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Fisheries Organization

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Survey results of the longline survey on NAFO Division 3M

by

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#### **Abstract**

This paper presents the results of the Faroese longline survey carried out in NAFO 3M during the months of June and July in 2021. The 1737 GRT longline vessel “Klakkur” (LOA 51.3 m) conducted the survey. The goal was primarily to provide information about the stock status of the cod stock on Flemish Cap.

#### **Introduction**

The objective of the survey was to cover as much as possible of area 3M with an alternative fishing gear and contrasts the results with those of the EU groundfish survey and the potential inclusion in the assessment of 3M cod in the future. The area covered mainly the shallow area (< 600 m) on Flemish Cap with 101 longline sets of approximately 6000 hooks each (Figure 1).

#### **Results**

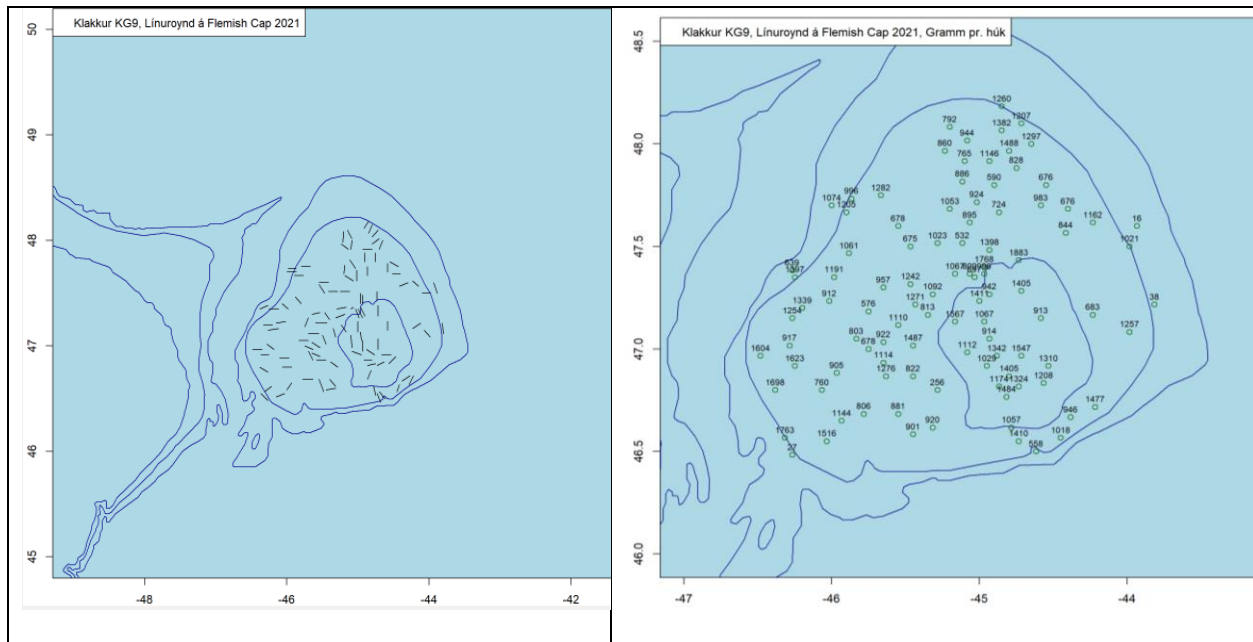
Cod dominated the catch and the overall catch rate of cod was extremely high, 1049 grams per hook (Table 1). In addition to cod other fish species such as Greenland and Atlantic halibut, tusk and spotted wolffish were caught in the survey. The high catch rates of cod were apparent at all depths (shallower than 600 m) and areas on the Flemish Cap (Figure 1). A histogram of the catch rates showed that the catch rates were bell shaped, i.e., most hauls yielded between 600 and 1400 grams per hook (Figure 2). Hence, the overall cpue of cod was well defined since the effect of outliers was very limited in contrast to what is frequently observed in trawl surveys. Biological samples of cod were also taken. A total of 1009 length, 1008 weight and 1005 otoliths (age-readings) measurements were collected. Length composition data and weight-length relationship are displayed in table 2 and figure 3. ALK keys are displayed in table 3. Length distribution disaggregated by age is shown in figure 4. Age groups dominant in the samples ranged from 2 to 11-years old individuals (Figure 4).

Length distributions of other fish species caught in the survey are shown in table 4 and figure 5.

