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KOREA ANNUAL REPORT ON FISHING AND OBSERVER IMPLEMENTATION IN THE SPRFMO CONVENTION AREA IN 2024

National Institute of Fisheries Science
NIFS

CONTENTS

1. Introduction

This report summarizes the Republic of Korea's fishing activities and observer implementation in the SPRFMO Convention Area during the 2024 fishing season. After a three- and four-year absence (2021-2023, 2020-2023), Korean fishing operations resumed in 2024 with one pelagic trawl vessel targeting jack mackerel (*Trachurus murphyi*) and one jigging vessel targeting jumbo flying squid (*Dosidicus gigas*). This report provides details on fishing effort, catch, catch-per-unit effort (CPUE), data collection system, and observer coverage, in accordance with the reporting requirements of the SPRFMO.

2. Description of Fisheries

2.1 Trawl fishery

The Republic of Korea commenced trawl fishing operations targeting jack mackerel (*Trachurus murphyi*) in the SPRFMO Convention Area in 2003, initially utilizing the research vessel *Tamgu* No.1. Between 2004 and 2019, the number of active Korean trawl vessels ranged from one to three annually (Table 1). No Korean trawl fishing activity occurred in the Convention Area from 2020 to 2023. In 2024, one commercial trawler resumed operations in the area.

Table 1. Summary of the number and size of Korean trawlers in the SPRFMO Convention Area.

Year	Number of vessels	Gross Registered Tonnage (GRT)			
		2,000-2,999	3,000-3,999	4,000-4,999	5000<
2004	3	√	√	√	
2005	2	√	√	-	
2006-2008	3	√	√	√	
2009	2		√	√	
2010-2012	2		√		√
2013-2014	1		√		
2015-2016	2		√		√
2017	1		√		
2018-2019	2		√		√
2020-2023	0				
2024	1				√

2.2 Jigging fishery

Korea's jigging fishery targeting jumbo flying squid (*Dosidicus gigas*) has been commercially active in the SPRFMO Convention Area since 1990. The number of vessels peaked at 50 in 1995 but declined sharply thereafter (Table 2). Throughout the 2000s, vessel numbers remained at low levels, and no Korean jigging vessels operated in the Convention Area from 2021 to 2023. In 2024, one jigging vessel resumed operations in the area.

Table 2. The number of Korean jigging vessels operated in the SPRFMO Convention Area.

Year	Number of vessels	Year	Number of vessels	Year	Number of vessels	Year	Number of vessels
1990	6	2000	14	2010	1	2020	13
1991	24	2001	7	2011	1	2021	0
1992	33	2002	17	2012	6	2022	0
1993	42	2003	5	2013	6	2023	0
1994	49	2004	8	2014	6	2024	1
1995	50	2005	2	2015	2		
1996	48	2006	1	2016	4		
1997	27	2007	-	2017	8		
1998	-	2008	1	2018	17		
1999	11	2009	1	2019	15		

3. Catch, Effort and CPUE Summaries

3.1 Pelagic trawl fishery

Figure 1 and Table 3 collectively present the annual fishing effort, jack mackerel (CJM, *Trachurus murphyi*) catch, and catch per unit effort (CPUE) by Korean trawlers in the SPRFMO Convention Area from 2004 to 2024. The number of vessels and fishing days increased until 2009, corresponding to a steady rise in CJM catch, which peaked at around 14,000 tonnes. As shown in Figure 2, CPUE also increased during this period, reaching the highest level in 2009, indicating higher fishing efficiency. From 2010 onward, both fishing effort and catch declined, and the trend in CPUE largely reflects the catch pattern described in Table 3. No fishing activity was reported from 2020 to 2023, and a limited resumption in 2024 resulted in notably lower catch and CPUE compared to previous years.

In addition to jack mackerel, Korean trawlers also reported catches of chub mackerel (MAS, *Scomber japonicus*), although at generally lower levels. As shown in Table 3, MAS catches varied considerably across years, with the highest recorded catch of 1,460 tonnes in 2006. Since 2010, reported MAS catch has remained relatively low, often below 500 tonnes, and in some years (e.g. 2012 and 2014) it dropped close to zero. However, in 2024, MAS catch increased noticeably to 519 tonnes, marking the highest proportion since 2004.

