Northwest Atlantic Fisheries Organization

Serial No. N7503 **NAFO SCS Doc. 24/07**

SCIENTIFIC COUNCIL MEETING - JUNE 2024

National Research Report of Japan (2024)

Japan Fisheries Research and Education Agency, Japan

Contents

1. Summary

Since April 8, 2016, one Japanese otter trawler, FV No 68 Fukuyoshi maru has been operating in Div. 3L and 3M. The total catch including discards was 1 214 tons in 2023. Main target stock was SA2+3KLMNO Greenland halibut (GHL) (1 151 tons in 3L and 3M). There were small catches of redfish (5 tons) in 3M and no catches of yellowtail flounder in 2023. Following recommendation in the September SC meeting in 2023, aggregated total catch length distributions for five stocks were calculated by Division based on the designated protocol. The aggregated total catch length distributions of SA2+3KLMNO GHL in Division 3L formed unimodal in each year. The mean total length gradually decreased from 50 to 46cm during 2016-2021, but gradually increased from 46 to 48cm during 2021-2023. A total of 49 individuals of Greenland sharks were incidentally bycaught, mainly in the slope of Sackville Spur during 2021-2023. A total of 23 non-significant catches of Sea pen and 5 non-significant catches of Sponge occurred since 2016.

2. Introduction

Japan joined NAFO in 1980 and conducted fishing operations in the Convention area continuously for 29 years (1980-2008). From 2009, fishing operations stopped for 7 years (2009-2015) due to various reasons, i.e., socio-economics problems of fishing companies, Tsunami disasters (2011) and others. Fishing operations resumed in 2016 with one otter trawl fishing vessel and have continued till now (2024) (9^{th} year after the resumption).

This document is the National Research Report (Japan), responding to a series of requests by SC and NAFO Secretariat (Table 1). Table 1 summarizes progress of these requests as reference.

Table 1. Summary of requests by SC and the Secretariat and responses by Japan (as of May 5, 2024).

Information requested	NAFO circulation No.	Deadline	Response
● Environmental data	NAFO/24-030	April 15, 2024	No data available
● STATLANT 21A	NAFO/24-031	May 1, 2024	To be submitted by Fisheries Agency of JAPAN.
● National Research Report		May 3, 2024	This document
● Planned Surveys for 2024 and Early 2025			No surveys planned
● Lists of Biological Sampling Data during 2016-2023			Table 5 and Figs 7-11 of pages 15-20, Annex A of pages 29-33 (this document)
● List of Tag Releases in 2023 and early 2024			None
● Information on research vessel surveys on a stock-by-stock basis			No research vessel surveys
● STATLANT 21B		**Aug 31, 2024**	To be submitted by Fisheries Agency of JAPAN .

3. Data (1980-2023)

Three data sources used for this National Research Report of Japan are 'STATLANT21A (1980-2023)', 'STATLANT21B (1980-2023)', and 'Japanese Observer data (2016-2023)', which were officially provided by the Fisheries Agency of JAPAN, and the CESAG (2017-2023) and CDAG (2016) catches.

4. Overviews (NAFO CA) (1980-2023)

Before describing subarea-based information, the overall situation (1980-2023) since Japan joined NAFO in 1980, is reviewed.

4.1 Gear types

Table 2 shows gear types used in operations by year based on STATLANT 21 available in the NAFO database downloaded from the NAFO homepage (April 2024). Circles indicated gear types used, but numbers of vessels are unknown. Only the numbers of bottom otter trawlers operated are available, which were obtained from Ms Jana Aker (NAFO Fisheries Information Administrator) (January 2019) and the Fisheries Agency of Japan (September 2023). However, numbers are unknown for nine years.

Table 2. Gear types used in fishing operations (1980-2023).

Gear types used in fishing operations by Japan. Circles indicate that at least one vessel used the corresponding gear, but actual number of boats are unknown except bottom otter trawl in column [A]

NAFO area code [STATLANT21B]		8	9	10	12	15	49	51	56	70
	[A]*	[B] Gear type (STATLANT21B)								
Year	No. of bottom otter trawl operated	Bottom otter trawl (charters)	Midwater trawl	Bottom otter trawl (not specified)	Bottom otter trawl	Midwater trawl (stern)	Longlines (charters)	Set lines	Mechanized squid jigger	Dredge (charters)
1980	17	○			○	○				
1981	?	○			○	○				
1982	?	○	○		○	○				
1983	9				○	○				
1984	?	○			○	○				
1985	?	○			○	○				
1986	15	○			○		○			
1987	?	○			○	○	○			
1988	?	○			○	○	○			○
1989	21				○		○			
1990	?				○	○			○	
1991	?	○			○	○			○	
1992	?	○			○	○				
1993	2	○			○					
1994	2	○	○		○					
1995	2	○			○					
1996	2	○			○					
1997	2	○			○	○				
1998	2	○			○	○				
1999	2				○	○				
2000	2				○					
2001	2				○					
2002	2				○					
2003	2				○			○		
2004	1				○					
2005	1				○					
2006	1			○						
2007	1				○					
2008	1				○					
2009										
2010										
2011										
2012					No operations					
2013										
2014										
2015										
2016	1				○					
2017	1				○					
2018	1				○					
2019	1				○					
2020	1				○					
2021	1				○					
2022	1				○					
2023	1				○					

***: Sources from NAFO Secretariat (1980,1983,1986,1989) and Fisheries Agency of Japan (1993-2023).**

?: numbers are unknown.

Data source: STATLANT21A based on the official statistics provided by Fisheries Agency of Japan.

(1) Japan jointed NAFO in 1980.

(2) Majority gear is the bottom otter trawl.

(3) Fishing vessel operated in recent years (2016-2023) is described in Annex B.

4.2 Catch by subarea (Table 3 and Map 1)

Table 3. Annual catch by sub-area (tons). All species and gears are combined (1980-2023).

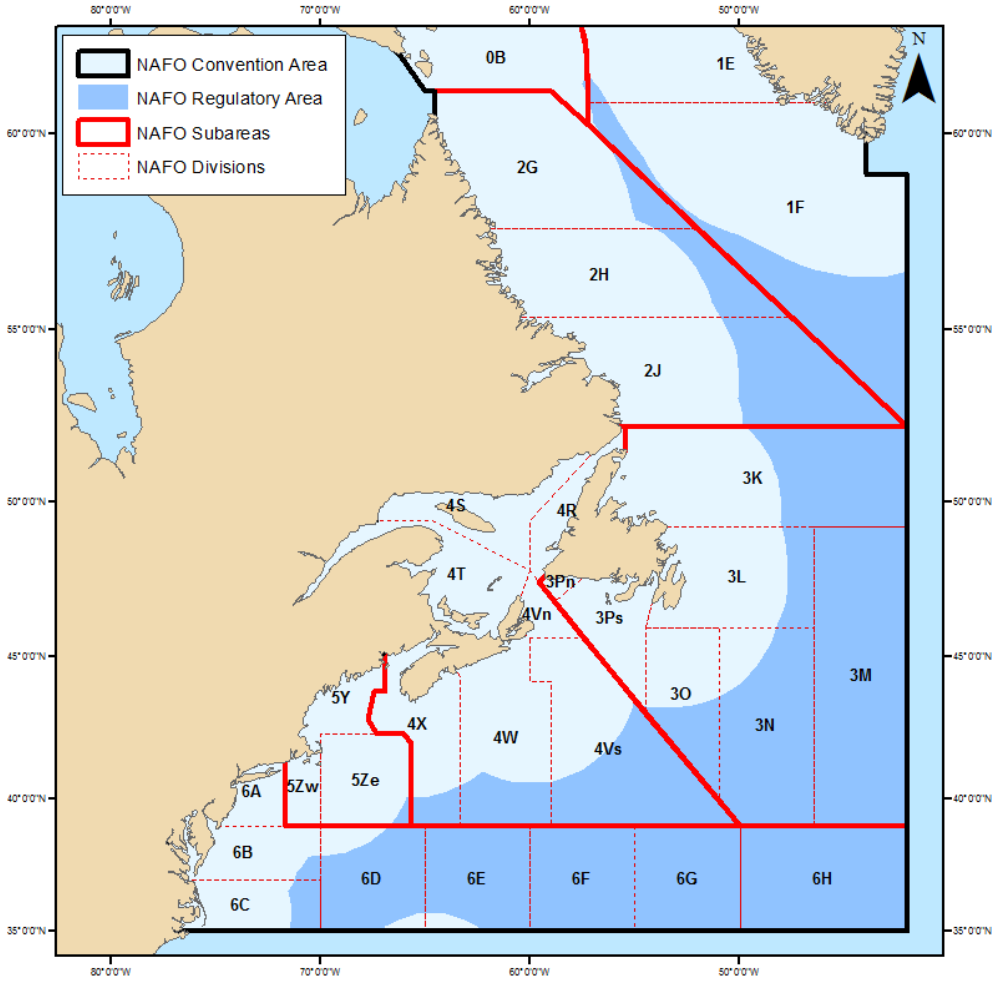
Year	Subarea							
	0	1	2	3	4	5	6	Total
1980				2,223	18,683	4,652	5,850	31,408
1981				3,191	6,556	3,035	7,795	20,577
1982				6,479	1,416	1,853	5,204	14,952
1983				410	1,360	1,335	1,190	4,295
1984		802	1,221	3,667	2,094	718	1,548	10,050
1985		1,680	111	4,983	1,161	103	379	8,417
1986		2,079	1,546	6,077	1,845	79	229	11,855
1987		1,765	1,705	5,467	1,651			10,588
1988		2,045	1,463	5,085	1,041			9,634
1989		1,428	531	6,546	830			9,335
1990	124	1,189	1,745	6,797	2,182			12,037
1991	235	794	1,774	3,009	1,622	45		7,479
1992	386	3,011	968	5,715	763			10,843
1993	270	1,284	579	3,863				5,996
1994	674	874		1,822				3,370
1995	1,085	376		2,872				4,333
1996	522		28	3,333				3,883
1997				2,565			7	2,572
1998				3,109				3,109
1999				3,112				3,112
2000				2,941				2,941
2001				3,627				3,627
2002				3,389				3,389
2003				3,216				3,216
2004				1,948				1,948
2005				1,996				1,996
2006				1,901				1,901
2007				2,011				2,011
2008				1,972				1,972
2009								
2010								
2011								
2012				No operations				
2013								
2014								
2015								
2016				2,409				2,409
2017				2,595				2,595
2018				2,990				2,990
2019				2,786				2,786
2020				1,764				1,764
2021				1,716				1,716
2022				1,282				1,282
2023				1,214				1,214

Additional Note:

(1) Data source: STATLANT21A based on the official statistics provided by Fisheries Agency of Japan.

(2) Japan jointed NAFO in 1980.

(3) Majority gear is the bottom otter trawl.



Map 1. Map of NAFO CA highlighted subareas and Divisions.

Fig. 1 shows catch compositions among subareas (all species and gears combined but the majority gear is bottom otter trawler as indicated in Table 1). Japan operated in all of seven subareas (0-6) in the past, and subarea 3 was the major fishing ground during 1980-1996. From 1997 to now, subarea 3 is the only fishing ground for Japan.

Fig. 2 shows catch trends by subareas (all species and gears combined, but majority gears are bottom otter trawls). There is a shift of three different catch levels, i.e., during 1st stage (1980-1982), the catch level was the highest (15,000-31,000 tons), then in the 2nd stage (1983-1993) decreased by half (6,000-12,000 tons except 4,000 tons in 1983) and in the 3rd stage (1994-2008 and 2016-2023), it further decreased to less than 4,000 tons. The decreases are considered mainly due to constraints by TAC.

Subarea 3 has been the only fishing ground for Japan since 1997, thus this report describes the information in subarea 3.

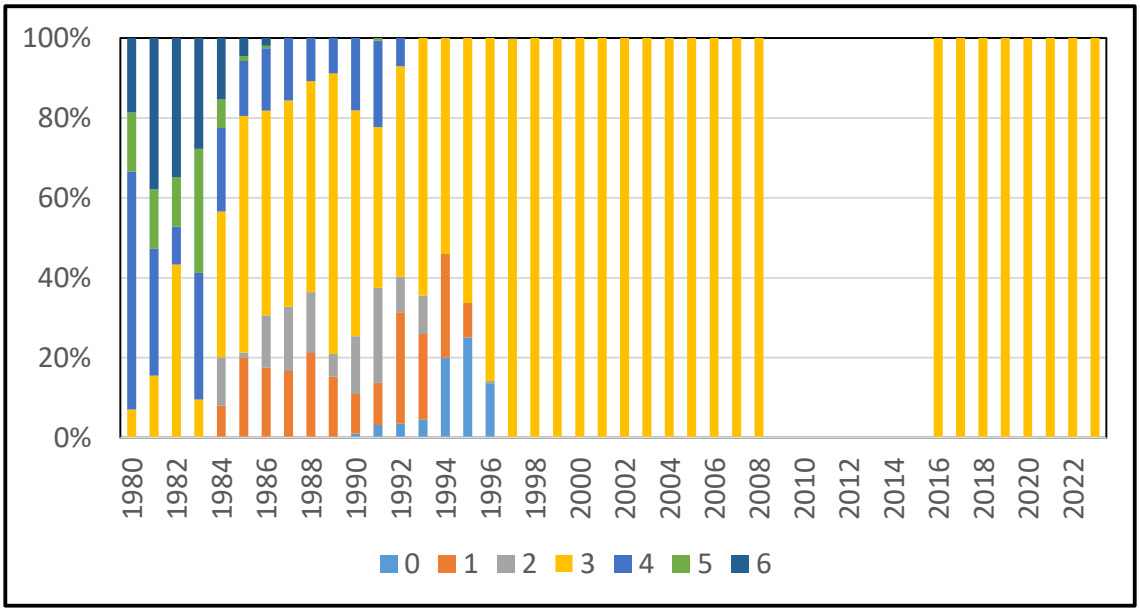


Figure 1. Catch compositions among subareas (1980-2023). All species and gears are combined.

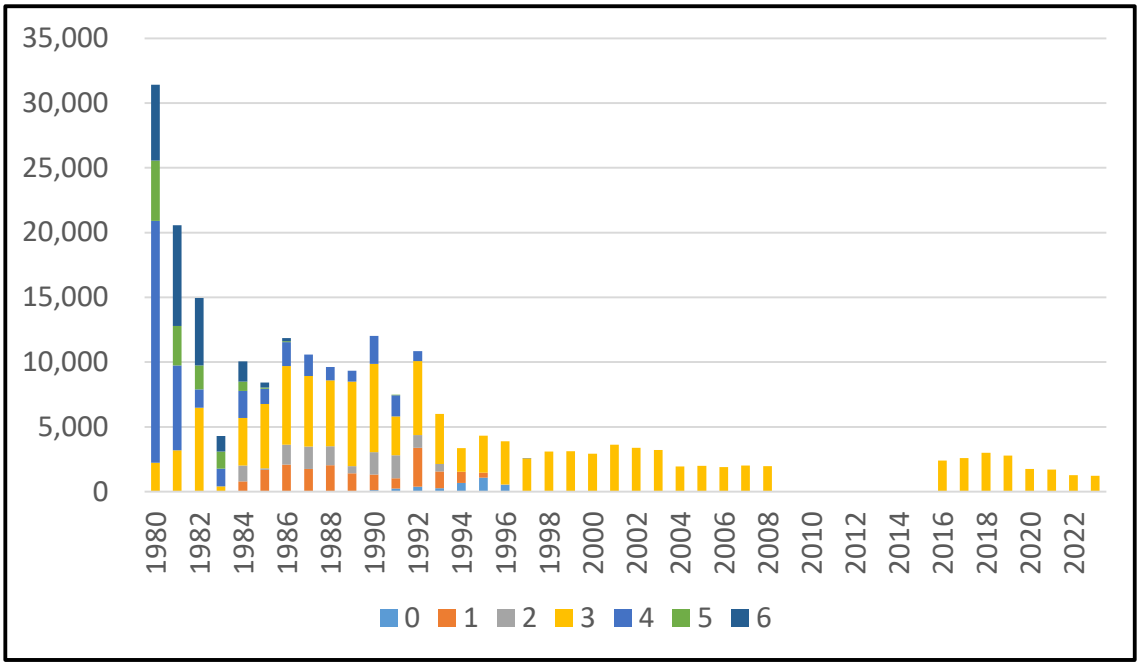


Figure 2. Catch by sub-areas (tons) (1998-2023). All species and gears are combined. No operations were done during 2009-2015.