Summarizing statistics such as average length, weight and sample sizes are displayed in table 5.

Length-weight relationships are shown and figure 6.





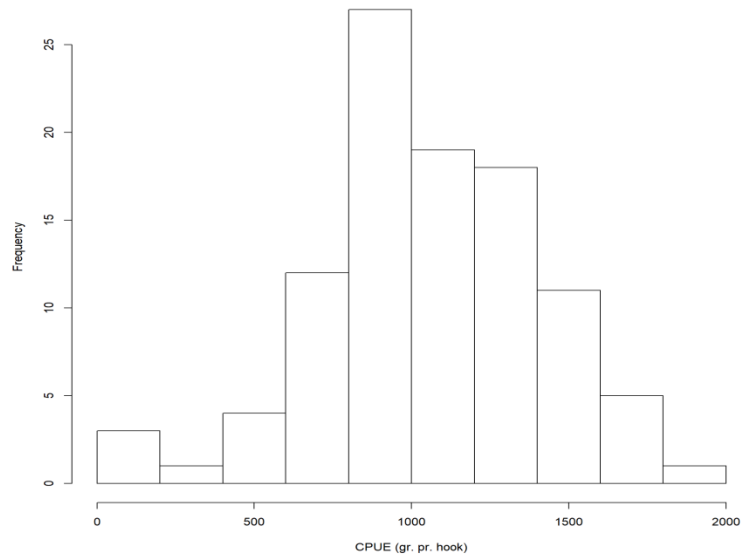
**Figure 1.** Spatial distribution of Faroese longline survey in SA3 (2021)(left). Cod cpue (gram per hook) on the 101 longline sets(right). Depth contours of 200, 500 and 1000 m are shown. 100 out of total 101 sets consisted of 6000 hooks.

**Table 1.** Faroese longline survey on Flemish Cap in June-July 2021. Catch composition and the number of sets where the species was caught.

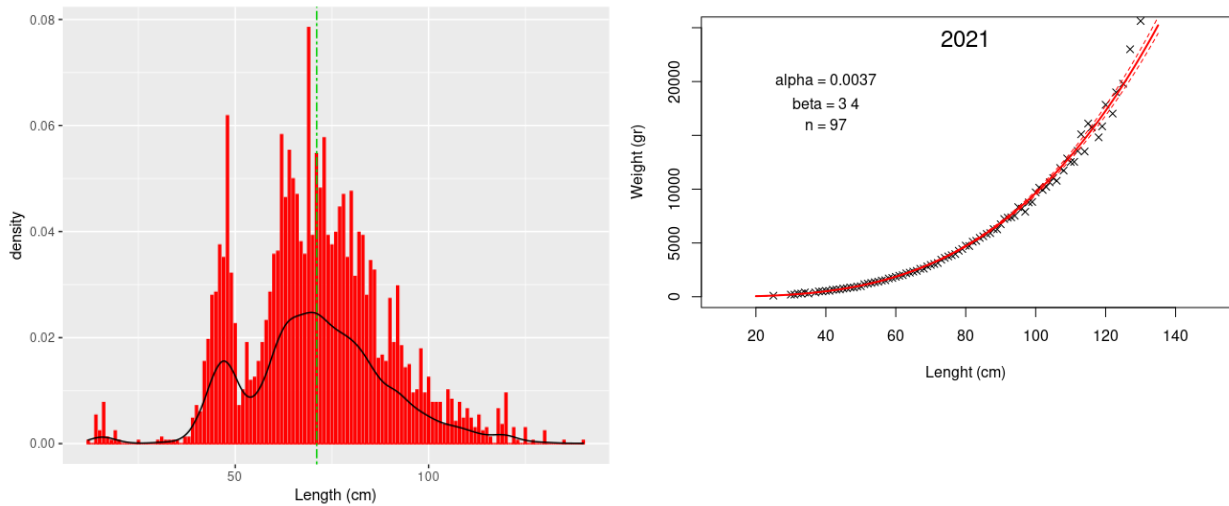
Fish species	Total catch (tons)	Number of sets
Tusk	1.6	34
Atlantic halibut	11.2	76
Spotted wolffish	9.5	95
Greenland halibut	0.2	9
Atlantic cod	630.6	101
<b>Total</b>	<b>653.1</b>	<b>101</b>

