Supplementary Information: Figures and Tables

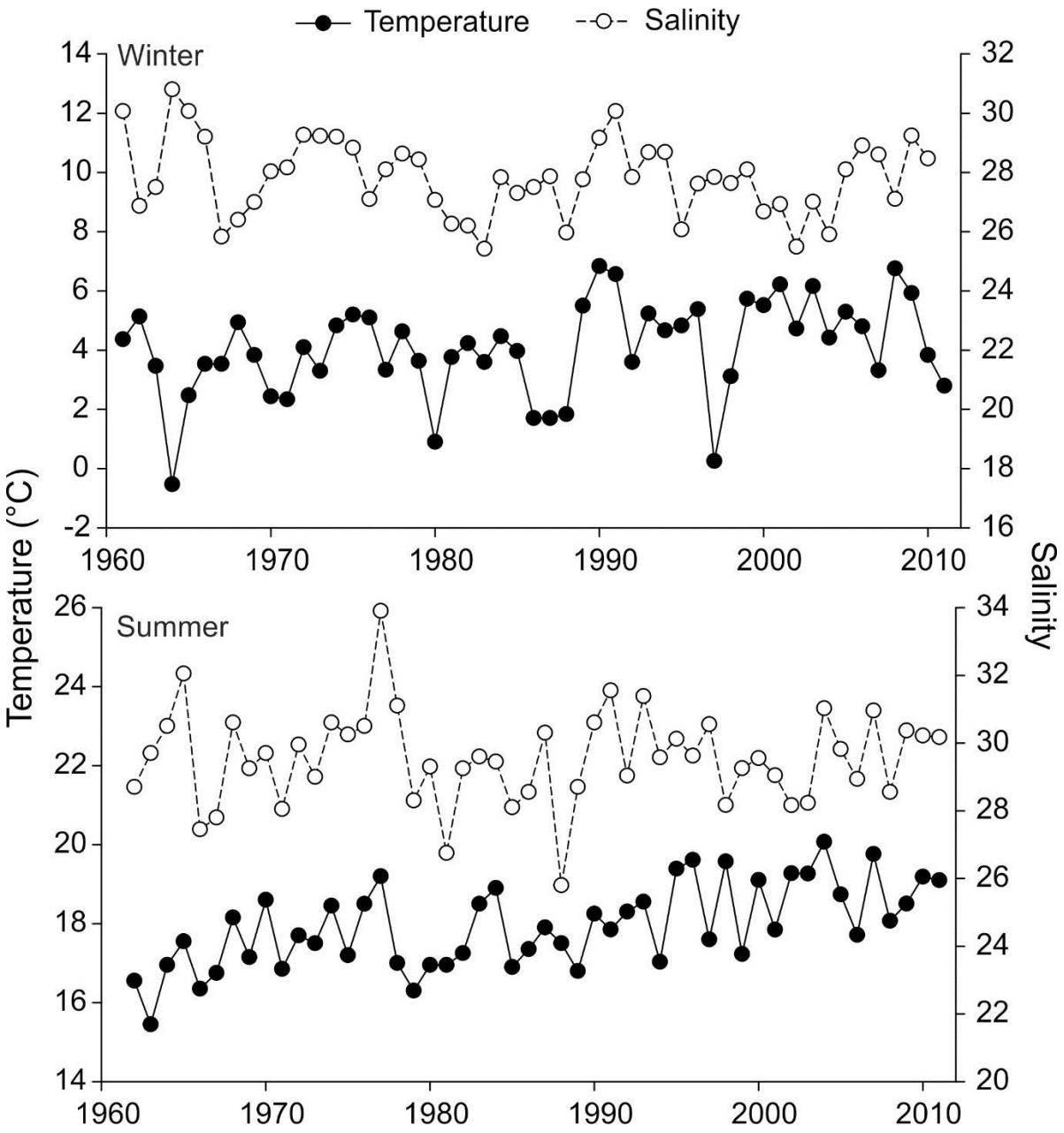

Figure S1. Mean temperature and salinity long-term trends in winter and summer in the western Dutch Wadden Sea.

