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Indonesia's tuna longline fishery interacted with Southern Bluefin Tuna in 2024

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SUMMARY

Southern bluefin tuna (*Thunnus maccoyii*) are seasonally caught as bycatch by Indonesian tuna longline fleets operating in the Indian Ocean. This report summarizes scientific information on the Indonesian tuna longline fishery related to SBT for the 2024 calendar year (1 January – 31 December 2024). The total reported SBT catch was 1,224 tons, equivalent to 12,754 individuals. A total of 201 longline vessels, 9 handline vessels, and 1 troll line vessel interacted with SBT, with sizes ranging from 86–210 cm FL (mean = 164.6 cmFL) in area 1 and 109–287 cm FL (mean = 167.7 cmFL) in area 2. Twenty-five observer trips were conducted, covering at least 2.16% of hooks in areas 1 and 2.

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 2024 calendar year, which spanning from 1 January to 31 December 2024.

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. The scientific port sampling program has been on hold since 2022 due to the shifting research policy from the Ministry of Marine Affairs and Fisheries (MMAF) to the National Research and Innovation Agency (BRIN), while the observer program has continued under the Directorate General of Capture Fisheries (DGCF).

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 1,336 tons[1] for 2024-2026. 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. In 2024, the total catch was reported at 1,224 tons, about 21 tons below the quota.

[1] Does not include 91.3 t to be repaid by Indonesia every year until 2026 as part of an agreed Payback Plan for a previous overcatch.

2. CATCH AND EFFORT

2.1. Trends by Gear Type

Historically, only tuna longline gear was used to catch SBT in Indonesia. However, in recent years, handline and troll line vessels have also been interacting with this species. In total, 201 longline, 9 handline, and 1 troll line vessels were interacted with the species.

2.2. Trends by Area and Season

Port sampling, 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 November 2018. The usual fishing season for SBT is from September to April with January, February and November being the most abundant months, while May and June being the least abundant (Table 1).

Since 2015, no SBT have been recorded outside CCSBT statistical areas 1 and 2. It appears that the fishing operations of longline vessels have changed with more concentration in area 2 compared to area 1, as indicated by the decrease in activity in area 1 and the corresponding increase in area 2 since 2021 (Table 6). In 2024, the total catch was 214 tons in area 1 and 1,010 tons in area 2 (Table 2). The largest markets for SBT were the USA (fillets, loins, etc.) and Japan (fresh). Most exports to Japan were in GGO (gilled and gutted, tail on) form, requiring a conversion factor of 1.15 to estimate live weight. Consequently, the total estimated live weight in 2024 was 1,224 tons (Table 3), equivalent to 12,754 individuals. On the other hand, the total estimated effort in 2024 was around 29 million hooks (Table 4).

3. Nominal CPUE

3.1. Trends by Fleet

All recorded SBT catch was obtained from domestic fleets.

3.2. Trends by Area and Season

Catch-per-unit-of-effort (CPUE) from 2005 to 2016 was consistently low and stable. A large increase in catch per unit effort (CPUE) was recorded in 2017, reaching 2.14, likely resulting from high catch in Area 2 (Table 5). This was followed by fluctuating trends, with CPUE values generally remaining below 1 fish per 1,000 hooks.

4. SIZE COMPOSITION

4.1. Trends by Fleet

The size of SBT has regularly monitored through port sampling, observer program, and Catch Documentation Scheme (CDS). This report presented size data from CDS. All the data recorded and reported came from the domestic fleets, consisted of small-scale fleet (up to 60 GT) and/or industrial fleet (60-200 GT) that operated in areas 1 and 2. Those fleets caught SBT with the size ranging between 86 and 221 cm FL in 2024 from areas 1 and 2 (Figures 1 and 2).

4.2. Trends by Area and Season

During the 2024 calendar year, a total of 12,754 individuals were measured and weighted to the nearest centimeter and kilogram. The individuals were mostly measured from area 2 (n=10,544), while the rest (n=2,210) were from area 1. The length-frequency distribution showed a consistent pattern in the last five years. In 2024, size from area 1 distributed between 86–210 cm FL (mean = 164.6 cm) (Figure 1), whereas from area 2 ranged from 109–221 cm FL (mean = 167.6 cm) (Figure 2).

5. FLEET SIZE AND DISTRIBUTION

5.1. Trends by Area and Season

In 2024, SBT catches were reported from 201 authorized longline vessels, 9 handline vessels, and 1 troll line vessel, out of a total of 314 registered longline and 18 artisanal vessels. The total number of active vessels in 2024 was decreased compared to the previous year (227 vessels). 92 vessels were operated in area 1, and the rest (119) were in area 2 (Table 6).

