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**Data proposed for use in Operating Models for the 2023 Management Strategy Evaluation Review for Greenland Halibut in NAFO Subarea 2 and Divisions 3KLMNO**

Paul Regular<sup>1</sup>

<sup>1</sup>Fisheries and Oceans Canada, P.O.Box 5667, St. John's, NL, A1C 5X1, Canada

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**Abstract**

This document outlines the data products proposed for use in the Operating Model development for the upcoming Management Strategy Evaluation (MSE) review process for Greenland halibut in NAFO divisions 2+3KLMNO. The proposed data are largely the same as those used in the 2017 MSE process, barring a minor modification to the Canadian survey indices and a potential augmentation of the EU-Spain surveys. For the Canadian indices, inshore strata that are no longer surveyed are now excluded from the stratified analyses to produce a more consistent index. Though these strata were occupied by halibut, the area is relatively small and, as such, the exclusion of these data had a minor impact on the indices (<5% difference). Finally, data from the EU-Spain survey of 3L are considered and the potential utility of these data in the Operating Models are discussed.

**Background**

The Greenland Halibut stock in NAFO Subarea 2 and Divisions 3KLMNO has been managed using a harvest control rule (HCR) since 2010. Since 2017, TACs have been set based on a HCR adopted in 2017 (NAFO, 2017). This Management Strategy was tested using operating models (OMs) derived from two assessment model formulations: 1) a statistical-catch-at-age (SCAA) model (Rademeyer and Butterworth, 2017), and 2) a state-space model (SSM) (Regular et al., 2017). The Management Strategy applied for Greenland halibut is currently under review and a first step in this process is to review the data products utilized in the OMs. The products proposed for use are largely the same as those considered in the 2017 Management Strategy Evaluation (MSE) process, with some minor modifications to the Canadian survey indices. Currently available information includes:

- Landings (kt; 1960-2021)
- Catch at age (numbers; 1975-2021)
- Catch weights at age (kg; 1975-2021)
- Aggregate (mean weight (kg) per tow) and age dis-aggregated (mean numbers per tow) indices from the following surveys:
  - Canada Autumn 2]3K (1996-2021)



- Canada Autumn 3LNO (1996-2020)
- Canada Spring 3LNO (1996-2019)
- EU 3M 0-1400m (2004-2021)
- EU 3M 0-700m (1995-2003)
- EU-Spain 3NO (1997-2021)
- EU-Spain 3L (2003-2019)

Note that an integrated EU-Spain 3LNO (2003-2019) index is also an option.

## Methods

As noted in Regular et al. (2022) and elsewhere, several inshore strata and some deep water strata are rarely covered by the Canadian surveys. Strata greater than 750 m were previously excluded from the indices calculations for the Autumn and Spring surveys of 3LNO; however, data from inshore strata (strata 608-616 in NAFO division 3K and strata 784-800 in NAFO division 3L) have yet to be excluded. This area constitutes less than 6% and 4% of the total area of the 2J3K and 3LNO surveys, respectively. To generate a more consistent index, data collected from these strata were excluded from the stratified analyses. The resultant indices were compared to the previously used indices that include data from these strata. See Figure 1 for a depiction of the proposed core strata.

## Results and discussion

Since the area of the inshore strata was small relative to the total area of the 2J3K and 3LNO surveys, the exclusion of data from these discontinued strata had a minor impact on the resultant indices (<5% difference). The proposed Canadian indices that utilize only the core strata are therefore effectively the same as the indices used in the previous MSE process. Nevertheless, Canadian indices based on core strata are proposed for use as it constitutes a more consistent index. The full set of proposed data products, which exclude data from the inshore strata, for use in OM development are listed in Tables 1-5 below.

As demonstrated previously (NAFO, 2017), there is general consistency in the indices at age across surveys (Figure 2). Poor correspondence of ages 4 and below in the EU 3M surveys indicates that an inconsistent portion of the younger component of the stock resides on the Flemish Cap. Residual patterns for these indices from both the SCAA and SSM models are correspondingly large (Rademeyer and Butterworth, 2017; Regular et al., 2017). Though excluded from the OMs when evaluated previously, correlations are generally positive with EU-Spain 3L index. Correlations are also stronger when these data are integrated to produce a EU-Spain 3LNO index. The trade-off with this integration is that it truncates the time series, so the benefits of improved between-survey correlation may be lost due to its relatively short time-series. Given the difficulty with anticipating how these patterns might affect the OMs, it is recommended that three options be considered: 1) utilize only the EU-Spain 3NO index as done previously, 2) utilize both the EU-Spain 3NO and 3L indices, 3) utilize the 3U-Spain 3LNO index.

