

**Ministry for Primary Industries**  
Manatū Ahu Matua



# **Annual Review of National Southern Bluefin Tuna Fisheries for the Extended Scientific Committee**

**New Zealand Country Report**

Prepared for the 22<sup>nd</sup> Meeting of the Extended Scientific Committee  
(ESC22)

**August 2017**

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# 1 Introduction

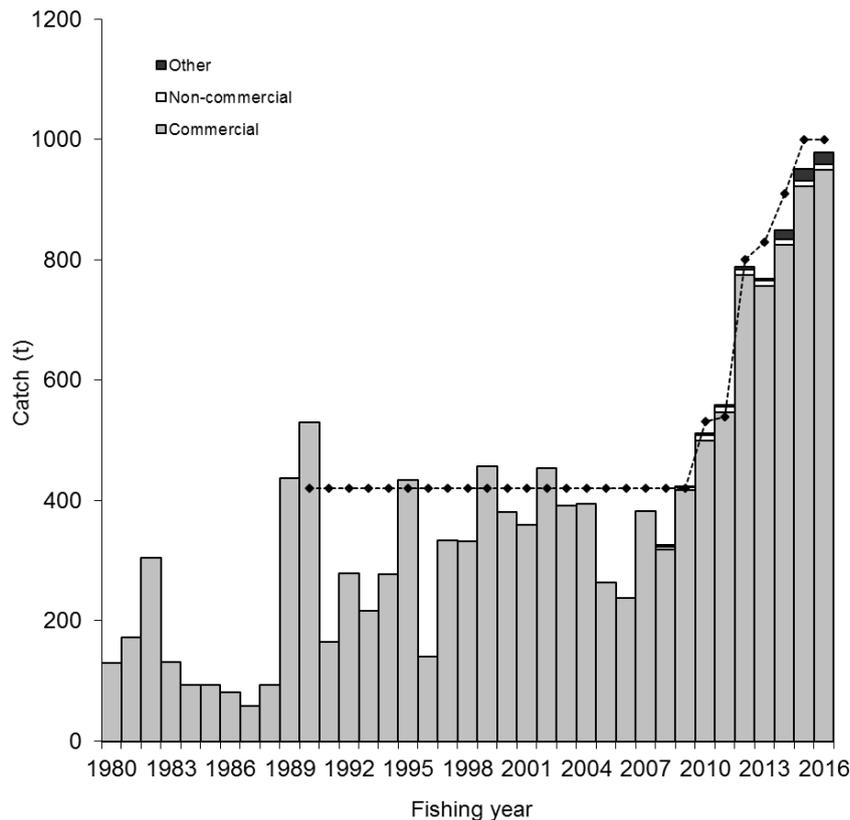
## 1.1 SUMMARY OF HISTORICAL DEVELOPMENTS IN THE FISHERY

Historically, adult and juvenile southern bluefin tuna (**SBT**) were distributed around New Zealand. During the 1960s and 1970s, juvenile SBT were encountered on both the east and west coasts of the North Island and the west coast of the South Island during summer months. Domestically, several tonnes were taken in pole and line and troll fisheries.

In the early 1980s, a concerted effort to develop a domestic SBT fishery to service the Japanese market was undertaken. By 1982, a handline fishery was established with the catch frozen on board a former Japanese longline vessel. Following the high catches of the 1982 season (305t landed), the handline fishery continued into the late 1980s, albeit at a reduced level (below 100t until 1989). Around this time, longlining became the dominant fishing method for SBT, and remains so until this day.

In 1989, New Zealand implemented a national catch limit of 420t per year, which remained until 2008/09. In 2009, the 16<sup>th</sup> Commission Meeting of the Commission for the Conservation of Southern Bluefin Tuna (**CCSBT**) agreed to reduce the global total allowable catch (**TAC**) by 20% and apply revised national allocations for 2010 and 2011. New Zealand increased its national catch limit for 2009/10 in reflection of the meeting's allocation decisions. New Zealand's national catch limit has increased over the years to 1000t in 2014/15, where it remained for the 2015/16 fishing season. On the few occasions when the New Zealand allocation has been exceeded, the domestic catch limit has been reduced in the following year by an equivalent amount (**Figure 1, Table 1**).

Since 1 October 2004, SBT has been managed under the quota management system (**QMS**). The introduction to the QMS saw a change from the "Olympic" race for fish, to fishing spread throughout the season, and was associated with a consolidation of the fleet.



**Figure 1: Commercial catches of SBT (t, whole weight) by New Zealand fishing year (1 October to 30 September). Annual total catch is from Licensed Fish Receiver returns for 1998/99 to 2000/01, and from Monthly Harvest Returns from permit holders since 2001/02. The dashed horizontal line refers to the catch limit for New Zealand. From the 2007/08 fishing year, estimates of non-commercial catch and discard mortality are included.**

## 1.2 OVERVIEW OF THE MOST RECENT FISHING SEASON

For the 2015/16 fishing year, the New Zealand SBT fishery was allocated a total allowable commercial catch (TACC) of 971t, the remainder of New Zealand's TAC being allocated to recreational (eight tonnes) and customary non-commercial fishers (one tonne), and other sources of fishing-related mortality (20t). Commercial removals were 949.2t in the 2015/16 fishing year. No charter vessels fished in New Zealand in 2016 and therefore the entire catch of SBT was taken by the domestic fleet.

## 2 Catch and effort

### 2.1 TRENDS BY GEAR TYPE

Prior to the early 1990s, small vessels handlining and trolling dominated the domestic fishery. Since 1991, surface longlining has been the predominant method used to target SBT in the domestic fishery, with 96% of all days fished using this method and only 4% using hand line (<1% used trolling). This represents a major change from the 1980s when most fishing was by hand line.

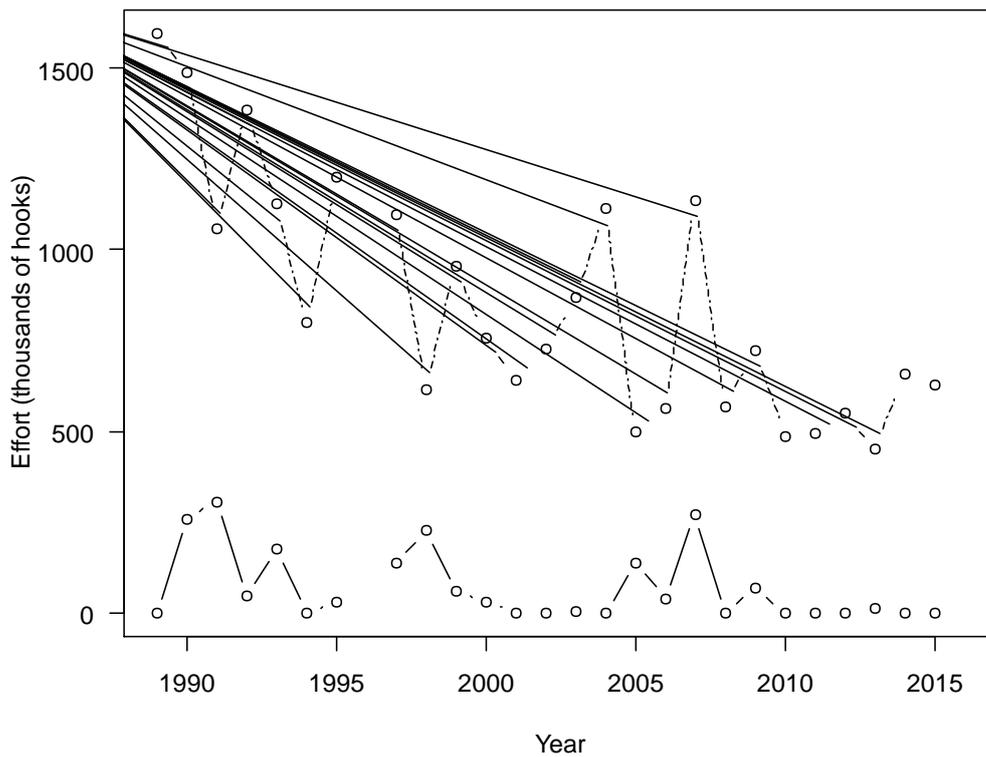
## 2.2 TRENDS BY AREA AND SEASON

New Zealand catch data shows most SBT are caught off the west coast of the South Island (**WCSI**; CCSBT Region 6) or the east coast of the South Island (**ECNI**; CCSBT Region 5) from April to July. SBT catch has steadily increased over the years, with 2016 reaching a record high of 950.7t. Due to no charter vessels fishing in 2016, effort was around 75% of previous years.

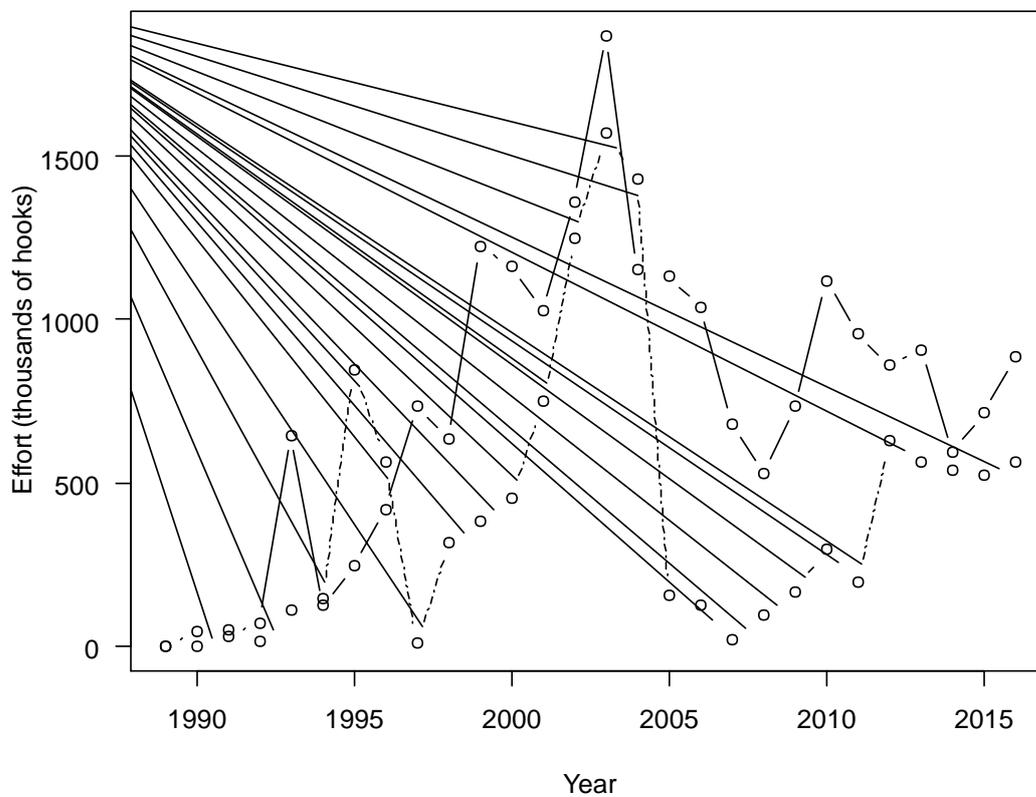
Catches for the charter fleet by calendar year and CCSBT region are provided in **Table 2**. Effort information is provided in **Figure 2** and **Table 3**. Most catch and effort occurred in Region 6, which covers WCSI fishing grounds. In 2016, due to changes in legislation, no charter vessels fished in New Zealand.