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 national regulation only applies to specific 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, SBT catch from the traditional handline and troll line vessels has been reported in CDS of 2024.

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. After new institutional arrangement for National Research and Innovation Agency in 2022, there are temporary no activities for scientific observer program under this agency. A National observer program that was established in 2013 following the Ministerial Regulation No. 01/PERMEN-KP/2013 and the Ministerial Regulation No. 33/PERMEN-KP/2021 is still running under DGCF.

7.2. Scientific observer program design and coverage

Summary of scientific observer activities for Longliner of a period 2005-2024 can be seen in Table 7. A total of 25 trips were observed in 2024, increased more than threefold compared to previous year. Every trip lasted between 18 and 69 days at sea, with 44 days/trip on average. In 2024, the total effort observed in areas 1 and 2 was 751,963 hooks, with observation slightly higher in area 2 (Table 8).

7.3. Observer data collected

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 trips in 2018 and 2022, but none in 2019 or 2020. Two dart tags were reported in 2023. There is no tag returned in 2024.

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). The COVID-19 outbreak has limited the number observer trips since 2020 to 2022. In addition, transition of research institutes under MMAF to BRIN has been completed, the continuation of scientific and port sampling programs was put on hold indefinitely due to budget constraint.

8. OTHER RELEVANT INFORMATION

There is no information at the moment.

9. ACKNOWLEDGEMENTS

We acknowledge the past contribution of all active enumerators and observers in the Research Institute for Tuna Fisheries, Bali, for their significant research works and data. 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, logbook and observer data, supports this national report.

10. REFERENCES

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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
2022	172	175	105	28	15	17	34	47	93	93	156	97	1,031
2023	323	105	87	32	14	10	29	60	81	105	126	61	1,031
2024	354	236	138	114	34	37	36	24	85	67	49	49	1,224

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
2022	139	892	0	0	0	1,031
2023	202	829	0	0	0	1,031
2024	214	1,010	0	0	0	1,224

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

Year	Reported to CCSBT	National Fisheries Statistics	Catch estimate/CDS
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
2022	1,031	1,031	1,031
2023	1,031	1,031	1,031
2024	1,224	1,224	1,224

Table 4. The total estimated effort by statistical area (source: scientific observer program RITF 2010-2021, observer Program DGCF 2022-2024).

Country / Fishing Entity	Calendar Year	Fishery		CCSBT Statistical Area	Total & Observed Effort		
		Gear Code	Fleet Code		Total Effort[2]	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
ID	2022	LL	IDD	1	9,792,081	177,700	1.81
ID	2022	LL	IDD	2	12,336,846	144,736	1.17
ID	2023	LL	IDD	1	20,554,300	73,653	0.36
ID	2023	LL	IDD	2	10,857,600	235,072	2.16
ID	2024	LL	IDD	1	12,730,814	253,313	1.99
ID	2024	LL	IDD	2	16,467,931	377,127	2.29

Data 2024 was validated by DGCF prior to ESC 30th of the CCSBT

Table 5. Nominal CPUE by statistical area. Source: scientific observer program RITF 2005-2021, logbook program of DGCF 2017-2023 and observer Program of DGCF 2022-2024.

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

[2] Estimated based on CDS active vessel list

Year	Scientific Observer (No/1000 hooks)			Logbook (kg/1000 hooks)		
	Area 1	Area 2	Combined	Area 1	Area 2	Combined
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
2022	0.00	0.31	0.14	43.86	284.76	45.49
2023	0.00	0.84	0.53	7.19	18.40	11.30
2024	0.09	1.80	0.79	6.16	28.73	10.56

Table 6. 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
2022	43	127	0	0	0	170
2023	86	149	0	0	0	235
2024	92	119	0	0	0	211

Table 7. Summary of scientific observer activities for Longliner of a period 2005-2021 (RITF) and observer program 2022-2023 (DGCF).

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
2022	9	10	7	396,700	453	24-84	45
2023	5	7	4	308,725	358	17-116	51
2024	21	25	15	751,963	1,102	18-69	44

Note: information for 2022-2024 includes observer trips occurred in the CCSBT Statistical Areas 0,1 and 2.

Table 8. Summary of observer activities for tuna longliners in 2024 (source: DGCF).

