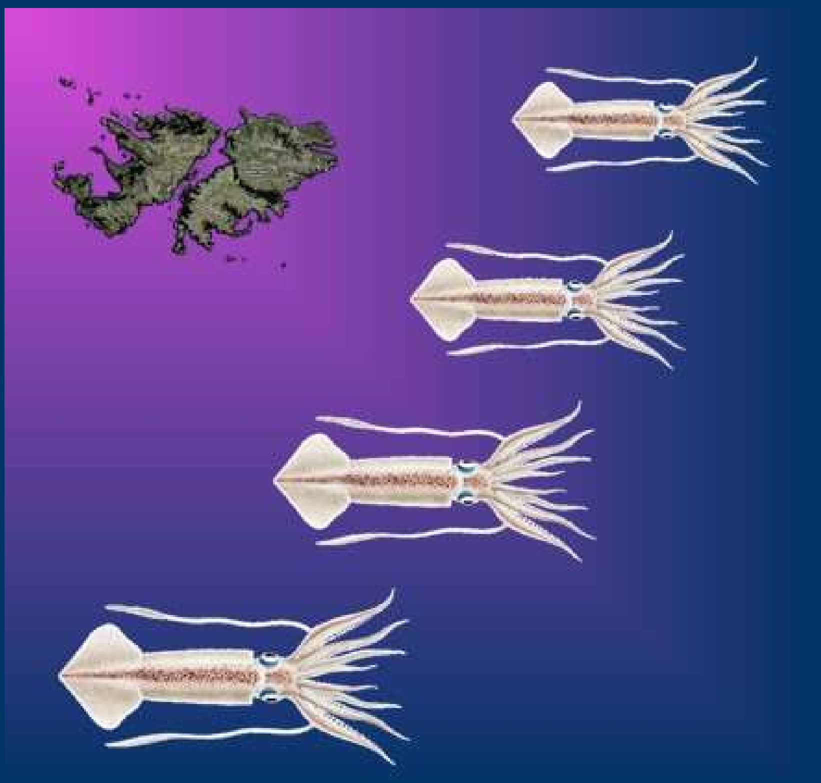
2025 2nd Pre-Season Assessment Survey

Falkland calamari

(*Doryteuthis gahi*)



Andreas Winter · Jon Ander Estevez
Louis Desmet · Martin Villarroel

Natural Resources - Fisheries
Falkland Islands Government

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ZDLS4 – S2 – 2025

Index

Summary

1) A stock assessment survey for *Doryteuthis gahi* (Falkland calamari) was conducted in the Loligo Box from 10th to 24th July 2025. Sixty scientific trawls were taken during the survey; 39 fixed-station trawls and 21 adaptive-station trawls. The scientific catch of the survey was 196.07 tonnes *D. gahi*.
2) An estimate of 21,695 tonnes *D. gahi* (95% confidence interval: 17,568 to 31,591 t) was calculated for the fishing zone by inverse distance weighting. The biomass estimate was highest for 2nd pre-seasons since 2022, but below long-term median. Of the total, 7,464 tonnes were estimated north of 52 ºS, and 14,231 tonnes were estimated south of 52 ºS. The proportion north (34.4%) was the highest for a 2nd pre-season since 2022.
3) *D. gahi* had significantly greater average mantle lengths and maturities north than south of 52 ºS. Males north: mean mantle length 11.68 cm; mean maturity stage 3.37, south: mantle length 10.99 cm; maturity 3.24. Females north: mantle length 10.95 cm; maturity 2.03, south: mantle length 10.53 cm; maturity 2.02. Mantle length distributions did not suggest any ongoing immigration during the survey.
4) 108 taxa were identified in the catches. *D. gahi* was the largest species group at 52.6% of total catch by weight; second-lowest percentage among 2nd pre-season survey catches since 2012. Hake (41.0%), rock cod (3.5%), red cod (1.1%) and toothfish (0.7%) were the other taxa comprising ≥0.5% of total survey catch. Biological measurements and samples were taken from *D. gahi*, toothfish, rock cod, red cod, southern hake, southern blue whiting, hoki, kingclip, and several non-commercial species.

Introduction

A stock assessment survey for *Doryteuthis gahi* (Falkland calamari – Patagonian longfin squid – colloquially *Loligo*) was carried out by the FIFD on-board the fishing vessel *Prion* (ZDLS4) from the 10th to 24th July 2025; experimental license FK049E25. This survey continues the series of surveys that have, since February 2006, been conducted immediately prior to season openings to estimate *D. gahi* stock available to commercial fishing at the start of the season, and to initiate the in-season management model based on depletion time series of the stock.

Objectives of the survey were to:

1) Estimate the biomass and spatial distribution of *D. gahi* on the fishing grounds at the onset of the 2nd fishing season, 2025.
2) Estimate the biomass and distribution of common rock cod (*Patagonotothen ramsayi*) and other commercial species in the 'Loligo Box', for continued monitoring of these stocks in parallel to the finfish research survey.
3) Estimate the bycatch of toothfish (*Dissostichus eleginoides*) in *D. gahi* trawls.
4) Collect biological information on *D. gahi*, rock cod, toothfish and opportunistically other fish and invertebrates taken in the trawls.

The survey was designed to cover the 'Loligo Box' fishing zone (Arkhipkin et al. 2008, 2013) that extends along the shelf break across the southern and eastern part of the Falkland Islands Interim Conservation Zone (FICZ). The delineation of the Loligo Box (Figure 1) represents an area of approximately 31,517.9 km^2, subtracting the 3-nautical mile exclusion zone around Beauchêne Island. Following large catches in the far south-west of the Loligo Box during first season (Skeljo and Winter 2025), the survey was intended to occupy an additional day of trawling to the west of the Loligo Box. However, this could not be realized due to mechanical breakdown on the last day.