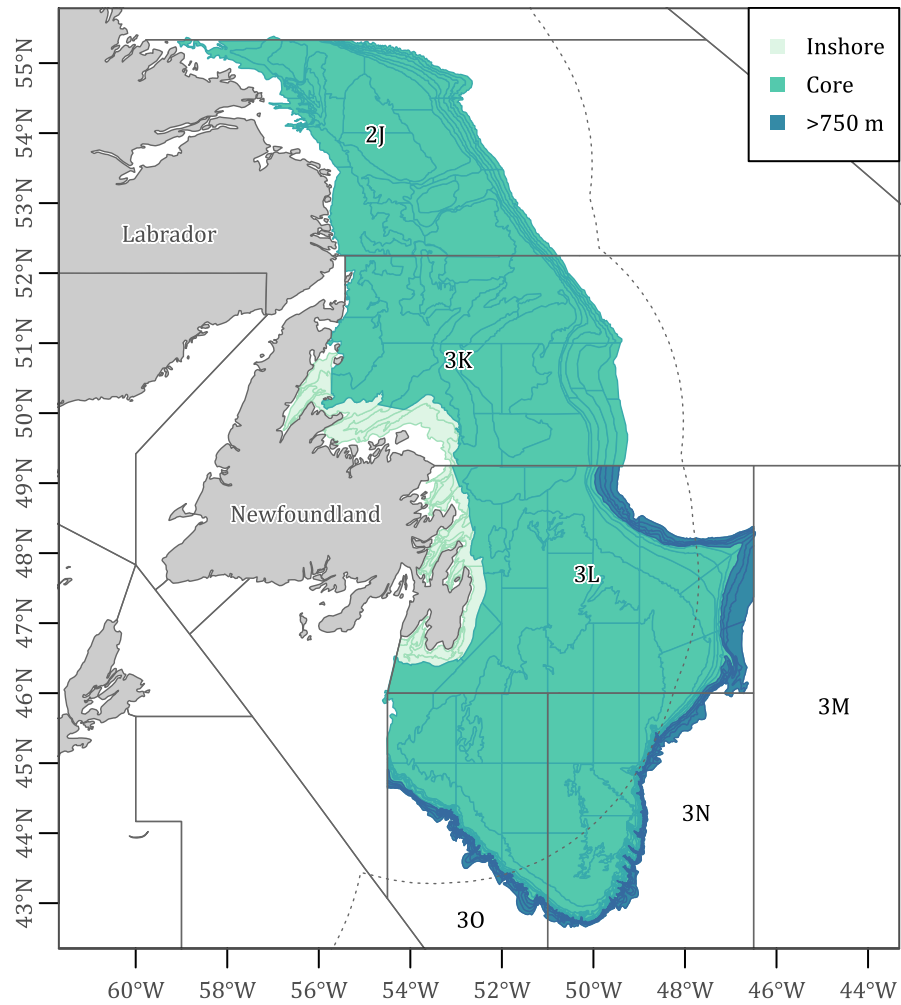
## Acknowledgements

These data sources would not exist without the extensive efforts of the scientific sampling teams, crews of the survey vessels, and age reading technicians. I thank Fernando González, Doug Butterworth, Ricardo Alpoim, Diana Gonzalez and others for their valuable suggestions and careful checking of this document and the data within.

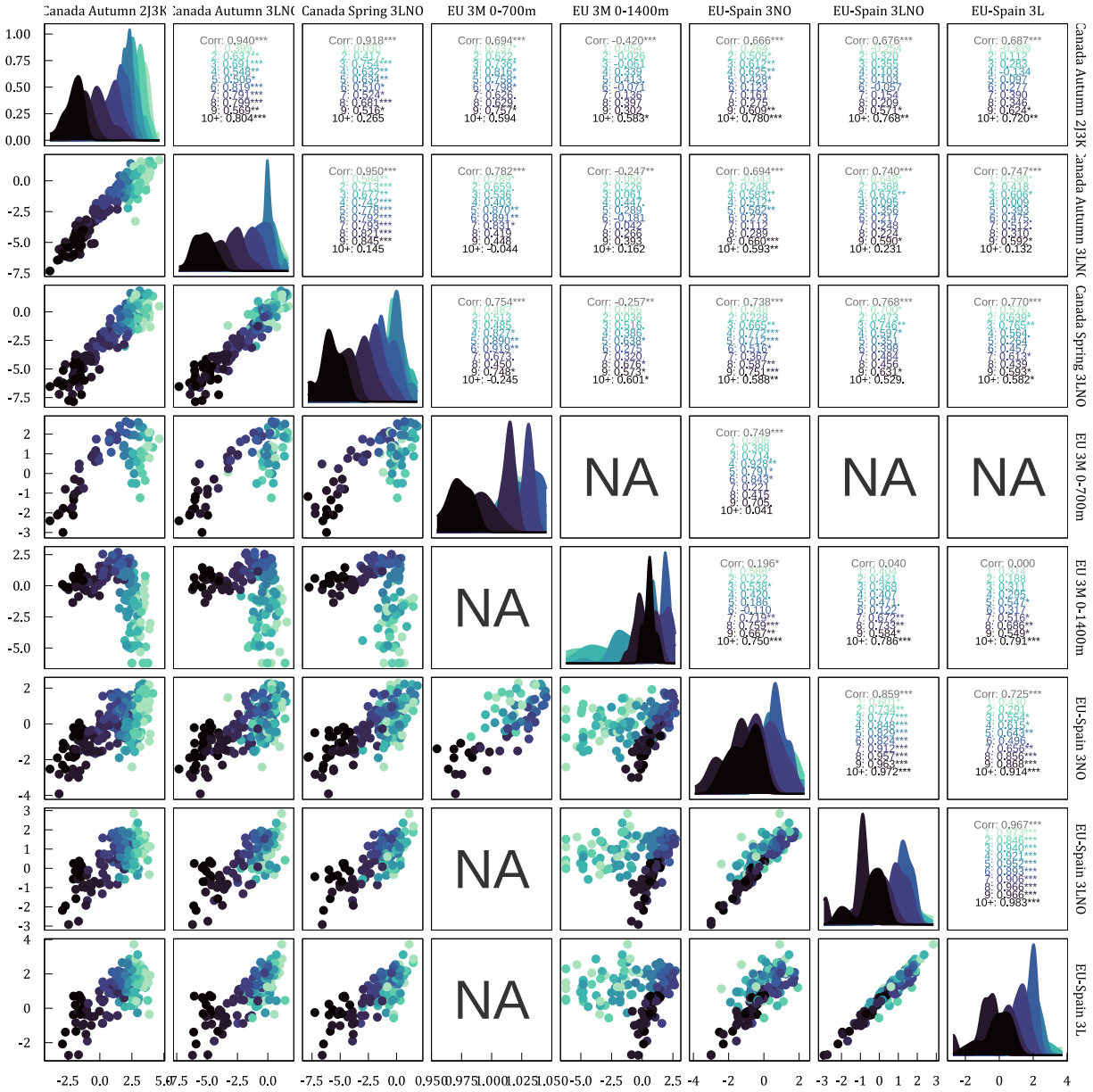
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## Figures