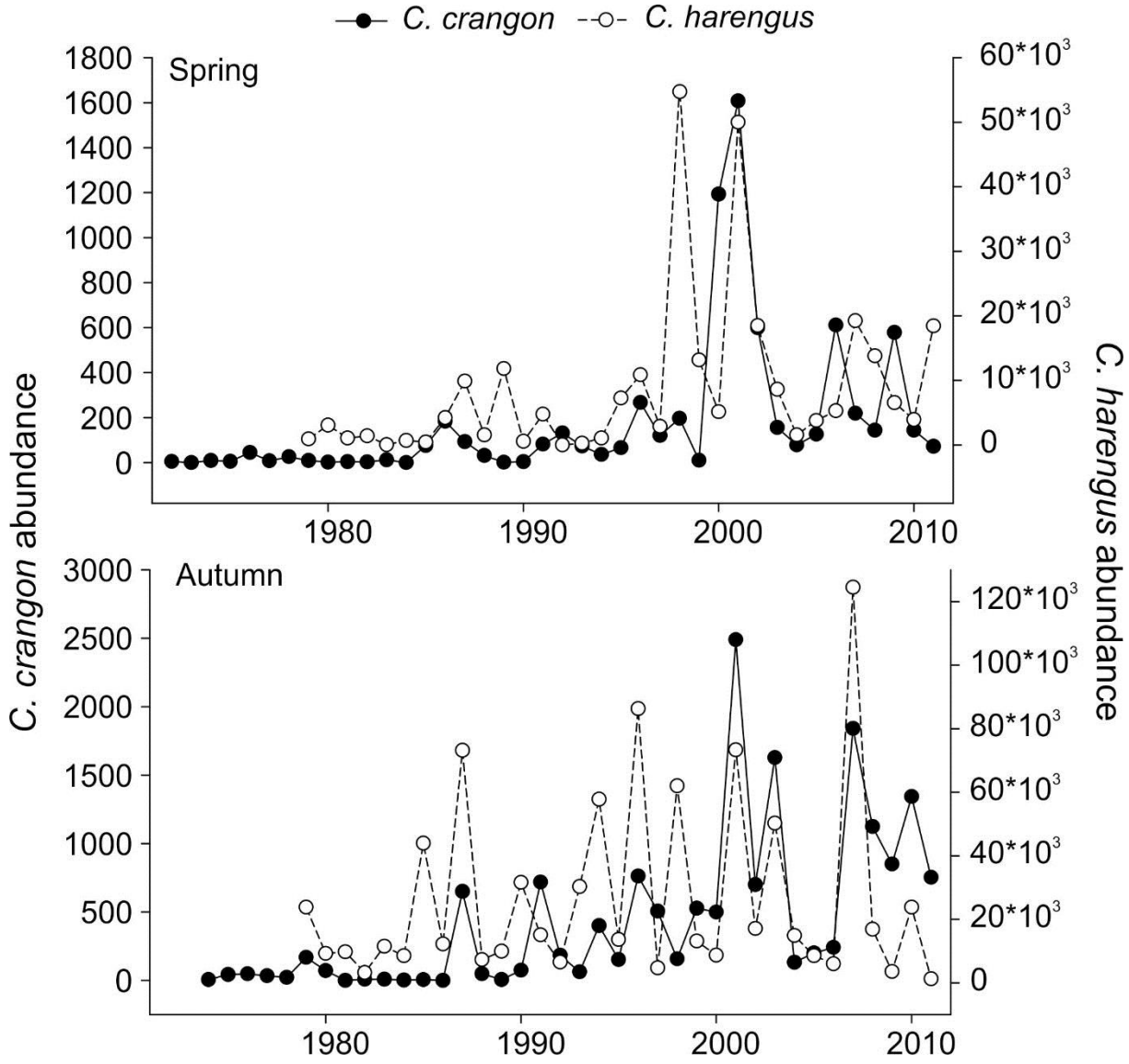

Figure S2. Abundance of *C. crangon* and *C. harengus* in spring and autumn (total numbers caught per season) in the western Dutch Wadden Sea.

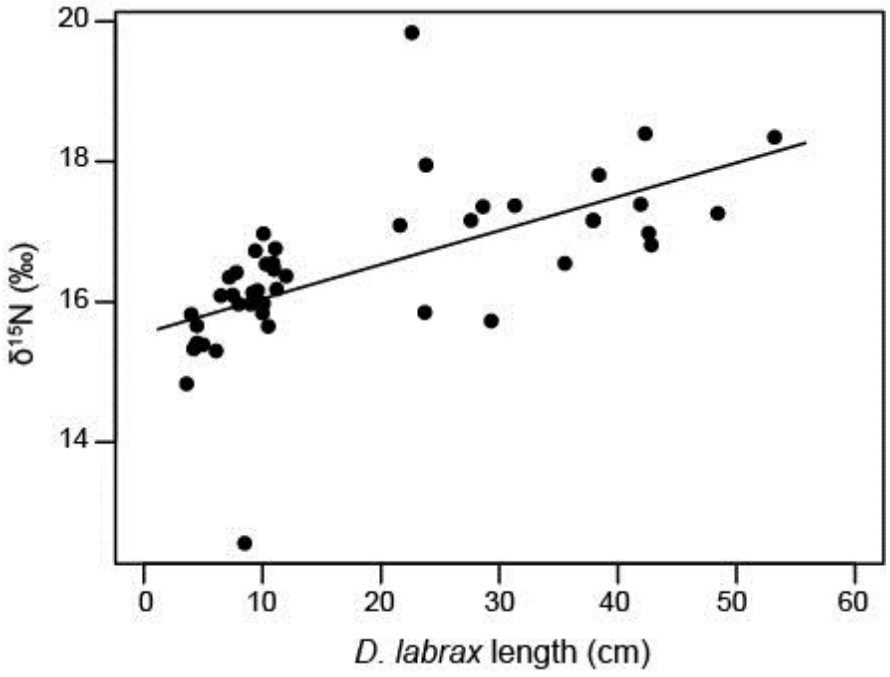

Figure S3. Nitrogen ($\delta^{15}N$) isotope ratios plotted against *D. labrax* total length. Each point represents one muscle tissue sample (average of 2 replicates). Line indicates the best linear fit.

