

**SCIENTIFIC COUNCIL MEETING - JUNE 2017****ESTONIAN RESEARCH REPORT FOR 2016**

by

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This Report contains information for Estonian fishing vessels which operated in NAFO RA in 2016. Vessels targeting shrimp were excluded. Fishery took place only in SA 3. Catch, effort and length distribution information in sub-area 3 is from onboard NAFO observers. In Estonia, NAFO observers are employed by the Estonian Marine Institute, and they are also specially trained to collect basic scientific data.

Sub-area 3**A. Status of the Fishery**

Two vessels were involved in finfish fishery in 2006. There has been mainly one vessel involved in finfish fishery from 2007 to 2012. There were four vessels involved in finfish fishery of which two targeted mainly shrimp and switched to finfish when shrimp catch was poor in 2013. Two vessels were involved in finfish fishery in 2014 but one of them targeted mainly shrimp. In 2015 and 2016 two vessels were fishing only finfish and no fishing for shrimp was carried out.

Total effort has slightly increased in 2016 and was higher than the average of 2006 to 2016. Fishing effort has been fluctuating from 2006 to 2016 (Tables 1-2). According to observer estimated catch and discard data, main target species were RED, GHL and YEL, followed by SKA and COD in 2016 (Table 3).

In addition to effort and discard information, specifically trained NAFO observers collected length, age and sex data. The list of collected data is in Table 4. All lengths are TL and length group (LG) 10 means lengths from 10.0 to 10.9 cm. Mesh size of trawls for finfish fishery in codend was 139-145 mm, for skates 286 mm. Length distributions are presented as sampled number of fish (Tables 5-9, figures 1-5).



Table 1. Fishing effort (hours) of Estonian fleet targeting finfish in NAFO area in 2016 by division and month.

2016 Month	Division				Grand Total
	3L	3M	3N	3O	
1	85	98	18		200
2	328	144	81	8	560
3			279	11	290
4				35	35
5	44		286	92	422
6	342	30			372
7		180	111	113	403
8				32	32
9			248	206	454
10	37	35	261	129	461
11	129		181	110	420
12	22		18		40
Total effort, hrs	985	486	1483	736	3690

Table 2. Fishing effort (hours) of Estonian fleet targeting finfish in NAFO area in 2006-2016 by division.

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
3L	1621	1705	1527	916	1785	1240	531	1413	1425	980	985
3M	1649	367	324	580	1107	1550	243	2534	1260	816	486
3N	567	388	230	20	152	98	796	937	856	999	1483
3O	0	172	8	41	49	50	48	92	423	578	736
Total effort, hrs	3843	2652	2089	1556	3093	2938	1619	4976	3965	3373	3690

Table 3. Observer estimated catch and discard (tonnes) of Estonia in NAFO areas in 2016 by division.

