management actions specified in the Seabird Implementation Plan under Objectives 5, 6, 7 and 8 respectively.

5.1. Objective 5

Objective 5	**Research is undertaken to improve bycatch mitigation across sectors, especially where there are high bycatch rates and no known effective mitigation (note: mitigation may include spatial and temporal closures)**

This objective relates to both the commercial and non-commercial sectors. It acknowledges the importance of continuously improving mitigation practices.

Three performance measures will be used to track progress towards meeting Objective 5. Research reports regarding seabird bycatch mitigation that were published, planned, or undertaken during the 2020/21 financial year are shown in Appendix 7.

Performance measure 16	**Number of mitigation practices assessed**

Performance measure 17	**Number of mitigation practices improved, where applicable**

Performance measures 16 and 17 are complementary. In support of moving towards zero fishing-related seabird mortalities, continuous improvement of mitigation is a key aspect of the NPOA Seabirds 2020. Where mitigation practices that apply to the commercial sector are improved, Mitigation Standards, PSRMPs or other components of the mitigation process will be updated to reflect the best available information.

During 2020/21:

- A Southern Seabirds Solutions-facilitated net capture workshop was held in Nelson in June 2021. This workshop followed on from previous engagements, where participants provided updates on various mitigation trials and brainstormed new ideas to reduce risk of seabird net captures in the southern squid trawl fishery and increase fisher and observer awareness.[26] This workshop was attended by representatives of the commercial fishing industry (including skippers), DOC, Fisheries New Zealand and Southern Seabirds Solutions. Following the meeting, participants contributed to further developing ideas and identifying the primary factors contributing to net captures in trawl fisheries;
- Department of Conservation continued the development of an underwater line setting device for small bottom longline vessels, completed initial development of haul mitigation options

[26] A report based on previous workshops is available here

for small longline vessels, undertook a mitigation gaps analysis, investigated lighting adjustments to mitigation against fishing vessel deck strikes and developed an adaptive management tool for line setting in small vessel longline fisheries together with sink rate verification trials. The distribution of Hookpods to surface longline fishers and associated data collection was also continued

- During 2020/21, Fisheries New Zealand purchased several time depth recorders (TDRs). Towards the end of the year, observers deployed on longline vessels began using the TDRs to collect data on sink rates. Results will be reported in future annual reports; and
- The collaborative trial of an underwater bait setting device for surface longline fishers also continued, with progress limited due to COVID-19.

Performance measure 18	Number of fisheries without available or known effective mitigation
Target	Decreasing

This performance measure recognises the need to identify or develop mitigation options for those fisheries with a risk of seabird capture, but that do not currently have recognised or effective mitigation.

It is acknowledged that effective mitigation for non-commercial fisheries is not well known. As noted in section 3.2.2. the process of forming a steering group of recreational fishers and amateur charter vessel (ACV) operators was ongoing during 2020/21. It is anticipated that one of the functions of the group will be to collect information on effective mitigation for non-commercial fishers.

5.1.1. Progress against Seabird Implementation Plan

Activity 1	Review the factors that contribute to seabirds getting caught in trawl nets in deepwater fisheries (FNZ)
	Ongoing analysis to determine high risk parts of the trawl net and the factors contributing to capture events. Continued development of material to increase observer and fisher awareness on seabird interaction around the trawl net.

Activity 2	Facilitate the industry/govt working group testing solutions to reduce captures of seabirds in trawl nets in deepwater fisheries
	The net capture working group (Southern Seabirds, Deepwater Group, Fisheries NZ, DOC, NIWA, and fishing companies) continued to trial new mitigation ideas throughout the year Although there was limited success with the tools trialled (none of the measures tested to date have deterred seabirds from the danger areas), the project as a whole has been useful in narrowing down when and where seabirds are likely most at risk. The group will continue facilitate this work and review new ideas for mitigating seabird net captures and ensure that the information feedback loop between the groups involved is maintained.

Activity 3	Continue trials of underwater bait-setting devices in relevant fisheries
	Trials of underwater bait-setting devices began in 2019 with a successful completion of phase 1 in 2020, however phase 2 trials were delayed due to the pandemic.

Activity 4	Lead an investigation into albatross-safe pelagic hook design with a leading hook manufacturer
	Southern Seabirds sought and received funding from DOC and the Australian Fisheries Management Authority to manufacture 6,000 heavy (52gm) hooks (dubbed the Procella

	hook). These were designed by Nigel Brothers of Australia, with help from fishers and the hook manufacturer. The intention is to trial these in NZ and Australia during 2022.

5.2. Objective 6

Objective 6	**Monitoring programmes for New Zealand commercial fisheries are designed and implemented to provide statistically robust information to assess progress toward the NPOA Seabirds 2020's objectives**

This objective is focused solely on the commercial sector and ensuring that monitoring programmes are appropriately designed to support the NPOA Seabirds 2020. To date, Fisheries New Zealand's observer programme has been the primary means of monitoring commercial fisheries. However, it is anticipated that during the term of the NPOA, electronic monitoring (cameras on vessels) will provide an additional means of monitoring commercial fisheries.

Performance measures 19-23 are used to track progress towards meeting Objective 6.

Performance measure 19	**Monitoring objectives and needs are documented and updated annually, informed by the risk assessment and species conservation concern**

This performance measure will demonstrate transparent and robust planning and documenting of monitoring priorities for seabirds.

A summary of monitoring objectives, fishery risk, and observer coverage in relation to species of particular concern was developed for 2021/22 and circulated to the Seabird Advisory Group prior to the 23 November 2021 meeting. The document is included as Appendix 5.

Performance measure 20	Monitoring coverage across all fisheries
Target	Increasing

Observer coverage

Information on the delivery of the observer seadays plan for the 2020/21 financial year is provided in Appendix 8.

Figures 3-9 show observer coverage levels (% of effort observed) between the 2014/15 and 2020/21 fishing years for >28 m trawl, <28 m trawl, scampi trawl, surface longline, set net, autoline and manual baiting bottom longline fisheries. To provide a greater level of information, coverage levels are further broken down by target species, vessel size or area (as appropriate).

Figures 3-9 indicate the impacts that COVID-19 had in terms of achieving planned coverage in some fisheries during 2020/21, including scampi and bottom longline.

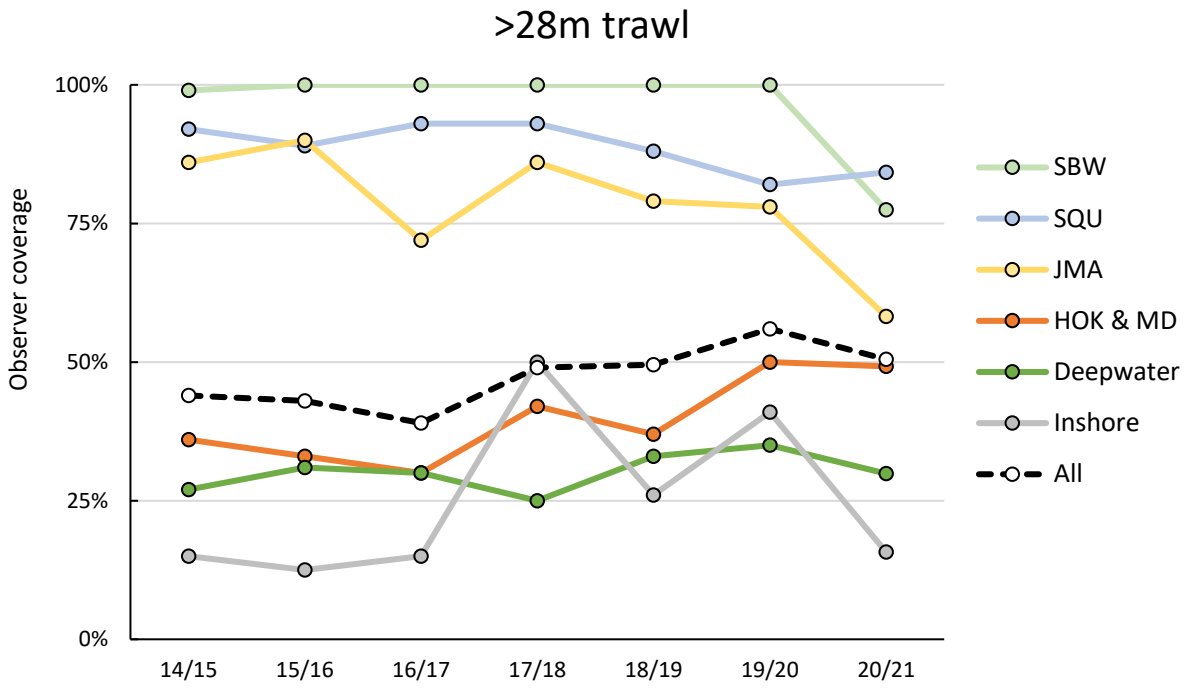


Figure 3 – Percent observer coverage (% tows observed) of the >28 m trawl fleet by target species[27] between the 2014/15 and 2020/21 fishing years. '*Deepwater* (DW)' target species are principally orange roughy and oreo species, '*hoki and middle-depth*' includes hoki, hake and ling, as well as barracouta, warehou species (and others) while '*Inshore*' target species are predominantly tarakihi, trevally and snapper.

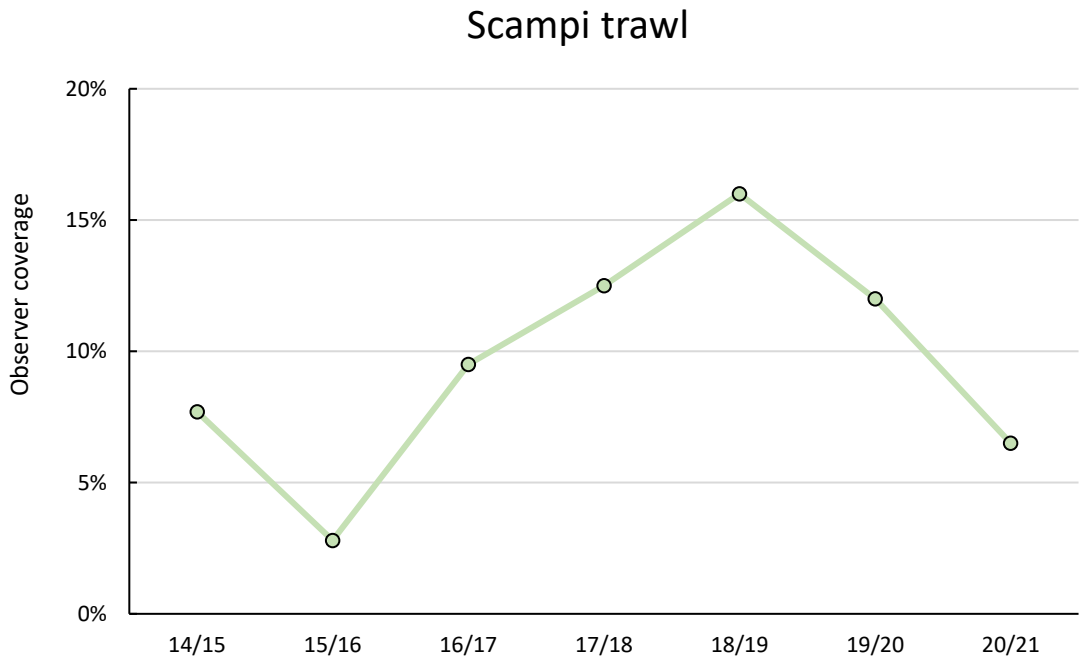


Figure 4 – Percent observer coverage (% tows observed) of the scampi trawl fleet (all QMAs combined) between the 2014/15 and 2020/21 fishing years.

[27] SBW = southern blue whiting, SQU = squid, JMA = jack mackerel, DW = deepwater, HOK = hoki

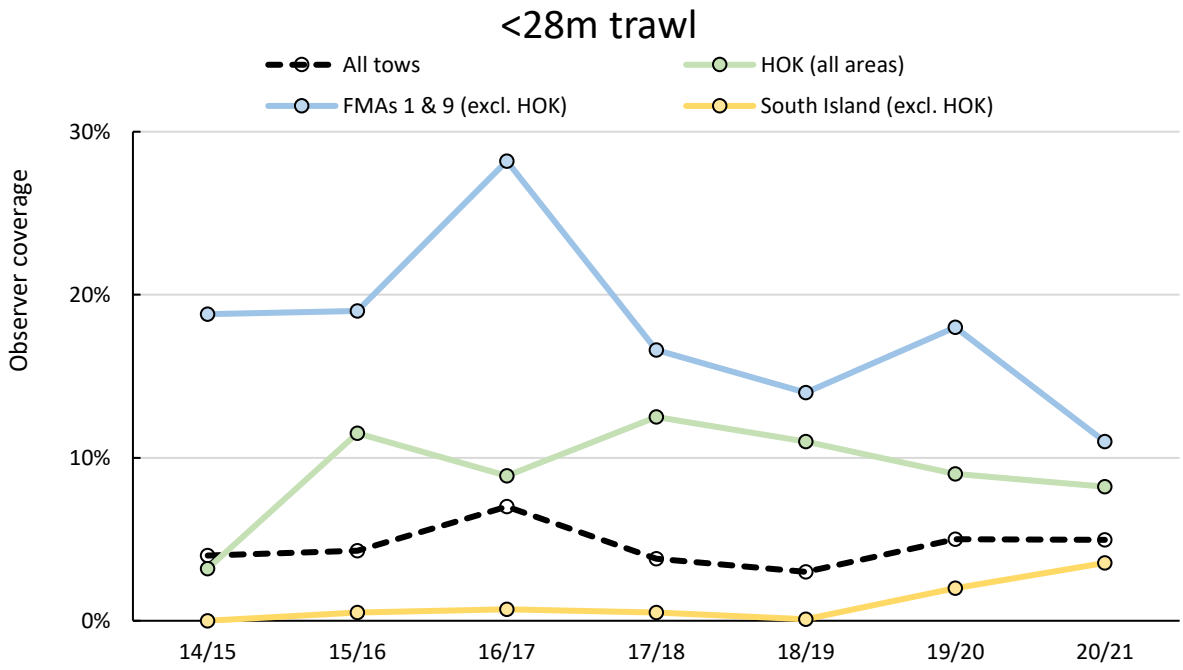


Figure 5 – Percent observer coverage (% tows observed) of the <28 m trawl fleet by target species/area between the 2014/15 and 2020/21 fishing years. '*South Island*' includes all effort in FMAs 3, 5 & 7 excluding tows that targeted hoki.

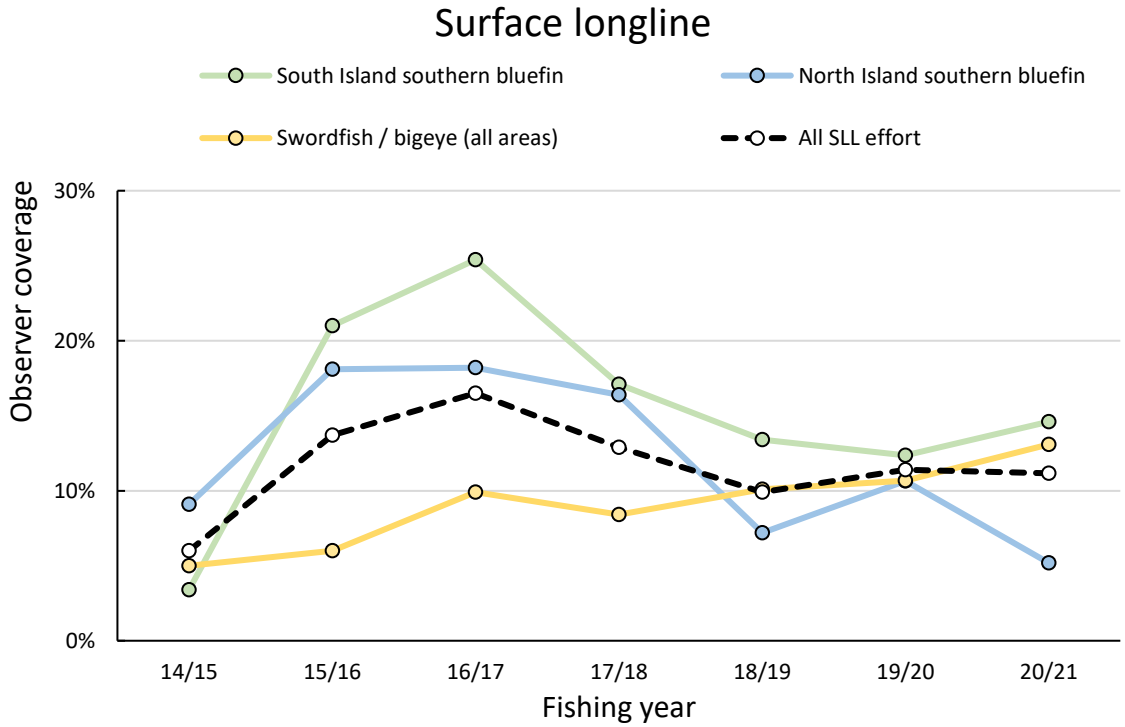


Figure 6 – Percent observer coverage (% of hooks set) of the surface longline fleet by target species/area between the 2014/15 and 2020/21 fishing years. '*North Island*' includes all effort in FMAs 1, 2, 8 & 9; '*South Island*' includes all effort in FMAs 3, 4, 5, 6 & 7.

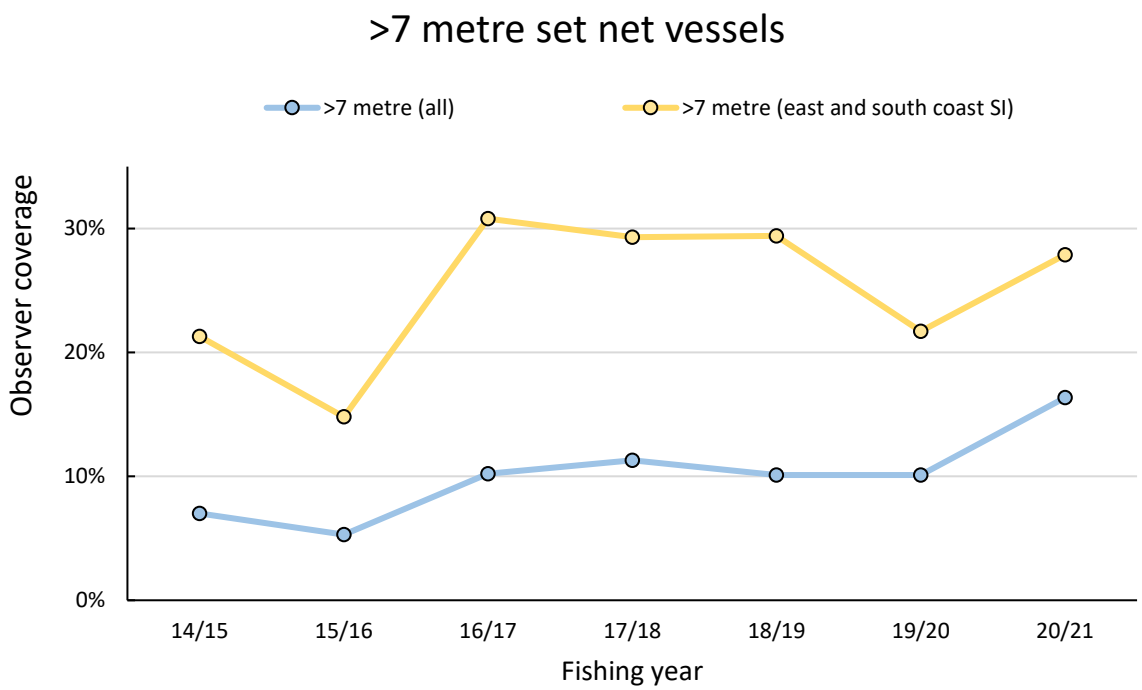


Figure 7 – Percent observer coverage (metres of net set) of the >7 metre set net fleet between the 2014/15 and 2020/21 fishing years. '*East and South Coast South Island*' (E&S SI) includes all effort off the coast of Otago, Southland, Stewart Island & Fiordland (statistical areas 024 – 032).