Note:

(1) Data source: STATLANT21A based on the official statistics provided by Fisheries Agency of Japan.

(2) Japan jointed NAFO in 1980.

(3) Major gear used is the bottom otter trawl.

5. SUBAREA 3

A. Status of the Fisheries

This should be broken down by species and should first indicate the changes that have been observed in the catches. Any available information regarding quantities of fish, by species if possible, being used for industrial purposes should also be presented. An explanation should follow for these changes based on scientists' best judgement. Reference to biological conditions (e.g. length and age composition), fishing conditions (e.g. effort and availability) and environmental conditions, should be made where necessary and appropriate. Any forecasts for the coming year should be included here. Graphic presentations supporting the text are acceptable.

We will first review the overall situation in subarea 3 then will analyze by Division in subarea 3.

5.1 Overview

(1) Fisheries

Table 4 shows annual catch (tons) by Division in subarea 3 (all species and gears combined) (1980-2023). There are catch for almost all period in Division 3L+3M, while more in the first half for 3K+3N+3O.

Fig. 3 shows catch compositions among Divisions in subarea 3 (all species and gears combined). Japan operated in five Divisions (3K, 3L, 3M, 3N and 3O), but major fishing Division shifted by period, i.e., Division 3L was the major fishing ground in 1980-1981, then shifted to 3K (1984-1987), 3N (1988-1990), 3M (1991-1995), and 3L (1996-2008 and 2016-2023).

Fig. 4 shows annual catch trends by Division in subarea 3 (all species and gears combined). There are two different catch levels, i.e., the higher catch level (average 4,500 tons) in the first half period (1980-1993), while the lower level (average 2,500 tons) in the latter half period (1994-2008 and 2016-2023) resulting 2,000 tons difference.

Table 4. Annual catch by Division in sub-area 3 (tons). All species and gears are combined (1980-2023).

Year	Division					
	3K	3L	3M	3N	3O	Total
1980	208	983	1,030		2	2,223
1981	40	2,708	442		1	3,191
1982	3,462	2,014	455		548	6,479
1983			406		4	410
1984	1,257	461	416	85	1,448	3,667
1985	3,790	133	339		721	4,983
1986	4,270	140	444	12	1,211	6,077
1987	2,671	298	436	845	1,217	5,467
1988	856	347	507	1,537	1,828	5,075
1989	526	141	1,409	2,701	1,769	6,546
1990	261	175	2,494	2,431	1,436	6,797
1991	88	488	2,096	103	234	3,009
1992		1,810	3,748	21	136	5,715
1993		1,254	2,441		168	3,863
1994		649	1,173			1,822
1995		847	1,759		266	2,872
1996		2,093	813		427	3,333
1997		2,032	224	15	294	2,565
1998		2,162	577		370	3,109
1999		2,739	370	3		3,112
2000		2,794	147			2,941
2001		3,228	399			3,627
2002		3,071	318			3,389
2003		2,978	238			3,216
2004		1,724	222		2	1,948
2005		1,404	591		1	1,996
2006		1,490	410		1	1,901
2007		1,293	654		64	2,011
2008		1,334	638			1,972
No operations						
2016		624	168	1,573	44	2,409
2017		1,178	242	1,168	7	2,595
2018		1,555	707	724	4	2,990
2019		1,813	585	378	10	2,786
2020		1,399	344		21	1,764
2021		949	767			1,716
2022		1,084	198			1,282
2023		989	226			1,214

Additional Note:
(1) Data source: STATLANT21A based on the official statistics provided by Fisheries Agency of Japan.
(2) Japan jointed NAFO in 1980.
(3) Majority gear is the bottom otter trawl.

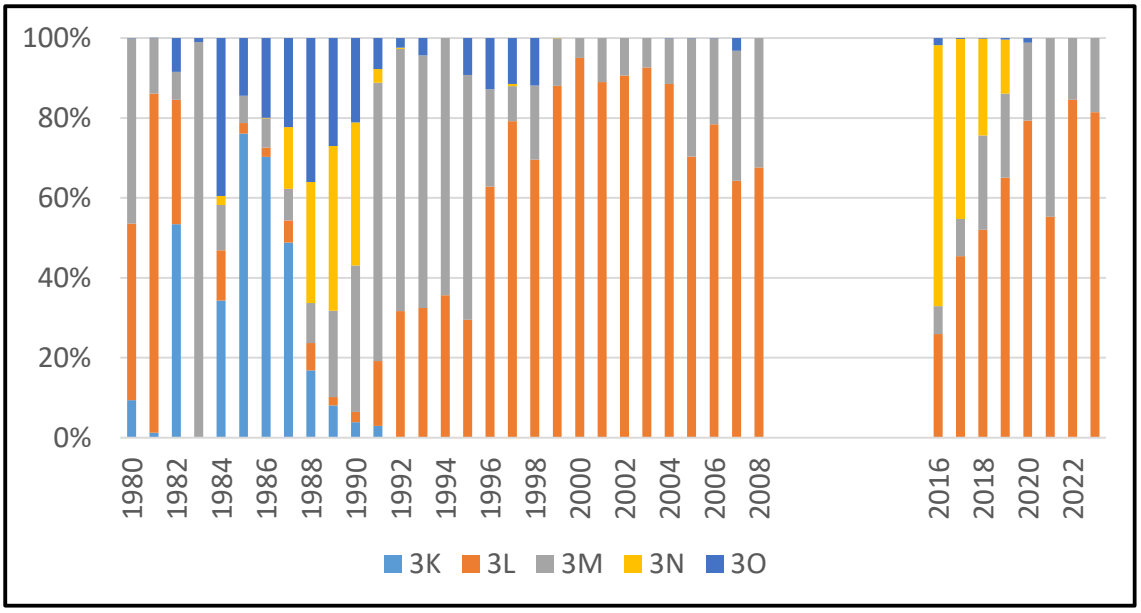


Figure 3. Catch compositions among Divisions in sub-area 3 (1980-2023). All species and gears are combined.

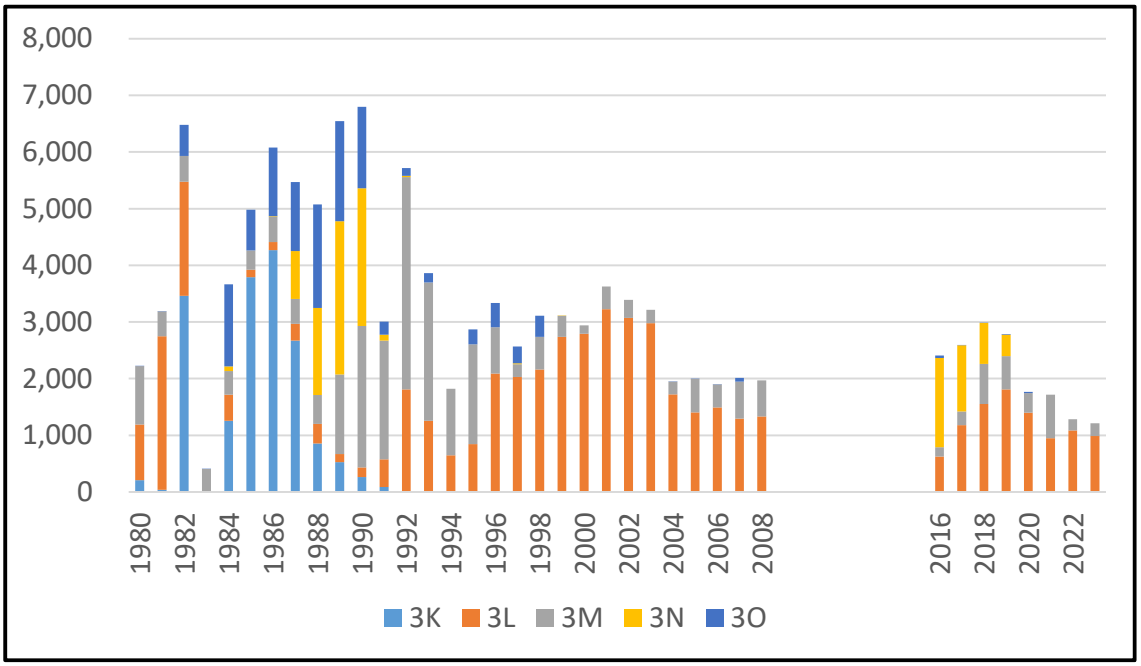


Figure 4. Annual catch (tons) by Division in sub-area 3. All species and gears are combined (1980-2023).

Note:

(1) Data source: STATLANT21A based on the official statistics provided by Fisheries Agency of Japan.

(2) Japan jointed NAFO in 1980.

(3) Majority gear is the bottom otter trawl.

Fig. 5 shows TAC species compositions of catch for Japan in subarea 3, i.e., Greenland halibut, Atlantic cod, Atlantic redfish, caplin and squid. Major species compositions vary by period, i.e., Atlantic cod and red fish (1980-1983), redfish (1984-1991), Greenland halibut and redfish (1992-2008), Greenland halibut and yellowtail flounder (2016-2017), Greenland halibut and red fish (2018-2021), and Greenland halibut (2022-2023). Yellowtail flounder is not TAC species for Japan, but its ratio was high in 2016-2017 because of quota transfers (Greenland halibut, red fish and yellowtail flounders) between Japan and Canada in 2016-2017, thus catch in this period did not reflect the allocation of quota (TAC).

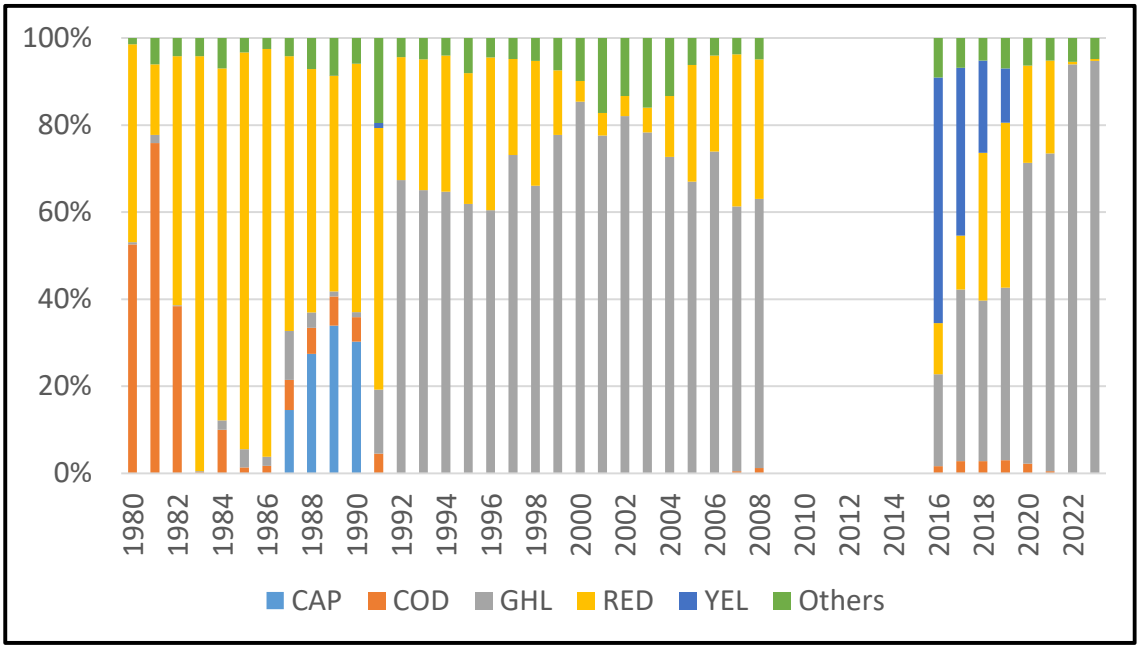


Figure 5. Species compositions of catch in Subarea 3. All gears are combined (1980-2023).
Note:

(1) Data source: STATLANT21A based on the official statistics provided by Fisheries Agency of Japan.

(2) Japan jointed NAFO in 1980.

(3) Majority gear is the bottom otter trawl

Fig. 6 shows annual catch trends by species in subarea 3 during two periods (1980-1993 and 1994-2023). There are high and low catch level periods, i.e., high (1980-1993) (average=4,500 tons) and low (1994-2023) (Average=2,500 tons), the difference of which is 2,000 tons. Yellowtail flounder catch was high (2016-2017) as explained above.

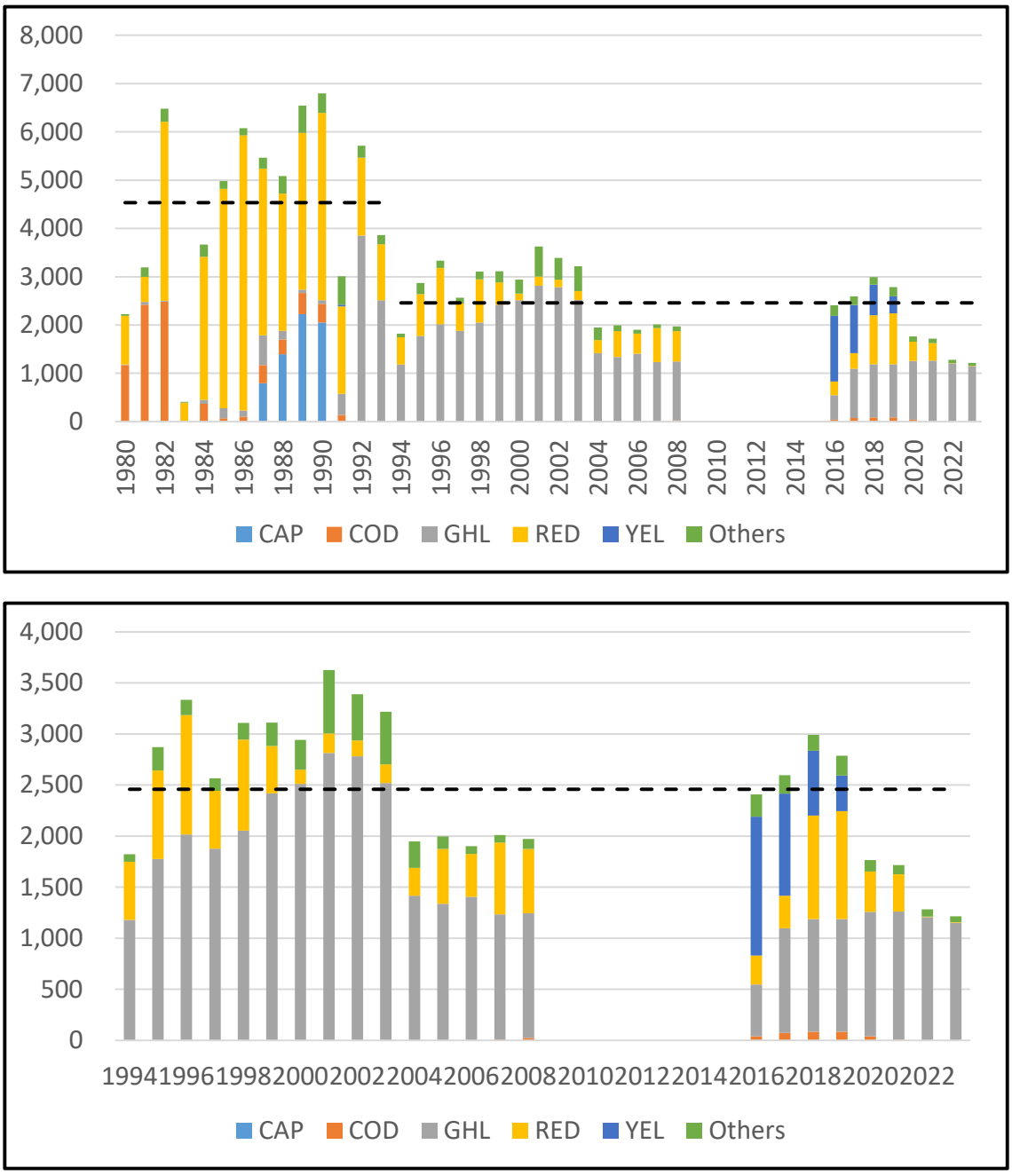


Figure 6. Catch by species (tons) in Subarea 3. All gears are combined (1980-2023: upper, 1994-2023: lower).