2016 3- Alpha Code	English name	Latin name	3L			3M			3N			3O			All areas
			kept	disc	total	kept	disc	total	kept	disc	total	kept	disc	total	total
COD	Atlantic Cod	<i>Gadus morhua</i>	6.76	3.64	10.39	72.00	0.03	72.03	20.74	0.11	20.85	12.29	0.10	12.39	115,66
GHL	Greenland halibut	<i>Reinhardtius hippoglossoides</i>	520.85	0.08	520.93	64.19	0	64.19	145.46	0	145.46	0	0	0	730.51
PLA	Amer. plaice(=Long rough dab)	<i>Hippoglossoides platessoides</i>	10.46	0.03	10.48	7.35	0.01	7.36	53.69	0.09	53.78	16.94	0.06	17.00	88.43
YEL	Yellowtail flounder	<i>Limanda ferruginea</i>	0	0	0	0	0	0	335.09	0.23	335.32	1.08	0	1.08	336.17
WIT	Witch flounder	<i>Glyptocephalus cynoglossus</i>	1.19	0	1.19	10.56	0.02	10.58	20.59	0.05	20.63	10.97	0.07	11.03	43.31
RED	Atlantic redfishes nei	<i>Sebastes</i> spp	204.19	0.25	204.44	505.10	0.12	505.21	248.34	0.40	248.74	692.96	0.95	693.91	1652,30
RHG	Roughhead grenadier	<i>Macrourus berglax</i>	7.20	0.90	8.10	1.73	0.04	1.77	4.88	1.14	6.01	0	0	0	15,89
GDE	Threebeard rockling	<i>Gaidropsarus ensis</i>	0	0.01	0.01	0	0	0	0	0	0	0	0	0	0,01
CAA	Atlantic wolffish	<i>Anarhichas lupus</i>	0	0	0	0.24	0	0.24	0.24	0	0.24	0	0	0	0.48
SKA	Raja rays nei	<i>Raja</i> spp <i>Melanogrammus</i>	2.28	0	2.28	2.36	0	2.36	141.84	0.09	141.93	20.66	0.01	20.67	167.14
HAD	Haddock	<i>aeglefinus</i>	0	0	0	0.04	0	0.04	1.21	0	1.21	22.64	0.24	22.89	24,13
HKW	White hake	<i>Urophycis tenuis</i>	0	0	0	0	0	0	0	0	0	0	0.20	0.20	0,20
HKS	Silver hake	<i>Merluccius bilinearis</i>	0	0	0	0	0	0	0	0	0	56.81	1.30	58.11	56.81
SQI	Short-finned squid (<i>Illex</i>)	<i>Illex illecebrosus</i>	0	0	0	0	0	0	0	0.06	0.06	0	0	0	0,06
PRA	Northern prawn	<i>Pandalus borealis</i>	0	7.20	7.20	0	0	0	0	13.20	13.20	0	0	0	20,40
HAL	Atlantic halibut	<i>Hippoglossus hippoglossus</i>	5.17	0	5.17	0.99	0	0.99	8.20	0	8.20	13.67	0	13.67	28.03
CAP	Capelin	<i>Mallotus villosus</i>	0	0	0	0	0	0	0.10	0	0.10	5.19	0	5.19	5.30
ANG	American angler (=Goosefish)	<i>Lophius americanus</i>	0	0	0	0	0	0	0	0	0	1.40	0	1.40	1.40
CAS	Spotted wolffish	<i>Anarhichas minor</i>	0	0	0	0.08	0	0.08	0	0.10	0.10	0	0	0	0.08
MZZ	Marine fishes nei	<i>Osteichthyes</i>	0	2.73	2.73	0	2.83	2.83	0	4.03	4.03	0	1.75	1.75	11,34

Table 4. Biological sampling list for Estonia in 2016. *Number of sexed fish; **Only age structures collected, fish not aged yet.

Country	Species Code	NAFO Division	Gear	Month	Type of Sample	Directed/Bycatch/ Discard	No. of samples	No. Measured	No. Sexed*	No. Aged**	No. Weighed
EST	PLA	3N	OTB	5	OC	Kept	1	40	40		40
EST	COD	3L	OTB	6	OC	Kept	1	70	30	70	59
EST	COD	3M	OTB	2	OC	Kept	1	57		57	57
EST	COD	3M	OTB	6	OC	Kept	2	70	20	40	70
EST	COD	3M	OTB	7	OC	Discarded	1	30	30	30	4
EST	COD	3M	OTB	7	OC	Kept	1	60	60		
EST	COD	3N	OTB	2	OC	Kept	1	32		32	32
EST	COD	3N	OTB	5	OC	Kept	4	119	99		119
EST	COD	3N	OTB	6	OC	Discarded	1	20	20	20	10
EST	COD	3O	OTB	5	OC	Kept	1	10	10		10
EST	COD	3O	OTB	7	OC	Kept	1	40	40	30	
EST	GHL	3L	OTB	1	OC	Kept	4	349	201	140	349
EST	GHL	3L	OTB	2	OC	Kept	18	1425	1158	209	1365
EST	GHL	3L	OTB	5	OC	Discarded	1	1		1	1
EST	GHL	3L	OTB	5	OC	Kept	2	79		28	79
EST	GHL	3L	OTB	6	OC	Discarded	1	29		29	29
EST	GHL	3L	OTB	6	OC	Kept	9	378		118	378
EST	GHL	3L	OTB	11	OC	Kept	4	205	205	84	205
EST	GHL	3M	OTB	2	OC	Kept	1	73		73	73
EST	GHL	3M	OTB	10	OC	Kept	1	52	52	20	52
EST	GHL	3N	OTB	1	OC	Kept	3	242		117	242
EST	GHL	3N	OTB	2	OC	Kept	3	234		178	234
EST	GHL	3N	OTB	5	OC	Discarded	1	1		1	1
EST	GHL	3N	OTB	5	OC	Kept	4	288		93	288
EST	GHL	3N	OTB	9	OC	Kept	7	460	460	231	460
EST	GHL	3N	OTB	10	OC	Kept	5	316	316		316
EST	GHL	3N	OTB	11	OC	Kept	1	61	61		61
EST	PLA	3L	OTB	6	OC	Discarded	1	1		1	1
EST	PLA	3N	OTB	5	OC	Kept	2	190	150		190
EST	PLA	3N	OTB	7	OC	Kept	1	40			
EST	PLA	3O	OTB	4	OC	Kept	1	45	25	1	45
EST	RED	3L	OTB	5	OC	Kept	2	190	190	20	120
EST	RED	3L	OTB	6	OC	Kept	18	540	405	190	486
EST	RED	3M	OTB	1	OC	Kept	1	52			52
EST	RED	3M	OTB	2	OC	Kept	1	137		137	137
EST	RED	3M	OTB	6	OC	Kept	1	30	30		30
EST	RED	3M	OTB	7	OC	Discarded	1	20	20		8
EST	RED	3M	OTB	7	OC	Kept	5	181	181		1
EST	RED	3N	OTB	1	OC	Kept	3	244		100	244
EST	RED	3N	OTB	2	OC	Kept	4	397		397	397