In 2024, the reported bycatch species included southern Ray's bream (*Brama australis*, UBA), redbait (*Emmelichthys nitidus*, EMT), swordfish (*Xiphias gladius*, SWO), and jumbo flying squid (*Dosidicus gigas*, GIS). The catch of these species ranged from less than 1 tonne to a maximum of 38 tonnes.

The spatial distribution of fishing operations conducted in the Convention Area are described in Figure 2. Each point represents the start position of an individual tow, primarily concentrated between 25°S and 30°S latitude and 74°W to 78°W longitude. A smaller number of operations were observed further north, around 15°S, indicating occasional fishing activity in the northern part of the region during the late part of the year.

The distributions of CPUEs (tonne/hour) on two main species (CJM, MAS) are described in Figure 3. Both two species were mainly distributed between 25°S and 28°S, and 74°W and 76°W. The relative size of the CPUE points suggests that CJM exhibited slightly higher catch densities compared to MAS.

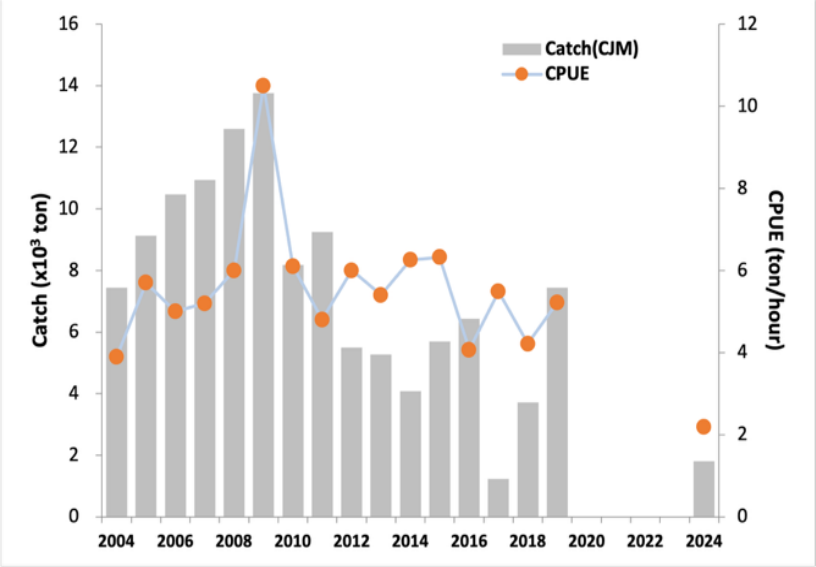

Figure 1. Annual catch and CPUE (tonne/hour) of jack mackerel in the SPRFMO Convention Area. No fishing conducted in the Convention area from 2020 to 2023.

Table 3. Annual fishing effort (number of vessels, fishing days, and tows) and catch (tonnes) of jack mackerel (CJM), chub mackerel (MAS), and other species by Korean trawlers in the SPRFMO Convention Area from 2004 to 2024. Data include only days when fishing activity occurred.

Year	Number of Vessels	*Number of Fishing days	Number of Tows	Total towed hours	CJM (tonne)	MAS (tonne)	Other species (tonne)	Total catch (tonne)
2004	3	205	N/A	N/A	7,438	708	0	8,146
2005	2	170	N/A	N/A	9,126	381	0	9,507
2006	3	232	N/A	N/A	10,474	1,460	0	11,934
2007	3	237	N/A	N/A	10,940	1,240	0	12,180
2008	3	249	N/A	N/A	12,600	968	0	13,568
2009	2	182	N/A	N/A	13,759	716	59	14,534
2010	2	136	N/A	N/A	8,183	84	0	8,267
2011	2	205	N/A	N/A	9,253	24	100	9,377
2012	2	117	N/A	N/A	5,492	0	0	5,492
2013	1	140	N/A	975	5,267	111	0	5,378
2014	1	86	N/A	652	4,078	21	0	4,099
2015	2	104	N/A	900	5,749	82	3	5,834
2016	2	182	N/A	1,581	6,430	486	16	6,931
2017	1	40	N/A	225	1,235	191	3	1,429
2018	2	138	209	882	3,717	246	86	4,049
2019	2	111	249	1,427	7,444	82	96	7,622
2020-2023	0	0	0	0	0	0	0	0
2024	1	80	106	852	1,797	519	69	2,385

* No. of fishing days: only days of fishing activity occurred.