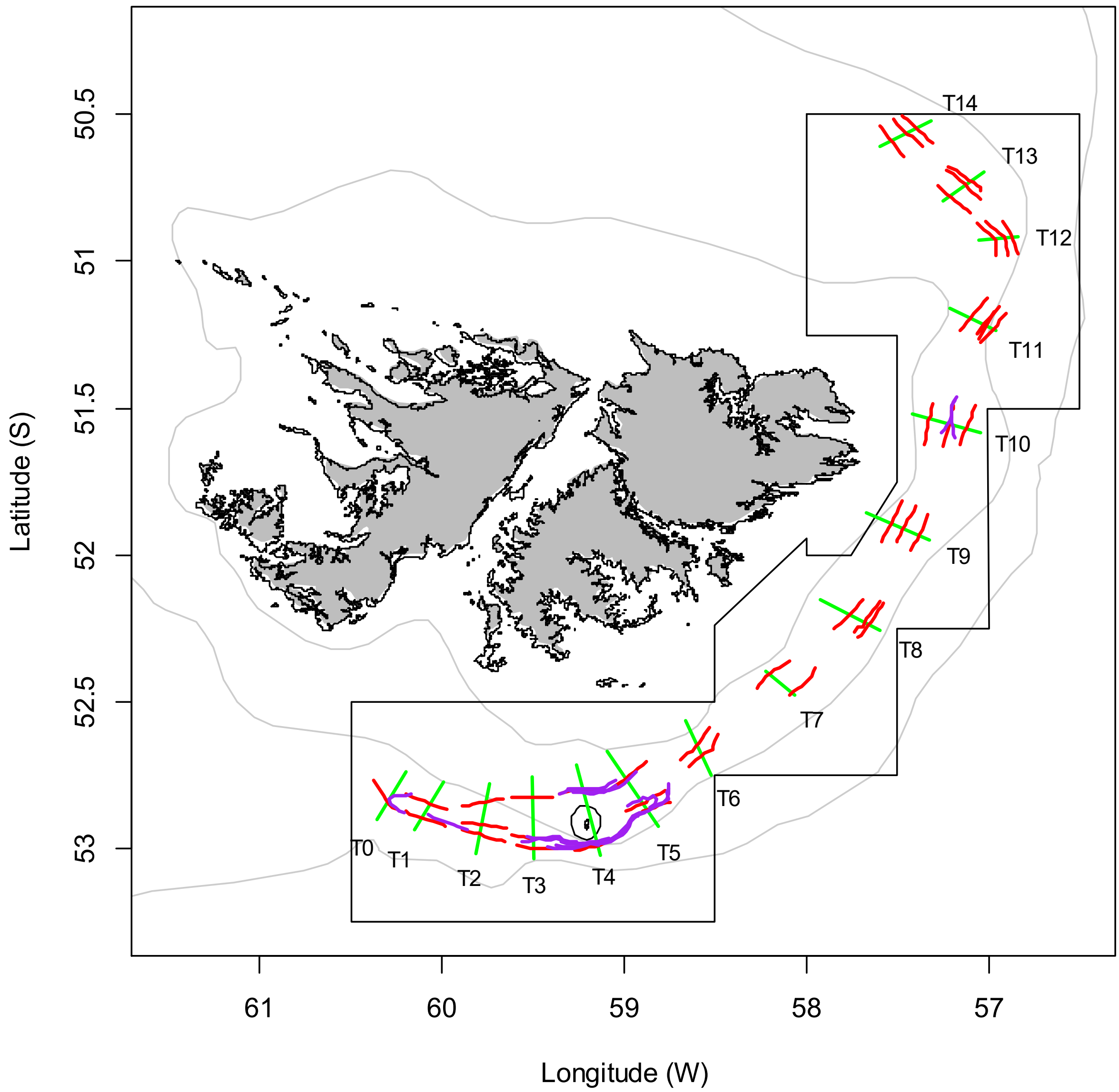


Figure 1. Survey transects (green lines), fixed-station trawls (red), and adaptive-station trawls (purple) sampled during the 2nd pre-season 2025 survey. Boundaries of the 'Loligo Box' and Beauchêne Island exclusion zone are in black.

F/V *Prion* is a Falkland Islands - registered stern trawler of 85 m length and 2499 GT. Prion is a new entrant in the Falkland Islands calamari fishery, having participated for the first time in 1st season (C licence) 2025. Like all vessels employed for pre-season surveys, *Prion* used its commercial trawl gear for the survey catches. The following FIFD personnel participated in the 2nd pre-season 2025 survey:

Jon Ander Estevez	lead scientist
Louis Desmet	fisheries observer
Martin Villarroel	fisheries observer

Methods

Sampling procedures

The regular survey plan includes 39 fixed-station trawls located on a series of 15 transects perpendicular to the shelf break around the Loligo Box (Figure 1), followed by up to 21 adaptive-station trawls selected to increase the precision of *D. gahi* biomass estimates in high-density or high-variability locations. This dual approach ensures that the scientific requirements of randomization and repeatability are met (via fixed stations) and the spatio-temporal variability of the *D. gahi* population is captured (via adaptive stations) (Gawarkiewicz and Malek Mercer 2018). All trawl tracks were designed for an expected duration of two hours each. All trawls were bottom (demersal) trawls. During the progress of each trawl, GPS latitude, GPS longitude, bottom depth, bottom temperature, net height, cable length, trawl door spread, and trawl speed were recorded on the ship's bridge in 15-minute intervals, and a visual score was assessed of the quantity and quality of acoustic marks observed on the net-sounder. Following the procedure described in Roa-Ureta and Arkhipkin (2007), the acoustic marks were used to apportion the *D. gahi* catch of each trawl to the 15-minute intervals and thereby increase spatial resolution of the catches. For small catches acoustic apportioning cannot be assessed with accuracy, and any *D. gahi* amounts <100 kg were iteratively aggregated by adjacent intervals (if the total *D. gahi* catch in a trawl was <100 kg it was assigned to one interval; the middle one).

Catch estimation

The catch of every trawl was processed by the factory crew and retained catch weight of *D. gahi*, by size category, was calculated from the number of standard-weight blocks of frozen squid recorded by the factory shift leader. Catch weights of commercially valued fish species were also recorded from the number of blocks of frozen product, but without size categorization. Processed product weights were scaled to whole weights using standard conversion factors (FIG 2016). Total catch composition per trawl, including commercially unvalued species, damaged fish, and undersized fish, was estimated using a combination of visual assessment and basket sample data. Baskets (30 – 35 kg capacity) were hand-sorted by the FIFD survey personnel and species weighed separately. The aggregate quantities of bycatch species in baskets were proportioned to the *D. gahi* catch of the whole trawl. Scarce bycatch species, and all toothfish, were collected and weighed entirely from each trawl. Non-commercial bycatches were then added to the factory production weights (as applicable) to give total catch weights of all fish and squid.

Biomass calculation

Biomass density estimates of *D. gahi* per trawl were calculated as catch weight divided by swept area. The calculation of biomass density thus assumes a catchability coefficient = 1, as commonly used in fishery surveys (Somerton et al. 1999)[a]. Swept area equals the product of trawl distance × trawl width, and trawl distance was defined as the sum of distance measurements from the start GPS position to the end GPS position of each 15-minute interval[b]. Trawl width was derived from the distance between trawl doors (recorded per interval) according to the equation (Seafish 2010):

[a] Albeit more likely to underestimate than overestimate true density (Harley and Myers 2001); thus conservative.
[b] At the end of any trawl the net may continue to 'fish' for some distance as it is being hauled. Swept-area bias caused by this factor cannot be quantified but is unlikely to be substantial.

trawl width = (door distance × footrope length) / (footrope length + bridle + sweep)

Measurements of *Prion*'s trawl, provided by the director of fishing operations, were: footrope = 201.5 m, sweep = 132.0 m, bridle = 40.5 m. These measurements are a correction of measurements provided previously by the vessel master, resulting in the final biomass estimate differing from the one provided in the initial post-survey update to industry. *Prion* used two identical trawl nets throughout the survey.

Biomass density estimates were extrapolated to the fish stock area[c] using an inverse distance weighting algorithm (Ramos and Winter 2022). As previously, the fish stock area was delineated to 20,062.8 km^2, partitioned for analysis into 800 area units of 5×5 km. Forty area units with average depth either <90 m or >400 m, where calamari trawlers do not work, were assumed for this analysis to comprise zero *D. gahi*. Biomass densities from all 800 area units were averaged and multiplied by the total fish stock area for total biomass, as well as separately north and south of 52 ºS; the standard sub-area demarcation (Winter and Arkhipkin 2015).

