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SCIENTIFIC COUNCIL MEETING - 2019**ESTONIAN RESEARCH REPORT FOR 2018**

by

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This Report contains information for Estonian fishing vessels which operated in NAFO RA in 2018. 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. In 2017 there was two vessels targeting finfish as new vessels joined the fishing. In 2018 two vessels were fishing all year round.

As new vessels took part of the fishing almost the whole year, then the fishing effort increased significantly in 2017 and remained the almost the same in 2018. Fishing effort has been fluctuating from 2008 to 2018 (Tables 1-2). According to observer estimated catch and discard data, main target species were RED, COD and GHL, followed by YEL and PLA in 2018 (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 2018 by division and month.

2018	<u>Division</u>				
Month	3L	3M	3N	3O	Grand Total
1	15	256	15		287
2	56	590			646
3	188	261	154		603
4	42		244	21	307
5			13	7	19
6	201	172	97	136	606
7	129	767			895
8	280	177			456
9	27	419	32		479
10	323	282	51	41	696
11	320		34	19	373
12			62	6	68
Total effort, hrs	1581	2922	702	229	5434

Table 2. Fishing effort (hours) of Estonian fleet targeting finfish in NAFO area in 2008-2018 by division.

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
3L	1527	916	1785	1240	531	1413	1425	980	985	1022	1581
3M	324	580	1107	1550	243	2534	1260	816	486	2702	2922
3N	230	20	152	98	796	937	856	999	1483	1130	702
3O	8	41	49	50	48	92	423	578	736	560	229
Total effort, hrs	2089	1556	3093	2938	1619	4976	3965	3373	3690	5414	5434

Table 3. Observer estimated retained catch and discard (tonnes) of Estonia in NAFO areas in 2018 by division.

2018			3L			3M			3N			3O			All areas
3-Alpha Code	English name	Latin name	kept	disc	total	kept	disc	total	kept	disc	total	kept	disc	total	total
ANG	American angler (=Goosefish)	<i>Lophius americanus</i>										0.2		0.2	0.2
CAA	Atlantic wolffish	<i>Anarhichas lupus</i>					0.4	0.4							0.4
CAP	Capelin	<i>Mallotus villosus</i>								1.1	1.1				1.1
CAS	Spotted wolffish	<i>Anarhichas minor</i>					0.8	0.8							0.8
COD	Atlantic Cod	<i>Gadus morhua</i>	5.6	0.1	5.7	904.0	3.4	907.4	27.1	0.2	27.3	12.0	0.1	12.1	952.6
GHL	Greenland halibut	<i>Reinhardtius hippoglossoides</i>	639.6	0.2	639.8	85.2	0.1	85.3	1.1		1.1				726.2
GSK	Boreal (Greenland) shark	<i>Somnousus microcephalus</i>		30.5	30.5		7.5	7.5		9.7	9.7		4.0	4.0	51.7
HAD	Haddock	<i>Melanogrammus aeglefinus</i>										0.1		0.1	0.1
HAL	Atlantic halibut	<i>Hippoglossus hippoglossus</i>	5.1		5.1	19.6		19.6	8.3	0.0	8.3	4.8		4.8	37.8
HKS	Silver hake	<i>Merluccius bilinearis</i>										20.4	0.5	20.8	20.8
HKW	White hake	<i>Urophycis tenuis</i>										0.8	0.0	0.8	0.8
MZZ	Marine fishes nei	<i>Osteichthyes</i>		2.5	2.5		10.0	10.0		2.2	2.2		0.9	0.9	15.6
PLA	American plaice(=Long rough dab)	<i>Hippoglossoides platessoides</i>	5.3	0.1	5.5	74.4	1.3	75.7	60.9	0.2	61.1	9.9	0.1	10.1	152.4
POR	Porbeagle	<i>Lamna nasus</i>											0.4	0.4	0.4
PRA	Northern prawn	<i>Pandalus borealis</i>					0.5	0.5							0.5
RED	Atlantic redfishes nei	<i>Sebastes spp</i>	362.4	0.5	362.9	2139.7	5.8	2145.5	377.9	1.0	378.9	401.7	1.2	403.0	3290.3
RHG	Roughhead grenadier	<i>Macrourus berglax</i>	11.9	2.6	14.5	0.4		0.4	0.2	0.0	0.3	0.0			15.2
SHX	Large sharks (NS)	<i>Squaliformes</i>								0.3	0.3		0.8	0.8	1.1
SKA	Raja rays nei	<i>Raja spp</i>	2.9	0.0	2.9	6.9	0.1	6.9	34.2	0.0	34.2	3.4		3.4	47.5
WIT	Witch flounder	<i>Glyptocephalus cynoglossus</i>	0.3	0.0	0.3	22.6	1.1	23.7	1.3		1.3	2.1	0.0	2.1	27.5
YEL	Yellowtail flounder	<i>Limanda ferruginea</i>							348.8	0.0	348.8				348.8

