



Report to the Ecologically Related Species Working Group

New Zealand

Prepared for the 13th Meeting of the Ecologically Related Species Working Group (ERSWG13)
of the Commission for the Conservation of Southern Bluefin Tuna (CCSBT)

May 2019

Disclaimer

While every effort has been made to ensure the information in this publication is accurate, Fisheries New Zealand does not accept any responsibility or liability for error of fact, omission, interpretation or opinion that may be present, nor for the consequences of any decisions based on this information.

Disclaimer	i
1 Introduction	1
1.1 General comments on fishing methods by which southern bluefin tuna is caught in party fisheries (by fleet, area, and time).	1
1.2 General comments on type and magnitude of ecologically related species (ERS) caught by fishery/method.	1
2 Review of SBT fisheries	1
2.1 Fleet size and distribution (brief summary of trends)	1
2.2 Distribution of Catch and Effort (Summary of catch and effort by area and fleet)	2
3 Fisheries monitoring for each fleet	3
3.1 Summary of recent observer coverage of SBT fisheries fleets	3
3.2 Summary of data collection activities of observers.	3
3.3 Summary of data collection activities from non observed activities.	3
4 Seabirds	4
4.1 Summary of cpue and total numbers of seabirds incidentally caught by area and fleet and list of numbers of each seabird species caught reported from observers.	4
4.2 Summary of seabird captures from sources other than observers.	4
5 Other non-target fish	5
5.1 Summary of cpue and total numbers of shark and the predominant non-target fish species by area and fleet reported from observers.	5
5.2 Summary of non-target fish captures from sources other than observers.	5
6 Marine mammal and marine reptile	5
6.1 Summary of total numbers of marine mammal and marine reptile incidentally caught reported from observers.	5
6.2 Summary of marine mammal and marine reptile captures from sources other than observers.	5
7 Mitigation measures to minimise seabird and other species bycatch	5
7.1 Current Measures	5
7.2 Measures under Development/Testing	7
8 Public relations and education activities	8
8.1 Public Relations Activities	8
8.2 Education	8
8.3 Information Exchange	8
9 Information on other ERS (non-bycatch), such as prey and predator species	9
10 Others	9
11 Implementation of the IPOA-Seabirds and IPOA-Sharks	9
11.1 Activities undertaken for the implementation of NPOAs in relation to SBT fisheries	9
12 Appendix – Tables	12
13 Appendix – Figures	38
14 Annex	42

1 Introduction

1.1 GENERAL COMMENTS ON FISHING METHODS BY WHICH SOUTHERN BLUEFIN TUNA IS CAUGHT IN PARTY FISHERIES (BY FLEET, AREA, AND TIME).

Since the start of New Zealand's southern bluefin tuna (SBT) fishery, handline, trolling, and surface longlines have been used to target SBT in the New Zealand Exclusive Economic Zone (EEZ). All but a few tonnes of the SBT catch is now taken in the surface longline fishery.

The SBT surface longline fishery primarily occurs off the west coast of the South Island, and the east coast of the North Island of New Zealand.

The main fishing season for SBT generally begins in April/May and finishes in August/September. Small amounts of SBT are also caught as bycatch outside of the main fishing period.

1.2 GENERAL COMMENTS ON TYPE AND MAGNITUDE OF ECOLOGICALLY RELATED SPECIES (ERS) CAUGHT BY FISHERY/METHOD.

Protected species, such as seabirds, fur seals, and turtles, are caught as bycatch in the New Zealand SBT surface longline fishery. Seabirds are the most common protected species bycatch. During 2016, observed seabird captures increased substantially and were primarily driven by a few high mortality incidents. No high mortality events were observed in 2017 and totals for that year dropped significantly.

Non-target fish species, such as blue sharks, mako sharks, ray's bream, and albacore, are also caught as bycatch in the New Zealand SBT surface longline fishery. Blue sharks are the most common non-target fish bycatch, and usually result in live release. During 2016 and 2017, observed blue shark captures remained at similar levels as those seen in previous years.

2 Review of SBT fisheries

SBT catch has steadily increased since the early 1990s, with 2016 reaching a record high of 950.8 tonnes, dropping to 913.3 tonnes in 2017 (**Table 1**, **Table 2**, and **Table 3**).

Total effort has also steadily increased, peaking around 2003 before declining back to similar levels as the 1990s (**Table 4** and **Table 5**).

2.1 FLEET SIZE AND DISTRIBUTION (BRIEF SUMMARY OF TRENDS)

The number of vessels catching SBT in New Zealand fisheries waters by year is provided in **Table 6**.

2.1.1 Trends by season

Up until 1991, foreign charter vessels dominated the New Zealand SBT fishery. In 1991, the first domestic longline vessel began fishing for SBT, and then throughout the 1990s and early 2000s the domestic fleet expanded. Since around the time that SBT was introduced into the quota management system, the number of vessels operating in the New Zealand fishery has been declining, with 32 vessels operating in the fishery during the 2016/17 fishing year

2.1.2 Trends by area

The SBT surface longline fishery primarily occurs off the east coast of the North Island, north of 40° South, in CCSBT statistical area 5 (area 5), and off the west coast of the South Island, south of 40° South, in CCSBT statistical area 6 (area 6).

Historically, the charter fleet, which was primarily composed of the larger -60° freezer vessels, dominated the west coast South Island fishery. The charter vessels left the fishery in 2016 after there were changes in legislation (**Figure 1** and **Figure 2**).

The domestic fleet is primarily composed of smaller vessels, which operate mainly in the longline fishery off the east coast of the North Island, however, in recent years, domestic vessels have increased effort off the west coast of the South Island replacing some of the effort previously made by the foreign charter fleet (**Figure 3** and **Figure 4**). The domestic vessels are usually at sea for a few days, and land SBT both as a target and as a bycatch of bigeye and swordfish target sets.

2.2 DISTRIBUTION OF CATCH AND EFFORT (SUMMARY OF CATCH AND EFFORT BY AREA AND FLEET)

Maps of historical catch and effort by the SBT fishery are provided in **Figure 1** and **Figure 2** for the charter fleet, and **Figure 3** and **Figure 4** for the domestic fleet.

2.2.1 Summary by area

For the charter fleet, catch and effort predominantly occurred in area 6, with under 10 percent of total charter catch and effort occurring in area 5 (**Table 2**, **Table 4**, **Figure 1**, and **Figure 2**).

For the domestic fleet, effort increased dramatically in both areas from 1994 to 2003, which was followed by a decline to a low level in 2007 and 2008, particularly in area 6 (**Table 5** and **Figure 3**). This decline is associated with a substantial decrease in the number of vessels in the surface longline fleet (**Table 6**), and the removal from the fleet of a domestically-owned freezer vessel that fished in area 6. Since 2008, domestic vessels have increased effort in area 6. This increased effort has been reflected in increased catch in area 6, which reached 429 tonnes in 2017, almost equalling catch in area 5 (483.2 tonnes) (**Table 3** and **Figure 4**).

2.2.2 Summary by fleet

For the foreign charter fleet, catch fluctuated around 200 tonnes since the early 1990s (**Table 2**). Effort gradually declined from the early 1990s to 2016, when, due to changes in legislation, the vessels left the fishery (**Table 4**).

For the domestic fleet, catch remained below 300 tonnes up until 2012 when it began increasing, peaking in 2016 at 950.8 tonnes (**Table 3**).

Total effort in the fishery was around 25 percent less than levels seen prior to the exit of the foreign charter fleet. A longline fishery targeting other highly migratory species also operates outside the SBT fishing season, and this data has been included as “Other” (**Table 5**).

3 Fisheries monitoring for each fleet

3.1 SUMMARY OF RECENT OBSERVER COVERAGE OF SBT FISHERIES FLEETS

Observer coverage of the SBT surface longline fishery is provided by area in **Table 8**, **Table 9**, **Table 10**, and **Table 11**.

In 2016, 23 percent of the domestic catch and 19 percent of the domestic effort was observed, and in 2017, 21 percent of the domestic catch and 20 percent of the domestic effort was observed (**Table 8** and **Table 10**).

3.2 SUMMARY OF DATA COLLECTION ACTIVITIES OF OBSERVERS.

3.2.1 Biological information

Observers from the scientific Observer Programme are responsible for collecting biological data on SBT and bycatch for catch characterisation.

Length, weight (both processed and whole weights), and sex are recorded regularly for SBT and all major fish bycatch species. Observers on board the charter vessels collected otoliths from as many SBT as possible. It is often not feasible to collect otoliths on the domestic vessels due to the smaller size and the different processing practices. Otoliths have also been collected from recreational SBT fishers in the most recent year.

Full biological information is recorded for non-fish species (e.g. seabirds, turtles, marine mammals).

3.2.2 Fish bycatch estimates

Data from the Observer Programme are used to quantify the extent of fish bycatch caught in the SBT surface longline fishery. The data provides information on which species appeared as bycatch, the catch per unit effort (**CPUE**) of the most common species, and estimates of total catch.

3.2.3 CCSBT dart tags

During the 2017 calendar year, two dart tags were recovered during observed trips. One tag was recovered from a fish caught in area 5, which had a fork length of 138 centimetres. The other tag was recovered from a fish caught in area 6, which had a fork length of 123 centimetres. During the 2018 calendar year, one dart tag was recovered during observed trips. The tag was recovered from a fish caught in area 5, which had a fork length of 112 centimetres.

3.3 SUMMARY OF DATA COLLECTION ACTIVITIES FROM NON OBSERVED ACTIVITIES.

3.3.1 Southern bluefin tuna

From 1 October 2004, when SBT was introduced into the quota management system, the catch monitoring and catch balancing systems in place for all other New Zealand quota species were applied to SBT. All fishers are required to furnish monthly returns of catch (in addition to furnishing log books).

3.3.2 Fish bycatch - quota species

Most fish species associated with the SBT fishery within the New Zealand EEZ were introduced into the quota management on 1 October 2004. All fishers are required to furnish monthly returns of catch for these associated species (in addition to furnishing log books).

The total allowable catch (TAC) of fish bycatch species associated with New Zealand's SBT longline fishery is presented in **Table 7**.

3.3.3 Fish bycatch - non-quota species

Some species caught as bycatch in the SBT fishery are not managed under the quota management system, for example albacore tuna and striped marlin. However, fishers are required to report the catch of all species, including any non-quota management system species, when furnishing their monthly returns. As a result, the commercial reporting requirements provide information on total catch and effort of fish bycatch in the SBT fishery. For additional information on quota and non-quota fish species bycatch, see section 5.

3.3.4 Non-fish and protected species bycatch reporting

Events of non-fish bycatch and protected species bycatch are reported by fishers on separate Non-fish and Protected Species Returns. This applies to both observed and unobserved trips.

3.3.5 Electronic monitoring and reporting

This year (during 2019), electronic reporting and geospatial position reporting are being introduced into the New Zealand commercial fishing fleet. Electronic monitoring will be phased in over the next couple of years.

4 Seabirds

The majority of seabirds are protected in New Zealand under legislation.

4.1 SUMMARY OF CPUE AND TOTAL NUMBERS OF SEABIRDS INCIDENTALLY CAUGHT BY AREA AND FLEET AND LIST OF NUMBERS OF EACH SEABIRD SPECIES CAUGHT REPORTED FROM OBSERVERS.

Seabird captures by area during 2016, 2017 and 2018 are provided in **Table 12** to **Table 17**.

In area 5, observed seabird captures remained at a similar level during 2016 and 2017, before falling in 2018.

In area 6, observed seabird captures increased substantially in 2016 compared with previous years. The increase was primarily driven by a few high mortality incidents. No high mortality events were observed in 2017 and captures for that year dropped significantly. In 2018, observed captures increased again, with higher capture and mortality rates than seen in 2016. As in 2016, the increase was primarily driven by a few high mortality incidents.