Catches for the domestic fleet by calendar year and CCSBT region are provided in **Table 4**. Effort information is provided in **Figure 3** and **Table 5**. A longline fishery targeting other highly migratory species also operates outside the SBT fishing season, and this data has been included in **Table 5** as “Other\*”. Since the late 1990s, most domestic catch and effort has occurred in Region 5, which covers the ECNI fishing grounds. In 2016, despite domestic effort remaining similar to recent years, domestic catch reached a record high of 384.9t in Region 6 and 564.7t in Region 5.

While target effort increased dramatically in both regions from 1995 to 2003, it declined to a low level in 2007 and 2008, particularly in Region 6. This decline is associated with a substantial decrease in the number of vessels in the surface longline fleet (**Table 7**), and the removal from the fleet of a domestically-owned freezer vessel that fished in Region 6. Since 2008, reflecting increased catch limits in recent years and in an attempt to extend their SBT fishing season, domestic vessels have increased effort in Region 6.



**Figure 2: Effort (1000s of hooks) for the charter fleet in Region 5 (solid line – ECNI) and Region 6 (dashed line – WCSI). Note that this includes some non-SBT target effort in Region 5 and that no charter vessels fished in 1996 nor in 2016.**



**Figure 3: Target effort (hooks from sets that either targeted or caught SBT – 1000s of hooks) by the domestic fleet for Region 5 (solid line – ECNI) and Region 6 (dashed line – WCSI).**

### 3 Nominal CPUE

Nominal catch per unit effort (CPUE) by fleet across CCSBT regions based on targeted longline effort is provided in **Figure 4**.

#### 3.1 TRENDS BY FLEET

For the domestic fleet, CPUE was calculated for effort from sets that either caught or targeted SBT (referred to as target effort). Due to the large changes in the structure of the domestic fleet and the nature of the “Olympic system” under which the New Zealand fishery operated prior to 2004, the trends in the CPUE for the domestic fishery may not provide reliable information on trends in vulnerable biomass, although the CPUE does exhibit similar trends to that of the charter fleet.

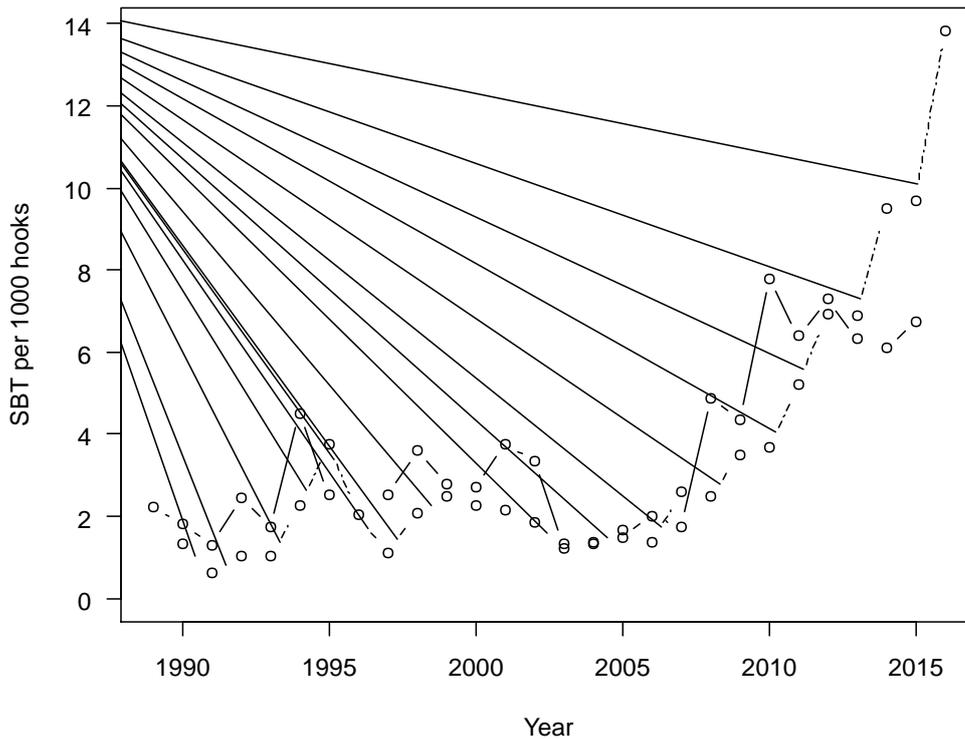
Up to 2016, the domestic fleets operating in both Regions 5 and 6 have experienced an increase in CPUE since 2008. This has been most profound in Region 5, where CPUE in 2016 is the highest on record at almost 14 fish per 1000 hooks.

The charter fleet also experienced a marked increase since 2008, reaching a peak in 2010 at nearer eight fish per 1000 hooks. Since then, CPUE has varied around seven fish per 1000 hooks.

#### 3.2 TRENDS BY AREA AND SEASON

Associated with the lack of new recruitment (Section 4), CPUE declined dramatically for both charter and domestic fleets in 2003 and remained at these low levels (about one fish per 1000 hooks) for four to five years.

CPUE was also calculated for the charter fleet in Region 6 for fish thought to be of spawning age (SBT greater than 10 years of age). This was done based on both the proportional ageing of observer lengths and on the smaller dataset of SBT that were directly aged. The series are compared in **Figure 5** and agree closely with each other. There is a slowly increasing trend to 2011; CPUE of SBT greater than 10 years has varied around one fish per 1000 hooks, with a historical low point in 2003 and the highest level for the series in 2008.



**Figure 4: CPUE (number of SBT per 1000 hooks) by calendar year for the charter (solid line) and domestic (dashed line) longline fleets based only on effort from sets that either targeted or caught SBT. Note that no charter vessels fished in 1996 nor in 2016.**

## 4 Size composition

Fish length data collected from 2001 to 2016 are shown in **Figures 6** and **7**.

There was a very clear reduction in the range of sizes of SBT taken in the New Zealand fishery between 2001 and 2006. There is evidence of growth (progression of modes) over this period, but little evidence of recruitment of smaller fish to the New Zealand fishery. However, more recent data show a change, with smaller recruits appearing from 2006 and dominating the catch (by number) since 2010 (**Figure 6**). This mode mainly represents fish from the 2004 to 2006 year classes.

### 4.1 TRENDS BY FLEET AND SEASON

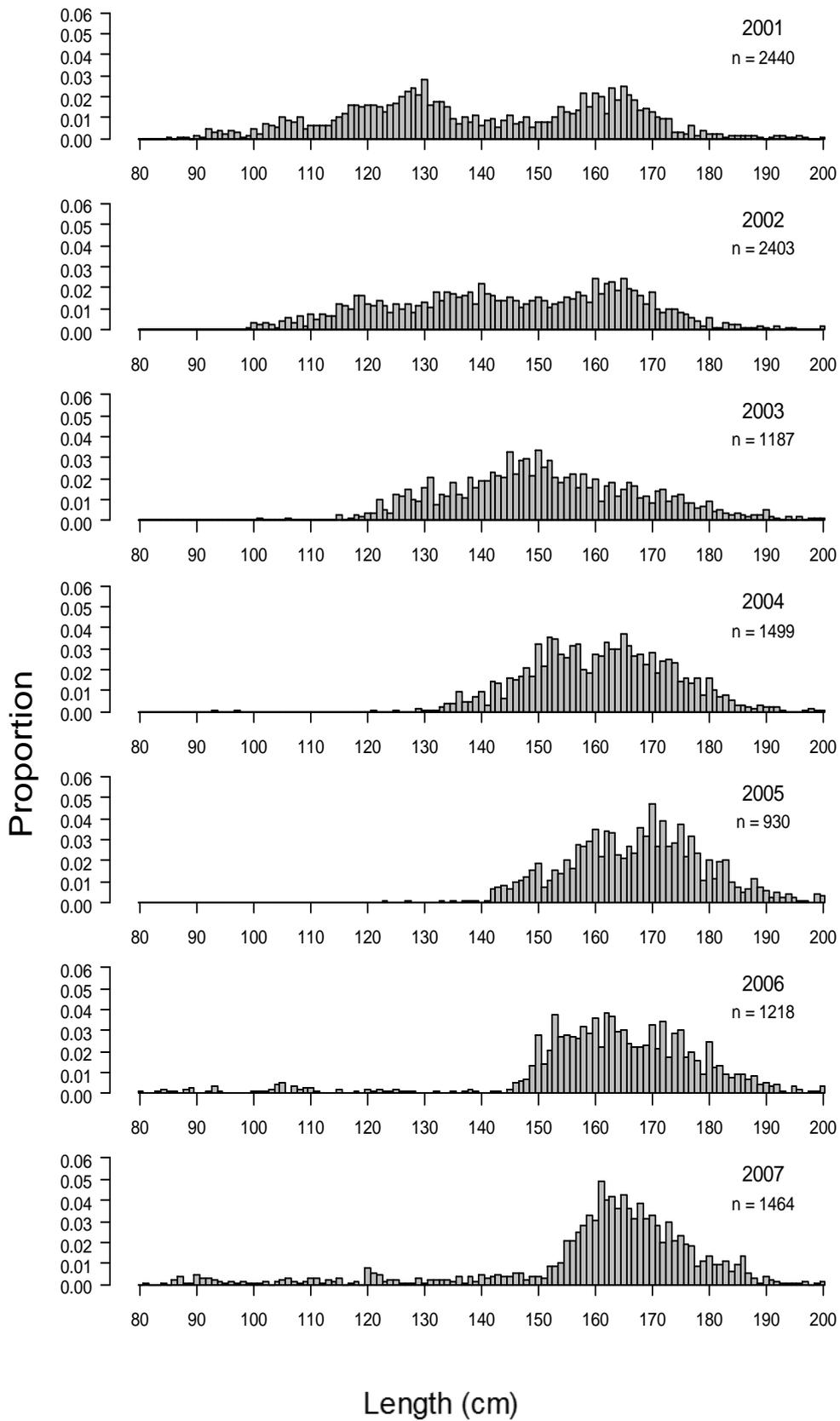
An examination of the proportion of the charter fleet catch under a given size since 1989 (**Table 6; Figure 8**) indicates that fish under 140 cm have varied from less than 10% from 2001 to 2004 to over 60% in 2010. In 2013 this had dropped to less than 30% as a result of growth (progression of the main length mode). Overall, the proportions fluctuate in a manner consistent with periods of above and below average recruitment (for example, two to three year cycles).