Uncertainty of the biomass density extrapolation was estimated by hierarchical bootstrapping. For 30,000 iterations a number of survey trawls equivalent to the total number were randomly selected with replacement, and within each selected survey trawl its 15-minute intervals were randomly selected with replacement. The trawl's catch was re-proportioned according to the selected intervals' acoustic scores, thus varying the spatial distribution of the catch over that trawl track. When applicable, the aggregation of *D. gahi* amounts <100 kg (see Sampling procedures) was summed to an interval of the trawl also chosen randomly; not necessarily the middle interval. At each of the 30,000 iterations, the inverse distance weighting algorithm was re-calculated over the 5 × 5 km area units.

Biological analyses

Random samples of *D. gahi* (target n = 150, as far as available) were collected from the factory at all trawl stations. Biological analysis at sea included measurements of the dorsal mantle length rounded down to the nearest half-centimetre, sex, and six-stage maturity scale scored by inspection of the gonads (Lipinski 1979). Statistical significance of sex ratio departures from 50/50, in total and by station, was evaluated with randomized re-sampling. Statistical significance of differences in mantle length and maturity stage distributions were evaluated with Kruskal-Wallis tests (Kruskal and Wallis 1952).

Additional specimens of *D. gahi* and *Illex argentinus* (n = 120 as far as available) were collected opportunistically according to area stratification (north, central, south) and depth (shallow, medium, deep), and frozen for statolith extraction and age analysis (Arkhipkin 2005), as well as calculation of the length-weight relationship $W = \alpha \cdot L^{\beta}$ (Froese 2006). A sample of rock cod was taken at every trawl station, as far as available. Samples of toothfish were collected from most of the trawl stations to maximize the time series catch and biological information base for juvenile toothfish. Otoliths were taken from toothfish that corresponded to required size/sex categories and area stratification, and other fish species as available; usually the predominant fish bycatch in any trawl, plus rare specimens that were frozen.

Results

Catch rates and distribution

[c] The (approximate) area occupied by the fishable stock of *D. gahi*. This is largely overlapping, but not exactly equal, to the Loligo Box, which is the area that is legally open to *D. gahi* trawling.

The survey started with fixed-station trawls near the north of the Loligo Box, then proceeded southward ahead of unstable weather to gain an overview of the fishing grounds. Transects in the south were surveyed on the second day before heading back north, followed by covering the Loligo Box generally north to south the usual pattern. A schedule of 4 scientific trawls per day was maintained every day (Table A1), resulting in 60 scientific trawls total recorded during the survey: 39 fixed station trawls catching 74.61 tonnes *D. gahi*, and 21 adaptive-station trawls catching 121.46 t *D. gahi*. Fifteen optional trawls (directed by the vessel master, after survey hours) yielded an additional 98.03 t *D. gahi*, bringing the total catch for the survey to 294.10 t. The scientific survey catch of 196.07 tonnes *D. gahi* is the highest for 2nd pre-seasons since 2023, although below the long-term average (Table 1).

Table 1. *D. gahi* pre-season survey scientific catches and biomass estimates (in metric tonnes). Before 2006, surveys were not conducted immediately prior to season opening.

Year	First season			Second season		
	No. trawls	Catch	Biomass	No. trawls	Catch	Biomass
2006	70	376	10213	52	240	22632
2007	65	100	2684	52	131	19198
2008	60	130	8709	52	123	14453
2009	59	187	21636	51	113	22830
2010	55	361	60500	57	123	51754
2011	59	50	16095	59	276	51562
2012	56	128	30706	59	178	28998
2013	60	52	5333	54	164	36283
2014	60	124	34673	58	207	40090
2015	57	184	36424	53	137	25422
2016	57	65	21729	58	225	43580
2017	59	180	48785	63[A]	314	56807
2018	59[A]	115	32194	53	510	183593
2019	55	382	49618	51	298	50880
2020	59	268	27991	55	575	92194
2021	55	280	31770	59	534	77526
2022	60	421	47058	59	441	63348
2023	61[B]	549	44015	56	294	19859
2024	64[B]	675	70334	47	49	13554
2025	64[B]	344	31048	60	196	21695

[A] Includes four juvenile toothfish transect trawls.
[B] Includes four extra trawls north of the Loligo Box.

Average *D. gahi* catch density (Figure 2) among fixed-station trawls north of 52° S was 2.03 t km^{-2}; the highest for 2nd pre-seasons since 2022. Average *D. gahi* catch density among fixed-station trawls south of 52° S was 1.46 t km^{-2}; higher than last year (0.91 t km^{-2}) although, like the north fixed stations, well below the long-term median. Average *D. gahi* catch density among adaptive-station trawls north of 52° S was 3.61 t km^{-2}; the first 2nd-season survey to record north adaptive trawls since 2022 and the highest average since 2021. Average *D. gahi* catch density among adaptive-station trawls south of 52° S was 3.54 t km^{-2}; higher than last year and only the third time since 2012 that 2nd-season south adaptive stations had a lower average than north adaptive stations.