4.2 SUMMARY OF SEABIRD CAPTURES FROM SOURCES OTHER THAN OBSERVERS.

Seabird captures are reported via commercial reporting, and fishers are also encouraged to report certain captures to Liaison Officers of the Protected Species Liaison Officer Programme.

Commercially reported seabird captures are provided in **Table 30**.

5 Other non-target fish

5.1 SUMMARY OF CPUE AND TOTAL NUMBERS OF SHARK AND THE PREDOMINANT NON-TARGET FISH SPECIES BY AREA AND FLEET REPORTED FROM OBSERVERS.

Non-target fish captures by area during 2016, 2017, and 2018 are provided in **Table 18** to **Table 23**.

Blue shark are the most commonly caught shark and non-target fish species. The capture rate was between 29 and 36 per 1,000 hooks for both area 5 and area 6, however increasing in 2018 in area 6 to over 50 per 1,000 hooks.

5.2 SUMMARY OF NON-TARGET FISH CAPTURES FROM SOURCES OTHER THAN OBSERVERS.

Non-target fish captures are also reported via commercial reporting, and are provided in **Table 31**.

6 Marine mammal and marine reptile

The majority of marine mammals are protected in New Zealand under legislation.

6.1 SUMMARY OF TOTAL NUMBERS OF MARINE MAMMAL AND MARINE REPTILE INCIDENTALLY CAUGHT REPORTED FROM OBSERVERS.

Marine mammal and marine reptile captures by area during 2016, 2017, and 2018 are provided in **Table 24** to **Table 29**.

Observed turtle captures have remained at a low level (of one capture, released alive) in area 5 in 2016, 2017, and 2018. There were no observed turtle captures in area 6.

6.2 SUMMARY OF MARINE MAMMAL AND MARINE REPTILE CAPTURES FROM SOURCES OTHER THAN OBSERVERS.

Marine mammal and marine reptile captures are also reported via commercial reporting, and to Liaison Officers of the Protected Species Liaison Officer Programme.

Commercially reported captures are provided in **Table 32** and **Table 33**.

7 Mitigation measures to minimise seabird and other species bycatch

7.1 CURRENT MEASURES

7.1.1 Mandatory measures for each fleet

Mandatory measures for the surface longline fleet are specified in the Fisheries (Seabird Mitigation Measures – Surface Longline) Circular 2018. Commercial surface longline fishers are required to use two of three prescribed mitigation measures when setting surface longline fishing gear:

1. Use a tori line, *and*
2. *Either:*
 - a. Use line weighting, *or*
 - b. Set lines at night

These requirements were based on early advice from the Agreement for the Conservation of Albatrosses and Petrels (ACAP), which were incorporated into WCPFC's conservation and management measure for mitigating the impacts of fishing on seabirds. This conservation and management measure has gone through a number of iterations over the years.

The current conservation and management measure was revised at the Commission meeting in December 2018 (CMM 2018-03). The change relevant to New Zealand was the inclusion of hook shielding devices as an optional standalone seabird mitigation measure (as an alternative to using two of the three prescribed mitigation measures) and to require the use of at least one form of mitigation on the high seas between 30°S and 25°S.

As a Member of the WCPFC, New Zealand has obligations to implement relevant conservation and management measures into domestic fisheries management. New Zealand is in the process of reviewing the mandatory measures in light of the revised Conservation and Management Measure to mitigate the impact of fishing for highly migratory fish stocks on seabirds.

Similar provisions are outlined in high seas permit conditions for any New Zealand vessels fishing on the high seas.

Compliance with these regulations is monitored by at-sea and in-port inspections via Fisheries Officers and observers placed on vessels. The observer coverage target is 10% effort and catch, as per CCSBT requirements.

During the 2016 calendar year, inspections found five incidents where breaches of seabird mitigation regulations may have occurred across the New Zealand surface longline fleet. Compliance followed up the allegations, for which two cases resulted in prosecution (one successfully completed, and one currently underway), while the remaining cases are being assessed for possible prosecution.

During the 2017 calendar year, inspections found six incidents where breaches of seabird mitigation regulations may have occurred across the New Zealand surface longline fleet. Compliance followed up the allegations, for which four cases resulted in warnings, while one case was discontinued and one case outcome is yet to be determined.

During the 2018 calendar year, inspections found two incidents where breaches of seabird mitigation regulations may have occurred across the New Zealand surface longline fleet. Compliance followed up the allegations, for which two are being processed for possible prosecution.

7.1.2 Voluntary Measures for Each Fleet

Since 2016, the Protected Species Liaison Officer Programme has been working with the surface longline fleet to mitigate incidental capture of seabirds. A key output of the programme has been to assist in the development of risk management plans specific to the individual vessel operations. The programme also encourages fishers to seek advice from liaison officers when a certain number of captures of certain species occur.

The risk management plans include mandatory and voluntary seabird mitigation measures. Voluntary measures include:

- Reporting seabird bycatch events to Liaison Officers
- Using all three prescribed measures (rather than just two)
- Using thawed bait (rather than frozen bait)

- Offal and bait retention or batching during hauling and setting
- Using a line shooter
- Reducing deck lighting when setting a night
- Aiming to increase sink rate of baited hooks during setting (for example, by reducing setting speed)

Compliance with voluntary measures is not recorded.

The Protected Species Liaison Officer Programme has recently received turtle de-hooker kits¹, which they will be providing to all surface longline vessels over the next couple of months during vessel visits. Kits include de-hookers of three sizes (small, medium, and large), a long-handled line-cutter and spare blades, bolt cutters, and scissors. The medium-sized de-hooker has a bite-blocker fitted. Some vessels already carry bolt-cutters and dip-nets.

7.2 MEASURES UNDER DEVELOPMENT/TESTING

Vessels are encouraged to test mitigation techniques and devices they consider may be effective.

Hook Shielding Devices

Hook shielding devices encase the barb of the baited hook until the device reaches a certain depth, where the baited hook is released.

In 2017, the Agreement for the Conservation of Albatrosses and Petrels assessed two hook shielding devices, the 'Hookpod' and the 'Smart tuna hook'. The outcome of the assessment was that both devices have been included in the list of best practice measures for mitigating seabird bycatch in surface longline fisheries.

The WCPFC seabird conservation and management measure was updated at the December 2018 Commission meeting to include hook shielding devices as an optional standalone seabird mitigation measure. New Zealand is working on incorporating the changes into domestic legislation.

Hookpods have previously been trialed in the New Zealand surface longline fishery during 2017 (report submitted as an information paper, abstract provided in Annex 1). Trials undertaken by industry are continuing this year to determine if Hookpods are a long term viable option for seabird mitigation. The trial will be focused on assessing the operational nature of Hookpods within New Zealand fisheries (i.e. loss rates and workability of the gear will be monitored).

Underwater Bait setter

An underwater bait setter is a device that deploys baited hooks at a certain depth, intended to be out of diving range of seabirds.

Industry is undertaking a project to trial an underwater bait setter in the surface longline fishery during 2019 and 2020. The purpose of the trial is to determine the operational functionality of the device during fishing, as well as to assess the extent to which the device can be used without other mitigation measures in the surface longline fishery.

¹ Kits were sourced from Jessn Marine.

8 Public relations and education activities

8.1 PUBLIC RELATIONS ACTIVITIES

In addition to Government activities, the organisation Southern Seabird Solutions (www.southernseabirds.org), formed in 2002, continued its work in education and awareness of seabird conservation. The organisation's priority projects at present include:

- An International Mitigation Mentor Programme to provide feedback and advice to fishers and other inventors on their mitigation ideas;
- A Seabird Smart Training Programme that educates and inspires fishers to carry out seabird smart fishing practices while on the water; and
- Working with communities to raise awareness of the importance of black petrel breeding grounds on Aotea/Great Barrier Island.
- Presentation of Seabird Smart Awards every second year that celebrate individuals who are voted by their peers and a judging panel as making significant effort and leadership towards seabird smart fishing.

8.2 EDUCATION

The Department of Conservation's Protected Species Liaison Officer Programme began engaging with the surface longline fleet in 2016. As part of this programme all surface longline vessels have received advice and assistance on implementing effective seabird mitigation (such as how to improve tori lines),

The programme helped vessel operators develop protected species risk management plans specific to their operation. The plans are accompanied by '10 Golden Rules for Surface Longliners to Save Seabirds', and a number of other information documents (such as safe handling and release of turtles). The programme also encourages fishers to seek advice from liaison officers when a certain number of captures of certain species occur.

The primary means of engagement by Fisheries New Zealand with surface longline fishers is through semi-annual workshops, where mitigation of captures of seabirds and other ERS are routinely discussed.

8.3 INFORMATION EXCHANGE

New Zealand participated in the Common Oceans project to assess seabird bycatch in surface longline fisheries south of 20 degrees South. This project, with meetings in Peru in February 2018, and South Africa in February 2019, was led by Birdlife. Delegates collaborated on applying the risk assessment method to estimating seabird bycatch at the species level, using observer data from CCSBT member countries including Japan, New Zealand, Korea, Australia, and South Africa.

The risk assessment method has been made openly available online.² As a result of collaboration on this project, there have been visits between New Zealand and Japan, to help reach a better understanding of the bycatch data, and to share analysis methods.

As part of the risk assessment work, Birdlife International has supported New Zealand in accessing the tracking data, which have been used to develop seabird distributions. These distributions are used in seabird bycatch assessment.

² The risk assessment can be found at the following link: <https://github.com/seabird-risk-assessment>

New Zealand has also been advising on a project to apply the risk assessment method to estimating seabird bycatch in the WCPFC area; including in areas of overlap with CCSBT.

In 2018, New Zealand hosted a visit from Chile, supported by ACAP, which was focussed on estimating seabird bycatch in Chilean trawl fisheries.

New Zealand regularly submits various discussion, background, and information documents to regional fisheries management organisations and international organisations on topics related to ecologically related species.³

Fisheries New Zealand the Department of Conservation also provide research and information through their respective websites.⁴

9 Information on other ERS (non-bycatch), such as prey and predator species

New Zealand has no information to report on other ERS (non-bycatch).

10 Others

New Zealand is providing other information on ERS-related fishing activities of non-party fleets through the 'Assessment of the risk of surface longline fisheries in the southern hemisphere to albatrosses and petrels, for 2016', presented under agenda item 5.1.3.

New Zealand also inspects vessels on the high seas, and part of those inspections relates to presence of seabird mitigation equipment.

11 Implementation of the IPOA-Seabirds and IPOA-Sharks

As a member of the United Nations Food and Agriculture Organisation, New Zealand is supportive of the International Plans of Action developed by the United Nations Food and Agriculture Organisation. In line with the International Plans of Action, New Zealand has developed National Plans of Action for seabirds and sharks.

New Zealand implemented the first National Plan of Action to reduce the incidental catch of seabirds in New Zealand fisheries in 2004. This plan was revised in 2013, and is currently under review again. Copies of this plan can be obtained from the Fisheries New Zealand website.

New Zealand implemented the first National Plan of Action for the conservation and management of sharks in 2008. This plan was revised in 2013, and will enter review towards the end of 2019. Copies of this plan can be obtained from the Fisheries New Zealand website.

11.1 ACTIVITIES UNDERTAKEN FOR THE IMPLEMENTATION OF NPOAS IN RELATION TO SBT FISHERIES

Fisheries New Zealand identifies activities to implement the national plans of actions for seabirds and sharks in relation to the southern bluefin tuna fishery in annual and long term plans for highly migratory species fisheries. The activities are then reported against in an annual review report.

³ New Zealand documents submitted to WCPFC and ACAP can be found on the organisations' websites.