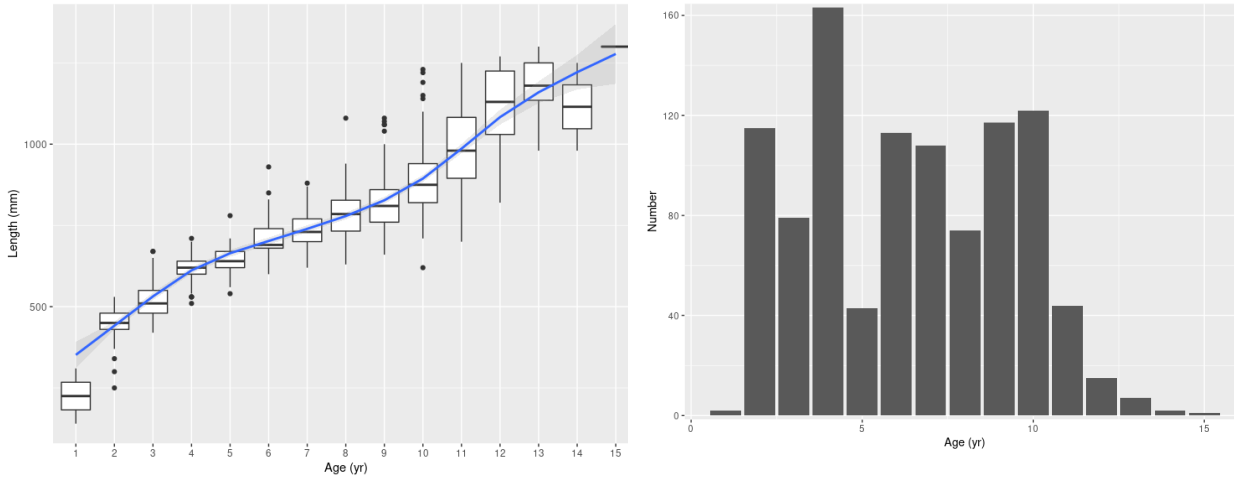
Total number of hooks:	Total cpue kg per hook	Cod cpue kg per hook
601000	1.087	1.049



**Figure 2.** Catch rates of cod (kg per hook) in the Faroese longline survey in SA3 (2021).



**Figure 3.** Length composition data (left) and weight-length relationship (right) of cod in the Faroese longline survey in SA3 (2021). Length measured in cm and weight in gr. Parameters of the weight-length equation are shown.



**Figure 4.** Length distribution disaggregated by age (left) and number of individuals in each age group (right) of cod in the Faroese longline survey in SA3 (2021). Length measured in mm and age in years.

**Table 2.** Length distribution of cod in the Faroese longline survey in SA3 (2021). Length measured in cm.

Length (cm)	n	Length (cm)	n	Length (cm)	n	Length (cm)	n
12	1	50	38	78	79	106	14
14	9	51	12	79	59	107	7
15	4	52	17	80	80	108	13
16	13	53	32	81	53	109	8
17	2	54	20	82	67	110	11
18	1	55	21	83	66	111	8
19	4	56	26	84	47	112	5
20	1	57	32	85	58	113	9
25	1	58	39	86	55	114	4
30	1	59	48	87	27	115	5
31	2	60	60	88	28	116	2
32	1	61	61	89	26	118	11
33	1	62	98	90	46	119	6
34	1	63	78	91	32	120	16
35	1	64	93	92	50	122	5
37	2	65	84	93	31	123	1
38	2	66	79	94	24	125	5
39	8	67	64	95	25	127	1
40	12	68	60	96	16	130	4
41	10	69	132	97	17	135	1
42	26	70	66	98	30	140	1
43	33	71	92	99	16		
44	47	72	81	100	21		
45	48	73	97	101	13		
46	63	74	66	102	13		
47	59	75	63	103	13		
48	104	76	67	104	6		
49	54	77	75	105	17		

