

Figure S1: Left: Spatial Omega 1 correlated against Depth, Right: Omega 1 correlated against substrate type

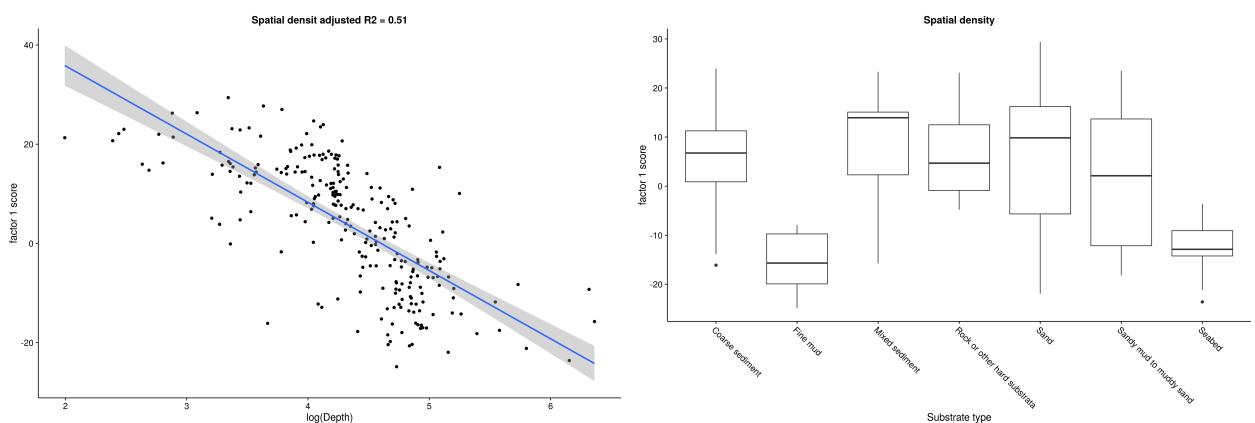


Figure S2: Left: Spatial Omega 2 correlated against Depth, Right: Omega 2 correlated against substrate type

