Table S1 – Model equations and deviance explained (%) for each species to use in Eq. (1). Number of data points in logarithmic scale was used as a weights term in all models except for herring. Species: cod, haddock (had), capelin (cap), herring (her), and *C. finmarchicus* (zoo).

Species	R Software syntax	
Cod	cod.n~s(DOY ,bs="ad",k=9) + s(DOY ,bs="ad",by=ST_A,k=9) + te(LON ,LAT ,k=5,bs="tp") + s(YEAR,bs="re") + $STAGE_L$ + ln(N_{eggnet}) + ln($N_{ringtrawl}$)	
Haddock	had.n~s(DOY ,bs="ad",k=9) + s(DOY ,bs="ad",by=ST_A,k=9) + te(LON ,LAT ,k=5,bs="tp") + s(YEAR,bs="re") + $STAGE_L$ + ln(N_{eggnet}) + ln($N_{ringtrawl}$)	
Capelin	cap.n~s(DOY ,bs="ad",k=9) + s(DOY ,bs="ad",by=ST_A,k=9) + te(LON ,LAT ,k=5,bs="tp") + s(YEAR,bs="re") + $STAGE_L$ + ln(N_{eggnet}) + ln($N_{ringtrawl}$)	
Herring	Ab_{her} ~ s(DOY ,bs="ad",k=9) + s(DOY ,bs="ad",by=ST_A,k=9) + te(LON ,LAT ,k=5,bs="tp") + s(EAR,bs="re") + $STAGE_L$ + ln(N_{eggnet}) + ln($N_{ringtrawl}$)	
Zooplankton	Nauplii	log(zoo.n) ~ s(DOY ,bs="cr",k=5) + s(DOY ,bs="cr",by=ST_A,k=5) + te(LON ,LAT ,k=5,bs="tp") + s(YEAR,bs="re")
	CI-III	log(zoo.n) ~ s(DOY ,bs="cr",k=9) + s(DOY ,bs="cr",by=ST_A,k=9) + te(LON ,LAT ,k=5,bs="tp") + s(YEAR,bs="re")
	CIV-V	log(zoo.n) ~ s(DOY ,bs="cr",k=9) + s(DOY ,bs="cr",by=ST_A,k=9) + te(LON ,LAT ,k=5,bs="tp") + s(YEAR,bs="re")
	CVI	log(zoo.n) ~ s(DOY ,bs="cr",k=5) + s(DOY ,bs="cr",by=ST_A,k=5) + te(LON ,LAT ,k=5,bs="tp") + s(YEAR,bs="re")

Table S2 – Results from the linear models as in Eq. (4) in Figure 2. r^2 refers to the multiple r^2 of the linear relationships calculated in step 4 (Figure 2). VIF marks the relationships that did not pass the collinearity test. Competitors (comp) 1 and 2, respectively: haddock and capelin for cod, cod and capelin for haddock, and cod and haddock for capelin. C1-3 is the same as Comp 1-3 in Figure 3.