⁴ Fisheries New Zealand fisheries research can be found at the following link: <https://www.mpi.govt.nz/news-and-resources/science-and-research/fisheries-research/> Department of Conservation research can be found at the following link: <https://www.doc.govt.nz/our-work/conservation-services-programme/>

National Plan of Action to reduce the incidental catch of seabirds in New Zealand fisheries 2013

The National Plan of Action to Reduce the Incidental Catch of Seabirds in New Zealand Fisheries 2013 (National Plan of Action for Seabirds 2013) sets out a long term objective that:

New Zealand seabirds thrive without pressure from fishing related mortalities, New Zealand fishers avoid or mitigate against seabird captures and New Zealand fisheries are globally recognised as seabird friendly.

A process for achieving the objective of continuous improvement in New Zealand fisheries has been developed under the third 5-year practical objective using capture rate reduction targets. This process also accounts for fisheries where reliable quantitative capture rates and targets cannot be determined due to consistently low observer coverage constraining the ability to collect information on seabird captures, particularly in small vessel fisheries, such as the SBT surface longline fishery. For these fisheries, 'proxy' targets have been used as an alternative to quantitative capture rate reduction targets to still give effect to the objective of continuous improvement.

Application of the Spatially Explicit Fisheries Risk Assessment framework to assess the impact of commercial fisheries on New Zealand seabirds has enabled management actions under the National Plan of Action to be prioritised according to species that are most at risk. First applied in 2009 the New Zealand Seabird Risk Assessment (hereafter referred to as "the risk assessment") has been through several iterations to accommodate methodological and structural improvements over the term of the current National Plan of Action to allow the risk assessment to be used for more quantitative purposes.

A range of research has been carried out improve information and seabird mitigation in the surface longline fleet. Demographic seabird research and seabird tracking studies have been undertaken on a range of high, and very-high risk seabirds (such as for antipodean albatross), whilst new seabird mitigation measures have been trialled (such as hook shielding devices). As described in section 8.2, the Protected Species Liaison Officer Programme worked with surface longline fishers to help improve effectiveness of seabird mitigation measures and raise awareness.

Extensive biological and population monitoring research has been completed under the Department of Conservation's Conservation Services Programme and Fisheries New Zealand Protected Species Programme. Prioritisation of this research has been driven by outputs from the risk assessment which identify variables, such as demographic information, for which uncertain parameter inputs have significant effects on risk estimation for species of interest.

Internationally, most of the focus has been on strengthening seabird conservation measures within regional fisheries management organisations, such as the CCSBT and the WCPFC.

At the WCPFC meeting in December 2018, New Zealand put forward a proposal to include hook shielding devices as an optional standalone seabird mitigation measure, and to require the use of at least one form of mitigation on the high seas between 30 degrees South and 25 degrees South. The proposed changes were agreed. New Zealand is working on incorporating the changes into domestic legislation.

Fisheries New Zealand leads and contributes to the Antipodean Albatross Working Group⁵, The group compiled a list of domestic and international actions intended on remedying the issue of the declining antipodean albatross population status.

During 2018, the Seabird Advisory Group began reviewing the National Plan of Action for Seabirds. Regular meetings have been held by the Seabird Advisory Group to progress the review.

National Plan of Action for the conservation and management of sharks 2013

New Zealand's National Plan of Action for the conservation and management of sharks 2013 (National Plan of Action for Sharks 2013)⁶ sets out the long-term objective:

To maintain the biodiversity and the long-term viability of all New Zealand shark populations by recognising their role in marine ecosystems, ensuring that any utilisation of sharks is sustainable, and that New Zealand receives positive recognition internationally for its efforts in shark conservation and management.

Fisheries New Zealand identifies management activities in relation to sharks in HMS fisheries that are aligned with the goals of National Plan of Action for Sharks in the following key areas:

- Biodiversity and long-term viability
- Utilisation, waste reduction, and elimination of shark finning
- Domestic engagement and partnership
- Non-fishing threats
- International engagement
- Research and information

Management of the blue, porbeagle and mako shark throughout the western and central Pacific Ocean is the responsibility of WCPFC. Under this regional convention, New Zealand is responsible for ensuring that the management measures applied within New Zealand fisheries waters are compatible with those of the Commission.

Shark finning was made illegal for commercial fishers in New Zealand from 1 October 2014. Under the ban, fishers are still able to land shark fins, however conditions apply depending on the species concerned.

Blue, porbeagle and mako shark were introduced into the quota management system on 1 October 2004. From 1 October 2014, fishers have been allowed to return blue, porbeagle and mako shark to the sea both alive and dead, although the status must be reported accurately. Those returned to the sea dead are counted against a fisher's annual catch entitlement and the total allowable catch limit for that species.

New Zealand cooperates with other countries to manage migratory shark species via regional fisheries management organisations, including WCPFC and CCSBT, and treaties, including the Convention on the Conservation of Migratory Species of Wild Animals.

New Zealand is a signatory to the subsidiary agreement to the Convention on the Conservation of Migratory Species of Wild Animals that is focused on migratory sharks. New Zealand became a Signatory to the Memorandum of Understanding on the Conservation of Migratory Sharks in 2015.

⁵ The Antipodean Albatross Working Group was set up in 2017 to address concerns that, based on recent research, the antipodean albatross will be functionally extinct within 20 years. The objective of the group is to investigate the declining population and determine what actions are needed to remedy it. Members of the group include HMS team members, DOC, the Ministry of Foreign Affairs and Trade (MFAT), industry representatives, environmental non-governmental organisations (eNGOs), and National Institute of Water and Atmospheric Research (NIWA).

⁶ Available here: <https://fs.fish.govt.nz/Page.aspx?pk=165>

12 Appendix – Tables

Table 1: Commercial catches of SBT in New Zealand fisheries waters (tonnes, whole weight) by calendar year and New Zealand fishing year (1 October to 30 September).

Year	Calendar year catches	Fishing year catches
1980	130.0	130.0
1981	173.0	173.0
1982	305.0	305.0
1983	132.0	132.0
1984	93.0	93.0
1985	94.0	94.0
1986	82.0	82.0
1987	59.0	59.0
1988	94.0	94.0
1989	437.2	437.1
1990	529.2	529.3
1991	164.5	164.5
1992	279.2	279.2
1993	216.6	216.3
1994	277.0	277.2
1995	436.4	434.7
1996	139.3	140.4
1997	333.7	333.4
1998	337.1	333.0
1999	460.6	457.5
2000	380.3	381.7
2001	358.5	359.2
2002	450.3	453.6
2003	389.6	391.7
2004	393.3	394.0
2005	264.4	264.0
2006	238.2	238.2
2007	382.6	383.1
2008	319.0	318.8
2009	418.5	417.3
2010	500.8	500.0
2011	547.1	547.2
2012	775.5	775.4
2013	756.4	758.2
2014	825.6	825.8
2015	922.3	922.2
2016	950.8	949.6
2017	913.3	913.9

Table 2: Catch (tonnes) for the charter fleet by year and CCSBT statistical area. Based on raised catches. (No charter vessels fished in 1996 nor in 2016, 2017.)

Calendar Year	Area 5	Area 6	Other*
1989		296.3	0.3
1990	66.7	174.9	
1991	23.0	102.6	
1992	4.8	214.5	0.5
1993	20.2	120.5	9.5
1994		234.1	
1995	1.6	228.7	0.2
1996			
1997	52.3	186.2	
1998	83.9	117.3	
1999	9.8	190.7	
2000	2.5	132.5	
2001		139.3	
2002		148.4	
2003		82.1	
2004		126.4	
2005	34.4	53.0	
2006	9.9	95.3	
2007	53.0	161.0	
2008		200.0	
2009	17.0	201.2	
2010		207.8	
2011		199.1	
2012		240.1	0.1
2013		183.9	
2014		223.9	
2015		256.8	
2016			
2017			

*Most often erroneous position data

Table 3: Catch (tonnes) for the domestic fleet by year and CCSBT statistical area based on raised catches.

Calendar Year	Area 5	Area 6	Other*
1980			130.0
1981			173.0
1982			305.0
1983			132.0
1984			93.0
1985			94.0
1986			82.0
1987			59.0
1988			94.0
1989	0.1	140.5	
1990	6.9	278.7	2.0
1991	0.9	37.8	0.1
1992	6.2	53.2	
1993	49.4	16.3	0.8
1994	6.5	35.6	0.8
1995	15.0	184.9	6.1
1996	34.2	103.8	1.3
1997	57.9	36.2	1.1
1998	83.4	52.2	0.4
1999	194.7	64.8	0.6
2000	184.0	60.9	0.4
2001	113.1	105.7	0.4
2002	135.7	162.9	3.2
2003	216.7	89.7	0.1
2004	101.0	165.9	
2005	165.2	11.6	0.3
2006	122.8	10.2	
2007	162.5	2.1	
2008	80.5	38.1	
2009	133.5	66.7	0.2
2010	204.8	88.2	
2011	237.2	110.8	
2012	249.1	285.8	
2013	344.1	227.2	
2014	334.0	267.6	
2015	406.1	259.3	0.1
2016	563.5	386.3	1.1
2017	483.2	429	1.1

* Includes erroneous position data and data without positions.

Table 4: Effort (1,000s of hooks) for the charter fleet by year and CCSBT statistical area region based on raised hooks. Note that this includes some non-SBT target effort in area 5. (No charter vessels fished in 1996 nor in 2016.)

Calendar Year	Area 5	Area 6	Other*
1989		1596	3.5
1990	259	1490.6	
1991	306	1056.5	
1992	47.6	1386.8	3
1993	174.1	1125.7	101.4
1994		799.1	
1995	27.1	1198.7	13.5
1996			
1997	135.2	1098.7	
1998	225	616	
1999	57.2	955.1	
2000	30.3	757.9	
2001		639.4	
2002		726.4	
2003	3	866.6	
2004		1113.5	
2005	137	498.9	
2006	39.4	562.5	
2007	271.6	1136.1	
2008		568.3	
2009	66.8	731.0	
2010		484.9	
2011		495.9	
2012		548.4	3.4
2013	13.2	450.8	
2014		655.8	
2015		625.9	
2016			
2017			

*Most often erroneous position data

Table 5: Effort (1,000s hooks that caught or targeted SBT) for the domestic fleet by year and CCSBT statistical area based on raised hooks.

Calendar Year	Area 5	Area 6	Other*
1989			
1990	41.7		
1991	31.5	49.2	
1992	71.7	12.1	
1993	644.0	108.1	7.7
1994	122.6	143.3	5.8
1995	221.5	760.4	26.7
1996	417.9	564.3	11.5
1997	736.4	8.9	17.3
1998	633.6	314.5	1.2
1999	1221.4	382.9	5.5
2000	1164.0	454.4	8.5
2001	1027.6	751.5	1.9
2002	1358.6	1246.8	13.5
2003	1868.7	1569.1	4.3
2004	1154.1	1431.9	1.2
2005	1133.0	153.6	2.4
2006	1036.4	122.4	0.9
2007	681.2	19.0	
2008	527.8	94.0	
2009	733.9	165.4	1.3
2010	1116.7	294.3	
2011	955.7	197.8	
2012	858.9	629.3	
2013	905.3	565.0	1.2
2014	595.0	540.2	
2015	716.0	524.1	0.7
2016	883.8	565.9	12.6
2017	866.1	590.2	7.9

* Includes erroneous position data and data without positions.

Table 6: Number of vessels catching SBT in New Zealand fisheries waters by calendar year and New Zealand fishing year (1 October to 30 September).

Year	Calendar year vessel numbers	Fishing year vessel numbers
2001	132	132
2002	151	155
2003	132	132
2004	99	101
2005	57	58
2006	56	57
2007	44	45
2008	35	36
2009	40	39
2010	44	42
2011	42	42
2012	43	44
2013	39	39
2014	37	38
2015	34	33
2016	32	32
2017	32	32

Table 7: TACs of the main fish bycatch species associated with the SBT surface longline fishery within the New Zealand EEZ as of 1 October 2017.

