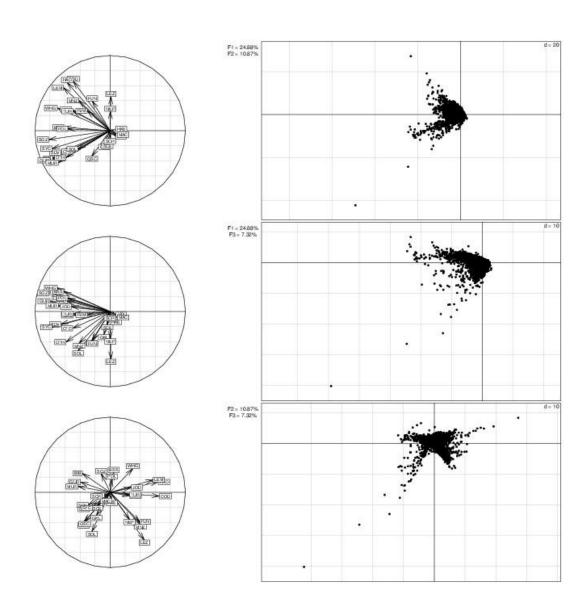
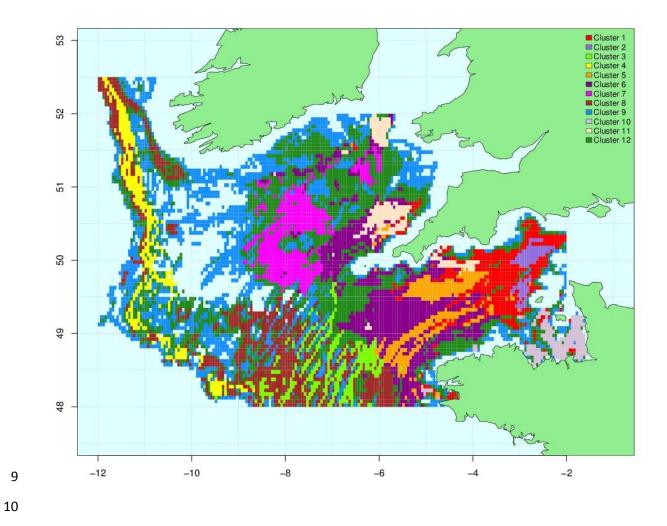
## 1 SUPLEMENTAL INFORMATION

- 2 Figure S1. PCA results. Correlation circle of the species (left) and squares factor map (right) on
- 3 axes 1 and 2 (top), 1 and 3 (middle) and 2 and 3 (bottom).
- 4



- 7 Figure S2. Cluster map (12 clusters, average 2010-2012). The same colour code was assigned to
- 8 each 3'\*3' square belonging to the same cluster.



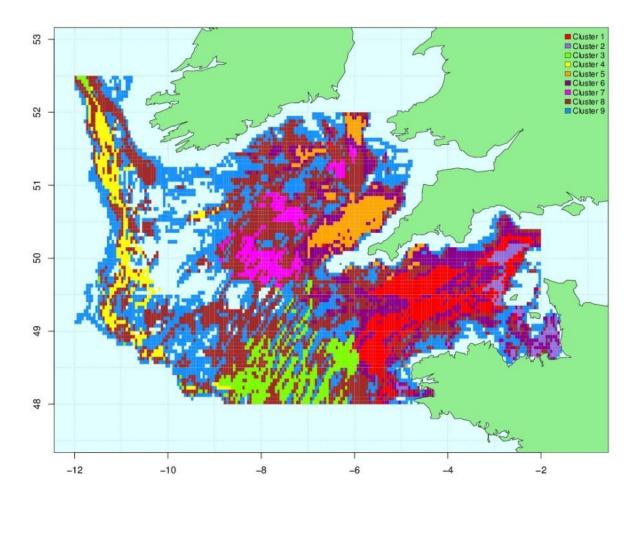
11 Characterization of clusters in terms of species assemblage (12 clusters, average 2010-2012).

