



INDONESIA SOUTHERN BLUEFIN TUNA FISHERIES
A National Report Year 2020

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SUMMARY

Southern bluefin tuna (*Thunnus maccoyii* Castelnau, 1872) is seasonally caught as a by-catch from Indonesian tuna longline fleets operating in the Indian Ocean. This report provides scientific information on the Indonesian tuna longline fishery related to southern bluefin tuna (SBT) for the 2020 calendar year, spanning from 1 January to 31 December 2020. The total number of active longline vessels recorded was 155 units, whereas the total reported SBT catch was 1,298 tons, or equal to 13,577 individuals. Size of SBT ranged from 50-231 cm FL (mean=173.8 cm FL) for area 1 and 64-205 cm FL (mean=156.1 cm FL) for area 2. Due to the Covid19 pandemic, only two successful scientific observer trips were deployed in 2020, covering at least 0.37% in area 1 and 0.20% in area 2 in terms of total hooks.

1. INTRODUCTION

1.1. Background

This review report updates the scientific information on the Indonesia tuna longline fishery related to southern bluefin tuna (SBT) for the 2020 calendar year, which was from 1 January to 31 December 2020.

1.2. Summary of Historical Development in the Fishery

Tuna longliner was introduced to Indonesia by Japan in the 1930s (Ishida et al., 1994), but the first commercial fishing commenced in the early 1960s, almost three decades later (Proctor et al., 2003). Southern Bluefin Tuna (*Thunnus maccoyii*, SBT) has been historically caught as a by-catch from longline fisheries targeting yellowfin since the late-1970s (Farley et al., 2014) and bigeye since the early 1980s after deep-longlining was introduced (Sadiyah et al., 2011). Among the tuna fishing ports, SBT mainly landed in Bena. Landing activities are regularly monitored by Research Institute for Tuna Fisheries (RITF) through scientific port sampling and scientific observer programs. The first program was initiated in mid-2002 but had a long history as a collaboration project, traced back to 1993 (Farley et al., 2014). On the other hand, the scientific observer program has been introduced since mid-2005 as an Indonesia-Australia collaboration (Project FIS/2002/074 of Australian Centre for International Agricultural Research). After 2010 the activities were conducted by RITF with support from the state budget.

1.3. Overview of the Most Recent Fishing Season

Indonesia officially became a full member of the Commission for the Conservation of Southern Bluefin Tuna (CCSBT) in 2008. Therefore, Indonesia reserved the right to have a

total allowable catch (TAC) of around 1,023 tons for 2018-2020. To establish reliable catch data, the Directorate General of Capture Fisheries (DGCF) introduced a catch documentation scheme (CDS) in 2010 under the CCSBT framework. It has been fully implemented as a basis for official catch data since 2015. SBT catch for the last four years increased steadily (~150 tons/year), whereas the excess catches compensated through carrying over policy. The total catch in 2020 (1,298 tons) was slightly higher than the previous year, set a record for the second-highest catch after 2013 (1,383 tons).

2. CATCH AND EFFORT

2.1. Trends by Gear Type

Since early days, tuna longline was and the only known gear capable of catching SBT. Therefore, this review report only presents catch trends information from that particular gear.

2.2. Trends by Area and Season

In particular, the catch and effort of SBT are monitored through daily port sampling, scientific observer, catch documentation scheme, and fisheries logbook. As for the latter, improvement has been made since the introduction of the e-logbook program in 2017. The regular fishing season for SBT is during September-April, whereas January and February were marked as the highest, while July and December were joint lowest (Table 1). For the last three years, all the SBT caught were declared only from CCSBT statistical areas 1 and 2. The total catch in area 1 was relatively identical compared to last year for 1,067 tons.

In contrast, the total catch from area 2 was increased around 20% to 231 tons (Table 2). Since the largest market for SBT was Japan, most of SBT were processed in GGO (gilled and gutted, tail on) condition. Therefore, the total SBT catch in weight was produced using the processed weight's conversion factors 1.15. The total live weight in 2020 was 1,298 tons, or equivalent to 13,577 individuals (Table 3). On the other hand, the total estimated effort was slightly lower than the previous year for almost 30 million hooks, and mostly (60%) were conducted either in area 1 or Indonesian EEZ (Table 4).