Fish species	TAC (tonnes)
Bigeye Tuna	740
Yellowfin Tuna	358
Pacific Bluefin Tuna	145
Swordfish	919
Moonfish	527
Blue Shark	2,080
Mako Shark	276
Porbeagle Shark	129
Ray's Bream	1,045

Table 8: Observer coverage in terms of catch (proportion of individual SBT observed) for the domestic surface longline fleet for 2016 and 2017 calendar years.

Country/ Fishing Entity	Calendar Year	Fishery		CCSBT statistical area	Total SBT catch numbers	Observed SBT catch numbers	Observer coverage (%)
		Gear Code	Fleet Code				
NZ	2016	SLL	NZD	5	11,362	1,962	17%
				6	9,382	2,787	30%
NZ	2017	SLL	NZD	5	9,357	2,181	23%
				6	9,953	2,195	22%

Table 9: Observer coverage in terms of estimated catch (proportion of total estimated weight) for the domestic surface longline fleet for 2016 and 2017 calendar years.

Country/ Fishing Entity	Calendar Year	Fishery		CCSBT statistical area	Total SBT Catch (kgs)	Observed SBT Catch (kgs)	Observer coverage (%)
		Gear Code	Fleet Code				
NZ	2016	SLL	NZD	5	467,802	80,901	17%
				6	320,054	101,288	32%
NZ	2017	SLL	NZD	5	402,862	106,786	27%
				6	356,652	92,240	26%

Table 10: Observer coverage in terms of effort (proportion of hooks observed) for the domestic fleet for 2016 and 2017 calendar years.

Country/ Fishing Entity	Calendar year	Gear code	Fleet code	CCSBT statistical area	Total Effort (no. of hooks)	Observed Effort (no. of hooks)	Observer coverage (%)
6	539,330	129,930	24%				
NZ	2017	SLL	NZD	5	837,804	149,174	18%
				6	564,695	127,997	23%

Table 11: Observer coverage in terms of days for the domestic fleet for 2016 and 2017 calendar year

Country/ Fishing Entity	Calendar Year	Fishery		CCSBT statistical area	Total Effort (vessel days)	Total Effort (vessel days)	Observer coverage (%)
		Gear Code	Fleet Code				
NZ	2016	SLL	NZD	5	973	135	14%
				6	465	115	25%
NZ	2017	SLL	NZD	5	929	153	17%
				6	507	117	23%

Table 12: Reporting for estimation of total mortality of seabirds in CCSBT fisheries in 2016

Country: New Zealand

Year (calendar year) 2016

Area: 5

Species ⁸	Total & Observed Effort ⁷			Observed Captures					Estimate	Proportion of observed effort with specific mitigation measures							
	Total Effort ⁹	Total Observed Effort	Observer Coverage ¹⁰	Captures (number)	Capture Rate ¹¹	Fate (numbers)			Mortality Rate ⁸	Estimated total mortalities ¹² (number)	TP + NS ¹³	TP + WB ¹⁰	NS + WB ¹⁰	TP + WB + NS ¹⁰	TP ¹⁰ only	NS ¹⁰ only	Nil
						Retained (dead)	Discarded (dead)	Released (live)									
Buller's albatross	854,222	138,694	16.24	3	0.02	-	2	1	0.01	12	60.4	-	-	-	3.5	35.4	0.7
Campbell albatross	854,222	138,694	16.24	1	0.01	-	1	-	0.01	6	60.4	-	-	-	3.5	35.4	0.7
Wandering albatross	854,222	138,694	16.24	1	0.01	-	-	1	-	-	60.4	-	-	-	3.5	35.4	0.7
TOTAL	854,222	138,694	16.24	5	0.04	-	3	2	0.02	18	60.4	-	-	-	3.5	35.4	0.7

To note (and also applicable to following tables):

- The footnotes apply to all the similar tables that follow.
- Where fate does not equate to captures, the fate is unknown.
- Previously, observer reporting did not capture sufficient information to report on the use of weighted branch lines ('WB'). Therefore, no use of 'WB' is reported in the tables for 2016 and 2017. During mid-2018, observer reporting was amended to capture sufficient information to report on the use of weighted branch lines. Therefore, use of 'WB' is reported in 2018 tables.

⁷ Values in these shaded cells will be repeated for all species within a strata.

⁸ Use FAO's 3 alpha species codes.

⁹ For longline provide number of hooks, for purse seine provide number of sets.

¹⁰ For longline provide as a percentage of the number of hooks, for purse seine provide as a percentage of the number of shots.

¹¹ For longline provide as captures per thousand hooks, for purse seine provide as captures per set.

¹² Total mortalities should be estimated using either a simple ratio or another approach such as modelling. If using an approach other than a simple ratio, the method used to estimate total mortalities should be described in detail within the report and 95% confidence intervals should be provided if possible.

¹³ TP = tori poles, NS = night setting, WB = weighted branch line.

Table 13: Reporting for estimation of total mortality of seabirds in CCSBT fisheries in 2016

Country: New Zealand

Year (calendar year) 2016

Area: 6

Species	Total & Observed Effort			Observed Captures					Estimate	Proportion of observed effort with specific mitigation measures							
	Total Effort	Total Observed Effort	Observer Coverage	Captures (number)	Capture Rate	Fate (numbers)			Mortality Rate	Estimated total mortalities (number)	TP + NS	TP + WB	NS + WB	TP + WB + NS	TP only	NS only	Nil
						Retained (dead)	Discarded (dead)	Released (live)									
Buller's albatross	539,330	129,930	24.09	53	0.41	-	51	1	0.39	212	83.8	-	-	-	0.8	15.4	-
White-capped albatross	539,330	129,930	24.09	40	0.31	-	36	4	0.28	149	83.8	-	-	-	0.8	15.4	-
Westland petrel	539,330	129,930	24.09	12	0.09	-	10	2	0.08	42	83.8	-	-	-	0.8	15.4	-
Wandering albatross	539,330	129,930	24.09	1	0.01	-	1	-	0.01	4	83.8	-	-	-	0.8	15.4	-
Gibson's albatross	539,330	129,930	24.09	1	0.01	-	1	-	0.01	4	83.8	-	-	-	0.8	15.4	-
Campbell albatross	539,330	129,930	24.09	1	0.01	-	1	-	0.01	4	83.8	-	-	-	0.8	15.4	-
Grey-headed albatross	539,330	129,930	24.09	1	0.01	-	1	-	0.01	4	83.8	-	-	-	0.8	15.4	-
Southern Royal albatross	539,330	129,930	24.09	1	0.01	-	-	1	-	-	83.8	-	-	-	0.8	15.4	-
TOTAL	539,330	129,930	24.09	110	0.85	-	101	8	0.78	419	83.8	-	-	-	0.8	15.4	-

Table 14: Reporting for estimation of total mortality of seabirds in CCSBT fisheries in 2017

Country: New Zealand

Year (calendar year) 2017

Area: 5

Species	Total & Observed Effort			Observed Captures					Estimate	Proportion of observed effort with specific mitigation measures							
	Total Effort	Total Observed Effort	Observer Coverage	Captures (number)	Capture Rate	Fate (numbers)			Mortality Rate	Estimated total mortalities (number)	TP + NS	TP + WB	NS + WB	TP + WB + NS	TP only	NS only	Nil
						Retained (dead)	Discarded (dead)	Released (live)									
Buller's albatross	837,804	149,174	17.81	1	0.01	-	1	-	0.01	6	89.5	-	-	-	6.8	3.7	-
Campbell albatross	837,804	149,174	17.81	1	0.01	-	1	-	0.01	6	89.5	-	-	-	6.8	3.7	-
Shy albatross	837,804	149,174	17.81	1	0.01	-	-	1	-	-	89.5	-	-	-	6.8	3.7	-
Black petrel	837,804	149,174	17.81	1	0.01	-	1	-	0.01	6	89.5	-	-	-	6.8	3.7	-
Grey petrel	837,804	149,174	17.81	1	0.01	-	1	-	0.01	6	89.5	-	-	-	6.8	3.7	-
TOTAL	837,804	149,174	17.81	5	0.03	-	4	1	0.03	24	89.5	-	-	-	6.8	3.7	-

Table 15: Reporting for estimation of total mortality of seabirds in CCSBT fisheries in 2017

Country: New Zealand

Year (calendar year) 2017

Area: 6

Species	Total & Observed Effort			Observed Captures					Estimate	Proportion of observed effort with specific mitigation measures							
	Total Effort	Total Observed Effort	Observer Coverage	Captures (number)	Capture Rate	Fate (numbers)			Mortality Rate	Estimated total mortalities (number)	TP + NS	TP + WB	NS + WB	TP + WB + NS	TP only	NS only	Nil
						Retained (dead)	Discarded (dead)	Released (live)									
Royal albatrosses	564,695	127,997	22.67	1	0.01	-	1	-	0.01	4	99.3	-	-	-	0.7	-	-
Wandering albatross	564,695	127,997	22.67	2	0.09	-	1	1	0.01	4	99.3	-	-	-	0.7	-	-
Albatross unidentified	564,695	127,997	22.67	1	0.01	-	1	-	0.01	4	99.3	-	-	-	0.7	-	-
Buller's albatross	564,695	127,997	22.67	12	0.02	-	8	4	0.01	35	99.3	-	-	-	0.7	-	-
White-capped albatross	564,695	127,997	22.67	15	0.12	-	10	5	0.06	44	99.3	-	-	-	0.7	-	-
Westland petrel	564,695	127,997	22.67	8	0.06	-	8	-	0.08	35	99.3	-	-	-	0.7	-	-
TOTAL	564,695	127,997	22.67	39	0.30	-	29	10	0.23	126	99.3	-	-	-	0.7	-	-

Table 16: Reporting for estimation of total mortality of seabirds in CCSBT fisheries in 2018

Country: New Zealand

Year (calendar year) 2018

Area: 5

Species	Total & Observed Effort			Observed Captures					Estimate	Proportion of observed effort with specific mitigation measures							
	Total Effort	Total Observed Effort	Observer Coverage	Captures (number)	Capture Rate	Fate (numbers)			Mortality Rate	Estimated total mortalities (number)	TP + NS	TP + WB	NS + WB	TP + WB + NS	TP only	NS only	Nil
						Retained (dead)	Discarded (dead)	Released (live)									
Buller's albatross	906,231	155,323	17.14	1	0.01	-	1	-	0.01	6	68.9	1.2	-	24.8	0.6	4.3	-
TOTAL	906,231	155,323	17.14	1	0.01	-	1	-	0.01	6	68.9	1.2	-	24.8	0.6	4.3	-

Table 17: Reporting for estimation of total mortality of seabirds in CCSBT fisheries in 2018

Country: New Zealand

Year (calendar year) 2018

Area: 6

Species	Total & Observed Effort			Observed Captures					Estimate	Proportion of observed effort with specific mitigation measures							
	Total Effort	Total Observed Effort	Observer Coverage	Captures (number)	Capture Rate	Fate (numbers)			Mortality Rate	Estimated total mortalities (number)	TP + NS	TP + WB	NS + WB	TP + WB + NS	TP only	NS only	Nil
						Retained (dead)	Discarded (dead)	Released (live)									
Antipodean and Gibson's albatross	445,185	76,580	17.20	1	0.01	-	-	1	-	-	68.7	-	-	31.3	-	-	-
Royal albatrosses	445,185	76,580	17.20	3	0.04	-	1	2	0.01	6	68.7	-	-	31.3	-	-	-
Wandering albatross	445,185	76,580	17.20	1	0.01	-	1	-	0.01	6	68.7	-	-	31.3	-	-	-
Buller's albatross	445,185	76,580	17.20	15	0.20	-	13	2	0.17	76	68.7	-	-	31.3	-	-	-
White-capped albatross	445,185	76,580	17.20	51	0.67	-	48	3	0.63	279	68.7	-	-	31.3	-	-	-
White-chinned petrel	445,185	76,580	17.20	1	0.01	-	1	-	0.01	6	68.7	-	-	31.3	-	-	-
Westland petrel	445,185	76,580	17.20	5	0.07	-	5	-	0.07	29	68.7	-	-	31.3	-	-	-
Procellaria petrels	445,185	76,580	17.20	3	0.04	-	3	-	0.04	17	68.7	-	-	31.3	-	-	-
TOTAL	445,185	76,580	17.20	80	1.04	-	72	8	0.94	419	68.7	-	-	31.3	-	-	-