Species	Age	Others	Type	O	r^2	p-value	Dev.Exp.	STO_C	STO_F	STemp	Year	Intercept	O %	VIF
Cod	0-group	All comp	C	35.86	0.7	0.006	1.08E+22	7.82E+08		-5.92E+10	1.18E+10	-2.31E+13	19.86	
		C1: Haddock	C	15.92	0.75	0.002	8.85E+21	1.26E+09		-4.91E+10	9.35E+09	-1.83E+13	33.77	
		C2: Capelin	C	20.86	0.5	0.065	1.78E+22	8.42E+08		-4.32E+10	1.20E+10	-2.35E+13	5.16	
		C3: Herring	C	5.4	0.44	0.112	2.01E+22	4.93E+08		-2.96E+10	1.02E+10	-2.00E+13	1.33	
		Food	F	62.72	0.78	0.001	7.80E+21	NA	3.62E+08	-4.62E+10	8.37E+09	-1.64E+13	42.43	
		All comp	C+F	39.52	0.79	0.004	7.54E+21	2.07E+08	2.95E+08	-5.17E+10	9.21E+09	-1.80E+13	42.81	*
		C1: Haddock	C+F	22.29	0.78	0.005	7.80E+21	-35700000	3.71E+08	-4.60E+10	8.34E+09	-1.63E+13	42.43	*
		C2: Capelin	C+F	26.56	0.79	0.004	7.52E+21	2.78E+08	3.43E+08	-5.23E+10	9.32E+09	-1.82E+13	43.27	
		C3: Herring	C+F	13.2	0.79	0.004	7.59E+21	2.82E+08	3.57E+08	-5.10E+10	8.93E+09	-1.75E+13	43.03	
	R	All comp	C	35.86	0.38	0.002	4.47E+12	4970	NA	207000	-14900	28800000	22.33	
		C1: Haddock	C	15.92	0.29	0.012	5.06E+12	7330	NA	226000	-16200	31300000	11.7	
		C2: Capelin	C	20.86	0.31	0.009	4.95E+12	5340	NA	257000	-14900	28500000	13.26	
		C3: Herring	C	5.4	0.33	0.006	4.83E+12	14200	NA	250000	-13800	26600000	16.26	
		Food	F	62.72	0.35	0.004	4.66E+12	NA	2190	207000	-14800	28500000	19.65	
		All comp	C+F	39.52	0.38	0.005	4.43E+12	3720	731	199000	-14800	28700000	23	*
		C1: Haddock	C+F	22.29	0.35	0.009	4.64E+12	-2770	2760	211000	-14300	27600000	19.97	*
		C2: Capelin	C+F	26.56	0.37	0.006	4.48E+12	2930	1660	204000	-14700	28300000	22.13	
		C3: Herring	C+F	13.2	0.43	0.002	4.11E+12	11200	1830	181000	-13700	26600000	29.03	
Haddock	0-group	All comp	C	22.1	0.24	0.404	1.22E+20	9760000	NA	2.93E+09	1.26E+08	-2.63E+11	0.79	
		C1: Cod	C	15.92	0.24	0.417	1.23E+20	4720000	NA	3.18E+09	1.13E+08	-2.37E+11	0.12	
		C2: Capelin	C	10.38	0.27	0.345	1.17E+20	63100000	NA	2.22E+09	2.15E+08	-4.36E+11	3.74	
		C3: Herring	C	3.96	0.3	0.295	1.13E+20	66600000	NA	2.18E+09	2.31E+08	-4.67E+11	6.34	
		Food	F	32.93	0.24	0.415	1.23E+20	NA	3240000	3.14E+09	1.15E+08	-2.42E+11	0.18	
		All comp	C+F	23.57	0.33	0.417	1.09E+20	2.39E+08	-1.63E+08	2.01E+09	3.01E+08	-6.06E+11	10.04	*
		C1: Cod	C+F	18.23	0.24	0.604	1.22E+20	-45400000	28600000	3.00E+09	1.35E+08	-2.80E+11	0.41	
		C2: Capelin	C+F	13.45	0.29	0.49	1.14E+20	1.13E+08	-1.70E+07	2.15E+09	2.80E+08	-5.65E+11	5.94	
		C3: Herring	C+F	7.9	0.3	0.464	1.12E+20	75900000	-6770000	2.34E+09	2.41E+08	-4.88E+11	6.92	
	R	All comp	C	22.1	0.14	0.189	1.60E+12	1930	NA	129000	-1710	2870000	5.52	
		C1: Cod	C	15.92	0.11	0.295	1.66E+12	1250	NA	147000	-1670	2730000	1.25	
		C2: Capelin	C	10.38	0.24	0.037	1.42E+12	7570	NA	109000	-1140	1810000	18.08	
		C3: Herring	C	3.96	0.13	0.231	1.63E+12	3980	NA	149000	-1570	2530000	3.07	
		Food	F	32.93	0.16	0.147	1.57E+12	NA	1530	121000	-1430	2370000	8.2	
		All comp	C+F	23.57	0.17	0.218	1.55E+12	-4230	4260	119000	-870	1270000	9.89	*
		C1: Cod	C+F	18.23	0.23	0.087	1.44E+12	-7880	5350	107000	-238	77600	17.36	

		C2: Capelin	C+F	13.45	0.25	0.066	1.41E+12	10400	-1110	118000	-1050	1610000	19.05
		C3: Herring	C+F	7.9	0.17	0.231	1.56E+12	2370	1320	120000	-1480	2460000	9.03
Capelin	0-group	All comp	C	29.13	0.36	0.194	7.10E+23	-1.42E+09	NA	2.55E+11	-5.74E+10	1.13E+14	1.5
		C1: Cod	C	20.86	0.37	0.18	6.98E+23	-2.79E+09	NA	2.67E+11	-5.93E+10	1.17E+14	2.18
		C2: Haddock	C	10.38	0.35	0.21	7.23E+23	-2.19E+09	NA	2.29E+11	-5.37E+10	1.06E+14	0.6
		C3: Herring	C	1.81	0.37	0.181	6.99E+23	-7.00E+09	NA	2.60E+11	-5.73E+10	1.13E+14	2.04
		Food	F	484.02	0.58	0.03	4.71E+23	NA	2.06E+08	-3.02E+10	-2.37E+10	4.74E+13	39.86
		All comp	C+F	91.04	0.79	0.004	2.30E+23	-5.91E+09	3.34E+08	9.39E+10	-3.79E+10	7.49E+13	59.11
		C1: Cod	C+F	83.9	0.76	0.008	2.72E+23	-7.81E+09	2.95E+08	8.42E+10	-3.81E+10	7.54E+13	55.12
		C2: Haddock	C+F	74.84	0.76	0.007	2.64E+23	-1.47E+10	3.35E+08	8.02E+10	-3.13E+10	6.19E+13	59.19
		C3: Herring	C+F	67.44	0.85	0.001	1.65E+23	-2.69E+10	3.58E+08	6.76E+10	-3.18E+10	6.29E+13	67.66
	R	All comp	C	29.13	0.1	0.769	6.59E+17	-1160000	NA	1.49E+08	-26700000	5.25E+10	1.18
		C1: Cod	C	20.86	0.1	0.764	6.58E+17	-1880000	NA	1.48E+08	-26900000	5.29E+10	1.27
		C2: Haddock	C	10.38	0.1	0.768	6.59E+17	-3070000	NA	1.49E+08	-25700000	5.06E+10	1.19
		C3: Herring	C	1.81	0.14	0.661	6.31E+17	-8190000	NA	1.77E+08	-29100000	5.71E+10	3.3
		Food	F	484.02	0.33	0.234	4.89E+17	NA	174000	-90500000	1590000	-2.56E+09	31.59
		All comp	C+F	91.04	0.56	0.084	3.20E+17	-4930000	281000	13100000	-10200000	2.04E+10	53.92
		C1: Cod	C+F	83.9	0.5	0.149	3.71E+17	-6.00E+06	242000	-2580000	-9420000	1.89E+10	46.92
		C2: Haddock	C+F	74.84	0.6	0.061	2.95E+17	-14200000	299000	16300000	-5700000	1.14E+10	59.15
		C3: Herring	C+F	67.44	0.73	0.013	2.02E+17	-2.60E+07	321000	4220000	-6180000	1.24E+10	71.44