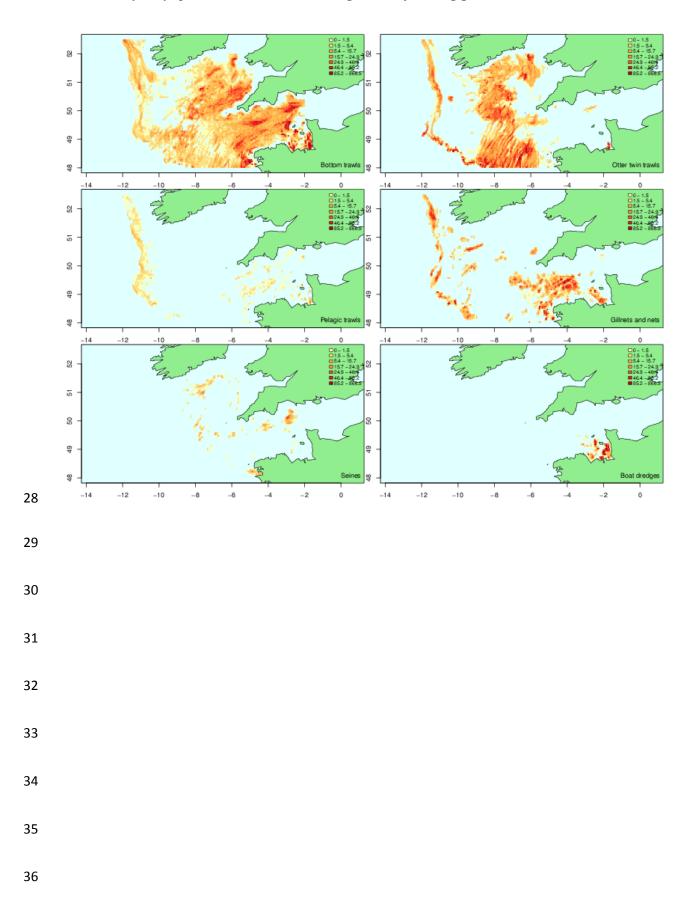
12 Species names in bold correspond to Indval species. Only 80% of the landed species are