**Figure 1.** Map of proposed core strata for Greenland halibut. These core strata are consistently covered by the Canadian Autumn survey of 2J3K and 3LNO and the Canadian Spring survey of 3LNO. Inshore strata in 3KL and strata > 750 m in 3LNO have been inconsistently covered by these surveys.



**Figure 2.** Between-survey correlations of log indices for ages 1-10+. Correlations are listed in the upper triangle panels and the colors correspond to ages.

## Tables

**Table 1.** Landings (kt) of Greenland Halibut in NAFO Subarea 2 and Divisions 3KLMNO. The SCAA uses data since 1960 and the SSM uses data since 1975.

Year	Landings
1960	0.900
1961	0.700
1962	0.600
1963	2.000
1964	4.000
1965	10.000
1966	19.000
1967	27.000
1968	32.000
1969	37.000
1970	37.000
1971	25.000
1972	30.000
1973	29.000
1974	28.000
1975	28.814
1976	24.611
1977	32.048
1978	39.070
1979	34.104
1980	32.867
1981	30.754
1982	26.278
1983	27.861
1984	26.711
1985	20.347
1986	17.976
1987	32.442
1988	19.215
1989	20.034
1990	47.454
1991	65.008
1992	63.193
1993	62.455
1994	51.029
1995	15.272
1996	18.840
1997	19.858

<b>Year</b>	<b>Landings</b>
1998	19.946
1999	24.226
2000	34.177
2001	38.232
2002	34.062
2003	35.151
2004	25.486
2005	23.255
2006	23.531
2007	22.747
2008	21.180
2009	23.156
2010	26.174
2011	24.960
2012	22.978
2013	19.976
2014	21.433
2015	15.273
2016	14.875
2017	14.760
2018	16.630
2019	16.481
2020	16.307
2021	15.039

**Table 2.** Catch numbers at age estimates (000s) for Greenland Halibut in NAFO Subarea 2 and Divisions 3KLMNO.

Year	1	2	3	4	5	6	7	8	9	10+
1975	0	0	0	0	334	2,819	5,750	4,956	3,961	3,092
1976	0	0	0	0	17	610	3,231	5,413	3,769	3,448
1977	0	0	0	0	534	5,012	10,798	7,346	2,933	1,563
1978	0	0	0	0	2,982	8,415	8,970	7,576	2,865	3,008
1979	0	0	0	0	2,386	8,727	12,824	6,136	1,169	1,344
1980	0	0	0	0	209	2,086	9,150	9,679	5,398	5,049
1981	0	0	0	0	863	4,517	9,806	11,451	4,307	1,400
1982	0	0	0	0	269	2,299	6,319	5,763	3,542	2,890
1983	0	0	0	0	701	3,557	9,800	7,514	2,295	1,258
1984	0	0	0	0	902	2,324	5,844	7,682	4,087	2,098
1985	0	0	0	0	1,983	5,309	5,913	3,500	1,380	943
1986	0	0	0	0	280	2,240	6,411	5,091	1,469	1,042
1987	0	0	0	0	137	1,902	11,004	8,935	2,835	2,092
1988	0	0	0	0	296	3,186	8,136	4,380	1,288	1,007
1989	0	0	0	0	181	1,988	7,480	4,273	1,482	1,688
1990	0	0	0	95	1,102	6,758	12,632	7,557	4,072	5,533
1991	0	0	0	220	2,862	7,756	13,152	10,796	7,145	7,782
1992	0	0	0	1,064	4,180	10,922	20,639	12,205	4,332	4,242
1993	0	0	0	1,010	9,570	15,928	17,716	11,918	4,642	4,438
1994	0	0	0	5,395	16,500	15,815	11,142	6,739	3,081	2,871
1995	0	0	0	323	1,352	2,342	3,201	2,130	1,183	1,610
1996	0	0	0	190	1,659	5,197	6,387	1,914	956	1,405
1997	0	0	0	335	1,903	4,169	7,544	3,215	1,139	1,498
1998	0	0	0	552	3,575	5,407	5,787	3,653	1,435	1,222
1999	0	0	0	297	2,149	5,625	8,611	3,793	1,659	1,568
2000	0	0	0	271	2,029	12,583	21,175	3,299	973	1,332
2001	0	0	0	448	2,239	12,163	22,122	5,154	1,010	1,368
2002	0	0	37	479	1,662	7,239	17,581	6,607	1,244	1,450
2003	0	0	203	1,279	4,491	10,723	16,764	6,385	1,614	1,111
2004	0	0	17	897	4,062	8,236	10,542	4,126	1,307	1,164
2005	0	0	40	534	1,652	5,999	10,313	3,996	1,410	912
2006	0	0	10	216	1,869	6,450	12,144	4,902	1,089	627
2007	0	0	0	88	570	3,732	11,912	5,414	1,230	785
2008	0	0	0	29	448	3,312	10,697	5,558	1,453	595
2009	0	0	0	61	476	3,121	8,801	7,276	1,949	846
2010	0	0	0	146	825	5,077	11,202	6,171	2,134	841
2011	0	0	430	690	1,385	4,101	7,257	3,953	1,255	715
2012	0	0	1,216	706	1,982	3,422	7,618	5,529	1,992	1,143
2013	0	0	125	460	1,744	3,873	3,997	3,255	787	330
2014	0	0	119	259	1,007	3,041	3,583	4,626	910	288