Table 4. Biological sampling list for Estonia in 2018. *Number of sexed fish; **Only age structures collected, fish not aged yet.

Country	Species Code	NAFO Division	Gear	Month	Type of Sample	Retained/ Discarded/ Unsorted	No. of samples	No. Measured	No. Sexed*	No. Aged**	No. Weighed
EST	CAA	3M	OTB	6	OC	Discarded	2	6			6
EST	CAB	3L	OTB	11	OC	Discarded	2	8			8
EST	CAB	3N	OTB	5	OC	Discarded	1	3			1
EST	CAS	3L	OTB	11	OC	Discarded	1	3			3
EST	CAS	3M	OTB	6	OC	Discarded	2	6			6
EST	CAS	3N	OTB	5	OC	Discarded	1	4			
EST	COD	3M	OTB	2	OC	Retained	7	345	345	195	195
EST	COD	3M	OTB	3	OC	Retained	5	266	266	91	166
EST	COD	3M	OTB	6	OC	Discarded	2	101	101		47
EST	COD	3M	OTB	6	OC	Retained	3	170	170		170
EST	COD	3M	OTB	7	OC	Retained	5	153	153	88	153
EST	COD	3M	OTB	8	OC	Retained	3	83	83		83
EST	COD	3M	OTB	9	OC	Discarded	2	50	50	25	50
EST	COD	3M	OTB	9	OC	Retained	3	73	73	48	73
EST	COD	3M	OTB	10	OC	Discarded	3	35	35	10	35
EST	COD	3M	OTB	10	OC	Retained	3	55	55	55	55
EST	COD	3N	OTB	4	OC	Retained	1	43			43
EST	COD	3N	OTB	5	OC	Discarded	1	22	22		22
EST	COD	3N	OTB	12	OC	Discarded	1	18	18		18
EST	GDE	3L	OTB	11	OC	Discarded	3	40			40
EST	GHL	3L	OTB	2	OC	Retained	2	53	20	20	53
EST	GHL	3L	OTB	3	OC	Retained	4	155	89	37	155
EST	GHL	3L	OTB	7	OC	Retained	6	225		165	225
EST	GHL	3L	OTB	8	OC	Retained	3	119		31	119
EST	GHL	3L	OTB	10	OC	Retained	9	523	523	305	523
EST	GHL	3L	OTB	11	OC	Discarded	4	154	149		154
EST	GHL	3L	OTB	11	OC	Retained	1	39	39		39
EST	GHL	3M	OTB	2	OC	Retained	5	173	52	79	173
EST	GHL	3M	OTB	7	OC	Discarded	1	17	17		17
EST	PLA	3N	OTB	5	OC	Discarded	1	7			7
EST	PLA	3N	OTB	6	OC	Retained	2	3	3	3	3
EST	PLA	3N	OTB	11	OC	Retained	1	35	35		35
EST	PLA	3N	OTB	12	OC	Discarded	1	92	92		92
EST	RED	3L	OTB	1	OC	Retained	1	25	25	25	25
EST	RED	3L	OTB	6	OC	Retained	7	661	661	124	327
EST	RED	3L	OTB	10	OC	Retained	1	70	70		70
EST	RED	3M	OTB	1	OC	Discarded	5	13	13	3	7
EST	RED	3M	OTB	1	OC	Retained	11	619	619	109	445
EST	RED	3M	OTB	2	OC	Discarded	12	53	53	6	6
EST	RED	3M	OTB	2	OC	Retained	19	1144	1076	223	291
EST	RED	3M	OTB	3	OC	Discarded	4	15	15	7	7
EST	RED	3M	OTB	3	OC	Retained	5	256	225	83	114
EST	RED	3M	OTB	7	OC	Retained	12	1080	961	189	600
EST	RED	3M	OTB	8	OC	Retained	2	177	177		42
EST	RED	3M	OTB	9	OC	Discarded	3	52	52	2	52
EST	RED	3M	OTB	10	OC	Discarded	3	36	36	11	36
EST	RED	3N	OTB	1	OC	Discarded	1	16	16	10	10
EST	RED	3N	OTB	1	OC	Retained	1	94	94	30	30
EST	RED	3N	OTB	3	OC	Retained	4	163	163	99	163
EST	RED	3N	OTB	4	OC	Retained	2	263	263	41	83
EST	RED	3N	OTB	5	OC	Retained	4	503	503		20
EST	RED	3N	OTB	9	OC	Retained	1	217	217	42	42