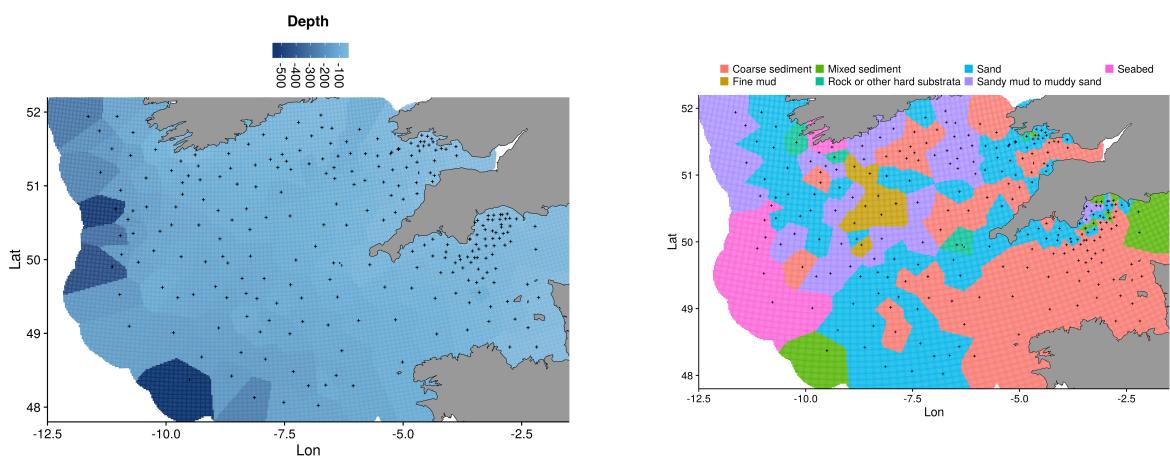


Figure S3: Left: Depth, Right: Substrate assigned to each spatial knot

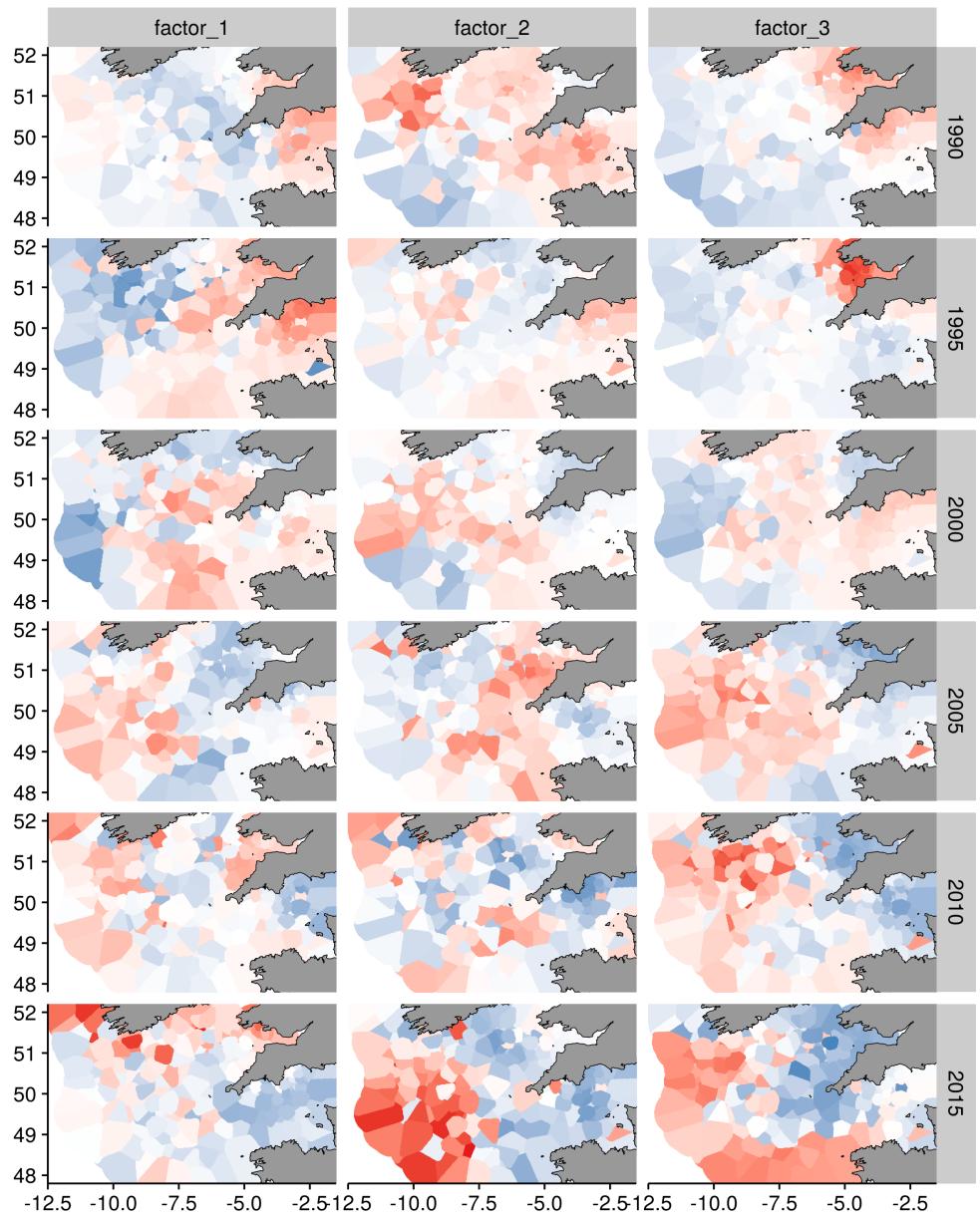


Figure S4: Spatial Loadings for first three factors every five years for spatio-temporal encounter probability

