Indonesia Annual Report
to the Extended Scientific Committee

Indonesia

Prepared for the 27th Meeting of the Extended Scientific Committee Meeting (ESC27) of the Commission for the Conservation of Southern Bluefin Tuna (CCSBT)

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SUMMARY

Southern bluefin tuna (*Thunnus maccoyii* Castelnau, 1872) is seasonally caught as 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 2021 calendar year, spanning from 1 January to 31 December 2021. The total number of active longline vessels recorded was 149 units, whereas the total reported SBT catch was 1,122.7 tons, or equal to 12,463 individuals. Size of SBT ranged from 130-240 cm FL (mean=168.5 cm FL) for area 1 and 82-218 cm FL (mean=161.7 cm FL) for area 2. Impacted by Covid19 pandemic, only five successful scientific observer trips were deployed in 2021, covering at least 0.58% in area 1 and 1.14% 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 2021 calendar year, which was from 1 January to 31 December 2021.

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 Benoa. 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 1,122.8 tons for 2021-2022. To ensure the reliability of

catch data, the Directorate General of Capture Fisheries (DGCF) has fully completed the catch documentation scheme (CDS), which was initially deployed in 2010 under the CCSBT framework. Since 2015, it has served as the foundation for official catch data. For the last four years, the SBT catch has climbed gradually, concurrently with a rise in the number of quotas granted. On the other hand, the excess catches have been compensated by the carrying over policy. In 2021, the total catch was 1,122.7 tons, fully utilizing the quota and somewhat less than last year's (1,298 tons).

2. CATCH AND EFFORT

2.1. Trends by Gear Type

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

2.2. Trends by Area and Season

Scientific port sampling, scientific observer program, Catch Documentation Scheme (CDS), and fisheries logbook were the tools used for monitoring the catch and effort of SBT. In terms of the latter, significant progress has been made since the implementation of the electronic logbook program in 2017. The usual fishing season for SBT is from September to April, with January and February being the most abundant months and July and December being the least abundant (Table 1). For the last three years, no SBT has been caught outside of CCSBT statistics areas 1 and 2. The total catch in area 1 was dropped more than half compared to previous year's figure of 482 tons.

In contrast, the total catch from area 2 was tripled to 641 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 2021 was 1,122.7 tons, or equivalent to 12,463 individuals (Table 3). On the other hand, the total estimated effort was lower than the previous year for around 27 million hooks, and mostly (70%) 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 2021 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 and 2022, where more frequent observer trips were allocated, especially in area 2 (Table 5). In recent years, the hook rate (0.66/1000 hooks) directly responded to the better proportionated observer deployment in both areas. Catch rate estimation from logbook data was also presented in this report for 2017-2021 (Table 5) as a consequence of quality improvement over the years. Impressively, the total effort coverage was reaching up to 85%. 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 scientific port sampling, scientific observer program and Catch Documentation Scheme (CDS) report. This report presented size data from CDS to avoid discrepancies among available datasets. All the data recorded and reported came from the domestic fleets. Whether small-scale fleet (up to 60 GT) and/or industrial fleet (60-200 GT) produced a similar mean length, around 161.7-166.9 cm FL.

4.2. Trends by Area and Season

During the 2021 calendar year, 12,463 individuals were measured and weighted to the nearest centimeter and kilogram. More half of the fish were declared from area 2 (n=8,227), while the rest (n=5,562) were harvested from area 1. The length-frequency distribution showed a consistent pattern in the last five years years. Size from area 1 distributed between 121-230 cm FL with an average of 166.9 cm FL (Figure 1), whereas smaller fishes measured from area 2 ranged from 82-218 cm FL (mean=163.6 cm FL) (Figure 2).

5. FLEET SIZE AND DISTRIBUTION

5.1. Trends by Area and Season

A total of 149 authorized tuna longline vessels were reportedly caught SBT in 2021. The total number of active vessels was slightly decreased (~4%) compared to the previous year (155 vessels). 64 vessels were primarily operated in area 1, and the rest (85) 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 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^{o}S and reside 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 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 three 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 four scientific observers were deployed in 2021, involved in 5 trips, lasted for 241 days at sea (48 days/trip on average) with 197,424 hooks observed. The number of observed efforts (hooks or trips) was substantially higher than in previous years ease restrictions of the Covid-19 outbreak and better deployment strategy (Table 8). Around half of the observation reside in area 2, while 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 and 2021, 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

We acknowledge the contribution of all active enumerators and observers in the Research Institute for Tuna Fisheries, Bali, for their significant research works and data contribution during this preparation. We also thanks ACIAR, CSIRO that shared a substantial role and contribution to strengthening research activities by improving port sampling and scientific observation. A significant contribution of the Directorate of Fish Resources, Directorate General for Capture Fisheries regarding CDS data, supports this national report. We also thanks Directorate Monitoring and Infrastructure Development, Directorate General of Marine Fisheries Surveillance (DGMFS) for their continuing support.