EST	RED	3N	OTB	10	OC	Retained	1	175	175	14	14
EST	RED	3N	OTB	11	OC	Retained	2	270	268		
EST	RED	3N	OTB	12	OC	Unsorted	2	103	103	103	103
EST	RED	3O	OTB	4	OC	Retained	2	357	357		84
EST	RED	3O	OTB	5	OC	Retained	4	513	513	33	129
EST	RED	3O	OTB	6	OC	Retained	8	872	791	186	420
EST	RED	3O	OTB	10	OC	Retained	2	544	544	84	84
EST	RED	3O	OTB	11	OC	Retained	1	264	264	42	42
EST	RED	3O	OTB	12	OC	Retained	1	154	154	30	30
EST	RHG	3L	OTB	11	OC	Discarded	1	66			
EST	RHG	3N	OTB	5	OC	Discarded	1	12			
EST	WIT	3M	OTB	7	OC	Discarded	1	14	14		14
EST	YEL	3N	OTB	3	OC	Retained	4	171	104	104	171
EST	YEL	3N	OTB	4	OC	Retained	5	235	235	108	235
EST	YEL	3N	OTB	6	OC	Retained	7	397	397	138	397
EST	YEL	3N	OTB	12	OC	Retained	1	103	103	42	103

Table 5. Length distribution (sampled number of fish) of cod in 2018 Estonian fisheries in NAFO area. 0-female, 1-male and ind-unsexed.

	3M		3M Total	3N			3N Total
LG, cm	0	1		0	1	ind	
25							
26							
27		1	1				
28	1	5	6				
29	6	5	11				
30	4	12	16				
31	7	8	15				
32	12	18	30				
33	6	7	13				
34	3	12	15		1		1
35	4	14	18				
36	3	8	11				
37	2	6	8	1			1
38	5	11	16		1		1
39	2	7	9	2			2
40	2	10	12	4	2		6
41	7	10	17	3	4		7
42	1	7	8	1	3		4
43	6	1	7	3	2		5
44	1	1	2		2		2
45	7	3	10	2	1		3
46	3	3	6	3			3
47	5	3	8	2			2
48	2	11	13	2			2
49	5	3	8				
50	9	11	20				
51	14	12	26		1	2	3
52	7	15	22				
53	7	8	15				
54	9	15	24			1	1
55	10	19	29			2	2
56	10	27	37			4	4
57	17	16	33				
58	15	27	42			4	4
59	31	25	56			3	3
60	27	29	56			1	1
61	23	35	58			6	6
62	28	50	78			2	2
63	18	26	44			2	2
64	20	50	70				
65	34	51	85			3	3
66	19	30	49			2	2
67	18	29	47			2	2
68	20	18	38			2	2
69	21	17	38			5	5
70	25	13	38			1	1
71	10	15	25				
72	14	15	29			1	1
73	12	12	24				
74	13	10	23				
75	5	6	11				

76	2	5	7				
77	5	2	7				
78	3	4	7				
79	5	6	11				
80	2	1	3				
81	2	1	3				
82	1	3	4				
83		4	4				
84	3		3				
85							
86	1		1				
87	1		1				
88	1		1				
89							
90							
91							
92							
93							
94							
95							
96							
97							
98							
99							
100							
101							
102	1		1				
103							
104							
105	1		1				
Total	558	773	1331	23	17	43	83

Table 6. Length distribution (sampled number of fish) of Greenland halibut in 2018 Estonian fisheries in NAFO area. 0-female, 1-male and ind-unsexed.