**Table 3.** ALK of cod in the Faroese longline survey in SA3 (2021). Length measured in cm and age in years.

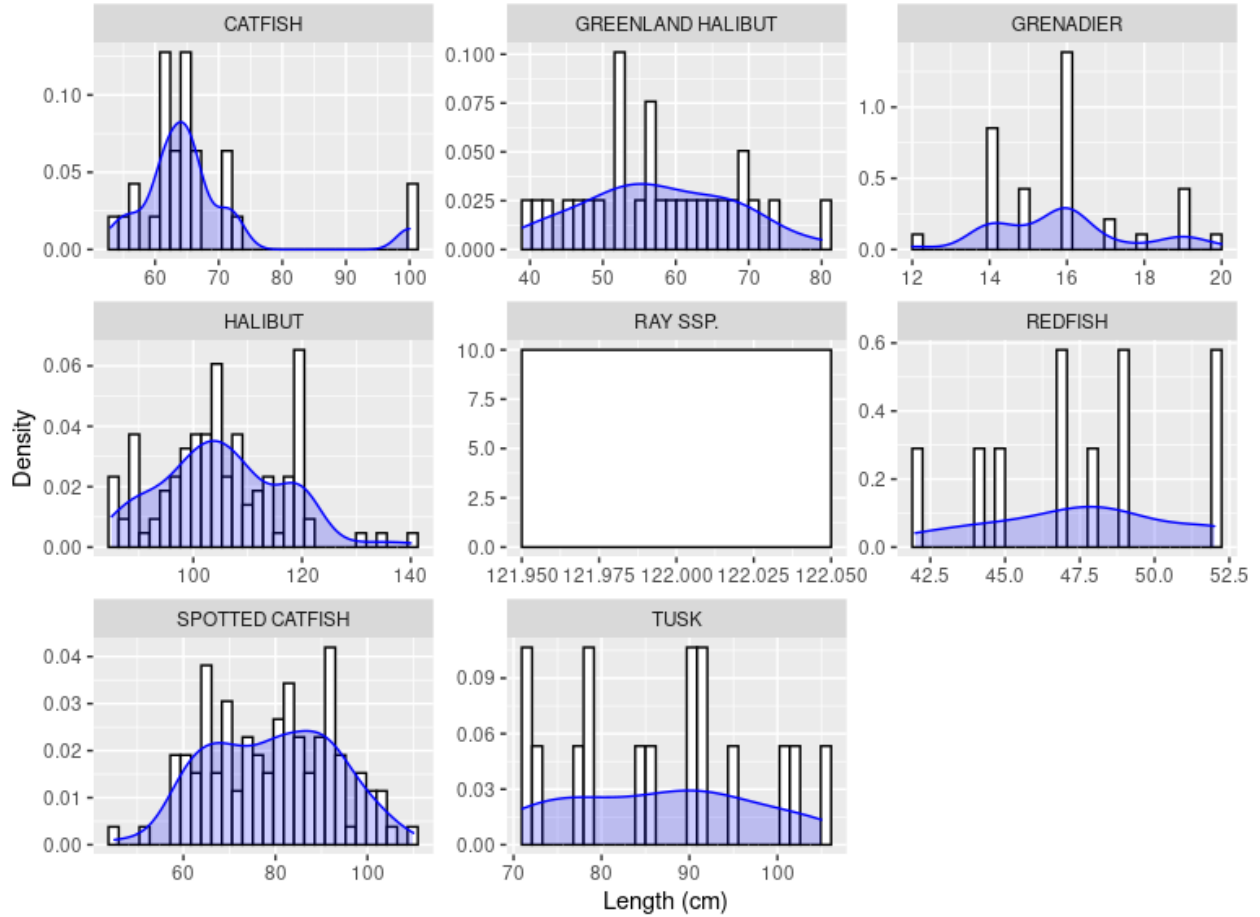
Length (cm)	Age (years)								
	<2	3	4	5	6	7	8	9	10
14	1	0	0	0	0	0	0	0	0
25	1	0	0	0	0	0	0	0	0
30	1	0	0	0	0	0	0	0	0
31	1	0	0	0	0	0	0	0	0
34	1	0	0	0	0	0	0	0	0
37	1	0	0	0	0	0	0	0	0
38	1	0	0	0	0	0	0	0	0
39	3	0	0	0	0	0	0	0	0
40	2	0	0	0	0	0	0	0	0
41	3	0	0	0	0	0	0	0	0
42	11	2	0	0	0	0	0	0	0
43	11	0	0	0	0	0	0	0	0
44	11	4	0	0	0	0	0	0	0
45	14	6	0	0	0	0	0	0	0
46	12	6	0	0	0	0	0	0	0
47	13	1	0	0	0	0	0	0	0
48	22	13	0	0	0	0	0	0	0
49	6	4	0	0	0	0	0	0	0
50	0	2	0	0	0	0	0	0	0
51	0	3	1	0	0	0	0	0	0
52	1	3	0	0	0	0	0	0	0
53	1	10	3	0	0	0	0	0	0
54	0	4	1	1	0	0	0	0	0
55	0	3	6	0	0	0	0	0	0
56	0	4	2	1	0	0	0	0	0
57	0	2	2	0	0	0	0	0	0
58	0	5	1	1	0	0	0	0	0
59	0	0	1	2	0	0	0	0	0
60	0	0	1	2	1	0	0	0	0
61	0	1	1	2	1	0	0	0	0
62	0	0	2	6	2	2	0	0	1
63	0	1	1	6	7	0	1	0	0
64	0	2	1	3	3	3	0	0	0
65	0	1	1	2	3	3	0	0	0
66	0	0	9	5	5	6	0	1	0
67	0	2	5	2	3	3	1	1	0
68	0	0	5	2	1	2	0	0	0
69	0	0	7	2	2	7	1	0	0
70	0	0	1	1	5	4	3	1	1
71	0	0	1	4	6	11	2	2	1
72	0	0	0	0	6	12	2	3	1
73	0	0	0	0	5	11	9	8	0
74	0	0	0	0	6	3	3	8	0
75	0	0	0	0	7	4	5	5	2
76	0	0	0	0	3	3	2	4	2
77	0	0	0	0	4	8	3	6	3
78	0	0	0	1	0	6	5	6	6
79	0	0	0	0	3	5	8	1	2
80	0	0	0	0	1	5	5	9	7
81	0	0	0	0	1	1	0	6	8
82	0	0	0	0	2	4	5	8	9
83	0	0	0	0	2	1	4	5	3
84	0	0	0	0	0	2	2	5	6
85	0	0	0	0	1	0	4	6	8
86	0	0	0	0	0	0	1	4	10