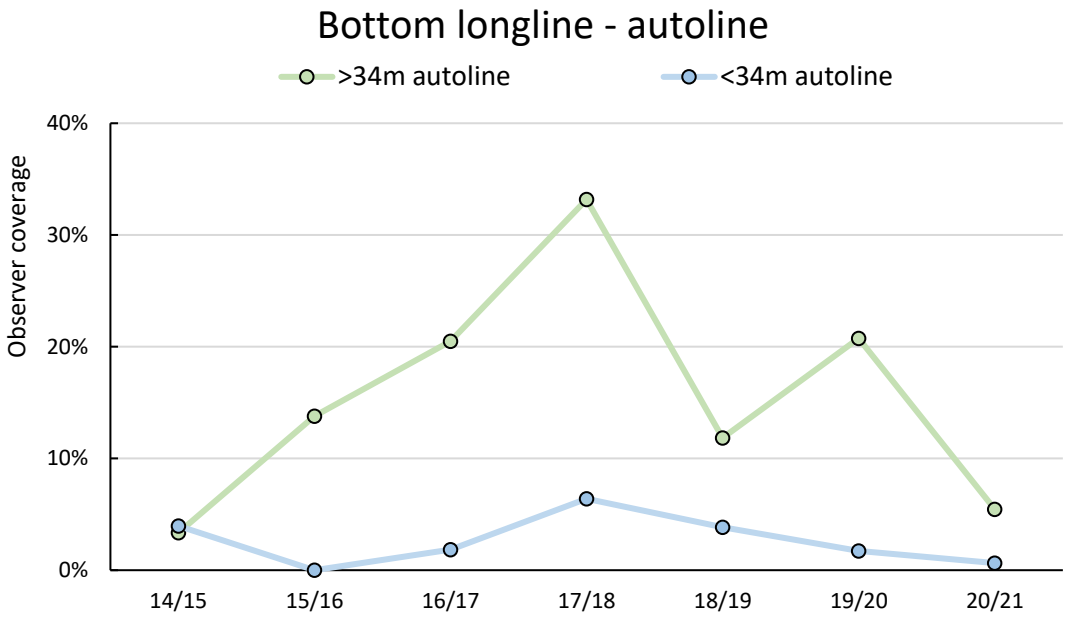


Figure 8 – Percent observer coverage (% of hooks set) of large (>34 m) and small (<34 m) autoliners (all target species and areas combined) between the 2014/15 and 2020/21 fishing years (excludes effort outside the EEZ).

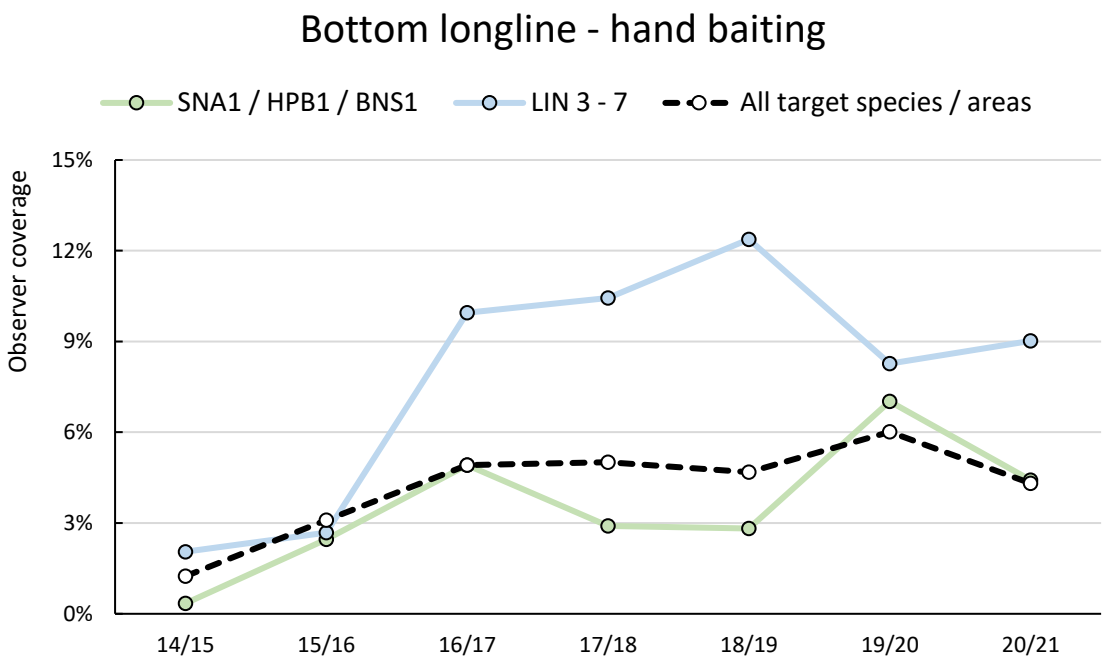


Figure 9 – Percent observer coverage (% of hooks set) of the manual bottom longline fleet by target fishery/area between the 2014/15 and 2020/21 fishing years.

Additional information on observer coverage can be found in Appendix 4, on the protected species capture website, and in the 2020/21 Annual Review Reports for deepwater and HMS[28] fisheries.

Other monitoring

The Black Petrel Electronic Monitoring Programme, initiated in 2016, continued during the 2020/21 black petrel breeding season (1 November 2020 to 31 May 2021) as a Fisheries New Zealand research project supported by ongoing voluntary participation from the fishing industry. Cameras were present on eight bottom longline vessels, primarily targeting snapper.

Refer to Activity 4 under performance measure 22 below for a summary of footage reviewed for the 2019/20 Black Petrel Electronic Monitoring.

Performance measure 21	**Uncertainty in risk assessment arising from limited monitoring data**
Target	Decreasing

Uncertainty arising from limited monitoring data is best reflected in the estimates of fishing-related deaths in the risk assessment, as observed (or e-monitored) captures are a key input to estimating fishing-related deaths.

The seabird risk assessment was not updated during 2020/21. Refer to the 2019/20 Seabird Annual Report for a description of reporting against this performance measure.

[28] Highly migratory species (HMS) are those fish that swim large distances and are found in New Zealand and international waters (e.g. tuna, swordfish and pelagic sharks).

Performance measure 22	The Fisheries New Zealand monitoring plan, and the plan's rationale is published annually

For the 2020/21 financial year, information on the objectives of deepwater and Highly Migratory Species (HMS) observer coverage was made available in the Annual Operational Plan for Deepwater Fisheries 2020/21 and the HMS Annual Operational Plan 2020/21. Information on the rationale for observer coverage in inshore fisheries was made available in the Conservation Services Programme Annual Plan 2020/21.

The draft monitoring plan (observer seadays plan) for the 2020/21 financial year was made available in the version of NPOA Seabirds 2020 Implementation Plan dated October 2020 as well as the Fisheries New Zealand website.

Future iterations of the monitoring plan will be discussed annually with the Seabird Advisory Group and uploaded onto the Fisheries New Zealand webpage at the start of each financial year.

5.2.1. Progress against Seabird Implementation Plan

Activity 1	Review the forms and data collection methods used by observers and fishers to make sure they are appropriate to support the NPOA Seabirds 2020
	Refer performance measure 24

Activity 2	Document monitoring objectives and needs based on risk assessment outputs. Include as Annex to Implementation Plan
	Refer Appendix 6

Activity 3	Continue the Black Petrel Electronic Monitoring project for the 2020/21 summer
	For the 2020/21 season, reporting will be done as part of PSB2021-04 (Comparing results of protected species captures using different data collection methods). A formal report summarising the Black Petrel Electronic Monitoring project 2021/22 will be produced in early 2023.

Activity 4	Review the footage collected by the 2019/20 Black Petrel Electronic Monitoring Project
	For the 2019/20 season, 95% of fishing trips with footage (608 fishing events) have been reviewed. This represents 23.6% of hooks set during 2019/20 in the SNA 1 BLL fishery. From the review, 65 seabird captures were detected, the most frequently caught species was the flesh-footed shearwater.

5.3. Objective 7

Objective 7	Observation and monitoring methods are researched, developed and implemented across all sectors

This objective covers all sectors and acknowledges that there are gaps in our observation and monitoring framework in terms of collecting information on seabird interactions, particularly for non-commercial fisheries.

Three performance measures (23-25) are used to track progress towards meeting Objective 7.

Performance measure 23	New observation and monitoring methods (including e-monitoring) are incorporated into monitoring programmes, analyses and reporting

Electronic reporting became mandatory for the entire commercial fishing fleet during the first quarter of the 2019/20 fishing year. Fishers using surface and bottom long-lining fishing methods are required to report detailed information on setting and hauling, including the location and time of the start and end of set.

This information can be analysed to provide additional data on adherence to specific aspects of the Mitigation Standards. The two bottom longline Mitigation Standards encourage fishers to conduct setting at night to limit seabirds' access to baited hooks during setting. The surface longline Mitigation Standard encourages fishers to set at night and use line weighting unless hook-shielding devices are used.

Using fisher-reported setting information, the nautical dusk and dawn times at that specific location, for that day, can be calculated. In this analysis, the results of which are presented in the table below, the calculation was done using the 'getSunlightTimes()' function from the suncalc package in the statistical software R. For the purposes of this analysis, 30 minutes was added to the nautical dusk time and 30 minutes subtracted from the nautical dawn time to be consistent with requirements in the relevant circulars.

The window between these times is what we consider to be 'night'. Once the relevant times have been calculated, a logic test is run over the data. If the start or end of set took place during the 'night' (between ½ an hour after dusk, and ½ an hour before dawn), it is tagged with a 'night' flag, otherwise it is given a 'day' flag.

A summary of setting time of day information for longline fishing undertaken during the 2019/20 and 2020/21 fishing years is provided in Table 8 below.

Table 8. Summary of time of day setting information for longline fishing for the 2019/20 and 2020/21 fishing years

Auto bottom longline					
Year	# of sets for which data available	Start and end at night (%)	Start and end during day	Start at night, end during day	Start during day, end at night
2019/20	3,002	45%	44%	9%	2%
2020/21	2,865	47%	42%	8%	2%

Hand-baiting bottom longline					
Year	# of sets for which data available	Start and end at night (%)	Start and end during day	Start at night, end during day	Start during day, end at night
2019/20	15,050	33%	50%	12%	4%
2020/21	15,853	36%	50%	10%	4%

Surface longline					
Year	# of sets for which data available	Start and end at night (%)	Start and end during day	Start at night, end during day	Start during day, end at night
2019/20	2,178	77%	1%	8%	14%
2020/21	1,805	73%	2%	5%	20%

Information on fisher-reported seabird captures is provided in Appendix 2. The information that fishers provide under ER provides more context on seabird captures; this is also included in Appendix 2.

Following a successful pilot project testing a new monitoring tool and stakeholder engagement framework in the Marlborough Sounds in 2020/21, the Department of Conservation (DOC) extended the programme to include improved monitoring of recreational fishing bycatch in the wider Hauraki Gulf region in 2021/22. This work supports DOC's commitments under the Sea Change Strategy. Project objectives are supported by a diversified programme of public outreach through education and awareness using new and existing networks such as the Hauraki Gulf Forum, seabird conservation groups, Kelly Tarlton's and the Hutchwilco Boat show. The focus has been on large target audiences (fishers and citizen scientists) to promote the use of the Protected Species Catch app to report recreational bycatch of marine protected species, including seabirds. Data can be viewed here https://docnewzealand.shinyapps.io/protectedspeciescatch/.

Performance measure 24	**Update and improve observer and fisher reporting requirements to enable effective analysis of bycatch and mitigation use as necessary**

Observer reporting requirements

No amendments to observer reporting requirements were made during 2020/21.

Fisher reporting requirements

During 2020, Fisheries New Zealand began a review of specific aspects of the two electronic logbook circulars.[29] This resulted in the release of a consultation document, followed a decision document. In relation to seabirds, the decision maker agreed that amendments be made to the circulars including:

- Requiring fishers to report whether a PSRMP had been developed for the fishing method that would be used most during a trip
- Mandatory reporting of mitigation use by trawl and longline fishers
- Expanding the list of mitigation devices and operational practices available to trawl and longline fishers
- Requiring surface longline fishers and bottom longline fishers (except those using integrated weight line) to recording line weighting regime details
- Requiring the fish catch event ID to be reported on non-fish and protected fish species catch reports (with the exception of seabird deck strikes)

More information on the specific changes to reporting are available here. The amended reporting requirements were phased in between September and November 2021. Information resulting from the amended requirements will be available for most of the 2021/22 fishing year.

Performance measure 25	**Proportion of commercial fishers reporting mitigation use**
Target	100% by 2022

As noted under performance measure 24 above, reporting of mitigation use by trawl and longline fishers became mandatory at the end of the 2021 calendar year. For the 2019/20 and 2020/21 fishing years, reporting of mitigation use was not required although the majority of fishers reported this information (refer Table 9).

Table 9 summarises the available information for 2019/20 and 2020/21 fishing years.

Table 9 - Summary of commercial fisher mitigation use reporting during the 2019/20 and 2020/21 fishing years

Fleet	Fishing year	Number of fishing events reported electronically[30]	Proportion of events reported electronically	Number of fishing events where mitigation use was reported	Proportion of electronically-reported events where mitigation use was reported
Trawl >28m	2019/20	23,862	100%	23,829	99.9%
	2020/21	21,676	100%	21,317	98.3%
Scampi trawl	2019/20	4,562	100%	4,553	99.8%
	2020/21	4,926	100%	4,911	99.6%
Trawl <28m	2019/20	37,325	99%	17,056	46%
	2020/21	37,810	100%	17,942	47.5%
Auto BLL	2019/20	3,018	94%	3,005	99.6%
	2020/21	2,870	100%	2,870	100%
Manual BLL	2019/20	15,119	98%	13,292	88%
	2020/21	15,933	100%	12,429	78%
Surface longline	2019/20	2,178	99%	1,960	90%
	2020/21	1,832	100%	1,707	93%

[29] All circulars, including those in force and those that have been revoked can be viewed here

[30] Rollout of ER across the fleet was not completed until the first quarter of the 2019/20 fishing year.

5.3.1. Progress against Seabird Implementation Plan

Activity 1	Continue analysis of EM trials in FMA 1 bottom longline fishery
	PSB2021-04 (comparing results of protected species captures using different data collection methods) will estimate captures of seabirds using observer data, and observer data plus electronic monitoring records. These will be compared to fisher reported data and provide the basis for integrating these data into capture estimation processes for the wider roll-out of onboard cameras. A report is now available for seabird captures during the FMA 1 bottom longline fishery in the 2017/18 fishing year: comparison of electronic monitoring, observer, and audit data.

Activity 2	Facilitate access to software and stills of seabird captures to support development of software to allow AI detection of seabirds in EM by CSIRO in Australia
	Southern Seabirds has facilitated the provision of stills of seabirds captures from a range of organisations to assist CSIRO build up an image library.

5.4. Objective 8

Objective 8	A research programme provides information to reduce uncertainty in estimates of risk to seabirds from fishing across all sectors

This objective, and its associated performance measures, relates to the seabird risk assessment and complements the work undertaken in relation to Objectives 6 and 7.

Two performance measures are used to track progress towards meeting Objective 8.

Performance measure 26	Uncertainty in risk assessment due to limited biological data
Target	Decreasing

Assessing the risk to a population (or the impacts of fishing on the population) relies on having good information on population size and any trends, as well as distribution and behavioural information.

The seabird risk assessment was not updated during 2020/21. Refer to the 2019/20 Seabird Annual Report for a description of reporting against this performance measure.

Performance measure 27	Uncertainty in risk assessment due to limited information about the nature of fishing interactions with seabirds (such as vulnerability and cryptic mortality)
Target	Decreasing

This performance measure is focused on reducing uncertainty associated with understanding the nature of fishing interactions with seabirds.

Cryptic mortality

Cryptic mortality refers to direct mortalities that would not be recorded by an observer. For example, a bird that strikes a trawl warp but is not recovered on the vessel. Cryptic mortality estimates are a

key component of overall estimates of vulnerability (the likelihood that a seabird is captured or killed in a fishing event).

The seabird risk assessment was not updated during 2020/21. Refer to the 2019/20 Seabird Annual Report for a description of reporting against this performance measure.

Vulnerability

Seabird vulnerability to capture differs according to both the species group and fishery type. Some species are more attracted to fishing vessels than others, and some fisheries are more likely than others to catch birds.

The seabird risk assessment was not updated during 2020/21. Refer to the 2019/20 Seabird Annual Report for a description of reporting against this performance measure.

5.4.1. Progress against Seabird Implementation Plan

Activity 1	**Initiate multi-threat assessment for yellow-eyed penguin (hoiho)**
	On research longlist for 2022/23

Activity 2	**Integrate data from EM trials in FMA 1 bottom longline fishery into capture estimations (PRO2019-01) and risk assessment**
	PSB2021-04 (Comparing results of protected species captures using different data collection methods) will estimate captures of seabirds using observer data, and observer data plus electronic monitoring records. These will be compared to fisher reported data and provide the basis for integrating these data into capture estimation processes for the wider roll-out of onboard cameras.

6. International Engagement

Goal 4 of the NPOA Seabirds 2020 is that ***New Zealand actively engages internationally to promote measures and practices that reduce impacts on New Zealand seabirds.***

This goal will be achieved through four measurable objectives that relate to assessing the risk that fishing outside the New Zealand EEZ poses to New Zealand seabirds and communicating this internationally, advocating for international seabird conservation measures and capacity building.

This section of the report provides an update on the status, as at the end of the 2020/21 fishing year, on the nine performance measures that will be used to track progress towards meeting Goal 4 of the NPOA Seabirds 2020. This section of the report also summarises progress towards achieving the management actions specified in the Seabird Implementation Plan under Objectives 9, 10 and 11 respectively.