3. Nominal CPUE

3.1. Trends by Fleet

All recorded SBT catch was obtained from domestic fleets. There was no authorization for foreign, ex-foreign, or foreign charter fleet since Ministerial Decree 10/PERMEN-KP/2015.

3.2. Trends by Area and Season

Catch-per-unit-of-effort was collected through a scientific observer program from mid-2005 to 2020 conducted by Research Institute for Tuna Fisheries (RITF). The nominal CPUE for SBT from 2006 never exceeded 0.5/1000 hooks, except for 2017-2019, where more frequent observer trips were allocated, especially in area 2 (Table 5). In recent years, the low hook rate (0.10/1000 hooks) directly responded to the Covid-19 pandemic, which caused a shortage in scientific observer deployment. Catch rate estimation from logbook data is also presented in this report for 2017-2020 (Table 5) as a direct consequence of quality improvement over the years. However, total coverage is still around 10% of the total catch. The CPUE are presented in kg/1000 hooks.

4. SIZE COMPOSITION

4.1. Trends by Fleet

The size of SBT is regularly monitored through the port sampling program, scientific observer program, and Catch Documentation Scheme (CDS) report. This report only presents size data obtained from CDS to avoid discrepancies among available datasets. All the data recorded and reported came from the domestic fleets. Whether small-scale domestic fleet (up to 60 GT), middle fleet (60-200 GT) produced a similar mean length, around 169-172 cm FL.

4.2. Trends by Area and Season

During the 2020 calendar year, 13,577 individuals were measured and weighted to the nearest centimeter and kilogram. More than 80% of the fish were declared from area 1 (10,902 individuals), while the rest (2,675 individuals) were harvested from area 2. The length-frequency distribution showed a consistent pattern in the last four years. Size from area 1 distributed between 50-231 cm FL with an average of 173.8 cm FL (Figure 1), whereas smaller fishes measured from area 2 ranged from 64-205 cm FL (mean=156.1 cm FL) (Figure 2).

5. FLEET SIZE AND DISTRIBUTION

5.1. Trends by Area and Season

A total of 155 authorized tuna longline vessels were reportedly caught SBT in 2020. The total number of active vessels was slightly increased (~3%) compared to the previous year (150 vessels). 118 vessels were primarily operated in area 1, and the rest (37) were in area 2 (Table 7).

6. RESEARCH AND MONITORING TO IMPROVE ESTIMATES OF ATTRIBUTABLE CATCH

6.1. RELEASE AND/OR DISCARDS

6.1.1. Current status

There is no regulation in place related to release and discards for southern bluefin tuna. The law only applies to some species of sharks and rays. Since all SBT were retained, there is no need for estimation on non-retained catches.

6.1.2. Research

There is currently no research in this area.

6.1.3. Monitoring

Monitoring compliance (for sharks and rays) with these requirements is conducted by self-reporting, scientific sampling at the port, and observer coverage.

6.2. RECREATIONAL FISHING

6.2.1. Current status

Since the traditional fishing ground of SBT is at least below 10°S and resides on a deep layer water column, there is no reported catch or permission issuance on recreational fisheries for this species by the association (FORMASI) nor the government.

6.2.2. Research

There is currently no research in this area.

6.2.3. Monitoring

Monitoring of compliance (for other species) with these requirements is conducted by self-reporting.

6.3. OTHER SOURCES (EG CUSTOMARY, TRADITIONAL, AND/OR ARTISANAL FISHING)

6.3.1. Current status

Other sources of SBT mortality may occur from the incidental catch by traditional handline fishers and artisanal longliners, which need further investigation. However, the complexities of traditional handline fishers and limited monitoring tools are still a substantial challenge up to date.

6.3.2. Research

There is currently no research in this area.

6.3.3. Monitoring

Monitoring is conducted by self-reporting and scientific sampling at the port.