Proportions-at-age determined from direct ageing of fish caught by the charter fleet are available for the years 2001 to 2015 (**Figure 10**). Direct aging data for 2016 is expected to be available in November 2017.

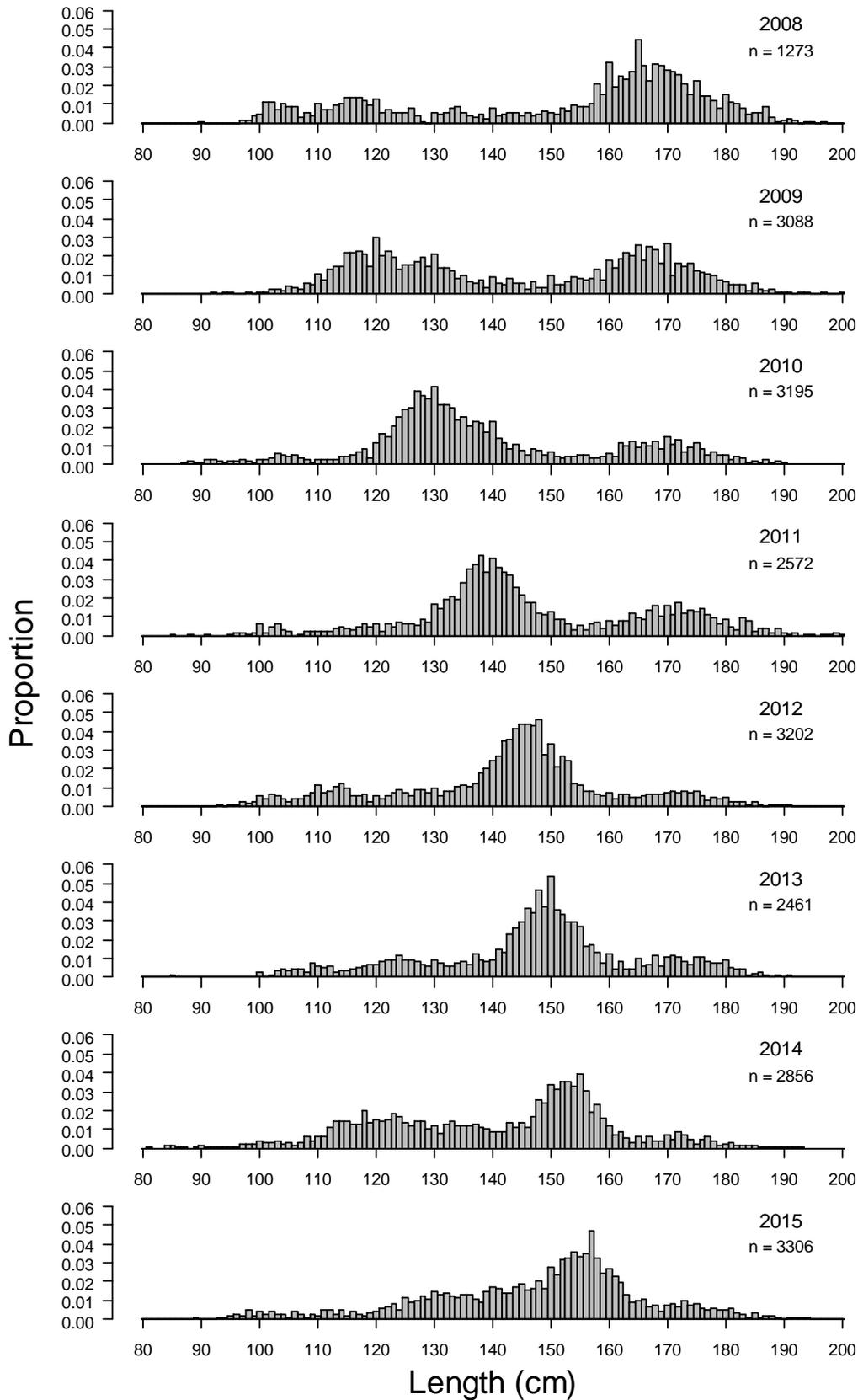
It is noted that the direct ageing showed considerably fewer “plus group” fish than were estimated from proportional ageing (see New Zealand’s country report 2010 for comparison). Direct ageing data have also been used to calculate the annual catch rates for SBT that are greater than 10 years of age (spawning age fish), as shown in **Figure 5** above.

Historically, observer coverage was low in the domestic fishery, therefore size composition data are not as well estimated for this fleet. Nevertheless, size composition data for the domestic fleet (based on observer reports) are provided in **Figure 7** and show similar patterns to that observed in the charter fleet. These distributions would now be better described by data from the Catch Documentation System, which provides a complete census of fish lengths for the fishery since 2011.

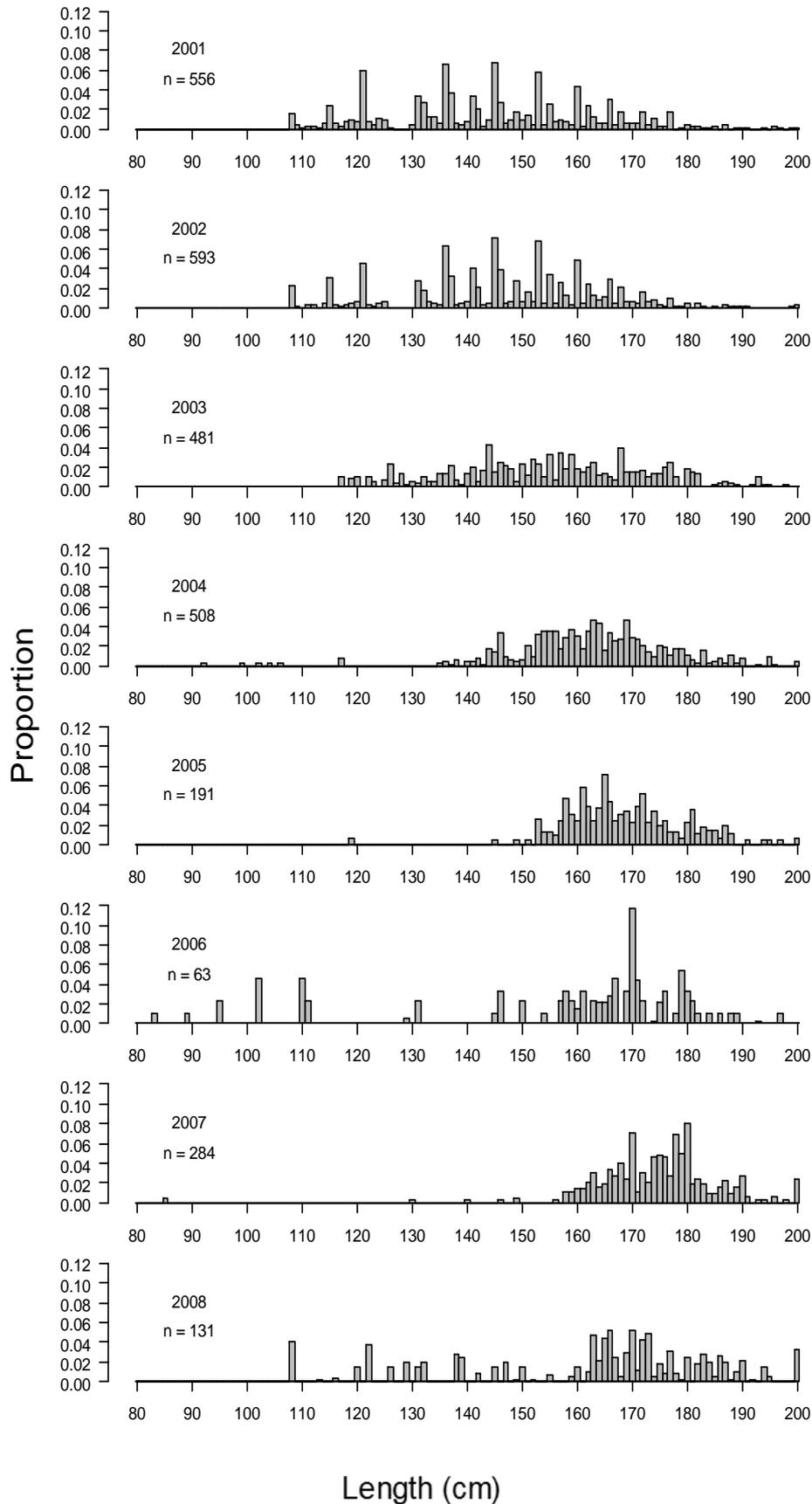
An examination of the proportion of the domestic fleet catch under a given size since 1990 (**Table 7; Figure 9**) indicates that fish under 140 cm have varied from less than around 20% from 2003 to 2008 to over 60% in 2016.