<b>Year</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10+</b>
2015	0	0	59	89	429	1,237	4,037	5,546	1,571	331
2016	0	0	39	116	445	1,294	2,457	6,072	1,399	445
2017	0	0	0	2	38	442	2,688	4,623	2,922	1,671
2018	0	0	0	117	516	1,582	2,671	4,587	2,923	830
2019	0	0	0	221	752	2,038	3,168	4,288	2,605	947
2020	0	1	20	283	1,276	3,286	2,391	2,913	2,059	1,251
2021	0	7	39	211	819	3,749	3,692	2,527	2,204	983

**Table 3.** Catch weight-at-age estimates (kg) for Greenland Halibut in NAFO Subarea 2 and Divisions 3KLMNO.

Year	1	2	3	4	5	6	7	8	9	10+
1975	0.00	0.00	0.13	0.24	0.61	0.76	0.95	1.19	1.58	2.85
1976	0.00	0.00	0.13	0.24	0.61	0.76	0.95	1.19	1.58	2.51
1977	0.00	0.00	0.13	0.24	0.61	0.76	0.95	1.19	1.58	2.70
1978	0.00	0.00	0.13	0.24	0.61	0.76	0.95	1.19	1.58	2.91
1979	0.00	0.00	0.13	0.24	0.61	0.76	0.95	1.19	1.58	3.44
1980	0.00	0.00	0.13	0.24	0.51	0.66	0.87	1.05	1.15	1.40
1981	0.00	0.00	0.13	0.24	0.39	0.60	0.79	0.98	1.24	2.40
1982	0.00	0.00	0.13	0.24	0.52	0.68	0.89	1.13	1.40	2.58
1983	0.00	0.00	0.13	0.24	0.41	0.63	0.86	1.18	1.65	3.38
1984	0.00	0.00	0.13	0.24	0.38	0.58	0.83	1.10	1.46	2.75
1985	0.00	0.00	0.13	0.24	0.57	0.75	0.94	1.24	1.69	3.19
1986	0.00	0.00	0.13	0.24	0.35	0.58	0.81	1.10	1.58	3.31
1987	0.00	0.00	0.13	0.24	0.36	0.59	0.84	1.16	1.59	3.44
1988	0.00	0.00	0.13	0.24	0.36	0.57	0.80	1.16	1.66	3.49
1989	0.00	0.00	0.13	0.24	0.40	0.56	0.77	1.08	1.66	3.10
1990	0.00	0.00	0.09	0.18	0.34	0.55	0.77	1.12	1.61	3.01
1991	0.00	0.00	0.13	0.24	0.38	0.59	0.83	1.23	1.81	3.38
1992	0.00	0.00	0.17	0.29	0.43	0.58	0.79	1.23	1.82	3.46
1993	0.00	0.00	0.13	0.23	0.37	0.55	0.81	1.21	1.73	3.23
1994	0.00	0.00	0.08	0.20	0.33	0.51	0.79	1.18	1.70	3.29
1995	0.00	0.00	0.08	0.29	0.36	0.53	0.81	1.20	1.76	3.75
1996	0.00	0.00	0.16	0.24	0.36	0.54	0.83	1.27	1.80	3.41
1997	0.00	0.00	0.12	0.21	0.34	0.49	0.77	1.16	1.73	3.30
1998	0.00	0.00	0.12	0.23	0.37	0.54	0.81	1.20	1.75	3.17
1999	0.00	0.00	0.18	0.25	0.36	0.53	0.82	1.25	1.68	3.19
2000	0.00	0.00	0.00	0.25	0.35	0.52	0.79	1.19	1.77	3.12
2001	0.00	0.00	0.00	0.25	0.38	0.57	0.83	1.17	1.79	3.18
2002	0.00	0.00	0.22	0.25	0.37	0.56	0.84	1.19	1.76	3.00
2003	0.00	0.00	0.19	0.25	0.39	0.56	0.82	1.20	1.65	2.87
2004	0.00	0.00	0.18	0.25	0.38	0.54	0.81	1.20	1.63	2.91
2005	0.00	0.00	0.25	0.30	0.40	0.56	0.85	1.25	1.69	2.78
2006	0.00	0.00	0.13	0.27	0.40	0.60	0.81	1.09	1.50	2.36
2007	0.00	0.00	0.00	0.28	0.39	0.58	0.83	1.14	1.50	2.41
2008	0.00	0.00	0.00	0.28	0.40	0.62	0.89	1.20	1.60	2.44
2009	0.00	0.00	0.00	0.28	0.39	0.60	0.86	1.16	1.61	2.43
2010	0.00	0.00	0.00	0.25	0.35	0.57	0.84	1.21	1.65	2.45
2011	0.00	0.00	0.13	0.21	0.31	0.53	0.85	1.25	1.75	2.63
2012	0.00	0.00	0.17	0.24	0.30	0.57	0.89	1.28	1.75	2.73
2013	0.00	0.00	0.14	0.27	0.42	0.63	0.87	1.25	1.83	2.87
2014	0.00	0.00	0.15	0.24	0.40	0.62	0.89	1.31	1.92	2.96