EST	RED	3N	OTB	5	OC	Kept	1	1	1	1	1
EST	RED	3N	OTB	6	OC	Kept	1	20	20	20	20
EST	RED	3N	OTB	9	OC	Kept	4	733	733	126	126
EST	RED	3N	OTB	10	OC	Kept	5	1035	1035		
EST	RED	3N	OTB	11	OC	Kept	4	807	807		
EST	RED	3N	OTB	12	OC	Kept	1	201	201		
EST	RED	30	OTB	4	OC	Kept	2	55	46	1	55
EST	RED	30	OTB	5	OC	Kept	6	450	447	89	350
EST	RED	30	OTB	7	OC	Kept	3	110	110	60	60
EST	RED	30	OTB	8	OC	Kept	1	164	164	42	42
EST	RED	30	OTB	9	OC	Kept	5	885	885	168	168
EST	RED	30	OTB	10	OC	Kept	3	610	610		
EST	RED	30	OTB	11	OC	Kept	4	801	801		
EST	WIT	30	OTB	4	OC	Kept	1	19			3
EST	YEL	3N	OTB	3	OC	Kept	7	264			264
EST	YEL	3N	OTB	5	OC	Discarded	1	67	67	30	67
EST	YEL	3N	OTB	5	OC	Kept	6	193	152	7	193
EST	YEL	3N	OTB	7	OC	Kept	1	40	40		
EST	YEL	30	OTB	5	OC	Kept	1	30			30

Table 5. Length distribution (sampled number of fish) of cod in 2015 Estonian fisheries in NAFO area. 0-female, 1-male and ind-unsexed.

LG, cm	3L			3L Total	3M			3M Total	3N			3N Total	3O		3O Total
	0	1	ind		0	1	ind		0	1	ind		0	1	
25															
26						1		1							
27															
28															
29															
30															
31															
32											2		2		
33			1	1	1		2	3	1	2			3		
34		1		1	1	2	1	4							
35	1	1		2	4	3		7	1				1		
36	1			1	1			1		1			1		
37	2			2	1	1		2		1			1		
38	1	2		3	1			1							
39					1			1	3	1			4		
40	1			1	2			2		1			1		
41	3			3	4		1	5		2			2		
42	2			2	1		1	2							
43	3			3	1			1	2				2		
44	1			1						1			1		
45	1			1	2		3	5	1				1		
46									1				1		
47							2	2						1	1
48	1	2	1	4		2	1	3					2	2	4
49	1	1	1	3		2	7	9					1		1
50			2	2	1	1	6	8	1	1			2	2	3
51	1			1			7	7		1			1	5	6
52			3	3	3	1	13	17	1	1	3		5	4	5
53			5	5	6	1	10	17	2	2	2		6	5	9
54			1	1	4	2	13	19	4		8		12	1	2
55	1		5	6	5	3	5	13	2	3	5		10	5	5
56			3	3	5	1	8	14	1		3		4	4	4
57			3	3	5	3	4	12	4	5	4		13	2	2
58			4	4	5	3	5	13	5	2	3		10	1	1
59					2	1	2	5	2	2	5		9		
60		1	3	4	2	1	7	10	4	1	2		7		
61			1	1	5	1	4	10	5	1	4		10	1	1
62			2	2	3	1	2	6	5	1	3		9	2	2
63			1	1		2	2	4	3	2	2		7		
64			1	1	3		1	4		4	2		6		
65						1		1	1	3	2		6	2	2
66			2	2	1	1	1	3	3	3	3		9		
67			1	1					1				1		
68	1		1	2					5		1		6		
69									2				2		
70					2		1	3							
71					1		1	2		1			1		
72															
73															
74									2	1			3		