- 13 presented.
- 14

1       29       OTH Others         BIB Pouting (Bi       GUR Red gurnar         WHG Whiting       HAD Haddock         JAX Jack and horse m       MNZ Monkfishe         QSC Queen scall       CTC Common cuttl         SYC Small-spotted ca       OTH Others         BIB Pouting (Bi       CTC Common cuttl         SYC Small-spotted ca       SYC Small-spotted ca         QSC Queen scall       CTC Common cuttl         SYC Small-spotted ca       SYC Small-spotted ca         MKG Whiting       SYC Small-spotted ca         MKG Whiting       SYC Small-spotted ca         MKZ Monkfishe       HAD Haddock	rd 9.1 7.6 7.4 ackerel 7.3 s 6.3 op 5.4 efish 5.3 itshark 4.8 14.1 12.0 b) 11.8 efish 10.6 8.7 itshark 7.4 op 5.9	7 8 9	26 28 29	MNZ COD HAD NEP OTH LEZ RJN HKE JAX OTH HKE JAX MNZ	Monkfishes Atlantic cod Haddock Norway lobster Others Megrims Monkfishes Megrims Cuckoo ray European hake Haddock Jack and horse mackerel Others European hake Jack and horse mackerel	17.2 15.3 15.2 14.0 8.8 8.8 32.2 11.5 9.2 8.5 8.0 7.5 6.3 24.2 17.7
1     29     GUR WHG     Red gurnar WHG       1     29     HAD HAD     Haddock       JAX     Jack and horse m MNZ     Monkfishe       QSC     Queen scall     CTC       CTC     Common cuttl     SYC       SYC     Small-spotted ca       GUR     Red gurnar       BIB     Pouting (Bi       CTC     Common cuttl       SYC     Small-spotted ca       QSC     Queen scall       MNZ     Small-spotted ca       QSC     Queen scall       MNZ     Monkfishe	rd 9.1 7.6 7.4 ackerel 7.3 s 6.3 op 5.4 efish 5.3 ttshark 4.8 14.1 rd 12.0 b) 11.8 efish 10.6 8.7 ttshark 7.4 op 5.9 s 4.6	8	28	HAD NEP OTH LEZ KJN HKE HAD JAX OTH HKE JAX	Haddock Norway lobster Others Megrims Monkfishes Megrims Cuckoo ray European hake Haddock Jack and horse mackerel Others European hake Jack and horse mackerel	15.2 14.0 8.8 8.8 32.2 11.5 9.2 8.5 8.0 7.5 6.3 24.2 17.7
1     29     WHG HAD JAX     WHG HAD JAX     WhG HAD JAX       29     HAD JAX     Jack and horse m MNZ       MNZ     Monkfishe QSC     Queen scall CTC       CTC     Common cuttl SYC     Small-spotted ca       SYC     Small-spotted ca       BB     Pouting (Bi CTC       CTC     Common cuttl       SYC     Small-spotted ca       SYC     Small-spotted ca       SYC     Small-spotted ca       MHG     Whiting       SYC     Small-spotted ca       QSC     Queen scall       MNZ     Monkfishe	$\begin{array}{cccc} 7.6 \\ 7.4 \\ ackerel & 7.3 \\ s & 6.3 \\ op & 5.4 \\ efish & 5.3 \\ tshark & 4.8 \\ & 14.1 \\ rd & 12.0 \\ b) & 11.8 \\ efish & 10.6 \\ 8.7 \\ tshark & 7.4 \\ op & 5.9 \\ s & 4.6 \\ \end{array}$	8	28	NEP OTH LEZ RJN HKE HAD JAX OTH HKE JAX	Norway lobster Others Megrims Monkfishes Megrims Cuckoo ray European hake Haddock Jack and horse mackerel Others European hake Jack and horse mackerel	14.0 8.8 32.2 11.5 9.2 8.5 8.0 7.5 6.3 24.2 17.7
1     29     HAD JAX     Haddock JAX       JAX     Jack and horse m MNZ     Monkfishe QSC       QSC     Queen scall CTC     Common cuttl SYC       SYC     Small-spotted cz       GUR     Red gurnar       BIB     Pouting (Bi       CTC     Common cuttl       SYC     Small-spotted cz       QSC     Queen scall       GUR     Red gurnar       BIB     Pouting (Bi       CTC     Common cuttl       SYC     Small-spotted cz       QSC     Queen scall       MNZ     Monkfishe	$\begin{array}{cccc} & 7.4 \\ ackerel & 7.3 \\ s & 6.3 \\ op & 5.4 \\ efish & 5.3 \\ tshark & 4.8 \\ & 14.1 \\ rd & 12.0 \\ b) & 11.8 \\ efish & 10.6 \\ & 8.7 \\ tshark & 7.4 \\ op & 5.9 \\ s & 4.6 \\ \end{array}$	8	28	OTH LEZ MNZ LEZ RJN HKE HAD JAX OTH HKE JAX	Others Megrims Monkfishes Megrims Cuckoo ray European hake Haddock Jack and horse mackerel Others European hake Jack and horse mackerel	8.8 8.8 32.2 11.5 9.2 8.5 8.0 7.5 6.3 24.2 17.7
129JAXJack and horse mMNZMonkfisheQSCQueen scallCTCCommon cuttlSYCSmall-spotted caOTHOthersGURRed gurnarBIBPouting (BiCTCCommon cuttlSYCSmall-spotted caQSCQueen scallCTCCommon cuttlQSCQueen scallMNZMonkfishe	ackerel       7.3         s       6.3         op       5.4         efish       5.3         atshark       4.8         14.1         rd       12.0         b)       11.8         efish       10.6         8.7       8.7         atshark       7.4         op       5.9         s       4.6			LEZ MNZ LEZ RJN HKE HAD JAX OTH HKE JAX	Megrims Monkfishes Megrims Cuckoo ray European hake Haddock Jack and horse mackerel Others European hake Jack and horse mackerel	8.8 32.2 11.5 9.2 8.5 8.0 7.5 6.3 24.2 17.7