Note:

(1) Horizontal broken lines represent averages for the two periods (1980-1993 and 1994-2023).

(2) Data source: STATLANT21A based on the official statistics provided by Fisheries Agency of Japan.

(3) Japan jointed NAFO in 1980.

(4) Majority gear is the bottom otter trawl.

(2) Aggregated total catch length distribution (Total/Fork length by 0.5cm is shown in Annex A)

The Japanese observers measured total lengths for ca. 50 samples of SA2+3KLMNO Greenland halibut (GHL) and 3LNO Yellowtail flounder (YEL) and fork lengths for ca. 100 samples of 3LN Redfish (RED), 3O RED and 3M RED for every 2-5 hauls during the cruises.

Following recommendation in the September SC meeting in 2023 (NAFO SCS Doc. 23/22), aggregated total catch length distributions for 3LN RED, 3O RED, 3M RED, 3LNO YEL and SA2+3KLMNO GHL were calculated using the Japanese Observer reports, following a protocol developed by then STACREC Chair (Dr. D. Gonzalez-Troncoso) in April 2023 as follows:

For a given stock in a given Division during a given year, total number of length class i within total catch (with all hauls) by a Japanese vessel (TNL_i ; with an interval by 0.5cm) was estimated as follows:

$TNL_i = \Sigma_j (NL_{ij}) \times TCw / Sw$ ----------(1)

where

NL_{ij} is number of length class i estimated within catch of haul j :

$NL_{ij} = \Sigma_j (NL'_{ij} \times cw_j / sw_j)$ ----------(2)

where NL'_{ij} is number of length class i sampled and measured from catch of haul j,

cw_j is catch weight (kg) for haul j, and

sw_j is weight (kg) of samples (i.e., weight of all length classes) measured from catch of haul j.

TCw is total catch weight (kg) based on CESAG (for 2017-2023), CDAG and/or STATLANT (for 2016).

Sw is total weight (kg) of hauls with samples measured:

$Sw = \Sigma_j (cw_j)$ ----------(3)

We referred the total catch weight (TCw) by Division of the 5 stocks during 2017-2023 to CESAG reports (com-sccesag-wp 18-01 2018; com-sccesag-wp 19-06REV 2019; com-sccesag-wp 20-02 2020; com-sccesag-wp 21-04 2021; com-sccesag-wp 22-01REV2 2022; com-sccesag-wp 23-01REV2 2023, com-sccesag-wp 24-01) (Table 5).

For 2016, the total catches for 3M RED and SA2+3KLMNO GHL were estimated using CDAG Estimation Strategy (non-published EXCEL file provided by Dr. D. Gonzalez-Troncoso), thus those were applied to the TCw. On the other hand, the TCw for 3LN RED, 3O RED, and 3LNO YEL was referred to STATLANT. The CDAG catch for SA2+3KLMNO GHL (caught in 3L and 3M by a Japanese vessel) is aggregately estimated at 553,716kg but not separately estimated by Division, thus the catches by Division were estimated based on the proportional rate of those by STATLANT (i.e., 97% in Division 3L vs. 3% in Division 3M). In result, the TCw was estimated at 515,641kg and 38,075kg in

Divisions 3L and 3M, respectively (Table 5).

There isn't data for weight of samples measured (sw_j) for all hauls for SA2+3KLMNO GHL and large part of hauls for 3LN RED in 2016. Thus, the sw_j was estimated referring length-weight relationship equations in the literatures. Namely, the estimated $sw_j = \Sigma_i$ (0.00336 x (mid-point of length class i) ^ 3.2284 x number of length class i sampled and measured) for haul j for SA2+3KLMNO GHL (scr17-013 https://www.nafo.int/Portals/0/PDFs/sc/2017/scr17-013.pdf?ver=2017-08-29-103336-540), and the estimated $sw_j = \Sigma_i$ (0.0088 x (mid-point of length class i) ^ 3.1297 x number of length class i sampled and measured) for haul j for 3LN RED (scr17-016 https://www.nafo.int/Portals/0/PDFs/sc/2017/scr17-016.pdf?ver=2017-08-29-103815-767).

Table 5. STATLANT and CDAG/CESAG catches (kg) for a Japanese vessel during 2016-2023. Lower red values for each Division for each year are used for total catch weight (TCw).

	SA2+3KLMNO GHL				3LN RED		3M RED		3O RED		3LNO YEL			
	3L		3M		3L		3M		3O		3N		3O	
	STATLANT	CDAG/ CESAG	STATLANT	CDAG/ CESAG	STATLANT	CDAG/ CESAG	STATLANT	CDAG/C ESAG	STATLANT	CDAG/ CESAG	STATLANT	CDAG/ CESAG	STATLANT	CDAG/ CESAG
2016	474,000	ND	35,000	ND	125,000	ND	128,000	135,664	30,000	ND	1,355,000	ND	4,000	ND
	515,641*		38,075*		125,000		135,664		30,000		1,355,000		4,000	
2017	1,024,000	1,129,000	0	0	125,000	142,000	190,000	197,000	6,000	6,000	1,000,000	1,048,000	0	0
	1,129,000				142,000		197,000		6,000		1,048,000			
2018	1,101,000	1,251,000	2,000	2,000	412,000	441,000	600,000	636,000	4,000	5,000	634,000	660,000	0	0
	1,251,000				441,000		636,000				660,000			
2019	1,075,000	1,101,000	29,000	30,000	606,000	630,000	450,000	478,000	0	0	348,000	350,000	0	0
	1,101,000		30,000		630,000		478,000				350,000			
2020	1,204,000	1,240,000	15,000	16,000	108,000	112,000	286,000	295,000	1,000	0	0	0	0	0
	1,240,000		16,000		112,000		295,000							
2021	788,000	731,000	465,000	357,000	109,000	112,000	257,000	265,000	0	0	0	0	0	0
	731,000		357,000		112,000		265,000							
2022	1,019,000	1,048,000	186,000	191,000	7,000	7,000	0	0	0	0	0	0	0	0
	1,048,000		191,000		7,000									
2023	942,000	958,000	209,000	214,000	0	0	5,000	5,000	0	0	0	0	0	0
	958,000		214,000				5,000							

*: Estimated based on aggregated CDAG catch and proportional rate of STATLANT catches by Division (see details in the text).

SA2+3KLMNO GHL (during 2016-2023)

Length measurement samples for SA2+3KLMNO GHL were collected in Divisions 3L and 3M during 2016-2023. The sample collection was mainly done in Division 3L. Both fishing depth and mean total length for the samples were larger in Division 3M than those in Division 3L in each year (Table 6).

Table 6. Numbers of hauls and samples, fishing depths (m), mean total lengths (cm) for length measurement samples of SA2+3KLMNO GHL by Division during 2016-2023.

	SA2+3KLMNO GHL							
	3L GHL				3M GHL			
	No. of hauls	No. of samples	Depth range (mean)	Mean total length	*No. of hauls*	No. of samples	Depth range (mean)	Mean total length
2016	*35*	1,750	750-1,085 (924)	50.3	*3*	150	1,104-1,114 (1,108)	51.7
2017	*60*	2,999	584-1,206 (897)	49.7	-	-	-	-
2018	*29*	1,450	765-968 (851)	48.7	-	-	-	-
2019	*44*	2,200	747-958 (846)	48.5	*1*	50	925	50.3
2020	*50*	2,500	778-1,013 (871)	47.9	*1*	50	963	50.5
2021	*21*	1,052	793-1,001 (874)	46.3	*16*	800	888-1,042 (1,005)	52.7
2022	*36*	1,799	758-960 (886)	47.3	*4*	200	993-1,025 (1,008)	53.7
2023	*28*	1,401	803-1,025 (889)	48.0	*7*	350	1,009-1,049 (1,022)	52.3

The aggregated total catch length distributions of GHL in Division 3L formed unimodal in each year. The mean total length gradually decreased from 50 to 46cm during 2016-2021, but gradually increased from 46 to 48cm during 2021-2023 (Fig. 7). The distribution data by 0.5cm interval in Divisions 3L, 3M, and 3L+3M were shown in Annex A - 1) - 3).

SA2+3KLMNO GHL for Division 3L

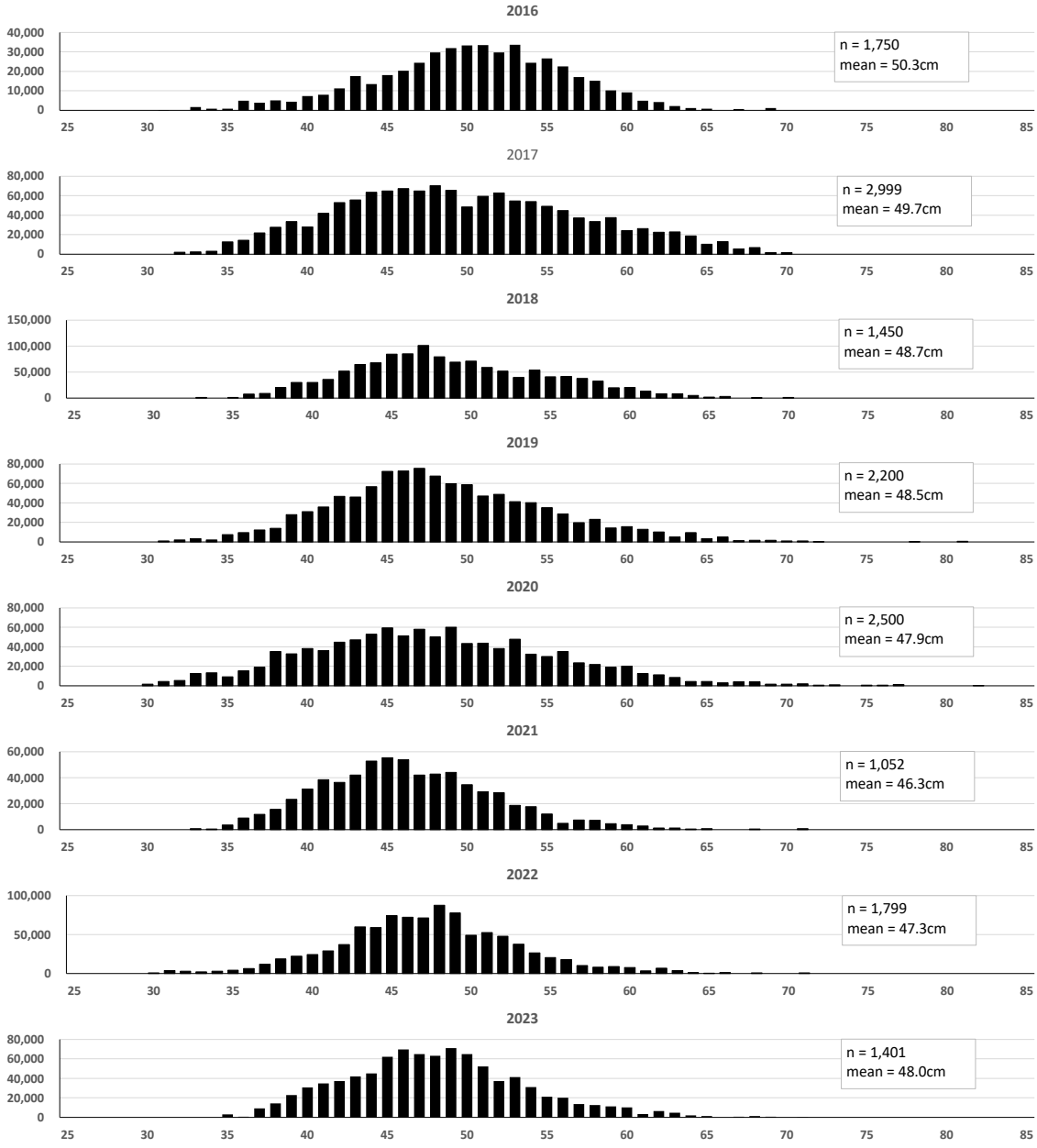


Figure 7. Aggregated total catch length distribution based on the total length data measured by one on-board observer for SA 2+3KLMNO GHL in Division 3L (2016-2023).

3LN RED, 3O RED, and 3M RED (during 2016-2021)

The length measurement samples for 3LN RED were conducted only in Division 3L during 2016-2023. The sample collection for 3O RED was conducted in the shallower area than 3LN RED and 3M RED. The mean fork length of 3O RED was smaller than those in 3LN RED and 3M RED (Table 7).

Table 7. Numbers of hauls and samples, fishing depths (m), mean fork lengths (cm) for length measurement samples of 3LN RED, 3O RED, and 3M RED during 2016-2023.

	3LN RED (only sampled in 3L)				3O RED				3M RED			
	No. of hauls	No. of samples	Depth range (mean)	Mean fork length	*No. of hauls*	No. of samples	Depth range (mean)	Mean fork length	*No. of hauls*	No. of samples	Depth range (mean)	Mean fork length
2016	*13*	1,303	335-1,039 (727)	30.4	*18*	1,801	231-392 (306)	25.0	*7*	703	506-537 (518)	33.6
2017	*8*	800	335-536 (398)	27.8	*2*	200	275-311 (293)	23.2	*3*	300	446-530 (476)	31.6
2018	*14*	1,400	319-530 (435)	32.1	-	-	-	-	*20*	2,000	244-531 (450)	33.4
2019	*29*	2,896	321-559 (425)	30.4	-	-	-	-	*28*	2,797	255-515 (417)	32.7
2020	*5*	500	338-530 (463)	35.0	-	-	-	-	*14*	1,400	349-462 (408)	35.0
2021	11	1,101	479-541 (513)	36.3	-	-	-	-	*15*	1,500	374-537 (479)	37.5
2022	*1*	100	492	33.1	-	-	-	-	-	-	-	-
2023	-	-	-	-	-	-	-	-	*2*	200	405-524 (464)	33.9

The mean fork length of 3LN RED in Division 3L varied from 28 to 32cm during 2016-2019, but it became significantly large to 35 cm in 2020. Individuals with larger lengths (42-49cm) occurred in high percentage in that year as compared to other years. The mean length was highest at 36cm in 2021 (Fig. 8). Note the length distribution for 2022 was omitted here due to small sampling size. The distribution data by 0.5cm interval for 3LN RED in Division 3L was shown in Annex A - 4).

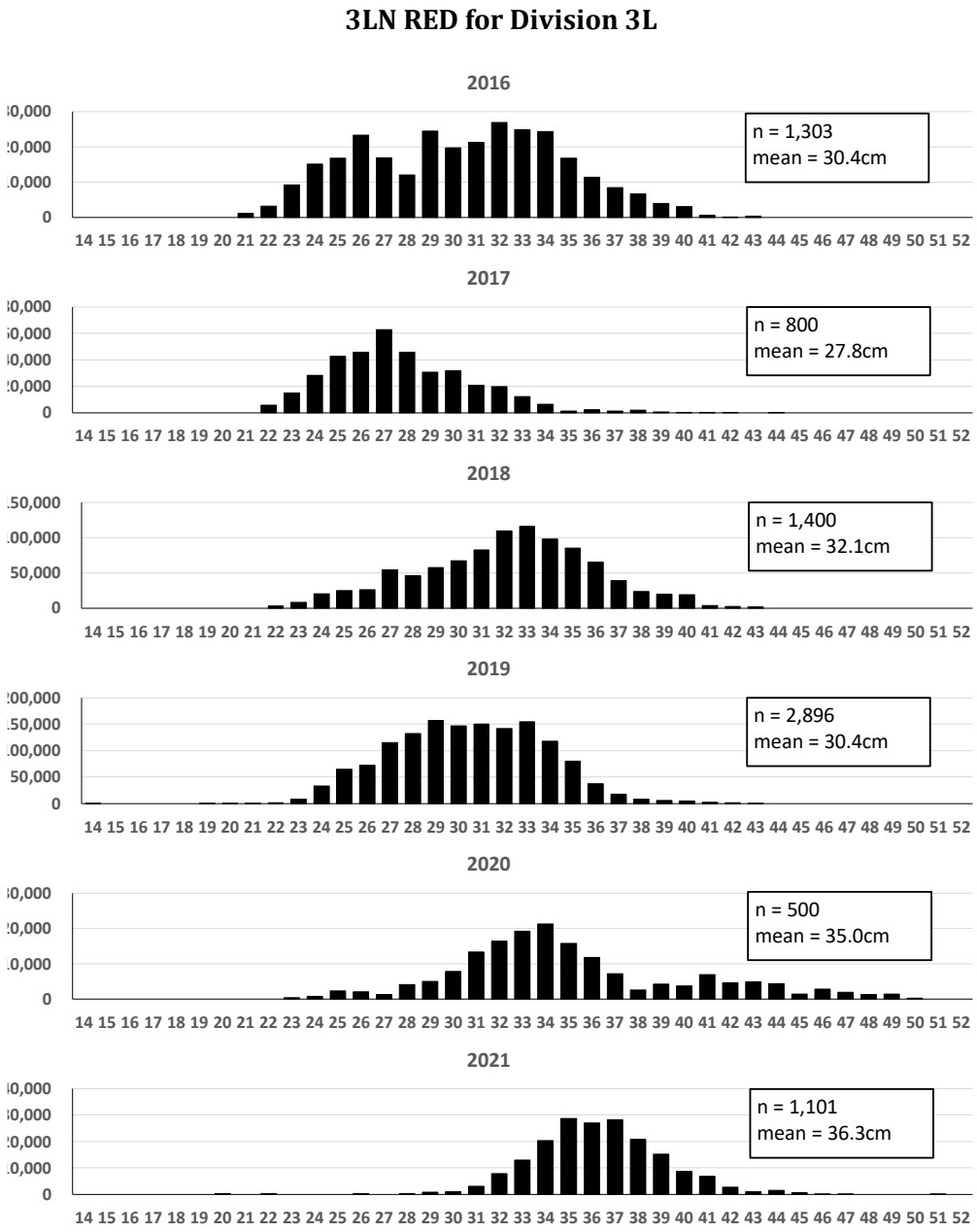


Fig. 8. Aggregated total catch length distribution based on the fork length data measured by one on-board observer for 3LN RED in Division 3L (2016-2021) .