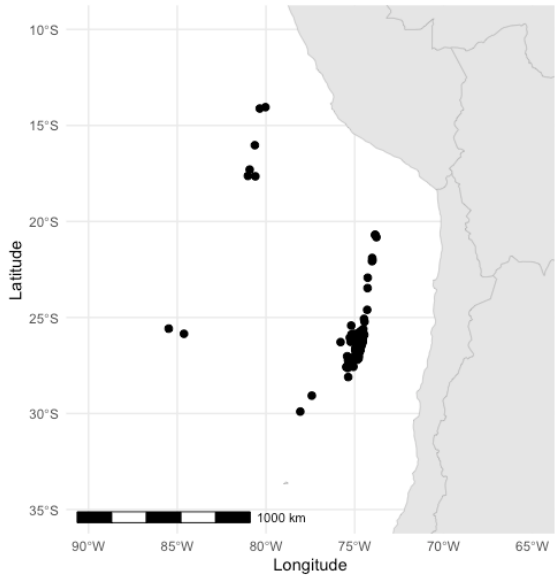

Figure 2. Spatial distribution of trawl fishing activity in the SPRFMO Convention Area in 2024.

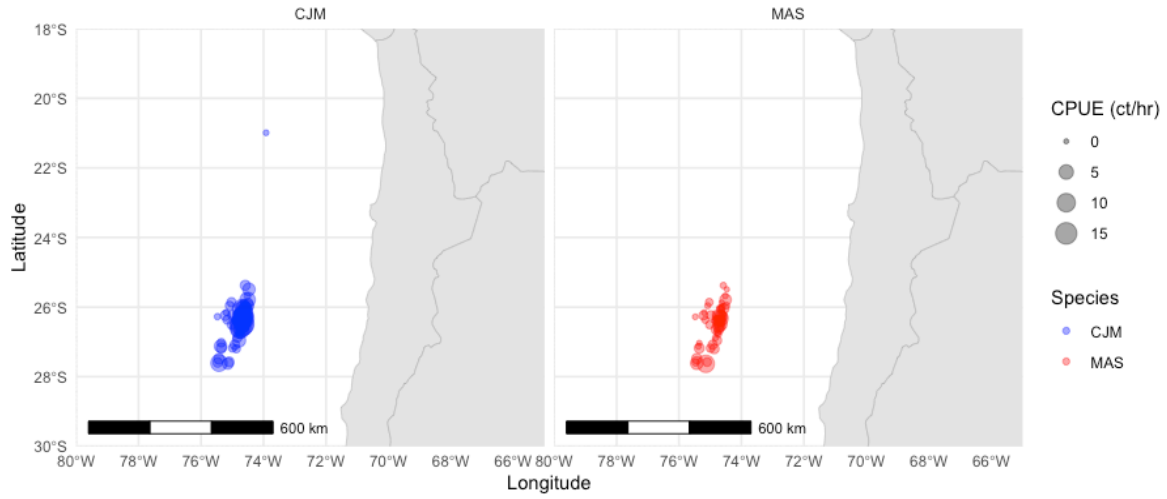

Figure 3. Distribution of CPUE (tonne/hour) of jack mackerel (CJM) and chub mackerel (MAS) in the SPRFMO Convention Area in 2024.

3.2 Bottom trawl fishery

Korea did not conduct any bottom trawl fishery in 2024. The Korean bottom trawl fishery, which primarily targeted orange roughy (*Hoplostethus atlanticus*), has not been active in the SPRFMO Convention Area since 2008 (see SC6-Doc27).

3.3 Exploratory fishery

The exploratory fishing for toothfish, initiated from 2025 under CMM14h-2025, will be reported separately in a dedicated progress report.