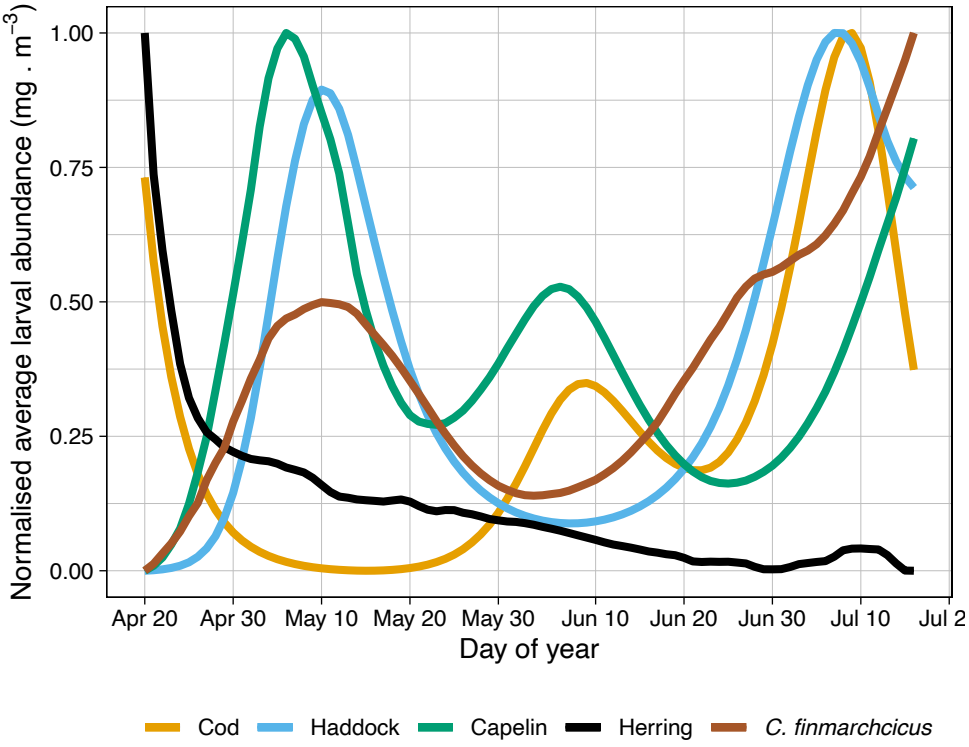

Figure S1 – Normalised average seasonal cycle for each of the fish species and *C. finmarchicus*.