7. DEVELOPMENT AND IMPLEMENTATION OF SCIENTIFIC OBSERVER PROGRAM

7.1. Observer training

Indonesia developed a scientific observer program in mid-2005, which was initially a collaboration program between Indonesia's Ministry of Marine Affairs through the Research Center for Capture Fisheries (RCCF) and CSIRO Marine and Atmospheric Research Australia (Sadiyah et al., 2012). The program was continued by Research Institute for Tuna Fisheries (RITF) in 2011 funded through the government state budget. Directorate General of Capture Fisheries (DGCF) is the governing body responsible for the recruitment and training of Fisheries Observers. 15 scientific observers were recruited and trained in 2014 through a week-long program. Currently, there are six active scientific observers in RITF. In addition, a national observer program was established in 2013 following the Ministerial Regulation No. 01/PERMEN-KP/2013.

7.2. Scientific observer program design and coverage

A total of two scientific observers were deployed in 2020, involved in 2 trips, lasted for 108 days at sea (54 days/trip on average) with 86,845 hooks observed. The number of observed efforts (hooks or trips) was substantially lower than in previous years due to restrictions during the Covid-19 outbreak (Table 8). A quarter of the spatial coverage was observed in area 2, and the rest were either in area 1 or EEZ (Table 9).

7.3. Observer data collected

List of observer data collected against the agreed range of data set out in Attachment 1.

Catch data: Amount of catch observed of SBT and other species (if collected), area and season, and % observed out of total estimated SBT catch by area and calendar year.

See **Tables 4** and **5**.

Effort data: Amount of effort observed (hooks), by area and calendar year and % observed out of total by area and seasons

See **Tables 4** and **5**.

Length frequency data: Number of fish measured per species, by area, and calendar year.

It is not presented in this report.

Biological data: Type and quantity of other biological data or samples (otoliths, sex, maturity, gonadosomatic index, etc.) collected per species.

It is not presented in this report.

7.4. Tag return monitoring

One dart tag was reported during the observer trip in 2018, but none in 2019 and 2020.

7.5. Problems experienced

Retention from some fishing companies is no longer an issue in deploying scientific observers due to the assistance from FIP (Fisheries Improvement Project). However, the Covid-19 outbreak has limited the number of trips.

8. OTHER RELEVANT INFORMATION

There is no information at the moment.

9. ACKNOWLEDGEMENTS

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10. REFERENCES

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11. APPENDIX – Tables

Table 1. Nominal catch by month (in tons)

| Year | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | All |
|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|
| 2011 | 69 | 61 | 97 | 78 | 62 | 17 | 67 | 70 | 79 | 117 | 48 | 77 | 842 |
| 2012 | 68 | 75 | 53 | 44 | 12 | 20 | 49 | 110 | 147 | 128 | 99 | 105 | 910 |
| 2013 | 156 | 245 | 232 | 114 | 18 | 21 | 28 | 93 | 126 | 105 | 134 | 110 | 1,383 |
| 2014 | 86 | 119 | 102 | 54 | 26 | 35 | 30 | 84 | 86 | 127 | 148 | 167 | 1,063 |
| 2015 | 83 | 92 | 129 | 59 | 5 | 1 | 3 | 6 | 37 | 64 | 39 | 74 | 593 |
| 2016 | 75 | 131 | 95 | 56 | 33 | 24 | 30 | 28 | 49 | 39 | 12 | 29 | 601 |
| 2017 | 82 | 98 | 104 | 68 | 14 | 0 | 3 | 46 | 98 | 119 | 134 | 68 | 835 |
| 2018 | 241 | 243 | 191 | 95 | 12 | 3 | 4 | 28 | 60 | 82 | 79 | 48 | 1,087 |
| 2019 | 139 | 123 | 81 | 29 | 19 | 22 | 46 | 79 | 169 | 173 | 203 | 123 | 1,206 |
| 2020 | 384 | 360 | 181 | 89 | 57 | 11 | 7 | 35 | 63 | 72 | 33 | 5 | 1,298 |

Table 2. Nominal catch by statistical area (in tons)

| Year | Area1 | Area2 | Area8 | Area9 | Area14 | All |
|------|-------|-------|-------|-------|--------|-------|
| 2011 | 616 | 30 | 175 | 17 | 4 | 842 |
| 2012 | 676 | 218 | 10 | 6 | 0 | 910 |
| 2013 | 1,061 | 241 | 74 | 6 | 0 | 1,383 |
| 2014 | 802 | 121 | 140 | 0 | 0 | 1,063 |
| 2015 | 593 | 0 | 0 | 0 | 0 | 593 |
| 2016 | 601 | 0 | 0 | 0 | 0 | 601 |
| 2017 | 700 | 135 | 0 | 0 | 0 | 835 |
| 2018 | 773 | 313 | 0 | 0 | 0 | 1,087 |
| 2019 | 1,015 | 191 | 0 | 0 | 0 | 1,206 |
| 2020 | 1,067 | 231 | 0 | 0 | 0 | 1,298 |