Table 18: Reporting for estimation of total mortality of non-target fish in CCSBT fisheries in 2016

Country: New Zealand

Year (calendar year) 2016

Area: 5

Species	Total & Observed Effort			Observed Captures					Estimate	Proportion of observed effort with specific mitigation measures							
	Total Effort	Total Observed Effort	Observer Coverage	Captures (number)	Capture Rate	Fate (numbers)			Mortality Rate	Estimated total mortalities (number)	TP + NS	TP + WB	NS + WB	TP + WB + NS	TP only	NS only	Nil
						Retained (dead)	Discarded (dead)	Released (live)									
Blue shark	854,222	138,694	16.24	4986	35.95	3	859	4044	6.22	5309	60.4	-	-	-	3.5	35.4	0.7
Porbeagle shark	854,222	138,694	16.24	538	3.88	-	233	304	1.68	1435	60.4	-	-	-	3.5	35.4	0.7
Mako shark	854,222	138,694	16.24	218	1.57	3	77	136	0.58	493	60.4	-	-	-	3.5	35.4	0.7
Thresher shark	854,222	138,694	16.24	32	0.23	-	7	25	0.05	43	60.4	-	-	-	3.5	35.4	0.7
Bigeye thresher	854,222	138,694	16.24	1	0.01	-	1	-	0.01	6	60.4	-	-	-	3.5	35.4	0.7
Bronze whaler shark	854,222	138,694	16.24	2	0.01	-	1	1	0.01	6	60.4	-	-	-	3.5	35.4	0.7
Hammerhead shark	854,222	138,694	16.24	1	0.01	-	-	1	-	-	60.4	-	-	-	3.5	35.4	0.7
Skates and rays	854,222	138,694	16.24	19	0.14	-	1	14	0.01	6	60.4	-	-	-	3.5	35.4	0.7
TOTAL	854,222	138,694	16.24	5797	41.80	6	1179	4525	8.54	7298	60.4	-	-	-	3.5	35.4	0.7

Table 19: Reporting for estimation of total mortality of non-target fish in CCSBT fisheries in 2016

Country: New Zealand

Year (calendar year) 2016

Area: 6

Species	Total & Observed Effort			Observed Captures					Estimate	Proportion of observed effort with specific mitigation measures							
	Total Effort	Total Observed Effort	Observer Coverage	Captures (number)	Capture Rate	Fate (numbers)			Mortality Rate	Estimated total mortalities (number)	TP + NS	TP + WB	NS + WB	TP + WB + NS	TP only	NS only	Nil
						Retained (dead)	Discarded (dead)	Released (live)									
Blue shark	539,330	129,930	24.09	4,163	32.04	-	326	3482	2.51	1,353	83.8	-	-	-	0.8	15.4	-
Porbeagle shark	539,330	129,930	24.09	320	2.46	15	104	198	0.92	494	83.8	-	-	-	0.8	15.4	-
Mako shark	539,330	129,930	24.09	58	0.45	3	15	39	0.14	75	83.8	-	-	-	0.8	15.4	-
Thresher shark	539,330	129,930	24.09	8	0.06	-	1	7	0.01	4	83.8	-	-	-	0.8	15.4	-
School shark	539,330	129,930	24.09	6	0.05	5	-	1	0.04	21	83.8	-	-	-	0.8	15.4	-
Skates and rays	539,330	129,930	24.09	34	0.26	-	-	33	-	-	83.8	-	-	-	0.8	15.4	-
TOTAL	539,330	129,930	24.09	4,589	35.32	23	446	3760	3.61	1,947	83.8	-	-	-	0.8	15.4	-

Table 20: Reporting for estimation of total mortality of non-target fish in CCSBT fisheries in 2017

Country: New Zealand

Year (calendar year): 2017

Area: 5

Species	Total & Observed Effort			Observed Captures						Estimate	Proportion of observed effort with specific mitigation measures						
	Total Effort	Total Observed Effort	Observer Coverage	Captures (number)	Capture Rate	Fate (numbers)			Mortality Rate	Estimated total mortalities (number)	TP + NS	TP + WB	NS + WB	TP + WB + NS	TP only	NS only	Nil
						Retained (dead)	Discarded (dead)	Released (live)									
Blue Shark	837,804	149,174	17.81	4695	31.47	3	710	3939	4.76	3988	89.5	-	-	-	6.8	3.7	-
Mako Shark	837,804	149,174	17.81	148	0.99	3	44	94	0.29	247	89.5	-	-	-	6.8	3.7	-
Porbeagle Shark	837,804	149,174	17.81	362	2.43	-	254	108	1.70	1427	89.5	-	-	-	6.8	3.7	-
Big-Eye Thresher Shark	837,804	149,174	17.81	1	0.01	-	-	1	-	-	89.5	-	-	-	6.8	3.7	-
Bronze Whaler Shark	837,804	149,174	17.81	15	0.10	-	4	11	0.03	22	89.5	-	-	-	6.8	3.7	-
School Shark	837,804	149,174	17.81	2	0.01	-	-	2	-	-	89.5	-	-	-	6.8	3.7	-
Thresher Shark	837,804	149,174	17.81	22	0.15	-	10	12	0.07	56	89.5	-	-	-	6.8	3.7	-
Pelagic Stingray	837,804	149,174	17.81	68	0.46	-	-	68	-	-	89.5	-	-	-	6.8	3.7	-
Ray unspecified	837,804	149,174	17.81	1	0.01	-	1	-	0.01	6	89.5	-	-	-	6.8	3.7	-
Longtailed Stingray	837,804	149,174	17.81	2	0.01	-	-	2	-	-	89.5	-	-	-	6.8	3.7	-
TOTAL	837,804	149,174	17.81	5316	35.64	6	1023	4237	6.90	4237	89.5	-	-	-	6.8	3.7	-

Table 21: Reporting for estimation of total mortality of non-target fish in CCSBT fisheries in 2017

Country: New Zealand

Year (calendar year) 2017

Area: 6

Species	Total & Observed Effort			Observed Captures					Estimate	Proportion of observed effort with specific mitigation measures							
	Total Effort	Total Observed Effort	Observer Coverage	Captures (number)	Capture Rate	Fate (numbers)			Mortality Rate	Estimated total mortalities (number)	TP + NS	TP + WB	NS + WB	TP + WB + NS	TP only	NS only	Nil
						Retained (dead)	Discarded (dead)	Released (live)									
Blue Shark	564,695	127,997	22.67	3760	29.38	15	290	3398	1.94	1098	99.3	-	-	-	0.7	-	-
Mako Shark	564,695	127,997	22.67	36	0.28	10	6	19	0.04	23	99.3	-	-	-	0.7	-	-
Porbeagle Shark	564,695	127,997	22.67	272	2.13	-	127	142	0.85	481	99.3	-	-	-	0.7	-	-
Bronze Whaler Shark	564,695	127,997	22.67	1	0.01	-	-	1	-	-	99.3	-	-	-	0.7	-	-
Sharpnose Sevengill Shark	564,695	127,997	22.67	1	0.01	-	-	1	-	-	99.3	-	-	-	0.7	-	-
Sixgill Shark	564,695	127,997	22.67	1	0.01	-	-	1	-	-	99.3	-	-	-	0.7	-	-
School Shark	564,695	127,997	22.67	12	0.09	12	-	-	-	-	99.3	-	-	-	0.7	-	-
Broadnose Sevengill Shark	564,695	127,997	22.67	6	0.05	-	-	6	-	-	99.3	-	-	-	0.7	-	-
Thresher Shark	564,695	127,997	22.67	14	0.11	-	3	11	0.02	11	99.3	-	-	-	0.7	-	-
Pelagic Stingray	564,695	127,997	22.67	8	0.06	-	-	8	-	-	99.3	-	-	-	0.7	-	-
Ray unspecified	564,695	127,997	22.67	1	0.01	-	-	1	-	-	99.3	-	-	-	0.7	-	-
Deepwater Dogfish	564,695	127,997	22.67	5	0.04	-	1	4	0.01	4	99.3	-	-	-	0.7	-	-
TOTAL	564,695	127,997	22.67	4117	32.16	37	427	3592	3.63	1617	99.3	-	-	-	0.7	-	-

Table 22: Reporting for estimation of total mortality of non-target fish in CCSBT fisheries in 2018

Country: New Zealand

Year (calendar year) 2018

Area: 5

Species	Total & Observed Effort			Observed Captures					Estimate	Proportion of observed effort with specific mitigation measures							
	Total Effort	Total Observed Effort	Observer Coverage	Captures (number)	Capture Rate	Fate (numbers)			Mortality Rate	Estimated total mortalities (number)	TP + NS	TP + WB	NS + WB	TP + WB + NS	TP only	NS only	Nil
						Retained (dead)	Discarded (dead)	Released (live)									
Blue Shark	906,231	155,323	17.14	4644	29.90	4	824	3642	5.52	5006	68.9	1.2	-	24.8	0.6	4.3	-
Mako Shark	906,231	155,323	17.14	196	1.26	3	65	125	0.44	395	68.9	1.2	-	24.8	0.6	4.3	-
Porbeagle Shark	906,231	155,323	17.14	153	0.99	-	79	74	0.53	480	68.9	1.2	-	24.8	0.6	4.3	-
Bronze Whaler Shark	906,231	155,323	17.14	4	0.03	-	1	3	0.01	6	68.9	1.2	-	24.8	0.6	4.3	-
Big-Eye Thresher Shark	906,231	155,323	17.14	2	0.01	-	-	2	-	-	68.9	1.2	-	24.8	0.6	4.3	-
School Shark	906,231	155,323	17.14	23	0.15	17	1	5	0.01	6	68.9	1.2	-	24.8	0.6	4.3	-
Thresher Shark	906,231	155,323	17.14	20	0.13	-	3	17	0.02	18	68.9	1.2	-	24.8	0.6	4.3	-
Pelagic Stingray	906,231	155,323	17.14	99	0.64	-	1	97	0.01	6	68.9	1.2	-	24.8	0.6	4.3	-
Longtailed Stingray	906,231	155,323	17.14	2	0.01	-	-	1	-	-	68.9	1.2	-	24.8	0.6	4.3	-
TOTAL	906,231	155,323	17.14	5143	33.11	24	974	3966	6.43	5917	68.9	1.2	-	24.8	0.6	4.3	-

Table 23: Reporting for estimation of total mortality of non-target fish in CCSBT fisheries in 2018