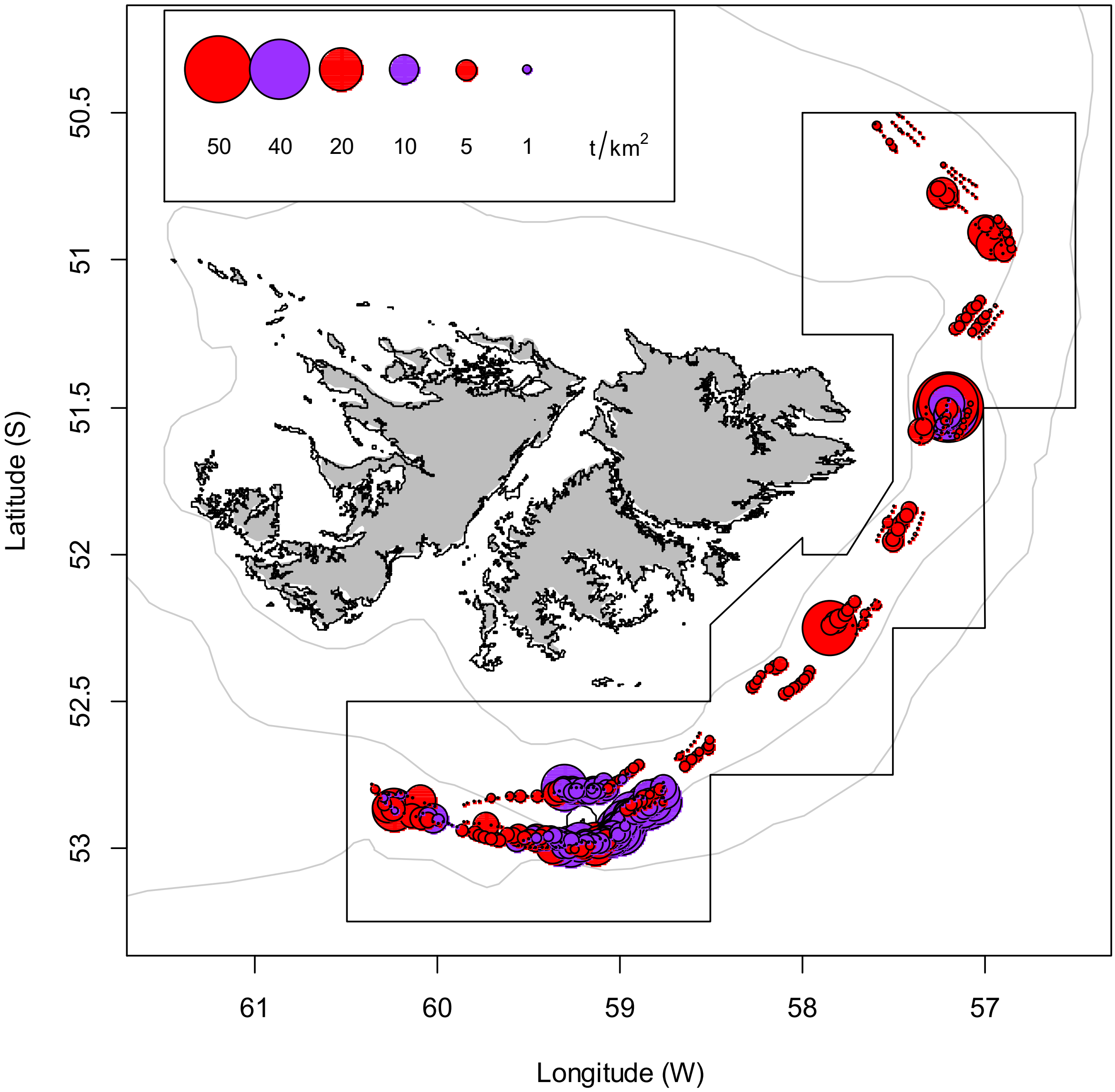


Figure 2. *D. gahi* CPUE (t km^{-2}) of fixed-station (red) and adaptive-station (purple) trawls per 15-minute trawl interval. Boundaries of the 'Loligo Box' fishing zone and the Beauchêne Island exclusion zone (mostly hidden) are traced in black.

Biomass estimation

Total *D. gahi* biomass in the fish stock area was estimated at 21,695 tonnes, with a 95% confidence interval of [17,568 to 31,591 t]. The total biomass estimate was the highest for 2nd pre-seasons since 2022, but lower than the long-term median (5th-lowest over the twenty-year period 2006 to 2025) (Table 1). Partition of the estimated biomass was 7,464 tonnes north [4,281 to 15,818 t] vs. 14,231 tonnes south [11,351 to 18,874 t]. The biomass proportion north (34.4%) was the highest for a 2nd pre-season since 2022. Within the north sub-area 50% of *D. gahi* density was aggregated in 67 of 368 5×5 km area units, and 95% of density was aggregated in 269 of the 368 5×5 km area units (Figure 3). Within the south sub-area 50% of *D. gahi* density was aggregated in 84 of 392 5×5 km area units, and 95% of density was aggregated in 308 of the 392 5×5 km area units (Figure 3).

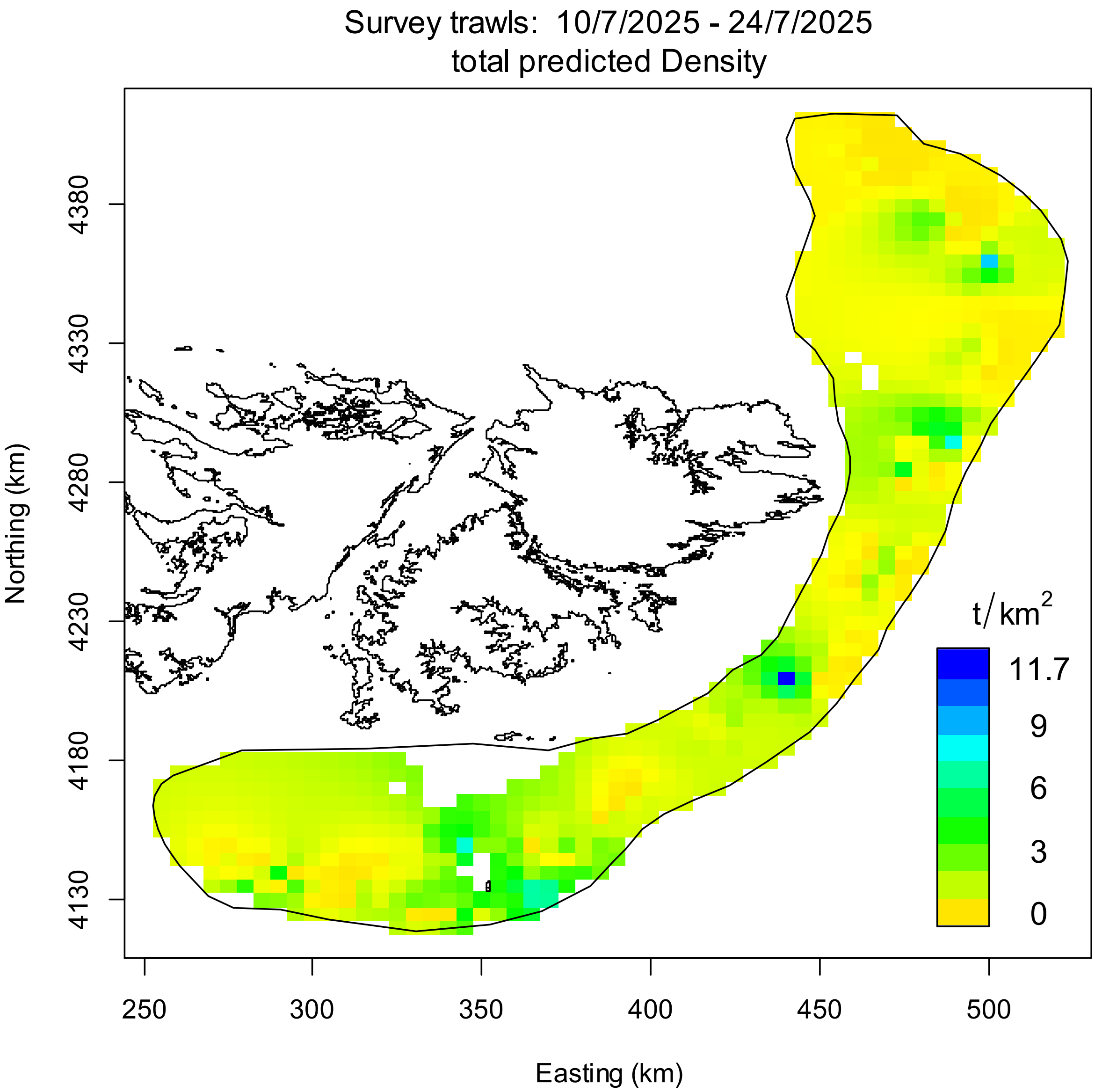


Figure 3. *D. gahi* predicted density estimates per 5 km^2 area units. Blank area units within the perimeter are either <90 or >400 m average depth. Coordinates were converted to WGS 84 projection in UTM sector 21F using the R library rgdal (proj.maptools.org).

Biological data

One hundred and eight taxa were identified in the survey catches (Appendix Table A2). *D. gahi* was the predominant catch but with just 52.6% of the total (Table A2); second-lowest among 2nd pre-season survey catches since 2012, ahead only of last year. Second-highest catch species was common hake *Merluccius hubbsi*, for the fifth time in the last six 2nd pre-season surveys[d], with by far the highest total survey catch on record (Figure 4 – upper left, Table A2). Hake catches were taken on stations throughout the Loligo zone, with the highest concentration in the north (Figure 4 – upper right). Hake catches correlated significantly with depth; very little

[d] Whereby common hake was the highest catch in last year's 2nd pre-season survey (Chemshirova et al. 2024).

hake shallower than 150 m, then increasing with depth (although variable) down to about 250 m (Figure 4 – lower left).