Table 3. Annual catches of SBT (in tons)

| Year | Reported to CCSBT | National Fisheries Statistics | Catch estimate/CDS |
|------|-------------------|-------------------------------|--------------------|
| 2004 | 633 | 665 | 613 |
| 2005 | 1,726 | 1,831 | 1,690 |
| 2006 | 598 | 747 | 558 |
| 2007 | 1,077 | 1,079 | 1,077 |
| 2008 | 926 | 891 | 905 |
| 2009 | 641 | 641 | 641 |
| 2010 | 636 | 636 | 580 |
| 2011 | 842 | 842 | 769 |
| 2012 | 910 | 910 | 817 |
| 2013 | 1,383 | 1,383 | 722 |
| 2014 | 1,063 | 1,063 | 1,187 |
| 2015 | 593 | 593 | 593 |
| 2016 | 601 | 601 | 601 |
| 2017 | 835 | 835 | 835 |
| 2018 | 1,087 | 1,087 | 1,087 |
| 2019 | 1,206 | 1,206 | 1,206 |
| 2020 | 1,298 | 1,298 | 1,298 |

Table 4. The total estimated effort by statistical area

| Country / Fishing Entity | Calendar Year | Fishery | | CCSBT Statistical Area | Total & Observed Effort | | |
|--------------------------------|------------------|--------------|---------------|------------------------------|------------------------------|-----------------------------|--------------------------------------|
| | | Gear Code | Fleet Code | | Total Effort ¹ | Total Observed Effort | Observer Coverage (percentage) |
| ID | 2010 | LL | IDD | 1 | NA | 189,086 | NA |
| ID | 2011 | LL | IDD | 1 | NA | 110,384 | NA |
| ID | 2012 | LL | IDD | 1 | NA | 98,916 | NA |
| ID | 2012 | LL | IDD | 2 | NA | 154,074 | NA |
| ID | 2013 | LL | IDD | 1 | NA | 244,383 | NA |
| ID | 2014 | LL | IDD | 1 | NA | 141,428 | NA |
| ID | 2015 | LL | IDD | 1 | NA | 147,526 | NA |
| ID | 2016 | LL | IDD | 1 | NA | 95,167 | NA |
| ID | 2017 | LL | IDD | 1 | 17,312,208 | 32,212 | 0.19 |
| ID | 2017 | LL | IDD | 2 | 3,660,367 | 63,960 | 1.75 |
| ID | 2018 | LL | IDD | 1 | 22,198,042 | 160,686 | 0.72 |
| ID | 2018 | LL | IDD | 2 | 7,043,942 | 19,890 | 0.28 |
| ID | 2019 | LL | IDD | 1 | 18,510,529 | 84,947 | 0.46 |
| ID | 2019 | LL | IDD | 2 | 8,063,024 | 63,850 | 0.79 |
| ID | 2020 | LL | IDD | 1 | 17,898,400 | 65,914 | 0.37 |
| ID | 2020 | LL | IDD | 2 | 10,656,100 | 20,930 | 0.20 |