	3L			3L Total	3M			3M Total
LG, cm	0	1	ind		0	1	ind	
24	1			1				
25	0	1		1				
26	0							
27	0							
28	0							
29	0							
30	0							
31	1		1	2				
32	1	2	1	4				
33	3	2	1	6				
34	9	4		13				
35	4	8		12				
36	20	10	2	32	3	1		4
37	21	14	1	36	1			1
38	10	10	9	29	4	1		5
39	11	7	10	28				
40	11	13	6	30	3	2		5
41	10	9	13	32	3	4		7
42	6	11	18	35	4	4		9
43	15	10	18	43	7	1		9
44	12	7	31	50	5	4		9
45	11	12	36	59	9	3		12
46	23	24	29	76	5	10		16
47	19	17	45	81	9	2		16
48	20	16	61	97	10			14
49	30	8	17	55	11	3		18
50	26	12	14	52	8			10
51	34	14	14	62	9			13
52	19	6	20	45	6			7
53	34	9	21	64	3	1		7
54	23	8	5	36	7			7
55	29	5	8	42	5			5
56	32	6	11	49	8			10
57	17	2	9	28				2
58	24	5	15	44	1			3
59	20		11	31				
60	17	1	8	26				
61	12	1	5	18		1		1
62	14		7	21				

63	4			4				
64	6			6				
65	11			11				
66	1			1				
67	1			1				
68	2			2				
69	1			1				
70	1			1				
71	0							
72	0							
73	0							
74	0		1	1				
Total	484	254	448	1268	11	37	121	190

Table 7. Length distribution (sampled number of fish) of redfish in 2018 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		0	1	ind		0	1	ind		0	1	ind	
16												2			2
17										2	2		2		2
18												1	2		3
19												3	1		4
20					1		1	3			3	4	1		5
21	1		1	2			2	2	10		12	10	12	2	24
22		2	2	2	1		3	3	48		51	18	80	7	105
23	4	4	8		7		7	20	165		185	42	219	6	267
24	6	15	21	8	11		19	56	232		288	114	348	16	478
25	6	42	48	2	8		10	134	172		306	245	292	20	557
26	9	53	62	4	27		31	203	78		281	377	147	21	545
27	20	49	69	5	65	4	74	207	56		263	282	39	9	330
28	37	47	84	16	67	2	85	137	34		171	178	8		186
29	34	53	87	24	161	19	204	93	5		98	83	6		89
30	34	69	103	69	330	26	425	57	5		62	44	3		47
31	50	28	78	120	322	34	476	33	4		37	23			23
32	59	8	67	228	370	55	653	18	1		19	14			14
33	43	4	47	254	230	41	525	18			18	11			11
34	36	1	37	203	135	15	353	5	1		6	9			9
35	17		17	143	38	15	196					2			2
36	11		11	93	38	7	138	2			2				
37	3		3	60	28		88								
38	2	3	5	25	12		37								
39	1		1	26	10		36								
40	1		1	22	4		26					1			1
41				9	1		10								
42				16	3		19								
43	1	1	2	4			4								
44		1	1	4			4								
45	1		1	4			4								
46				3			3								
47				3	2		5								
48				2			2								
49				1			1								
50				1			1								
51				1			1								
52				1			1								
53															
54															
55															
56															
57															
58															
59															
60															
61															
62															
63															
64															
65															
66															
67				1			1								
Total	376	380	756	1356	1870	218	3445	991	811	2	1804	1463	1160	81	2704

Table 8. Length distribution (sampled number of fish) of yellowtail flounder in 2018 Estonian fisheries in NAFO area 0-female, 1-male and ind-unsexed.

	3N			3N Total
LG, cm	0	1	ind	
25		1		1
26	1			1
27				
28				
29		3		3
30				
31		6		6
32	4	10	2	16
33	1	20	4	25
34	6	67	2	75
35	52	35	4	91
36	60	46	6	112
37	48	15	5	68
38	68	37	12	117
39	98	24	8	130
40	73	20	12	105
41	51	6	5	62
42	16	1	2	19
43	14	1		15
44	14		3	17
45	10	1		11
46	14			14
47	6		2	8
48	4			4
49	1			1
50	1			1
51	1			1
52				
53	1			1
54	1			1
55				
56	1			1
Total	546	293	67	906

Table 9. Length distribution (sampled number of fish) of American plaice in 2018 Estonian fisheries in NAFO area 0-female, 1-male and ind-unsexed.