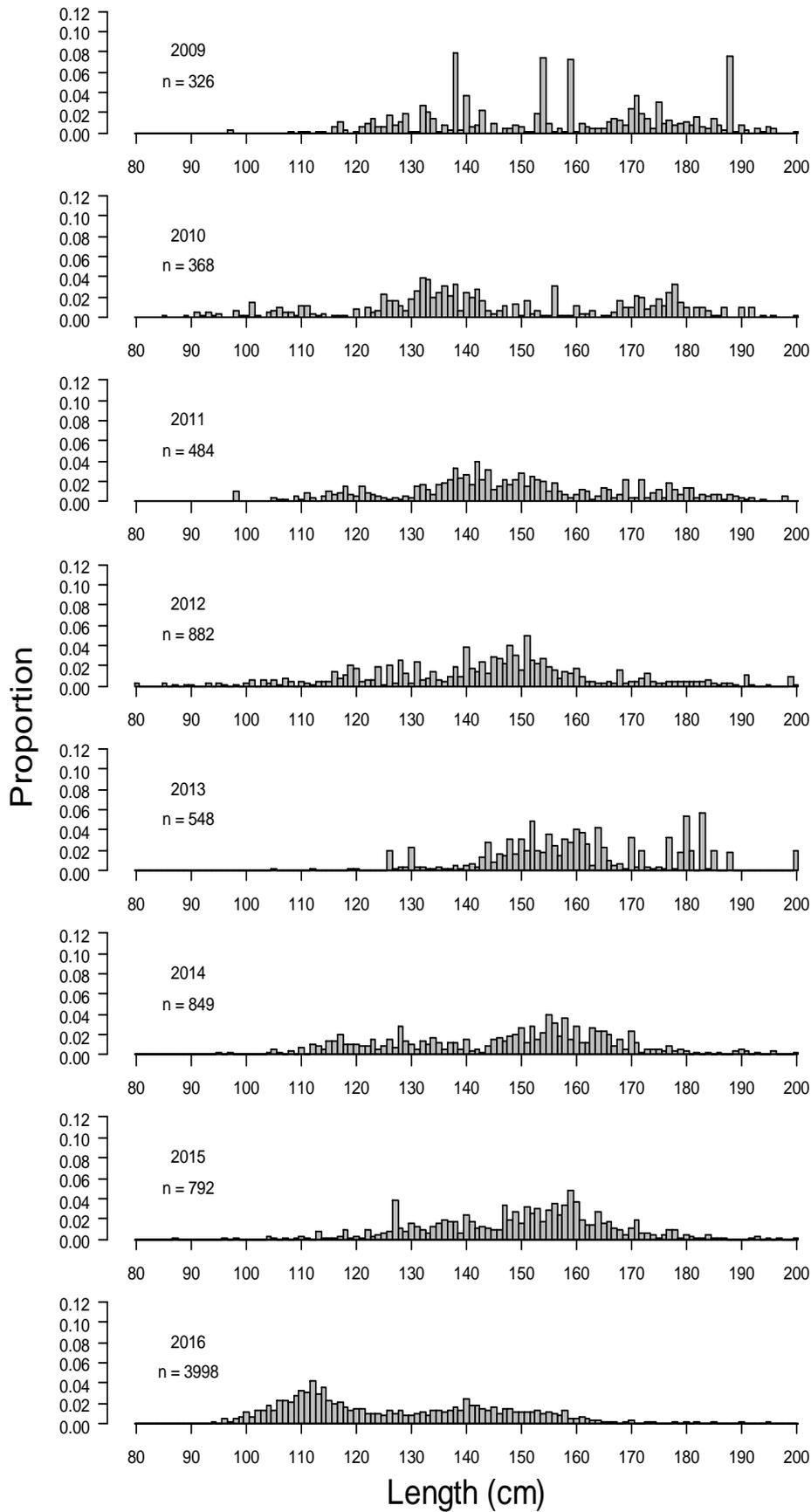
**Figure 6: Proportion-at-length for the charter fleet for 2001 to 2015. (No charter vessels fished in 2016.)**



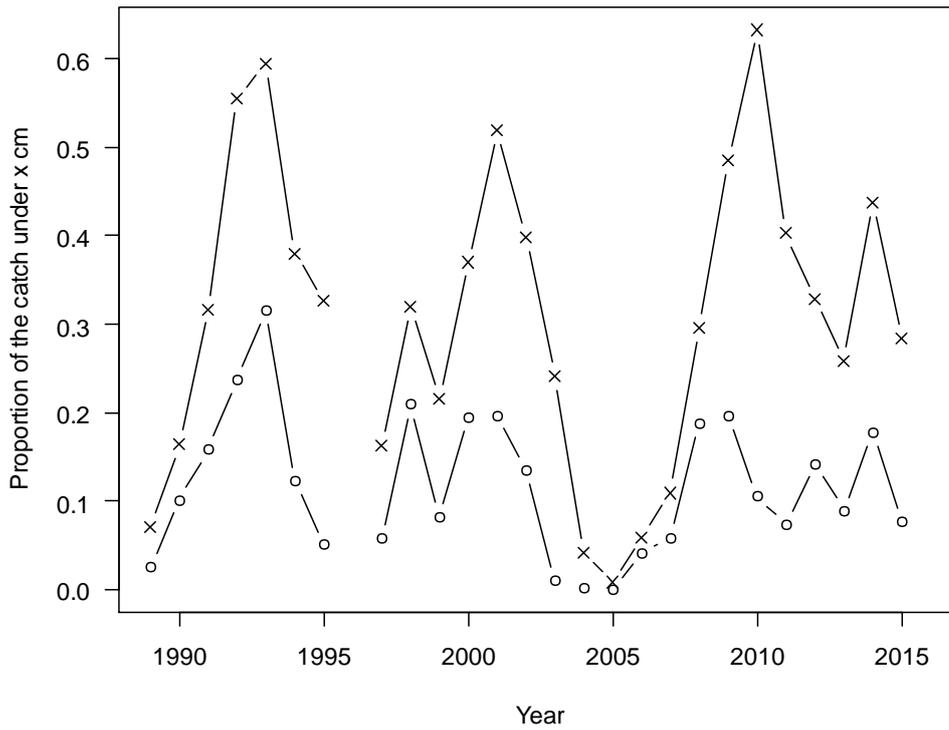
**Figure 6(cont.): Proportion-at-length for the charter fleet for 2001 to 2015. (No charter vessels fished in 2016.)**



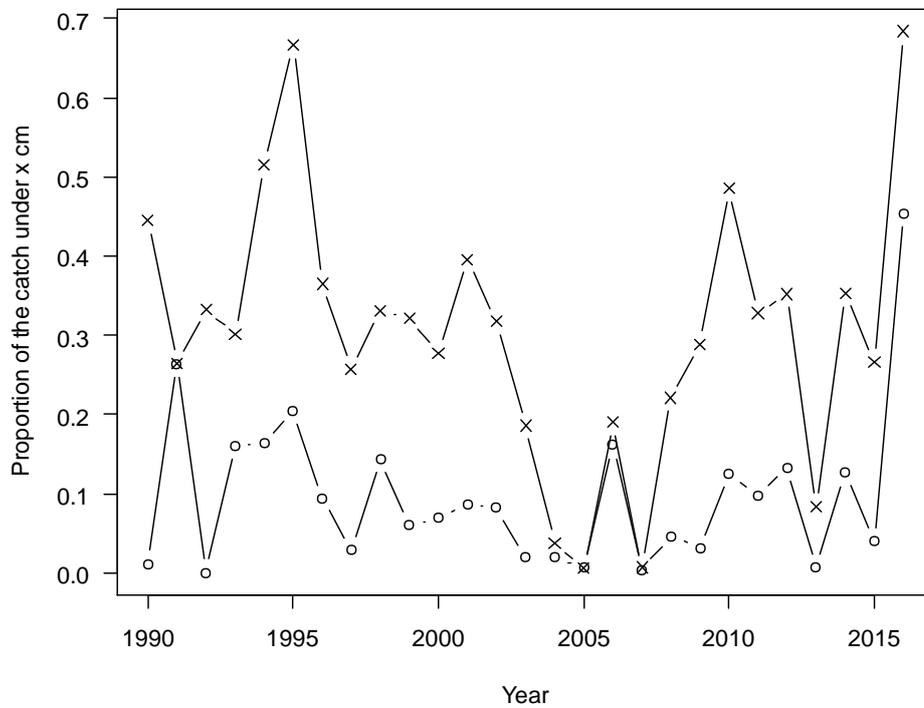
**Figure 7: Proportion-at-length for the domestic fleet for 2001 to 2016.**