Table 5. Nominal CPUE by statistical area. Source: scientific observer program

| Year | Scientific Observer (No/1000 hooks) | | | Logbook (kg/1000 hooks) | | |
|------|-------------------------------------|--------|----------|-------------------------|--------|----------|
| | Area 1 | Area 2 | Combined | Area 1 | Area 2 | Combined |
| 2005 | 0.04 | NA | 0.04 | NA | NA | NA |
| 2006 | 0.07 | 0.66 | 0.25 | NA | NA | NA |
| 2007 | 0.03 | 0.30 | 0.10 | NA | NA | NA |
| 2008 | 0.02 | 0.00 | 0.02 | NA | NA | NA |
| 2009 | 0.09 | NA | 0.09 | NA | NA | NA |
| 2010 | 0.02 | NA | 0.02 | NA | NA | NA |
| 2011 | 0.05 | NA | 0.05 | NA | NA | NA |
| 2012 | 0.22 | 0.03 | 0.11 | NA | NA | NA |
| 2013 | 0.12 | NA | 0.12 | NA | NA | NA |
| 2014 | 0.09 | NA | 0.09 | NA | NA | NA |
| 2015 | 0.08 | NA | 0.08 | NA | NA | NA |
| 2016 | 0.04 | NA | 0.04 | NA | NA | NA |
| 2017 | 0.00 | 3.22 | 2.14 | 13.21 | 28.79 | 21.00 |
| 2018 | 0.57 | 3.42 | 0.89 | 56.87 | 152.34 | 104.60 |
| 2019 | 0.24 | 1.06 | 0.65 | 24.73 | 225.07 | 124.90 |
| 2020 | 0.10 | 0.09 | 0.10 | 11.93 | 49.57 | 26.00 |

¹ Estimated based on CDS active vessel list

Table 7. Number of active vessels recorded by statistical area

| Year | Area 1 | Area 2 | Area 8 | Area 9 | Area 14 | Total |
|------|--------|--------|--------|--------|---------|-------|
| 2010 | 180 | 5 | 0 | 1 | 0 | 186 |
| 2011 | 166 | 15 | 4 | 1 | 1 | 187 |
| 2012 | 135 | 3 | 6 | 1 | 0 | 145 |
| 2013 | 153 | 2 | 2 | 1 | 0 | 158 |
| 2014 | 188 | 1 | 2 | 0 | 0 | 191 |
| 2015 | 112 | 0 | 0 | 0 | 0 | 112 |
| 2016 | 107 | 0 | 0 | 0 | 0 | 107 |
| 2017 | 108 | 1 | 0 | 0 | 0 | 109 |
| 2018 | 119 | 20 | 0 | 0 | 0 | 139 |
| 2019 | 120 | 30 | 0 | 0 | 0 | 150 |
| 2020 | 118 | 37 | 0 | 0 | 0 | 155 |

Table 8. Summary of scientific observer activities of a period 2005-2020.

| Year | No. Of Obs | No. Of Trips | No. Of Company | Number of Hooks | Total Day at Sea (DAS) | Range DAS | Mean DAS |
|------|------------|--------------|----------------|-----------------|------------------------|-----------|----------|
| 2005 | 6 | 6 | 1 | 140,406 | 251 | 19-22 | 20 |
| 2006 | 6 | 19 | 5 | 667,479 | 758 | 7-99 | 39 |
| 2007 | 6 | 14 | 5 | 396,952 | 648 | 21-108 | 34 |
| 2008 | 5 | 15 | 7 | 523,627 | 481 | 23-66 | 30 |
| 2009 | 5 | 14 | 8 | 321,591 | 535 | 15-59 | 38 |
| 2010 | 5 | 8 | 4 | 220,302 | 240 | 40-50 | 50 |
| 2011 | 5 | 6 | 3 | 131,644 | 210 | 30-50 | 40 |
| 2012 | 6 | 7 | 5 | 282,147 | 496 | 11-93 | 83 |
| 2013 | 5 | 3 | 3 | 251,774 | 170 | 52-60 | 57 |
| 2014 | 8 | 6 | 4 | 216,641 | 371 | 29-90 | 62 |
| 2015 | 4 | 5 | 5 | 172,463 | 241 | 31-61 | 48 |
| 2016 | 3 | 3 | 3 | 175,868 | 170 | 32-86 | 57 |
| 2017 | 5 | 5 | 5 | 192,188 | 241 | 31-61 | 48 |
| 2018 | 6 | 6 | 6 | 262,856 | 321 | 26-83 | 53 |
| 2019 | 5 | 9 | 4 | 216,836 | 328 | 15-104 | 36 |
| 2020 | 2 | 2 | 2 | 86,845 | 108 | 26-81 | 54 |

Table 9. Summary of scientific observer activities in 2020.