The total catch fork length data are available only in 2016 and 2017 for 3O RED. The weighed

length distributions formed the unimodal for both years, peaked around 25cm and 23cm in 2016 and 2017, respectively (Fig. 9). The distribution data by 0.5cm interval for 3O RED was shown in Annex A - 5).

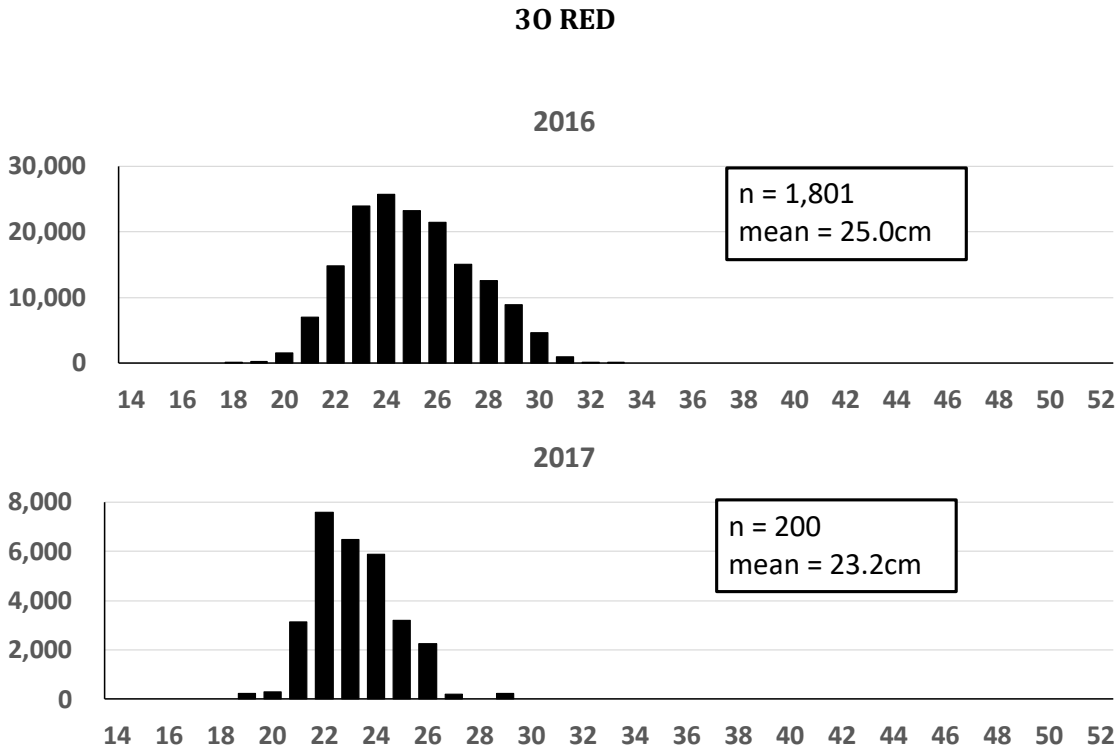


Figure 9. Aggregated total catch length distribution based on the fork length data measured by one on-board observer for 3O RED (2016-2017).

The mean fork lengths in 3M RED varied from 32-34cm during 2016-2019 but increased to 35cm in 2020 due to the occurrence in high percentage of individuals with larger lengths (42-50 cm). The weighed length distribution formed the unimodal with the largest average length of 38cm in 2021 (Fig. 10). Note the length distribution for 2023 was omitted here due to small sampling size. The distribution data by 0.5cm interval for 3M RED was shown in Annex A - 6).

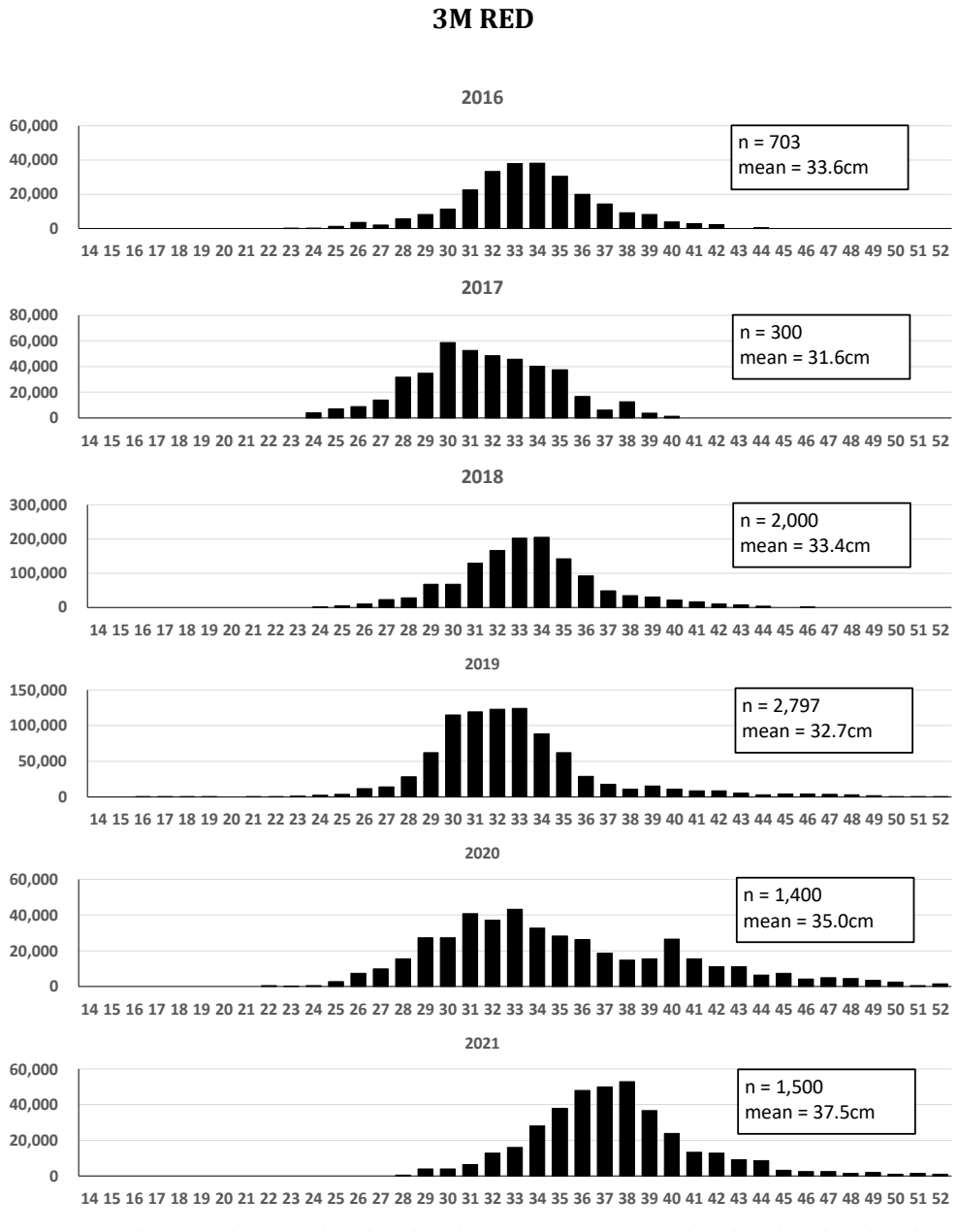


Figure 10. Aggregated catch length distribution based on the fork length data measured by one on-board observer for 3M RED (2016-2021).

3LNO Yellowtail flounder

The length measurement samples for 3LNO YEL were mainly collected in Division 3N during 2016-2019. Only small sample size was collected in Division 3O in 2016. The fishing depth for the samples was about 60m in Division 3N in each year (Table 8).

Table 8. Numbers of hauls and samples, fishing depths (m), mean total lengths (cm) for length measurement samples of 3LNO YEL by Division during 2016-2023.

	3LNO YEL							
	3N YEL				3O YEL			
	No. of hauls	No. of samples	Depth range (mean)	Mean total length	*No. of hauls*	No. of samples	Depth range (mean)	Mean total length
2016	*72*	3,603	56-77 (60)	34.0	*1*	50	76	35.8
2017	*47*	2,350	57-64 (60)	34.3	-	-	-	-
2018	*23*	1,150	57-66 (61)	34.6	-	-	-	-
2019	*15*	750	59-64 (61)	34.9	-	-	-	-
2020	-	-	-	-	-	-	-	-
2021	-	-	-	-	-	-	-	-
2022	-	-	-	-	-	-	-	-
2023	-	-	-	-	-	-	-	-

The aggregated total length distributions in 3N formed unimodal during 2016-2019. The mean total length tended to be gradually larger as years with the largest sizes in 2019 (ca. 35cm). The distribution data by 0.5cm interval of 3LNO YEL in Divisions 3N, 3O, and 3N+3O was shown in Annex A - 7) - 9).

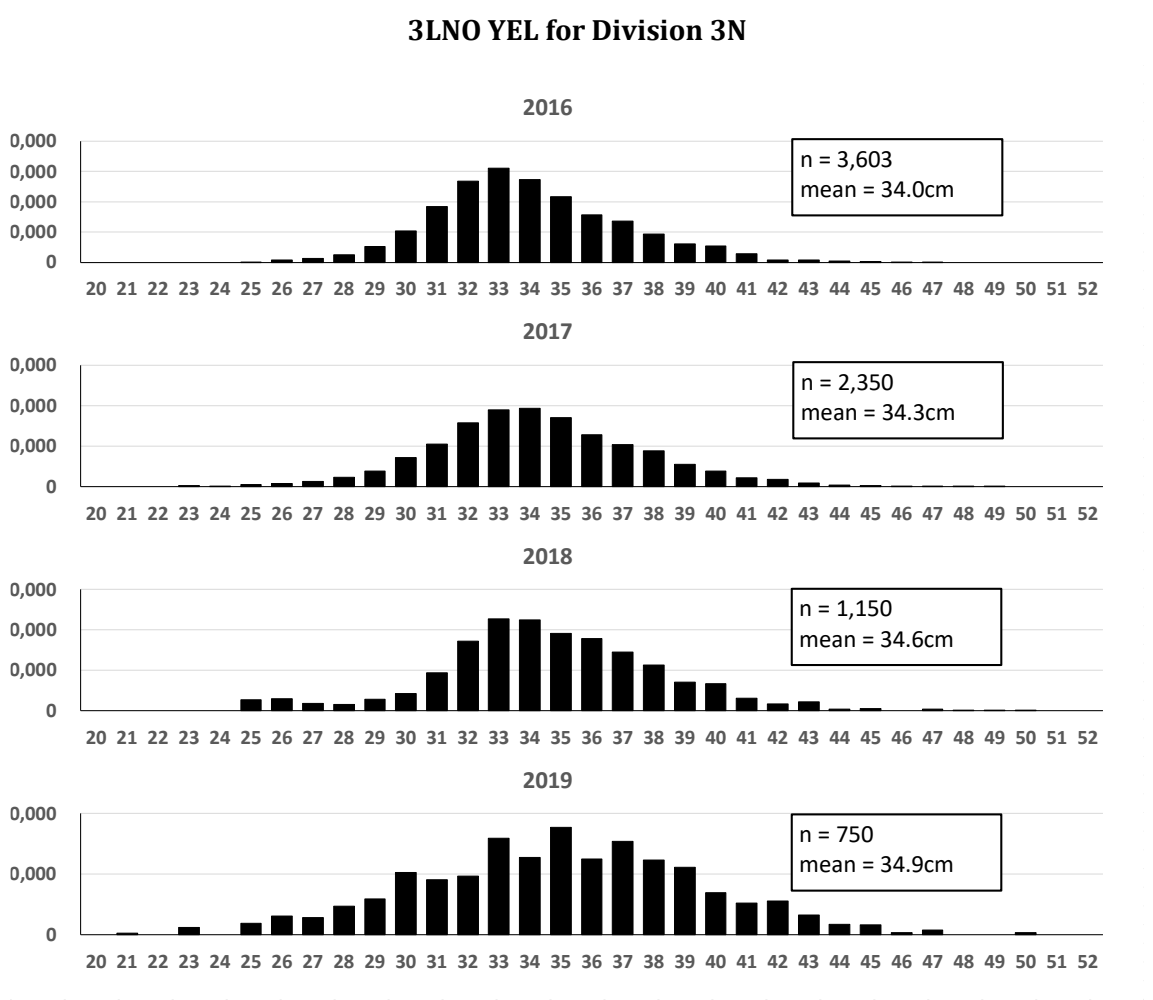


Figure 11. Aggregated total catch length distributions based on the total length data collected by one on-board observer for 3LNO YEL in Division 3N (2016-2019).

5.2 Division 3K

Table 9 shows catch by species in Division 3K (1980-2023) (all gears combined). There were operations only for 11 years (1980-91 except 1983). Redfish was the largest catch (average=1,345 ton), followed by Cod (119 tons) and Greenland halibut (85 tons).

Table 9. Catch (tons) by species in Division 3K (1980-2023) (all gears combined)

CODE	CAT	COD	DGX	FIN	FLW	FLX	GHL	GRO	HAL	PLA	RED	RNG	SHX	SKA	WIT
1980		194				5					9				
1981	2	33									4				1
1982	12	752	1	7			9		2		2,662			2	15
1983	There were operations in NAFO CA, but not in Division 3K.														
1984		40					67	7			1,132		4		7
1985	5	60					196	23		12	3,439				55
1986	27	97					87	9	10	2	3,986	11	9		32
1987		96					431	20	3	8	2,079	9	1		24
1988		17	1				104	19	1	3	693	9	3		6
1989		8					18	6		1	485	5			3
1990		9			1		10				239		1		1
1991				2			8	2		2	63	3	1		7
1992															
1993															
1994															
1995															
1996															
1997															
1998															
1999															
2000	There were operations in NAFO CA, but not in Division 3K.														
2001															
2002															
2003															
2004															
2005															
2006															
2007															
2008															
2009															
2010															
2011															
2012	No operations in NAFO CA.														
2013															
2014															
2015															
2016															
2017															
2018															
2019	There were operations in NAFO CA, but not in Division 3K.														
2020															
2021															
2022															
2023															

Note:

(1) Data source: STATLANT21A based on the official statistics provided by Fisheries Agency of Japan.

(2) Japan jointed NAFO in 1980.

(3) Majority gear is the bottom otter trawl.

(4) Blank means catch (tons) < 0.5 (including 0 catch) or no operations.

5.3 Division 3L

Table 10 shows catch by species in Division 3L (1980-2023) (all gears combined) except 1983 and during 2009-2015. Redfish and Greenland halibut were major target (TAC) species, but the catch was very small (7 tons) for Redfish in 2022. No catch was made for Redfish in 2023.