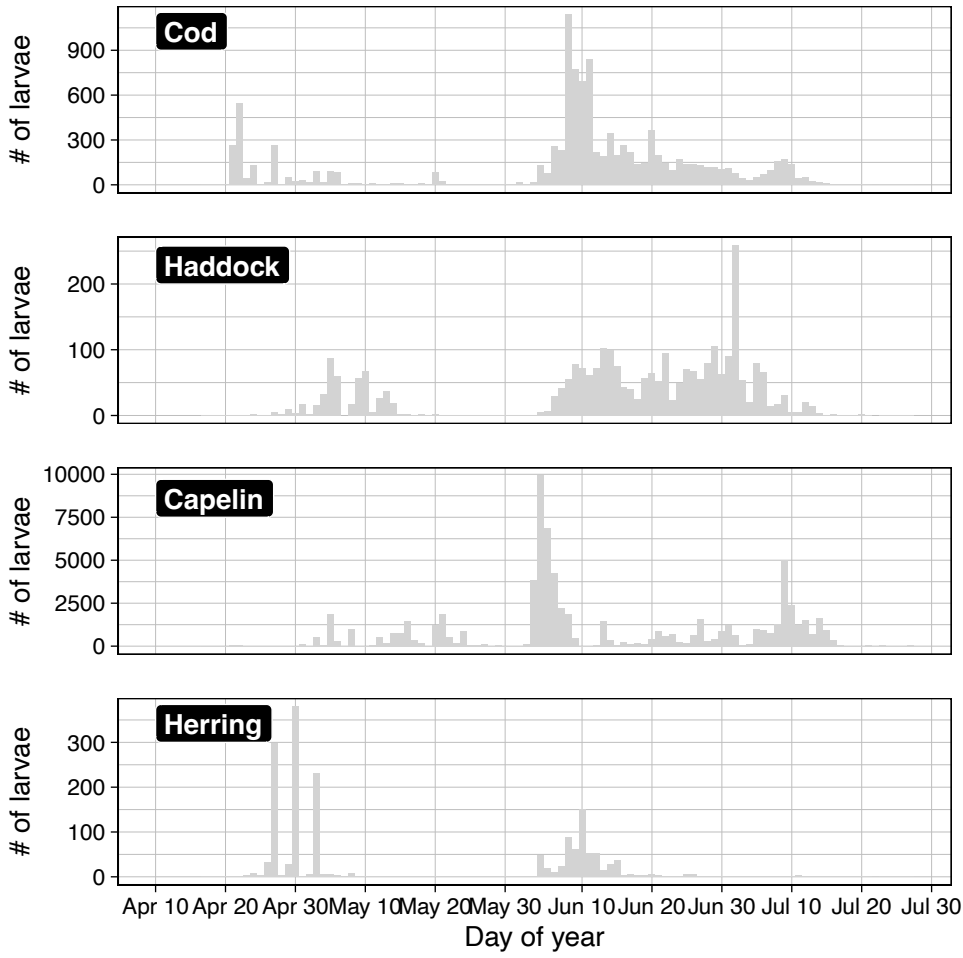

Figure S2 –Data points distribution over the day of year for the four fish species: cod, haddock, capelin, and herring. Note that the y-axes scales differ.