| No. | Trip ID | Day at sea | No of Setting | No of Hooks | No of SBT | HR(x10 ³) | CCSBT Statistical Area |
|-----|---------|------------|---------------|-------------|-----------|-----------------------|------------------------|
| 1 | Trip 1 | 26 | 15 | 20220 | 5 | 0.249 | 1 |
| 2 | Trip 2 | 104 | 35 | 45695 | 1 | 0.031 | 1 |
| 3 | Trip 2 | 104 | 15 | 20930 | 2 | 0.085 | 2 |

12. APPENDIX – Figures

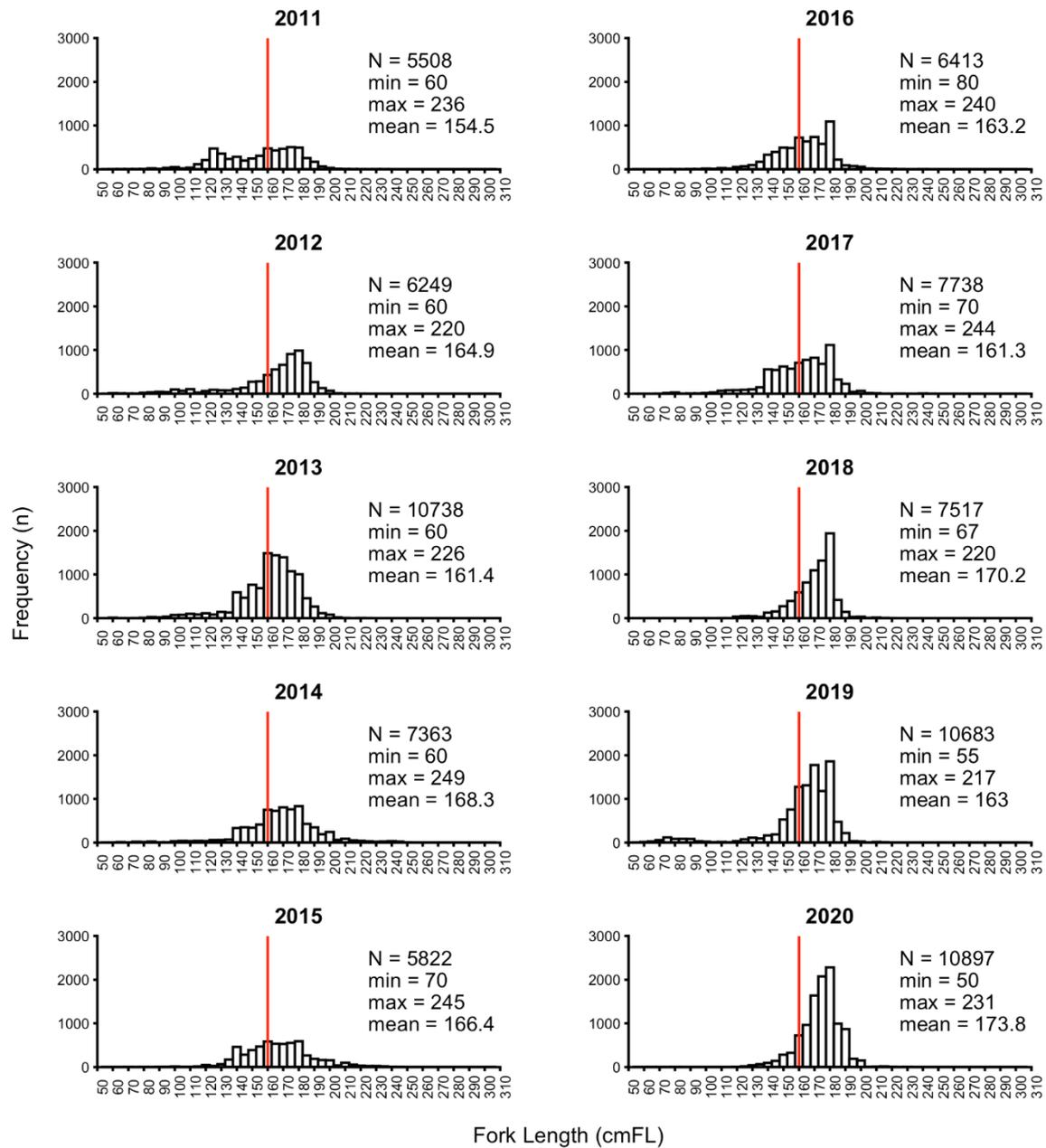


Figure 1. Length frequency distribution of all individual SBT from area 1 based on CDS data 2011-2020 (remarks= red line is a threshold for small SBT).