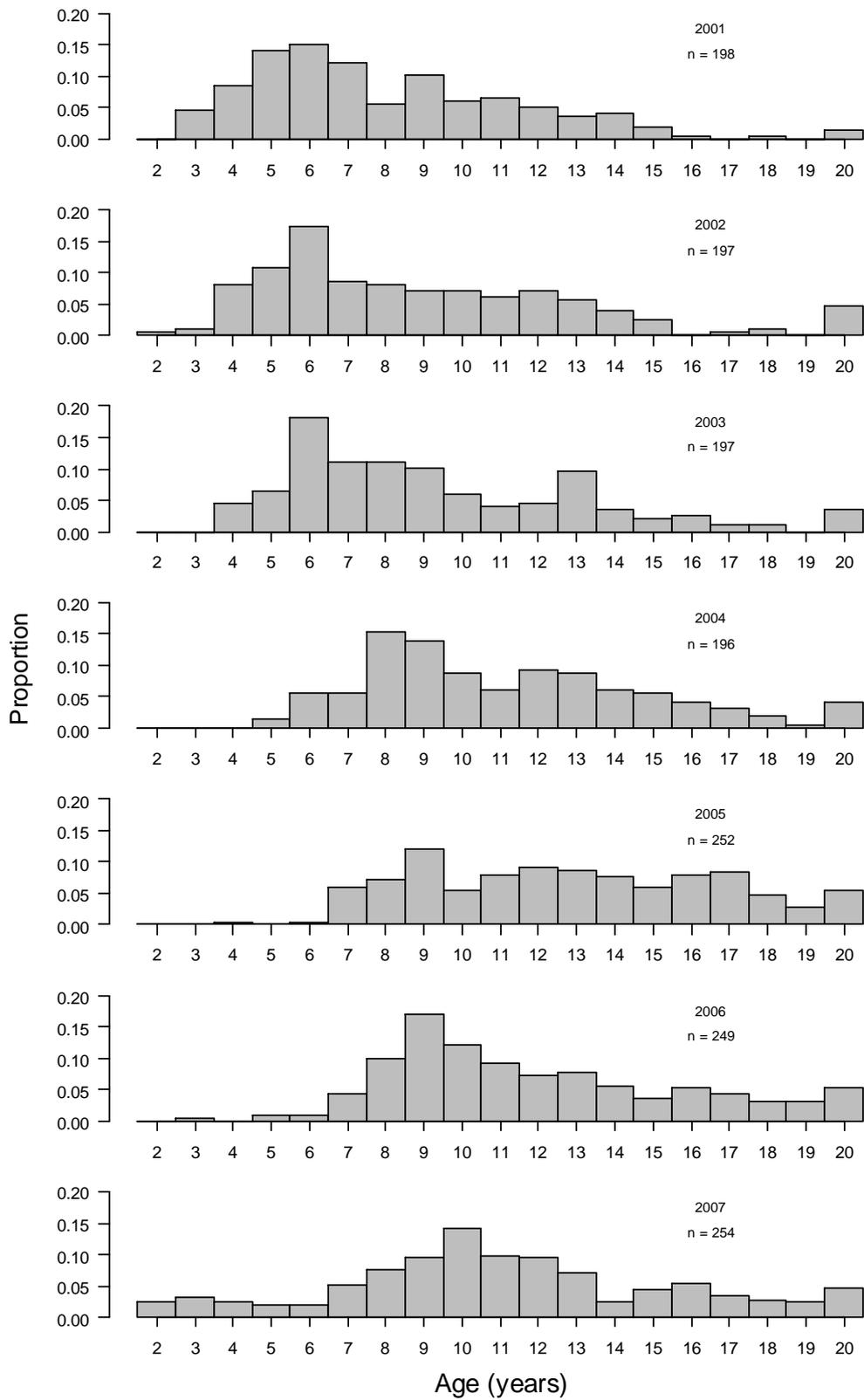
**Figure 7 (cont.): Proportion-at-length for the domestic fleet for 2001 to 2016.**



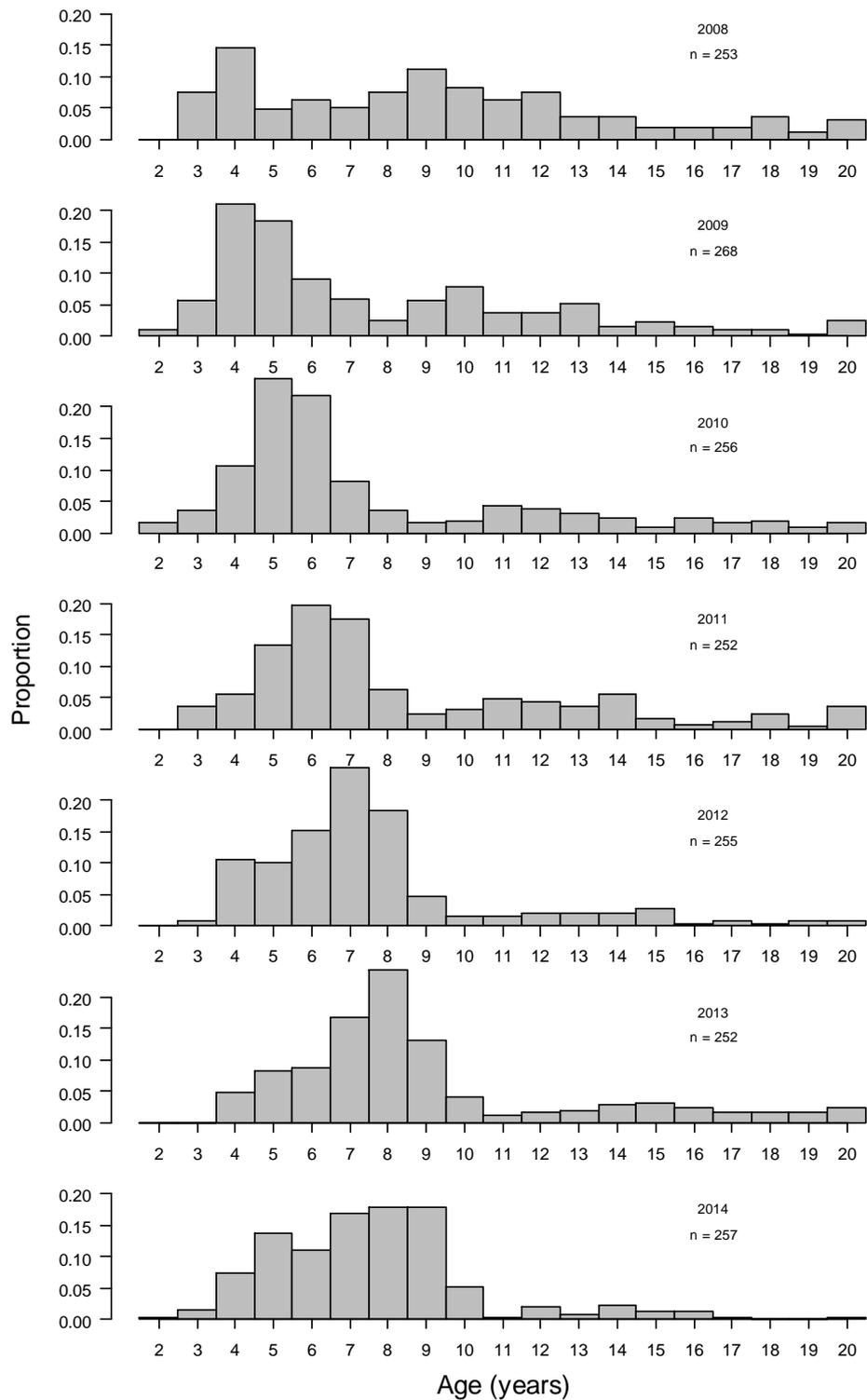
**Figure 8: Proportion of the catch from the charter fleet under 120 cm (o) and 140 cm (x) for 1989 to 2016 (no charter vessels fishing in 1996 nor in 2016).**



**Figure 9. Proportion of the catch from the domestic fleet under 120 cm (o) and 140 cm (x) for 1989 to 2016.**



**Figure 10: Proportion-at-age for the charter fleet for 2001 to 2014 based on direct ageing. Age 20 is a plus group.**



**Figure 10 (Cont.): Proportion-at-age for the charter fleet for 2001 to 2014 based on direct ageing. Age 20 is a plus group.**

## 5 Fleet size and distribution

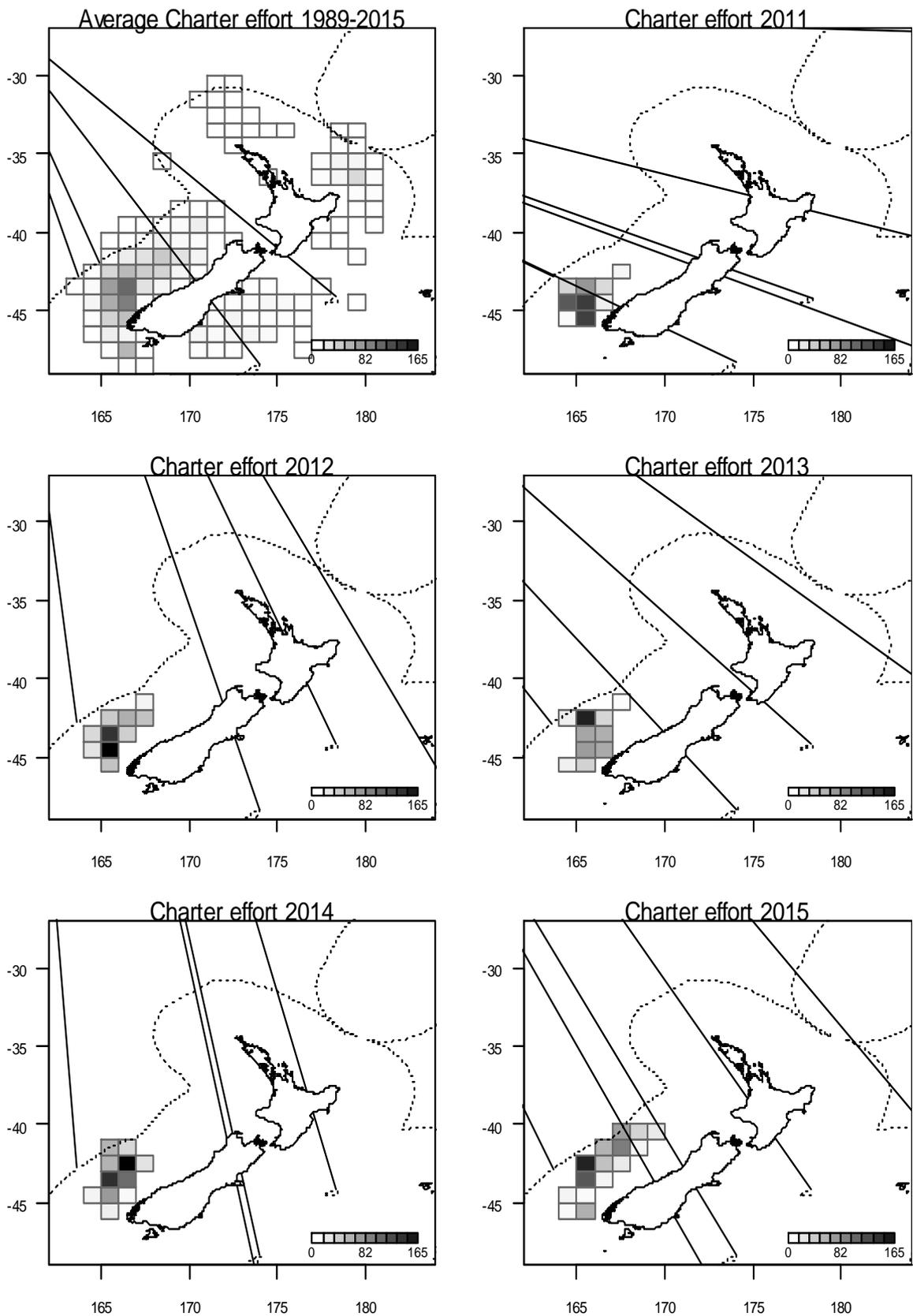
### 5.1 TRENDS BY SEASON

In 1991, the first domestic longline vessel began fishing for SBT and charter vessels dominated the fishery. The number of domestic vessels targeting SBT expanded throughout the 1990s and early 2000s prior to the introduction into the QMS. Since then, the number of vessels in the fleet has been declining, with 32 vessels operating in the fishery during the 2015/16 fishing year (**Table 7**).