6.1. Objective 9

Objective 9	The risk to New Zealand seabirds from fisheries outside the New Zealand EEZ is assessed and communicated to international organisations, governments and other stakeholders

The migratory nature of many New Zealand seabirds means they are also threatened by the operations of New Zealand and foreign-flagged vessels on the high seas, or by fishers operating in waters under the jurisdiction of other states.

Four performance measures (28-31) are used to track progress towards meeting Objective 9.

Performance measure 28	A fisheries risk assessment for seabirds is completed and updated to incorporate data for New Zealand seabirds caught outside the New Zealand EEZ

Extending the risk assessment framework to New Zealand seabirds caught outside the EEZ will assist with prioritising management action at a global scale.

A Southern Hemisphere Risk Assessment incorporating surface longline effort, was presented to the Commission for the Conservation of Southern Bluefin Tuna (CCSBT) Ecologically Related Species Working Group in May 2019.

Extensive tracking of the Antipodean albatross, Salvin's albatross and Gibson's albatross has been undertaken since 2019 including tracking of individuals of different breeding status, sex and life stage. These are being incorporated into the next iteration of the Southern Hemisphere Risk Assessment (scheduled to be presented to CCSBT Ecologically Related Species Working Group in March 2022).

Further work on the identification of seabird capture 'hotspots' will be presented to CCSBT. This will focus on areas of elevated risk to seabirds to progress discussions on potential spatial management options.

Performance measure 29	New Zealand's information on compliance with seabird measures is shared with relevant flag states, CCAMLR,[31] and Regional Fisheries Management Organisations

CCAMLR and the Regional Fisheries Management Organisations (RFMOs) that New Zealand is a member of, have management measures relating to seabird mitigation. This performance measure acknowledges the need for a feedback loop between vessels, flag states, regional bodies, and RFMOs relating to compliance with seabird measures.

New Zealand routinely undertakes high seas boarding and inspection patrols in the Tasman Sea and South West Pacific Ocean and shares, in line with our international obligations, the results of High Seas inspections with relevant regional bodies and RFMOs. During the 2020/21 fishing year, at sea boarding and inspection capability was severely impacted by the COVID-19 pandemic and resulted in no foreign flagged fishing vessels being inspected on the high seas.

New Zealand's high seas operational activity was limited to aerial surveillance[32] provided by the Royal New Zealand Air Force (RNZAF) P-3K2 Orion aircraft. A summary of high seas aerial surveillance conducted during 2020/21 is set out in Table 10.

New Zealand completed 28 surveillance flights; seven flights patrolling the high seas on behalf of the Western and Central Pacific Fishery Commission (WCPFC) that detected 125 longline fishing vessels, and 19 flights in the South West Pacific in support of Forum Fisheries Agency (FFA) countries in undertaking wide area surveillance within the countries' EEZs, that detected 188 longline fishing vessels.

Two flights in support of CCAMLR detected and reported a total of 17 vessels involved in bottom longlining. One objective of the flights was to detect any potential non-compliance with WCPFC CMM[33] 2018-03, and another was to provide an overt presence to deter any future non-compliance. No breaches were identified in relation to seabird mitigation measures during the reporting period.

New Zealand reports these observations and interactions to the WCPFC and relevant flag states, which can investigate any alleged non-compliance.

[31] Commission for the Conservation of Antarctic Marine Living Resources.
[32] COVID-19 also impacted on aerial surveillance operations with border closures preventing operations within the Pacific for extended durations
[33] CMM – Conservation and Management Measure

Table 10 – Summary of aerial surveillance operational activity conducted during 2020/21

Month	Area of operation	Purpose for flight	All FVs	Trawl (>28m) FVs observed	Surface Longlining FVs observed	Bottom Longlining FVs observed	Surface Long Liners Operating Below 30S	Surface Long Liners observed day setting	Vessels Imaged	Incorrect BMD deployment
Nov-20	Nauru to Auckland	FFA Patrol	18	0	13	0	0	0	0	0
Nov-20	Auckland to Fiji	FFA Patrol	9	0	9	0	0	0	8	0
Nov-20	Fiji/Tokelau/Tuvalu and High Seas Corridor	FFA Patrol	41	0	34	0	0	0	27	0
Dec-20	Southern Ocean	CCAMLR patrol	10	0	0	10	0	0	10	0
Jan-21	Southern Ocean	CCAMLR patrol	7	0	0	7	0	0	7	0
Jan-21	Southern Fijian EEZ	FFA Patrol	8	0	8	0	0	0	7	0
Jan-21	Northern Fijian EEZ	FFA Patrol	5	0	4	0	0	0	5	0
Mar-21	Op Rai Balang, Vanuatu/Solomon Islands EEZ	FFA Patrol	13	0	13	0	0	0	11	0
Mar-21	Op Rai Balang, Nuaru/Kiribati EEZs	FFA Patrol	14	0	0	0	0	0	9	0
Mar-21	Op Rai Balang., Solomon Islands EEZ	FFA Patrol	12	0	12	0	0	0	4	0
Mar-21	Fijian EEZ	FFA Patrol	10	0	10	0	0	0	7	0

Mar-21	Kiribati (Gilbert) EEZ	FFA Patrol	5	0	0	0	0	0	1	0
Mar-21	Tongan EEZ	FFA Patrol	4	0	2	0	0	0	1	0
May-21	Albatross high risk area West	WCPFC Patrol	18	0	18	0	17	6	18	4
May-21	Albatross high risk area East	WCPFC Patrol	12	0	12	0	7	0	9	0
May-21	Op Tui Moana, Kiribati (Line Islands) EEZ	FFA Patrol	7	0	5	0	0	0	2	0
May-21	Op Tui Moana, North East Cook Islands EEZ	FFA Patrol	14	0	14	0	0	2	9	0
May-21	Op Tui Moana, North West Cook Islands EEZ	FFA Patrol	13	0	13	0	0	1	11	0
May-21	Op Tui Moana, Northern Tongan and Niue EEZs	FFA Patrol	2	0	2	0	0	0	2	0
Jun-21	Albatross high risk area West	WCPFC Patrol	21	0	21	0	17	4	20	2
Jun-21	Albatross high risk area East	WCPFC Patrol	17	0	17	0	12	0	15	0
Jul-21	Op Nasse Area 3.1 - East of Kermadec EEZ	WCPFC Patrol	19	0	18	0	1	0	16	0
Jul-21	Western Fijian EEZ	FFA Patrol	14	0	14	0	0	3	13	0
Jul-21	Op Nasse area 2, West of Kermadec EEZ	WCPFC Patrol	22	0	22	0	7	3	22	8
Jul-21	Op Nasse area 3.2, Well East of Kermadec EEZ	WCPFC Patrol	16	0	15	0	4	0	11	0

Jul-21	Op Island Chief, Nauru EEZ	FFA Patrol	48	0	20	0	0	2	22	0
Jul-21	Op Island Chief, Kiribati EEZ and Marshall Islands EEZ	FFA Patrol	43	0	7	0	0	0	34	0
Jul-21	Op Island Chief, High Seas North East of Tuvalu EEZ	FFA Patrol	8	0	8	0	0	2	8	0
Total:			**412**	**0**	**298**	**17**	**65**	**23**	**309**	**14**

Total vessels reported in RFMOs:	**412**
Forum Fisheries Agency	270
Western and Central Pacific Fishery Commission	125
Commission for the Conservation of Antarctic Marine Living Resources	17

The southern hemisphere risk assessment for New Zealand seabirds identifies where the greatest risk lies and where engagement should be prioritised. For clarification, in the context of this performance measure, '*New Zealand*' includes all stakeholders. This performance measure is intended to reflect broader engagement rather than that of just the New Zealand government.

Performance measure 31	**New Zealand actively facilitates data sharing (relevant to New Zealand seabirds and fishing) between relevant international organisations, governments, and stakeholders**

This performance measure is complementary to the others under Objective 9 and acknowledges that feedback loops need to be created as part of the process of reducing the risk to New Zealand seabirds from fishing outside the EEZ.

New Zealand works collaboratively with all members of the CCSBT on addressing seabird bycatch, but Japan, Australia, and South Africa played a key part in sharing data and expertise towards the final seabird risk assessment project. The 14th Ecologically Related Species Working Group of CCSBT is scheduled for March 2022, and the updated southern hemisphere risk assessment will be presented at this meeting.

Data from tracking studies, in particular Antipodean albatross, was made open-access to interested parties to help target bycatch reduction activities. These data can be found online at https://docnewzealand.shinyapps.io/albatrosstracker/

Other bilateral and multi-lateral activities in 2020/21 included: continued collaboration with Chile, in particular the implementation of the Antipodean albatross Concerted Action Plan under CMS; holding a bilateral seabird bycatch workshop with China; and delivering a seabird initiative with APEC's Ocean and Fisheries Working Group as part of the New Zealand host year.

6.1.1. Progress against Seabird Implementation Plan

Activity 1	Continue work on update of southern hemisphere risk assessment
	This is reported under performance measure 28 above.

Activity 2	Seek funding to purchase satellite transmitters for Antipodean albatrosses
	Fisheries New Zealand and the Department of Conservation provided funding for continued satellite tracking.

Activity 3	Communicate risk assessment results to international organisations, governments and other stakeholders
	A range of bilateral and multilateral initiatives were progressed as described above.

6.2. Objective 10

Objective 10	New Zealand advocates for the development, adoption, improvement, and uptake of seabird conservation measures

This objective relates to the role New Zealand plays in RFMOs and CCAMLR in implementing measures to mitigate the risk to New Zealand seabirds from fisheries outside the EEZ.

Three performance measures (32-34) are used to track progress towards meeting Objective 10.

Performance measure 32	Where possible, meeting reports from CCAMLR and Regional Fisheries Management Organisations show that seabird matters, including new conservation measures, have been considered

This performance measure provides transparency about what New Zealand advocates for at CCAMLR and RFMO meetings related to reducing the risk to New Zealand seabirds from fisheries outside the EEZ.

At the WCPFC Scientific Committee in 2021, New Zealand supported recommendations for small-scale longline vessels operating above 23° North to report on specific seabird mitigation measures used (such as streamer-less tori lines and experimental offal discharge and blue-dyed bait) and associated seabird interaction rates. This will inform the Commission's upcoming review of the seabird measure (CMM 2018-03).

The 2021 meeting reports from CCSBT show an update to the CCSBT ecologically related species measure to reflect updates to measures in other regional fisheries management organisations. Additionally, it was decided by members that meetings of the Ecologically Related Species Working Group will occur annually, instead of bi-annually.

The report from the 2021 meeting of the South Pacific Regional Fisheries Management Organisation (SPRFMO) documents New Zealand's support for a management measure to increase observer

coverage in the South Pacific squid fishery. New Zealand also highlighted the risk of interaction with seabirds, including the endangered Antipodean albatross.

The report from the 2021 CCAMLR meeting shows that the Commission approved reconvening the Working Group on Incidental Mortality Associated with Fishing to address seabird strikes on warps and net monitoring cables. The report also notes the Commission endorsed extending a net monitoring cable trial for one more year.

Performance measure 33	Where possible, conservation measures from relevant fora consider the risk to seabirds from fishing

This performance measure is complementary to the southern hemisphere fisheries risk assessment for seabirds and outcomes from New Zealand advocacy as covered by performance measure 32. Conservation measures should be informed by the risk assessment.

CCSBT's 'Resolution to Align CCSBT's Ecologically Related Species measures with those of other tuna RFMOs', and WCPFC's 'Conservation and Management Measure to mitigate the impact of fishing for highly migratory fish stocks on seabirds' consider the risk to seabirds from fishing and require vessels fishing under those RFMOs to use relevant mitigation practices to reduce this risk. The two measures were adopted in 2021 and 2018 respectively.

Performance measure 34	New Zealand carries out compliance checks for all high seas vessels visiting New Zealand ports, where appropriate, consistent with port state measures, and in keeping with the relevant Regional Fisheries Management Organisation rules and conservation and management measures

This performance measure recognises that by undertaking in-port inspections New Zealand can contribute to the feedback loop between RFMOs, vessels, and flag states on adherence with seabird-related conservation and management measures.

In the 2020/2021 fishing year, New Zealand Fishery Officers conducted six in-port inspections of foreign flagged fishing vessels visiting New Zealand ports from the high seas (refer Table 11). MPI Fisheries Compliance advised Fishery Officers that boarding foreign vessels for inspections was not recommended due to COVID-19 risks. Though many vessels were not inspected, Fisheries Observers were present at the majority of foreign vessel arrivals to monitor catch. Vessels inspected had been fishing under CCAMLR. Of the six, one inspected seabird mitigation measures. One breach of Conservation and Management Measures was detected in relation to seabird mitigation, and the vessel was provided with advice to ensure compliance for future trips.

Table 11 – Summary of in-port inspections of foreign-flagged fishing vessels conducted during 2020/21

Number of foreign vessel arrivals	Number of Fishery Officer inspections	Number of vessels covered by inspections	Number of inspections of seabird mitigation	Trawl vessels	Longliners	Other methods
46	6	3	1	1	0	0

Type of vessel only applies to those inspected.

6.2.1. Progress against Seabird Implementation Plan

Activity 1	**Advocate for strengthening of seabird conservation measures to ensure international best practice, and effective monitoring of measures through engagement in CCSBT, WCPFC, SPRFMO, and CCAMLR**
	At the CCSBT, New Zealand is working with our Australian counterparts to progress a new Seabird Strategy. This along with the risk assessment work taking place in the ERSWG is aimed at introducing tailored measures aimed at SBT fishing hotspots. At WCPFC in 2020, New Zealand secured agreement for the inclusion of obligations relating to the mitigation of seabird capture by longline fishing vessels in the list of obligations to be assessed through the Compliance Monitoring Scheme. This is on the back of the New Zealand-led strengthening of the seabird CMM in 2018. At CCAMLR in 2021, New Zealand supported the extension of the conservation measure on minimising incidental mortality of seabirds in trawl fisheries, which requires evaluation of further improvements to seabird bycatch mitigation options. At SPRFMO, New Zealand consistently promotes compliance with observer coverage and seabird bycatch mitigation standards being implemented and reported. New Zealand is currently considering options for reviewing the seabird conservation and management measure.

Activity 2	**Support implementation of the CMS Concerted Action Plan for Antipodean albatross**
	Implementation was undertaken and reported, although progress was limited due to COVID-19

Activity 3	**Continue engagement with ACAP, including active input to progress the Advisory Committee and Working Group work programmes**
	New Zealand actively supported various ACAP work programmes and participated at Advisory Committee and Working Group meetings, including presentation of a range of papers.

Activity 4	**Enhance high seas and port inspection forms used by the High Seas Compliance Team to improve understanding of seabird mitigation use**
	New inspection forms have been developed for use on foreign vessels entering ports in New Zealand. Implementing use of the new forms was limited due to COVID 19 restricting inspections taking place. The new form will be trialled in March 2022.

Activity 5	**Participate in a briefing of relevant NZDF and Navy personnel on seabirds and mitigation**
	This did not happen during 2020/21

Activity 6	**Brief fisheries officers involved in Operation Nasse**
	Operation Nasse did not proceed during 2020/21

Activity 7	Contribute to EM minimum data field standards for WCPFC relating to seabird captures and mitigation use
	WCPFC is not yet at the development stage of the EM minimum data field standards programme. However, New Zealand is committed to engaging constructively when the time comes.

6.3. Objective 11

Objective 11	New Zealand actively works bilaterally, multi-laterally, and with international organisations to build capacity to reduce the risk to New Zealand seabirds

This objective recognises work to reduce bycatch in New Zealand fisheries alone may not be sufficient to protect wide-ranging seabirds and acknowledges the need to work with other jurisdictions to achieve our objectives for New Zealand.

Two performance measures will be used to track progress towards meeting Objective 11.

Performance measure 35	Active and effective programmes, including mitigation research and outreach, are in place, or completed, that build the capacity of governments and other stakeholders in fisheries that create risks to New Zealand seabirds

This performance measure acknowledges the importance of capacity-building in other jurisdictions. It also recognises that to be effective, mitigation may need to be designed specifically for the fisheries operating in that jurisdiction.

Amongst other initiatives, Ministry of Foreign Affairs and Trade (MFAT) funds work delivered by the Ministry of Primary Industries (MPI) aimed at enhancing fisheries management capacity in the Pacific, including the management of bycatch.

Relevant work undertaken during 2020/21 included:

- Joint data analysis of seabird distribution between DOC and the Instituto del Mar del Perú.
- Planning for a bilateral observer training workshop with Ecuador on seabird data collection.

Performance measure 36	New Zealand supports small-island developing states in developing and implementing NPOA Seabirds, as necessary

Under Te Pātuitanga Ahumoana a Kiwa work programme, small island developing states in the Pacific can request support from New Zealand in developing and implementing NPOA Seabirds.[34]

Activity 1	Continue to engage with countries and work bilaterally to progress initiatives where possible given impacts of COVID-19
	A range of activities were undertaken through virtual means, as detailed above.

[34] More information about the Te Pātui programme is available here.

Activity 2	Engage with APEC on seabird conservation during NZ host year 2021
	New Zealand delivered a seabird initiative to APEC's Ocean and Fisheries Working Group. This included a series of webinars which attracted active participation from a range of member economies.

Activity 3	Continue Pacific capacity development programmes
	Te Pātuitanga Ahumoana a Kiwa has been severely hampered in its ability to deliver capacity development with ongoing travel restrictions in place. The programme has been developing fisheries compliance e-learning modules on high seas boarding and inspection. The modules should be made available in 2022. The modules will include a course on the WCPFC conservation and management measures to ensure Pacific Island Countries and Territories understand how to correctly monitor compliance with the conservation and management measures, including the measures on seabirds. Topics will include how to inspect vessels and equipment to ensure compliance with the conservation and management measure to mitigate HMS fishing impacts on seabirds (2018-03).

Activity 4	Develop a stakeholder map and identify opportunities to engage with NGOs and the tuna supply chain to improve compliance with the WCPFC seabird measure
	Southern Seabirds has used DOC's analysis of vessel overlap with Antipodean albatrosses to identify the tuna companies and retailers associated with these vessels in the albacore tuna supply chain. As part of this, the Trust has also engaged with the key tuna partnerships and NGOs working with these companies on labour and sustainability topics, to seek opportunities to expand their work programmes to include albatrosses. A report is available.

Activity 5	Work with MPI, FNZ, DOC, MFAT and Pacific NGOs to increase capacity and capability for Pacific Island fisheries agencies to carry out mitigation inspections of high seas vessels operating south of 25˚
	No progress was made during 2020/21.

Activity 6	Seek funding for mitigation (tori line materials) for distribution to priority high seas vessels
	Southern Seabirds secured funding for tori line materials for twenty high seas vessels using the port of Suva.

Appendix 1 – Observed seabird captures during 2020/21

The tables below show the number of observed seabird captures on >28 m trawl vessels, <28 m trawl, scampi trawl, surface longline, set net, autoline and manual baiting bottom longline fisheries during the 2020/21 fishing year. All figures exclude deck strikes, impacts against the vessel and records where seabirds ride the codend up the stern ramp and are released alive. Fishery-specific figures are only provided for those fisheries where a seabird capture was recorded, or a significant proportion of effort was observed.