<b>Year</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10+</b>
2015	0.00	0.00	0.16	0.24	0.41	0.63	0.89	1.22	1.76	2.93
2016	0.00	0.00	0.22	0.31	0.47	0.67	0.90	1.28	1.82	2.71
2017	0.00	0.00	0.00	0.26	0.31	0.52	0.71	1.08	1.37	2.03
2018	0.00	0.00	0.00	0.30	0.42	0.62	0.88	1.25	1.79	2.75
2019	0.00	0.00	0.19	0.28	0.41	0.60	0.85	1.19	1.73	2.65
2020	0.00	0.08	0.24	0.28	0.41	0.63	0.87	1.23	1.80	2.90
2021	0.09	0.12	0.24	0.32	0.41	0.60	0.85	1.18	1.64	2.64

**Table 4.** Stratified estimates of mean weight per tow (kg) and mean numbers per tow from Canadian and EU research vessel surveys.

Year	Canada Autumn 2J3K	Canada Autumn 3LNO	Canada Spring 3LNO	EU-Spain 3L	EU-Spain 3LNO	EU-Spain 3NO	EU 3M 0- 1400m	EU 3M 0- 700m
1995								13.52
1996	22.66	2.58	1.53					14.42
1997	25.89	2.73	2.46			7.73		20.01
1998	24.82	3.97	4.65			11.73		30.13
1999	32.48	2.82	2.83			12.00		26.37
2000	25.17	2.37	3.04			9.48		21.08
2001	23.67	2.06	1.40			8.17		17.25
2002	14.78	1.42	0.72			2.64		15.05
2003	15.95	1.62	1.46	14.64	7.98	5.10		7.73
2004	18.17	1.68	1.15	12.29	6.93	3.68	23.33	
2005	21.24	2.47	1.67			3.39	16.71	
2006	27.02	2.43		15.48	7.83	3.03	19.17	
2007	29.12	2.38	3.03	16.64	9.14	3.98	25.10	
2008		2.87	2.10	24.40	14.11	7.66	32.35	
2009	19.99	1.57	0.68	20.78	17.15	14.78	29.44	
2010	19.92	1.59	1.68	23.41	18.25	14.80	22.13	
2011	26.74	2.21	1.06	14.61	9.99	7.09	26.15	
2012	23.50	1.71	1.94	14.67	10.18	7.37	19.20	
2013	29.79	2.53	0.73	17.31	10.03	5.46	19.11	
2014	33.34		0.66	24.09	13.12	6.24	23.92	
2015	22.29	0.87		23.90	15.04	9.49	47.52	
2016	18.54	1.31	0.66	21.26	13.60	8.80	28.30	
2017	15.10	1.25		34.83	23.64	16.63	42.66	
2018	17.05	1.89	1.88	21.75	13.22	7.88	29.80	
2019	16.28	1.87	1.45	29.69	16.87	8.82	16.89	
2020	15.84	2.71					13.23	
2021	21.15					8.09	16.31	