	3N			3N Total
LG, cm	0	1	ind	
26		1		1
27	4	4		8
28				
29	1	2	1	4
30		5	2	7
31	9	5	3	17
32	5	8	1	14
33	6	10		16
34	5	12		17
35	4	16		20
36	2	10		12
37	1	4		5
38	1			1
39	3	2		5
40	3			3
41	2	1		3
42	1			1
43				
44				
45				
46	1			1
47				
48				
49				
50				
51				
52				
53	1			1
54				
55				
56				
57				
58				
59				
60	1			1
Total	50	80	7	137

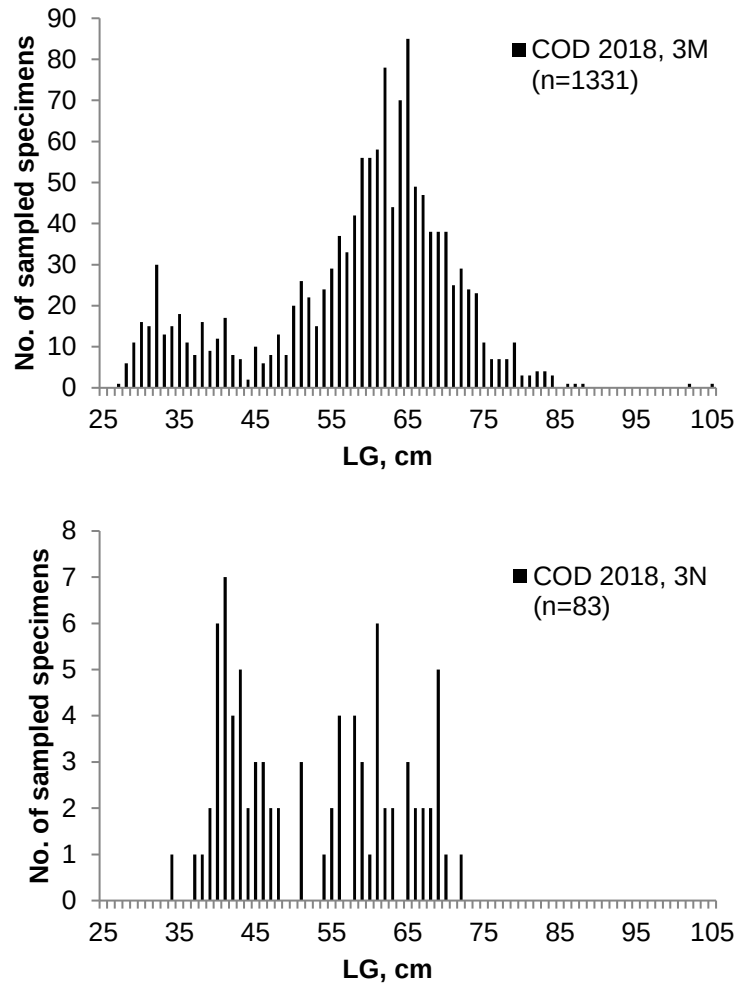


Figure 1. Length distribution (number of sampled specimens) of cod in Div. 3N and 3M Estonian fisheries in 2018.