Country: New Zealand

Year (calendar year) 2018

Area: 6

Species	Total & Observed Effort			Observed Captures					Estimate	Proportion of observed effort with specific mitigation measures							
	Total Effort	Total Observed Effort	Observer Coverage	Captures (number)	Capture Rate	Fate (numbers)			Mortality Rate	Estimated total mortalities (number)	TP + NS	TP + WB	NS + WB	TP + WB + NS	TP only	NS only	Nil
						Retained (dead)	Discarded (dead)	Released (live)									
Blue Shark	445,185	76,580	17.20	3946	51.53	-	218	3715	1.46	651	68.7	-	-	31.3	-	-	-
Mako Shark	445,185	76,580	17.20	32	0.42	-	9	23	0.06	27	68.7	-	-	31.3	-	-	-
Porbeagle Shark	445,185	76,580	17.20	261	3.41	-	98	163	0.66	292	68.7	-	-	31.3	-	-	-
Sixgill Shark	445,185	76,580	17.20	12	0.16	-	-	12	-	-	68.7	-	-	31.3	-	-	-
School Shark	445,185	76,580	17.20	8	0.10	8	-	-	-	-	68.7	-	-	31.3	-	-	-
Broadnose Sevengill Shark	445,185	76,580	17.20	5	0.07	-	-	5	-	-	68.7	-	-	31.3	-	-	-
Thresher Shark	445,185	76,580	17.20	5	0.07	-	1	4	0.01	3	68.7	-	-	31.3	-	-	-
Pelagic Stingray	445,185	76,580	17.20	1	0.01	-	-	1	-	-	68.7	-	-	31.3	-	-	-
Deepwater Dogfish	445,185	76,580	17.20	1	0.01	-	-	1	-	-	68.7	-	-	31.3	-	-	-
TOTAL	445,185	76,580	17.20	4271	55.77	8	326	3924	4.36	973	68.7	-	-	31.3	-	-	-

Table 24: Reporting for estimation of total mortality of marine mammals and marine reptiles in CCSBT fisheries in 2016

Country: New Zealand

Year (calendar year) 2016

Area: 5

Species	Total & Observed Effort			Observed Captures					Estimate	Proportion of observed effort with specific mitigation measures							
	Total Effort	Total Observed Effort	Observer Coverage	Captures (number)	Capture Rate	Fate (numbers)			Mortality Rate	Estimated total mortalities (number)	TP + NS	TP + WB	NS + WB	TP + WB + NS	TP only	NS only	Nil
						Retained (dead)	Discarded (dead)	Released (live)									
Leatherback turtle	854,222	138,694	16.24	1	0.01	-	-	1	-	-	60.4	-	-	-	3.5	35.4	0.7
TOTAL	854,222	138,694	16.24	1	0.01	-	-	1	-	-	60.4	-	-	-	3.5	35.4	0.7

Table 25: Reporting for estimation of total mortality of marine mammals and marine reptiles in CCSBT fisheries in 2016

Country: New Zealand

Year (calendar year) 2016

Area: 6

Species	Total & Observed Effort			Observed Captures					Estimate	Proportion of observed effort with specific mitigation measures							
	Total Effort	Total Observed Effort ^{Error! ookmark not defined.}	Observer Coverage	Captures (number)	Capture Rate	Fate (numbers)			Mortality Rate	Estimated total mortalities (number)	TP + NS	TP + WB	NS + WB	TP + WB + NS	TP only	NS only	Nil
						Retained (dead)	Discarded (dead)	Released (live)									
-	539,330	129,930	24.09	-	-	-	-	-	-	-	83.8	-	-	-	0.8	15.4	-
TOTAL	539,330	129,930	24.09	-	-	-	-	-	-	-	83.8	-	-	-	0.8	15.4	-

Table 26: Reporting for estimation of total mortality of marine mammals and marine reptiles in CCSBT fisheries in 2017

Country: New Zealand

Year (calendar year) 2017

Area: 5

Species	Total & Observed Effort			Observed Captures					Mortality Rate	Estimate	Proportion of observed effort with specific mitigation measures							
	Total Effort	Total Observed Effort	Observer Coverage	Captures (number)	Capture Rate	Fate (numbers)					Estimated total mortalities (number)	TP + NS	TP + WB	NS + WB	TP + WB + NS	TP only	NS only	Nil
						Retained (dead)	Discarded (dead)	Released (live)										
Leatherback turtle	837,804	149,174	17.81	1	0.01	-	-	1	-	-	89.5	-	-	-	6.8	3.7	-	
TOTAL	837,804	149,174	17.81	1	0.01	-	-	1	-	-	89.5	-	-	-	6.8	3.7	-	

Table 27: Reporting for estimation of total mortality of marine mammals and marine reptiles in CCSBT fisheries in 2017

Country: New Zealand

Year (calendar year) 2017

Area: 6

Species	Total & Observed Effort			Observed Captures					Mortality Rate	Estimate	Proportion of observed effort with specific mitigation measures							
	Total Effort	Total Observed Effort	Observer Coverage	Captures (number)	Capture Rate	Fate (numbers)					Estimated total mortalities (number)	TP + NS	TP + WB	NS + WB	TP + WB + NS	TP only	NS only	Nil
						Retained (dead)	Discarded (dead)	Released (live)										
-	564,695	127,997	22.67	-	-	-	-	-	-	-	99.3	-	-	-	0.7	-	-	
TOTAL	564,695	127,997	22.67	-	-	-	-	-	-	-	99.3	-	-	-	0.7	-	-	

Table 28: Reporting for estimation of total mortality of marine mammals and marine reptiles in CCSBT fisheries in 2018

Country: New Zealand

Year (calendar year) 2018

Area: 5

Species	Total & Observed Effort			Observed Captures					Estimate	Proportion of observed effort with specific mitigation measures							
	Total Effort	Total Observed Effort	Observer Coverage	Captures (number)	Capture Rate	Fate (numbers)			Mortality Rate	Estimated total mortalities (number)	TP + NS	TP + WB	NS + WB	TP + WB + NS	TP only	NS only	Nil
						Retained (dead)	Discarded (dead)	Released (live)									
Leatherback turtle	906,231	155,323	17.14	1	0.01	-	-	1	-	-	68.9	1.2	-	24.8	0.6	4.3	-
TOTAL	906,231	155,323	17.14	1	0.01	-	-	1	-	-	68.9	1.2	-	24.8	0.6	4.3	-

Table 29: Reporting for estimation of total mortality of marine mammals and marine reptiles in CCSBT fisheries in 2018

Country: New Zealand

Year (calendar year) 2018

Area: 6

Species	Total & Observed Effort			Observed Captures					Estimate	Proportion of observed effort with specific mitigation measures							
	Total Effort	Total Observed Effort	Observer Coverage	Captures (number)	Capture Rate	Fate (numbers)			Mortality Rate ^{Error! ookmark not defined.}	Estimated total mortalities (number)	TP + NS	TP + WB	NS + WB	TP + WB + NS	TP only	NS only	Nil
						Retained (dead)	Discarded (dead)	Released (live)									
-	445,185	76,580	17.20	-	-	-	-	-	-	-	68.7	-	-	31.3	-	-	-
TOTAL	445,185	76,580	17.20	-	-	-	-	-	-	-	68.7	-	-	31.3	-	-	-

Table 30: Commercially reported seabird captures in CCSBT fisheries during 2016, 2017, and 2018.

Year	CCSBT Stat Area	Total Effort (No. of Hooks)	Species	Number Caught	Number Dead
2016	5	854,222	Buller's albatross	2	1
			Campbell albatross	1	1
			Buller's and Pacific albatross	1	1
			Shy albatross	3	1
			Sooty shearwater	1	1
			Albatrosses (Unidentified)	1	1
			Petrels, Prions and Shearwaters	1	1
Total				10	7
2016	6	539,330	Buller's and Pacific albatross	42	41
			Wandering (Snowy) albatross	10	1
			Buller's albatross	10	10
			Southern royal albatross	1	0
			Wandering albatross (Unidentified)	2	2
			White-capped albatross	40	37
			Black-browed albatross (Unidentified)	1	1
			Sooty shearwater	2	2
			Westland petrel	10	8
			Common diving petrel	2	0
			Black (Parkinson's) petrel	2	2
			Albatrosses (Unidentified)	24	16
			Petrel (Unidentified)	2	2
			Petrels, Prions and Shearwaters	7	7
Total				155	129
2017	5	837,804	Albatrosses (Unidentified)	3	3
			Black (Parkinson's) petrel	1	1
			Grey petrel	1	1
			Black-browed albatross (Unidentified)	1	1
			Buller's and Pacific albatross	1	1
			Shy albatross	1	0
Total				8	7
2017	6	564,695	Albatrosses (Unidentified)	4	4
			Buller's albatross	11	7
			Black (Parkinson's) petrel	1	1
			Buller's and Pacific albatross	2	2
			Royal albatrosses	1	1
			Sooty shearwater	11	10
			Wandering albatross (Unidentified)	2	1
			White-chinned petrel	4	4
			White-capped albatross	15	10
			Westland petrel	8	8
			Petrels, Prions and Shearwaters	2	2
Total				61	50

			Antipodean and Gibson's albatross	2	1
			Albatrosses (Unidentified)	16	14
			Buller's albatross	10	9
			Buller's and Pacific albatross	5	4
			Procellaria petrels	4	4
2018	6	445,185	Royal albatrosses	2	2
			Southern black-browed albatross	2	1
			Shy albatross	3	3
			White-capped albatross	67	61
			Westland petrel	8	8
			Petrels, Prions and Shearwaters	4	4
			Total	123	111

* There were no commercially reported seabirds captures in area 5 in 2018.

Table 31: Commercially reported non-target fish captures in CCSBT fishery during 2016, 2017, and 2018.

Year	CCSBT Stat Area	Total Effort (No. of Hooks)	Species	Number Caught	Number Retained	Number Discarded
2016	5	854,222	Blue Shark	30459	85	30374
			Mako shark	1918	110	1808
			Porbeagle shark	2470	1	2469
			Bronze whaler shark	12	0	12
			Thresher shark	201	0	201
			Moonfish	1065	1056	9
			Total	36125	1252	34873
2016	6	539,330	Blue Shark	18765	0	18765
			Mako shark	319	3	316
			Porbeagle shark	755	15	740
			Bronze whaler shark	0	0	0
			Thresher shark	19	0	19
			Moonfish	192	180	12
			Total	20050	198	19852
2017	5	837,804	Blue Shark	26438	139	26299
			Mako shark	1041	65	976
			Porbeagle shark	1436	26	1410
			Bronze whaler shark	29	0	29
			Thresher shark	84	0	84
			Moonfish	770	738	32
			Total	28798	968	28830
2017	6	564,695	Blue Shark	14363	372	13991
			Mako shark	112	12	100
			Porbeagle shark	841	0	841
			Bronze whaler shark	1	0	1
			Thresher shark	11	0	11
			Moonfish	140	139	1
			Total	15468	523	14945
2018	5	907,681	Blue Shark	23795	57	23738
			Mako shark	878	16	862
			Porbeagle shark	617	4	613
			Bronze whaler shark	151	0	151
			Thresher shark	75	0	75
			Moonfish	1210	1192	18
			Total	26726	1269	2547
2018	6	445,185	Blue Shark	18083	0	18083
			Mako shark	144	0	144
			Porbeagle shark	1103	0	1103
			Bronze whaler shark	0	0	0
			Thresher shark	8	0	8
			Moonfish	240	240	0
			Total	19578	240	19338

Table 32: Commercially reported marine mammal captures in CCSBT fisheries during 2016, 2017, and 2018.

Year	CCSBT Stat Area	Total Effort (No. of Hooks)	Species	Number Caught	Number Dead
2016	5	854,222	New Zealand fur seal	8	0
			Dolphins and Toothed whales	1	0
	6	539,330	New Zealand fur seal	3	0
2017	5	837,804	New Zealand fur seal	24	2
			New Zealand fur seal	24	3
	6	564,695	Beaked whales	1	0
2018			New Zealand fur seal	3	0
	5	907,681	Orca	1	0
			Seals and Sealions	1	0
	6	445,185	New Zealand fur seal	8	1

Table 33: Commercially reported marine reptiles captures in CCSBT fisheries during 2016, 2017, and 2018.