3.4 Jigging fishery

The annual fishing effort (in fishing days) and catch by Korean jigging vessels, which primarily target jumbo flying squid (*Dosidicus gigas*), from 2015 to 2024 are summarized in Table 4 and Figure 4. The number of vessels operating in the Convention Area peaked in 2018 but has declined since then. No fishing was conducted between 2021 and 2023. One jigging vessel resumed fishing for a limited number of days in 2024.

The annual CPUE (catch per fishing day) has shown a continuous decline since 2015, reaching its lowest value in 2024. The spatial distribution of fishing positions by the jigging vessel is described in Figure 5. The plotted points represent start positions, color-coded by month (October to December). The operations were primarily concentrated between 15°S and 25°S latitude and 75°W to 80°W longitude. It appears that fishing operations were broadly distributed in October, but gradually shifted southward in November and December.

Table 4. Annual fishing efforts (number of vessels and fishing days) and catches of jumbo flying squid by Korean jigging fisheries in the SPRFMO Convention Area.

Year	No. Vessels	No. Fishing days	Avg. fishing days/vessel	Total catch (tonne)
2015	2	151	76	4,263
2016	4	409	102	4,388
2017	8	456	57	3,460
2018	17	1,003	59	3,651
2019	15	1,037	69	5,577
2020	13	212	16	1,003
2021-2023	0	0	0	0
2024	1	53	53	128

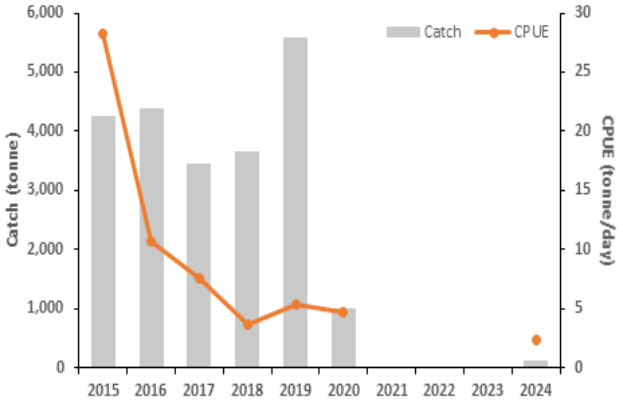

Figure 4. Annual catch (tonne) and CPUE (tonne/day) of jumbo flying squid in the SPRFMO Convention Area from 2015 to 2024.

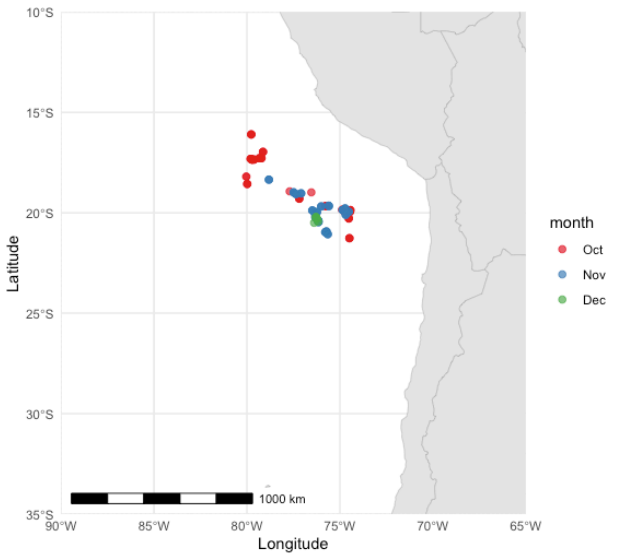

Figure 5. Spatial distribution of jigging fishing activity in the SPRFMO Convention Area in 2024.

4. Fisheries Data Collection

4.1 Fisheries catch & effort data collection system

The data collection system for Korean high-seas fishing vessels underwent a significant change in 2015. Prior to that, the system was operated in a dual format: total catch data were collected by the Korea Overseas Fisheries Association (KOFA), while the fishing logbooks were collected and managed by the National Institute of Fisheries Science (NIFS).