2 29 WHG Whiting SYC Small-spotted cz QSC Queen scall CTC Common cuttl SYC Small-spotted cz GUR Red gurnar BIB Pouting (Bi CTC Common cuttl SYC Small-spotted cz QSC Queen scall MNZ Monkfishe	s 6.3 op 5.4 efish 5.3 ttshark 4.8 14.1 rd 12.0 b) 11.8 efish 10.6 8.7 ttshark 7.4 op 5.9 s 4.6			MNZ LEZ RJN HKE HAD JAX OTH HKE JAX	Monkfishes Megrims Cuckoo ray European hake Haddock Jack and horse mackerel Others European hake Jack and horse mackerel	32.2 11.5 9.2 8.5 8.0 7.5 6.3 24.2 17.7
2 29 WHG Whiting SYC Small-spotted ca GUR Red gurnar BIB Pouting (Bi CTC Common cuttl CTC Common cuttl SYC Small-spotted ca QSC Queen scall MNZ Monkfishe	op         5.4           efish         5.3           atshark         4.8           14.1           rd         12.0           b)         11.8           efish         10.6           8.7         8.7           ttshark         7.4           op         5.9           s         4.6			LEZ RJN HKE HAD JAX OTH HKE JAX	Megrims Cuckoo ray European hake Haddock Jack and horse mackerel Others European hake Jack and horse mackerel	11.5 9.2 8.5 8.0 7.5 6.3 24.2 17.7
2 29 WHG Whiting SYC Small-spotted ca GUR Red gurnar BIB Pouting (Bi CTC Common cuttl SYC Small-spotted ca QSC Queen scall MNZ Monkfishe	fish         5.3           atshark         4.8           14.1           rd         12.0           b)         11.8           efish         10.6           8.7           atshark         7.4           op         5.9           s         4.6			RJN HKE HAD JAX OTH HKE JAX	Cuckoo ray European hake Haddock Jack and horse mackerel Others European hake Jack and horse mackerel	9.2 8.5 8.0 7.5 6.3 24.2 17.7
2 29 WHG Whiting SYC Small-spotted ca GUR Red gurnar BIB Pouting (Bi CTC Common cuttl SYC Small-spotted ca QSC Queen scall MNZ Monkfishe	attshark         4.8           14.1         12.0           b)         11.8           efish         10.6           8.7         8.7           ttshark         7.4           op         5.9           s         4.6			HKE HAD JAX OTH HKE JAX	European hake Haddock Jack and horse mackerel Others European hake Jack and horse mackerel	8.5 8.0 7.5 6.3 24.2 17.7
OTH         Others           GUR         Red gurnar           BIB         Pouting (Bi           CTC         Common cuttl           2         29         WHG         Whiting           SYC         Small-spotted ca         QSC         Queen scall           MNZ         Monkfishe         Monkfishe	14.1           rd         12.0           b)         11.8           efish         10.6           8.7           ttshark         7.4           op         5.9           s         4.6			HAD JAX OTH HKE JAX	Haddock Jack and horse mackerel Others European hake Jack and horse mackerel	8.0 7.5 6.3 24.2 17.7
2 29 WHG Whiting SYC Small-spotted ca QSC Queen scall MNZ Monkfishe	rd 12.0 b) 11.8 efish 10.6 8.7 ttshark 7.4 op 5.9 s 4.6	9	29	JAX OTH HKE JAX	Jack and horse mackerel Others European hake Jack and horse mackerel	7.5 6.3 24.2 17.7
2 29 WHG Common cuttl 29 WHG Whiting SYC Small-spotted ca QSC Queen scall MNZ Monkfishe	b) 11.8 efish 10.6 8.7 ttshark 7.4 op 5.9 s 4.6	9	29	ÓTH HKE JAX	Others European hake Jack and horse mackerel	6.3 24.2 17.7
2 29 WHG Common cuttl 29 WHG Whiting SYC Small-spotted ca QSC Queen scall MNZ Monkfishe	efish 10.6 8.7 ttshark 7.4 op 5.9 s 4.6	9	29	HKE JAX	European hake Jack and horse mackerel	24.2 17.7
2 29 WHG Whiting SYC Small-spotted ca QSC Queen scall MNZ Monkfishe	8.7 atshark 7.4 op 5.9 s 4.6	9	29	JAX	Jack and horse mackerel	17.7
SYC Small-spotted cc QSC Queen scall MNZ Monkfishe	tshark 7.4 op 5.9 s 4.6	9	29			
QSC Queen scall MNZ Monkfishe	op 5.9 s 4.6	9	29	MNZ		
MNZ Monkfishe	s 4.6	9	29		Monkfishes	13.1
				HAD	Haddock	9.8
HAD Haddock	4.4			OTH	Others	9.1
				LEZ	Megrims	5.3
MNZ Monkfishe	s 33.5			QSC	Queen scallop	27.3
HAD Haddock				SCE	Great atlantic scallop	17.7
<b>DIN</b> Cuckoo ray		10	29	GKL	Common european bittersweet	14.8
3 28 LEZ Megrims	8.7			ОТН	Others	11.4
CTC Common cuttl				SCR	Spinous spider crab	10.3
OTH Others	6.9			HAD	Haddock	28.3
JAX Jack and horse m	ackerel 59.8	-		WHG	Whiting	17.9
4 29 HKE European ha				COD	Atlantic cod	8.3
MAC Atlantic mack		11	28	RIM	Spoteed ray	7.9
MNZ Monkfishe				MNZ	Monkfishes	7.4
HAD Haddock				OTH	Others	6.7
CTC Common cuttl				SOZ	Inshore squids	3.1
WHG Whiting	8.7			JAX	Jack and horse mackerel	17.9
OTH Others	8.3			HAD	Haddock	17.7
5 28 GUR Red gurnar				MNZ	Monkfishes	12.5
BIB Pouting (Bi				OTH	Others	9.5
SQZ Inshore squ	2	12	29	COD	Atlantic cod	7.6
IAX Jack and horse m				HKE	European hake	5.2
COD Atlantic co				LEZ	Megrims	4.8
HAD Haddock		-		WHG	Whiting	4.7
MNZ Monkfishe					5	
COD Atlantic co						
OTH Others	8.491					
WHC Whiting	7.248					
6 28 CTC Common cuttl						
IOD John dory						
JAX Jack and horse m						
GUR Red gurnar						
POL Pollack	2.845					