**Table 5.** Stratified estimates of mean number per tow at age from Canadian and EU research vessel surveys.

Year	0	1	2	3	4	5	6	7	8	9	10+
<b>Canada</b>											
<b>Autumn 2J3K</b>											
1996	5.18	103.8 3	49.99	33.64	10.28	6.60	2.55	0.88	0.20	0.19	0.10
1997	2.30	29.55	63.09	43.89	21.84	10.67	5.13	2.11	0.68	0.21	0.13
1998	1.59	25.33	26.23	32.20	22.23	11.11	4.68	2.18	0.60	0.14	0.13
1999	6.46	15.99	34.42	24.07	28.28	20.04	10.53	3.81	0.70	0.14	0.13
2000	3.30	38.10	23.18	16.83	13.73	14.54	7.72	2.28	0.53	0.07	0.06
2001	8.94	46.30	23.34	17.42	14.53	10.33	7.91	3.59	0.73	0.12	0.06
2002	8.75	42.85	25.48	13.09	9.95	6.31	2.07	0.76	0.20	0.04	0.02
2003	10.44	47.57	27.90	12.14	9.92	6.63	2.43	0.94	0.28	0.04	0.04
2004	4.39	33.77	34.54	14.24	13.01	9.41	2.81	1.26	0.38	0.09	0.05
2005	5.31	16.57	17.09	8.75	14.36	11.41	7.22	4.16	0.70	0.12	0.09
2006	3.95	33.80	18.90	8.97	18.44	13.67	9.52	4.45	1.21	0.19	0.07
2007	2.21	32.61	14.51	12.81	18.77	9.57	10.35	6.17	2.14	0.34	0.15
2009	5.52	50.91	19.26	11.47	8.47	9.96	5.40	3.61	1.40	0.25	0.13
2010	20.28	47.17	36.27	14.72	9.61	6.88	3.96	2.31	1.07	0.19	0.15
2011	4.81	43.75	41.89	20.97	18.79	10.32	5.50	3.15	1.26	0.33	0.22
2012	5.15	12.28	9.61	11.27	11.86	10.96	9.03	4.30	1.69	0.29	0.22
2013	2.81	23.47	12.19	6.98	6.97	10.98	9.14	7.98	3.97	0.51	0.24
2014	3.10	22.08	30.41	11.39	4.54	7.96	7.38	8.92	6.62	0.97	0.30
2015	0.50	17.17	13.98	15.14	7.77	6.82	4.18	3.91	3.92	0.65	0.24
2016	10.58	29.65	19.47	10.81	8.15	4.83	4.89	3.01	2.09	0.51	0.21
2017	6.43	30.57	22.75	10.20	8.76	5.72	2.63	1.26	0.96	0.36	0.20
2018	1.70	14.18	17.04	17.21	8.62	7.00	5.04	2.02	1.03	0.45	0.20
2019	26.62	16.52	19.53	19.17	12.12	8.82	3.65	1.38	0.41	0.15	0.13
2020	3.57	24.36	25.32	13.55	8.29	6.24	4.29	1.26	0.62	0.35	0.28
2021	10.95	23.70	29.21	18.98	7.82	4.81	5.77	3.29	0.88	0.35	0.22
<b>Canada</b>											
<b>Autumn 3LNO</b>											
1996	0.26	5.41	5.07	3.94	1.45	1.04	0.41	0.08	0.00	0.00	0.00
1997	0.25	1.27	3.45	4.53	3.61	1.73	0.49	0.10	0.04	0.00	0.00
1998	0.06	0.56	1.81	1.87	2.94	4.07	1.49	0.31	0.08	0.01	0.00
1999	0.22	0.04	0.62	0.73	1.04	1.97	1.67	0.39	0.04	0.01	0.01
2000	0.12	1.66	1.34	0.40	0.77	1.17	1.41	0.45	0.04	0.01	0.00
2001	0.51	1.36	0.67	0.64	1.42	0.77	1.17	0.62	0.05	0.01	0.00
2002	0.14	1.29	0.94	1.10	1.03	0.93	0.39	0.16	0.04	0.00	0.00
2003	0.18	1.83	1.11	1.57	1.94	0.93	0.28	0.05	0.02	0.00	0.00
2004	0.05	1.13	1.40	1.51	1.55	1.20	0.25	0.08	0.01	0.00	0.00
2005	0.08	0.55	0.93	0.44	1.81	1.48	1.06	0.47	0.06	0.01	0.00
2006	0.16	0.86	0.50	0.11	0.68	1.34	1.36	0.59	0.13	0.01	0.00

<b>Year</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10+</b>
2007	0.09	0.83	0.47	0.27	0.81	0.61	1.24	0.75	0.21	0.02	0.02
2008	0.25	0.95	0.28	0.82	1.13	0.90	1.00	0.76	0.44	0.04	0.00
2009	0.23	2.11	0.23	0.41	0.47	0.87	0.61	0.30	0.14	0.03	0.01
2010	0.44	1.70	0.47	0.84	0.66	0.70	0.66	0.31	0.11	0.02	0.01
2011	0.33	1.30	4.13	1.20	2.02	0.93	0.67	0.32	0.06	0.02	0.01
2012	0.33	0.62	0.20	0.45	1.18	0.93	0.70	0.27	0.08	0.01	0.01
2013	0.08	2.67	0.95	0.37	0.38	1.00	1.01	0.61	0.26	0.01	0.02
2015	0.05	0.78	0.60	0.33	0.31	0.25	0.34	0.17	0.10	0.01	0.01
2016	0.98	1.30	0.44	0.56	0.50	0.63	0.38	0.21	0.09	0.03	0.01
2017	0.16	2.60	0.86	1.32	0.55	0.57	0.34	0.16	0.09	0.02	0.01
2018	0.00	3.13	1.81	1.64	0.94	1.14	0.71	0.22	0.06	0.02	0.00
2019	0.16	3.22	1.96	2.00	1.64	0.99	0.49	0.14	0.03	0.03	0.00
2020	0.00	4.74	2.59	1.54	2.00	1.51	0.79	0.23	0.10	0.04	0.02
<b>Canada Spring 3LNO</b>											
1996	0.00	1.62	4.25	4.60	2.19	0.83	0.28	0.06	0.00	0.00	0.00
1997	0.00	1.16	3.92	5.16	3.23	1.46	0.51	0.10	0.01	0.00	0.00
1998	0.00	0.24	0.86	3.97	6.33	5.06	1.26	0.33	0.07	0.01	0.00
1999	0.00	0.30	0.56	1.19	2.03	3.43	1.08	0.24	0.05	0.01	0.00
2000	0.02	0.79	1.07	1.07	1.51	1.95	2.04	0.56	0.03	0.01	0.01
2001	0.00	0.57	0.72	0.75	0.68	0.79	0.69	0.24	0.02	0.00	0.00
2002	0.00	0.65	0.58	0.61	0.59	0.61	0.21	0.05	0.01	0.00	0.00
2003	0.00	0.93	2.15	1.68	1.58	1.05	0.21	0.05	0.01	0.00	0.00
2004	0.00	0.68	0.58	1.21	1.21	1.19	0.26	0.04	0.02	0.00	0.00
2005	0.00	0.35	0.31	1.09	0.95	1.37	0.82	0.21	0.02	0.00	0.00
2007	0.00	1.60	0.52	0.80	0.40	1.40	1.49	1.12	0.18	0.02	0.00
2008	0.00	0.44	0.77	0.96	0.71	1.25	0.75	0.64	0.28	0.02	0.01
2009	0.00	0.27	0.22	0.19	0.39	0.45	0.26	0.13	0.07	0.01	0.00
2010	0.00	0.77	0.66	0.52	0.40	0.84	1.08	0.35	0.14	0.02	0.02
2011	0.00	1.98	1.41	0.93	0.65	0.62	0.29	0.16	0.10	0.01	0.00
2012	0.02	0.32	0.80	2.48	1.40	1.16	0.50	0.18	0.06	0.02	0.01
2013	0.00	1.28	0.68	0.05	0.38	0.61	0.23	0.11	0.04	0.00	0.00
2014	0.00	1.62	1.19	0.32	0.20	0.24	0.24	0.14	0.06	0.01	0.00
2016	0.08	0.42	0.56	0.37	0.46	0.30	0.20	0.08	0.05	0.01	0.01
2018	0.00	3.05	4.40	1.90	1.37	0.90	0.64	0.10	0.09	0.02	0.01
2019	0.00	4.52	2.10	1.79	1.41	0.89	0.28	0.18	0.05	0.02	0.01
<b>EU 3M 0-700m</b>											
1995		12.41	2.54	2.23	1.91	2.66	5.10	3.77	2.12	1.31	0.35
1996		5.84	7.97	2.41	3.04	4.20	5.82	2.49	1.62	0.42	0.16
1997		3.33	3.78	6.00	6.50	7.11	8.46	4.99	2.15	0.66	0.31
1998		2.74	2.13	7.68	11.00	12.33	11.30	7.84	2.62	0.75	0.26
1999		1.06	0.70	3.01	10.47	13.41	12.58	5.55	1.82	0.35	0.12
2000		3.75	0.29	0.60	2.16	7.09	14.10	5.40	2.32	0.45	0.17