Since September 2015, detailed tow-by-tow catch and effort data from all Korean high-seas fishing vessels have been reported via an Electronic Reporting System (ERS) to Fisheries Monitoring Center (FMC) under the Ministry of Oceans and Fisheries (MOF) of the Republic of Korea. These data from vessels operating in the SPRFMO Convention Area are submitted to the Secretariat in accordance with SPRFMO data standard.

5. Observer Implementation Report

5.1 Observer program design and training

The Korean scientific observer program for distant-water fisheries has been in place since 2002. According to the Enforcement Decree of the Distant-Water Fisheries Development Act, the program is jointly operated by two organizations: 1. the National Institute of Fisheries Science (NIFS) and 2. the Korea Fisheries Resources Agency (FIRA).

NIFS is responsible for scientific analysis tasks, including briefing and debriefing observers, managing observer data, verifying data quality, and providing training on the Conservation and Management Measures (CMMs) of relevant Regional Fisheries Management Organizations (RFMOs). FIRA oversees the overall operation of the observer program, excluding the responsibilities assigned to NIFS.

Observer training under the Korean program is categorized into four types: 1. Candidate training for new recruits, 2. Regular training for all active observers, 3. Self-development training, and 4. Pre-survey training before deployment.

The observer recruitment process begins with a document screening of application forms and CVs based on the following qualifications: a university graduate with a degree in natural sciences, or a vocational high school graduate in fisheries who has at least one year of onboard experience and holds a deck officer certificate.

Candidates who pass the document screening are invited to an in-person interview, which assesses their basic fisheries knowledge, English communication skills, and availability for deployment. Those who pass the interview attend the candidate training course. Only those who pass the final assessment at the end of the training become eligible for deployment.

NIFS provides regular training twice a year for certified observers who are temporarily off duty. The curriculum includes updated CMMs of relevant RFMOs, safety procedures, identification and handling of protected species (such as marine mammals, seabirds, and Vulnerable Marine Ecosystems), as well as ethics and integrity training.

In cases where group training is limited or not feasible, self-development training is encouraged. Observers are financially supported to improve skills such as English language proficiency, computer literacy, and other relevant capabilities.

Before each deployment, pre-survey training is conducted by NIFS to provide observers with RFMO-

specific CMMs, instructions on data and biological sample collection, and detailed guidance on completing survey reports.

Following a formal Accreditation Assessment, the Korean scientific observer program was approved by the SPRFMO Commission in 2022.

Table 5. Types of observer training process by the Korean scientific observer program

Type of training	Candidate training	Regular training	Self-development training	Pre-survey training
Organization	FIRA	FIRA	FIRA	NIFS
Period	Only once	Biannual	Time of need	Before every dispatching
Materials	An overview of the observer program, Gear-specific observer duties, Identification and measurement for target species, Observation of sharks/whales/seabirds, Observation of Vulnerable Marine Ecosystems (VMEs), Hand-on computer program training, Marine species identification, Introduction of RFMOs, Systematic management of fishing information, Catch product processing, Marine meteorology, At-sea safety training English (maritime everyday), Organizational structure and culture of a ship, and Fish dissection LAB	Scientific research, Protected species (seabirds, mammals), Identification on VMEs, Safety education, and Integrity education	English, Computer skill, and Physical training	Update on RFMO's CMMs, Scientific survey process, How to write logbook, Sample collection method, and Preparation of survey report

5.2 Observer coverage and data collection

Korean scientific observers collect a wide range of biological and operational data from both target and bycatch species to support stock assessments and other scientific analyses. The data collected are based on the requirements outlined in SPRFMO CMM 02-2025 Annex 7, and are submitted following the official Data Submission Template (https://sprfmo.int/fisheries/data-2/data-submission).

Observer coverage for Korean trawl vessels in the SPRFMO Convention Area began in 2008. That year, two trawlers operated, and one observer was deployed across both vessels for a total of 9 days. No observers were deployed during 2009–2010. In 2011 and 2012, one observer was placed on a single trawler in each year, with coverage levels of 6.8% and 58.1%, respectively. Since 2013, 100% observer coverage has been maintained for all Korean bottom trawl operations in the Convention Area. The Korean observer program was expanded to include commercial jigging vessels starting in 2015. In 2020, one observer was deployed on a jigging vessel, achieving an observer coverage rate of 20% based on total fishing days. Detailed observer coverage statistics are summarized in Table 6.

