

Fleet and metier

Offshore 20-24 m bottom trawlers fishing in the Western Channel in winter with a single four-sided trawl and a cod-end with 80 mm mesh.

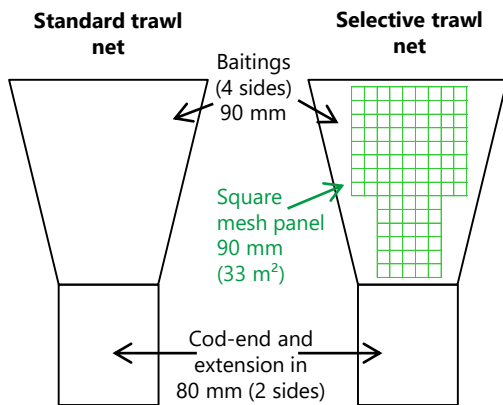
Targeted species:

Whiting > 32 cm; haddock > 34 cm; monkfish; squids; cuttlefish; red mullet

Unwanted species:

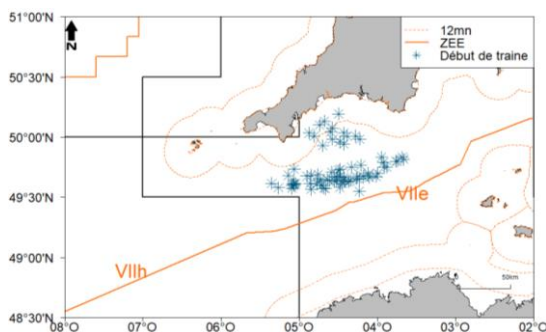
Whiting < 32 cm; haddock < 34 cm; horse mackerel; mackerel

Selective gear



Sea trials

39 pairs of rig trawls (protocol in alternate hauls) from December to February 2017



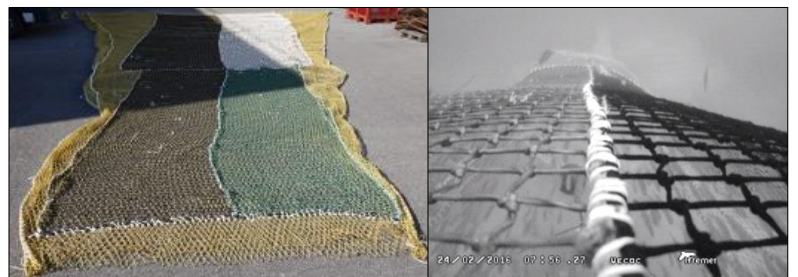
Comparison of catches

Species	Variation in weight caught by commercial grade between selective and standard gears				
	Undersized	40	30	20	10
Monkfish			=		
Horse mackerel			=		
Haddock			?		
Squids			=		
Mackerel	= (but observations on board + trend in data suggest escaping)				
Whiting	< 27 cm	27-32 cm	33-36 cm	37-40 cm	> 40 cm
	?	-40%	=	=	=
Red mullet			=		
Cuttlefish			=		

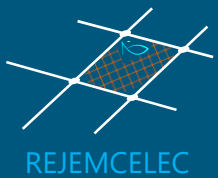
+: positive result; -: negative result; = : No significant difference; ?: Insufficient or atypical data

Report

The device has been effective in selecting whiting of above the target size (32 cm), although the 90 mm may be slightly too large in view of tests carried out on the ground by passing fish through square meshes. Overall, the large vertical opening of the four-sided trawl at the level of the device limited the escapement, leading to differences in catch between the two gears. Nevertheless, pelagic fish such as mackerel which are capable of swimming rapidly in the upper part of the baitings, seem to have escaped better. Finally, no commercial losses were observed.



90 mm square mesh panel on the baitings of the AZUR (ashore on the left, at sea on the right) - © Ifremer



Large square mesh panel (80 mm gauge) in the baitings (last tapered section)

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Offshore 20-24 m bottom trawlers fishing in the Western Channel in summer with a single two-sided trawl and a cod-end with 80 mm mesh.