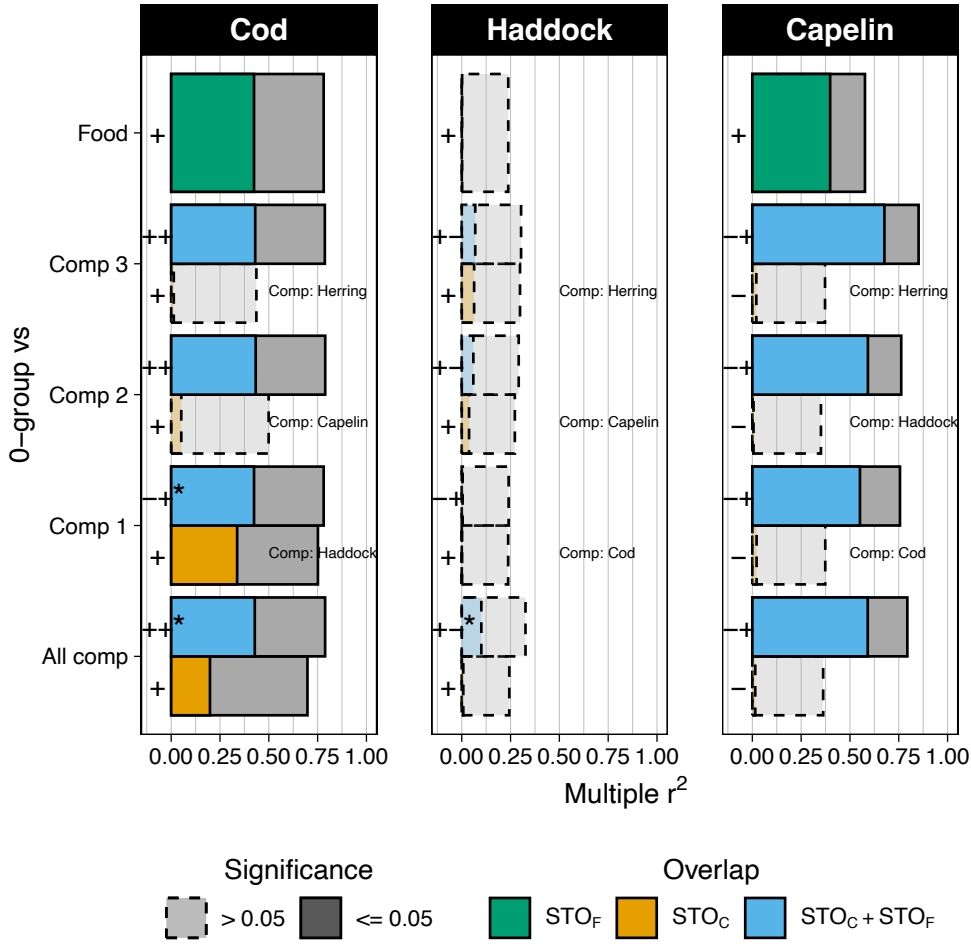

Figure S3 – Multiple r^2 between the 0-group index and the spatio-temporal overlaps: STO_C (orange), STO_F (green), $STO_C + STO_F$ (blue), and the overall contribution of the multiple regression, linear model (dark grey) as calculated in step 4 (Figure 2 and Table 1). Dashed borders paired with light grey indicate that the relationship is not significant. Full borders with full colours indicate significant relationships. The length of the bar in green (STO_F), orange (STO_C), and blue ($STO_C + STO_F$) indicates the relative importance of the overlap (*STO*) on 0-group variability. Recruitment of cod and haddock is at age 3, and capelin is at age 1. The full length of the bars (colours and grey) represents the r^2; however, the coloured section represents the percentage of *r2* that is explained by the overlap indices. Comp 1-3 refer to haddock, capelin, and herring for cod; cod, capelin, and herring for haddock; and cod, haddock, and herring for capelin. Full borders paired with light grey indicate a statistically significant relationship (*p-value* ≤ 0.05). "*" indicates when the covariate combination failed the collinearity test. "-", "-+", "+", "+-, and "++" indicate the sign of the parameter estimates of the linear relationship between R and each of the STO (Eq. (4) in Figure 2, Supplementary Table 1), where two signs indicate the sign for STO_C coefficient first and then the one for STO_F. * denotes relationships that did not pass the for collinearity test. Competitors (comp) 1 and 2, respectively: haddock and capelin for cod, cod and capelin for haddock, and cod and haddock for capelin.

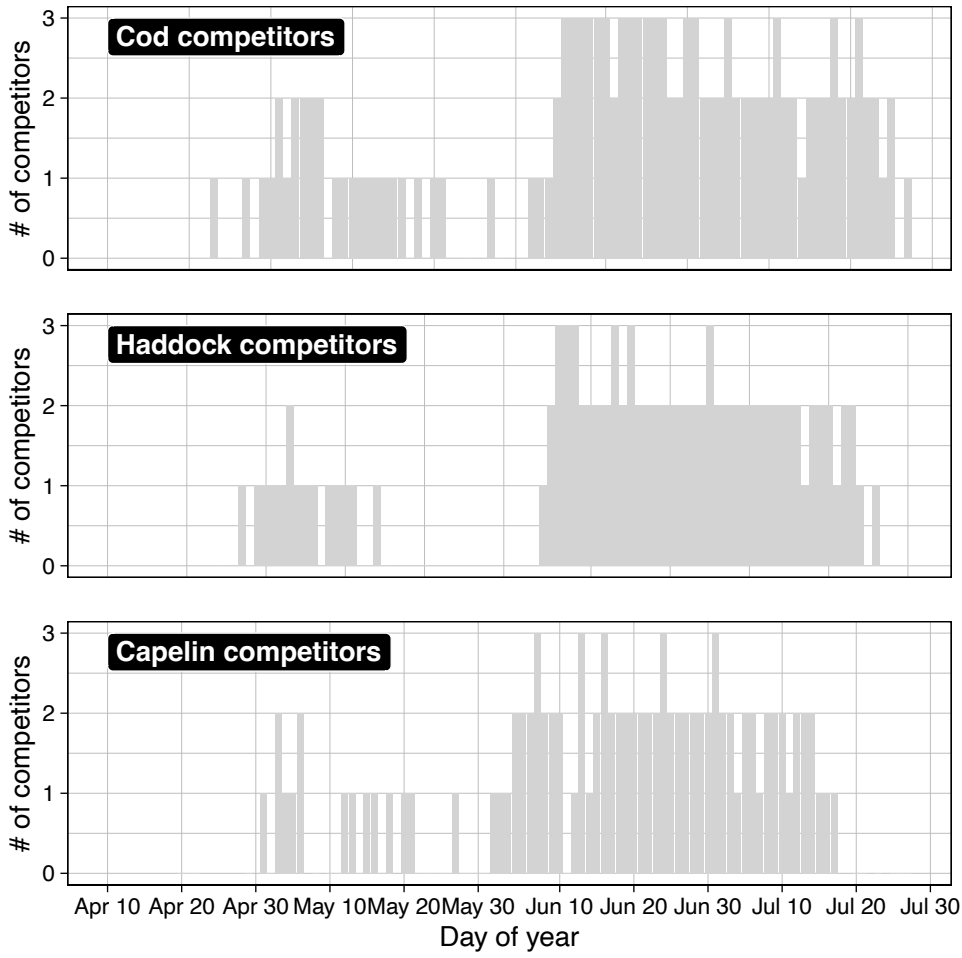

Figure S4 – Data points distribution over the day of year for the competitors of the three fish species in focus: cod, haddock, and capelin.