Figure S3. Spatial patterns in the retained catches in 2010 (9 clusters). The same colour code
was assigned to each 3'\*3' square belonging to the same cluster

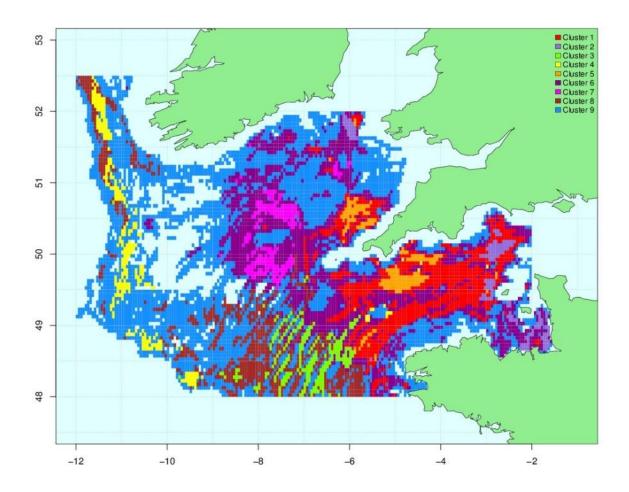




- 37 Characterization of cluster in term of species assemblage in 2010. Species names in bold
- 38 correspond to Indval species. Only 80% of the landed species are presented.