Seabirds are classified according to initial species identifications recorded by Fisheries New Zealand observers. As species identifications may not yet have been verified, figures are subject to change after specimens are necropsied or observer photos are formally identified.

In the tables, captures are grouped by the following seabird types:

Acronym / term used	Description	Species included
L. alb	Large albatrosses	All *Diomedea* albatross species
S. alb	Small albatrosses	All *Thallasarche* albatross species
U. alb	Unknown albatrosses	All albatross species not identified to genus level
Pet & Shw	Petrels & shearwaters	All P*rocellaria* petrels and shearwaters
Diving		All penguin and shag species
Other		All other seabird species (prions, giant petrels, cape petrels etc.) and those birds recorded using generic codes.

Additional information on seabird captures for 2020/21 (including location of capture and life status) can be found in the Deepwater Fisheries Annual Review Report 2020/21 (available here and the Conservation Services Programme Annual Research Summary 2020/21, which is available here. Information on observed seabird captures in previous years can be found on the Protected Species Capture website.

Table 12a – Observed captures on >28 m trawl vessels during 2020/21

Fishery	# of tows (fisher reported)	% observed	Observed captures	Observed capture rate (per 100 tows)	Observed captures by seabird type					
					L. alb	S. alb	U. alb	Pet & Shw	Diving	Other
Squid	3,770	84%	204	6.42	-	88	4	110	-	2
Hoki & MD	10,048	49%	117	2.36	5	45	6	55	-	6
Deepwater	4,412	30%	4	0.30	-	1	-	1	-	2
SBW	439	77%	2	0.59	2	-	-	-	-	-
Jack mackerel	1,636	58%	2	0.21		1		1	-	-
Inshore	1,371	16%	-	-	-	-	-	-	-	-
All	**21,676**	**51%**	**329**	**3.00**	**7**	**135**	**10**	**167**	**-**	**10**

- *'Hoki and middle depth (MD)'* includes all >28 m trawl effort targeting hoki, hake, ling, barracouta and warehou species.
- *'Jack mackerel'* includes blue mackerel and frostfish target tows as well
- *'Deepwater'* includes all tows targeting CDL, ORH, oreo species and BYX
- *'Inshore'* includes all tows for inshore species including SNA, RCO and TAR

Table 12b – summary of observer records of 'operating in accordance with PSRMP' during observed capture events on >28m trawl vessels during 2020/21

Number of observed captures	Number of observed captures where 'operating in accordance with PSRMP' attribute was recorded	Percentage of captures recorded as Y (yes)	Percentage of captures recorded as N (no)	Percentage of captures recorded as U (unknown)
329	329	99%	0%	1%

Table 13a - Observed captures on scampi trawl vessels during 2020/21

Fishery	# of tows (fisher reported)	% observed	Observed captures	Observed capture rate (per 100 tows)	Observed captures by seabird type					
					L. alb	S. alb	U. alb	Pet & Shw	Diving	Other
SCI 1	420	38%	3	1.90	-	-	-	3	-	-
SCI 2	680	5%	1	3.13	-	-	-	1	-	-
SCI 3/4A	2,472	3%	8	10.67	-	6	-	2	-	-
SCI 6A	1,354	4%	-	0	-	-	-	-	-	-
All	**4,926**	**6%**	**12**	**3.75**	**-**	**6**	**-**	**6**	**-**	**-**

Table 13b – summary of observer records of 'operating in accordance with PSRMP' during observed capture events on scampi trawl vessels during 2020/21

Number of observed captures	Number of observed captures where 'operating in accordance with PSRMP' attribute was recorded	Percentage of captures recorded as Y (yes)	Percentage of captures recorded as N (no)	Percentage of captures recorded as U (unknown)
12	11	100%	0%	0%

Table 14a - Observed captures on <28 m trawl vessels during 2020/21

Fishery	# of tows (fisher reported)	% observed	Observed captures	Observed capture rate (per 100 tows)	Observed captures by seabird type					
					L. alb	S. alb	U. alb	Pet & Shw	Diving	Other
Hoki	1,083	8%	3	3.37	-	1	-	2	-	
FMAs 1 & 9	5,944	11%	8	1.23	-	-	-	6	-	2
South Island	24,173	4%	12	1.40	1	3	-	8	-	
All	**37,810**	**5%**	**23**	**1.22**	**1**	**4**	**-**	**16**	**-**	**2**

- *'Hoki'* includes all <28 m trawl effort targeting hoki regardless of area
- '*FMAs 1 & 9*' includes all <28 m trawl effort in FMAs 1 or 9 except that targeting hoki.
- '*South Island*' includes all <28 m trawl effort in FMAs 3, 4, 5, 6 or 7 except that targeting hoki.
- '*All*' includes all <28 m trawl effort regardless of area or target species.

Table 14b – summary of observer records of 'operating in accordance with PSRMP' during observed capture events on <28m trawl vessels during 2020/21

Number of observed captures	Number of observed captures where 'operating in accordance with PSRMP' attribute was recorded	Percentage of captures recorded as Y (yes)	Percentage of captures recorded as N (no)	Percentage of captures recorded as U (unknown)
23	22	95%	5%	0%

Table 15a - Observed captures on auto bottom longline vessels during 2020/21

Vessel size	# of hooks (fisher reported)	% observed	Observed captures	Observed capture rate (per 1,000 hooks)	Observed captures by seabird type					
					L. alb	S. alb	U. alb	Pet & Shw	Diving	Other
<34 m	3,815,667	1%	1	0.04	-	-	-	1	-	-
>34 m	16,095,865	5%	17	0.02	-	-	-	17	-	-
All	**19,911,532**	**5%**	**18**	**0.02**	**-**	**-**	**-**	**18**	**-**	**-**

Table 15b – summary of observer records of 'operating in accordance with PSRMP' during observed capture events on auto bottom longline vessels during 2020/21

Number of observed captures	Number of observed captures where 'operating in accordance with PSRMP' attribute was recorded	Percentage of captures recorded as Y (yes)	Percentage of captures recorded as N (no)	Percentage of captures recorded as U (unknown)
18	18	94%	0%	6%

Table 16a - Observed captures on manual bottom longline vessels during 2020/21

Fishery	# of hooks (fisher reported)	% observed	Observed captures	Observed capture rate (per 1,000 hooks)	Observed captures by seabird type					
					L. alb	S. alb	U. alb	Pet & Shw	Diving	Other
SNA 1	11,105,659	4%	30	0.06	-	-	-	29	-	1
LIN 3 - 7	3,357,511	9%	14	0.05	1	-	-	13	-	-
HPB/BNS	2,527,509	3%	0	0	-	-	-	-	-	-
All	**21,058,690**	**4%**	**67**	**0.07**	**1**	**-**	**-**	**65**	**-**	**1**

- '*SNA 1*' includes all manual bottom longline effort targeting snapper in FMA 1.
- '*LIN 3 – 7*' includes all manual bottom longline effort targeting ling in FMAs 3, 4, 5, 6, 7 or 8.
- '*HPB/BNS*' includes all manual bottom longline effort targeting bluenose or hapuka/bass regardless of area.
- '*All*' includes all bottom longline effort regardless of area or target species.

Table 16b – summary of observer records of 'operating in accordance with PSRMP' during observed capture events on manual bottom longline vessels during 2020/21

Number of observed captures	Number of observed captures where 'operating in accordance with PSRMP' attribute was recorded	Percentage of captures recorded as Y (yes)	Percentage of captures recorded as N (no)	Percentage of captures recorded as U (unknown)
67	67	91%	0%	9%

Table 17a - Observed captures on surface longline vessels during 2020/21

Fishery	# of hooks (fisher reported)	% observed	Observed captures	Observed capture rate (per 1,000 hooks)	Observed captures by seabird type					
					L. alb	S. alb	U. alb	Pet & Shw	Diving	Other
SWO/BIG/TOR	636,866	13%	20	0.24	1	9	-	9	-	1
North Island bluefin	485,490	5%	0	0	-	-	-	-	-	-
South Island bluefin	480,990	15%	28	0.40	-	19	-	9	-	-
All	**1,611,669**	**11%**	**48**	**0.27**	**1**	**28**	**-**	**18**	**-**	**1**

- '*SWO/BIG/TOR'* includes all surface longline effort targeting big eye tuna, swordfish or Pacific bluefin tuna.
- '*North Island bluefin'* includes all surface longline effort targeting southern bluefin tuna in FMAs 1, 2, 8 or 9.
- '*South Island bluefin*' includes all surface longline effort targeting southern bluefin tuna in FMAs 3, 4, 5, 6 or 7
- 'All' includes all surface longline effort regardless of area or target species.

Table 17b – summary of observer records of 'operating in accordance with PSRMP' during observed capture events on surface longline vessels during 2020/21

Number of observed captures	Number of observed captures where 'operating in accordance with PSRMP' attribute was recorded	Percentage of captures recorded as Y (yes)	Percentage of captures recorded as N (no)	Percentage of captures recorded as U (unknown)
48	40	98%	2%	0%

Table 18a - Observed captures on set net (>7 m) vessels during 2020/21

Fishery	Fisher-reported effort (m of net set)	% observed	Observed captures	Observed capture rate (per 1,000 metres of net)	Observed captures by seabird type					
					L. alb	S. alb	U. alb	Pet & Shw	Diving	Other
E&S SI	2,369,450	28%	7	0.01	-	-	-	-	7	-
All	**5,430,153**	**16%**	**10**	**0.01**	**-**	**-**	**-**	**-**	**7**	**3**

- *East and South Coast South Island*' (E&S SI) includes all set net effort off the coast of Otago, Southland, Stewart Island & Fiordland (statistical areas 024 – 032).
- '*All*' includes all effort by set net vessels >7m in length regardless of area.
- There was no observer coverage on set net vessels <7 m in length during the 2020/21 fishing year.

Table 18b – summary of observer records of 'operating in accordance with PSRMP' during observed capture events on set net (>7m) vessels during 2020/21

Number of observed captures	Number of observed captures where 'operating in accordance with PSRMP' attribute was recorded	Percentage of captures recorded as Y (yes)	Percentage of captures recorded as N (no)	Percentage of captures recorded as U (unknown)
10	10	100%	0%	0%

Appendix 2 – Fisher-reported seabird captures

The tables below show the number of fisher-reported seabird captures between 2014/15 and 2020/21 for >28 m trawl, <28 m trawl, scampi trawl, surface longline, set net, autoline and manual baiting bottom longline fisheries.

'*Large seabirds*' includes all albatross species and giant petrel, '*Small seabirds*' includes all petrels, shearwaters, prions, gulls, terns, gannets & boobies, penguins and shags.

Note that these figures include deck strikes and cases where seabirds '*ride*' the cod end onto the vessel and are released alive.

Greater than 28 metre trawl vessels

Table 19 – Fisher-reported captures on >28 m trawl vessels between 2014/15 and 2020/21

Year	Number of vessels that reported captures	Large seabirds		Small seabirds		Total
		Alive	Dead	Alive	Dead	
2014/15	30	100	184	272	318	874
2015/16	31	83	234	97	225	639
2016/17	30	74	146	82	288	590
2017/18	35	110	184	171	235	700
2018/19	32	83	228	141	247	699
2019/20	32	105	191	160	290	746
2020/21	31	95	159	71	172	497

Table 20 - 2019/20 and 2020/21 fisher-reported captures by capture type for >28m trawl vessels

Capture type	Fishing year	Number of captures reported by category type		
		Large seabirds	Small seabirds	Total
Deck strike	2019/20	16	15	31
	2020/21	18	32	50
Net	2019/20	168	292	460
	2020/21	115	128	243
Warp	2019/20	40	3	43
	2020/21	69	4	73
Other	2019/20	14	33	47
	2020/21	11	10	21
Not reported	2019/20	58	107	165
	2020/21	41	69	110

Scampi trawl vessels

Table 21 - Fisher-reported captures on scampi trawl vessels between 2014/15 and 2020/21

Year	Number of vessels that reported captures	Large seabirds		Small seabirds		Total
		Alive	Dead	Alive	Dead	
2014/15	7	14	33	9	17	73
2015/16	8	12	37	12	26	87
2016/17	10	11	26	3	15	55
2017/18	6	16	28	7	11	62
2018/19	11	6	40	0	14	60
2019/20	6	6	23	2	0	31
2020/21	9	10	31	6	5	52

Table 22 - 2019/20 and 2020/21 fisher-reported captures by capture type for scampi trawl vessels

Capture type	Fishing year	Number of captures reported by category type		
		Large seabirds	Small seabirds	Total
Deck strike	2019/20	1	2	3
	2020/21	1	0	1
Net	2019/20	5	0	5
	2020/21	14	8	22
Warp	2019/20	18	0	18
	2020/21	19	1	20
Other	2019/20	3	0	3
	2020/21	6	0	6
Not reported	2019/20	2	0	2
	2020/21	1	2	3

Under 28 metre trawl vessels

Table 23 - Fisher-reported captures on <28 m trawl vessels between 2014/15 and 2020/21

Year	Number of vessels that reported captures	Large seabirds		Small seabirds		Total
		Alive	Dead	Alive	Dead	
2014/15	15	0	21	23	19	63
2015/16	20	3	40	43	32	118
2016/17	20	2	19	84	49	154
2017/18	20	7	39	71	93	210
2018/19	13	1	29	34	17	81
2019/20	23	7	37	22	20	86
2020/21	27	4	34	45	36	119

Table 24 - 2019/20 and 2020/21 fisher-reported captures by capture type for <28m trawl vessels

Capture type	Fishing year	Number of captures reported by category type		
		Large seabirds	Small seabirds	Total
Deck strike	2019/20	1	4	5
	2020/21	2	115	17
Net	2019/20	2	14	16
	2020/21	2	40	42
Warp	2019/20	28	5	33
	2020/21	26	11	37
Other	2019/20	-	-	-
	2020/21	-	3	3
Not reported	2019/20	13	19	32
	2020/21	8	12	20

Autoline bottom longline vessels

Table 25 - Fisher-reported captures on autoline bottom longline vessels between 2014/15 and 2020/21

Year	Number of vessels that reported captures	Large seabirds		Small seabirds		Total
		Alive	Dead	Alive	Dead	
2014/15	5	1	11	1	61	74
2015/16	7	-	13	-	131	144
2016/17	6	-	4	2	57	63
2017/18	3	-	7	2	36	45
2018/19	4	-	7	-	45	52
2019/20	5	4	11	2	164	182
2020/21	6	6	10	7	123	146

Table 26 - 2019/20 and 2020/21 fisher-reported captures by capture type for autoline bottom longline vessels

Capture type	Fishing year	Number of captures reported by category type		
		Large seabirds	Small seabirds	Total
Deck strike	2019/20	0	0	0
	2020/21	3	6	9
Setting	2019/20	2	59	61
	2020/21	3	55	58
Hauling	2019/20	7	62	69
	2020/21	7	61	68
Other	2019/20	0	1	1
	2020/21	0	0	0
Not reported	2019/20	6	45	51
	2020/21	3	8	11

Manual bottom longline

Table 27 - Fisher-reported captures on manual bottom longline vessels between 2014/15 and 2020/21

Year	Number of vessels that reported captures	Large seabirds		Small seabirds		Total
		Alive	Dead	Alive	Dead	
2014/15	12	3	18	6	57	84
2015/16	15	1	11	11	49	72
2016/17	21	-	17	36	82	135
2017/18	21	3	10	45	65	123
2018/19	23	4	12	30	79	125
2019/20	29	9	11	80	142	242
2020/21	33	4	11	178	217	410

Table 28 - 2019/20 and 2020/21 fisher-reported captures by capture type for manual bottom longline vessels

Capture type	Fishing year	Number of captures reported by category type		
		Large seabirds	Small seabirds	Total
Deck strike	2019/20	0	0	0
	2020/21	0	3	3
Setting	2019/20	2	11	13
	2020/21	4	109	113
Hauling	2019/20	14	145	159
	2020/21	5	165	170
Other	2019/20	0	1	1
	2020/21	0	3	3
Not reported	2019/20	4	65	69
	2020/21	6	115	121

Surface longline

Table 29 - Fisher-reported captures on surface longline vessels between 2014/15 and 2020/21

Year	Number of vessels that reported captures	Large seabirds		Small seabirds		Total
		Alive	Dead	Alive	Dead	
2014/15	15	23	60	35	17	135
2015/16	18	40	170	7	46	263
2016/17	12	12	30	2	41	85
2017/18	14	14	105	-	33	152
2018/19	14	15	91	8	44	158
2019/20	14	2	47	18	40	107
2020/21	14	16	85	30	49	180

Table 30 - 2019/20 and 2020/21 fisher-reported captures by capture type for surface longline vessels

Capture type	Fishing year	Number of captures reported by category type		
		Large seabirds	Small seabirds	Total
Deck strike	2019/20	-	-	-
	2020/21	-	1	1
Setting	2019/20	1	5	6
	2020/21	13	5	18
Hauling	2019/20	25	38	63
	2020/21	32	54	86
Other	2019/20	11	3	14
	2020/21	24	8	32
Not reported	2019/20	12	12	24
	2020/21	32	11	43

Set net (all vessel sizes)

Table 31 - Fisher-reported captures on set net vessels between 2014/15 and 2020/21

Year	Number of vessels that reported captures	Large seabirds		Small seabirds		Total
		Alive	Dead	Alive	Dead	
2014/15	3	-	-	1	3	4
2015/16	3	-	-	1	10	11
2016/17	6	-	-	-	9	9
2017/18	6	-	-	2	21	23
2018/19	6	-	-	1	20	21
2019/20	9	1	-	1	17	19
2020/21	4	-	-	2	16	18

Appendix 3 – Observed mitigation use

Observed mitigation use on trawl vessels

Seabird scaring devices such as bird bafflers, tori lines or warp scarers are deployed on trawl vessels to reduce the risk trawl warps pose to seabirds. Fisheries New Zealand observers record information on the use of seabird scaring devices (tori lines, bird bafflers, warp scarers etc.) during each observed fishing event on trawl vessels.

Since 2014/15, observers have recorded the use of at least one seabird scaring device during almost all observed tows on trawl vessels >28 m in length. During this time the observed use of two types of seabird scaring devices simultaneously (typically both bird bafflers and tori lines) almost doubled from 18% of tows in 2014/15 to 35% of tows during 2020/21 (Figure 10). Vessel crews typically deploy two seabird scaring devices simultaneously when fishing in areas with a high level of seabird interactions (e.g. the squid fishery) or when the risk to seabirds from the vessel may be higher (e.g. following the failure of a fishmeal plant). Deployment of tori lines (in addition to bird bafflers) is often weather dependent however, and crews may not use tori lines if conditions are too windy.