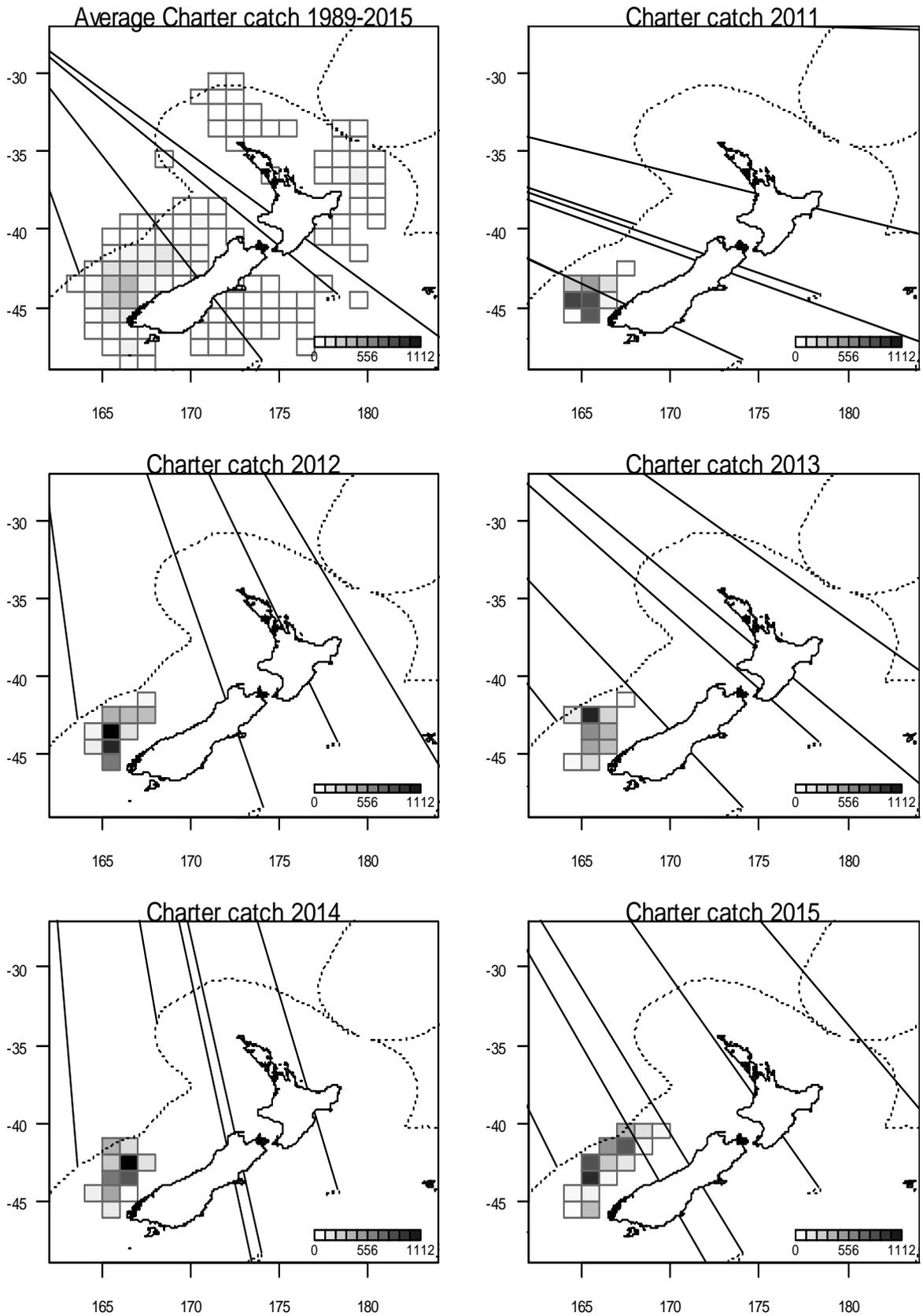
### 5.2 TRENDS BY AREA

Historically, the charter fleet, which was primarily composed of the larger -60° freezer vessels, dominated the WCSI fishery. In 2016, due to changes in legislation, no charter vessels fished in New Zealand. The spatial distribution of fishing effort and SBT catches of the charter fleet are provided in **Figures 11** and **12**, respectively.

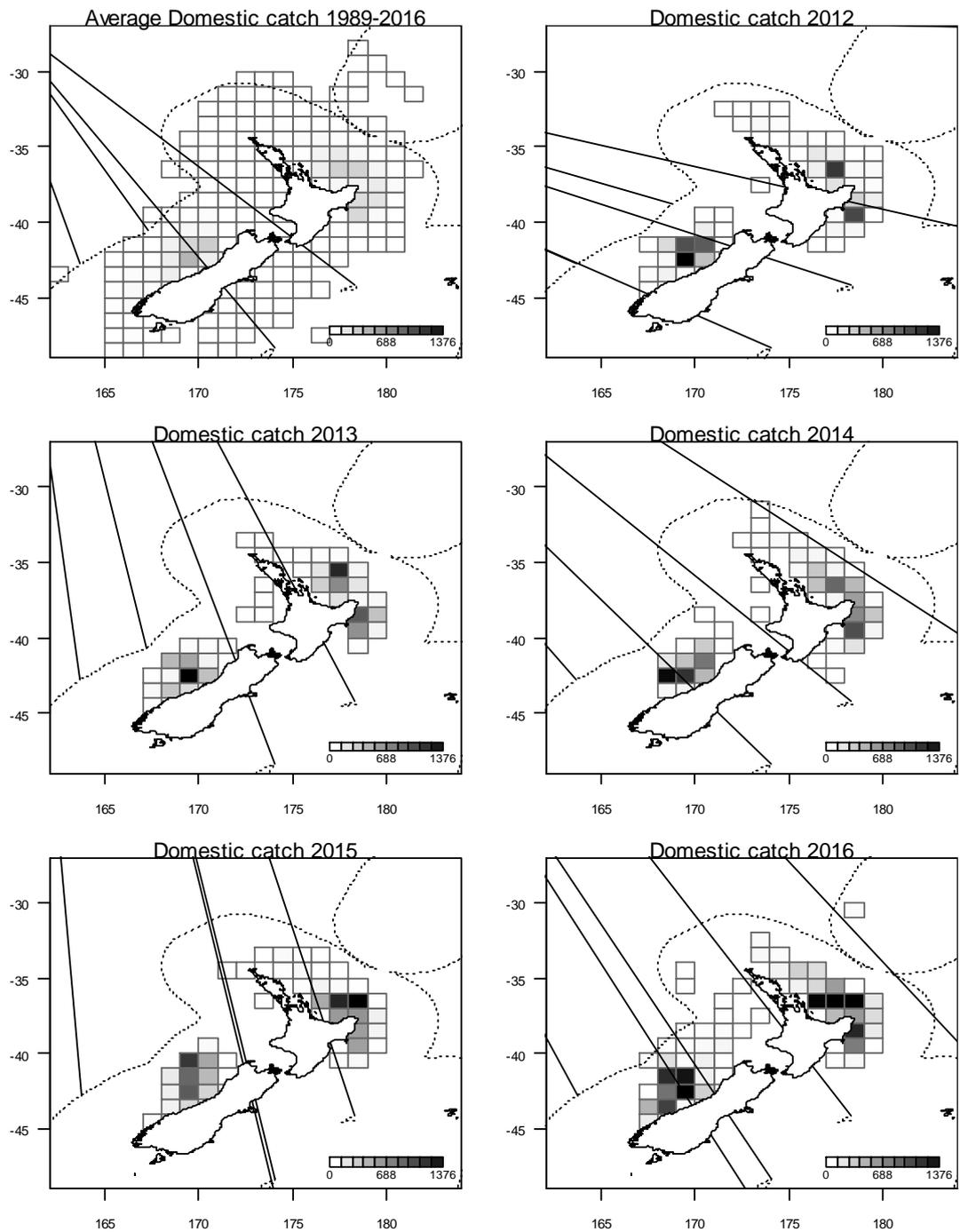
The domestic fleet is primarily composed of smaller “ice boats”, which operate mainly in the longline fishery off ECNI. However, in recent years, domestic vessels have increased effort off WCSI in an attempt to extend their SBT fishing season. The domestic vessels are typically at sea for only a few days, and land SBT both as a target and as a bycatch of bigeye target sets. The spatial distribution of target fishing effort and SBT catches of the domestic fleet are provided in **Figures 13** and **14**, respectively.