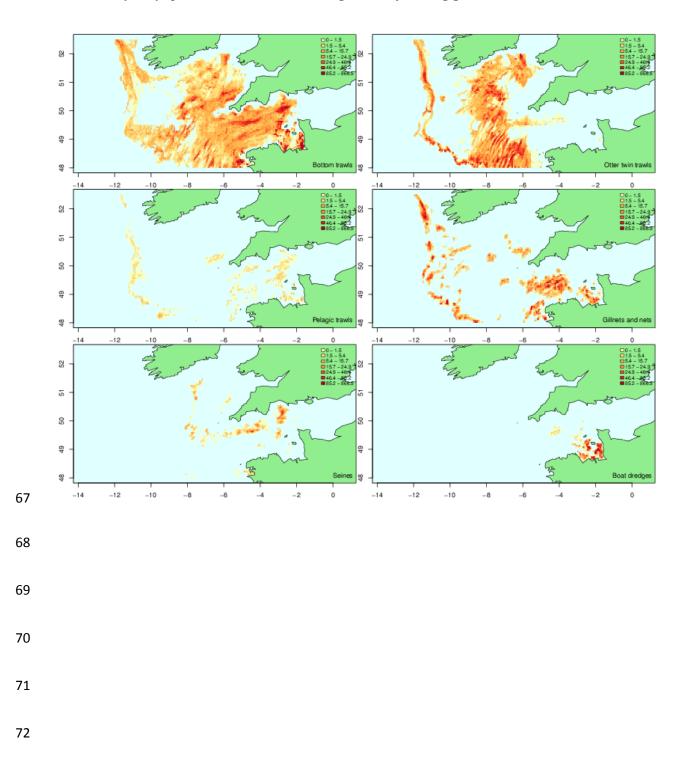
Cluster	Nb of species	FAO code	Species	% Lands	Cluster	Nb of species	FAO code	Species	% Lands
		MNZ	Monkfishes	14.0			OTH	Others	15.1
		CTC	Common cuttlefish	11.0			HAD	Haddock	13.4
		OTH	Others	9.9			MNZ	Monkfishes	8.5
		GUR	Red gurnard	9.4			WHG	Whiting	7.9
	28	JAX	Jack and horse mackerel	9.2			BIB	Pouting (Bib)	5.4
1	28	BIB	Pouting (Bib)	8.6			QSC	Queen scallop	4.6
		WHG	Whiting	6.0	6	29	GUR	Red gurnard	4.3
		HAD	Haddock	5.1			SCE	Great atlantic scallop	4.3
		SQZ	Inshore squids	4.0			JAX	Jack and horse mackerel	4.0
		PÕL	Pollack	3.3			ŚCR	Spinous spider crab	3.9
		QSC	Queen scallop	28.7	-		СТС	Common cuttlefish	3.7
		OTH	Others	13.7			SYC	Small-spotted catshark	3.4
		SCE	Great atlantic scallop	10.3			COD	Atlantic cod	3.2
		CTC	Common cuttlefish	8.1			NEP	Norway lobster	24.1
2	29	GKL	Common european bittersweet	7.5			MNZ	Monkfishes	18.3
		GUR	Red gurnard	5.1			LEZ	Megrims	11.4
		BIB	Pouting (Bib)	4.8	7	26	HAD	Haddock	8.8
		SCR	Spinous spider crab	4.3			OTH	Others	8.7
		MNZ	Monkfishes	36.0	-		COD	Atlantic cod	7.4
		RJN	Cuckoo ray	16.2			JAX	lack and horse mackerel	24.7
<b>3</b> 29	ĹÉZ	Megrims	11.7			MNZ	Monkfishes	15.5	
		OTH	Others	8.1			HAD	Haddock	9.0
		CTC	Common cuttlefish	7.7			OTH	Others	7.7
		JAX	lack and horse mackerel	82.0	8	29	LEZ	Megrims	6.9
4	26	MAC	Atlantic mackerel	9.8			HKE	European hake	6.2
		HKE	European hake	5.5			RIN	Cuckoo ray	4.1
		HAD	Haddock	34.5			COD	Atlantic cod	3.4
	WHG	Whiting	18.8			MAC	Atlantic mackerel	3.2	
	OTH	Others	7.0			OTH	Others	17.5	
5	<b>5</b> 28	MNZ	Monkfishes	5.7			MNZ	Monkfishes	16.2
		RJM	Spotted ray	5.4			JAX2	Jack and horse mackerel	14.5
		COD	Atlantic cod	4.7	9		HAD	Haddock	11.4
		IOD	John dory	3.1		28	HKE	European hake	6.7
		,	joint dory	0.1		-0	LEZ2	Megrims	5.8
							WHG	Whiting	3.6
							COD	Atlantic cod	3.0
							RIN	Cuckoo ray	2.5

Figure S4. Spatial patterns in the retained catches in 2011 (9 clusters). The same colour code
was assigned to each 3'\*3' square belonging to the same cluster.