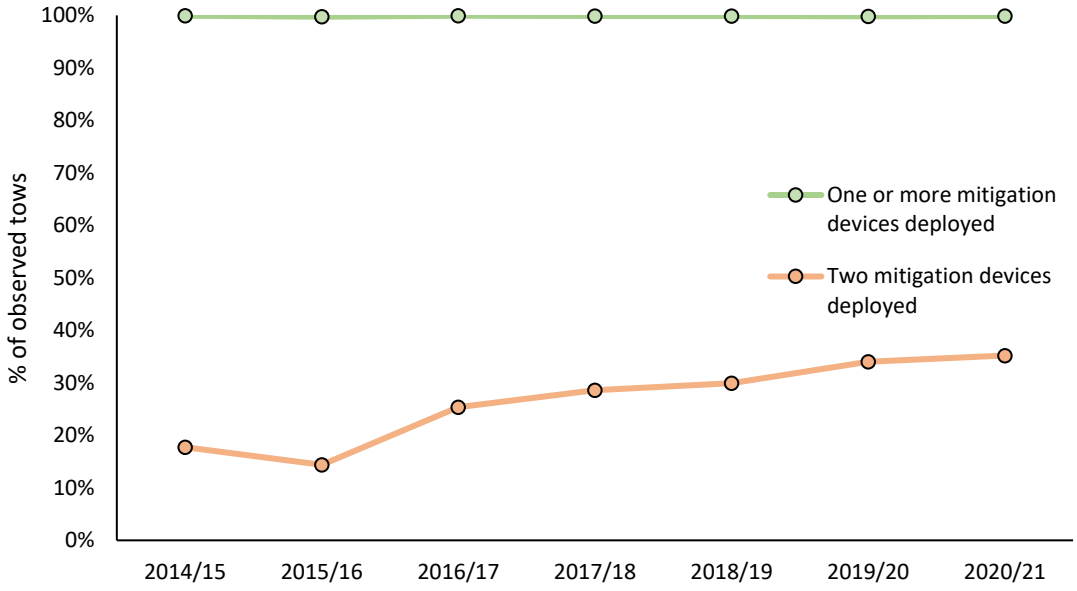


Figure 10 – Observer recorded information on the use of seabird scaring devices on >28 m trawl vessels between the 2014/15 and 2020/21 fishing years.

Since 2014/15, observers have recorded the use of seabird scaring devices for the majority of observed tows on scampi trawl vessels (Figure 11).

On a tow by tow basis, the observed use of seabird scaring devices on <28 m trawl vessels has fluctuated since 2014/15 (Figure 11). However, observer coverage of the <28 m trawl fleet is low (typical less than 5% per annum) and both spatially and temporally unrepresentative with coverage focused on those fisheries with lower rates of seabird captures (e.g. winter hoki fisheries and the West Coast of the North Island inshore fishery). Therefore, information on the observed use of seabird scaring devices on <28 m trawl vessels may not be representative of the wider <28 m trawl fleet.

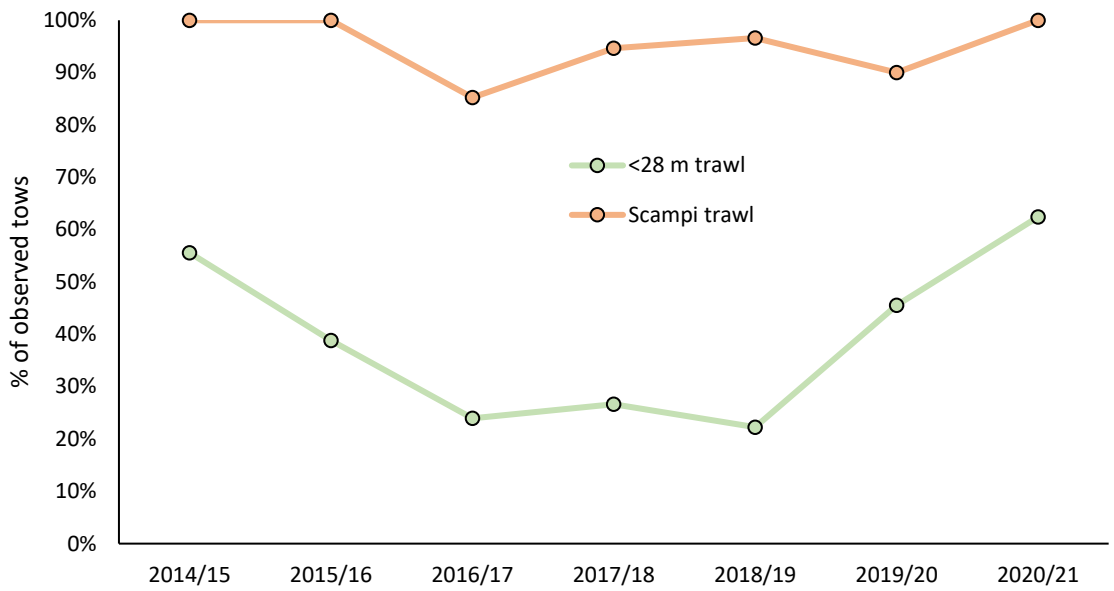


Figure 11 – Observer recorded information on the use of seabird scaring devices on scampi trawl and <28 m trawl vessels between the 2014/15 and 2020/21 fishing years (% of observed tows where at least one seabird mitigation device was used)

Trawl vessels utilise a variety of fish waste management systems both between vessels (depending on onboard equipment) and between different fish waste sources.[35] Likewise, given other observer duties (biological sampling, independent catch quantification etc.) it is not generally possible for observers to continuously record information on a vessel's fish waste management system (particularly on large factory vessels where processing may occur 24 hours a day).

Therefore, standardised data collected by observers on a trawl vessel's fish waste management system is limited to information on the discharge of offal and whole fish during the shooting and hauling of each observed tow. During 2020/21, no offal or whole fish were discharged during either shooting or hauling for the majority (99%) of observed tows on >28 m trawl vessels, 96% of observed tows on <28 m trawl vessels where this data was recorded,[36] and 100% of observed tows on scampi trawl vessels (Figure 12). Note that the term '*whole fish*' includes species able to be returned to the water under the Schedule 6 of the Fisheries Act 1996 (e.g. spiny dogfish or kingfish), species legally required to be returned to the sea (e.g. species subject to minimum legal size requirements) and very large fish such as sharks, stingrays or sunfish.

Observers also record adherence to a vessel's agreed fish waste management system, as codified in PSRMPs[37] on a trip by trip basis. This information is recorded on PSRMP audit forms and is summarised in Section 3.1.1.

[35] For example, some species/types of offal may be processed to fish meal whereas others (such as spiny dogfish or warehou heads) are not as they may compromise the quality of fish meal if processed in large quantities.

[36] During 2020/21, this data was only recorded on around 50% of trips on inshore trawl vessels

[37] Also known as vessel management plans or VMPs

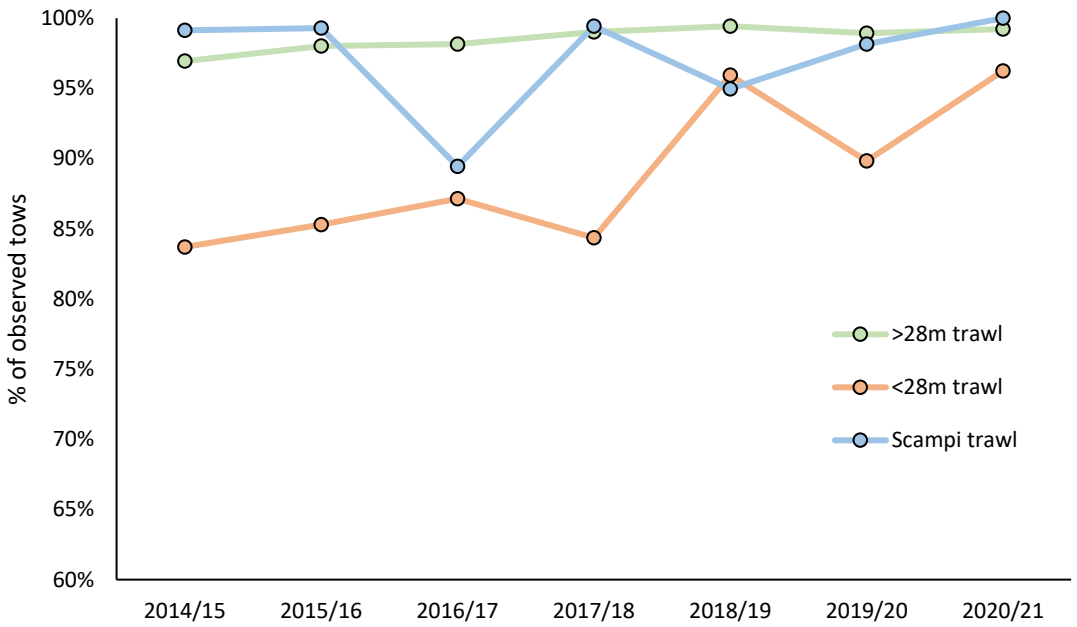


Figure 12 – Proportion of observed tows during which no offal (including minced offal) or whole fish (including schedule 6 and sub-MLS fish) was discharged during either shooting or hauling (data limited to those tows for which information on discharge during shooting/hauling is available and the observer was in a position to ascertain whether offal or fish discharge occurred during both shooting and hauling).

Observed mitigation use on bottom longline vessels

Prior to April 2019, observers did not systematically record data on the line weighting regime, fish waste management system, or the use of mitigation devices (including tori lines) on an event by event basis for all trips on bottom longline vessels. Likewise, prior to April 2019, observers did not record date, time, and position for both the start and end of setting. Therefore, it is not possible to provide data on the observed set by set use of mitigation practices (including night setting) for either autoline or manual baiting bottom longline vessels over the last five years.

This data began to be recorded during the 2019/20 fishing year however, and the available information is summarised in Tables 32-39.

Setting

Table 32 – Summary of observed tori line use during setting on bottom longline vessels during 2019/20 and 2020/21

Longline vessel category	Fishing year	# of observed sets where data on tori line use was recorded	Percentage of observed sets where tori line use was recorded
>34m autoline	2019/20	195	100%
	2020/21	108	98%
<34m autoline	2019/20	37	100%
	2020/21	11	100%
Hand baiting[38]	2019/20	814	97%
	2020/21	543	99%

The data the table above indicates there may have either been some non-compliance with regulatory requirements around use of tori lines during setting or that the observer has recorded the data incorrectly. For example, on one trip on a >34m autoliner during 2020/21, the observer noted that a tori line was used on every set but also recorded that a tori line was not used on two sets.

As part of the observer deployment process, a compliance debrief is conducted with each observer at the conclusion of each trip. Fisheries Compliance assesses each debrief and will consider whether further action is required.

Additionally, observers audit crew performance against a vessel's PSRMP. As part of the feedback loop, audit forms are sent to liaison officers. Where failure to adhere to a PSRMP is recorded, liaison officers will assess whether follow up with vessel operators is required.

Table 33 – Summary of observed other types of mitigation use on bottom longline vessels during setting in 2019/20 and 2020/21

Fishing year	Number of observed sets where acoustic deterrent used	Number of observed sets where laser deterrent used	Number of observed sets without unnecessary deck lighting	Number of observed sets where use of alternative mitigation device was recorded
>34m autoline				
2019/20	78	1	183	-
2020/21	-	108	108	78[39]
<34m autoline				
2019/20	-	-	39	-
2020/21	4	4	9	-
Hand baiting				
2019/20	-	17	822	32
2020/21	-	-	469	4

[38] All hand baiting vessels are under 25 metres in length

[39] Bait was dyed blue

Table 34 – Summary of observed bait state on bottom longline vessels during setting in 2019/20 and 2020/21[40]

Vessel category	Fishing year	Number of observed sets where data on bait state was recorded	Proportion of observed sets where bait state was recorded as not fully frozen
>34m autoline	2019/20	315	100%
	2020/21	108	100%
<34m autoline	2019/20	39	100%
	2020/21	13	100%
Hand baiting	2019/20	939	99%
	2020/21	555	100%

Table 35 – Summary of observed offal management on bottom longline vessels during setting in 2019/20 and 2020/21

Vessel category	Fishing year	Number of observed sets where offal management data was recorded	Proportion of observed sets with no discharge during setting
>34m autoline	2019/20	313	100%
	2020/21	108	100%
<34m autoline	2019/20	39	100%
	2020/21	7	86%
Hand baiting	2019/20	849	99%
	2020/21	543	99%

[40] The rationale for recording information on bait state is that thawed baits sink faster than frozen baits. More information is available in this report. Using bait that is not fully frozen is consistent with the outcome of reducing seabirds' access to baited hooks during setting.

Hauling

Observers record discarding of bait, offal, and whole fish separately for hauling. Observers also record whether discarded items are discarded on the same side of the vessel as the hauling station.[41] Tables 36-38 summarise that information for the 2019/20 and 2020/21 fishing years.

Table 36 – Summary of observed fish waste management on >34m autoline bottom longline vessels during hauling in 2019/20 and 2020/21 (*HS refers to hauling station*)

Fishing year	Discarding description	No. of hauls for which information available	Percentage
	Bait		
2019/20	No bait discard / baits retained for duration of haul	246	91%
	Discarded on different side of vessel to HS	25	9%
2020/21	No bait discard / baits retained for duration of haul	108	100%
	Offal		
2019/20	No offal discard / offal retained for duration of haul	187	69%
	Discarded on different side of vessel to HS	83	31%
	Occasional – **same** side as HS	1	<1%
2020/21	No offal discard / offal retained for duration of haul	108	100%
	Whole fish		
2019/20	No whole fish discard / whole fish retained for duration of haul	204	75%
	Discarded on different side of vessel to HS	24	9%
	Occasional – **same** side as HS	43	16%
2020/21	Occasional – **same** side as HS	105	100%

Table 37 – Summary of observed fish waste management on <34m autoline bottom longline vessels during hauling in 2019/20 and 2020/21 (*HS refers to hauling station*)

Fishing year	Discarding description	No. of hauls for which information available	Percentage
	Bait		
2019/20	No bait discard / baits retained for duration of haul	1	3%
	Batched and discarded on **same** side as HS	1	3%
	Continuous – **same** side as HS	1	3%
	Occasional – **same** side as HS	36	92%
2020/21	No bait discard / baits retained for duration of haul	11	92%
	Occasional – **same** side as HS	1	8%
	Offal		
2019/20	No offal discard / offal retained for duration of haul	34	87%
	Continuous – **same** side as HS	1	3%
	Occasional – **same** side as HS	4	10%
2020/21	No offal discard / offal retained for duration of haul	13	100%
	Whole fish		
2019/20	No whole fish discard / whole fish retained for duration of haul	4	10%
	Continuous – **same** side as HS	32	82%
	Occasional – **same** side as HS	3	8%
2020/21	Occasional – **same** side as HS	8	66%
	Continuous – **same** side as HS	4	33%

[41] Legislative requirements are that offal or fish may be discharged during hauling, but only from the side of the vessel that is opposite to the side on which the hauling station is located. Longline mitigation standards specify that fish waste is to be held on board for the duration of hauling (when possible) with any discharge occurring in a way that minimises the risk to seabirds.

Table 38 – Summary of observed fish waste management on hand baiting bottom longline vessels during hauling in 2019/20 and 2020/21 (*HS refers to hauling station*)

Fishing year	Discarding description	No. of hauls for which information available	Percentage
	Bait		
2019/20	No bait discard / baits retained for duration of haul	526	58%
	Batched and discarded on **same** side as HS	13	1%
	Continuous – **same** side as HS	134	15%
	Discarded on **different** side of vessel to HS	16	2%
	Occasional – **same** side as HS	225	25%
2020/21	No bait discard / baits retained for duration of haul	287	57%
	Batched – **opposite** side as HS	82	16%
	Batched – **same** side as HS	44	9%
	Continuous – **same** side as HS	12	2%
	Occasional – **opposite** side as HS	3	1%
	Occasional – **same** side as HS	78	15%
	Offal		
2019/20	No offal discard / offal retained for duration of haul	227	36%
	Batched - **same** side as HS	3	<1%
	Continuous – **same** side as HS	1	<1%
	Discarded on **different** side of vessel to HS (all categories combined)	357	56%
	Occasional – **same** side as HS	50	8%
2020/21	No offal discard / offal retained for duration of haul	233	43%
	Batched - **same** side as HS	37	7%
	Continuous – **same** side as HS	1	<1%
	Occasional – **same** side as HS	106	19%
	Discarded on **different** side of vessel to HS (all categories combined)	168	31%
	Whole fish		
2019/20	No whole fish discard / whole fish retained for duration of haul	137	15%
	Batched - **same** side as HS	3	<1%
	Continuous – **same** side as HS	104	12%
	Occasional – **same** side as HS	509	58%
	Discarded on different side of vessel to HS (all categories combined)	132	15%
2020/21	No whole fish discard / whole fish retained for duration of haul	97	19%
	Batched - **same** side as HS	4	1%
	Continuous – **same** side as HS	27	5%
	Occasional – **same** side as HS	296	57%
	Discarded on different side of vessel to HS (all categories combined)	94	18%

The data the tables above indicate there may have been some non-compliance with regulatory requirements around fish waste management. As already noted, a compliance debrief is conducted with observers at the conclusion of each trip part of the observer deployment process. Fisheries Compliance assesses each debrief and will consider whether further action is required.

Additionally, observers audit crew performance against a vessel's PSRMP. As part of the feedback loop, audit forms are sent to liaison officers. Where failure to adhere to a PSRMP is recorded, liaison officers will assess whether follow up with vessel operators is required.

Haul mitigation use

Observers record mitigation use during hauling. While there is no legislative requirement to use haul mitigation, the bottom longline Mitigation Standards state that vessel operators should utilise measures appropriate to both the vessel and the situation to actively deter seabirds from approaching hauled hooks. The categories currently available to observers are water deterrent, acoustic deterrent, bird exclusion device, or 'other'. Observed use of mitigation during hauling for the 2019/20 and 2020/21 fishing years is summarised in Table 39.

Table 39 – Summary of observed haul mitigation use on bottom longline vessels during 2019/20 and 2020/21

Vessel category	Fishing year	Number of observed hauls where data on mitigation use was recorded	Proportion of observed hauls where at least one form of mitigation was recorded
>34m autoline	2019/20	270	80%
	2020/21	108	91%
<34m autoline	2019/20	38	18%
	2020/21	13	31%
Hand baiting	2019/20	907	21%
	2020/21	539	36%

Observed mitigation use on surface longline vessels

Setting

Information for 2020/21 on observed mitigation during setting and hauling is summarised in Tables 40 and 41.

Table 40. Summary of observed mitigation during setting for 2020/21

Tori line use	
Number of sets where use of tori line was recorded	190
Percentage of sets where observer recorded that a tori line was used during setting	100%
Use of additional mitigation device	
Number of sets where data on additional mitigation was recorded[42]	190
Percentage of sets where observer recorded that additional mitigation was used during setting	0%
Discards during setting	
Number of sets where data on discards during setting was recorded	166
Percentage of sets where observer recorded that there was no discards during setting	99%

Hauling

Table 41. Summary of observed fish waste management and mitigation during hauling for 2020/21

Bait	
Number of sets where data on bait fish waste management was recorded	187
Percentage of sets where observer recorded that used baits were retained or not discarded during hauling	26%
Offal	
Number of sets where data on bait fish waste management was recorded	189
Percentage of sets where observer recorded that offal was retained or not discarded during hauling	9%
Whole fish	
Number of sets where data on whole fish waste management was recorded	174
Percentage of sets where observer recorded that whole fish were retained or not discarded during hauling	10%
Haul mitigation	
Number of sets where data on haul mitigation use was recorded	186
Percentage of sets where observer recorded that haul mitigation was used	1%

Additional information on observed mitigation use on surface longline vessels can be found in Highly Migratory Species Annual Review Reports, which are available here.