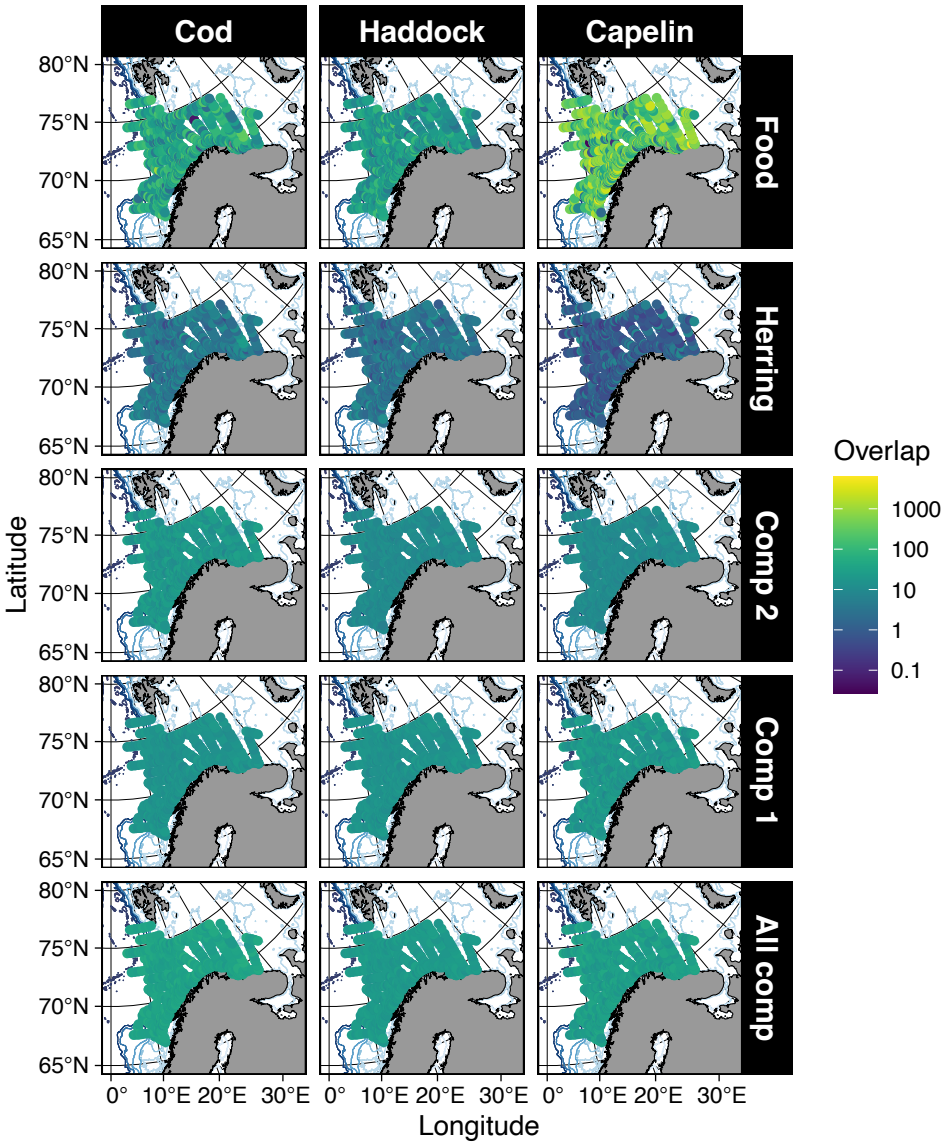

Figure S5 – Spatial average distribution of the overlap between the food and the competitors of the three fish species in focus (cod, haddock, and capelin). Competitors (comp) 1 and 2, respectively: haddock and capelin for cod, cod and capelin for haddock, and cod and haddock for capelin.