75											1		1				
76																	
77										1			1				
78																	
79										2	1		3	1		1	
80										2			2				
81										1			1				
82														1		1	
83										1			1				
84											1		1				
85										2			2				
Total	21	8	41		70		73	34	110	217	71	46	54	171	33	17	50

Table 6. Length distribution (sampled number of fish) of Greenland halibut in 2016 Estonian fisheries in NAFO area. 0-female, 1-male and ind-unsexed.

LG, cm	3L			3L Total	3M			3M Total	3N			3N Total
	0	1	ind		0	1	ind		0	1	ind	
20												
21												
22												
23												
24			2	2								
25			1	1								
26												
27												
28										1		1
29												
30	1	1	1	3								
31	2		5	7								
32	1		7	8								
33			3	3								
34	1		7	8					1		5	6
35	4	2	10	16						1	1	2
36	6	2	17	25							5	5
37	5	7	9	21					2	1	2	5
38	10	10	8	28					1		12	13
39	16	9	23	48			1	1	6	6	6	18
40	20	14	31	65					3	5	22	30
41	11	13	48	72			2	2	13	3	38	54
42	20	11	44	75					7	6	30	43
43	24	15	48	87			1	1	15	8	28	51
44	28	25	55	108			3	3	23	9	45	77
45	33	18	35	86			3	3	17	3	43	63
46	39	18	40	97	2		1	3	31	7	52	90
47	64	29	40	133					30	8	56	94
48	61	47	66	174	1	1	4	6	26	9	54	89
49	44	23	60	127			9	9	37	13	67	117
50	64	37	79	180	3	2	12	17	46	19	65	130
51	67	33	71	171	3	1	9	13	52	13	66	131
52	72	44	62	178		2	8	10	51	16	55	122
53	92	32	44	168		1	11	12	50	8	34	92
54	95	24	36	155	3		4	7	45	7	16	68
55	73	22	17	112	5	1	3	9	59	6	20	85
56	62	8	9	79	3		1	4	33	5	12	50
57	43	12	10	65	1		1	2	39	2	7	48
58	38	5	2	45	6			6	29	2	6	37
59	28		2	30	5	1		6	22		3	25
60	23	1	2	26	4			4	14	1	2	17
61	15	2	4	21	3			3	3		2	5
62	10		1	11	1			1	9		3	12
63	9			9	1			1	3		1	4
64	5		1	6	1			1	5			5
65	4			4					2			2
66	5			5								
67	1			1								
68	1			1							1	1
69									3		2	5

70	1			1																
71	2			2						1										1
72																				
73										1										1
74																				
75						1				1				1						1
76																				
77																				
78														1						1
79																				
80			1		1															
81														1						1
82																				
83																				
84																				
85																				
86																				
87			1		1															
Total	1100	464	902		2466	43	9	73		125	679	158	765							1602



Table 7. Length distribution (sampled number of fish) of redfish in 2016 Estonian fisheries in NAFO area. 0-female, 1-male and ind-unsexed.