Year	CCSBT Stat Area	Total Effort (No. of Hooks)	Species	Number Caught	Number Dead
2016	5	854,222	Leatherback turtle	2	0
2017	5	837,804	Leatherback turtle	2	0
2018	5	907,681	Leatherback turtle	3	0

13 Appendix – Figures

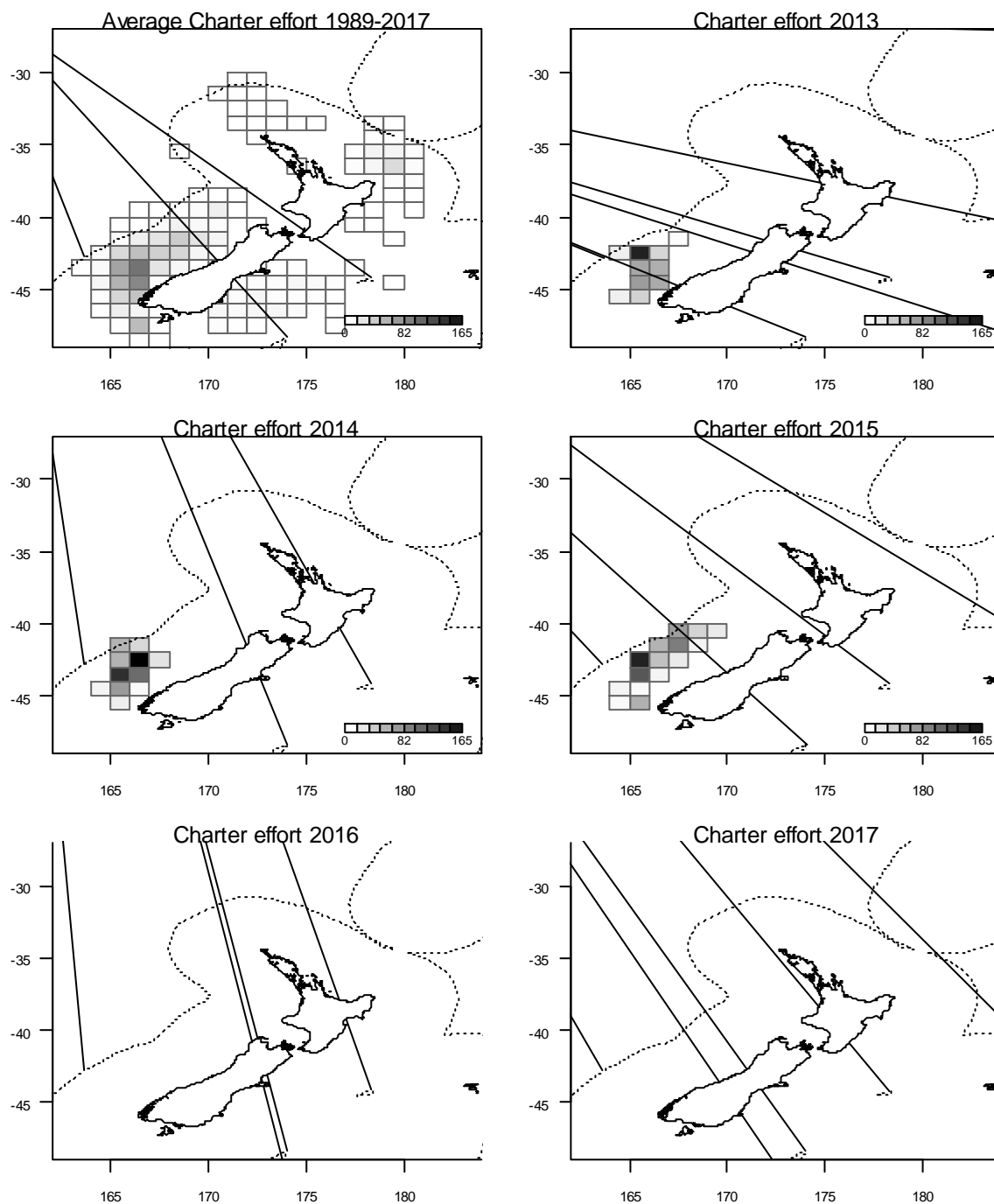


Figure 1: Distribution of longline effort (1,000s of hooks per one degree square) for the charter fleet: average for the time series (1989 to 2017), and annually for 2013 to 2017. (No charter vessels fished in 2016 or 2017.)

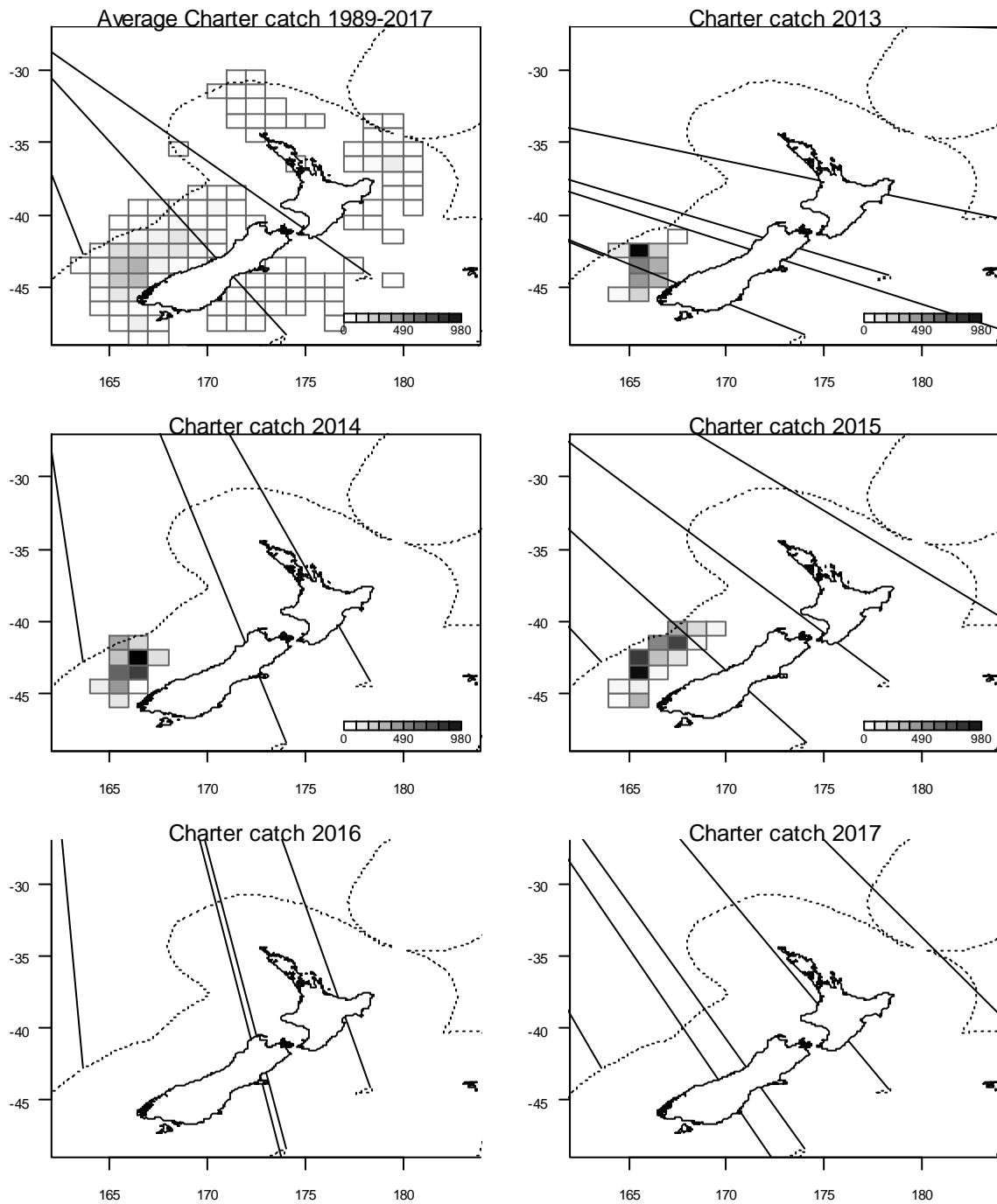


Figure 2: Distribution of longline catches (number of fish per one degree square) for the charter fleet: average for the time series (1989 to 2017), and annually for 2013 to 2017. (No charter vessels fishing in 2016 or 2017.)

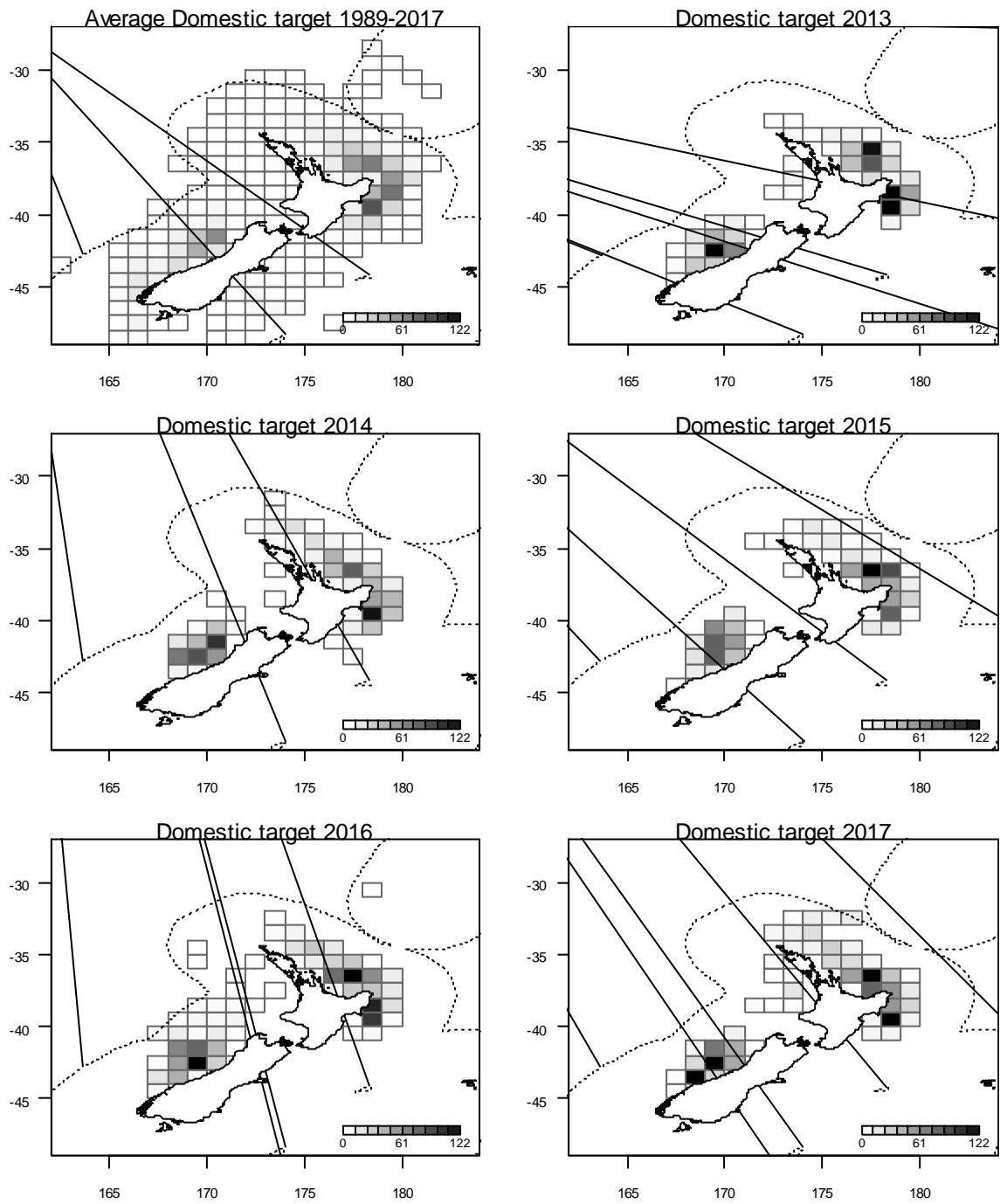


Figure 3: Distribution of longline effort (1,000s of hooks per one degree square) for the domestic fleet that was targeted at SBT: average for the time series (1989 to 2017), and annually for 2013 to 2017.