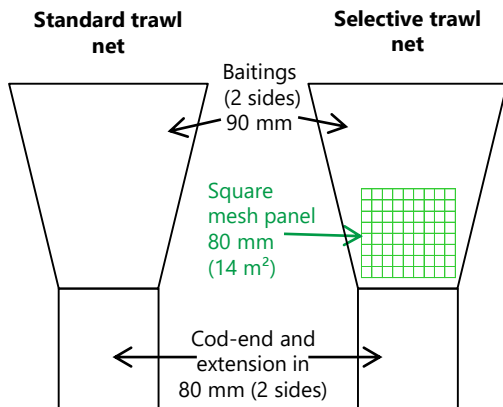
Targeted species:

Whiting > 27 cm; red mullet; whiting-pout; gurnards; squids

Unwanted species:

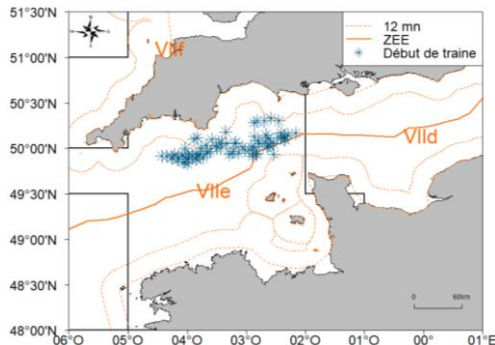
Whiting < 27 cm; haddock; mackerel < 20 cm; horse mackerel

Selective gear



Sea trials

43 pairs of rig trawls (protocol in alternate hauls) from June to July 2017



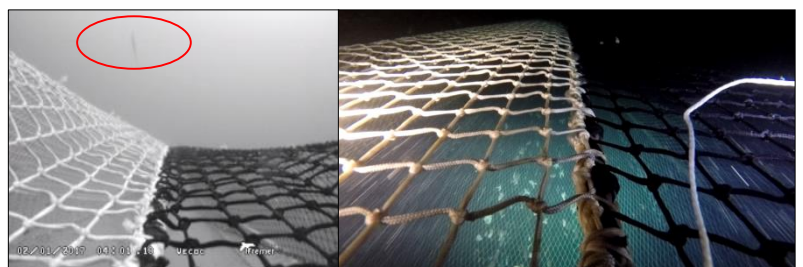
Comparison of catches

Species	Variation in weight caught by commercial grade between the selective and standard gears					
	Undersized	50	40	30	20	10
Horse mackerel	< 15 cm -76%	15-21 cm	22-29 cm	30-36 cm	37-41 cm	> 41 cm
Haddock				?		
Squids				=		
Gurnards				=		
Mackerel	< 20 cm -90%	-	-	20-30 cm -65%	31-38 cm ?	> 38 cm ?
Whiting	< 27 cm -35%	-	27-32 cm	33-36 cm	37-40 cm	> 40 cm
Red mullet				=		
Whiting-pout				=		

%. positive result; %: negative result; = : No significant difference; ? : Insufficient or atypical data

Report

This case study aims to study the interest of the square mesh in the baitings for a two-sided trawl (lower vertical opening than a four-sided trawl). 80mm was chosen to match the targeted size of whiting for these fleets. The results show a decrease in under-sizes of whiting, the two trawls having an equivalent selectivity from 30 cm for this species. An escapement of under-sized mackerel and horse mackerel is also observed. On the other hand, losses are recorded on the size 30 of the mackerel (landed by the studied fleet).



Whiting escaping from the SMP on the left (without artificial light) and SMP illuminated with a spotlight (on the right) (CARPE DIEM III vessel) - © Ifremer



Square mesh panels (80 mm gauge) in the baitings (last tapered section) and the extension and 4-sided cod-end

Fleet and metier

Offshore 20-24 m bottom trawlers fishing in the Western Channel in winter with a single four-sided trawl and a cod-end with 100 mm mesh.

Targeted species:

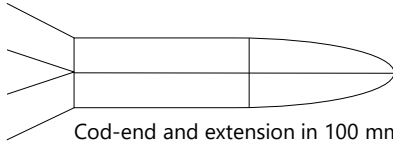
Whiting > 32 cm; haddock > 34 cm; monkfish; squids; cuttlefish; red mullet

Unwanted species:

Whiting < 32 cm; haddock < 34 cm; horse mackerel; mackerel

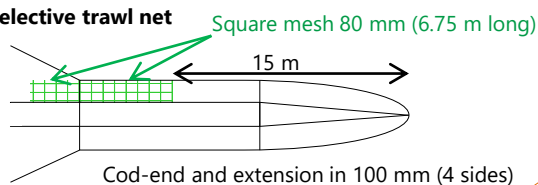
Selective gear

Standard trawl net



Cod-end and extension in 100 mm (2 sides)