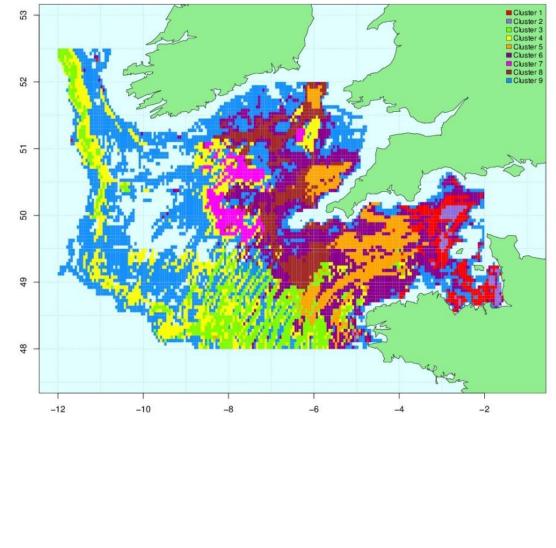
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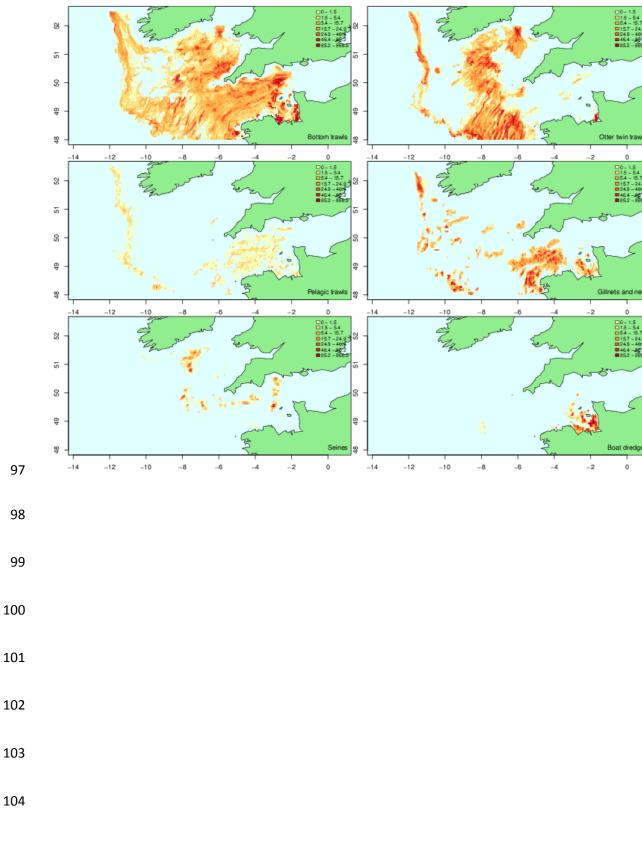


- 75 Characterization of cluster in term of species assemblage in 2011. Species names in bold
- correspond to Indval species. Only 80% of the landed species are presented.

Cluster	Nb of species	FAO code	Species	% Lands	Cluster	Nb of species	FAO code	Species	% Lands
		HAD	Haddock	15.3			HAD	Haddock	15.5
	MNZ	Monkfishes	11.4			OTH	Others	12.3	
		ОТН	Others	10.5			MNZ	Monkfishes	11.7
		WHG	Whiting	9.1			COD	Atlantic cod	8.5
		GUR	Red gurnard	7.4			QSC	Queen scallop	7.4
1	29	BIB	Pouting (Bib)	7.3	6	29	WHG	Whiting	6.3
		COD	Atlantic cod	5.0	0	29	SCE	Great atlantic scallop	3.5
		SQZ	Inshore squids	4.9			HKE	European hake	3.0
		JAX	Jack and horse mackerel	4.5			SYC	Small-spotted catshark	2.9
		CTC	Common cuttlefish	4.0			CTC	Common cuttlefish	2.8
		QSC	Queen scallop	25.4	-		SCR	Spinous spider crab	2.6
		QSC OTH	Others	23.4 12.0			LEZ	Megrims	2.5
		CTC	Common cuttlefish	7.8			MNZ	Monkfishes	18.1
		SCE		7.8 6.9			HAD	Haddock	15.9
<b>2</b> 29	GKL	Great atlantic scallop		7		NEP	Norway lobster	13.4	
	SYC	Common european bittersweet	6.1		26	COD	Atlantic cod	13.4	
	GUR	Small-spotted catshark	5.0			OTH	Others	9.5	
		Red gurnard	4.5			LEZ	Megrims	9.1	
		SCR Spinous spider crab WHG Whiting BIB Pouting (Bib)	4.5			MNZ	Monkfishes	35.0	
			0	4.3		28	HAD	Haddock	11.6
			Pouting (Bib)	4.0	8		LEZ	Megrims	11.5
		MNZ	Monkfishes	31.1			RJN	Cuckoo ray	9.6
	<b>3</b> 27	HAD	Haddock	13.7			HKE	European hake	9.3
3		CTC	Common cuttlefish	13.1			HKE	European hake	20.7
		RJN	Cuckoo ray	11.1			MNZ	Monkfishes	
	LEZ	Megrims	7.0	9	29	OTH	Others	18.8	
	OTH	Others	6.0			HAD	Haddock	13.0 10.2	
<b>4</b> 26			50.3			LEZ			
	26		,	24.7			COD	Megrims	6.8
	MAC Atlantic mackere		13.7	-			Atlantic cod	5.3	
5 28	HAD	Haddock	22.4			JAX	Jack and horse mackerel	4.5	
	WHG	Whiting	19.9						
		MNZ	Monkfishes	9.7					
		OTH	Others	6.7					
	28	COD	Atlantic cod	6.0					
		CTC	Common cuttlefish	6.0 5.0					
				5.0 4.8					
		SQZ BIB	Inshore squids	4.8 4.2					
		RIR	Pouting (Bib)	4.2					