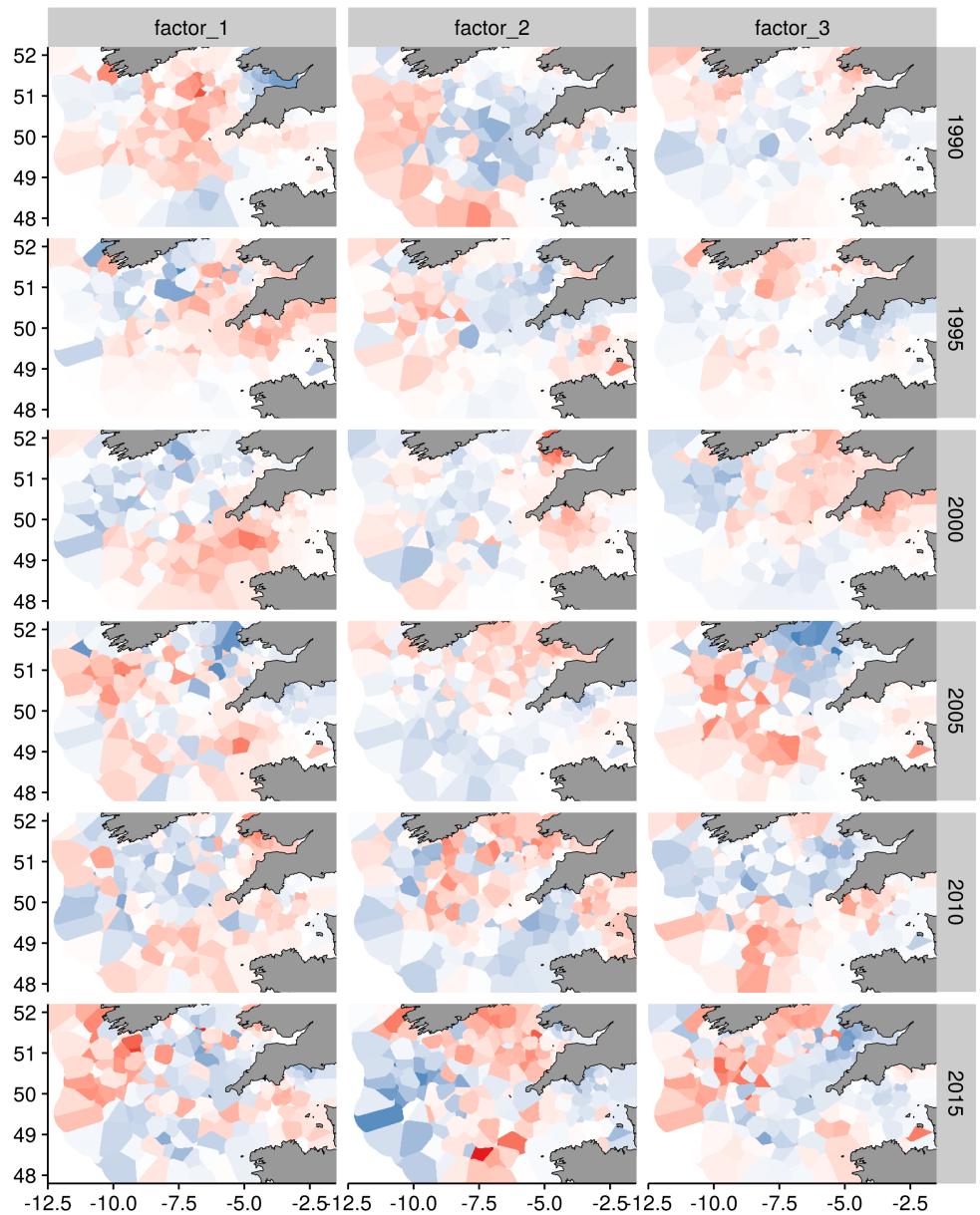


Figure S5: Spatial Loadings for first three factors every five years for spatio-temporal density