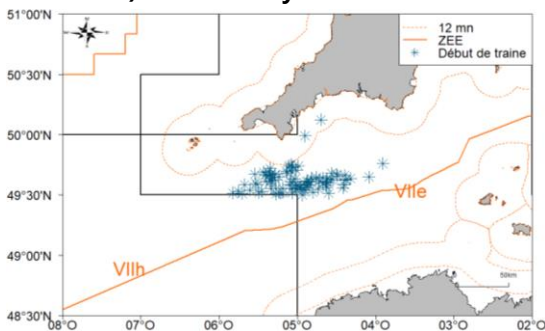
Selective trawl net



Cod-end and extension in 100 mm (4 sides)

Sea trials

46 pairs of rig trawls (protocol in alternate hauls) from January to March 2017



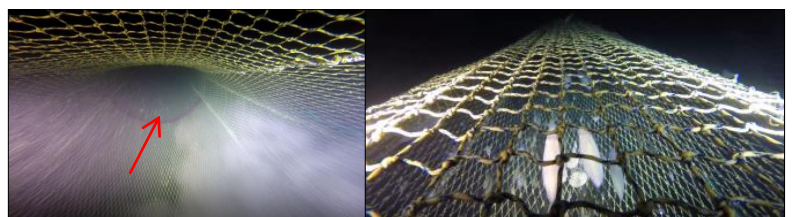
Comparison of catches

Species	Variation in weight caught by commercial grade between selective and standard gears				
	Undersized	40	30	20	10
Monkfish	=				
Horse mackerel	-65% (all rejected)				
Haddock	< 30 cm	30-34 cm	35-40 cm	41-48 cm	> 48 cm
	-35%	-13%	?	?	=
Squids	?				
Mackerel	-78% (all rejected)				
Whiting	< 27 cm	27-32 cm	33-36 cm	37-40 cm	> 40 cm
	?	-71%	-39%	=	=
Red mullet	-46% (all landed)				
Cuttlefish	-				

+: positive result; -: negative result; = : No significant difference; ?: Insufficient or atypical data

Report

The 80 mm square mesh in the extension has reduced unwanted catches of haddock (<30 calibre), as well as discards of horse mackerel and mackerel. On the other hand, a significant escapement of whiting and red mullet was detected on the 30 gauge. The commercial analysis carried out during the project indicates that these losses could represent a 17% decrease in the whiting turnover on the scale of the PO fleet studied (-6% of the total turnover including red mullet). This device also included a technical innovation with an extension and a four-sided cod-end whose use was to improve the vertical opening, and to reduce the probability of contact between squid and fabric. Unfortunately, technical hazards did not confirm this hypothesis thanks to video images.



Visualisation of the beginning of the extension in four sides (after the red arrow) and of the square mesh on the top of the netting (on the left). Squids under the 80 mm square mesh panel (right) (L'ECUME DES JOURS) © Ifremer



T90 panels (80 mm gauge) in the baitings (last tapered section) and extension + 2-sided cod-end

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Offshore 20-24 m bottom trawlers fishing in the Western Channel in winter with a single four-sided trawl and a cod-end with 80 mm mesh.

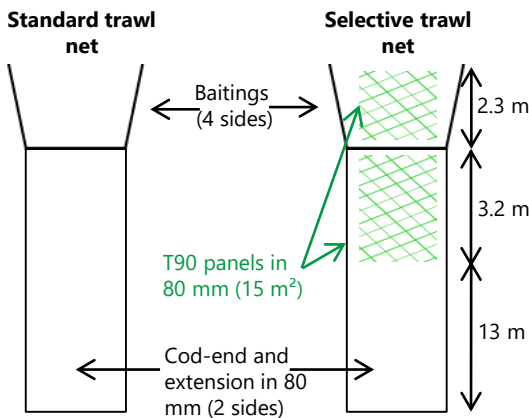
Targeted species:

Whiting > 32 cm; haddock > 34 cm; monkfish; squids; cuttlefish; red mullet

Unwanted species:

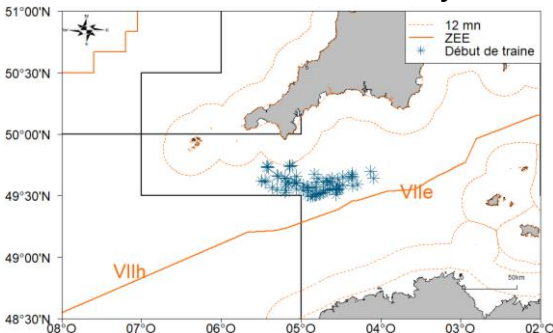
Whiting < 32 cm; haddock < 34 cm; horse mackerel; mackerel