Figure S5. Spatial patterns in the retained catches in 2012 (9 clusters). The same colour code
was assigned to each 3'\*3' square belonging to the same cluster .





## 106 Characterization of cluster in term of species assemblage in 2012. Species names in bold

107 correspond to Indval species. Only 80% of the landed species are presented.

Cluster	Nb of species	FAO code	Species	% Lands	Cluster	Nb of species	FAO code	Species	% Lands
		SCE	Great atlantic scallop	18.4			HAD	Haddock	21.9
		OTH	Others	10.7			MNZ	Monkfishes	13.2
		SCR	Spinous spider crab	10.1			OTH	Others	10.6
		JAX	Jack and horse mackerel	8.6			COD	Atlantic cod	9.0
1	29	CTC GUR	Common cuttlefish Red gurnard	8.3 5.9	(	29	WHG	Whiting	5.8 4.2
		BIB	Pouting (Bib)	5.9 5.7	6	29	GUR CTC	Red gurnard Common cuttlefish	4.2 3.9
		WHG	Whiting	5.1			JOD	John dory	3.9
		GKL	Common european bittersweet	4.4			BIB	Pouting (Bib)	3.4
		SYC	Small-spotted catshark	4.2			POL	Pollack	3.0
		GKL	Common european bittersweet	19.7			SYC	Small-spotted catshark	2.8
		CTC	Common cuttlefish	19.6			COD	Atlantic cod	20.8
		OTH	Others	19.0			HAD	Haddock	17.8
		QSC	Queen scallop	10.8			MNZ	Monkfishes	16.6
2	29	WHG	Whiting	5.8	7	26	NEP	Norway lobster	9.3
		JAX	Jack and horse mackerel	4.7			OTH	Others	9.0
		GUR	Red gurnard	4.7			HKE	European hake	8.5
		BIB	Pouting (Bib)	4.5			HAD	Haddock	40.2
		MNZ	Monkfishes	35.8			COD	Atlantic cod	40.2
		HAD	Haddock	55.0 11.5	8	29	MNZ	Monkfishes	10.0
		LEZ	Megrims	9.0	Ŭ	-	WHG	Whiting	8.4
3	27	RJN	Cuckoo ray	8.0			ОТН	Others	5.2
	2,	OTH	Others	6.7			HKE	European hake	21.3
		JAX	Jack and horse mackerel	6.3			MNZ	Monkfishes	17.6
		HKE	European hake	4.7			HAD	Haddock	11.9
		JAX	Jack and horse mackerel	23.7	9	29	OTH	Others	8.3
		HKE	European hake	23.4			LEZ	Megrims	7.8
4	27	MAC	Atlantic mackerel	20.3			JAX	Jack and horse mackerel	7.6
		MNZ	Monkfishes	12.8			COD	Atlantic cod	6.6
		HAD	Haddock	21.8					
		MNZ	Monkfishes	16.4					
		WHG	Whiting	9.4					
		COD	Atlantic cod	7.4					
5	27	OTH	Others	7.3					
		CTC	Common cuttlefish	5.5					
		GUR	Red gurnard	4.2					
		RJM	Spoteed ray	3.8					
		BIB	Pouting (Bib)	3.5					

Figure S6. Overlapping of the cluster map and fishermen knowledge of the Celtic Sea fishinggrounds (Pichon 1992).