LG, cm	3L			3L Total	3M			3M Total	3N			3N Total	30			30 Total
	0	1	ind		0	1	ind		0	1	ind		0	1	ind	
15																
16													1	1		2
17														1		1
18													5	1		6
19							1	1	1		1	2		4	1	5
20							1	1	2	5	19	26	7	8	2	17
21	1	6	1	8	1	3	5	9	9	37	59	105	24	53	4	81
22	13	10	4	27	6	10	13	29	40	210	117	367	83	188	4	275
23	20	22	1	43	18	28	13	59	132	358	142	632	171	326	2	499
24	40	38	12	90	24	12	15	51	249	329	143	721	299	343		642
25	66	32	14	112	31	20	17	68	296	234	80	610	405	187		592
26	39	21	13	73	14	5	25	44	281	88	50	419	356	80		436
27	50	30	16	96	21	5	15	41	193	49	19	261	201	36		237
28	28	13	6	47	15		16	31	104	21	5	130	115	16		131
29	21	22	23	66	3		15	18	60	10	1	71	57	11		68
30	15	16	17	48	8	1	9	18	28	3	4	35	39	1		40
31	18	8	12	38	4	1	8	13	22	1	1	24	17			17
32	11	5	8	24			6	6	9	3		12	10	1		11
33	10	4	5	19	1		10	11	6			6	11			11
34	9		1	10			5	5	7			7	3			3
35	11	1		12			3	3	5			5				
36	6		1	7			6	6	1			1	1			1
37	6			6			3	3								
38	2		1	3					1			1				
39																
40	1			1			1	1								
41																
42																
43							1	1								
44																
45									1			1				
46																
47																
48																
49																
50																
51																
52																
53									1			1				
54																
55																
56																
57									1			1				
Total	367	228	135	730	146	85	189	420	1449	1348	641	3438	1805	1257	13	3075

Table 8. Length distribution (sampled number of fish) of American plaice in 2016 Estonian fisheries in NAFO area. 0-female, 1-male and ind-unsexed.

LG, cm	3N			3N Total	30			30 Total
	0	1	ind		0	1	ind	
25	2	2		4				
26	2			2				
27	3	1		4				
28	6	3		9				
29	6	1		7				
30	5	1		6				
31	3	3		6	1		3	4
32	4	1	2	7		1	3	4
33	4	1	3	8	2	3		5
34	7	3	6	16				
35	2	2	3	7		3		3
36	4	3	3	10		2		2
37	11	4	10	25		3	2	5
38	10	3	10	23	2	2		4
39	8	4	11	23	1		2	3
40	3	2	6	11	1		1	2
41	2	4	6	12				
42	3	6	7	16			4	4
43	1	1	1	3	1			1
44	2			2	2			2
45	4	2	2	8			1	1
46			2	2			1	1
47								
48		1		1			1	1
49								
50	4	2	3	9	1		1	2
51	3	1	5	9			1	1
Total	99	51	80	230	11	14	20	45

Table 9. Length distribution (sampled number of fish) of yellowtail flounder in 2016 Estonian fisheries in NAFO area 0-female, 1-male, ind-unsexed and juv-juvenile.

LG, cm	3N			ind	3N Total	30 ind	30 Total
	0	1	juv				
15			1		1		
16							
17							
18			2	1	3		
19			1		1		
20			1		1		
21			2	3	5		
22			2	1	3		
23			11	2	13		
24			22	5	27		
25	1		11		12		
26	1		5	3	9		
27	9	4		6	19		
28	2	1		7	10		
29	3	5		18	26		
30	5	4		19	28		
31	7	8		29	44		
32	16	8		30	54		
33	14	14		28	56		
34	13	4		34	51		
35	18	5		30	53	3	3
36	14	4		28	46	3	3
37	12	3		12	27	1	1
38	9	1		14	24	7	7
39	5	1		5	11	3	3
40	3	1		7	11	3	3
41				6	6	1	1
42	1			3	4	2	2
43	2			6	8	4	4
44	1			5	6		
45	1				1	3	3
46							
47	1				1		
48				3	3		
Total	138	63	58	306	565	30	30