Table 10. Catch (tons) by species in Division 3L (1980-2023) (all gears combined)

CODE	CAT	COD	DGX	FIN	FLX	GHL	GRO	GSK	HAL	PLA	POK	RED	RHG	RNG	SHX	SKA	SQI	WIT	YEL
1980		938				12			1	6		26							
1981	68	2,379				60			2	29		128				18		24	
1982	60	1,707				5			5	43		159				29		6	
1983	There were operations in NAFO CA, but not in Division 3L.																		
1984	11	317		1	1	2	5		2	15		105						2	
1985		1					2		1			129							
1986		1				1				3		135							
1987			1			152	16		2			114		8	5				
1988		114				49	17		6	2		152		6	1				
1989		2				4				21		114							
1990		1				8	1			6		151		3				5	
1991		4				302	11			44		84		5				2	36
1992						1,642	17		16	21		67		3				44	
1993						1,168	48					37						1	
1994			2			516	4		2	1		82		41	1				
1995			6			691	50					47		32	16			5	
1996			35		7	1,900	25			11		74		21	9			11	
1997			3		19	1,849	15		4	7		69		40	22			4	
1998			2		34	1,927	33		3	16		98		34	13			2	
1999					92	2,376	35		5	21		141		39	28			2	
2000					72	2,511	25		3	21		107		27	24			4	
2001					244	2,666	8		33	6		109		134	24			4	
2002						2,645	82		14	78		88		92		34		38	
2003	26					2,505	27		2	71		86	2	183		64		12	
2004	5					1,413	18		5	39		61	3	119		54		7	
2005						1,237	7		5	29		52		53	17			4	
2006						1,383	5		2	15		36		43		2	2	2	
2007						1,198	2			27		29	24			8		5	
2008						1,210	15			43		29	20			9		8	
2009																			
2010																			
2011																			
2012	No operations in NAFO CA.																		
2013																			
2014																			
2015																			
2016	2					474	1		2	4		125		11				5	
2017	5	1				1,024			1	3		125		13		1		5	
2018	8	1				1,101			4			412		28				1	
2019	19	1	1			1075	1		6	1		606	88	1		10		4	
2020	22	2				1204		2	4	1		108	53					3	
2021	7	3				788		10	3			109	28			1			
2022	13					1019		9	1			7	35						
2023	9					942		7	2				28						

Note:
(1) Data source: STATLANT21A based on the official statistics provided by Fisheries Agency of Japan.
(2) Japan jointed NAFO in 1980.
(3) Majority gear is the bottom otter trawl.
(4) Blank means catch (tons) < 0.5 (including 0 catch) or no operations.

5.4 Division 3M

Table 11 shows catch by species in Division 3M (1980-2023) (all gears combined). Redfish and Greenland halibut were major target (TAC) species, but no Redfish catch was made in 2022-2023.

Table 11. Catch (tons) by species in Division 3M (1980-2023) (all gears combined)

CODE	CAT	COD	DGX	FIN	FLX	GHL	GRO	GSK	HAL	PLA	POK	PRA	RED	RHG	RNG	SHX	SKA	WIT
1980		37		16						1			976					
1981		9								47			386					
1982		10								53			392					
1983		1			3	1	2			9			390					
1984		9		3	1	10	2		1	1			389					
1985		5				13	5		1	2			313					
1986		6				35				3			400					
1987		269				33	2						131		1			
1988		5				27	2			78	1		393		1			
1989		38	2			44	25			402			885		9			4
1990		24				58	6			308			2,082		16			
1991		54				128	26		1	450			1,431		6			
1992		2				2,185	78			50			1,424		5			4
1993						1,341	75			49			967		7			2
1994						663							488		22			
1995			8			1,086	82		4				553		25	1		
1996			1			114	7						678		2	11		
1997						12							212					
1998					3	123	6						439		3	3		
1999					5	42							320		1	2		
2000					1	1						114	31					
2001					24	149			3			130	80		12	1		
2002						137	3			5		100	67		6			
2003						14	1			3		117	98	3	2			
2004	1					3				4			209		4		1	
2005	1					100	1		5				483			1		
2006	1					21			3				383				2	
2007	1	10				24			6				613					
2008		24				9			2				603					
2009																		
2010																		
2011																		
2012										No operations in NAFO CA.								
2013																		
2014																		
2015																		
2016	1					35			3				128		1			
2017	1	49							1				190				1	
2018	11	82				2			4	2			600		2		3	1
2019	7	81				29			3	3			450	3			7	2
2020	3	37				15			1				286	1			1	
2021	6	5				465		10	3				257	20			1	
2022	2					186			0					11			0	
2023	0					209			0				5	12				

Note:
(1) Data source: STATLANT21A based on the official statistics provided by Fisheries Agency of Japan.
(2) Japan jointed NAFO in 1980.
(3) Majority gear is the bottom otter trawl.
(4) Blank means catch (tons) < 0.5 (including 0 catch) or no operations.

5.5 Division 3N

Table 12 shows catch by species in Division 3M (1980-2023) (all gears combined). Fisheries were not so active comparing to other Divisions except for the high capelin catch (1987-1990) (average =1,616 tons) and the high yellowtail flounder catch (2016-2019) (834 tons). No operation was made in this Division from 2020 to 2023.

Table 12. Catch (tons) by species in Division 3N (1980-2023) (all gears combined)

CODE	CAP	CAT	COD	DGX	FIN	GHL	GRO	HAL	PLA	RED	RNG	SKA	WIT	YEL
1980														
1981						There were operations in NAFO CA, but not in Division 3N.								
1982														
1983														
1984					4					81				
1985														
1986										12				
1987	793					1				51				
1988	1,395	2	114					24	2					
1989	2,222		391	1	3	3	7		31	39	1		2	1
1990	2,054		350				2		21	4				
1991			77			2	2		5	4			13	
1992						18	1			1			1	
1993														
1994														
1995														
1996														
1997						13	1						1	
1998														
1999						2	1							
2000														
2001														
2002														
2003														
2004														
2005														
2006														
2007														
2008														
2009														
2010														
2011														
2012						No operations in NAFO CA.								
2013														
2014														
2015														
2016			38					6	145			22	7	1,355
2017			22					3	116			23	4	1,000
2018									77			12	1	634
2019			2						17			11		348
2020														
2021						There were operations in NAFO CA, but not in Division 3N.								
2022														
2023														

Note:
(1) Data source: STATLANT21A based on the official statistics provided by Fisheries Agency of Japan.
(2) Japan jointed NAFO in 1980.
(3) Majority gear is the bottom otter trawl.
(4) Blank means catch (tons) < 0.5 (including 0 catch) or no operations.

5.6 Division 3O

Table 13 shows catch by species in Division 3O (1980-2023) (all gears combined). Fisheries were not so active comparing to other Divisions except high redfish catch during 1982-1993 and 1995-1998 (average =701 tons).

Table 13. Catch (tons) by species in Division 3O (1980-2023) (all gears combined)

CODE	ANG	ARG	BET	BFT	CAT	COD	DGX	FIN	GHL	GRO	HAD	HAL	HKR	HKS	HKW	PLA	POK	RED	RNG	SHX	SKA	SQI	SWO	WIT	YEL	YFT
1980															2											
1981																						1				
1982	1	11				16		1				8		3	6	5		496						1		
1983											1				2			1								
1984	1	12				1		10		5	29	14	13	16	69	5	1	1,258				1		13		
1985	3	2								3	7	6		2	19	2		661						16		
1986		4				1		1	3	1	4	7		16	8	1		1,162	1	1				1		
1987		9	5			14				4	44	18		1	34			1,074		1		2		10		1
1988	1	12	2	2	1	50			1	5	7	9	2		101	4		1,606		2			2	21		
1989	1	4					2		5	11		14			6			1,724		2						
1990	1	3						1		5	2	5			5	2		1,406				4		2		
1991	1	1							3	1		2						226								
1992	1								2	5		1						125		1				1		
1993	2	1							3	2		1						159								
1994	There were operations in NAFO CA, but not in Division 3O.																									
1995												1			1			264								
1996						1				1		1			1			417		4		1		1		
1997									2	3		2						285		2						
1998									3	7		4						355		1						
1999																										
2000																										
2001																										
2002																										
2003																										
2004																		2								
2005																		1								
2006									1																	
2007									1							1		61			1					
2008																										
2009																										
2010																										
2011																										
2012	No operations in NAFO CA.																									
2013																										
2014																										
2015																										
2016	2					1						3			1	1		30			1			1	4	
2017												1						6								
2018																		4								
2019														1								9				
2020														1				1				19				
2021																										
2022	There were operations in NAFO CA, but not in Division 3O.																									
2023																										

Note: Data source: (1) STATLANT21A based on the official statistics provided by Fisheries Agency of Japan. (2) Japan jointed NAFO in 1980, (3) Majority gear is the bottom otter trawl and (4) Blank means catch (tons) < 0.5 (including 0 catch) or no operations.

5.7 Incidental bycatch of Greenland shark

Table 14 shows the number of incidental bycatch, mean weight, length, and fishing depth for Greenland shark during 2021-2023. Total of 49 individuals were incidentally bycaught during the 3 years. They tended to be caught in deeper areas (ca. 700-900 m). The weight ranged from 300–2,100kg. The measured or estimated length ranged from 350-608cm. The sex was unidentified.

Fig. 12 shows the locations of incidentally bycatch. The Greenland sharks were bycaught mainly in the slope of Sackville Spur.

Table 14. Number of catches, weight, total length, and fishing depth for Greenland shark during 2021-2023.

Total length for 34 individuals was estimated while the length for 15 individuals was measured.

	Division	Number caught	Estimated mean weight (range) (kg)	Total length (cm)				Mean fishing depth (range) (m)
				Estimated		Measured		
				N	mean (range)	N	mean (range)	
2021	3L	15	550 (320-700)	14	431 (350-550)	1	415	859 (493-1003)
	3M	9	1,122 (700-2100)	9	473 (420-570)	-	-	706 (374-1022)
2022	3L	13	708 (400-1000)	3	417 (400-430)	10	436 (423-470)	898 (828-996)
2023	3L	12	608 (300-1000)	8	520 (450-600)	4	428 (400-480)	864 (489-985)

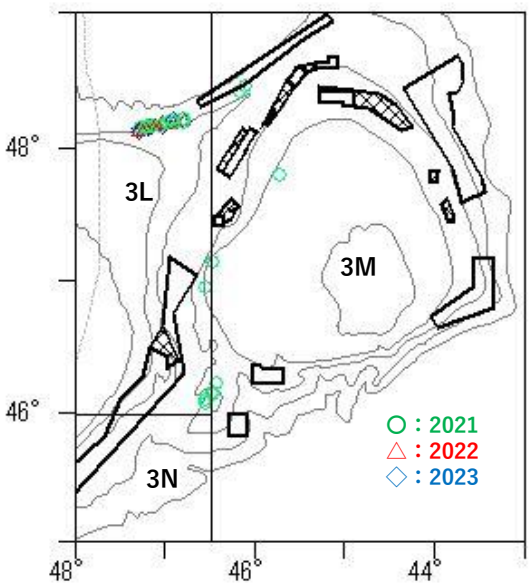


Figure. 12. Locations of incidentally bycatch of Greenland shark during 2021-2023.

5.8. Encounter of VMEs

Since 2016, a total of 22 non-significant catches (≤0.2kg) of Sea pen occurred in 2019 (21 locations) and 2021 (1 location). A total of 5 non-significant catches of Sponge occurred in 2021. The weight for one catch was ca. 14kg. The weight for the remaining 4 catches was less than 4kg (Fig. 13).

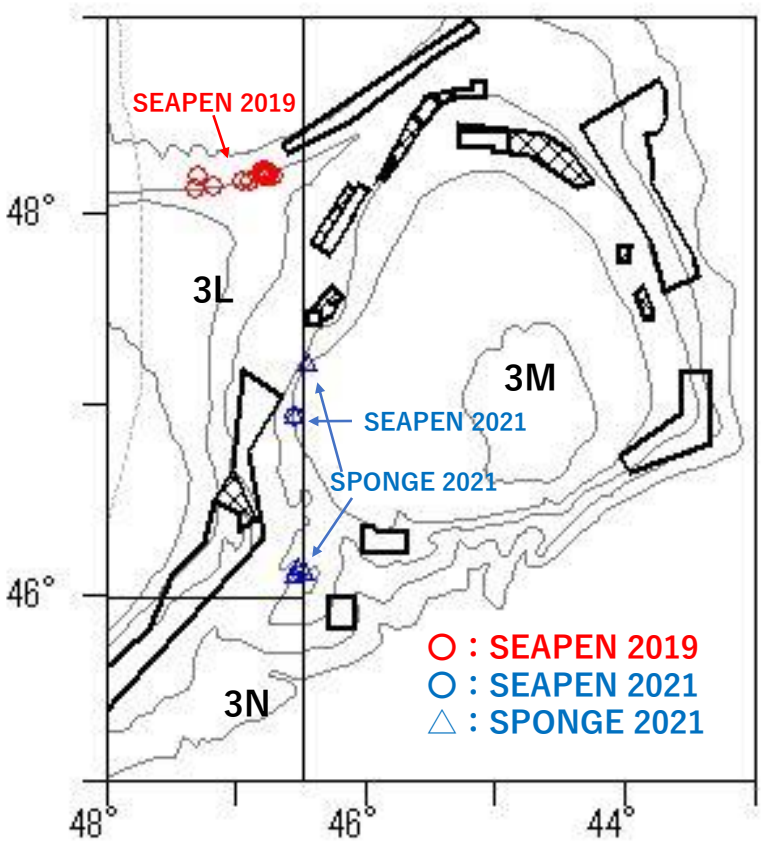


Figure 13. Locations of encounter of VMEs since 2016.

Not conduced in 2023.

B. Special Research Studies

1. Environmental Studies
    a) Hydrographic studies
    b) Plankton studies (including eggs and larvae)
    c) Benthic studies
    d) Observations on ice conditions in Subareas 0 to 4
    e) Other environmental studies
2. Biological studies by species
    Material should be presented in the order of the life cycle, reporting studies on eggs and larval stages first.
3. Gear and selectivity studies, including studies on fishing operations
4. Miscellaneous studies

6. Acknowledgements

I would like to express my sincere gratitude to Dr. D. Gonzalez-Troncoso, Scientific Council Chair, for her continuous guidance and invaluable suggestions for the arrangement of aggregated total catch length distributions. I am also grateful to NAFO Secretariat for their swift provision of the latest CESAG data.