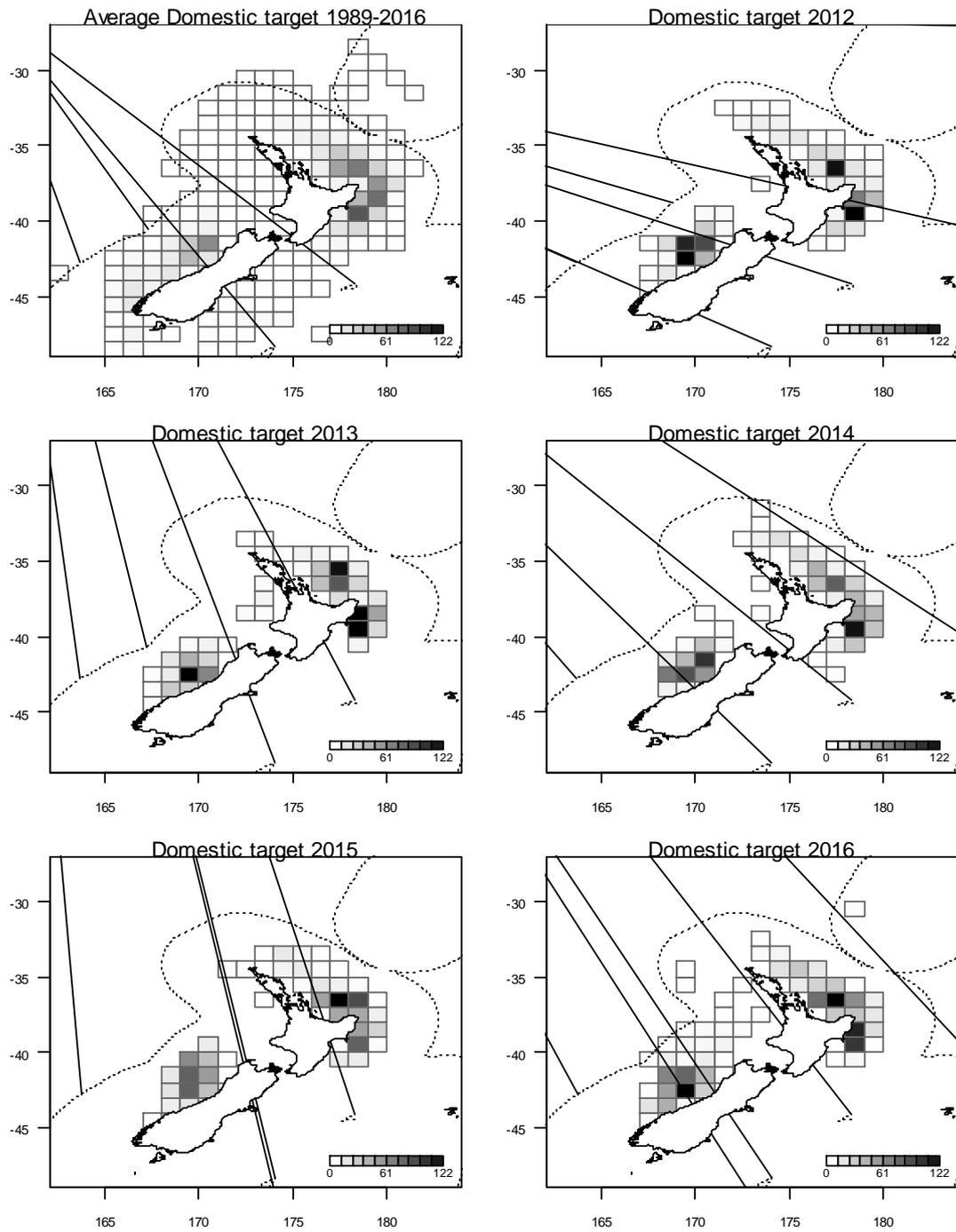
**Figure 11: Distribution of longline effort (1000s of hooks per one degree square) for the charter fleet: average for the time series (1989 to 2015), and annually for 2011 to 2015. (No charter vessels fished in 2016.)**



**Figure 12: Distribution of longline catches (number of fish per one degree square) for the charter fleet: average for the time series (1989 to 2015), and annually for 2011 to 2015. (No charter vessels fishing in 2016.)**



**Figure 13: Distribution of longline effort (1000s of hooks per one degree square) for the domestic fleet that was targeted at SBT: average for the time series (1989 to 2016), and annually for 2012 to 2016.**



**Figure 14: Distribution of longline catches (number of fish per one degree square) for the domestic fleet: average for the time series (1989 to 2016), and annually for 2012 to 2016.**

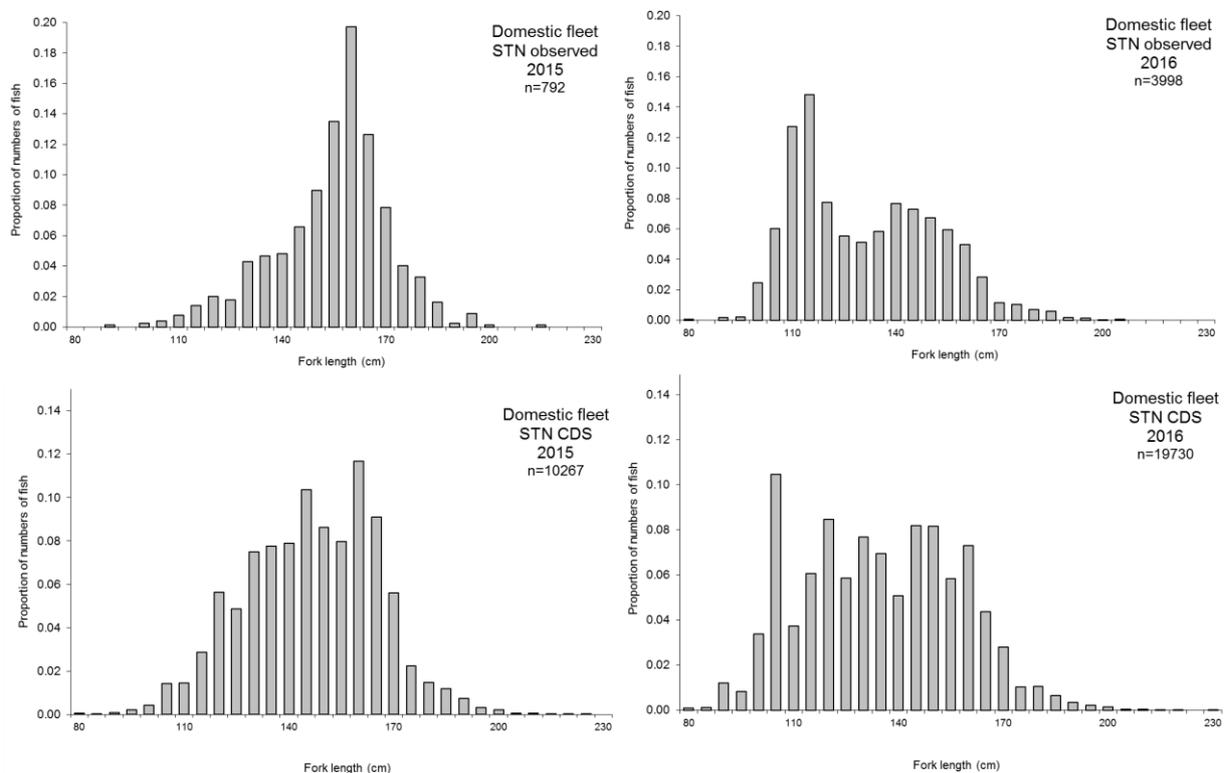
## 6 Development and implementation of scientific observer programs

New Zealand's Observer Programme covers both domestic and charter longline vessels. All four charter vessels were covered by observers in 2015. In 2016 no charter vessels fished and increased coverage of the domestic fleet was attained. The target coverage level for the domestic fleet is 10% of the effort to reflect 10% of the catch. Coverage is measured in two ways, proportion of catch (in numbers of fish) observed (**Table 8**) and proportion of hooks observed (**Table 9**) where relevant is hooks from sets that either targeted or caught SBT (unraised).

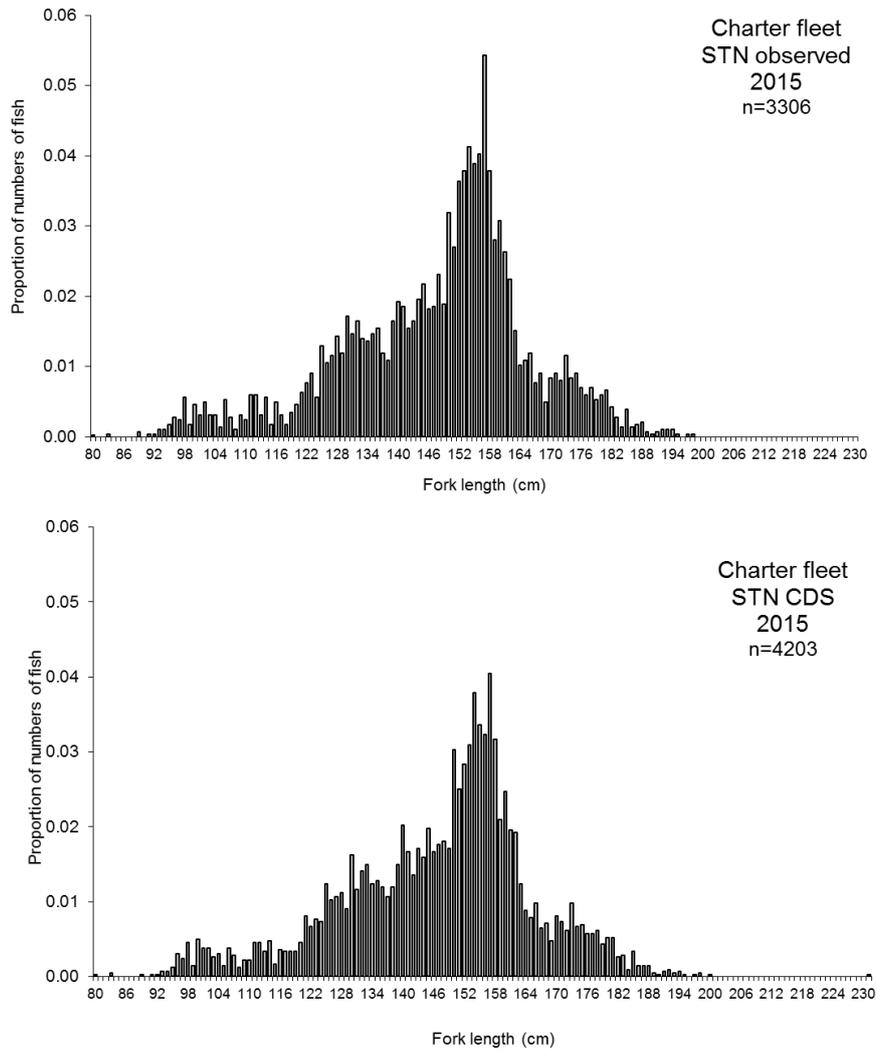
Around 80% of the catch was observed (and measured) in the charter fleet in 2015 while 81% of the hooks were observed. For the domestic fleet, 8% of the catch and 7% of the hooks were observed in 2015. In 2016, 23% of the total catch and 14% of the total effort was observed, all from the domestic fleet.