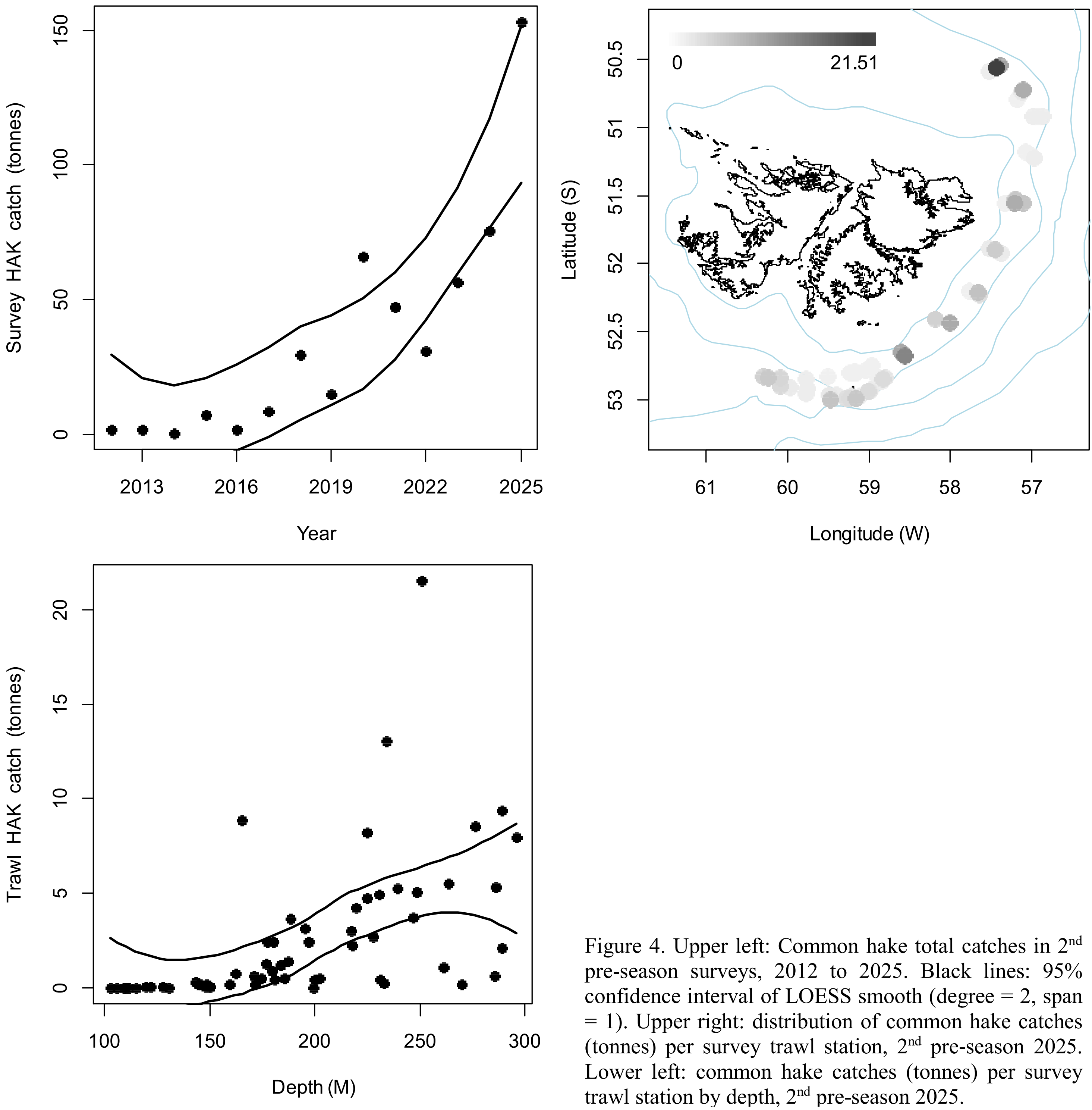


Figure 4. Upper left: Common hake total catches in 2nd pre-season surveys, 2012 to 2025. Black lines: 95% confidence interval of LOESS smooth (degree = 2, span = 1). Upper right: distribution of common hake catches (tonnes) per survey trawl station, 2nd pre-season 2025. Lower left: common hake catches (tonnes) per survey trawl station by depth, 2nd pre-season 2025.

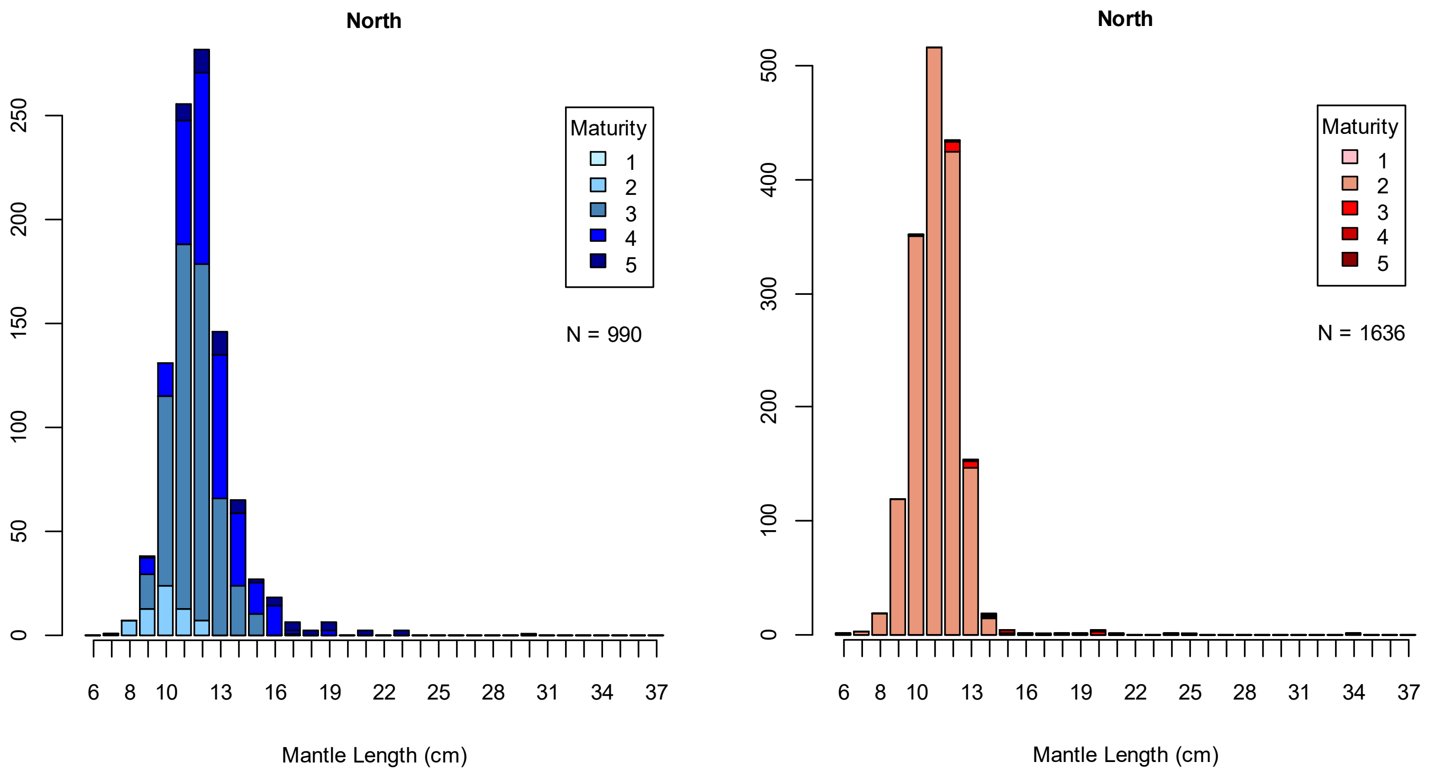
Third-highest catch species was rock cod with 3.5% of total catch, representing the second-highest total and percentage (after 2024) in a 2nd pre-season survey since 2017. Red cod *Salilota australis* followed as the fourth-highest (1.1%), then toothfish at 0.7% (Table A2), the highest percentage and total for 2nd pre-season surveys since at least 2012.