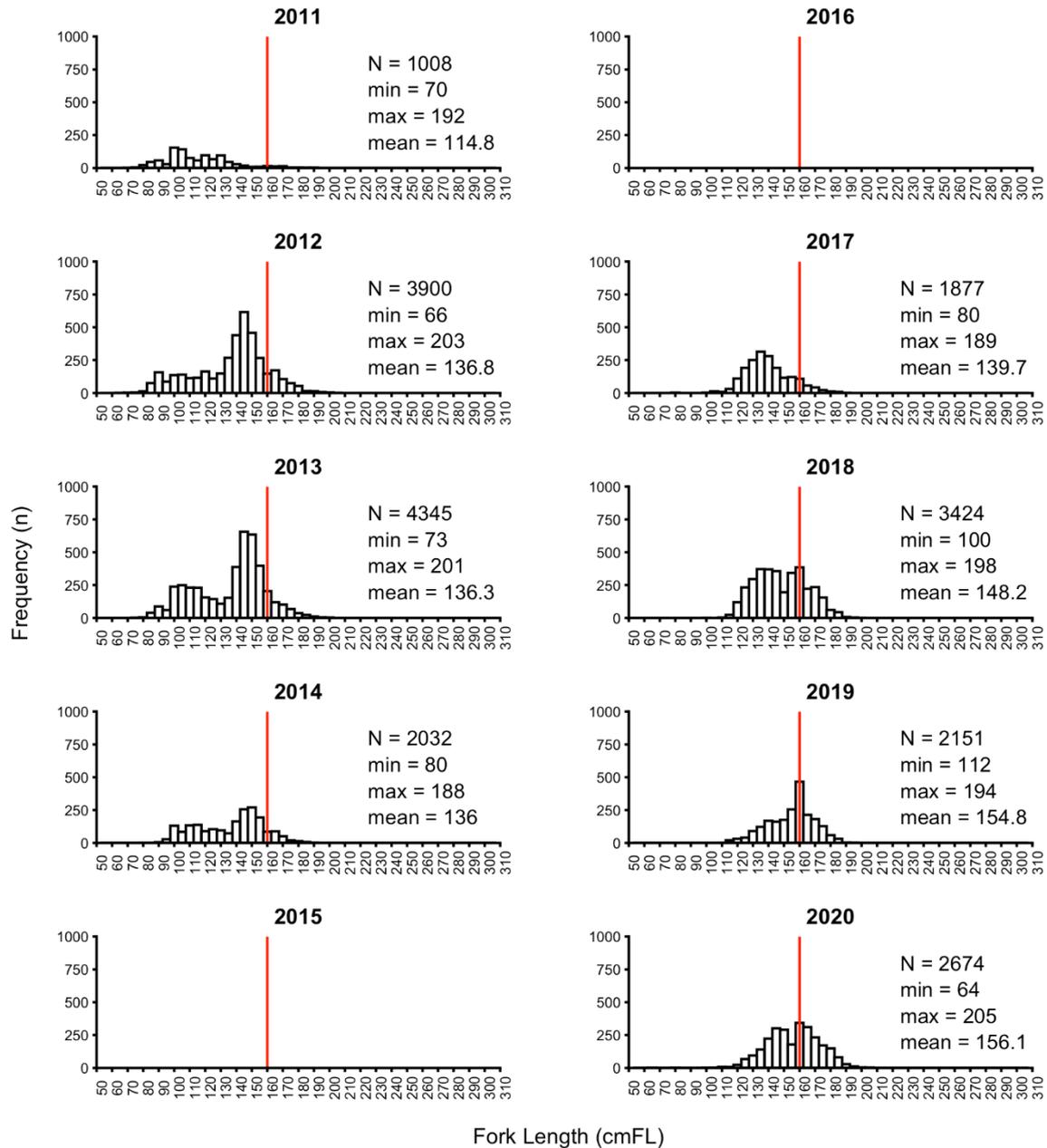


Figure 2. Length frequency distribution of all individual SBT from area 2 based on CDS data 2011-2020 (remarks= red line is a threshold for small SBT).