In 2024, three observers were deployed: two observers boarded a trawler during separate time periods, and one observer was assigned to a jigging vessel that resumed fishing operations in the Convention Area.

Table 6. Scientific observer coverage on Korean vessels in the SPRFMO Convention Area.

Year	Gear types	Vessel name	Observer onboard days	Coverage rate of the vessel (total coverage of the fishing method)
2008	Trawl	*F/V Insungho*	3	4%
	Trawl	*F/V Kwangjaho*	6	
2011	Trawl	*F/V Kwangjaho*	14	6.8%
2012	Trawl	*F/V Kwangjaho*	68	58.1%
2013	Trawl	*F/V Kwangjaho*	140	100% (100%)
2014	Trawl	*F/V Kwangjaho*	86	100% (100%)
2015	Trawl	*F/V Kwangjaho*	120	100% (100%)
	Trawl	*F/V Sejong*	10	100% (100%)
	Jigging	*F/V No.705 Amor*	75	100% (50%)
2016	Trawl	*F/V Kwangjaho*	179	100% (100%)
	Trawl	*F/V Sejong*	28	100% (100%)
2017	Trawl	*F/V Kwangjaho*	88	100% (100%)
2018	Trawl	*F/V Kwangjaho*	134	100% (100%)
	Trawl	*F/V Sejong*	37	100% (100%)
	Jigging	*F/V No.703 Amor*	93	100% (17%)
	Jigging	*F/V No.101 Agnes*	82	100% (17%)
2019	Trawl	*F/V Kwangjaho*	194	100% (100%)
	Trawl	*F/V Sejong*	17	100% (100%)
	Jigging	*F/V No.705 Amor*	88	84% (18%)
	Jigging	*F/V No.316 Sunhae*	99	86% (18%)
2020	Jigging	*F/V No. 5 Sae In*	*103	86%(20%)
2024	Trawl	*F/V Sejong*	100	100% (100%)
	Jigging	*F/V 5 Dong Il*	100	100% (100%)

* The observer embarked from the domestic port due to COVID-19 and sailed to the Convention Area

5.3 Biological sampling and length composition of catches

Length frequency and length-weight relationship of jack mackerel (CJM) and chub mackerel (MAS) are summarized in Figures 6 and 7. During the observation period, a total of 9,537 individuals were measured for both length and weight. Due to the limited catch rates of the target species, observers collected samples from 24 different species. The length frequency distributions for both CJM and MAS showed a prominent mode around 30 cm in fork length. The length-weight relationship for jack mackerel was estimated using non-linear least squares regression, based on 6,599 individuals. The resulting model was: $W = 9.547 \times 10^{-6} \cdot L^{3.009}$, where W is the body weight (g) and L is the fork length (mm), with a coefficient of determination of $R^2 = 0.889$. Similarly, the relationship for chub mackerel was modeled using 1,322 individuals, yielding the equation: $W = 1.0161 \times 10^{-4} \cdot L^{2.609}$, with $R^2 = 0.766$.

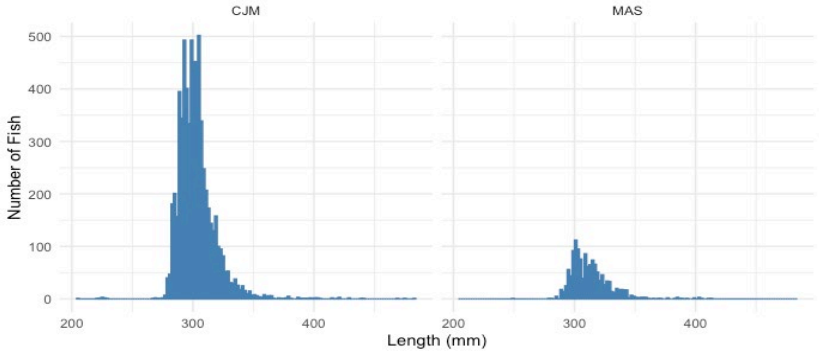

Figure 6. Length frequency distributions of jack mackerel (CJM) and chub mackerel (MAS) collected by scientific observers in 2024.