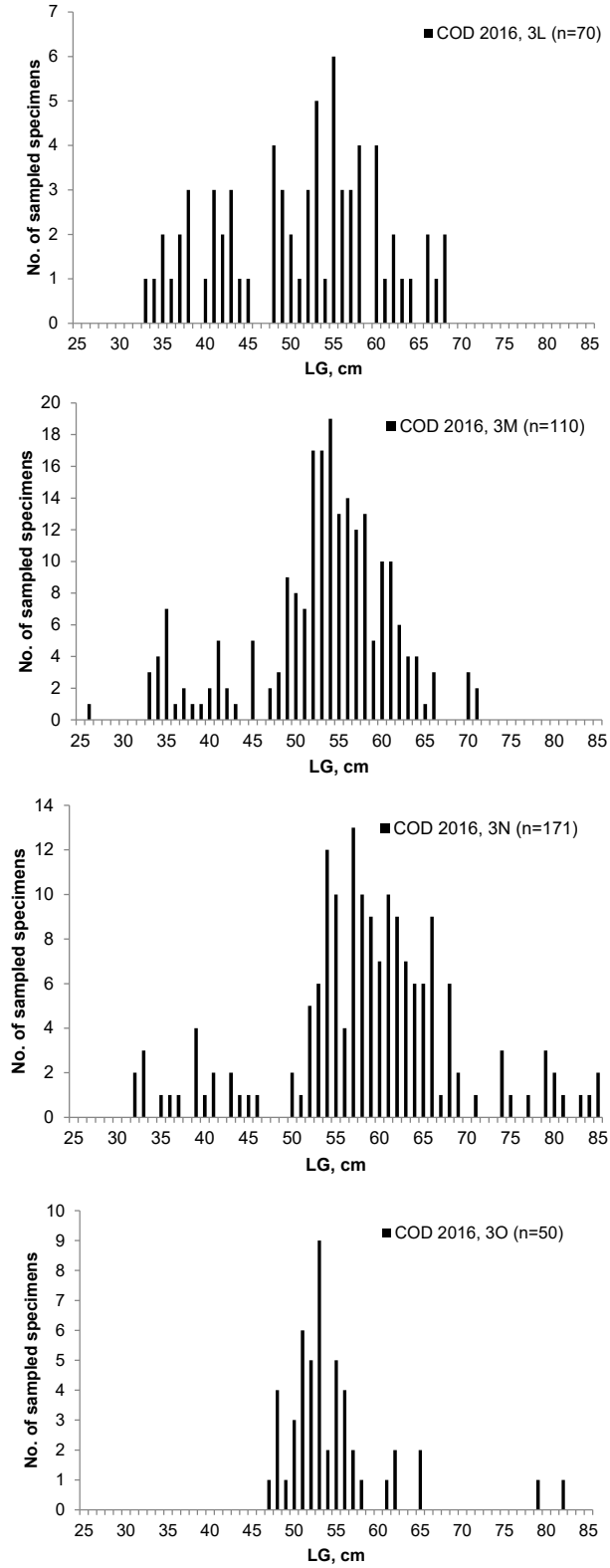


Fig.1 Length distribution (number of sampled specimens) of cod in Div. 3L,3M, 3N and 3O Estonian fisheries in 2016.