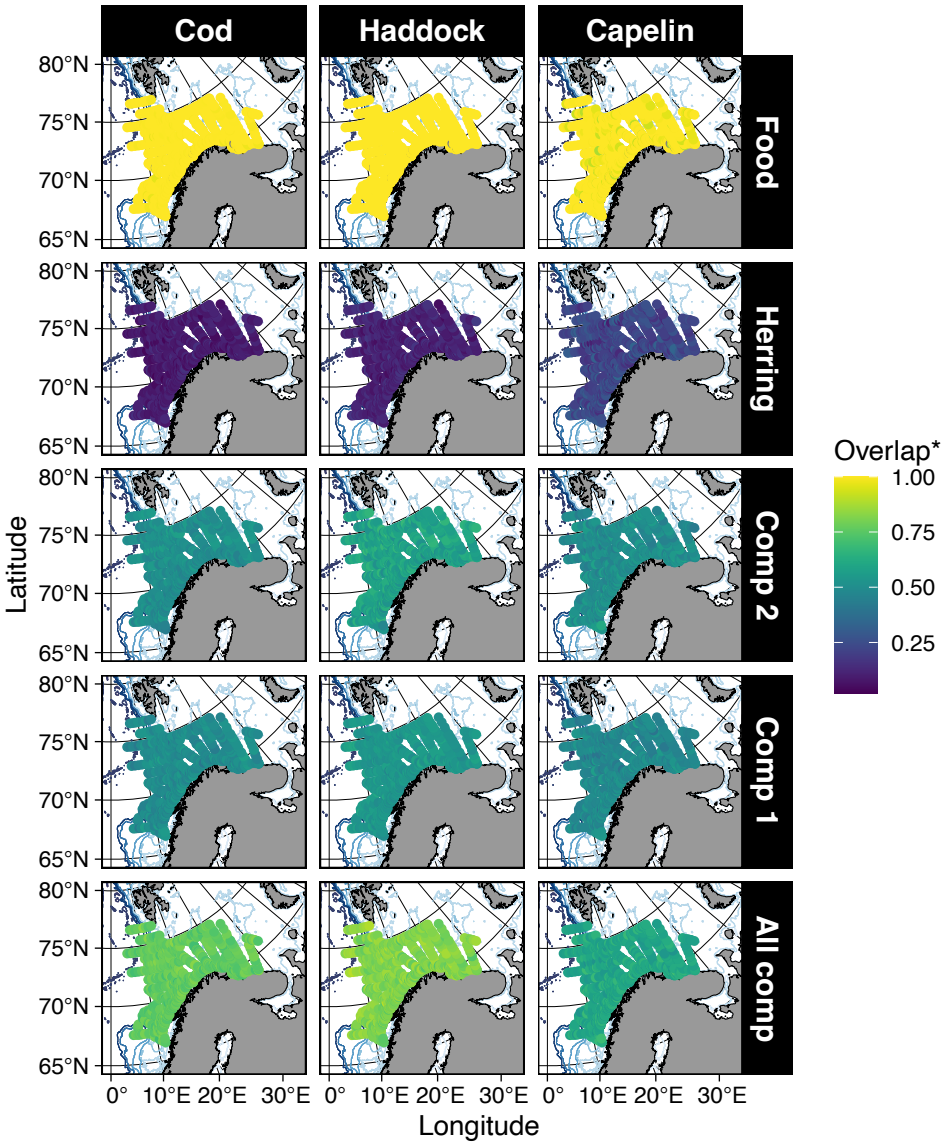

Figure S6 – Spatial average distribution of the overlap between the food and the competitors of the three fish species in focus (cod, haddock, and capelin) corrected for the species abundance (A_S, Overlap*). Therefore, 1 means a complete overlap: when the fish larva is present, there is always food or the competitor, *i.e.*, the area of overlap matches that of the species being studied (A_S). Competitors (comp) 1 and 2, respectively: haddock and capelin for cod, cod and capelin for haddock, and cod and haddock for capelin.