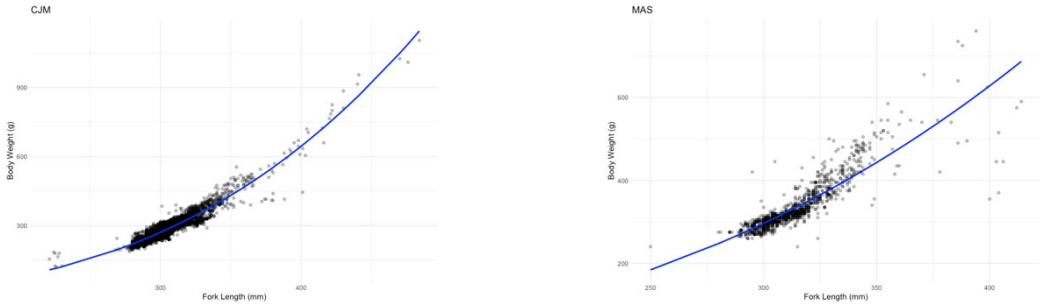

Figure 7. Length-weight relationships of jack mackerel (CJM) and chub mackerel (MAS) collected by scientific observers in 2024.

The mantle length frequency distributions of jumbo flying squid by sex are shown in Figure 8. A total of 921 individual were sampled during the observation period, including 723 females and 179 males. The histogram indicates a clear sexual dimorphism in body size, with females displaying a broader and more right-skewed distribution, peaking around 90 cm in mantle length. In contrast, males show a narrower distribution, with most individual clustered between 75 and 85 cm.

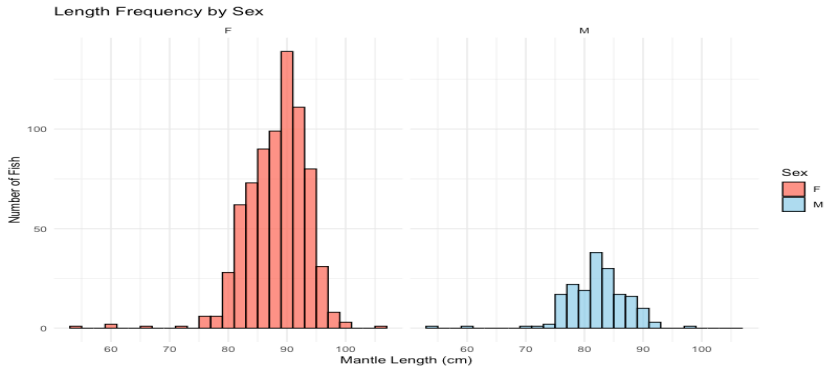

Figure 8. Length frequency distributions of jumbo flying squid by sex collected by scientific observers in 2024.

6. Ecosystem Approach considerations

6.1 Seabird mitigation measures

All Korean trawl vessels fishing in the SPRFMO Convention Area are required to comply with seabird mitigation measures specified in CMM 09-2017. The requirements include deployment of streamer (tori) lines or bird bafflers where it is not operationally feasible to use streamer lines and management of discharge of biological material. Trawl vessels are prohibited from discharging biological material during shooting and hauling.

6.2 Observed interactions with other species of concern

All scientific observers execute daily observation of seabirds at least once every set or haul for more than 15 minutes. Observers are instructed to observe whether seabirds are dipping their beaks or heads into the water near the net to feed on during fishing. The quantitative information on seabird observation is submitted by observers. A total of 24 species of seabirds were observed on trawl vessels from 2013 to 2024, and nine species were observed on jigging vessels from 2019 to 2024 (Table 7). There were no injured, struck or dead seabirds observed or reported from 2013 to 2024.

Table 7. A list of observed seabirds by scientific observers (2013-2024) in the SPRFMO Convention Area.