Table S1. Diet composition of *D. labrax* (2.5 – 70 cm total length) from the western Dutch Wadden Sea (2005-2011) according to numerical (NI, %) and occurrence (OI, %) indices.

Prey species	NI	OI
Bivalvia (total)	**7.3**	**5.6**
Mya arenaria siphons	0.1	0.4
Ensis americanus foot	7.2	5.2
Amphipoda (total)	**4.7**	**9.3**
Amphipoda n.i.	2.6	4.4
Corophium sp.	0.1	0.4
Gammarus sp.	1.9	4.4
Decapoda (total)	**41.9**	**58.5**
Carcinus maenas	3.5	10.7
Crangon crangon	37.0	49.3
Cancer pagurus	0.2	0.7
Portumnus latipes	0.1	0.4
Macropipus holsatus	1.1	2.6
Isopoda (total)	**0.5**	**1.9**
Idotea sp.	0.4	1.5
Isopoda *n.i.*	0.1	0.4
Mysidae (total)	**20.5**	**18.5**
Mysids n.i.	17.4	15.6
Praunus flexuosus	3.2	3.0
Teleostei (total)	**19.8**	**26.7**
Ammodytes tobianus	1.6	3.0
Alosa fallax	0.1	0.4
Ciliata mustela	0.5	0.4
Clupea harengus	13.8	17.0
Merlangius merlangus	0.5	1.9
Osmerus eperlanus	0.1	0.4
Platichthys flesus	0.1	0.4
Pleuronectes platessa	1.7	1.9
Pomatoschistus minutus	0.1	0.4
Fish n.i.	1.3	4.1
Polychaeta (total)	**4.4**	**7.4**
Arenicola marina	0.7	2.6
Capitella capitata	0.1	0.4
Marenzelleria sp.	2.2	0.7
Nereis virens	0.4	0.7
Polychaete n.i.	1.0	3.0
Others	**0.8**	**3.0**
Nemertea	0.1	0.4
Rhizosthoma remains	0.1	0.4
unidentified material	0.6	2.2
Total number of prey items	945	
Total number of stomachs	408	
Total number of non-empty stomachs	270	

Table S2. Model selection following forward selection procedure to analyse the influence of environmental (temperature and salinity) on *D. labrax* abundances in spring and autumn. The final model considered for each season is indicated in bold. GCV is the generalised cross-validation score.

Model	R^2(adj.)	Dev. explained (%)	GCV
Spring			
Abundance~offset(LogF)+ s(shr_ab_sp)	0.45	37.9	67.8
Abundance~offset(LogF)+ s(shr_ab_sp)+ s(prev_winterT)	0.59	55.7	51.4
Abundance~offset(LogF)+ s(shr_ab_sp)+ s(prev_winterT)+ s(pre_winterS)	0.73	72.7	49.3
Abundance~offset(LogF)+ s(shr_ab_sp)+ s(prev_winterT)+ s(pre_winterS)+ s(prev_summerT)	0.81	82.1	42.9
Abundance~offset(LogF)+ s(shr_ab_sp)+ s(prev_winterT)+ s(pre_winterS)+ s(prev_summerT)+ s(pre_summerS)	**0.82**	**87.9**	**38.8**
Abundance~offset(LogF)+ s(shr_ab_sp)+ s(prev_winterT)+ s(pre_winterS)+ s(prev_summerT)+ s(pre_summerS)+ s(har_ab_sp)	0.93	88.4	39.5
Autumn			
Abundance~offset(LogF)+ s(shr_ab_au)	0.38	24.2	68.5
Abundance~offset(LogF)+ s(shr_ab_au)+ s(prev_winterT)	**0.82**	**79.4**	**48.6**
Abundance~offset(LogF)+ s(shr_ab_au)+ s(prev_winterT)+ s(summerT)	0.36	25.1	75.8
Abundance~offset(LogF)+ s(shr_ab_au)+ s(prev_winterT)+ s(summerS)	0.73	71.9	55.9
Abundance~offset(LogF)+ s(shr_ab_au)+ s(prev_winterT)+ s(pre_winterS)	0.65	49.6	66.4
Abundance~offset(LogF)+ s(shr_ab_au)+ s(prev_winterT)+ s(har_ab_au)	0.34	21.4	79.9