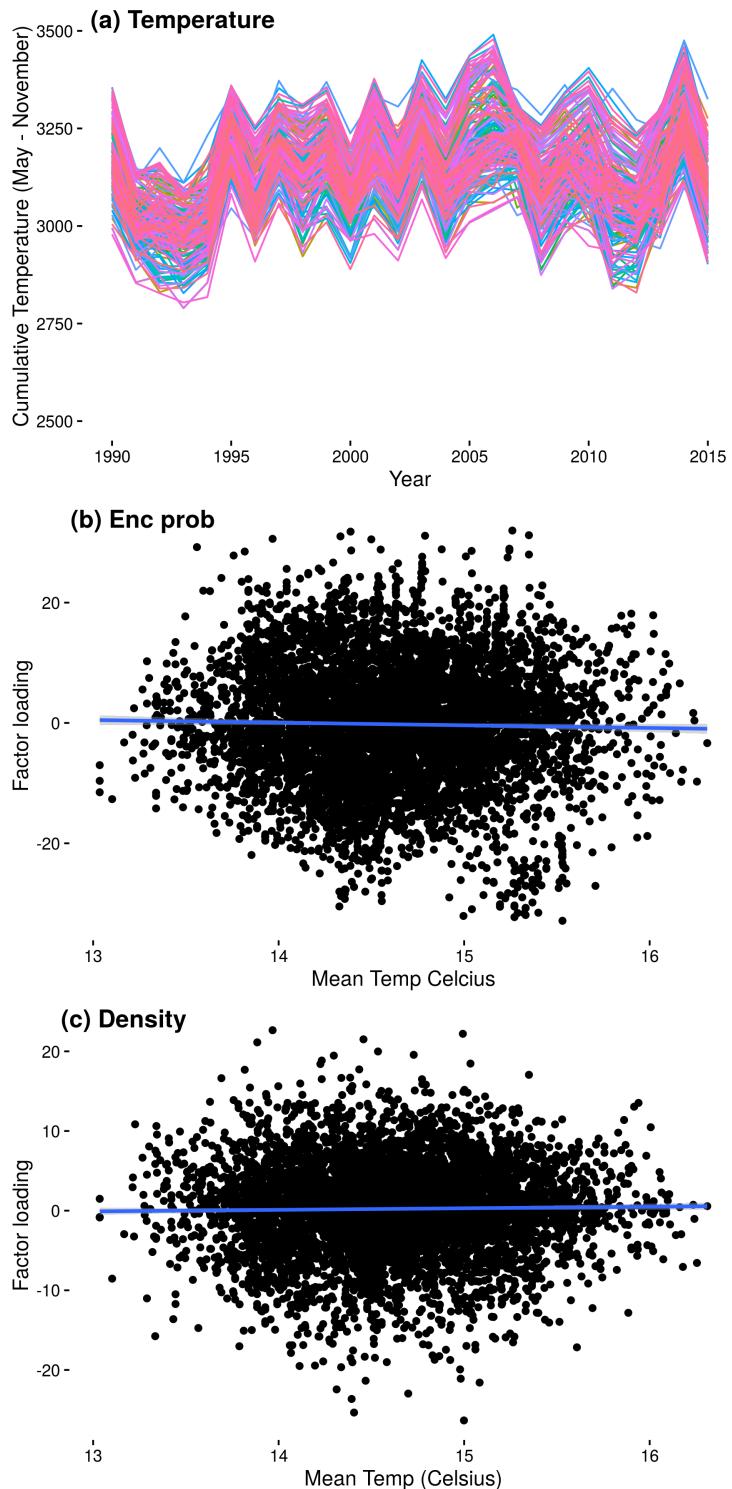


Figure S6: Association of temperature and knots (individual lines; top) with Spatio-temporal factor loadings for encounter probability (middle) and density (bottom)