<b>Year</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10+</b>
2001		8.03	1.43	1.81	0.99	2.79	7.79	6.63	3.21	0.18	0.05
2002		4.08	2.94	2.79	1.67	3.79	5.59	5.73	1.28	0.13	0.09
2003		2.20	1.00	0.61	1.51	2.48	2.94	1.93	0.47	0.13	0.12
<b>EU 3M 0-1400m</b>											
2004		1.40	2.19	2.92	1.54	6.80	9.16	4.95	1.46	0.73	1.11
2005		0.36	0.53	2.09	1.73	5.28	6.79	3.42	0.98	0.26	0.88
2006		0.45	0.26	0.44	0.91	5.85	8.56	4.68	1.39	0.42	0.90
2007		0.25	0.05	0.39	0.29	3.84	9.09	8.57	2.88	0.72	1.20
2008		0.13	0.07	0.10	0.16	2.03	9.00	12.53	3.18	1.14	1.90
2009		0.05	0.01	0.03	0.08	1.13	6.80	11.43	3.54	0.93	2.16
2010		0.03	0.01	0.02	0.11	2.00	6.01	7.83	2.50	0.98	1.63
2011		0.00	0.00	0.01	0.09	1.85	6.70	8.49	2.56	1.11	2.34
2012		0.00	0.01	0.04	0.16	2.42	5.78	5.00	1.92	0.75	1.78
2013		0.00	0.00	0.01	0.32	2.11	7.03	4.52	1.64	0.53	1.81
2014		0.02	0.00	0.01	0.16	2.78	8.04	6.87	1.62	0.45	1.53
2015		0.03	0.01	0.01	0.12	2.54	14.85	14.04	4.61	1.67	3.07
2016		0.17	0.02	0.01	0.01	0.58	4.88	9.24	3.94	1.47	2.21
2017		0.76	0.03	0.02	0.30	4.19	11.50	12.69	4.82	2.11	3.41
2018		0.30	0.19	0.21	0.12	2.13	5.99	7.17	3.09	1.58	4.30
2019		0.37	0.23	0.20	0.62	3.05	4.42	3.43	1.32	0.90	1.93
2020		0.05	0.12	0.31	0.51	2.77	4.71	2.32	0.72	0.67	1.48
2021		0.02	0.00	0.03	0.39	2.55	6.00	3.11	1.03	0.68	1.80
<b>EU-Spain 3NO</b>											
1997	0.00	9.92	5.52	3.49	3.81	2.24	1.97	1.22	0.60	0.07	0.15
1998	0.00	1.71	5.24	9.08	8.47	5.06	2.77	1.10	0.66	0.21	0.20
1999	0.15	4.38	4.80	7.21	9.31	6.29	2.92	0.77	0.49	0.23	0.24
2000	0.00	2.92	0.49	0.80	1.39	3.84	4.42	2.56	0.71	0.28	0.34
2001	0.00	8.87	5.90	1.18	1.07	2.84	3.96	1.56	0.22	0.06	0.25
2002	0.00	2.86	0.63	1.01	0.68	1.12	0.91	0.43	0.22	0.02	0.08
2003	0.00	3.52	2.37	1.67	1.89	1.56	0.89	0.77	0.26	0.06	0.15
2004	0.00	1.20	6.85	2.05	2.03	1.22	0.84	0.51	0.21	0.05	0.10
2005	0.00	1.07	0.96	1.80	1.03	1.31	1.44	0.68	0.19	0.08	0.16
2006	0.00	2.29	1.11	0.40	1.54	1.37	0.81	0.52	0.22	0.05	0.08
2007	0.00	1.83	0.65	0.51	0.33	1.50	1.41	1.03	0.29	0.10	0.17
2008	0.00	0.64	1.01	0.92	0.71	0.96	2.78	2.57	0.76	0.41	0.36
2009	0.00	0.57	3.03	2.13	2.54	2.66	4.86	5.58	0.83	0.35	0.49
2010	0.00	0.38	2.26	0.96	0.75	3.50	5.72	5.29	1.27	0.40	0.63
2011	0.00	2.26	1.34	0.50	0.64	0.98	2.07	2.18	0.45	0.23	0.48
2012	0.00	0.09	1.83	1.36	0.45	1.11	1.73	2.03	0.54	0.41	0.68
2013	0.00	0.28	0.46	0.23	0.82	1.19	1.50	1.23	0.34	0.21	0.59
2014	0.00	0.53	1.32	0.26	0.15	0.55	1.70	1.79	0.46	0.21	0.69
2015	0.00	0.95	0.63	0.21	0.22	0.48	1.85	3.46	0.96	0.45	0.80