Trip ID	Day at sea	No. of Setting	No. of Hooks	No. of SBT	HR(x10^3)	CCSBT Statistical Area
TRIP-1	32	19	26,680	10	0.376	1
TRIP-2	33	22	3,715	0	0.000	1
TRIP-3	18	10	16,492	3	0.179	1
TRIP-4	66	17	35,091	161	5.173	2
TRIP-5	68	20	41,680	36	0.863	2
TRIP-6	57	5	8,820	0	0.000	1
TRIP-6	57	9	16,080	6	0.359	2
TRIP-7	66	16	48,021	133	2.849	2
TRIP-8	47	23	34,083	0	0.000	0
TRIP-9	68	18	27,600	13	0.493	2
TRIP-10	44	16	25,130	146	5.665	2
TRIP-11	33	2	2,600	0	0.000	0
TRIP-12	33	20	25,200	1	0.042	1
TRIP-13	24	18	32,740	5	0.153	1
TRIP-14	28	15	20,280	0	0.000	0
TRIP-15	69	21	47,100	38	0.850	2
TRIP-16	27	18	32,760	3	0.092	1
TRIP-17	47	13	29,219	1	0.021	2
TRIP-18	51	16	21,896	63	2.855	2

TRIP-19	31	17	22,440	1	0.045	1
TRIP-20	50	23	55,860	0	0.000	2
TRIP-21	38	13	28,200	29	0.934	2
TRIP-22	55	30	45,360	0	0.000	0
TRIP-23	49	16	25,850	1	0.039	1
TRIP-23	49	1	1,250	0	0.000	2
TRIP-24	29	20	25,216	0	0.000	1
TRIP-25	40	16	19,200	0	0.000	0

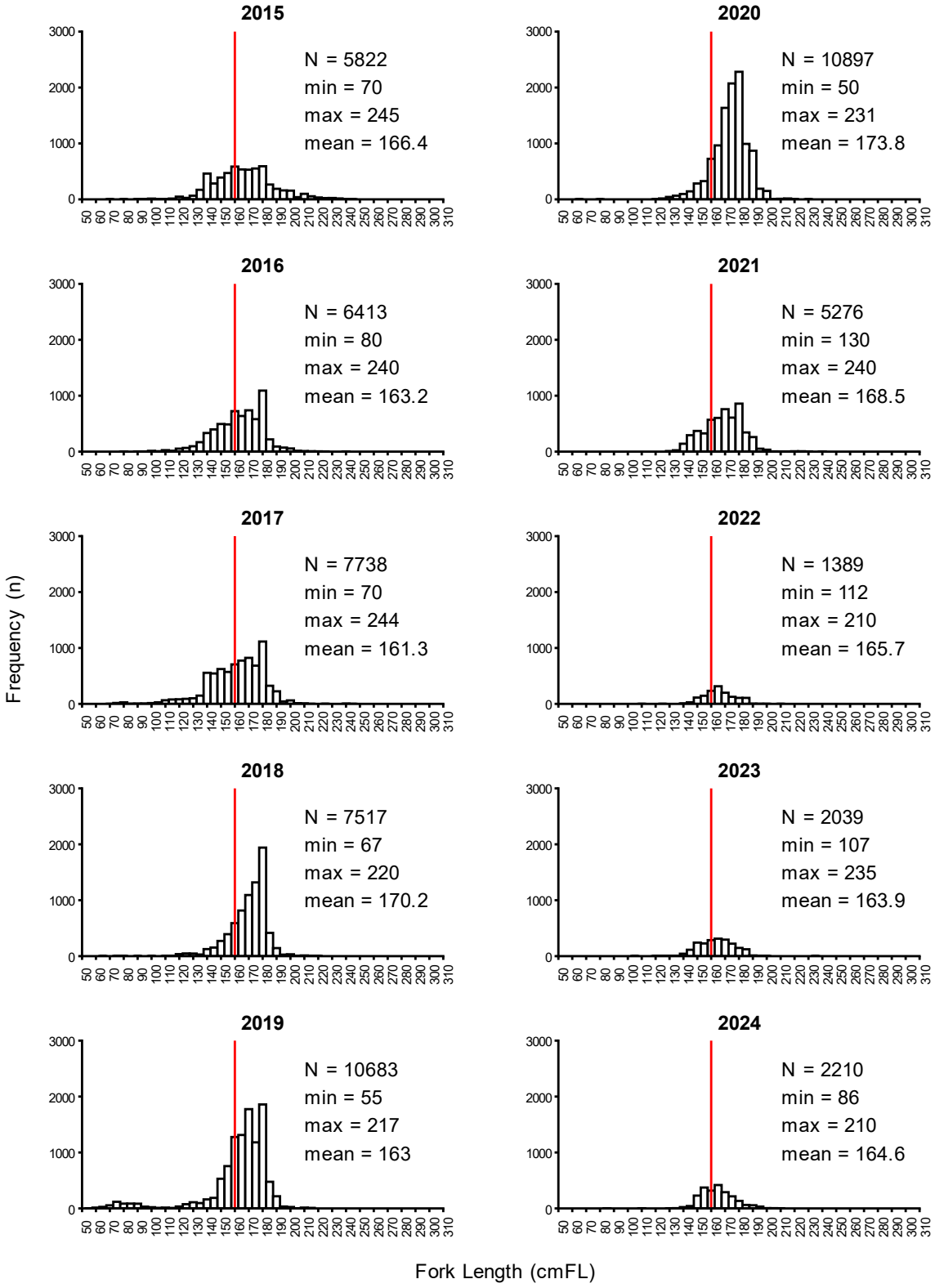

Figure 1. Length frequency distribution of all individual SBT from area 1 based on CDS data 2015-2024 (remarks= red line is a threshold for small SBT).