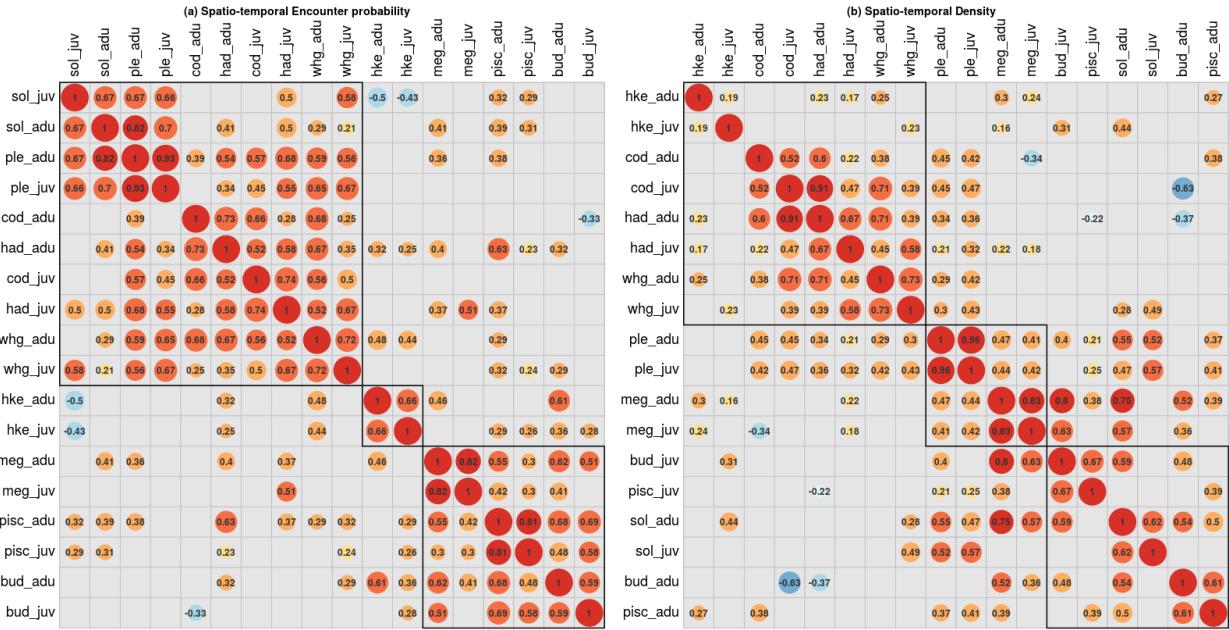


Figure S7: Inter-species correlations for (a) spatio-temporal encounter probability and b) spatio-temporal density. Species-groups are clustered into three groups based on a hierarchical clustering method with non-significant correlations (those where the Confidence Interval spanned zero) left blank

Table S1: List of survey codes, names and brief description

Survey code	Name	Gear	Temporal extent
CEXP	Celtic Explorer (IE)	Otter trawl	2003 - 2015
CARLHELMAR	Carlhelmar (UK)	Commercial beam trawl	1989 - 2013
NWGFS	North West groundfish survey (UK)	Beam trawl	1988 - 2015
Q1SWBEAM	Quarter 1 south-west beam trawl survey (UK)	beam trawl	2006 - 2015
Q4SWIBTS	Quarter 4 south-west international bottom trawl survey (UK)	Otter trawl	2003 - 2010
THA2	EVHOE survey on Thalasa (FR)	Otter trawl	1997 - 2015
WCGFS	Western channel ground-fish survey (UK)	Otter trawl (Portugese high headline)	1982 - 2004