<b>Year</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10+</b>
2016	0.00	1.13	0.57	0.36	0.47	0.53	1.94	2.66	0.94	0.23	0.84
2017	0.00	3.45	1.70	0.90	1.12	2.43	4.48	4.72	1.71	0.52	1.07
2018	0.00	2.45	2.09	1.01	0.84	1.70	1.96	1.68	0.98	0.30	0.52
2019	0.00	3.39	4.27	4.17	2.82	2.66	2.02	1.28	0.65	0.24	0.81
2021	0.00	2.40	6.89	1.48	1.11	2.26	2.52	1.31	0.39	0.28	0.73
<b>EU-Spain 3LNO</b>											
2003	0.00	4.25	6.17	4.53	4.32	3.08	1.45	0.88	0.27	0.06	0.19
2004	0.03	3.21	5.56	3.99	5.28	3.93	1.40	0.49	0.17	0.05	0.11
2006	0.00	4.64	2.19	1.00	2.98	4.77	2.96	1.21	0.27	0.06	0.14
2007	0.00	3.31	0.93	1.16	0.69	4.64	4.14	2.14	0.42	0.15	0.21
2008	0.00	1.84	0.98	2.61	1.18	3.03	5.84	4.65	1.08	0.44	0.50
2009	0.00	3.10	2.59	1.70	2.68	4.33	6.15	5.69	1.13	0.40	0.55
2010	0.00	0.74	2.73	1.45	1.56	5.15	6.69	4.97	1.50	0.57	0.87
2011	0.01	3.05	1.53	0.97	1.01	1.85	3.30	2.40	0.77	0.37	0.66
2012	0.00	1.25	2.32	3.93	1.18	2.18	3.14	2.26	0.60	0.42	0.69
2013	0.00	5.09	0.98	0.57	1.86	3.29	3.49	2.07	0.44	0.29	0.65
2014	0.00	3.53	4.56	1.30	0.63	3.05	3.80	3.25	0.95	0.45	0.92
2015	0.00	1.16	2.16	1.17	1.13	1.49	4.57	3.58	1.63	0.51	1.14
2016	0.01	2.10	2.18	2.02	1.80	1.84	2.74	3.18	1.63	0.39	1.29
2017	0.00	5.39	4.18	6.55	5.72	7.00	6.14	4.86	2.11	0.70	1.46
2018	0.00	17.21	6.51	3.53	2.69	3.66	2.92	2.03	1.25	0.45	1.04
2019	0.01	8.86	6.79	10.60	5.50	6.09	4.31	2.12	0.90	0.33	1.29
<b>EU-Spain 3L</b>											
2003	0.00	6.02	13.08	10.52	11.29	7.44	3.01	1.03	0.31	0.05	0.30
2004	0.07	6.71	3.37	7.10	9.68	9.42	2.31	0.46	0.15	0.06	0.12
2006	0.00	8.39	3.86	2.25	3.29	11.21	7.03	2.34	0.41	0.07	0.25
2007	0.00	5.45	1.27	2.17	0.77	9.06	8.40	4.06	0.59	0.22	0.26
2008	0.00	3.76	0.61	5.70	1.63	6.58	10.95	7.81	1.53	0.42	0.73
2009	0.00	7.08	1.49	1.16	2.50	7.53	8.19	5.76	1.61	0.38	0.69
2010	0.00	1.27	3.47	2.10	3.30	7.33	8.07	4.50	1.66	0.83	1.23
2011	0.03	4.49	1.58	1.78	1.55	3.50	5.20	2.34	1.44	0.68	0.94
2012	0.00	3.14	2.56	8.57	2.39	4.09	5.62	2.28	0.66	0.40	0.70
2013	0.00	12.87	1.70	1.10	3.95	6.10	6.83	3.25	0.65	0.37	0.78
2014	0.01	8.43	9.93	2.55	1.43	7.29	6.88	5.44	1.82	0.84	1.27
2015	0.00	1.51	4.73	2.59	2.63	2.99	8.88	3.89	2.63	0.62	1.68
2016	0.03	3.64	4.04	5.12	4.03	4.41	3.82	3.76	3.01	0.61	1.96
2017	0.00	8.30	5.58	17.59	14.60	14.28	8.32	4.67	2.70	0.91	2.12
2018	0.00	41.53	14.20	6.70	4.90	6.74	4.61	2.45	1.76	0.64	1.88
2019	0.02	17.91	8.99	22.64	9.46	12.70	6.55	3.44	1.34	0.44	2.06