Observed fishing vessel	FAO species code	Scientific name	English name
Trawl	CSK	*Catharacta skua*	Great skua
Trawl, Jigging	DAC	*Daption capense*	Cape petrel
Jigging	DAQ	*Phoebastria albatrus*	Short-tailed Albatross
Trawl	DCR	*Thalassarche chlororhynchos*	Yellow-nosed Albatross
Trawl	DIB	*Thalassarche bulleri*	Buller's albatross
Trawl	DIC	*Thalassarche chrysostoma*	Grey-headed albatross
Trawl, Jigging	DIM	*Thalassarche melanophrys*	Black-browed albatross
Trawl	DIU	*Thalassarche cauta*	Shy albatross
Trawl, Jigging	DIX	*Diomedea exulans*	Wandering albatross
Trawl	DMP	*Diomedea melanophris*	Black browed albatross
Trawl	DSL	*Thalassarche salvini*	Salvin’s albatross
Trawl	DSQ	*Sula dactylatra*	Masked Booby
Trawl, Jigging	FGZ	*Fregetta spp*	Storm petrels nei
Trawl	FUG	*Fulmarus glacialoides*	Southern fulmar
Trawl	MAH	*Macronectes halli*	Hall’s giant petrel
Trawl	MAI	*Macronectes giganteus*	Southern giant petrel
Trawl, Jigging	OCO	*Oceanites oceanicus*	Wilson's storm petrel
Trawl	PCI	*Procellaria cinerea*	Grey petrel
Trawl	PFG	*Puffinus griseus*	Sooty shearwater
Trawl	PHE	*Phoebetria palpebrata*	Light-mantled albatross
Trawl, Jigging	PRO	*Procellaria aequinoctialis*	White-chinned petrel
Jigging	PRX	Procellariidae	Petrels nei
Trawl	PWX	*Pachyptila spp*	Prions nei
Jigging	SZV	*Sula variegata*	Peruvian booby

Trawl	-	*Phaethon spp*	Tropicbird
Trawl	-	*Pteroderma externa*	Juan Fernandez petrel

A total of 14 juvenile porbeagle sharks (*Lamna nasus*) were incidentally caught in 2024, as summarized in Table 8. The observed size range was between 76 and 132 cm. Of these, 3 individuals were released alive, 7 were released in a lethargic condition, and 4 were found dead at retrieval. Efforts were made on board to release the sharks in a live condition whenever possible.

To encourage the reporting on incidental captures of species of concern and non-target species (CMM02-2022; CMM 02-2025) by jigging vessels, a poster to aid the identification of bycatch species was provided to all jigging vessels (Figure 9).

Table 8. Summary of species of concern from the Korean vessels in the SPRFMO Convention Area.

Year	Fishing vessels	Species	Amount caught	Datasets
2015	trawl	Porbeagle shark	7 (62kg)	FA, Obs
2016	trawl	Porbeagle shark	8 (97kg)	FA, Obs
2017	trawl	Porbeagle shark	2 (53kg)	FA, Obs
2018	jigging	Porbeagle shark	1 (no info)	Obs
2019	trawl	Porbeagle shark	20 (276.2kg)	Obs
2024	trawl	Porbeagle shark	14(177.3kg)	Obs

FA: Fishing activity Data, Obs: Observer data

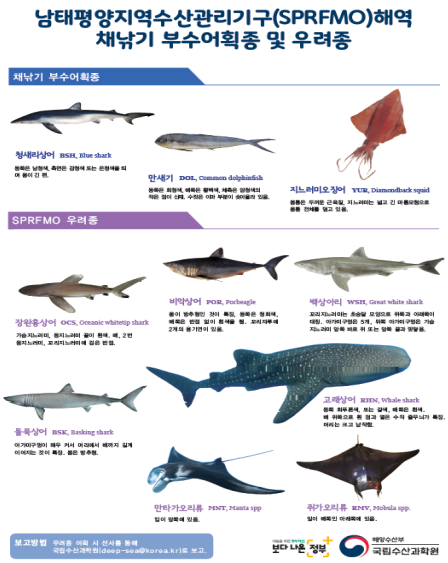

Figure 9. A poster for the identification of bycatch species provided to Korean fishing vessels operating in the SPRFMO Convention Area.