During the survey 8739 *D. gahi* were measured for length and maturity (3814 males, 4925 females), from 58 of the 60 trawl stations. The total sex ratio was statistically significantly ($p < 0.0001$) majority female. Twenty-seven individual trawl stations had a significant preponderance of females, and six individual trawl stations, all shallow stations in the south-west of the Loligo Box, had a significant preponderance of males. The remaining twenty-five sampled trawl stations had no significant sex preponderance.

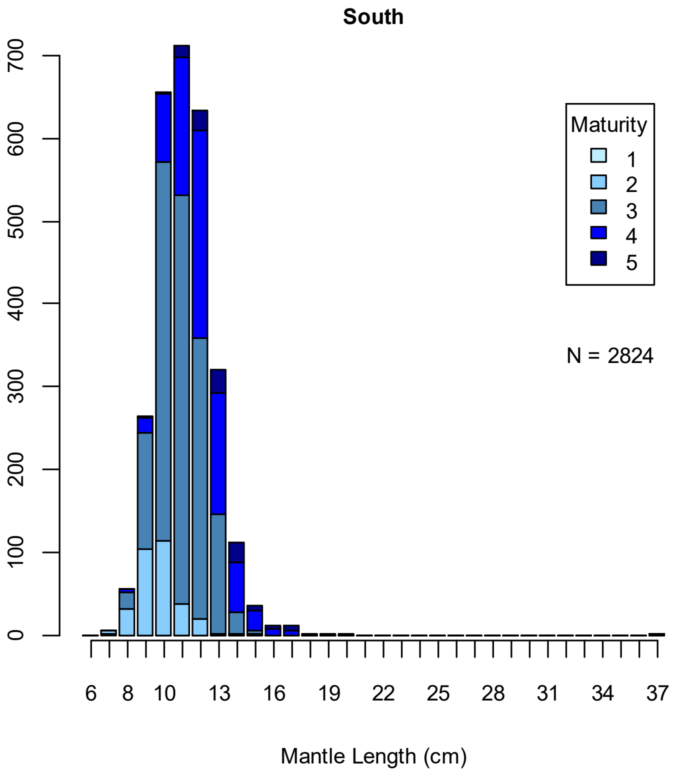
D. gahi mantle length and maturity distributions north and south of 52° S are plotted in Figure 5. For males north: mean mantle length 11.68 cm; mean maturity stage 3.37 (on a scale of 1 to 6[e]), males south: mean mantle length 10.99 cm; mean maturity stage 3.24. Females north: mean mantle length 10.95 cm; mean maturity stage 2.03, females south: 10.53 cm; stage 2.02. Mean mantle lengths of males as well as females were all higher than 2nd pre-season last year, but except for females north below median since 2015. Mantle length distributions and maturities were significantly different between north and south, for both males and females (Kruskal-Wallis test, $p < 0.05$). Mantle lengths of males and females did not show significantly decreasing trends with chronological sampling day throughout the survey time span, standardized for latitude / longitude (GAM; $p < 0.05$), suggesting that substantial levels of immigration did not occur during the survey. The mantle length distributions and maturities also did not suggest a carry-over stock from 1st season (I. Chemshirova, FIFD, personal communication).

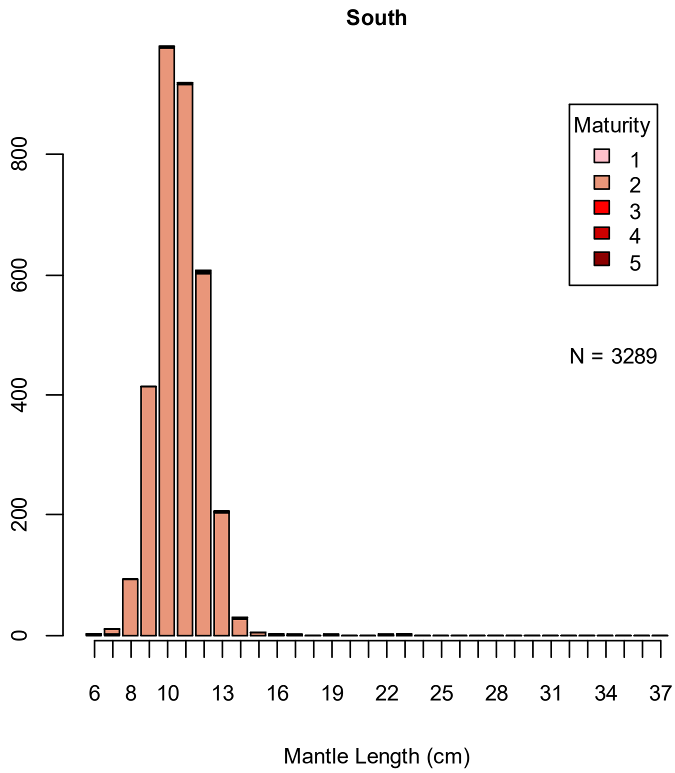
Otoliths taken during the survey are summarized in Table A3.

Figure 5 [below]. Length-frequency distributions by maturity stage of male (blue) and female (red) *D. gahi* from trawls north (top) and south (bottom) of latitude 52 ºS.



[e] Stage 6 was not observed in this survey.





Pinniped and seabird monitoring

The 2nd pre-season survey 2025 was conducted with seal exclusion devices (SED) in all trawls, to align with compulsory SED use in the following commercial X-licence fishery. Pinnipeds were sighted within close range of the vessel on one day, but none were caught in fishing gear, and no seabirds were caught.

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Appendix

Table A1. Survey stations with total *Doryteuthis gahi* catch. Time: Stanley FI time. Latitude: °S, longitude: °W. Transects labelled A were adaptive-station trawls.