[42] The choices available to observers are acoustic bird deterrent, water cannon and whether there was unnecessary deck lighting. Lasers may have been used as an additional mitigation method but there is no specific attribute for observers to record this other than as a comment. Additionally, observers did not record any use of hook-shielding devices on observed surface longline sets during 2020/21.

Appendix 4 – Monitoring of fisheries that interact with seabirds of particular concern[43]

Black petrel and flesh-footed shearwater

The majority of modelled black petrel and flesh-footed shearwater captures are estimated to occur off north-eastern New Zealand (Figure 13). Observer coverage of the fisheries that are estimated to pose the greatest risk to back petrel and flesh-footed shearwater is shown in Figure 14.

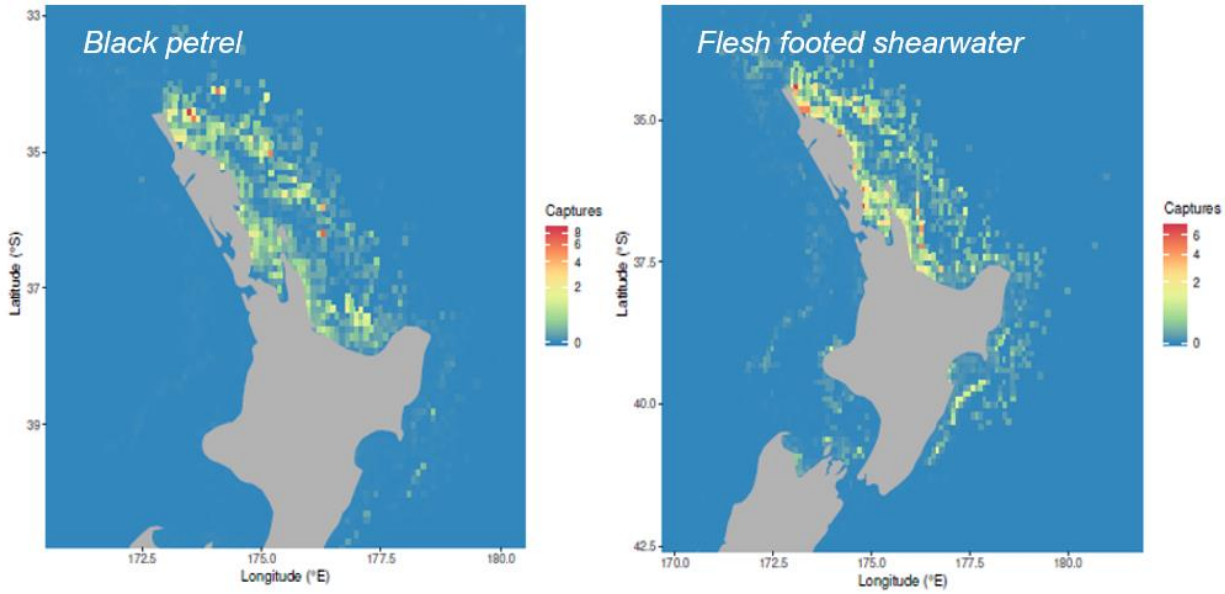


Figure 13 – Location of estimated black petrel and flesh-footed shearwater captures during the 2016/17 year. Data taken from Abraham & Richard 2019.

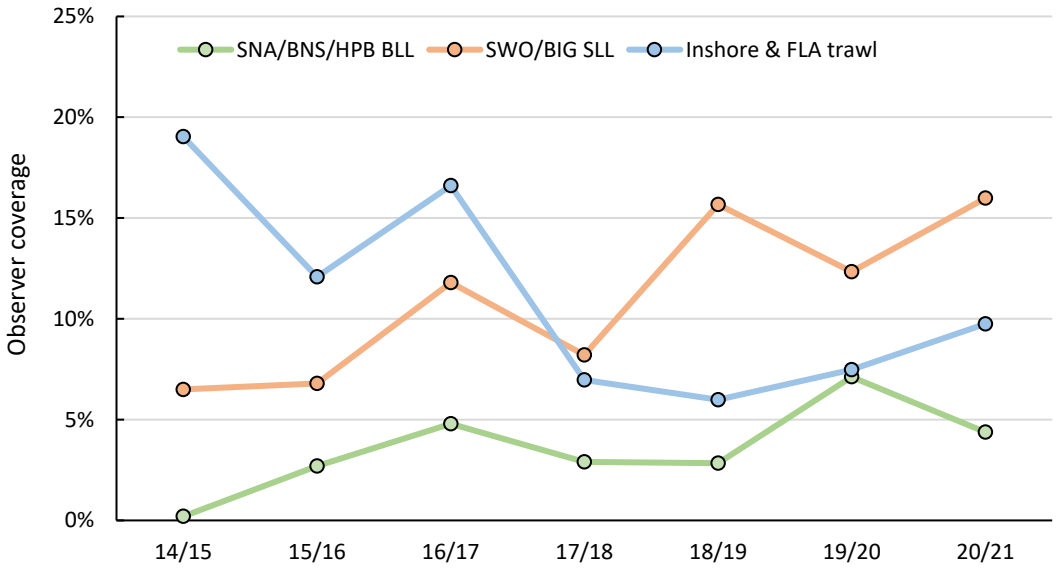


Figure 14 – Observer coverage rates for those commercial fisheries estimated to pose the greatest risk to black petrel and flesh-footed shearwater. All data limited to effort in FMA 1. '*Inshore & FLA trawl*' includes effort by vessels <28 m in length targeting middle-depth species (principally hoki).

[43] Refer to Appendix 4 of the 2019/20 Seabird Annual Report for more information on the fisheries that interact with seabirds of particular concern

Salvin's albatross

The majority of modelled Salvin's albatross captures are estimated to occur on the Chatham Rise and along the east coast of the South Island (Figure 15). Observer coverage of those fisheries estimated to contribute the greatest risk to Salvin's albatross is shown in Figure 16.

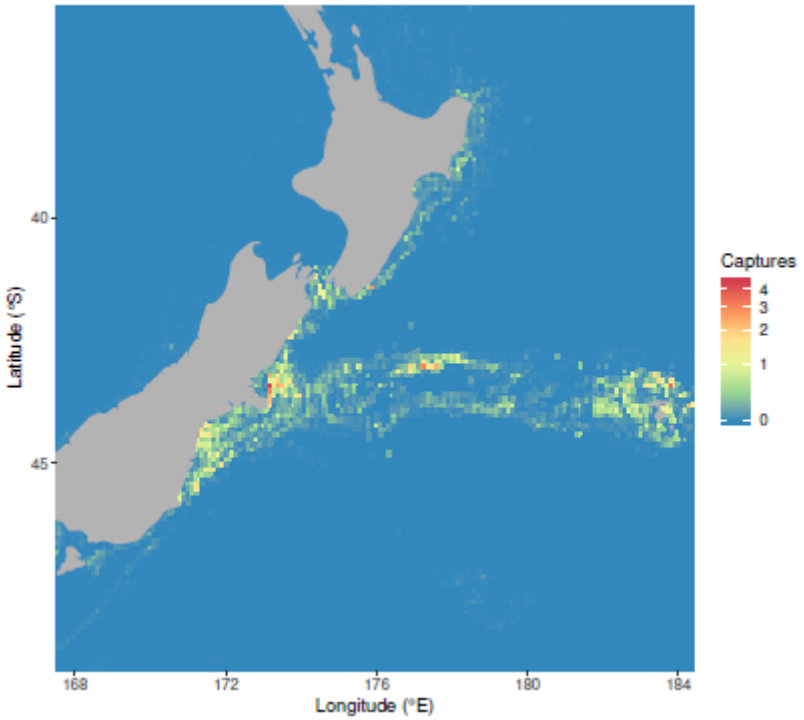


Figure 15 – Location of estimated Salvin's albatross captures during the 2016/17 year. Data taken from [Abraham & Richard 2019](#).

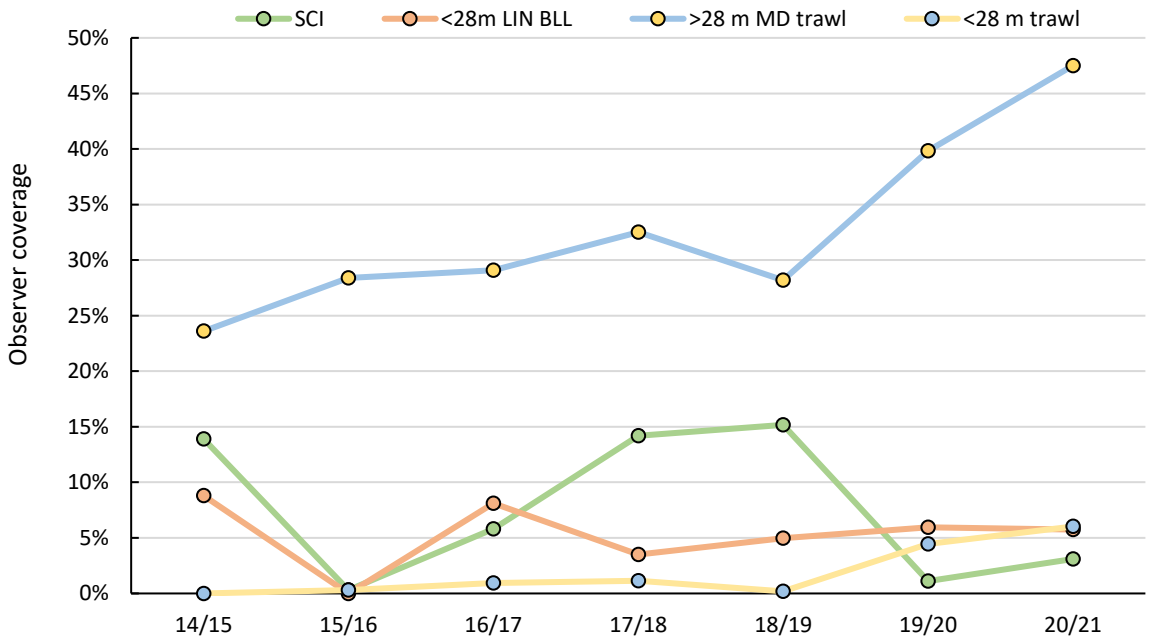


Figure 16 – Observer coverage rates for those fisheries estimated to pose the greatest risk to Salvin's albatross. All data limited to effort in FMAs 3 & 4. '*Middle-depth (MD)*' includes effort targeting alfonsino, barracouta, hake, hoki, ling and warehou species. '*<28 m trawl*' includes all effort by trawlers less than 28 m in overall length except those targeting scampi.

Westland petrel

Quantitative modelling of the location of estimated Westland petrel captures has not been conducted. However, the majority of observed captures have occurred close to the species breeding colonies on the South Islands West Coast. Observer coverage of those fisheries estimated to contribute the greatest risk to Westland petrel is shown in Figure 17.

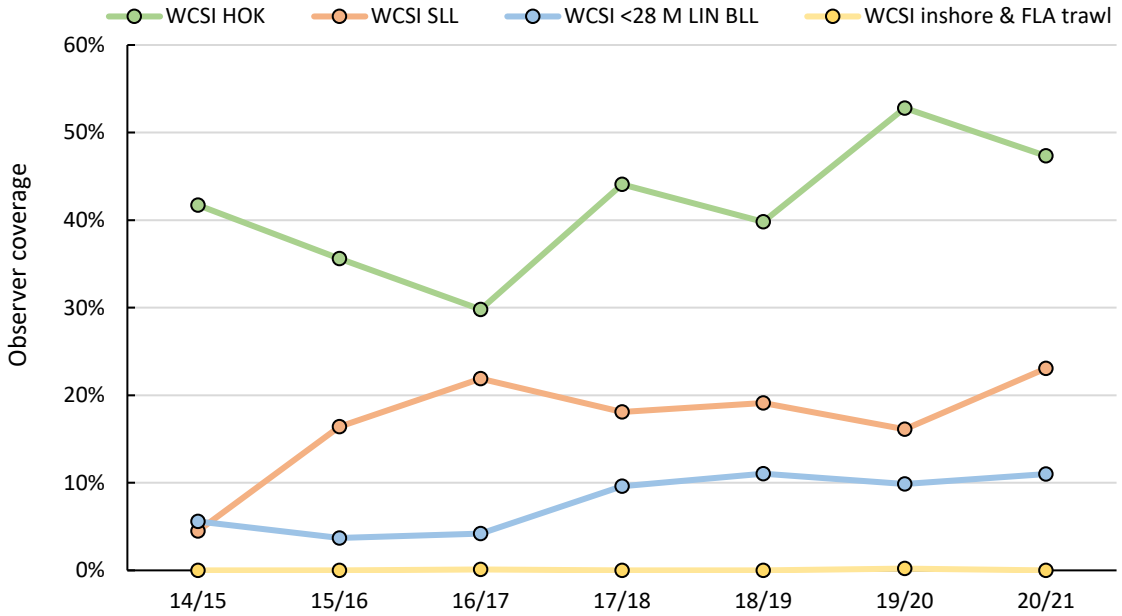


Figure 17 – Observer coverage rates for those fisheries estimated to pose the greatest risk to Westland petrel. All data limited to effort in FMA 7. Trawl data includes all vessels regardless of length; surface longline (SLL) data limited to vessels <28 m in length.

Hoiho

Quantitative modelling of the location of estimated hoiho captures has not been conducted. However, all observed captures have occurred close to the species breeding colonies off the east and south coasts of the South Island. Observer coverage of those fisheries estimated to contribute the greatest risk to hoiho is shown in Figure 18.

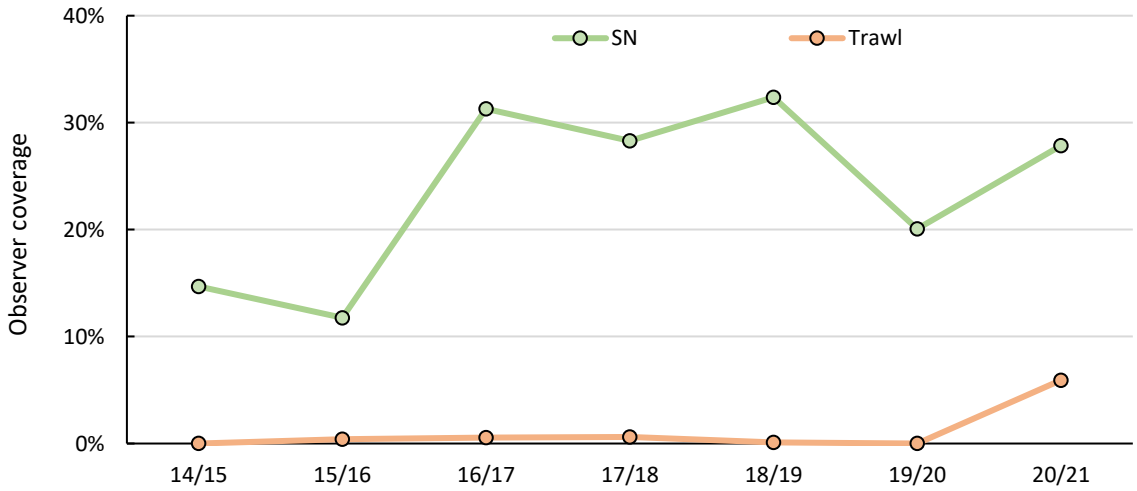


Figure 18 – Observer coverage rates for those commercial fisheries estimated to pose the greatest risk to hoiho. Data limited to the east and south coasts of the South Island (E&S SI) which are defined as statistical areas 024, 025, 026, 027, 028, 029, 030, 031 and 032. Data for set net excludes effort targeting flatfish, mullet, or kahawai.

Southern Buller's albatross

The majority of modelled southern Buller's albatross captures are estimated to occur in hoki and squid trawl fisheries off the West Coast of the South Island and the sub-Antarctic, and surface longline fisheries (Figure 19). Observer coverage of those fisheries estimated to contribute the greatest risk to southern Buller's albatross is shown in Figure 20.

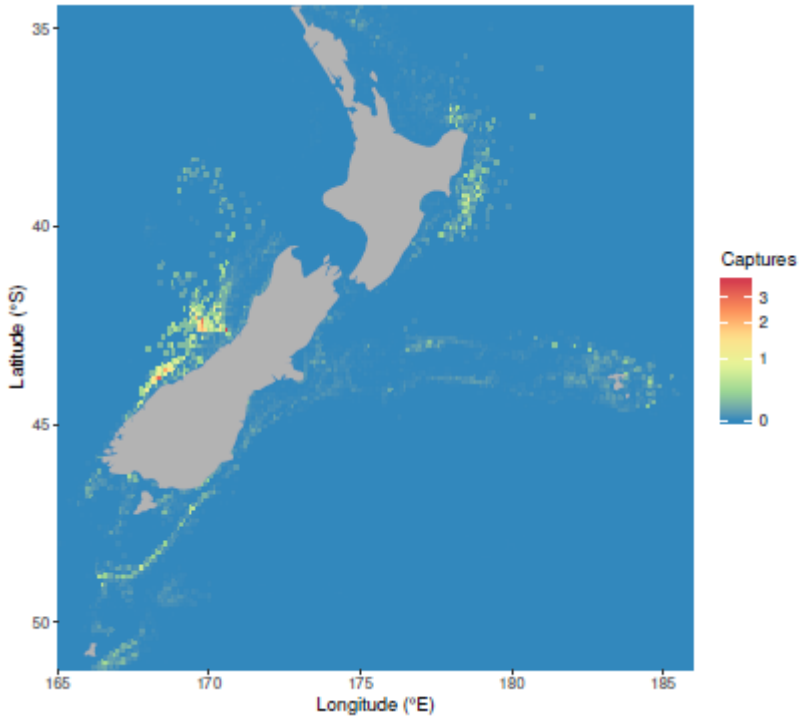


Figure 19 – Location of estimated Buller's albatross captures (both northern and southern sub-species combined) during the 2016/17 year. Data taken from Abraham & Richard 2019.