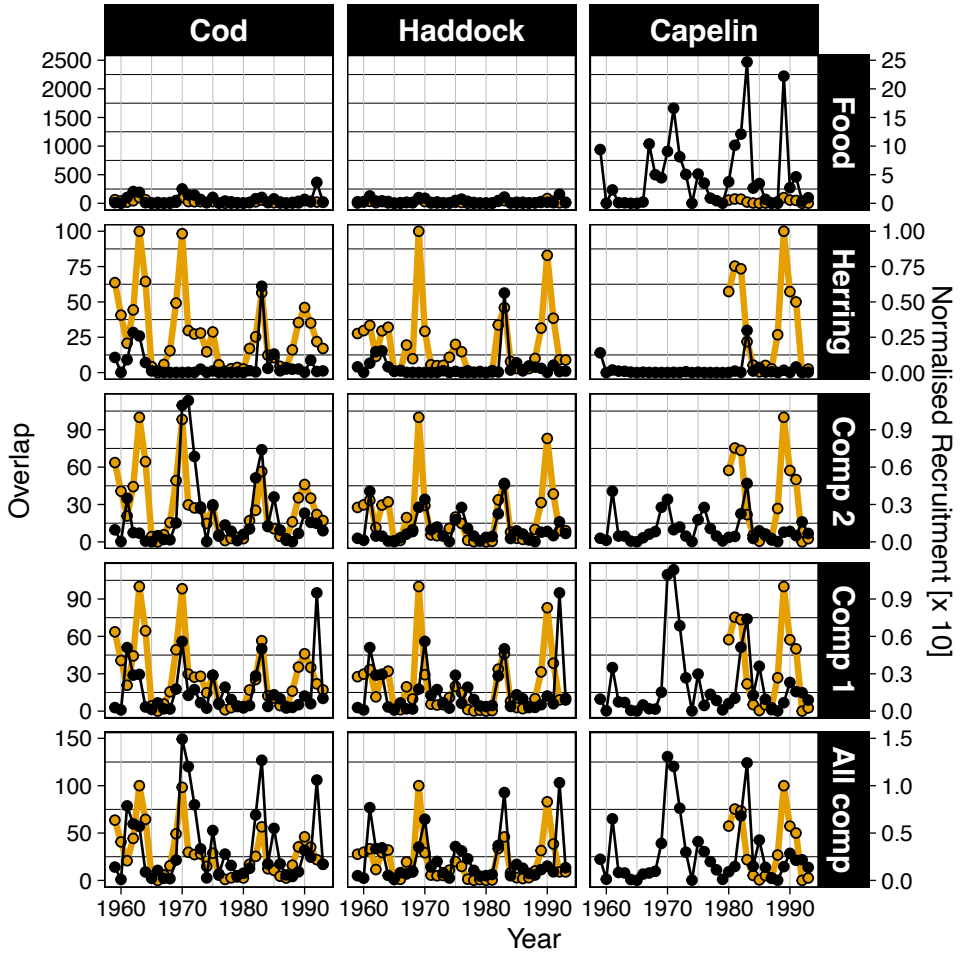

Figure S7 – Temporal average distribution of the recruitment (orange) and the overlap between the food and the competitors of the three fish species in focus (cod, haddock, and capelin, black). Competitors (comp) 1 and 2, respectively: haddock and capelin for cod, cod and capelin for haddock, and cod and haddock for capelin.

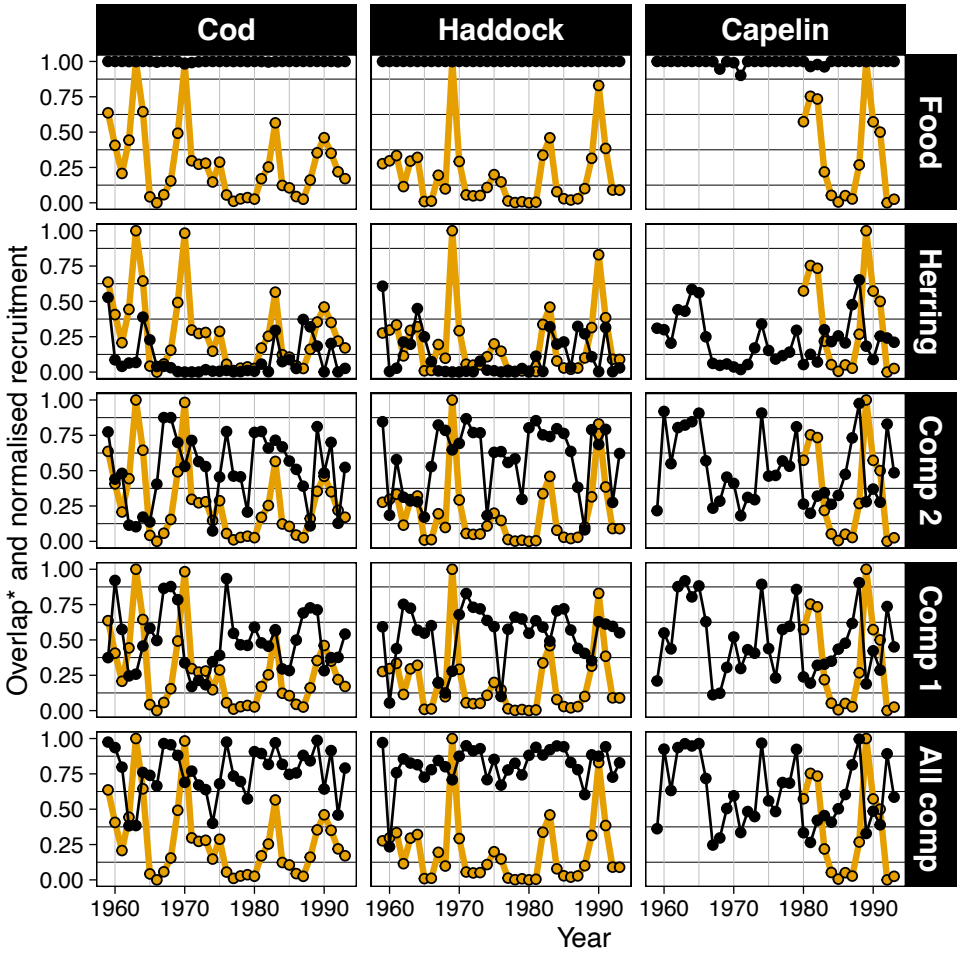

Figure S8 – Temporal average distribution of the recruitment (orange) and the overlap between the food and the competitors of the three fish species in focus (cod, haddock, and capelin, black) corrected for the species abundance (A_S, Overlap*). Therefore, 1 means a complete overlap: when the fish larva is present, there is always food or the competitor, *i.e.*, the area of overlap matches that of the species being studied (A_S). Competitors (comp) 1 and 2, respectively: haddock and capelin for cod, cod and capelin for haddock, and cod and haddock for capelin.