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Annex A Frequency of total/fork length by 0.5 cm for GLH, RED and YEL

1) Aggregated total catch length distribution for SA2+3KLMNO GHL in Division 3L

TL (cm)	2016	2017	2018	2019	2020	2021	2022	2023	TL (cm)	2016	2017	2018	2019	2020	2021	2022	2023
30.0-30.5	0	0	0	0	1489	0	652	0	60.0-60.5	6075	10162	11280	7588	10349	935	4834	4550
30.5-31.0	0	0	0	871	2340	0	2372	0	60.5-61.0	2857	10485	5008	7962	4728	883	1729	937
31.0-31.5	178	0	0	0	2146	0	1228	0	61.0-61.5	1983	15918	8627	4867	7796	1763	1612	2505
31.5-32.0	0	173	0	1492	3217	0	3004	0	61.5-62.0	693	13751	4731	5276	6740	1307	3051	3977
32.0-32.5	0	1878	0	443	2253	0	0	0	62.0-62.5	3596	8821	3395	4966	4645	0	3808	2544
32.5-33.0	572	1223	0	862	5177	0	1399	0	62.5-63.0	1513	12069	6760	2953	6272	1331	1028	2618
33.0-33.5	1073	1018	1110	2366	7355	637	749	0	63.0-63.5	720	10705	1699	1939	2055	0	2915	1939
33.5-34.0	73	1432	0	560	7211	441	1890	0	63.5-64.0	571	7651	0	5839	648	0	0	1180
34.0-34.5	732	1592	0	1540	6214	0	1139	0	64.0-64.5	616	11024	5224	3801	3589	554	1200	761
34.5-35.0	429	5269	0	2776	4041	0	1419	922	64.5-65.0	193	5681	0	2489	2389	0	428	1459
35.0-35.5	470	7266	1233	4619	5066	3613	2943	1992	65.0-65.5	550	4674	1635	980	1899	730	0	0
35.5-36.0	683	6749	2999	2885	8466	3755	1037	0	65.5-66.0	0	6416	1415	3047	2167	0	761	0
36.0-36.5	4245	7514	4628	6608	6980	5085	5124	623	66.0-66.5	0	6367	1800	1916	787	0	477	0
36.5-37.0	1395	8700	1037	4949	7255	5441	4348	5475	66.5-67.0	436	3004	0	697	3439	0	0	0
37.0-37.5	2468	13008	7937	7386	11812	6299	7635	3729	67.0-67.5	255	2416	0	689	572	0	0	605
37.5-38.0	2243	13126	5663	6371	13208	7575	8096	7201	67.5-68.0	0	1814	659	1257	686	0	0	0
38.0-38.5	2927	14490	15009	7667	21809	8024	10625	7237	68.0-68.5	0	4793	0	530	3457	555	711	1160
38.5-39.0	1866	17456	12392	13979	16595	9415	7223	6645	68.5-69.0	0	928	0	1369	960	0	0	0
39.0-39.5	2543	15981	17635	13921	16072	13993	14736	16294	69.0-69.5	1200	713	0	126	837	0	0	598
39.5-40.0	4494	11294	13168	14263	18480	12155	11241	13672	69.5-70.0	0	635	1415	943	916	0	0	0
40.0-40.5	2895	16819	17072	16726	19880	19080	12981	16912	70.0-70.5	0	875	0	0	796	0	0	0
40.5-41.0	2424	23306	13170	22223	18069	18264	16869	16234	70.5-71.0	0	0	0	677	1834	800	0	394
41.0-41.5	5569	18553	22822	13567	18297	20288	11953	18566	71.0-71.5	0	0	0	187	0	0	761	0
41.5-42.0	3115	27558	23269	20766	24747	17502	19174	15003	71.5-72.0	0	0	0	187	0	0	0	0
42.0-42.5	8128	25458	28793	26165	19903	18805	17969	22184	72.0-72.5	0	0	0	0	518	0	0	0
42.5-43.0	6741	27490	27160	23140	18207	25320	25621	22294	72.5-73.0	0	0	0	0	976	0	0	0
43.0-43.5	10886	28179	37301	23104	28826	16743	34223	19630	73.0-73.5	0	0	0	0	0	0	0	0
43.5-44.0	6600	30791	43234	27299	28602	26379	25234	21630	73.5-74.0	0	0	0	0	0	0	0	0
44.0-44.5	6925	32932	24476	29369	24448	26460	33599	23510	74.0-74.5	0	0	0	0	0	0	0	0
44.5-45.0	3341	32218	42168	36516	27909	26981	44254	33795	74.5-75.0	0	0	0	0	568	0	0	0
45.0-45.5	14736	32709	42528	36059	31516	28320	30105	28515	75.0-75.5	0	0	0	0	0	0	0	0
45.5-46.0	2814	32817	48357	38726	27314	25939	34663	26797	75.5-76.0	0	0	0	0	568	0	0	0
46.0-46.5	17469	34671	36658	34077	24108	27937	37412	42896	76.0-76.5	0	0	0	0	0	0	0	0
46.5-47.0	6278	26079	53262	36113	32475	24070	35405	36586	76.5-77.0	0	0	0	0	0	0	0	0
47.0-47.5	18205	38779	48125	39360	25673	17863	35817	28312	77.0-77.5	0	0	0	0	1413	0	0	0
47.5-48.0	8751	28990	44649	38097	27182	21897	39851	33448	77.5-78.0	0	0	0	209	0	0	0	0
48.0-48.5	20953	41470	34712	29586	22985	21002	47646	29707	78.0-78.5	0	0	0	0	0	0	0	0
48.5-49.0	7887	31970	43848	27755	30097	19271	42521	36460	78.5-79.0	0	0	0	0	0	0	0	0
49.0-49.5	24016	33526	25167	32003	30172	24817	35195	34695	79.0-79.5	0	0	0	0	0	0	0	0
49.5-50.0	10550	27784	38736	32536	24246	24342	31313	40096	79.5-80.0	0	0	0	0	0	0	0	0
50.0-50.5	22744	20760	32232	26387	19105	10207	17825	24769	80.0-80.5	0	0	0	0	0	0	0	0
50.5-51.0	11596	31443	31328	27600	25788	12404	27860	25780	80.5-81.0	0	0	0	447	0	0	0	0
51.0-51.5	21854	28091	27673	19543	17992	16731	24868	26427	81.0-81.5	0	0	0	0	0	0	0	0
51.5-52.0	8390	32985	25997	24313	18302	19169	24227	19734	81.5-82.0	0	0	0	0	286	0	0	0
52.0-52.5	21321	30002	25683	24686	20057	9332	23649	17634	82.0-82.5	0	0	0	0	0	0	0	0
52.5-53.0	16323	27363	22285	23646	25060	10142	16535	21307	82.5-83.0	0	0	0	0	0	0	0	0
53.0-53.5	17354	27460	17478	17533	22721	8635	20975	20185	83.0-83.5	0	0	0	0	0	0	0	0
53.5-54.0	12136	27846	26698	23208	12393	9814	12713	14534	83.5-84.0	0	0	0	0	0	0	0	0
54.0-54.5	12350	26053	27087	17121	20110	7821	13896	16695	84.0-84.5	0	0	0	0	0	0	0	0
54.5-55.0	10207	21914	21862	19877	16214	6987	12035	9892	84.5-85.0	0	0	0	0	0	0	0	0
55.0-55.5	16519	27168	18974	15400	13958	5124	8284	11271	85.0-85.5	0	0	0	0	0	0	0	0
55.5-56.0	5664	23501	25753	14413	17753	2624	8800	6244	85.5-86.0	0	0	0	0	0	0	0	0
56.0-56.5	16846	21312	15867	14102	17502	2254	8990	13848	86.0-86.5	0	0	0	0	0	0	0	0
56.5-57.0	4236	20180	21201	10149	11889	3395	6125	9466	86.5-87.0	0	0	0	0	0	0	0	0
57.0-57.5	12858	17026	16206	9792	11740	3963	3945	4033	87.0-87.5	0	0	0	0	0	0	0	0
57.5-58.0	4976	17371	18129	13371	10710	5098	3394	6963	87.5-88.0	0	0	0	0	0	0	0	0
58.0-58.5	10222	16210	14279	9702	11281	1941	4645	5654	88.0-88.5	0	0	0	0	0	0	0	0
58.5-59.0	4470	24698	9347	8465	8383	3427	4046	5448	88.5-89.0	0	0	0	0	0	0	0	0
59.0-59.5	5724	12872	10301	5824	10617	1179	4991	5778	89.0-89.5	0	0	0	0	0	0	0	0
59.5-60.0	3197	14127	9418	8138	9636	2862	2650	5553	89.5-90.0	0	0	0	0	0	0	0	0

2) Aggregated total catch length distribution for SA2+3KLMNO GHL in Division 3M

TL (cm)	2016	2017	2018	2019	2020	2021	2022	2023	TL (cm)	2016	2017	2018	2019	2020	2021	2022	2023
30.0-30.5	0	0	0	0	0	0	0	0	60.0-60.5	660	10162	0	583	457	5674	663	3149
30.5-31.0	0	0	0	0	0	0	0	0	60.5-61.0	119	10485	0	0	229	5186	2439	272
31.0-31.5	0	0	0	0	0	0	0	0	61.0-61.5	551	15918	0	583	0	6332	4789	449
31.5-32.0	0	173	0	0	0	0	0	0	61.5-62.0	119	13751	0	0	0	2927	1934	1594
32.0-32.5	0	1878	0	583	0	0	0	0	62.0-62.5	695	8821	0	0	0	2969	1110	872
32.5-33.0	0	1223	0	0	0	0	0	0	62.5-63.0	192	12069	0	0	0	2020	1167	693
33.0-33.5	395	1018	0	0	0	0	0	0	63.0-63.5	587	10705	0	0	0	3407	5268	421
33.5-34.0	0	1432	0	0	0	0	0	0	63.5-64.0	119	7651	0	583	0	888	0	931
34.0-34.5	0	1592	0	0	229	0	0	0	64.0-64.5	0	11024	0	0	229	1343	1777	1712
34.5-35.0	0	5269	0	0	0	0	0	0	64.5-65.0	119	5681	0	0	0	918	1167	821
35.0-35.5	0	7266	0	0	0	0	0	0	65.0-65.5	0	4674	0	1165	0	3481	1246	1841
35.5-36.0	0	6749	0	0	0	192	0	0	65.5-66.0	0	6416	0	583	0	1009	0	1447
36.0-36.5	311	7514	0	0	0	245	0	0	66.0-66.5	0	6367	0	0	0	1496	1830	2126
36.5-37.0	192	8700	0	0	0	0	0	0	66.5-67.0	0	3004	0	0	0	1293	663	421
37.0-37.5	0	13008	0	0	229	300	609	0	67.0-67.5	0	2416	0	583	0	707	526	564
37.5-38.0	0	13126	0	0	0	1116	0	421	67.5-68.0	0	1814	0	0	0	0	609	272
38.0-38.5	0	14490	0	583	0	704	0	391	68.0-68.5	0	4793	0	0	229	623	584	545
38.5-39.0	311	17456	0	583	0	0	0	1113	68.5-69.0	0	928	0	0	0	302	0	481
39.0-39.5	119	15981	0	1165	229	304	0	391	69.0-69.5	276	713	0	0	0	809	0	272
39.5-40.0	192	11294	0	0	229	1815	1272	1451	69.5-70.0	0	635	0	0	0	192	584	754
40.0-40.5	192	16819	0	583	0	1004	3070	481	70.0-70.5	0	875	0	0	229	0	0	0
40.5-41.0	119	23306	0	1748	0	1603	1715	1142	70.5-71.0	0	0	0	0	0	0	0	0
41.0-41.5	395	18553	0	0	0	3666	663	1330	71.0-71.5	0	0	0	0	0	0	0	481
41.5-42.0	0	27558	0	1165	229	4422	526	1801	71.5-72.0	0	0	0	0	0	744	584	481
42.0-42.5	623	25458	0	583	229	2782	1246	2757	72.0-72.5	0	0	0	0	0	0	0	0
42.5-43.0	514	27490	0	583	686	5183	1719	3319	72.5-73.0	0	0	0	0	0	0	0	391
43.0-43.5	1222	28179	0	583	0	3238	1851	2257	73.0-73.5	0	0	0	0	0	0	0	0
43.5-44.0	1845	30791	0	1165	0	2839	609	3099	73.5-74.0	0	0	0	0	0	0	0	0
44.0-44.5	1138	32932	0	0	0	5872	2850	1632	74.0-74.5	0	0	0	0	0	0	584	0
44.5-45.0	0	32218	0	0	0	8461	1662	1648	74.5-75.0	0	0	0	0	0	404	0	0
45.0-45.5	0	32709	0	583	229	3649	1189	4401	75.0-75.5	0	0	0	0	0	339	0	272
45.5-46.0	0	32817	0	0	686	2117	1745	1841	75.5-76.0	0	0	0	0	0	339	584	0
46.0-46.5	1366	34671	0	1165	457	4349	4096	4600	76.0-76.5	0	0	0	0	0	0	0	481
46.5-47.0	192	26079	0	1165	686	7929	1855	4556	76.5-77.0	0	0	0	0	0	0	0	0
47.0-47.5	119	38779	0	0	457	5426	1110	4192	77.0-77.5	0	0	0	0	0	0	584	0
47.5-48.0	119	28990	0	1748	229	5475	2461	5591	77.5-78.0	0	0	0	0	0	0	584	0
48.0-48.5	358	41470	0	583	457	6321	2411	3186	78.0-78.5	0	0	0	0	0	0	0	0
48.5-49.0	0	31970	0	583	0	6880	4180	2126	78.5-79.0	0	0	0	0	0	0	0	0
49.0-49.5	1019	33526	0	0	457	5423	2987	5178	79.0-79.5	0	0	0	0	0	0	0	0
49.5-50.0	468	27784	0	0	457	5195	4263	5694	79.5-80.0	0	0	0	0	0	0	0	0
50.0-50.5	358	20760	0	583	229	5250	4595	3762	80.0-80.5	0	0	0	0	0	0	0	0
50.5-51.0	395	31443	0	1165	229	5445	663	6447	80.5-81.0	0	0	0	0	0	0	0	0
51.0-51.5	503	28091	0	0	229	7702	2377	6726	81.0-81.5	0	0	0	0	0	0	0	0
51.5-52.0	276	32985	0	0	229	7429	2324	3690	81.5-82.0	0	0	0	0	0	0	0	0
52.0-52.5	551	30002	0	0	914	6840	3513	4122	82.0-82.5	0	0	0	0	0	0	0	0
52.5-53.0	706	27363	0	0	0	6338	1193	1896	82.5-83.0	0	0	0	0	0	0	0	0
53.0-53.5	1642	27460	0	1165	229	6576	1052	5387	83.0-83.5	0	0	0	0	0	0	0	0
53.5-54.0	779	27846	0	583	457	5045	2328	5121	83.5-84.0	0	0	0	0	0	0	0	0
54.0-54.5	935	26053	0	0	0	6119	4373	5254	84.0-84.5	0	0	0	0	0	0	0	0
54.5-55.0	587	21914	0	0	0	6882	2490	2292	84.5-85.0	0	0	0	0	0	0	0	0
55.0-55.5	1247	27168	0	0	0	5260	3070	1289	85.0-85.5	0	0	0	0	0	0	0	0
55.5-56.0	0	23501	0	0	0	6838	2377	870	85.5-86.0	0	0	0	0	0	0	0	0
56.0-56.5	1677	21312	0	1165	229	5896	584	3013	86.0-86.5	0	0	0	0	0	0	0	0
56.5-57.0	743	20180	0	1748	229	4178	2298	2067	86.5-87.0	0	0	0	0	0	0	0	0
57.0-57.5	660	17026	0	583	0	7850	4164	2051	87.0-87.5	0	0	0	0	0	0	0	0
57.5-58.0	1174	17371	0	583	0	5419	2465	3721	87.5-88.0	0	0	0	0	0	0	0	0
58.0-58.5	634	16210	0	0	229	4524	1802	2851	88.0-88.5	0	0	0	0	0	0	0	0
58.5-59.0	852	24698	0	1165	0	5180	1052	3204	88.5-89.0	0	0	0	0	0	0	0	0
59.0-59.5	863	12872	0	0	0	3742	584	3526	89.0-89.5	0	0	0	0	0	0	0	0
59.5-60.0	119	14127	0	1165	686	5940	2413	2724	89.5-90.0	0	0	0	0	0	0	0	0

3) Aggregated total catch length distribution for SA 2+3KLMNO GHL in Divisions 3L+3M