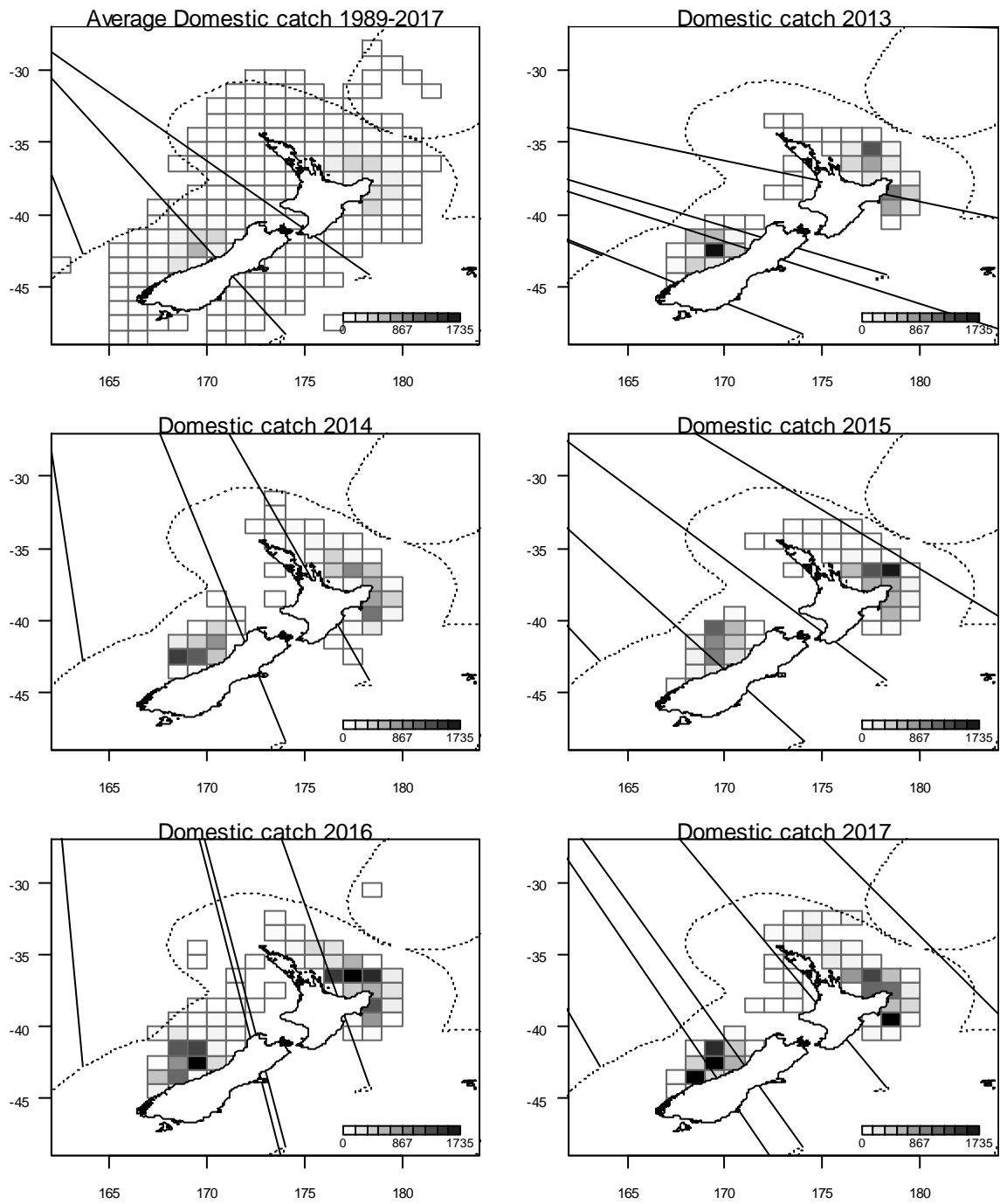


Figure 4: Distribution of longline catches (number of fish per one degree square) for the domestic fleet: average for the time series (1989 to 2017), and annually for 2013 to 2017.

14 Annex

Summary of papers submitted to ERSWG

#	CCSBT-ERS/1905/15
Title	Analysis to identify potential high-risk areas (using method 3A)
Authors	Edward Abraham, Yvan Richard, Nathan Walker, Will Gibson
Abstract	<p>This paper addresses the definition of high-risk areas for seabirds, based on the recommendations of the most recent meeting of the Ecologically Related Species Working Group (ERSWG 12). The meeting recommended that the summed mean risk, across assessed species, be used as a basis for defining high-risk areas.</p> <p>We applied this definition to the recent risk assessment of surface-longline fishing to seabirds in the Southern Hemisphere, including 26 albatross and petrel taxa that are listed by the Agreement for the Conservation of Albatrosses and Petrels (ACAP) and breed south of 20°S.</p> <p>The risk to the albatross and petrel species was highest in the mid-latitudes of the Southern Hemisphere, with most of the aggregated mean risk (86.5%) in the core Commission for the Conservation of Southern Bluefin Tuna (CCSBT) statistical areas (other than statistical areas 11, 12, and 13). Most (87.6%) of the surface-longline fishing in the core CCSBT areas was by CCSBT member countries.</p> <p>If a risk threshold was chosen so that all 5-degree cells with a mean aggregated risk over 0.96 were considered high-risk areas, then there are four 5-degree cells that were high risk (two areas in the southern Indian Ocean, near South Africa, and two areas in the Tasman Sea). In this case, 26.1% of the total mean risk and 18% of the CCSBT fishing effort was in high-risk areas. If a risk threshold was chosen so that all 5-degree cells with a mean aggregated risk over 0.32 were considered high-risk areas, then there are 17 5-degree cells that were high risk. In this case, 50.1% of the total mean risk and 39% of the CCSBT fishing effort was in high-risk areas.</p> <p>There were nine species with a mean aggregated risk over one (meaning that fisheries bycatch is higher than the population sustainability threshold). Reducing the bycatch within the high-risk areas by 50% would reduce the mean risk for wandering albatross to below one. A 50% reduction in captures across all surface-longline fishing would leave three species (sooty albatross, Tristan albatross, and Amsterdam albatross) with a mean risk above one.</p>

#	CCSBT-ERS/1905/16
Title	Proposed definition of high-risk areas
Authors	Fisheries New Zealand
Abstract	Having agreed on the most appropriate methodology to apply in the analysis of 'high risk areas', Members now need to agree on what level of risk identified under the agreed method can be considered 'high'.

	<p>In this paper, key considerations for identifying ‘high risk areas’ are identified, and then two options are proposed for a level of risk that could be considered ‘high’. Option 1 proposes a high risk threshold, which would capture around a quarter of the aggregate risk in the areas identified as ‘high risk areas’. Option 2 proposes a medium risk threshold, which would capture around half of the aggregate risk in the areas identified as ‘high risk areas’.</p> <p>New Zealand invites the group to consider the two options in terms of the fishing effort and potential impact on at-risk seabird species, and determine which option would be most appropriate in terms of meeting CCSBT ERS objectives.</p>
--	--

#	CCSBT-ERS/1905/17
Title	Assessment of the risk of surface longline fisheries in the southern hemisphere to albatrosses and petrels, for 2016
Authors	Edward Abraham, Yvan Richard, Nathan Walker, Will Gibson, Ochi Daisuke, Sachiko Tsuji, Sven Kerwath, Henning Winker, Mahdi Parsa, Cleo Small, Susan Waugh
Abstract	<p>Assessing the bycatch of seabirds is a key step in understanding the impact of fishing on their populations. In this analysis, we used the seabird risk assessment methodology that was developed in New Zealand to estimate the bycatch of 26 albatross and petrel taxa that breed in the Southern Hemisphere. The bycatch estimates were related to population productivity to estimate the impact of surface-longline fishing on the populations.</p> <p>This analysis was based on observer data provided by Japan, South Africa, Australia and New Zealand. These countries all record the seabird species caught during observed fishing, allowing the estimation of seabird bycatch at the species level. The observed captures were related to the overlap between the observed fishing and the distributions of the seabirds (with the latter derived from tracking data where possible). From the fitted risk assessment model, captures were then estimated across all surface-longline fishing effort in the Southern Hemisphere (as reported to regional fisheries management organisations). These estimates do not include any estimates of cryptic mortality or survival of released seabirds.</p> <p>Across all the seabird taxa and surface-longline fishing effort included in this study, the total estimated annual captures were 41 078 (95% c.i.: 39 432 to 42 746). Among all the taxa, captures of grey-headed albatross were the highest (8 444; 95% c.i.: 7 796 to 9 100). The petrel with the highest captures was white-chinned petrel, with estimated annual captures of 5 392 (95% c.i.: 2 131 to 13 166). There were nine species for which the estimated annual captures in surface longline fisheries exceeded the population productivity: Amsterdam albatross, sooty albatross, Tristan Albatross, Gibson’s albatross, grey-headed albatross, Buller’s albatross, black petrel, spectacled petrel and wandering albatross.</p> <p>The results are preliminary at this stage; however, this analysis demonstrates how distribution information, together with observer data of seabird bycatch, may be used to estimate the impact of fisheries bycatch on seabird populations.</p>

#	CCSBT-ERS/1905/18
Title	Analysis of differences in bycatch rates between fleets
Authors	Fisheries New Zealand
Abstract	<p>Large differences in seabird bycatch rates between fleets prompted the need for analysis to identify the reasons behind these differences. New Zealand agreed to lead this workplan item, with collaboration from all Members.</p> <p>Table 1 of the ERSWG report template already captures potential effects of area on seabird bycatch rates based on CCSBT statistical area. In order to capture potential effects of seasons and mitigation measures, New Zealand requested additional information that attributed seabird captures to yearly quarters and mitigation measures set up.</p> <p>Four members, were able to provide the information requested. Although patterns were seen in the data provided, New Zealand was not in a position to provide a hypothesis on the potential drivers behind the large differences in capture rates between fleets given the missing data.</p>

#	CCSBT-ERS/1905/Info1
Title	Hookpod-mini: a smaller potential solution to mitigate seabird bycatch in pelagic longline fisheries
Authors	David Goad (Vita Maris), Igor Debski (Department of Conservation), Joanna Potts
Abstract	<p>Hookpods are an emerging technology designed to reduce seabird bycatch in pelagic longline fisheries. Hookpod-minis were trialled in the New Zealand surface longline fishery in 2016/17 during short-term experimental (20 longline sets) and longer-term operational (110 longline sets) trials.</p> <p>Two sets of experimental trials compared snoods fitted with Hookpod-minis with a tori line to unweighted snoods with a tori line, and snoods fitted with Hookpod-minis as a stand-alone mitigation measure compared to weighted snoods in combination with a tori line, with all gear set at night.</p> <p>Operational trials compared snoods fitted with Hookpod-minis and tori lines to standard mitigation requirements for unweighted gear and tori lines, with all gear set at night. Both sets of trials demonstrated that Hookpod-minis fit easily into fishing operations, do not reduce target species catch rate, and may reduce seabird bycatch to low levels.</p> <p>Our findings suggest that Hookpod-minis as a stand-alone mitigation measure are as effective, or more effective, than current bycatch mitigation measures including the combination of line weighting and tori lines.</p>