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
2021	340	269	186	78	17	13	4	13	80	36	20	67	1,123

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
2021	482	641	0	0	0	1,123

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
2021	1,123	1,123	1,123

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
ID	2021	LL	IDD	1	14,574,260	84,516	0.58
ID	2021	LL	IDD	2	8,256,944	94,445	1.14

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
2021	0.28	1.16	0.66	21.19	86.89	39.05

[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
2021	64	85	0	0	0	149

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
2021	4	5	5	197,424	248	21-90	48

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	60	19	37,635	51	1.305	2
2	Trip 2	25	2	1,798	0	0.000	0
3	Trip 2	25	13	12,407	0	0.000	1
4	Trip 3	21	13	16,665	1	0.058	0
5	Trip 4	90	16	23,920	24	0.997	1
6	Trip 4	90	36	56,810	72	1.239	2
7	Trip 5	45	31	48,189	2	0.036	1

12. APPENDIX – Figures

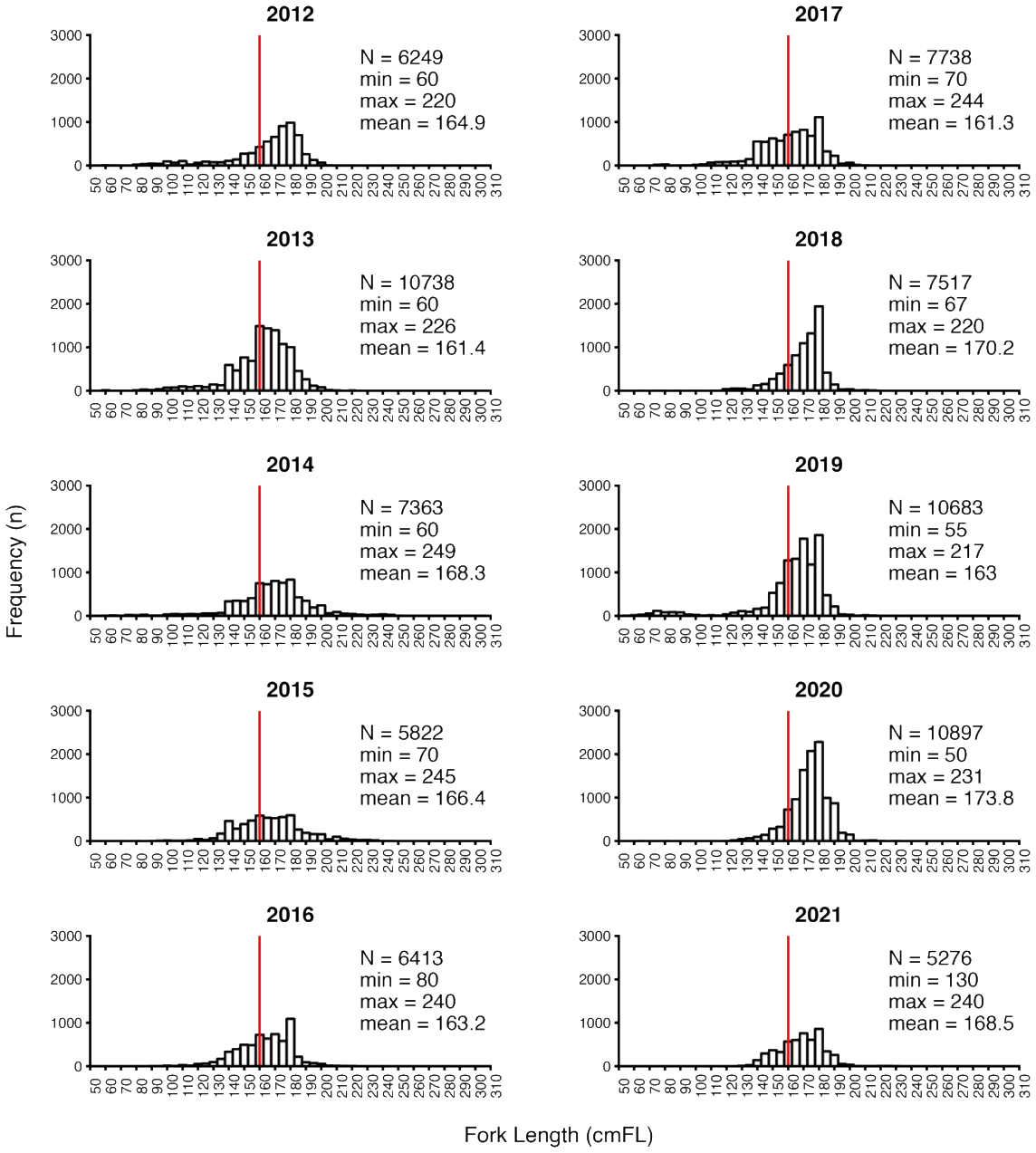

Figure 1. Length frequency distribution of all individual SBT from area 1 based on CDS data 2011-2020 (remarks= red line is a threshold for small SBT).