TL (cm)	2016	2017	2018	2019	2020	2021	2022	2023	TL (cm)	2016	2017	2018	2019	2020	2021	2022	2023
30.0-30.5	0	0	0	0	1489	0	652	0	60.0-60.5	6735	10162	11793	8171	10806	6609	5496	7699
30.5-31.0	0	0	0	871	2340	0	2372	0	60.5-61.0	2977	10485	4116	7962	4956	6069	4168	1209
31.0-31.5	178	0	0	0	2146	0	1228	0	61.0-61.5	2535	15918	9019	5450	7796	8095	6401	2954
31.5-32.0	0	173	0	1492	3217	0	3004	0	61.5-62.0	812	13751	4946	5276	6740	4234	4986	5571
32.0-32.5	0	1878	0	1025	2253	0	0	0	62.0-62.5	4292	8821	3549	4966	4645	2969	4918	3416
32.5-33.0	572	1223	0	862	5177	0	1399	0	62.5-63.0	1705	12069	7067	2953	6272	3351	2195	3311
33.0-33.5	1468	1018	41	2366	7355	637	749	0	63.0-63.5	1306	10705	1777	1939	2055	3407	8182	2360
33.5-34.0	73	1432	0	560	7211	441	1890	0	63.5-64.0	691	7651	0	6421	648	888	0	2111
34.0-34.5	732	1592	0	1540	6443	0	1139	0	64.0-64.5	616	11024	5461	3801	3817	1897	2977	2472
34.5-35.0	429	5269	0	2776	4041	0	1419	922	64.5-65.0	313	5681	0	2489	2389	918	1595	2280
35.0-35.5	470	7266	1289	4619	5066	3613	2943	1992	65.0-65.5	550	4674	1710	2145	1899	4210	1246	1841
35.5-36.0	683	6749	3135	2885	8466	3947	1037	0	65.5-66.0	0	6416	1480	3629	2167	1009	761	1447
36.0-36.5	4556	7514	4839	6608	6980	5329	5124	623	66.0-66.5	0	6367	1882	1916	787	1496	2307	2126
36.5-37.0	1587	8700	1084	4949	7255	5441	4348	5475	66.5-67.0	436	3004	0	697	3439	1293	663	421
37.0-37.5	2468	13008	8298	7386	12040	6599	8244	3729	67.0-67.5	255	2416	0	1271	572	707	526	1169
37.5-38.0	2243	13126	4801	6371	13208	8691	8096	7622	67.5-68.0	0	1814	689	1257	686	0	609	272
38.0-38.5	2927	14490	15692	8250	21809	8728	10625	7627	68.0-68.5	0	4793	0	530	3685	1178	1294	1705
38.5-39.0	2178	17456	11836	14561	16595	9415	7223	7758	68.5-69.0	0	928	0	1369	960	302	0	481
39.0-39.5	2663	15981	17316	15086	16301	14296	14736	16684	69.0-69.5	1476	713	0	126	837	809	0	871
39.5-40.0	4686	11294	11527	14263	18708	13970	12513	15123	69.5-70.0	0	635	1480	943	916	192	584	754
40.0-40.5	3087	16819	17849	17309	19880	20084	16051	17393	70.0-70.5	0	875	0	0	1025	0	0	0
40.5-41.0	2544	23306	13769	23971	18069	19867	18584	17376	70.5-71.0	0	0	0	677	1834	800	0	394
41.0-41.5	5964	18553	21620	13567	18297	23954	12616	19896	71.0-71.5	0	0	0	187	0	0	761	481
41.5-42.0	3115	27558	23207	21931	24975	21924	19700	16804	71.5-72.0	0	0	0	187	0	744	584	481
42.0-42.5	8750	25458	28982	26747	20131	21586	19215	24941	72.0-72.5	0	0	0	0	518	0	0	0
42.5-43.0	7255	27490	26155	23723	18892	30503	27340	25613	72.5-73.0	0	0	0	0	976	0	0	391
43.0-43.5	12108	28179	37877	23687	28826	19981	36074	21887	73.0-73.5	0	0	0	0	0	0	0	0
43.5-44.0	8444	30791	45200	28464	28602	29218	25843	24729	73.5-74.0	0	0	0	0	0	0	0	0
44.0-44.5	8063	32932	24469	29369	24448	32333	36450	25142	74.0-74.5	0	0	0	0	0	0	584	0
44.5-45.0	3341	32218	41845	36516	27909	35442	45915	35443	74.5-75.0	0	0	0	0	568	404	0	0
45.0-45.5	14736	32709	38862	36641	31744	31969	31294	32917	75.0-75.5	0	0	0	0	0	339	0	272
45.5-46.0	2814	32817	49435	38726	27999	28055	36407	28639	75.5-76.0	0	0	0	0	568	339	584	0
46.0-46.5	18835	34671	38325	35242	24565	32286	41508	47495	76.0-76.5	0	0	0	0	0	0	0	481
46.5-47.0	6470	26079	53444	37279	33161	31998	37260	41142	76.5-77.0	0	0	0	0	0	0	0	0
47.0-47.5	18324	38779	46954	39360	26130	23289	36926	32504	77.0-77.5	0	0	0	0	1413	0	584	0
47.5-48.0	8871	28990	46679	39844	27411	27372	42312	39038	77.5-78.0	0	0	0	209	0	0	584	0
48.0-48.5	21311	41470	35170	30169	23443	27323	50058	32893	78.0-78.5	0	0	0	0	0	0	0	0
48.5-49.0	7887	31970	43602	28338	30097	26151	46700	38585	78.5-79.0	0	0	0	0	0	0	0	0
49.0-49.5	25035	33526	24071	32003	30629	30240	38182	39873	79.0-79.5	0	0	0	0	0	0	0	0
49.5-50.0	11018	27784	37137	32536	24704	29537	35576	45790	79.5-80.0	0	0	0	0	0	0	0	0
50.0-50.5	23102	20760	31457	26969	19334	15457	22420	28531	80.0-80.5	0	0	0	0	0	0	0	0
50.5-51.0	11991	31443	31632	28765	26017	17849	28522	32227	80.5-81.0	0	0	0	447	0	0	0	0
51.0-51.5	22357	28091	27812	19543	18220	24433	27245	33153	81.0-81.5	0	0	0	0	0	0	0	0
51.5-52.0	8666	32985	24939	24313	18530	26598	26551	23424	81.5-82.0	0	0	0	0	286	0	0	0
52.0-52.5	21872	30002	25731	24686	20972	16172	27162	21756	82.0-82.5	0	0	0	0	0	0	0	0
52.5-53.0	17030	27363	23298	23646	25060	16480	17728	23203	82.5-83.0	0	0	0	0	0	0	0	0
53.0-53.5	18995	27460	17153	18698	22950	15212	22028	25572	83.0-83.5	0	0	0	0	0	0	0	0
53.5-54.0	12915	27846	27912	23791	12850	14860	15041	19655	83.5-84.0	0	0	0	0	0	0	0	0
54.0-54.5	13285	26053	27199	17121	20110	13940	18269	21949	84.0-84.5	0	0	0	0	0	0	0	0
54.5-55.0	10794	21914	21736	19877	16214	13869	14525	12185	84.5-85.0	0	0	0	0	0	0	0	0
55.0-55.5	17766	27168	19837	15400	13958	10385	11354	12560	85.0-85.5	0	0	0	0	0	0	0	0
55.5-56.0	5664	23501	26924	14413	17753	9462	11177	7114	85.5-86.0	0	0	0	0	0	0	0	0
56.0-56.5	18523	21312	16588	15267	17731	8149	9574	16861	86.0-86.5	0	0	0	0	0	0	0	0
56.5-57.0	4980	20180	21045	11896	12117	7572	8423	11533	86.5-87.0	0	0	0	0	0	0	0	0
57.0-57.5	13518	17026	16943	10374	11740	11813	8109	6084	87.0-87.5	0	0	0	0	0	0	0	0
57.5-58.0	6150	17371	16713	13953	10710	10517	5859	10684	87.5-88.0	0	0	0	0	0	0	0	0
58.0-58.5	10855	16210	14928	9702	11510	6465	6448	8505	88.0-88.5	0	0	0	0	0	0	0	0
58.5-59.0	5322	24698	9772	9630	8383	8607	5098	8653	88.5-89.0	0	0	0	0	0	0	0	0
59.0-59.5	6587	12872	9649	5824	10617	4921	5575	9304	89.0-89.5	0	0	0	0	0	0	0	0
59.5-60.0	3316	14127	9846	9303	10322	8802	5063	8277	89.5-90.0	0	0	0	0	0	0	0	0

4) Aggregated total catch length distribution for 3LN RED in Division 3L

FL (cm)	2016	2017	2018	2019	2020	2021	2022
10.0-10.5	0	0	0	0	0	0	0
10.5-11.0	0	0	0	0	0	0	0
11.0-11.5	0	0	0	0	0	0	0
11.5-12.0	0	0	0	0	0	0	0
12.0-12.5	0	0	0	0	0	0	0
12.5-13.0	0	0	0	0	0	0	0
13.0-13.5	0	0	0	0	0	0	0
13.5-14.0	0	0	0	797	0	0	0
14.0-14.5	0	0	0	0	0	0	0
14.5-15.0	0	0	0	0	0	0	0
15.0-15.5	0	0	0	0	0	0	0
15.5-16.0	0	0	0	0	0	0	0
16.0-16.5	0	0	0	0	0	0	0
16.5-17.0	0	0	0	0	0	0	0
17.0-17.5	0	0	0	0	0	0	0
17.5-18.0	0	0	0	0	0	0	0
18.0-18.5	0	0	0	0	0	0	0
18.5-19.0	0	0	0	428	0	0	0
19.0-19.5	0	0	0	0	0	0	0
19.5-20.0	0	0	0	0	0	277	0
20.0-20.5	0	0	0	703	0	0	0
20.5-21.0	1067	0	0	0	0	0	0
21.0-21.5	0	0	0	417	0	0	0
21.5-22.0	0	1004	1492	369	0	0	0
22.0-22.5	3235	4805	1729	797	0	277	0
22.5-23.0	4320	6666	3349	2826	0	0	0
23.0-23.5	4871	8403	4880	5427	367	0	0
23.5-24.0	6520	7077	8475	8779	367	0	0
24.0-24.5	8658	21111	12052	24023	367	0	0
24.5-25.0	7086	19702	8909	31271	476	0	0
25.0-25.5	9751	22869	15875	33280	1854	0	0
25.5-26.0	12466	20021	11841	37201	660	0	0
26.0-26.5	10879	25719	14604	35073	1404	277	0
26.5-27.0	9792	28011	22787	52735	559	0	0
27.0-27.5	7076	34865	31454	62528	753	0	135
27.5-28.0	6750	20313	21587	63559	942	0	0
28.0-28.5	5318	25634	24205	68445	3088	277	0
28.5-29.0	13995	20812	29578	85324	2144	490	269
29.0-29.5	10518	9861	27874	72244	2798	277	0
29.5-30.0	12829	15928	33036	76645	2343	672	673
30.0-30.5	6957	15770	33943	70542	5416	368	808
30.5-31.0	10518	10899	37571	75919	6502	1071	942
31.0-31.5	10804	9840	44755	74807	6814	1892	942
31.5-32.0	13471	8009	60855	75023	6816	3357	1481
32.0-32.5	13412	11910	48583	66699	9558	4474	538
32.5-33.0	12311	5885	51932	80695	10590	5962	808
33.0-33.5	12581	6529	64375	74139	8687	7049	942
33.5-34.0	11212	3885	49127	64056	11813	9233	1077
34.0-34.5	13158	2396	49065	53784	9450	11141	673
34.5-35.0	7824	739	39464	47176	7213	14020	1077
35.0-35.5	8967	689	45991	32796	8524	14676	942
35.5-36.0	6667	1170	42060	24609	4197	13870	942
36.0-36.5	4680	1312	23096	12978	7519	13067	269
36.5-37.0	5440	517	16351	12887	5414	15073	269
37.0-37.5	2948	914	22505	4894	1788	13119	269
37.5-38.0	3195	517	12621	4889	1535	10851	269
38.0-38.5	3503	1365	10733	3621	1049	9902	0
38.5-39.0	2647	517	11112	3212	3648	7403	135
39.0-39.5	1290	0	8694	2707	573	7774	0
39.5-40.0	1601	0	8511	2309	2615	4363	0
40.0-40.5	1496	172	10780	2339	1123	4283	0
40.5-41.0	568	0	1541	1204	2139	3125	0
41.0-41.5	0	345	2378	764	4777	3637	0
41.5-42.0	0	172	1644	1031	2960	1480	0
42.0-42.5	14	0	806	428	1599	1197	0
42.5-43.0	374	0	806	428	2521	498	0
43.0-43.5	0	0	806	0	2315	521	0
43.5-44.0	0	0	0	0	1405	1089	0
44.0-44.5	0	225	0	0	2885	461	0
44.5-45.0	0	0	0	0	194	404	0
45.0-45.5	0	0	0	0	1199	241	0
45.5-46.0	0	0	0	0	2045	121	0
46.0-46.5	0	0	0	0	756	0	0
46.5-47.0	0	0	0	0	659	0	0
47.0-47.5	0	0	0	0	1221	158	0
47.5-48.0	0	0	0	0	562	0	0
48.0-48.5	0	0	0	0	659	0	0
48.5-49.0	0	0	0	0	464	0	0
49.0-49.5	0	0	0	0	929	0	0
49.5-50.0	0	0	0	0	194	0	0
50.0-50.5	0	0	0	0	0	0	0
50.5-51.0	0	0	0	0	0	121	0
51.0-51.5	0	0	0	0	0	0	0
51.5-52.0	0	0	0	0	0	0	0
52.0-52.5	0	0	0	0	0	0	0
52.5-53.0	0	0	0	0	0	0	0
53.0-53.5	0	0	0	0	0	0	0
53.5-54.0	0	0	0	0	0	0	0
54.0-54.5	0	0	0	0	0	0	0
54.5-55.0	0	0	0	0	0	0	0

5) Aggregated total catch length distribution for 3O RED

FL (cm)	2016	2017	FL (cm)	2016	2017
10.0-10.5	0	0	35.0-35.5	0	0
10.5-11.0	0	0	35.5-36.0	0	0
11.0-11.5	0	0	36.0-36.5	0	0
11.5-12.0	0	0	36.5-37.0	0	0
12.0-12.5	0	0	37.0-37.5	0	0
12.5-13.0	0	0	37.5-38.0	0	0
13.0-13.5	0	0	38.0-38.5	0	0
13.5-14.0	0	0	38.5-39.0	0	0
14.0-14.5	0	0	39.0-39.5	0	0
14.5-15.0	0	0	39.5-40.0	0	0
15.0-15.5	0	0	40.0-40.5	0	0
15.5-16.0	0	0	40.5-41.0	0	0
16.0-16.5	0	0	41.0-41.5	0	0
16.5-17.0	0	0	41.5-42.0	0	0
17.0-17.5	0	0	42.0-42.5	0	0
17.5-18.0	0	0	42.5-43.0	0	0
18.0-18.5	23	0	43.0-43.5	0	0
18.5-19.0	68	233	43.5-44.0	0	0
19.0-19.5	194	0	44.0-44.5	0	0
19.5-20.0	682	294	44.5-45.0	0	0
20.0-20.5	910	0	45.0-45.5	0	0
20.5-21.0	2583	122	45.5-46.0	0	0
21.0-21.5	4390	2994	46.0-46.5	0	0
21.5-22.0	6424	3633	46.5-47.0	0	0
22.0-22.5	8455	3939	47.0-47.5	0	0
22.5-23.0	11279	3117	47.5-48.0	0	0
23.0-23.5	12619	3362	48.0-48.5	0	0
23.5-24.0	13639	2539	48.5-49.0	0	0
24.0-24.5	12097	3350	49.0-49.5	0	0
24.5-25.0	12639	1706	49.5-50.0	0	0
25.0-25.5	10549	1484	50.0-50.5	0	0
25.5-26.0	11011	1190	50.5-51.0	0	0
26.0-26.5	10448	1067	51.0-51.5	0	0
26.5-27.0	7259	61	51.5-52.0	0	0
27.0-27.5	7814	122	52.0-52.5	0	0
27.5-28.0	6607	0	52.5-53.0	0	0
28.0-28.5	5993	0	53.0-53.5	0	0
28.5-29.0	4568	233	53.5-54.0	0	0
29.0-29.5	4303	0	54.0-54.5	0	0
29.5-30.0	3478	0	54.5-55.0	0	0
30.0-30.5	1134	0			
30.5-31.0	898	0			
31.0-31.5	125	0			
31.5-32.0	177	0			
32.0-32.5	0	0			
32.5-33.0	4	0			
33.0-33.5	41	0			
33.5-34.0	0	0			
34.0-34.5	0	0			
34.5-35.0	0	0			

6) Aggregated total catch length distribution for 3M RED (note there is no sample in 2022)