87	0	0	0	0	0	1	0	0	2
88	0	0	0	0	0	1	0	2	5
89	0	0	0	0	0	0	1	5	4
90	0	0	0	0	0	0	1	1	8
91	0	0	0	0	0	0	0	3	3
92	0	0	0	0	0	0	4	6	9
93	0	0	0	0	1	0	0	0	6
94	0	0	0	0	0	0	1	1	5
95	0	0	0	0	0	0	0	0	5
97	0	0	0	0	0	0	0	2	7
98	0	0	0	0	0	0	0	1	7
99	0	0	0	0	0	0	0	0	3
100	0	0	0	0	0	0	0	2	4
101	0	0	0	0	0	0	0	0	3
102	0	0	0	0	0	0	0	0	2
103	0	0	0	0	0	0	0	0	5
104	0	0	0	0	0	0	0	1	0
106	0	0	0	0	0	0	0	2	0
107	0	0	0	0	0	0	0	1	2
108	0	0	0	0	0	0	1	1	3
109	0	0	0	0	0	0	0	0	1
110	0	0	0	0	0	0	0	0	5
111	0	0	0	0	0	0	0	0	3
112	0	0	0	0	0	0	0	0	2
113	0	0	0	0	0	0	0	0	2
114	0	0	0	0	0	0	0	0	2
115	0	0	0	0	0	0	0	0	1
116	0	0	0	0	0	0	0	0	2
118	0	0	0	0	0	0	0	0	3
119	0	0	0	0	0	0	0	0	3
120	0	0	0	0	0	0	0	0	3
122	0	0	0	0	0	0	0	0	1
123	0	0	0	0	0	0	0	0	1
125	0	0	0	0	0	0	0	0	5
127	0	0	0	0	0	0	0	0	1
130	0	0	0	0	0	0	0	0	3

**Table 4.** Length distribution of other fish species caught in the Faroese longline survey in SA3 (2021). Length measured in cm