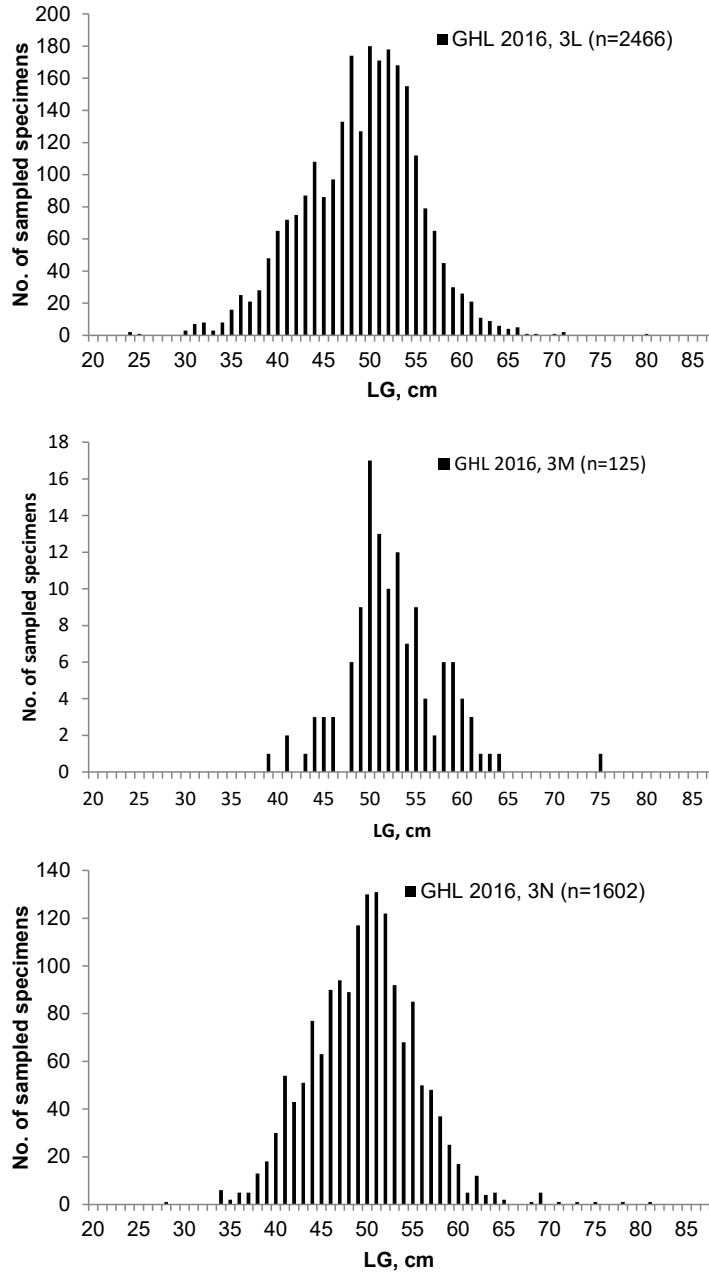


Fig. 2. Length distribution (number of sampled specimens) of Greenland halibut in Div. 3L 3M and 3N Estonian fisheries in 2016.

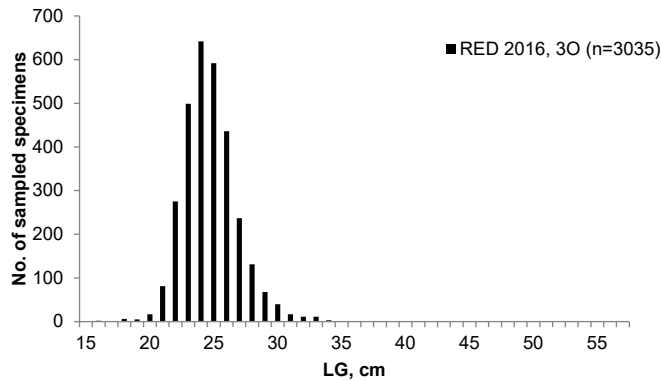
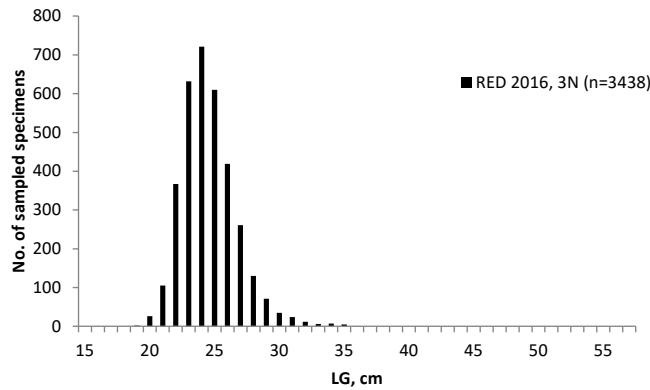
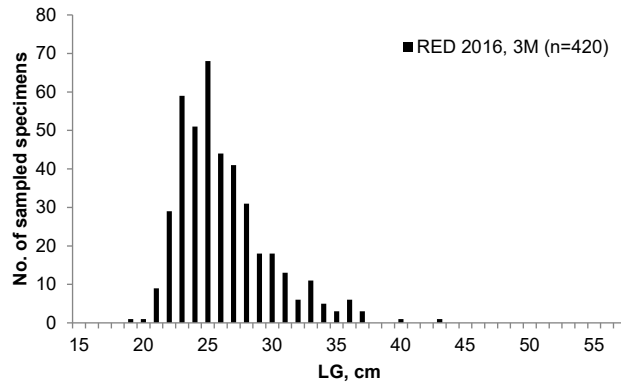
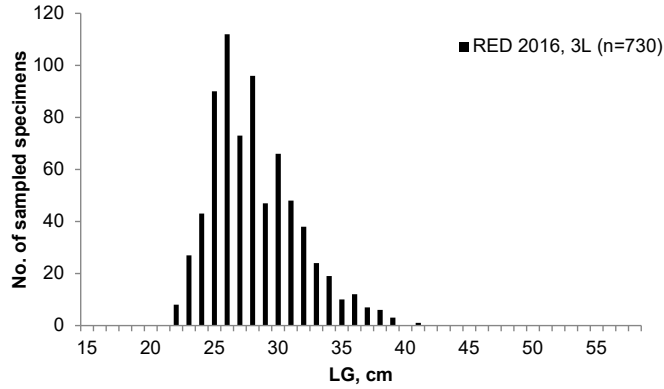


Fig. 3. Length distribution (number of sampled specimens) of redfish in Div. 3L, 3M, 3N and 3O Estonian fisheries in 2016.