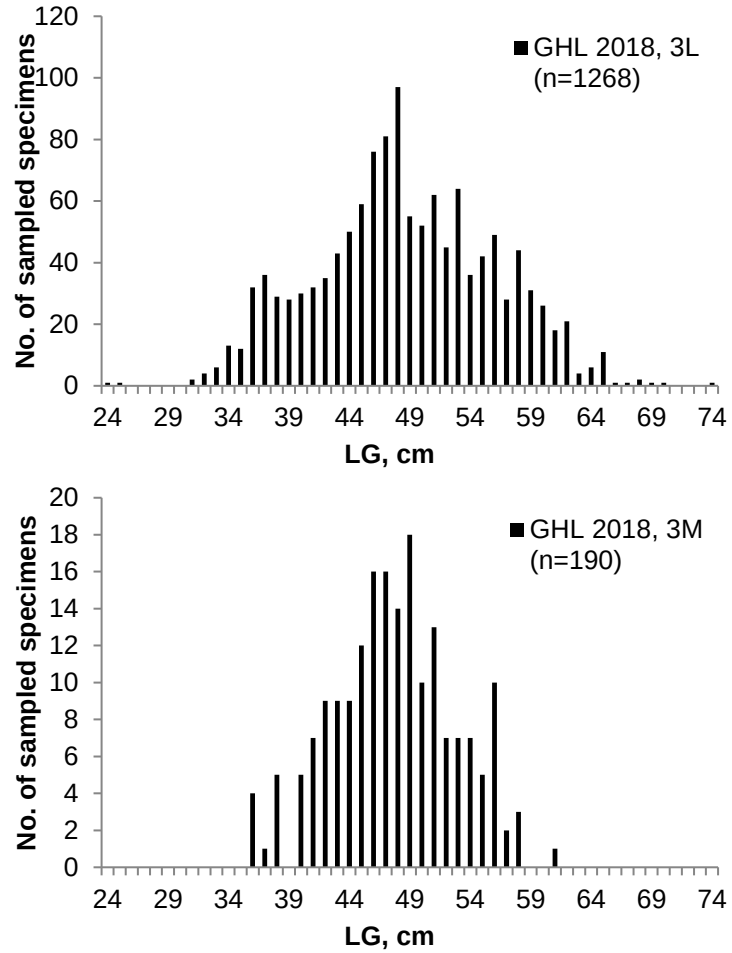
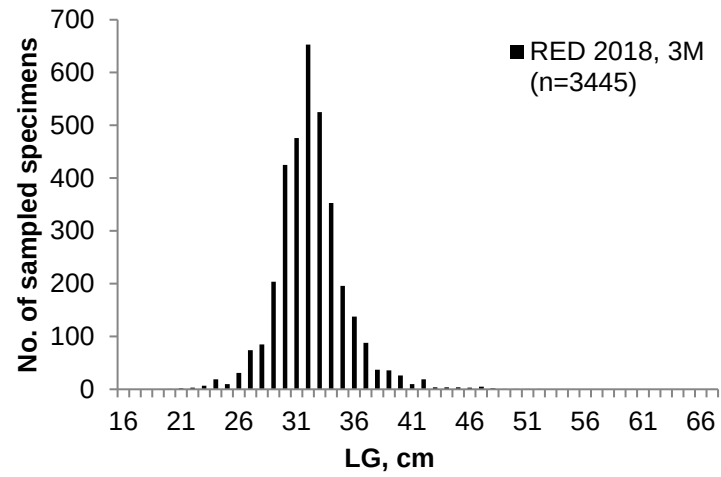
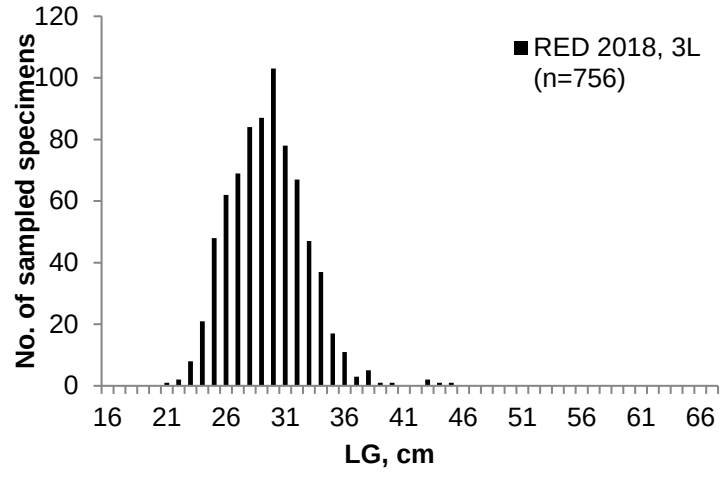


Figure 2. Length distribution (number of sampled specimens) of Greenland halibut in Div. 3L and 3M Estonian fisheries in 2018.