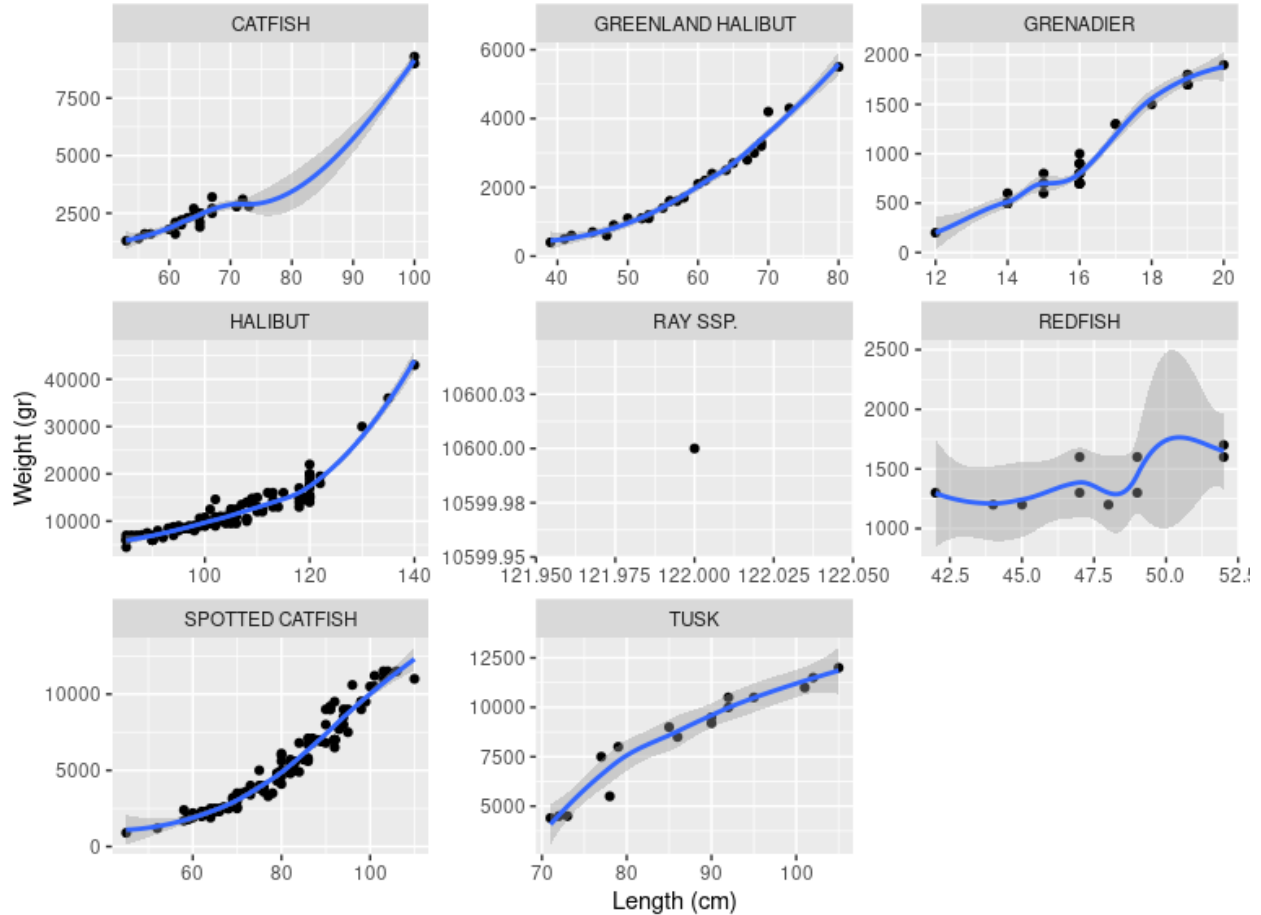
length(cm)	RAY SSP.	CATFISH	G. HALIBUT	GRENADIER	HALIBUT	REDFISH	SPOTTED CATFISH	TUSK
12	0	0	0	1	0	0	0	0
14	0	0	0	8	0	0	0	0
15	0	0	0	4	0	0	0	0
16	0	0	0	13	0	0	0	0
17	0	0	0	2	0	0	0	0
18	0	0	0	1	0	0	0	0
19	0	0	0	4	0	0	0	0
20	0	0	0	1	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
31	0	0	0	0	0	0	0	0
32	0	0	0	0	0	0	0	0
33	0	0	0	0	0	0	0	0
34	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
37	0	0	0	0	0	0	0	0
38	0	0	0	0	0	0	0	0
39	0	0	1	0	0	0	0	0
40	0	0	0	0	0	0	0	0
41	0	0	1	0	0	0	0	0
42	0	0	1	0	0	1	0	0
43	0	0	0	0	0	0	0	0
44	0	0	0	0	0	1	0	0
45	0	0	1	0	0	1	1	0