FL (cm)	2016	2017	2018	2019	2020	2021	2023
10.0-10.5	0	0	0	0	0	0	0
10.5-11.0	0	0	0	0	0	0	0
11.0-11.5	0	0	0	0	0	0	0
11.5-12.0	0	0	0	0	0	0	0
12.0-12.5	0	0	0	0	0	0	0
12.5-13.0	0	0	0	0	0	0	0
13.0-13.5	0	0	0	0	0	0	0
13.5-14.0	0	0	0	0	0	0	0
14.0-14.5	0	0	0	0	0	0	0
14.5-15.0	0	0	0	0	0	0	0
15.0-15.5	0	0	0	0	0	0	0
15.5-16.0	0	0	0	189	0	0	0
16.0-16.5	0	0	0	0	0	0	0
16.5-17.0	0	0	0	95	0	0	0
17.0-17.5	0	0	0	95	0	0	0
17.5-18.0	0	0	0	0	0	0	0
18.0-18.5	0	0	0	95	0	0	0
18.5-19.0	0	0	0	177	0	0	0
19.0-19.5	0	0	0	382	0	0	0
19.5-20.0	0	0	0	0	0	0	0
20.0-20.5	0	0	0	0	0	0	0
20.5-21.0	0	0	0	0	0	0	0
21.0-21.5	0	0	0	177	0	0	0
21.5-22.0	0	0	0	0	0	0	0
22.0-22.5	0	0	0	173	513	0	0
22.5-23.0	310	0	0	864	138	0	0
23.0-23.5	0	0	0	0	0	0	83
23.5-24.0	310	1144	0	1288	119	0	19
24.0-24.5	0	2888	1102	909	237	0	38
24.5-25.0	620	4031	1677	777	1162	0	57
25.0-25.5	725	3098	3513	2602	1550	0	115
25.5-26.0	1313	4241	5303	6327	2484	0	115
26.0-26.5	2121	4631	4749	5130	4903	0	115
26.5-27.0	699	4631	6757	4756	6491	0	38
27.0-27.5	1279	9263	15510	9365	3307	0	96
27.5-28.0	2243	12904	10171	13333	5388	0	57
28.0-28.5	3429	18709	17931	14903	10162	417	121
28.5-29.0	4954	12094	28339	26857	10941	1910	102
29.0-29.5	3317	22710	39125	34991	16310	1857	210
29.5-30.0	4885	24274	27645	53437	10432	1513	77
30.0-30.5	6339	34531	40401	61304	16893	2319	121
30.5-31.0	10715	28099	52549	55018	21664	2638	185
31.0-31.5	11760	24638	76895	64076	19285	3797	166
31.5-32.0	15493	23188	77029	62593	22042	5810	204
32.0-32.5	17757	25268	89539	60719	15211	6850	484
32.5-33.0	17902	23765	101332	61825	22094	6540	879
33.0-33.5	20065	21990	101605	62613	21256	9495	376
33.5-34.0	20694	22801	106767	46579	19693	15001	433
34.0-34.5	17498	17566	98038	41676	13058	12973	503
34.5-35.0	17092	16212	79947	31136	14950	15418	376

FL (cm)	2016	2017	2018	2019	2020	2021	2023
35.0-35.5	13372	21294	62064	30635	13339	22377	459
35.5-36.0	11041	7129	43418	16300	12472	24945	484
36.0-36.5	8920	9626	48278	12712	13765	23146	376
36.5-37.0	7587	3851	31312	10746	11292	27715	185
37.0-37.5	6813	2287	16901	6808	7486	22345	312
37.5-38.0	5743	7492	16804	4993	9191	29039	440
38.0-38.5	3384	4995	17481	5698	5554	23874	166
38.5-39.0	3221	0	16678	6996	7695	18131	255
39.0-39.5	4988	3641	13899	8043	7707	18517	127
39.5-40.0	2258	0	9961	4687	13383	14018	191
40.0-40.5	1565	1144	11271	6135	13236	9776	127
40.5-41.0	1974	0	7085	5938	6957	7989	0
41.0-41.5	712	0	8930	2606	8629	5253	64
41.5-42.0	667	0	4860	4469	7126	8014	64
42.0-42.5	1520	0	5710	4042	3991	4639	64
42.5-43.0	0	0	4408	3723	7012	5130	0
43.0-43.5	0	0	3529	1817	4077	4023	0
43.5-44.0	0	0	1750	1119	2778	5318	0
44.0-44.5	530	0	1735	1866	3575	3301	0
44.5-45.0	0	0	0	2223	865	1823	0
45.0-45.5	0	0	0	1689	6491	1249	0
45.5-46.0	0	0	718	1539	2281	1996	0
46.0-46.5	0	0	0	2419	1873	417	0
46.5-47.0	0	0	0	1649	1459	1451	0
47.0-47.5	0	0	0	1618	3350	900	0
47.5-48.0	0	0	0	1874	2015	512	0
48.0-48.5	0	0	0	972	2466	1031	0
48.5-49.0	0	0	0	823	2485	1073	0
49.0-49.5	0	0	0	691	1026	962	0
49.5-50.0	0	0	0	0	1440	274	0
50.0-50.5	0	0	0	357	1088	647	0
50.5-51.0	0	0	0	177	0	1027	0
51.0-51.5	0	0	0	353	513	382	0
51.5-52.0	0	0	0	279	513	752	0
52.0-52.5	0	0	0	177	1026	272	0
52.5-53.0	0	0	0	0	309	544	0
53.0-53.5	0	0	0	0	0	0	0
53.5-54.0	0	0	0	0	0	586	0
54.0-54.5	0	0	0	0	0	478	0
54.5-55.0	0	0	0	0	0	104	0
55.0-55.5	0	0	0	0	0	0	0
55.5-56.5	0	0	0	0	0	0	0
56.0-56.5	0	0	0	0	0	0	0
56.5-57.0	0	0	0	0	0	117	0
57.0-57.5	0	0	0	0	0	274	0
57.5-58.0	0	0	0	0	0	0	0
58.0-58.5	0	0	0	0	0	0	0
58.5-59.0	0	0	0	0	0	0	0
59.0-59.5	0	0	0	0	0	0	0
59.5-60.0	0	0	0	0	0	0	0
60.0-60.5	0	0	0	0	0	0	0
60.5-61.0	0	0	0	0	0	274	0
61.0-61.5	0	0	0	0	0	0	0
61.5-62.0	0	0	0	0	0	0	0

7) Aggregated total catch length distribution for 3LNO YEL in Division 3N

TL (cm)	2016	2017	2018	2019	TL (cm)	2016	2017	2018	2019
20.0-20.5	0	0	0	0	40.0-40.5	45954	37365	19006	14408
20.5-21.0	0	0	0	0	40.5-41.0	36150	26392	12278	15327
21.0-21.5	0	0	0	1155	41.0-41.5	22329	15902	17874	10592
21.5-22.0	0	0	0	0	41.5-42.0	14768	25076	7850	19427
22.0-22.5	0	0	0	0	42.0-42.5	1896	9824	8644	8410
22.5-23.0	0	921	0	0	42.5-43.0	13456	10908	8947	11331
23.0-23.5	0	4728	0	5944	43.0-43.5	4336	6561	12364	4689
23.5-24.0	0	1288	0	0	43.5-44.0	6254	4581	2033	6152
24.0-24.5	0	720	0	0	44.0-44.5	3677	2459	1764	2177
24.5-25.0	616	2351	0	2420	44.5-45.0	3918	2826	1137	4756
25.0-25.5	2735	6707	27025	7099	45.0-45.5	3775	1984	3470	3387
25.5-26.0	2509	7188	12627	8792	45.5-46.0	0	1328	0	1706
26.0-26.5	12588	7963	17189	6621	46.0-46.5	658	0	0	0
26.5-27.0	12665	9373	10052	6956	46.5-47.0	948	2057	893	976
27.0-27.5	15286	15171	7181	6857	47.0-47.5	1195	0	2439	2848
27.5-28.0	19528	17995	7654	4785	47.5-48.0	0	710	1406	0
28.0-28.5	31462	28521	7461	18668	48.0-48.5	0	0	0	0
28.5-29.0	59497	33181	10461	16826	48.5-49.0	0	908	1137	0
29.0-29.5	46498	42556	17885	12792	49.0-49.5	0	1215	0	0
29.5-30.0	103489	65846	16429	26363	49.5-50.0	0	0	1137	0
30.0-30.5	103926	78262	25309	24877	50.0-50.5	0	0	0	1693
30.5-31.0	183332	93088	31007	27014	50.5-51.0	0	0	0	0
31.0-31.5	186703	116168	62182	18043	51.0-51.5	0	0	0	0
31.5-32.0	294117	158873	84997	23083	51.5-52.0	0	0	0	0
32.0-32.5	240846	154990	86865	24960	52.0-52.5	0	0	0	0
32.5-33.0	312165	182858	115939	28566	52.5-53.0	0	0	0	0
33.0-33.5	308932	197121	110884	50730	53.0-53.5	0	0	0	0
33.5-34.0	280196	190342	120330	30841	53.5-54.0	0	0	0	0
34.0-34.5	266593	196588	104575	32866	54.0-54.5	0	0	0	0
34.5-35.0	256252	160872	102586	45102	54.5-55.0	0	0	0	0
35.0-35.5	176093	181119	87825	43539	55.0-55.5	0	0	0	0
35.5-36.0	185431	126959	98927	31357	55.5-56.0	0	0	0	0
36.0-36.5	129242	128223	79075	30840	56.0-56.5	0	0	0	0
36.5-37.0	148135	101751	70139	44539	56.5-57.0	0	0	0	0
37.0-37.5	124155	104405	74016	32483	57.0-57.5	0	0	0	0
37.5-38.0	105899	100648	57667	40189	57.5-58.0	0	0	0	0
38.0-38.5	82840	77035	55129	21379	58.0-58.5	0	0	0	0
38.5-39.0	72732	64459	35675	31723	58.5-59.0	0	0	0	0
39.0-39.5	49704	44366	34316	23722	59.0-59.5	0	0	0	0
39.5-40.0	63314	39683	47087	20280	59.5-60.0	0	0	0	0

8) Aggregated total catch length distribution for 3LNO YEL in Division 3O

TL (cm)	2016	2017	2018	2019	TL (cm)	2016	2017	2018	2019
20.0-20.5	0	0	0	0	40.0-40.5	0	0	0	0
20.5-21.0	0	0	0	0	40.5-41.0	0	0	0	0
21.0-21.5	0	0	0	0	41.0-41.5	444	0	0	0
21.5-22.0	0	0	0	0	41.5-42.0	0	0	0	0
22.0-22.5	0	0	0	0	42.0-42.5	0	0	0	0
22.5-23.0	0	0	0	0	42.5-43.0	0	0	0	0
23.0-23.5	0	0	0	0	43.0-43.5	0	0	0	0
23.5-24.0	0	0	0	0	43.5-44.0	0	0	0	0
24.0-24.5	0	0	0	0	44.0-44.5	0	0	0	0
24.5-25.0	0	0	0	0	44.5-45.0	222	0	0	0
25.0-25.5	0	0	0	0	45.0-45.5	0	0	0	0
25.5-26.0	0	0	0	0	45.5-46.0	0	0	0	0
26.0-26.5	0	0	0	0	46.0-46.5	0	0	0	0
26.5-27.0	0	0	0	0	46.5-47.0	0	0	0	0
27.0-27.5	0	0	0	0	47.0-47.5	0	0	0	0
27.5-28.0	0	0	0	0	47.5-48.0	0	0	0	0
28.0-28.5	0	0	0	0	48.0-48.5	0	0	0	0
28.5-29.0	0	0	0	0	48.5-49.0	0	0	0	0
29.0-29.5	0	0	0	0	49.0-49.5	0	0	0	0
29.5-30.0	222	0	0	0	49.5-50.0	0	0	0	0
30.0-30.5	0	0	0	0	50.0-50.5	0	0	0	0
30.5-31.0	0	0	0	0	50.5-51.0	0	0	0	0
31.0-31.5	444	0	0	0	51.0-51.5	0	0	0	0
31.5-32.0	0	0	0	0	51.5-52.0	0	0	0	0
32.0-32.5	444	0	0	0	52.0-52.5	0	0	0	0
32.5-33.0	667	0	0	0	52.5-53.0	0	0	0	0
33.0-33.5	444	0	0	0	53.0-53.5	0	0	0	0
33.5-34.0	667	0	0	0	53.5-54.0	0	0	0	0
34.0-34.5	222	0	0	0	54.0-54.5	0	0	0	0
34.5-35.0	889	0	0	0	54.5-55.0	0	0	0	0
35.0-35.5	889	0	0	0	55.0-55.5	0	0	0	0
35.5-36.0	1111	0	0	0	55.5-56.0	0	0	0	0
36.0-36.5	889	0	0	0	56.0-56.5	0	0	0	0
36.5-37.0	1111	0	0	0	56.5-57.0	0	0	0	0
37.0-37.5	444	0	0	0	57.0-57.5	0	0	0	0
37.5-38.0	667	0	0	0	57.5-58.0	0	0	0	0
38.0-38.5	667	0	0	0	58.0-58.5	0	0	0	0
38.5-39.0	444	0	0	0	58.5-59.0	0	0	0	0
39.0-39.5	222	0	0	0	59.0-59.5	0	0	0	0
39.5-40.0	0	0	0	0	59.5-60.0	0	0	0	0

9) Aggregated total catch length distribution for 3LNO YEL in Divisions 3N+3O

TL (cm)	2016	2017	2018	2019	TL (cm)	2016	2017	2018	2019
20.0-20.5	0	0	0	0	40.0-40.5	45954	37365	19006	14408
20.5-21.0	0	0	0	0	40.5-41.0	36150	26392	12278	15327
21.0-21.5	0	0	0	1155	41.0-41.5	22774	15902	17874	10592
21.5-22.0	0	0	0	0	41.5-42.0	14768	25076	7850	19427
22.0-22.5	0	0	0	0	42.0-42.5	1896	9824	8644	8410
22.5-23.0	0	921	0	0	42.5-43.0	13456	10908	8947	11331
23.0-23.5	0	4728	0	5944	43.0-43.5	4336	6561	12364	4689
23.5-24.0	0	1288	0	0	43.5-44.0	6254	4581	2033	6152
24.0-24.5	0	720	0	0	44.0-44.5	3677	2459	1764	2177
24.5-25.0	616	2351	0	2420	44.5-45.0	4140	2826	1137	4756
25.0-25.5	2735	6707	27025	7099	45.0-45.5	3775	1984	3470	3387
25.5-26.0	2509	7188	12627	8792	45.5-46.0	0	1328	0	1706
26.0-26.5	12588	7963	17189	6621	46.0-46.5	658	0	0	0
26.5-27.0	12665	9373	10052	6956	46.5-47.0	948	2057	893	976
27.0-27.5	15286	15171	7181	6857	47.0-47.5	1195	0	2439	2848
27.5-28.0	19528	17995	7654	4785	47.5-48.0	0	710	1406	0
28.0-28.5	31462	28521	7461	18668	48.0-48.5	0	0	0	0
28.5-29.0	59497	33181	10461	16826	48.5-49.0	0	908	1137	0
29.0-29.5	46498	42556	17885	12792	49.0-49.5	0	1215	0	0
29.5-30.0	103711	65846	16429	26363	49.5-50.0	0	0	1137	0
30.0-30.5	103926	78262	25309	24877	50.0-50.5	0	0	0	1693
30.5-31.0	183332	93088	31007	27014	50.5-51.0	0	0	0	0
31.0-31.5	187148	116168	62182	18043	51.0-51.5	0	0	0	0
31.5-32.0	294117	158873	84997	23083	51.5-52.0	0	0	0	0
32.0-32.5	241291	154990	86865	24960	52.0-52.5	0	0	0	0
32.5-33.0	312832	182858	115939	28566	52.5-53.0	0	0	0	0
33.0-33.5	309376	197121	110884	50730	53.0-53.5	0	0	0	0
33.5-34.0	280863	190342	120330	30841	53.5-54.0	0	0	0	0
34.0-34.5	266815	196588	104575	32866	54.0-54.5	0	0	0	0
34.5-35.0	257141	160872	102586	45102	54.5-55.0	0	0	0	0
35.0-35.5	176982	181119	87825	43539	55.0-55.5	0	0	0	0
35.5-36.0	186542	126959	98927	31357	55.5-56.0	0	0	0	0
36.0-36.5	130131	128223	79075	30840	56.0-56.5	0	0	0	0
36.5-37.0	149246	101751	70139	44539	56.5-57.0	0	0	0	0
37.0-37.5	124599	104405	74016	32483	57.0-57.5	0	0	0	0
37.5-38.0	106566	100648	57667	40189	57.5-58.0	0	0	0	0
38.0-38.5	83506	77035	55129	21379	58.0-58.5	0	0	0	0
38.5-39.0	73176	64459	35675	31723	58.5-59.0	0	0	0	0
39.0-39.5	49926	44366	34316	23722	59.0-59.5	0	0	0	0
39.5-40.0	63314	39683	47087	20280	59.5-60.0	0	0	0	0

Annex B Fishing vessel in recent years (2016-2024)

FV No 68 Fukuyoshi maru (stern trawler) (Gross Tonnage:401 t) (Photo 1) started her first fishing operation in the NAFO CA from April 8, 2016 (Division 3L) targeting Greenland halibut after 7 years absence of operations by other Japanese vessels. There are two scientific observers on-board.

Photo 1. FV No 68 Fukuyoshi maru
(St. John's, New Newfoundland and Labrador, Canada)