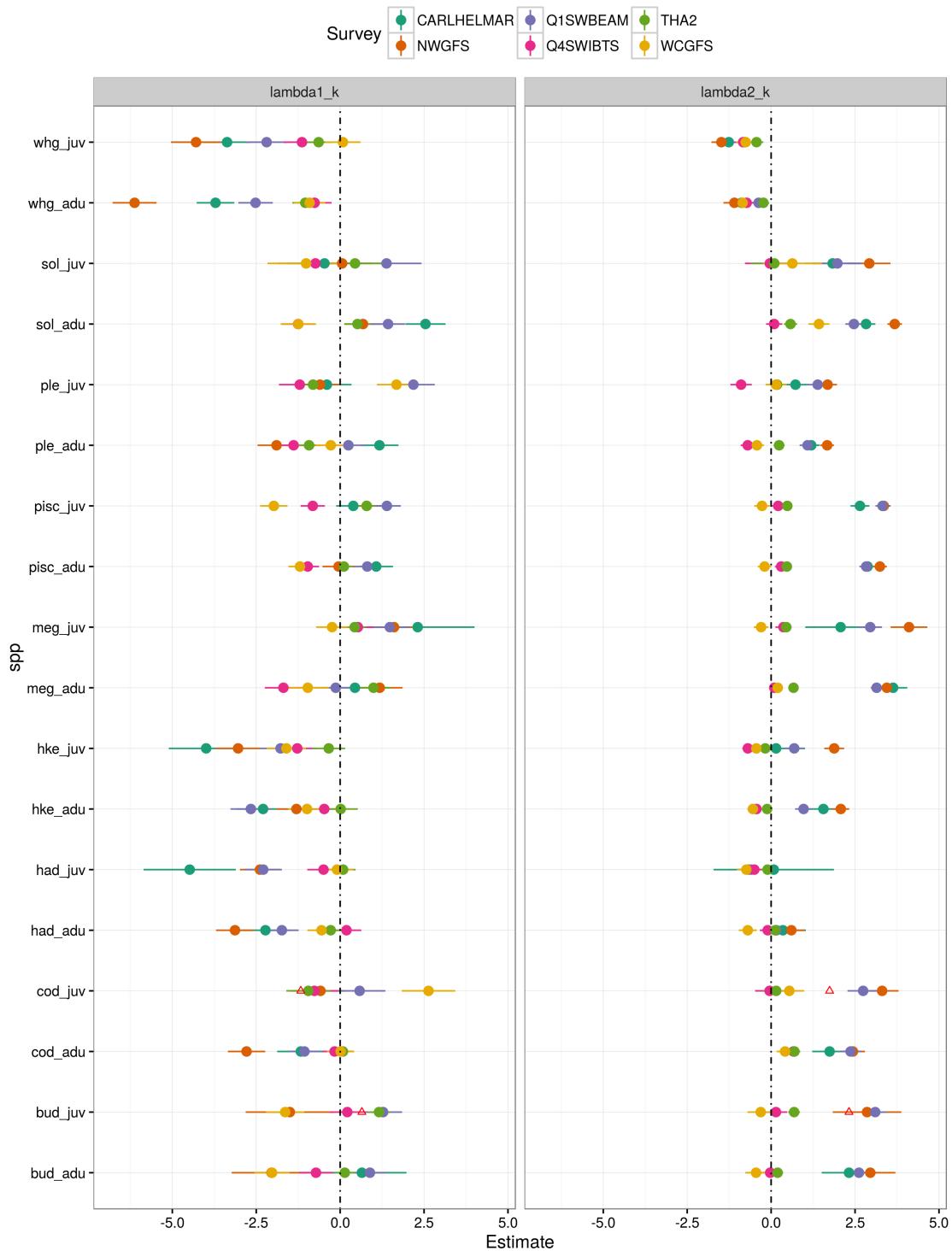


Figure S8: Fixed effect estimates for surveys for each species-group. Note all values within a species-group are relative to the CEXP survey

Table S2: List of species codes, names and minimum conservation reference size used to separate juvenile and adult fish

Species code	Common name	Species	MCRS (cm)
juv	Juvenile		
adu	Adult		
bud	Black bellied anglerfish	<i>Lophius budgessa</i>	32*
cod	Atlantic cod	<i>Gadus morhua</i>	35
had	Atlantic haddock	<i>Melanogrammus aeglefinus</i>	30
hke	Atlantic hake	<i>Merluccius merluccius</i>	27
meg	Megrim	<i>Lepidorhombus whiffiagonis</i>	20
pisc	White bellied anglerfish	<i>Lophius piscatorius</i>	32*
ple	European Plaice	<i>Pleuronectes platessa</i>	27
sol	Common sole	<i>Solea solea</i>	24
whg	Atlantic whiting	<i>Merlangius merlangus</i>	27

*Anglerfish species estimated based on a 500g minimum marketing weight