46	0	0	0	0	0	0	0	0	0
47	0	0	1	0	0	2	0	0	0
48	0	0	1	0	0	1	0	0	0
49	0	0	0	0	0	2	0	0	0
50	0	0	1	0	0	0	0	0	0
51	0	0	0	0	0	0	0	0	0
52	0	0	2	0	0	2	1	0	0
53	0	1	2	0	0	0	0	0	0
54	0	0	0	0	0	0	0	0	0
55	0	1	1	0	0	0	0	0	0
56	0	1	2	0	0	0	0	0	0
57	0	1	1	0	0	0	0	0	0
58	0	0	1	0	0	0	2	0	0
59	0	0	0	0	0	0	3	0	0
60	0	1	1	0	0	0	4	0	0
61	0	3	1	0	0	0	1	0	0
62	0	3	1	0	0	0	3	0	0
63	0	1	0	0	0	0	1	0	0
64	0	2	1	0	0	0	5	0	0
65	0	6	1	0	0	0	2	0	0
66	0	0	0	0	0	0	3	0	0
67	0	3	1	0	0	0	1	0	0
68	0	0	1	0	0	0	3	0	0
69	0	0	2	0	0	0	3	0	0
70	0	0	1	0	0	0	5	0	0
71	0	2	0	0	0	0	1	1	0
72	0	1	0	0	0	0	2	1	0
73	0	1	1	0	0	0	3	1	0
74	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	3	0	0
76	0	0	0	0	0	0	4	0	0
77	0	0	0	0	0	0	1	1	0
78	0	0	0	0	0	0	1	1	0
79	0	0	0	0	0	0	3	1	0
80	0	0	1	0	0	0	6	0	0
81	0	0	0	0	0	0	1	0	0
82	0	0	0	0	0	0	3	0	0
83	0	0	0	0	0	0	4	0	0
84	0	0	0	0	0	0	2	0	0
85	0	0	0	0	4	0	1	1	0
86	0	0	0	0	1	0	5	1	0
87	0	0	0	0	1	0	3	0	0
88	0	0	0	0	1	0	1	0	0
89	0	0	0	0	1	0	3	0	0
90	0	0	0	0	7	0	3	2	0
91	0	0	0	0	1	0	3	0	0
92	0	0	0	0	1	0	7	2	0
93	0	0	0	0	1	0	1	0	0
94	0	0	0	0	2	0	3	0	0
95	0	0	0	0	2	0	2	1	0
96	0	0	0	0	3	0	1	0	0
97	0	0	0	0	2	0	0	0	0
98	0	0	0	0	4	0	3	0	0
99	0	0	0	0	3	0	1	0	0
100	0	2	0	0	6	0	1	0	0
101	0	0	0	0	2	0	2	1	0
102	0	0	0	0	6	0	0	1	0
103	0	0	0	0	2	0	2	0	0
104	0	0	0	0	3	0	1	0	0
105	0	0	0	0	10	0	0	1	0
106	0	0	0	0	4	0	1	0	0
107	0	0	0	0	1	0	0	0	0
108	0	0	0	0	4	0	0	0	0
109	0	0	0	0	4	0	0	0	0
110	0	0	0	0	3	0	1	0	0
111	0	0	0	0	3	0	0	0	0
112	0	0	0	0	1	0	0	0	0
113	0	0	0	0	4	0	0	0	0
114	0	0	0	0	1	0	0	0	0
115	0	0	0	0	1	0	0	0	0
116	0	0	0	0	0	0	0	0	0
118	0	0	0	0	5	0	0	0	0
119	0	0	0	0	2	0	0	0	0
120+	1	0	0	0	17	0	0	0	0



**Figure 5.** Length distribution of other fish species caught in the Faroese longline survey in SA3 (2021). Length measured in cm.





**Figure 6.** Length-weight relation of other fish species caught in the Faroese longline survey in SA3 (2021). Length measured in cm and weight in gr. Blue line is a smoother on the data points.

**Table 5.** Mean length (mm), average weight (gr.) and number of individuals (N) sampled in the Faroese longline survey in SA3 (2021).

Species	mean L	mean W	N
COD	702.5	3616.6	3016
TUSK	867.5	8506.3	16
HALIBUT	1053.0	12036.3	113
SPOTTED CATFISH	793.0	5273.5	117
CATFISH	661.7	2731.0	29
GREENLAND HALIBUT	575.7	1978.6	28
GRENADIER	158.4	897.1	34
RAY SSP.	1220.0	10600.0	1
REDFISH	475.0	1400.0	10

## References

scwp 21-012. Preliminary results from the scientific Faroese longline survey on Flemish Cap 2021. NAFO SC Working Paper 21/012