Transect / Trawl	Data Station	Date	Start			End			Depth (m)	*D. gahi* (kg)
			Time	Lat	Lon	Time	Lat	Lon		
13 - 35	1	10/07/2025	6:10	50.69	57.22	8:10	50.79	57.04	261	4
12 - 32	2	10/07/2025	9:00	50.86	57.01	11:00	50.98	56.89	119	1470
11 - 29	3	10/07/2025	12:15	51.26	57.05	14:00	51.15	56.94	153	1284
10 - 25	4	10/07/2025	15:30	51.49	57.31	17:15	51.62	57.35	149	1827
2 - 4	5	11/07/2025	6:05	52.86	59.89	7:50	52.83	59.67	160	126
2 - 5	6	11/07/2025	8:40	52.91	59.89	10:35	52.93	59.65	171	1281
3 - 9	7	11/07/2025	11:25	52.99	59.58	13:05	53.00	59.37	241	1281
5 - 14	8	11/07/2025	14:40	52.89	58.95	16:15	52.84	58.75	182	126
9 - 24	9	12/07/2025	6:05	51.98	57.42	7:50	51.86	57.33	285	42
10 - 26	10	12/07/2025	9:25	51.63	57.25	11:20	51.49	57.19	225	7413
A - 1	11	12/07/2025	12:30	51.48	57.19	14:15	51.59	57.26	217	9219
9 - 23	12	12/07/2025	15:50	51.83	57.40	17:40	51.95	57.50	220	2982
11 - 30	13	13/07/2025	6:00	51.28	57.05	7:55	51.17	56.90	270	42
12 - 33	14	13/07/2025	9:15	50.98	56.84	11:00	50.87	56.92	231	1155
13 - 36	15	13/07/2025	12:05	50.76	57.04	14:05	50.68	57.22	293	105
14 - 37	16	13/07/2025	15:25	50.64	57.47	17:05	50.54	57.60	142	441
14 - 39	17	14/07/2025	7:15	50.59	57.31	9:05	50.50	57.47	289	6
14 - 38	18	14/07/2025	10:00	50.52	57.52	12:00	50.61	57.36	251	42
13 - 14	19	14/07/2025	13:20	50.74	57.28	15:15	50.83	57.10	131	2814
12 - 31	20	14/07/2025	15:55	50.87	57.06	17:50	50.98	56.96	143	5019
11 - 28	21	15/07/2025	7:05	51.13	57.01	9:05	51.24	57.15	127	1659
A - 2	22	15/07/2025	10:30	51.46	57.18	12:25	51.60	57.19	228	1344
10 - 27	23	15/07/2025	13:20	51.62	57.15	15:05	51.49	57.07	286	714
9 - 22	24	15/07/2025	17:25	51.82	57.48	19:25	51.95	57.59	163	210
8 - 20	25	16/07/2025	7:05	52.26	57.73	8:50	52.16	57.59	262	168
8 - 19	26	16/07/2025	9:45	52.15	57.69	11:35	52.25	57.84	198	5460
7 - 17	27	16/07/2025	13:10	52.36	58.09	15:05	52.45	58.27	187	1638
6 - 15	28	16/07/2025	16:40	52.59	58.53	18:35	52.70	58.69	166	105
3 - 7	29	17/07/2025	6:00	52.83	59.39	7:55	52.83	59.62	148	651
1 - 2	30	17/07/2025	9:30	52.87	59.97	11:15	52.81	60.19	195	1554
0 - 1	31	17/07/2025	12:35	52.77	60.37	14:30	52.87	60.23	249	4284
1 - 3	32	17/07/2025	15:15	52.87	60.20	17:05	52.92	59.98	229	2604
5 - 12	33	18/07/2025	7:00	52.71	58.88	9:00	52.80	59.07	122	1575
4 - 11	34	18/07/2025	10:20	52.96	59.05	12:20	53.01	59.27	247	7308
A - 3	35	18/07/2025	13:05	52.99	59.24	15:05	52.95	59.00	199	6804
5 - 13	36	18/07/2025	15:55	52.88	58.99	17:55	52.80	58.77	146	2037
4 - 10	37	19/07/2025	6:00	52.80	59.10	8:00	52.82	59.35	109	6510
3 - 8	38	19/07/2025	9:20	52.97	59.37	11:20	52.95	59.62	180	5019
2 - 6	39	19/07/2025	12:50	52.93	59.89	14:45	52.98	59.66	231	2058
A - 4	40	19/07/2025	15:35	52.96	59.53	17:35	52.98	59.26	175	3528
8 - 21	41	20/07/2025	7:00	52.28	57.71	8:50	52.17	57.57	289	294
7 - 18	42	20/07/2025	10:55	52.38	57.95	12:55	52.48	58.09	277	1596
6 - 16	43	20/07/2025	15:00	52.61	58.48	16:55	52.72	58.64	233	1701
A - 5	44	20/07/2025	18:15	52.74	58.93	20:15	52.80	59.15	115	480
A - 6	45	21/07/2025	6:00	52.77	59.05	8:00	52.80	59.30	109	5061
A - 7	46	21/07/2025	9:40	53.00	59.42	11:40	52.99	59.14	217	5439

A - 8	47	21/07/2025	12:30	52.97	59.10	14:30	52.88	58.91	185	11508
A - 9	48	21/07/2025	15:15	52.88	58.90	17:15	52.78	58.76	179	10290
A - 10	49	22/07/2025	6:00	52.79	59.05	8:00	52.81	59.29	105	8148
A - 11	50	22/07/2025	9:30	52.99	59.37	11:30	52.97	59.10	197	6069
A - 12	51	22/07/2025	12:15	52.98	59.07	14:15	52.88	58.89	169	14070
A - 13	52	22/07/2025	15:10	52.86	58.85	17:10	52.86	58.98	148	4158
A - 14	53	23/07/2025	6:00	52.79	59.04	7:55	52.81	59.28	102	3969
A - 15	54	23/07/2025	9:15	52.98	59.31	11:15	52.98	59.56	184	5145
A - 16	55	23/07/2025	13:00	52.94	59.85	15:00	52.89	60.07	201	2037
A - 17	56	23/07/2025	15:55	52.88	60.21	17:55	52.82	60.16	226	462
A - 18	57	24/07/2025	6:00	52.80	59.11	8:00	52.82	59.35	111	3423
A - 19	58	24/07/2025	9:15	52.98	59.35	11:15	52.97	59.09	184	7665
A - 20	59	24/07/2025	12:10	52.99	59.11	14:10	52.88	58.92	177	6321
A - 21	60	24/07/2025	14:50	52.89	58.92	16:50	52.80	58.75	181	6321

Table A2. Empirical estimates of survey total catches by species / taxon. Note that sample weight refers to all samples brought from board, some of which may subsequently not be included in the FIFD database.

Species Code	Species / Taxon	Total catch (kg)	Total catch (%)	Sample (kg)	Discard (kg)
LOL	*Doryteuthis gahi*	196066	52.6	354	670
HAK	*Merluccius hubbsi*	152876	41.0	2684	2075
PAR	*Patagonotothen ramsayi*	12963	3.5	263	7915
BAC	*Salilota australis*	4031	1.1	221	242
TOO	*Dissostichus eleginoides*	2596	0.7	1073	2237
CGO	*Cottoperca gobio*	939	0.3	6	939
MED	Medusa sp.	439	0.1	0	439
NED	*Neolithodes diomedeae*	314	0.1	0	314
PTE	*Patagonotothen tessellata*	293	0.1	26	293
ZYP	*Zygochlamys patagonica*	274	0.1	0	274
DGH	*Schroederichthys bivius*	265	0.1	0	265
RBR	*Bathyraja brachyurops*	203	0.1	0	202
GRC	*Macrourus carinatus*	141	<0.1	15	128
SPN	Porifera	105	<0.1	0	105
RFL	*Dipturus lamillai*	79	<0.1	0	79
ILL	*Illex argentinus*	77	<0.1	11	77
RAY	Rajiformes	67	<0.1	0	67
PAT	*Merluccius australis*	65	<0.1	11	11
RSC	*Bathyraja scaphiops*	64	<0.1	0	64
RGR	*Bathyraja griseocauda*	64	<0.1	0	64
RPX	*Psammobatis* sp.	58	<0.1	0	58
GOC	*Gorgonocephalus chilensis*	54	<0.1	0	54
KIN	*Genypterus blacodes*	52	<0.1	8	52
SQT	Ascidiacea	46	<0.1	0	46
STA	*Sterechinus agassizii*	33	<0.1	0	33
ING	*Onykia ingens*	33	<0.1	0	33
ALG	Algae	28	<0.1	0	28
RAL	*Bathyraja albomaculata*	23	<0.1	0	23
ANM	Anemonia	23	<0.1	0	23
CHE	*Champsocephalus esox*	22	<0.1	7	22
RMC	*Bathyraja macloviana*	17	<0.1	0	17
WHI	*Macruronus magellanicus*	14	<0.1	2	14
UCH	Echinoidea	13	<0.1	0	13
RMG	*Bathyraja magellanica*	12	<0.1	0	12