All catch is now measured to comply with the requirements of the Catch Documentation System (CDS) (**Figures 15 and 16**).

Six dart tags were recaptured during observed trips in 2015, none in 2016. Of those six dart tags, five came from Area 6, the other coming from Area 5. All six fish had a fork length within the range of 150-160 cm.



**Figure 15: Proportion-at-length for SBT catches from 2015, and 2016 for the domestic fleet measured by observers, and reported on CDS forms.**



**Figure 16: Proportion-at-length for the SBT catches from 2014, and 2015 for the charter fleet measured by observers, and reported on CDS forms.**

## 7 Other relevant information

### 7.1 OTOLITH COLLECTION

Observers onboard the charter vessels collect otoliths from as many SBT caught as possible. Due to the smaller size of the domestic vessels and the different processing practices, it is often not feasible to collect otoliths from the domestic fleet.

A sub-sample of the otoliths from 2001 to 2015 has been aged and the information is described in this report. The number of otoliths collected and aged per year is shown in **Table 10**.

## 7.2 ESTIMATION OF NON-RETAINED CATCHES

As required for the CCSBT data exchange, estimates of non-retained catches of SBT from the New Zealand charter and domestic fleets for the years 1989 to 2015 were provided to the Commission (**Tables 11** and **12**). The totals are based on observer estimates of discards and releases scaled to total effort.

There was no auxiliary information on the size structure of the discards, so it is assumed that they are representative of the retained catch. Discards have been separated into the categories alive and dead based on the annual proportions of alive/dead discards reported by observers. Dead discards can only occur when authorised by observers and are required to be reported against annual catch entitlement (**ACE**). In 2016 a total of 47 dead SBT were authorised as discards. These SBT included those with shark- or orca-inflicted damage. Scaled estimates for that year assume similar discard rates on unobserved vessels (noting that this would not be in compliance with QMS rules) and is counted within the TAC as an allowance for other sources of fishing related mortality.

Since 2004, fishers have also been required to report discards on their catch effort returns, providing another method to estimate non-retained catches. Also since 2004, specific provisions under the Fisheries Act 1996 have provided for the live releases of SBT where they are considered likely to survive. Such releases are also recorded on catch effort returns.

## 7.3 NON-COMMERCIAL CATCHES

Prior to 2007, recreational catches of SBT are likely to have been rare because of the locations and seasons during which SBT are found in New Zealand waters (generally winter months and areas with little recreational fishing). However, recreational catches have been recorded in the months from February to September, and in the last few years, SBT is becoming a more targeted species for recreational fishers on both coasts.

Compulsory reporting for recreational charter vessel operators<sup>1</sup> was introduced in November 2010. In 2015, 10 fish were caught, for an estimated weight of 1050kg of which only five were retained. In 2016, 37 fish were caught, for an estimated weight of 1127kg and 36 of them were retained.

## 8 Acknowledgements

MPI acknowledges Terese Kendrick and John Holdsworth for assistance with various parts of this report. Also, we thank Colin Millar for his assistance to New Zealand in the preparation of the data.

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<sup>1</sup> A recreational charter vessel is a vessel that takes paying recreational fishing customers on fishing trips. The fish caught on the fishing trips are retained by the customers, and are not entitled to be sold or traded, so the catch is regarded as recreational catch.

## 9 Appendix

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

<b>Year</b>	<b>Calendar year catches</b>	<b>Fishing year catches</b>
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	950.7	949.2

**Table 2: Catch (t) for the charter fleet by year and CCSBT region. Based on raised catches. (No charter vessels fished in 1996 nor in 2016.)**

<b>Calendar Year</b>	<b>Region 5</b>	<b>Region 6</b>	<b>Other*</b>
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			

\*Most often erroneous position data

**Table 3: Effort (1000s of hooks) for the charter fleet by year and CCSBT region based on raised hooks. Note that this includes some non-SBT target effort in Region 5. (No charter vessels fished in 1996 nor in 2016.)**

Calendar Year	Region 5	Region 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			

\*Most often erroneous position data

**Table 4: Catch (t) for the domestic fleet by year and CCSBT region based on raised catches.**

<b>Calendar Year</b>	<b>Region 5</b>	<b>Region 6</b>	<b>Other*</b>
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	564.7	384.9	

\* Includes erroneous position data and data without positions.

**Table 5: Effort (1000s of target<sup>#</sup> hooks) for the domestic fleet by year and CCSBT region based on raised hooks.**

Calendar Year	Region 5	Region 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	884.3	565.3	12.6

\* Includes erroneous position data and data without position data

<sup>#</sup> Effort for sets that either targeted or caught SBT

**Table 6: Proportion of catch from the charter fleet under 110, 120, 130, and 140 cm for 1989 to 2016. (No charter vessels in 1996 nor 2016.)**

<b>Year</b>	<b>&lt; 110 cm</b>	<b>&lt; 120 cm</b>	<b>&lt; 130 cm</b>	<b>&lt; 140 cm</b>
1989	0.006	0.026	0.045	0.071
1990	0.041	0.101	0.131	0.164
1991	0.114	0.158	0.274	0.317
1992	0.052	0.237	0.392	0.556
1993	0.217	0.316	0.472	0.594
1994	0.028	0.122	0.229	0.380
1995	0.019	0.05	0.161	0.326
1996	NA	NA	NA	NA
1997	0.038	0.057	0.098	0.162
1998	0.094	0.209	0.247	0.321
1999	0.033	0.082	0.157	0.216
2000	0.067	0.194	0.279	0.370
2001	0.093	0.196	0.378	0.519
2002	0.037	0.135	0.245	0.398
2003	0.002	0.009	0.094	0.241
2004	0.001	0.001	0.004	0.042
2005	0.000	0.000	0.002	0.008
2006	0.035	0.041	0.051	0.059
2007	0.042	0.058	0.087	0.109
2008	0.080	0.181	0.230	0.289
2009	0.033	0.196	0.384	0.485
2010	0.062	0.106	0.366	0.633
2011	0.035	0.073	0.135	0.403
2012	0.062	0.142	0.212	0.328
2013	0.039	0.089	0.175	0.258
2014	0.050	0.177	0.321	0.438
2015	0.044	0.077	0.159	0.284
2016	NA	NA	NA	NA

**Table 7: Number of vessels catching SBT in New Zealand fisheries waters by calendar year and New Zealand fishing year (1 October to 30 September).**

<b>Year</b>	<b>Calendar year vessel numbers</b>	<b>Fishing year vessel numbers</b>
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

**Table 8: Observer coverage in terms of catch (proportion of numbers observed) for the charter and domestic fleets for 2015 and 2016 calendar years.**

<b>Calendar year</b>	<b>Charter</b>	<b>Domestic</b>
2015	0.80	0.08
2016	0.NA	0.23

**Table 9: Observer coverage in terms of effort (proportion of hooks observed) for the charter and domestic fleets for 2015 and 2016 calendar years.**

<b>Calendar year</b>	<b>Charter</b>	<b>Domestic</b>
2015	0.81	0.07
2016	NA	0.19

**Table 10: Number of otoliths collected and aged by observers from the charter and domestic fleet catch for the years 2000 – 2016. (\*Number of aged otoliths not yet available for 2016.)**

Year	Charter fleet		Domestic fleet	
	Otoliths	Number aged	Otoliths	Number aged
2000	149	0		
2001	777	198		
2002	1199	197		
2003	838	197		
2004	1141	196	120	23
2005	417	252	3	3
2006	443	249		
2007	714	254		
2008	745	253		
2009	1066	268		
2010	875	258		
2011	604	270		
2012	1252	255		
2013	1019	252		
2014	1241	257		
2015	1231	254		
2016			111	

**Table 11: Actual number of releases and discards observed and the estimated total number of discards (separated by life status<sup>2</sup> - alive and dead) based on observer coverage and the life status of the observed discards for the charter fleet. Note that numbers are rounded to the nearest whole fish. (No charter vessels fishing in 1996 nor in 2016.)**

Year	Observed Numbers	Scaled estimate		
		Alive (released)	Dead	Total
1989	0	0	0	0
1990	0	0	0	0
1991	0	0	0	0
1992	0	0	0	
1993	22	55	13	68
1994	36	40	13	53
1995	5	4	9	13
1996				
1997	23	0	38	38
1998	20	0	20	20
1999	33	18	15	33
2000	3	0	4	4
2001	6	3	4	6
2002	5	2	3	5
2003	2	0	2	2
2004	2	0	2	2
2005	0	0	0	0
2006	4	2	2	5
2007	3	4	2	5
2008	0	0	0	0
2009	5	6	0	6
2010	12	12	3	15
2011	10	14	0	14
2012	36	43	0	43
2013	68	82	5	87
2014	65	78	0	78
2015	16	20	0	20

<sup>2</sup> The Resolution on Reporting all Sources of Mortality of Southern Bluefin Tuna requires that members report the fate of discards. New Zealand does not currently use the moribund category when reporting fate of captures. Moribund fish are included within the “dead” category reflecting the domestic requirement that only discarded fish which are “likely to survive” can be considered “alive”.

**Table 12: Actual number of releases and discards observed and the estimated total number of discards (separated by life status - alive and dead) based on observer coverage and the life status of the observed discards for the Domestic fleet. Note that numbers are rounded to the nearest whole fish.**

Year	Observed Numbers	Scaled estimate		
		Alive (released)	Dead	Total
1989	0			
1990	0			
1991	0			
1992	0	0	0	0
1993	0			
1994	0	0	0	0
1995	4	10	20	30
1996	5	25	6	31
1997	1	0	4	4
1998	0	0	0	0
1999	0	0	0	0
2000	0	0	0	0
2001	5	8	10	18
2002	4	24	30	53
2003	0	0	0	0
2004	1	0	7	7
2005	5	33	8	42
2006	1	16	0	16
2007	2	8	8	15
2008	2	13	0	13
2009	2	12	12	24
2010	26	282	25	307
2011	44	442	84	526
2012	66	745	65	810
2013	50	1180	0	1180
2014	67	697	276*	973
2015	77	910	214*	1124
2016	598	3941	297*	4237

\*Dead discards can only occur when authorised by observers, so the scaled estimates should be treated with caution, for example in 2016 a total of 47 dead SBT were discarded. These SBT included those with shark or orca-inflicted damage.