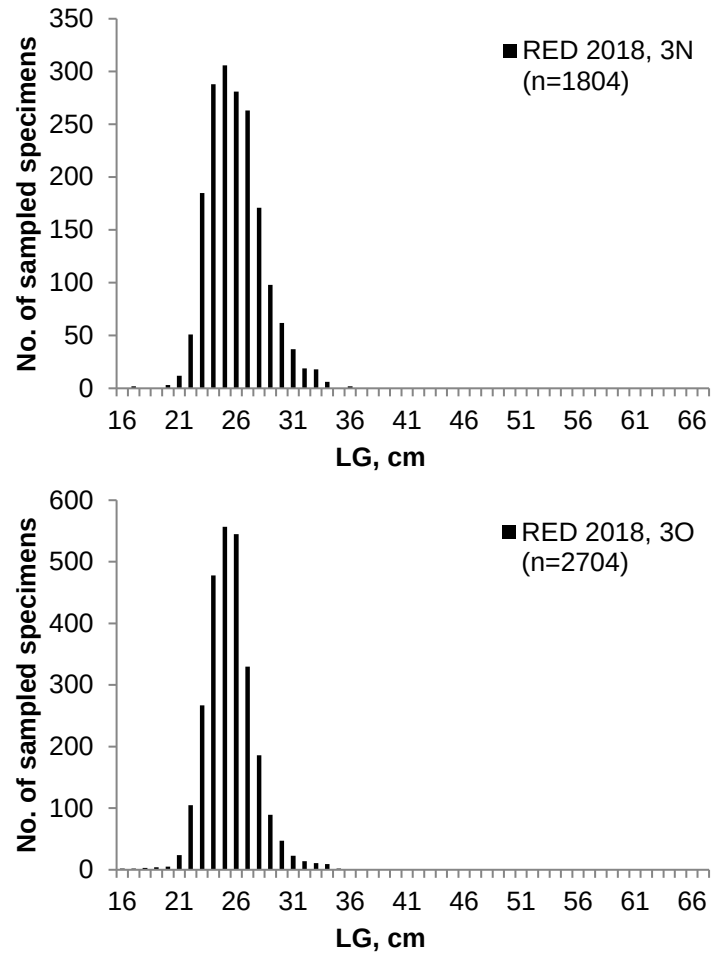


Figure 3. Length distribution (number of sampled specimens) of redfish in Div. 3L, 3M, 3N and 3O Estonian fisheries in 2018.

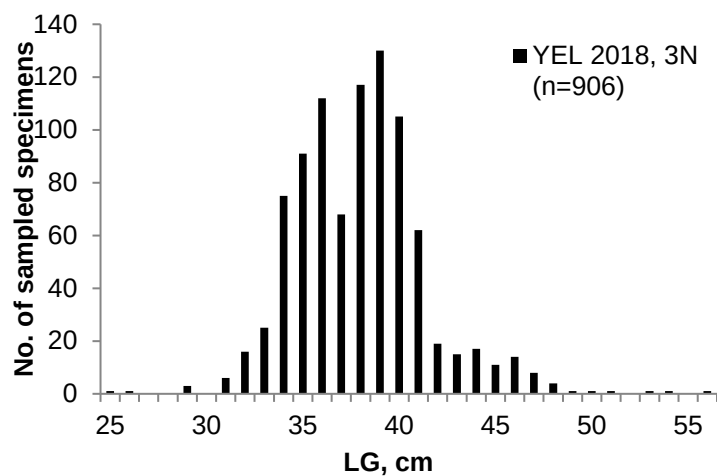


Figure 4. Length distribution (sampled number of fish) of yellowtail flounder in Div. 3N Estonian fisheries in 2018.

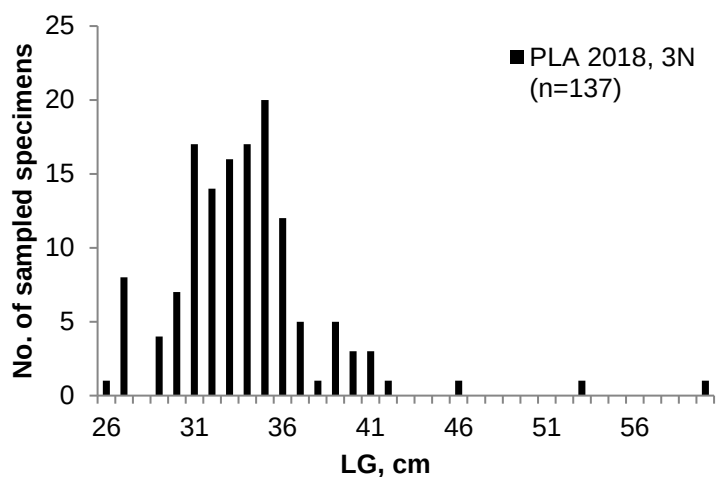


Figure 5. Length distribution (sampled number of fish) of American plaice in Div. 3N Estonian fisheries in 2018.