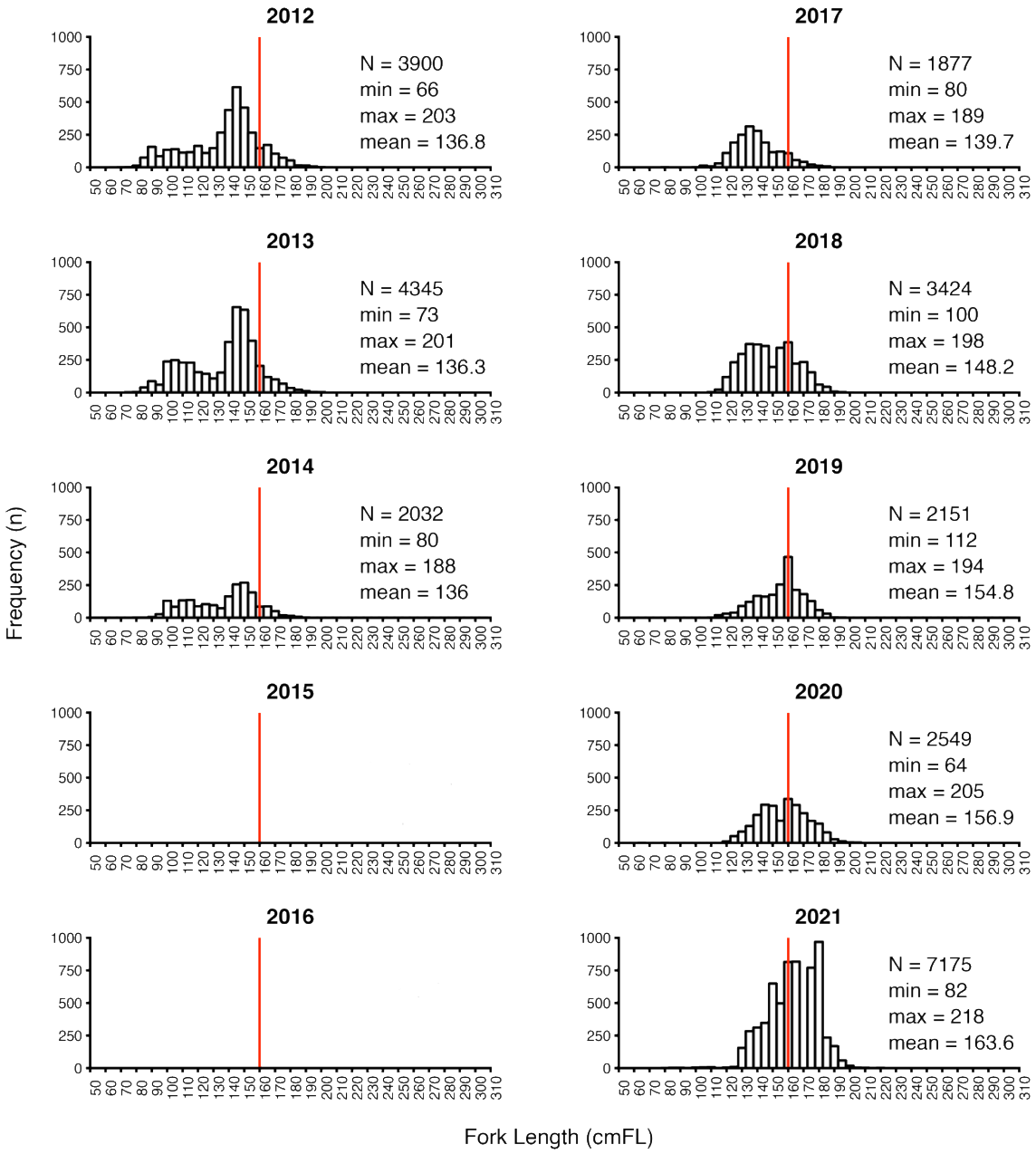

Figure 2. Length frequency distribution of all individual SBT from area 2 based on CDS data 2011-2020 (remarks= red line is a threshold for small SBT).