ILF	*Iluocoetes fimbriatus*	11	<0.1	0	11
BLU	*Micromesistius australis*	11	<0.1	2	11
SHT	Mixed invertebrates	10	<0.1	0	10
RBZ	*Bathyraja cousseauae*	10	<0.1	0	10
POA	*Glabraster antarctica*	8	<0.1	0	8
MYX	Myxine sp.	8	<0.1	0	8
MLA	*Muusoctopus longibrachus akambei*	8	<0.1	1	8
RDO	*Amblyraja doellojuradoi*	7	<0.1	0	7
PAU	*Patagolycus melastomus*	7	<0.1	0	7
ODM	*Odontocymbiola magellanica*	7	<0.1	0	7
FUM	*Fusitriton m. magellanicus*	6	<0.1	0	6
AST	Asteroidea	6	<0.1	0	6
OCM	*Enteroctopus megalocyathus*	5	<0.1	0	5
NEM	*Psychrolutes marmoratus*	5	<0.1	2	5
COG	*Patagonotothen guntheri*	5	<0.1	0	5
CAZ	*Calyptraster* sp.	5	<0.1	0	5
MUL	*Eleginops maclovinus*	4	<0.1	4	4
DGS	*Squalus acanthias*	4	<0.1	0	4
SUN	*Labidiaster radiosus*	3	<0.1	0	3
BDU	*Brama australis*	3	<0.1	2	3
THO	Thouarellinae	2	<0.1	0	2
GRF	*Coelorinchus fasciatus*	2	<0.1	0	2
CRY	*Crossaster* sp.	2	<0.1	0	2
BRY	Bryozoa	2	<0.1	0	2
ASA	*Astrotoma agassizii*	2	<0.1	0	2
ZYX	*Zygochlamys*	1	<0.1	0	1
SEP	*Seriolella porosa*	1	<0.1	1	1
RED	*Sebastes oculatus*	1	<0.1	1	1
PES	*Peltarion spinulosum*	1	<0.1	0	1
OPL	*Ophiura lymani*	1	<0.1	0	1
NEP	Nephtheidae	1	<0.1	0	1
MUU	*Munida subrugosa*	1	<0.1	0	1
MAN	*Mancopsetta* sp.	1	<0.1	0	1
LOS	*Lophaster stellans*	1	<0.1	0	1
EUL	*Eurypodius latreillii*	1	<0.1	0	1
BAO	*Bathybiaster loripes*	1	<0.1	0	1
AUC	*Austrocidaris canaliculata*	1	<0.1	0	1
XXX	Unidentified animal[f]	<1	<0.1	0	<1
WRM	Worm case	<1	<0.1	0	<1
TRP	*Tripylaster philippi*	<1	<0.1	0	<1
TED	*Terebratella dorsata*	<1	<0.1	0	<1
SET	Sertulariidae	<1	<0.1	0	<1
PYX	Pycnogonida	<1	<0.1	0	<1
PRX	*Paragorgia* sp.	<1	<0.1	0	<1
POX	*Chaetopterus variopedatus*	<1	<0.1	0	<1
POL	Polychaeta	<1	<0.1	0	<1
PLB	Primnoidae	<1	<0.1	0	<1
OPV	*Ophiacantha vivipara*	<1	<0.1	0	<1
OPS	*Ophiactis asperula*	<1	<0.1	0	<1
OPH	Ophiuroidea	<1	<0.1	0	<1
ODP	*Odontaster pencillatus*	<1	<0.1	0	<1
OCC	*Octocorallia* sp.	<1	<0.1	0	<1
NUD	Nudibranchia	<1	<0.1	0	<1
NOW	*Paranotothenia magellanica*	<1	<0.1	0	<1
MXX	Myctophidae sp.	<1	<0.1	0	<1
MUO	*Muraenolepis orangiensis*	<1	<0.1	0	<1
MAV	*Magellania venosa*	<1	<0.1	0	<1

[f] Returned to the FIFD laboratory for identification.

LOA	*Loxechinus albus*	<1	<0.1	0	<1
LAP	*Lamellaria patagonica*	<1	<0.1	0	<1
HYD	Hydrozoa	<1	<0.1	0	<1
HOL	Holothuroidea	<1	<0.1	0	<1
GAY	Gastropoda	<1	<0.1	0	<1
FLX	Flabellum sp.	<1	<0.1	0	<1
EGG	Egg mass	<1	<0.1	0	<1
CTA	*Ctenodiscus australis*	<1	<0.1	0	<1
CRI	Crinoidea	<1	<0.1	0	<1
CRB	Crab	<1	<0.1	0	<1
COT	*Cottunculus granulosus*	<1	<0.1	0	<1
CIR	Cirripedia	<1	<0.1	0	<1
CEX	*Ceramaster* sp.	<1	<0.1	0	<1
BIV	Bivalvia	<1	<0.1	0	<1
ALC	Alcyoniina	<1	<0.1	0	<1
AGO	*Agonopsis chiloensis*	<1	<0.1	0	<1
ACS	*Acanthoserolis schythei*	<1	<0.1	0	<1
		372,504		4,694	17,043

Table A3. Summary of otolith sample numbers by species by sex taken during the survey.

Species		N otolith pairs	
		M	F
Toothfish	*Dissostichus eleginoides*	75	94
Common hake	*Merluccius hubbsi*	44	104
Common rock cod	*Patagonotothen ramsayi*	39	44
Red cod	*Salilota australis*	6	16
Ridge-scaled grenadier	*Macrourus carinatus*	3	8
Southern rock cod	*Patagonotothen tessellata*	6	3
Yellowfin rock cod	*Patagonotothen guntheri*	4	5
Frogmouth	*Cottoperca gobio*	7	1
Southern hake	*Merluccius australis*	0	7
Blue whiting	*Micromesistius australis*	5	2
Hoki	*Macruronus magellanicus*	1	3
Icefish	*Champsocephalus esox*	1	3
Crocodile fish	*Agonopsis chiloensis*	2	2
Banded grenadier	*Coelorinchus fasciatus*	0	3
Fathead	*Psychrolutes marmoratus*	1	1
Mullet	*Eleginops maclovinus*	1	1
Kingclip	*Genypterus blacodes*	0	2
Driftfish	*Seriolella porosa*	0	1
Redfish	*Sebastes oculatus*	0	1
Yellowbelly	*Paranotothenia magellanica*	0	1