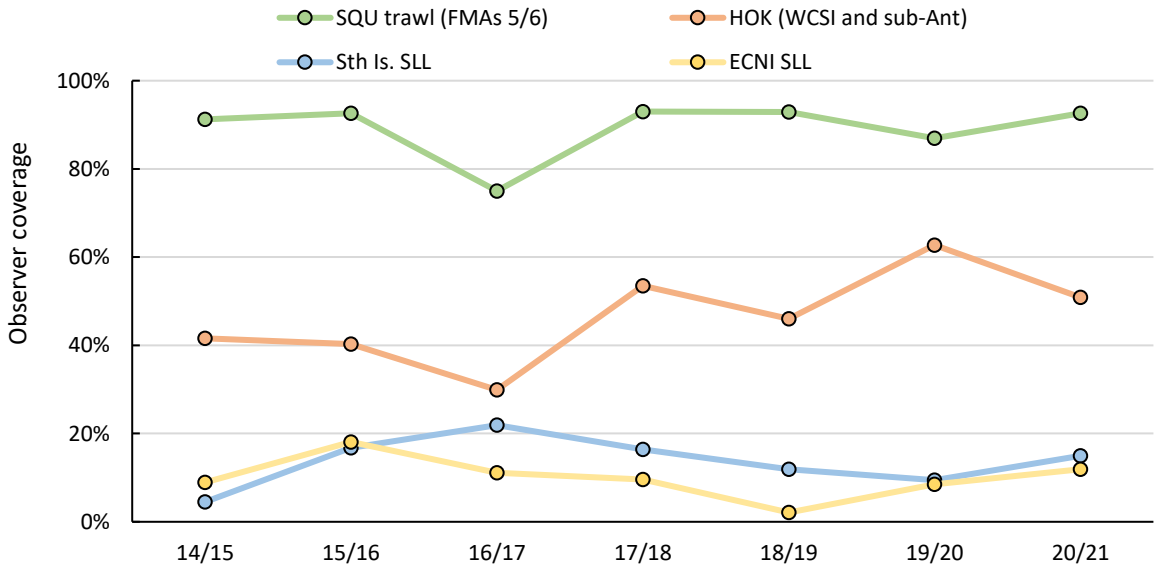


Figure 20 – Observer coverage rates for those commercial fisheries estimated to pose the greatest risk to southern Buller's albatross. Trawl data limited to vessels >28 m, surface longline (SLL) data limited to vessels <28 m in length. South Island (SI) SLL includes all effort in FMAs 3, 4, 5, 6 & 7; East Coast North Island (ECNI) SLL includes all effort in FMA 2.

Gibson's and Antipodean albatross

Quantitative modelling of the location of estimated Gibson's and Antipodean albatross captures has not been conducted. However, the majority of observed captures have occurred in surface longline fisheries off the North or East coasts of the North Island, or off the West Coast of the South Island.

Observer coverage of those fisheries estimated to contribute the greatest risk to Gibson's and Antipodean albatross is shown in Figure 21.

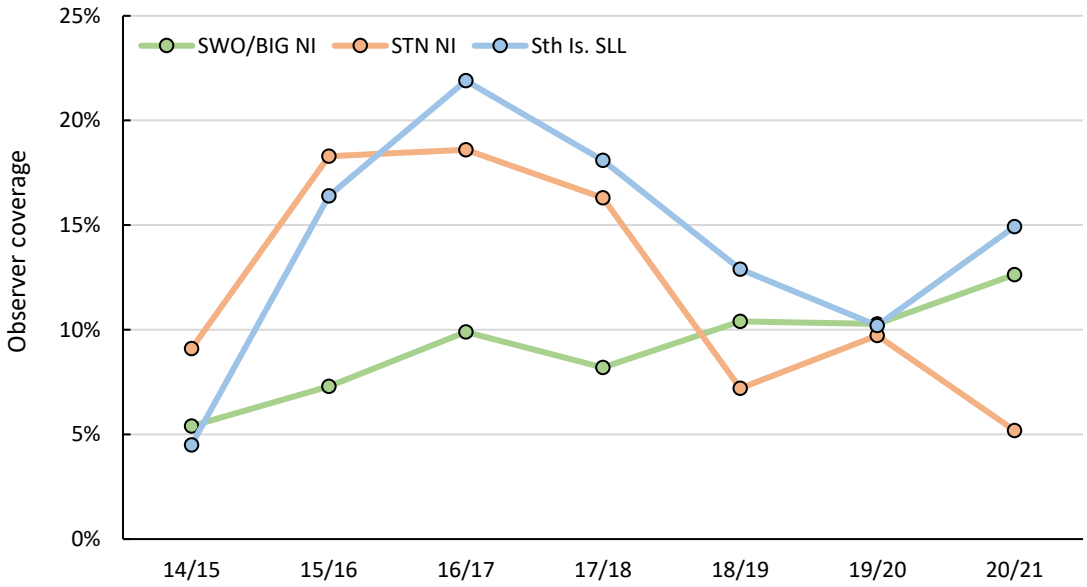


Figure 21 – Observer coverage rates for those commercial fisheries estimated to pose the greatest risk to Gibson's and Antipodean albatross. North Island includes all effort in FMAs 1, 2, 8 or 9 whilst South Island incudes all effort targeting swordfish, bigeye tuna or southern bluefin tuna in FMAs 3, 4, 5, 6 or 7.

Appendix 5 – Monitoring objectives, fishery risk, and observer coverage for 2021/22 in relation to species of particular concern

Introduction

Outputs from the seabird risk assessment will continue to be used as a prioritisation tool for various management activities including observer coverage.[44] The risk assessment estimates the level of risk to each seabird species posed by specific commercial fishery categories. Several of the fishery categories used in the risk assessment do not align completely with the fishery categories that are used for observer coverage planning purposes.

Generic monitoring objective

Fisheries New Zealand developed the first version of this document for the observer coverage plan for 2020/21. The document was developed to respond to performance measure 19 in the NPOA Seabirds 2020:

19	Monitoring objectives and needs are documented and updated annually, informed by the risk assessment and species conservation concern

In the 2020/21 version, a generic monitoring objective of 20% observer coverage for each fishery that contributes >10% of risk to the seabird species identified as being of particular concern was proposed. [45] That objective is also used in this document.

'Particular concern' means all those species identified through both the risk assessment (species categorised as at High or Very High risk) and review of other data (e.g. population monitoring indicating a significant population decline) and taking into account threat status. The species currently categorised as being of particular concern are set out in the table below.

Table 42. Seabird species of particular concern

Species	Risk category
Black petrel	Very high
Salvin's albatross	High risk
Westland petrel	
Flesh-footed shearwater	
Southern Buller's albatross	
Gibson's albatross	
Hoiho	Medium risk (species of 'particular concern')
Antipodean albatross	

For each of the eight species of particular concern, the following species-specific tables include:

- The fishery categories from the risk assessment that contribute >10% of risk to that species;
- Planned observer coverage for 2021/22 in relation to those fishery categories; and
- An assessment of whether the coverage is consistent with the generic monitoring objective
    - Assessments are colour-coded to indicate whether the generic monitoring objective is likely to be met during 2021/22

[44] Current seabird risk assessment available here
[45] The 2020/21 version is available as Appendix 5A of the Seabird Annual Report 2019/20

Indicates the generic monitoring objective is likely to be met or close to being met	Indicates the generic monitoring objective is unlikely to be met

Background

Observer coverage levels

Broadly, observer coverage across most of the deepwater and highly migratory species fisheries has been relatively consistent for a number of years. Coverage in some categories such as the scampi and small vessel bottom longline fisheries has increased in recent years.

Coverage of inshore fisheries has also been gradually increasing in recent years. This includes bottom longline fisheries in FMA1 and set net fisheries on the east and south coasts of the South Island. Recent coverage of inshore trawl fisheries around the east and south coasts of the South Island is also higher than historical coverage in this area.

Observer coverage planning

Fisheries New Zealand's observer programme is constrained as to the total number of days it can deliver. Fisheries New Zealand undertakes an annual planning process that considers requests for observer coverage (primarily from the deepwater, highly migratory species and inshore fisheries management teams but also from Fisheries Compliance). Requests are assessed against the programme's capacity to deliver and prioritised against considerations such as percentage coverage targets, Ministerial commitments, and international requirements.

Observer tasking

Some components of observer tasking are the top priorities for every trip; this includes recording protected species interactions and auditing performance against a vessel's Protected Species Risk Management Plan (PSRMP) or Operational Procedures. Depending on the nature of the trip, additional seabird-specific tasking may be undertaken, such as warp strike observations.

Acronyms used in tables

BIG – bigeye tuna
BLL – Bottom longline
BNS – bluenose
ECSI – east coast South Island
FMA – fishery management area
HPB – hāpuku / bass
LIN - ling
PSH – precision seafood harvesting
SCI - scampi
SCSI – south coast South Island
SLL – surface longline
SN – set net
SNA – snapper
SQU - squid
STN – southern bluefin tuna
SWO – swordfish
TAR – tarakihi
TMP – threat management plan (Hector's and Maui's dolphins)
WCSI – West Coast South Island

Table 43. Fishery risk and planned observer coverage for risk assessment fishery categories that contribute over 10% of the overall risk to **black petrel** (very high risk species)

Method or general fishery description	Fishery category (from risk assessment)	% of risk from risk assessment fishery category	Planned 2021/22 observer coverage			Comments
			Fishery name (from observer plan)	Expected % effort observer	Planned seadays	
Inshore trawl	Inshore trawl	45%	SNA1 – PSH	7	80	*The highest risk to black petrel is from the inshore trawl fishery (45% of overall risk). However, as the risk is primarily confined to FMA1, only the relevant FMA1 observer fishery categories have been included here.*[46] *Based on fishing activity during 2020/21, planned SNA1 trawl coverage, including PSH, (238 days in total) should equate to around 10% of total FMA1 inshore trawl effort. This is not consistent with the generic monitoring objective.*
			SNA1 trawl	12	158	
SLL	Bigeye SLL	14%	STN – North Island	At least 10%	145	*The surface longline fisheries collectively contribute 18% of risk to black petrel.*[47] *Based on fishing activity during Oct 2020 - May 2021, the coverage planned for the North Island swordfish/bigeye fishery for 2021/22 (120 days) is unlikely to cover 20% of effort.*[48]
			BIG/SWO – North Is.		120	
BLL	Snapper BLL	14%	BLL – SNA1	7	249	*Bottom longline fisheries collectively contribute 32% of risk to black petrel, primarily through*
	Bluenose BLL	14%	BLL – HPB/BNS1	15	74	

[46] Refer to page 18 of the following research report for location information of black petrel captures https://www.mpi.govt.nz/dmsdocument/36822-AEBR-226-Estimated-capture-of-seabirds-in-New-Zealand-trawl-and-longline-fisheries-to-201617

[47] As well as the 14% from the bigeye fishery, the swordfish fishery contributes an additional 4%.

[48] The species breeds between October to May but leaves New Zealand between June and September. The North Island southern bluefin fishery takes place primarily during winter (Jun-Aug), which is a time of year that black petrels are not present in New Zealand

						fisheries in FMA1.[49] The planned 2020/21 coverage in the SNA1 (249 days) and HPB1/BNS1 BLL fisheries (74 days) is expected to cover 7% and 15% of effort respectively. Based on fishing effort during 2020/21, planned coverage of bottom longline fisheries in FMA 1 during 2021/22 will likely cover less than 10% of total effort. It is therefore unlikely to meet the generic monitoring objective. Coverage will continue to be augmented by electronic monitoring (cameras).

[49] As well as the 14% from both the snapper and bluenose fisheries, the hāpuku and minor target BLL fisheries each contribute 2% of risk.

Table 44. Fishery risk and planned observer coverage for risk assessment fishery categories that contribute over 10% of the overall risk to **Salvin's albatross** (high risk species)

On the basis that risk is directly related to capture location information[50], risk for Salvin's albatross is spread across the east coasts of the South Island and North Island and the Chatham Rise. The west coasts of both islands, the south coast of the South Island and FMA 1 are largely excluded.

Method or general fishery description	Fishery category (from risk assessment)	% of risk from risk assessment fishery category	Planned 2021/22 observer coverage			Comments
			Fishery name (from observer plan)	Expected % effort observer	Planned seadays	
Inshore trawl	Inshore trawl	35%	TAR 2 trawl	10	154	*The highest risk to Salvin's albatross is from the inshore trawl fishery (35% of overall risk). The plan for 2021/22 includes 479 days and 154 days on the east coasts of the South Island and North Island respectively. This should equate to around 6% and 12% and of inshore trawl effort in FMAs 2 and 3 respectively. This is less than the generic monitoring objective but is higher than historic coverage in these fisheries.*
			ECSI trawl – TMP	35	295	
			ECSI trawl – TAR	30	184	
Deepwater trawl	Hoki trawl	16%	Chat. Rise mid. depth	30-40	680	*The hoki and middle depth fisheries contribute 16% and 11% of risk respectively to Salvin's albatross. Hoki and middle-depth coverage is spread around the South Island and Sub-Antarctic. Chatham Rise coverage for 2021/22 (680 days) is planned to achieve 30-40% of effort in this area and is consistent with the generic monitoring objective. Planned coverage of the Cook Strait hoki fishery (100 days) should*
	Middle depth trawl	11%	Cook Strait HOK	15-20	100	

[50] Refer to page 19 of this research report for location of estimated Salvin's albatross captures https://www.mpi.govt.nz/dmsdocument/36822-AEBR-226-Estimated-capture-of-seabirds-in-New-Zealand-trawl-and-longline-fisheries-to-201617

						equate to close to the generic monitoring objective.
Deepwater trawl	Scampi trawl	12%	SCI6A	25-30	201	*'SCI - other stocks' includes the SCI3 and SCI4A (Chatham Rise) fisheries and SCI2 (east coast North Island). The 200 days of planned coverage for 2021/22 may work out at only one observed trip for each scampi fishery outside SCI6A. The generic monitoring objective is unlikely to be met for any of the scampi fisheries outside SCI6A.*
			SCI – other stocks	10-15	200	
BLL	Small vessel ling BLL	12%	<34m mixed BLL	10-15	300	*The small vessel ling bottom longline fishery contributes 12% of risk to Salvin's albatross. The '<34m mixed BLL' category includes smaller vessels targeting ling. The 300 days in the 2021/22 coverage plan is based on covering 10-15% of effort in the fisheries in this category, which cover a larger area than just FMAs 2 and 3. Coverage is therefore unlikely to meet the generic monitoring objective.*

Table 45. Fishery risk and planned observer coverage for risk assessment fishery categories that contribute over 10% of the overall risk to **Westland petrel** (high risk species).

The distribution of this species is centred on the West Coast of the South Island and it is uncommon in FMAs 1 and 9. It is also not present in the country over summer.

Method or general fishery description	Fishery category (from risk assessment)	% of risk from risk assessment fishery category		Planned 2021/22 observer coverage			Comments
				Fishery name (from observer plan)	Expected % effort observer	Planned seadays	
SLL	Small vessel southern bluefin SLL	25%		STN - South Island	At least 10%	145	*The surface longline fisheries collectively contribute 31% of risk to Westland petrel.*[51] *The observer coverage planned for South Island surface longline fisheries for 2021/22 (170 days) may not be sufficient to cover up to 20% of effort*.
				BIG/SWO – South Is.		25	
Inshore trawl	Inshore trawl	22%		WCNI trawl	14	250	*The second highest risk to Westland petrel is from the inshore trawl fishery (22% of overall risk, with the flatfish trawl fishery contributing another 7%).*[52] *While around 1,000 days of inshore trawl coverage is planned for 2021/22 (not including coverage in FMA1), none of this is planned for the West Coast of the South Island where most observed captures of this species (across all methods) have been recorded to date.* [53]
				TAR 2 trawl	10	154	
				ECSI trawl – TMP	35	295	
				ECSI trawl – TAR	30	184	
				SCSI trawl	10	128	

[51] As well as the 25% of risk from the small vessel southern bluefin SLL fishery, the bigeye and swordfish fisheries each contribute an additional 3% of risk,
[52] The ECSI trawl – TMP and SCSI trawl observer fishery categories include the flatfish trawl fishery
[53] Refer to the protected species capture website for details on the location of observed Westland petrel captures

							Coverage is therefore unlikely to meet the generic monitoring objective.
Deepwater trawl	Hoki trawl	11%		Chat. Rise mid. depth	30-40	680	*The hoki trawl fishery contributes 11% of risk to Westland petrel with the middle depth fisheries contributing another 6%. Hoki and middle depth coverage is spread around the South Island and Sub-Antarctic. The extensive WCSI coverage planned for 2021/22 (600 days), should equate to over 50% of effort in this area, which as identified above, is where most captures have been recorded to date.*
				Sub-Ant mid. Depth	20-30	550	
				WCSI	50	500	
				WCSI (inside line)	15-20	100	
				Cook Strait HOK	15-20	100	

Table 46. Fishery risk and planned observer coverage for risk assessment fishery categories that contribute over 10% of the overall risk to **flesh-footed shearwater** (high risk species)

Method or general fishery description	Fishery category (from risk assessment)	% of risk from risk assessment fishery category	Planned 2021/22 observer coverage			Comments
			Fishery name (from observer plan)	Expected % effort observer	Planned seadays	
BLL	Snapper BLL	37%	BLL – SNA1	7	249	*Bottom longline fisheries collectively contribute 53% of risk to flesh-footed shearwater, primarily through the fisheries in FMA1.[54] The planned SNA1 and HPB1/BNS1 coverage for 2021/22 (323 days) is likely to represent less than 10% of bottom longline effort in FMA1 (based on 2020/21 data) and would not meet the generic monitoring objective. Observer coverage in FMA1 is augmented by electronic monitoring (cameras).*
	Minor target BLL	10%	BLL – HPB/BNS1	15	74	
			<34m mixed BLL	10-15	300	
Inshore trawl	Inshore trawl	30%	WCNI trawl	14	250	*The second-highest risk to flesh-footed shearwater is from the inshore trawl fishery (30% of overall risk).* *Just under 400 days of inshore trawl coverage in FMAs 1 and 2 is planned for 2021/22, which should equate to around 10% of effort (based on reported activity during 2020/21). This is not consistent with the generic monitoring objective.*
			SNA1 – PSH	7	80	
			SNA1 trawl	12	158	
			TAR 2 trawl	10	154	

[54] In addition to the snapper BLL and minor target BLL, the hāpuku BLL fishery contributes 6% of risk

Table 47. Fishery risk and planned observer coverage for risk assessment fishery categories that contribute over 10% of the overall risk to **southern Buller's albatross** (high risk species)

Method or general fishery description	Fishery category (from risk assessment)	% of risk from risk assessment fishery category	Planned 2021/22 observer coverage			Comments
			Fishery name (from observer plan)	Expected % effort observer	Planned seadays	
Deepwater trawl	Hoki trawl	31%	Chat. Rise mid. depth	30-40	680	*The hoki and middle depth trawl fisheries contribute 31% and 13% of risk respectively to southern Buller's albatross.[55] Hoki and middle depth coverage is spread around the South Island, Sub-Antarctic, and Chatham Rise. Collectively, the planned 2021/22 coverage (just under 2,000 days) should equate to around 40% of effort (based on 2021/22 data). This is consistent with the generic monitoring objective.*
	Middle depth	13%	Sub-Ant mid. depth	20-30	550	
			WCSI	50	500	
			WCSI – inside line	15-20	100	
			Cook Strait HOK	15-20	100	
SLL	Small vessel southern bluefin SLL	17%	STN – North Island	At least 10%	145	*The surface longline fisheries collectively contribute 20% of risk to southern Buller's albatross, primarily through the small vessel southern bluefin SLL fishery.[56] The southern bluefin coverage planned for 2021/22 (290 days) should cover between 10 and 20% of effort (based on 2020/21 data).*
			STN – South Island		145	
			BIG/SWO – North Is.		120	
			BIG/SWO – South Is.		25	
Deepwater trawl	Squid trawl	15%	SQU 6T, SQU 1T	80-90	1,960	*Although the coverage requirement is primarily for the SQU6T fishery, it results in high coverage across the sub-Antarctic (over 80% in recent years). Planned coverage of the squid trawl*

[55] Refer to page 19 of this research report for location of estimated Buller's albatross captures https://www.mpi.govt.nz/dmsdocument/36822-AEBR-226-Estimated-capture-of-seabirds-in-New-Zealand-trawl-and-longline-fisheries-to-201617

[56] The other SLL fisheries make up the additional 3% of risk.

						fishery for 2021/22 will be well above the generic monitoring objective.