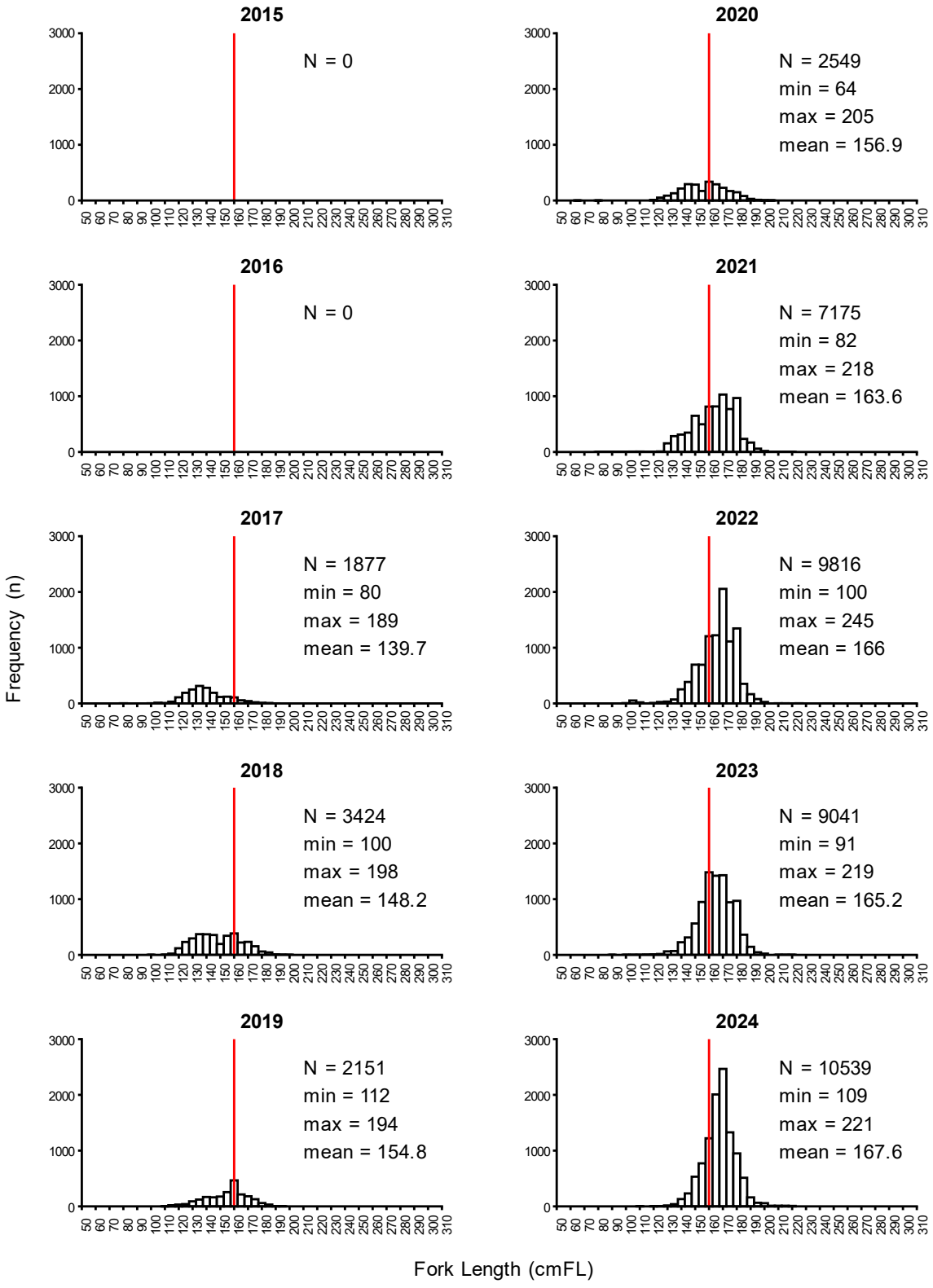

Figure 2. Length frequency distribution of all individual SBT from area 2 based on CDS data 2015-2024 (remarks= red line is a threshold for small SBT).