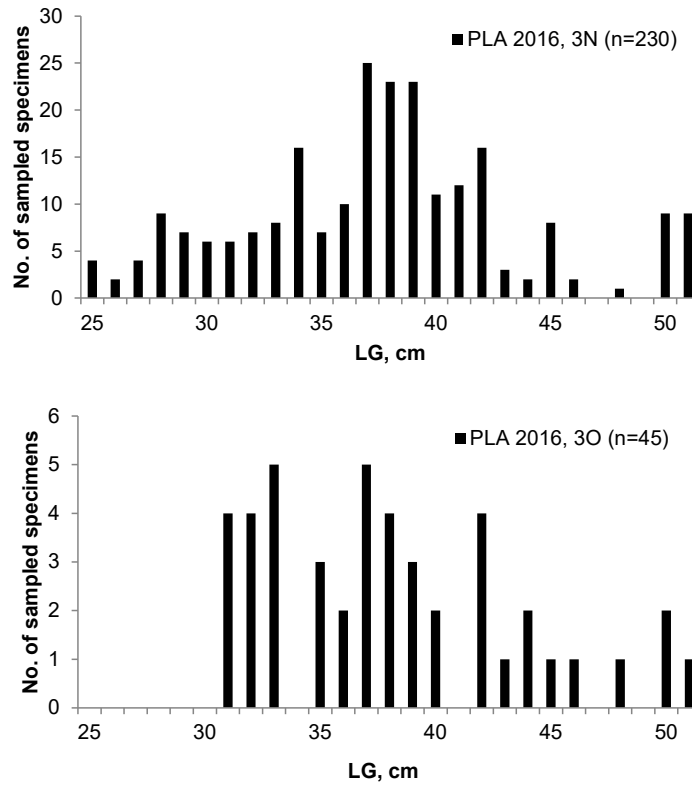


Fig. 4. Length distribution (sampled number of fish) of American plaice in Div. 3N and 3O Estonian fisheries in 2016.

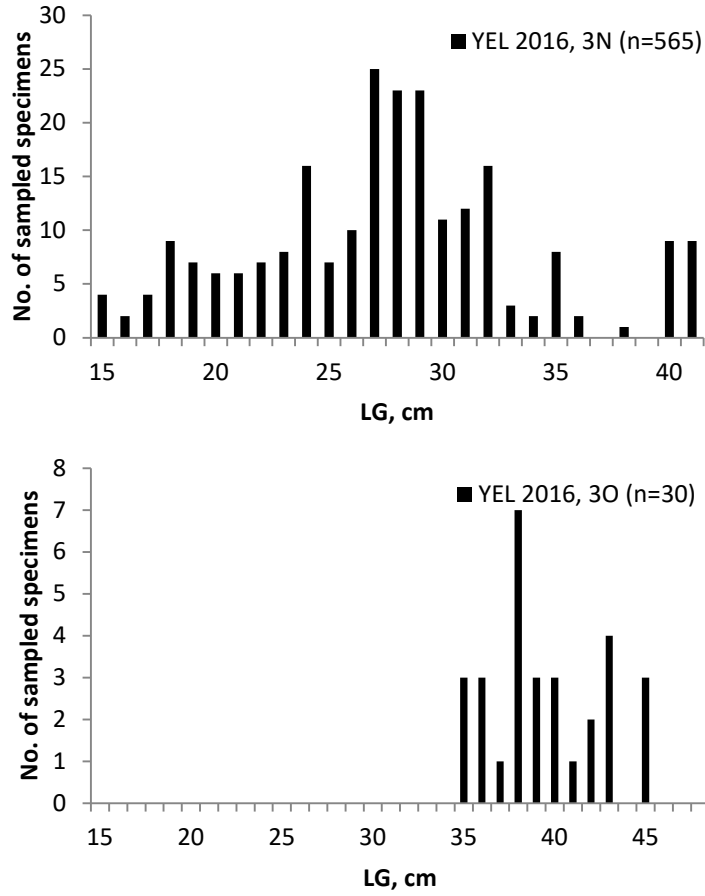


Fig. 5. Length distribution (sampled number of fish) of yellowtail flounder in Div. 3N and 3O Estonian fisheries in 2016.