Table 48. Fishery risk and planned observer coverage for risk assessment fishery categories that contribute over 10% of the overall risk to **Gibson's albatross** (high risk species)

Method or general fishery description	**Fishery category (from risk assessment)**	**% of risk from risk assessment fishery category**	**Planned 2021/22 observer coverage**			**Comments**
			Fishery name (from observer plan)	**Expected % effort observer**	**Planned seadays**	
SLL	Swordfish BLL	64%	STN – North Island	At least 10%	145	*The surface longline fisheries collectively contribute 93% of risk to Gibson's albatross.*[57] *The overall coverage planned for 2021/22 (435 days) may cover around 15% of effort across all fisheries (based on 2020/21 data). This is not consistent with the generic monitoring objective.*
	Small vessel southern bluefin SLL	22%	STN – South Island		145	
			BIG/SWO – North Is.		120	
			BIG/SWO – South Is.		25	

[57] In addition to the swordfish BLL (64%) and small vessel bluefin SLL fisheries (22%), the bigeye SLL fishery contributes another 7% of risk.

Table 49. Fishery risk and planned observer coverage for risk assessment fishery categories that contribute over 10% of the overall risk to **hoiho** (species identified as being of particular concern)

Method or general fishery description	Fishery category (from risk assessment)	% of risk from risk assessment fishery category	Planned 2021/22 observer coverage			Comments
			Fishery name (from observer plan)	Expected % effort observer	Planned seadays	
Set net	Shark	57%	SN – ECSI (Kaikoura)	25	284	*Set net fisheries collectively contribute 81% of risk to hoiho. The coverage planned for Otago and the south coast of the South Island during 2021/22 (461 days) is expected to cover 65% of effort in these set net fisheries. Most of this coverage will likely be where fishers target shark species (which contributes 57% of risk) and butterfish (included in the minor target category, which contributes 14% of risk).* *Set net coverage is consistent with the generic monitoring objective.*
	Minor target	14%	SN – SCSI	65	181	
	Flatfish	10%	SN – ECSI (Otago)	65	280	

Table 50. Fishery risk and planned observer coverage for risk assessment fishery categories that contribute over 10% of the overall risk to **Antipodean albatross** (species identified as being of particular concern)

Method or general fishery description	Fishery category (from risk assessment)	% of risk from risk assessment fishery category	Planned 2021/22 observer coverage			Comments
			Fishery name (from observer plan)	Expected % effort observer	Planned seadays	
SLL	Swordfish BLL	54%	STN – North Island	At least 10%	145	*The surface longline fisheries collectively contribute 84% of risk to Antipodean albatross.*[58] *The overall coverage planned for 2021/22 (435 days) may cover around 15% of effort across all fisheries (based on 2020/21 data). This is not consistent with the generic monitoring objective.*
	Small vessel southern bluefin SLL	22%	STN – South Island		145	
			BIG/SWO – North Is.		120	
			BIG/SWO – South Is.		25	

[58] In addition to the swordfish BLL (54%) and small vessel southern bluefin SLL (22%) fisheries, the bigeye SLL fishery contributes another 8% of risk.

Appendix 6 – Seabird research

Table 51 – Research reports not specifically focused on seabird populations of particular concern, but of relevance to seabirds, published during the 2020/21 financial year.

DOC bycatch programme reports	
BCBC2020-05	Spatial and temporal patterns in the diet of New Zealand king shag
	Numbers of northern royal albatross chicks and northern giant petrel adults on the Chatham Islands, September 2020
	Status of northern royal albatross *Diomedea sanfordi* nesting on the Chatham Islands, December 2020
BCBC2020-24	Otago and Foveaux shags population census trials
BCB2019-07a	Capture of protected species in New Zealand recreational marine fisheries
BCBC2019-05	Occurrence of prey species identified from remains in regurgitated pellets collected from king shags 2019-2020
POP2019-02	Fish shoal dynamics in north-eastern New Zealand
POP2020-04	Grey petrel population estimate methodology, Antipodes Island
BCBC2019-05	Determining the diet of New Zealand king shag using DNA metabarcoding
Fisheries New Zealand Aquatic Environment and Biodiversity Reports (AEBRs)	
AEBR-251	Seabird captures during the FMA1 bottom longline fishery in the 2017/18 fishing year: comparison of electronic monitoring, observer, and audit data
AEBR-249	Estimated capture of seabirds in New Zealand trawl and longline fisheries to 2017-18
AEBR-246	Population trends, at-sea distribution, and breeding population size of black petrels (*Procellaria parkinsoni*) – 2018/19 operational report
AEBR-244	Demographic assessment of black petrels (*Procellaria parksonsoni*) on Great Barroer Island (Aotea)
AEBR-243	Modelling marine habitat utilisation by yellow-eyed penguins along their mainland distribution: baseline information
AEBR-242	Estimated population size of the Westland petrel, 2007-2011

Appendix 7 – Mitigation Research

Table 52 – Research reports related to seabird bycatch mitigation published during the 2020/21 financial year.

DOC bycatch programme reports	
IT2020-03	Mitigation gaps analysis towards reducing protected species bycatch
MIT2019-03	Lighting adjustments to mitigate against fishing vessel deck strikes / vessel impacts
MIT2018-03	Development of an adaptive management tool for line setting
MIT2018-02	Hauling mitigation for small longline vessels
BCBC2020-11c	Longline sink rate verification

Appendix 8 – Delivery of the 2020/21 observer seadays plan

Observer coverage is planned based on a combination of desired percentage coverage targets, the number of days required to achieve biological sampling targets and an estimate of the number of days necessary to comply with operational plans (e.g. 100% coverage on vessels operating in the southern blue whiting fishery). Additional information on the planning of observer coverage can be found in the Annual Operational Plans for deepwater and highly migratory species Fisheries, and the Conservation Services Programme annual plans.

The planned number of observer seadays, and the number of days achieved for the 2020/21 financial year is shown in the table below. An observer seaday is defined as one day on which an observer is placed on board a vessel that has left port for the purposes of fishing.

The planned number of observer seadays may not have been achieved in certain fisheries for a number of reasons including:

- Prioritisation of observers onto those vessels participating in fisheries requiring high levels of observer coverage (e.g. SQU 6T)
- Difficulties associated with deploying observers during level 3 and 4 COVID restrictions
- Fewer vessels participating in fisheries than expected (of particular relevance to fisheries with high percentage effort targets e.g. southern blue whiting)

Table 53 - Comparison of planned, and achieved, observer coverage for the 2020/21 financial year.

Fishery	Target stocks	Days planned	Days achieved	% achieved
Deepwater and middle-depth fisheries				
North Island deepwater	ORH 1, ORH 2A, ORH 2B, ORH 3A, BYX 2 & CDL 2	75	53	57%
Chatham Rise deepwater	ORH 3B, OEO 3A, OEO 4 & BYX 3	250	233	93%
Sub-Antarctic deepwater	ORH 3B, OEO 1 & OEO 6	75	60	80%
West Coast deepwater	ORH 7A	60	97	162%
West Coast North Island	JMA 7, EMA 7 & BAR 7	300	300	100%
West Coast South Island (FMA 7)	HOK 1, HAK 7, LIN 7 & SWA 1	650	575	121%
WCSI HOK 'inside the line'	HOK 1	100	113	113%
Cook Strait HOK	HOK 1	100	94	94%
Chatham Rise middle-depth (FMA 3/FMA 4)	HOK 1, HAK 1, HAK 4, LIN 3, LIN 4, SWA 3, SWA 4, JMA 3, BAR 1 & BAR 4	825	734	89%
Sub-Antarctic middle-depth exc. SQU/SBW (FMA5/FMA6)	HOK1, SWA 4, WWA 5B, BAR 5 & JMA 3	655	487	74%
Southern blue whiting	SBW (all)	450	254	56%
Squid	SQU 1T & SQU 6T	1,600	2,253	141%
Bottom longline	LIN 3 – LIN 7	300	285	95%
Scampi	Scampi (all)	375	331	88%
Inshore fisheries				
WCNI set net + BLL + trawl	JDO 1; SCH 1; TRE 7; SNA 8; KAH 8; TAR 1; GUR 1 + others	330	329	100%
SNA 1 trawl - standard	SNA 1	218	180	83%
SNA 1 trawl - PSH	SNA 1	70	70	100%
TAR 2 trawl	TAR 2	154	142	92%
SNA 1 bottom longline	SNA 1	325	291	90%
HPB/BNS 1 bottom longline	BNS 1; HPB 1	101	67	66%
ECSI set net – Kaikoura	SCH 3; SPO 3; ELE 3; MOK 3	284	151	53%
ECSI set net – Otago	SCH 3; SPO 3; ELE 3; MOK 3	133	99	74%
Southland set net	SCH 5; SPO 3; ELE 5; SPD 5; BUT 5	181	162	60%
Set net – BNS 1	BNS 1; HPB 1	23	0	0%
ECSI Trawl- TMP	FLA 3; GUR 3	240	216	90%
ECSI Trawl- TAR	TAR 3	393	153	39%
SCSI Trawl	FLA 3, STA 5	128	93	73%
Highly migratory species fisheries				
North Island BIG/SWO SLL	BIG 1; SWO 1	115	96	83%
South Island BIG/SWO SLL	BIG 1; SWO 1	20	13	65%
North Island STN SLL	STN 1	155	171	110%
South Island STN SLL	STN 1	140	76	54%
Purse seine	SKJ 1	102	29	102%

Appendix 9 – Capture rate reduction targets developed under NPOA Seabirds 2013.

During the life of the NPOA Seabirds 2013, a working group of the SAG was tasked with determining a set of principles that could be used to determine capture rate reduction targets. The group recommended that fisheries be defined using the same groupings as that of the seabird risk assessment model, and that targets should be quantitative wherever possible. These targets would then be compared to a baseline capture rate, which was defined as the average estimated capture rate across the three-year block leading up to the implementation of the NPOA Seabirds 2013 (the 2010/11 to 2012/13 fishing years) with at least 10% observer coverage and an estimated seabird capture rate coefficient of variation (CV) of less than 0.30. It was also agreed that these targets should be meaningful, and a test was devised based on the level of actual observed captures, the estimated captures, and the corresponding capture rate.

Fisheries with meaningful capture reduction rate target

Using this approach, in 2015, the SAG agreed that **two fisheries** (>28 m squid trawl and >28 m middle-depth trawl)[59] have sufficient information to set numerical capture rate reduction targets.

For >28 m squid trawl, the capture rate reduction target was agreed at 12.0 estimated captures per 100 tows (14% reduction compared to the baseline of 14.0 estimated captures per 100 tows). For >28 m middle depth trawl, the capture rate reduction target was agreed at 2.3 estimated captures per 100 tows (15% reduction compared to the baseline of 2.7 estimated captures per 100 tow).

The information that is used to monitor capture rates is taken from the protected species capture website, from which data up to the end of the 2019/20 fishing year was available. Since data from 2018/19 was incorporated, estimated captures have only been available at a fishery level. For example, estimated capture information by vessel size, e.g. >28m trawl vessels, has not been available. This means that while the fishing effort component of capture rate calculations is available, the corresponding estimated capture information is only available at the fleet level. This means that the estimated capture rate information presented below is likely to be over-estimated, particularly for the middle depth fisheries. Consequently, the information may not be directly comparable to information that has previously been published.

Figure 22 shows the estimated capture rates for the >28m squid trawl and >28 m middle-depth trawl fisheries. Based on the estimated number of captures calculated using data up to the end of 2019/20, the capture rate reduction target for squid was met for the three-year rolling averages for the 2017/18 and 2018/19 fishing years.

The capture rate for middle-depth trawl has remained above the target during this time.

[59] >28 m middle-depth trawl includes fishing effort targeting hoki, hake, ling, barracouta and warehou species.

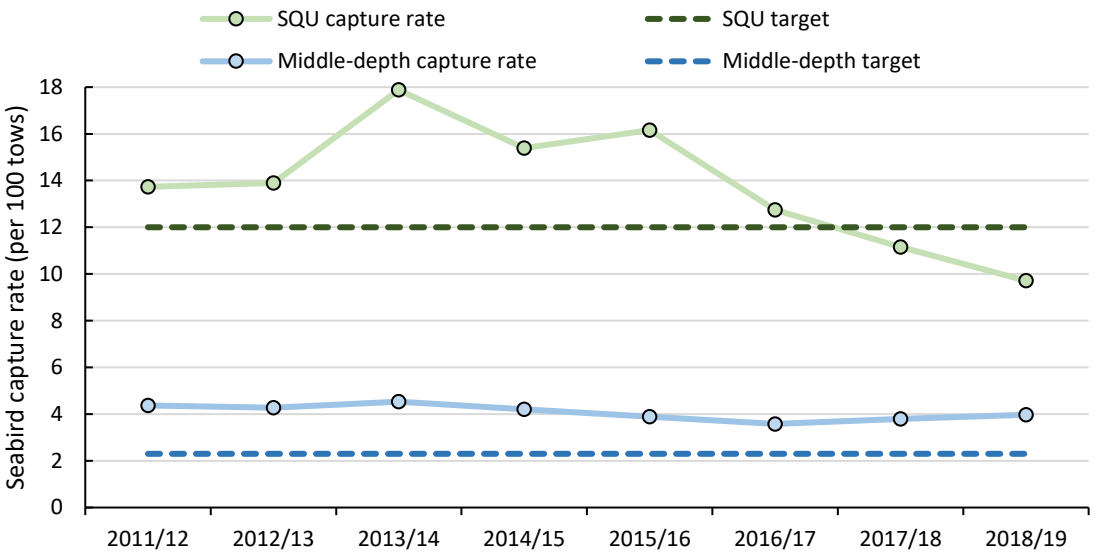


Figure 22 – Estimated seabird capture rates (captures per 100 tows) relative to agreed reduction targets, for the >28 m squid and middle-depth trawl fisheries between the 2011/12 and 2018/19 fishing years. As seabird capture rates are expressed as three-year rolling averages, data for 2018/19 represents the average for the 2017/18, 2018/19, and 2019/20 years. Data taken from the Protected Species Capture webpage.

Fisheries with baseline capture rate

For **three fisheries** (deepwater,[60] jack mackerel, and southern blue whiting trawl) sufficient information was available to calculate a baseline capture rate. As meaningful target could not be set, a target of '*no significant increase in capture rates*' was set. A baseline capture rate for the >28 m ling bottom longline fishery was subsequently calculated (refer to the deepwater fisheries Annual Review Report for 2016/17).

The initial baseline capture rates were calculated in 2015 using estimated captures for the three fishing years between 2010/11 and 2012/13. The model that is used to determine estimated captures is updated regularly. As a result, the number of estimated captures for a specific fishery may not remain static for a given fishing year. This resulted in the scenario in the 2018/19 Seabird Annual Report where the estimated capture rates for the deepwater and jack mackerel fisheries in 2011/12 were below the baseline; it should be the same as the baseline.

For this reason, Fisheries New Zealand recalculates the baseline capture rates using the most recent version of the protected species website. The issues that were outlined earlier about estimated capture information not being available for vessel size also apply to this data.

Figure 23 shows the estimated capture rates for the three fisheries. Between 2011/12 and 2018/19, the estimated seabird capture rate for deepwater has remained at around the level of the baseline. The estimated seabird capture rate for the jack mackerel trawl fishery stayed below the baseline whilst that of southern blue whiting has been below the baseline since the 2014/15 fishing year.

Data was not available to calculate capture rates for the >28 m ling bottom longline fishery.

[60] Deepwater trawl includes fishing effort targeting orange roughy, oreo species and black cardinalfish.

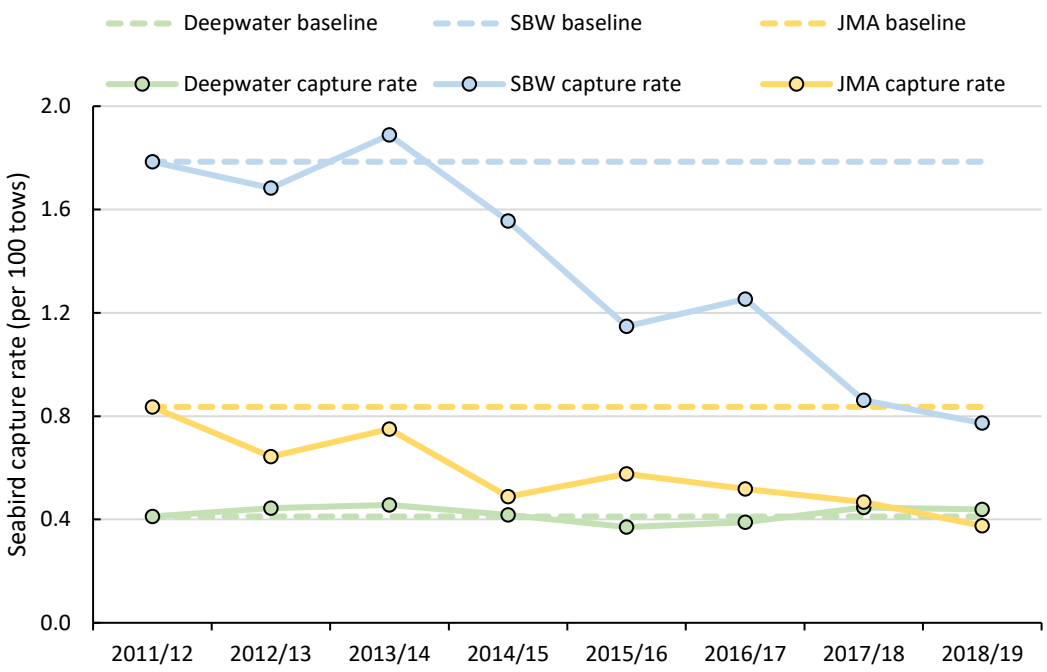


Figure 23 – Estimated seabird capture rates (captures per 100 tows) relative to baseline capture rates, for the deepwater, jack mackerel and southern blue whiting trawl fisheries between the 2011/12 and 2018/19 fishing years. As seabird capture rates are expressed as three-year rolling averages, data for 2018/19 represents the average for the 2017/18, 2018/19, and 2019/20 years. Data taken from the Protected Species Capture webpage.