Selective gear



Sea trials

38 pairs of rig trawls (protocol in alternating hauls) from October 2017 to February 2018



Comparison of catches

Species	Variation in weight caught by commercial grade between selective and standard gears				
	Undersized	40	30	20	10
Cuttlefish			=		
Haddock	< 30 cm	30-34 cm	35-40 cm	41-48 cm	> 48 cm
	-48%	?	?	?	=
Horse mackerel	Between -6% and -62% (all rejected) *				
Mackerel	Between -78% and -95% (all rejected) *				
Monkfish			=		
Red mullet			=		
Squids			=		
Whiting	< 27 cm	27-32 cm	33-36 cm	37-40 cm	> 40 cm
	-73%	-44%	?	?	=

*: The variations observed vary according to the trawl net on which the device was installed (exchange of the trawl during the experimentation)

%: positive result; %: negative result; = : No significant difference; ?: Insufficient or atypical data

Report

Despite a difference between the test periods (autumn and winter) and the trawls used, the 80 mm T90 appears to be the optimum mesh size for targeting whiting from 30 gauge. Indeed, it is estimated that the two trawls have an equivalent selectivity between 33 and 35 cm for this species. Measurements made on meshed whiting in the device and the passage of fish in mesh on land confirm these results. In addition, the device makes it possible to avoid under-sized haddock and catches of small pelagics such as mackerel and horse mackerel (especially on small sizes). No target species or size seems to escape through the device. Even squid is retained despite its fusiform morphology. This could be explained by the swelling usually observed on the T90 fabrics which would provide a greater swimming space for this species.



First panel in T90 on the sorting yard (ship THE ECUME DES JOURS)
© Cobrenord



Large T90 panel (100 mm gauge) in the extension as an alternative to the regulatory 120 mm square mesh panel

Fleet and metier

Offshore 20-24 m bottom trawlers fishing in the Celtic Sea in summer with a single four-sided trawl net and a cod-end with 100 mm mesh.

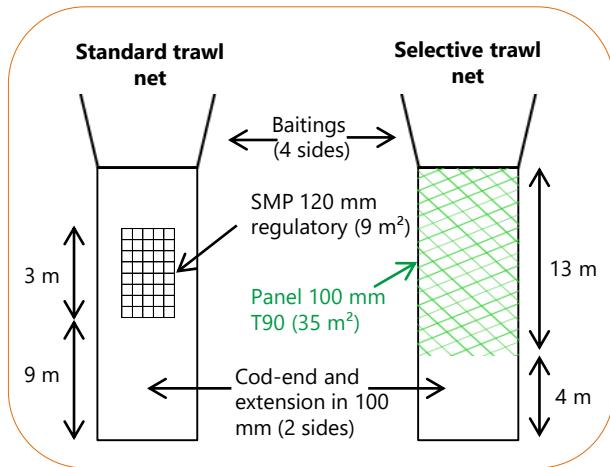
Targeted species:

John dory; hake > 36 cm; haddock > 34 cm; monkfish

Unwanted species:

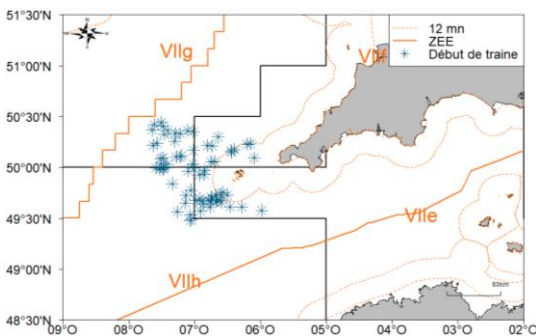
Haddock < 34 cm; boarfish; horse mackerel

Selective gear



Sea trials

36 pairs of rig trawls (protocol in alternate hauls) from June to August 2017



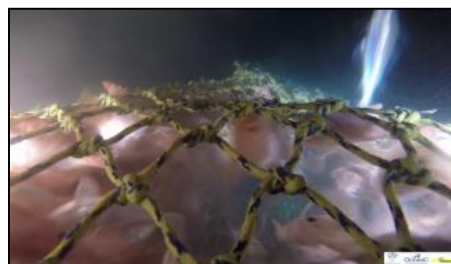
Comparison of catches

Species	Variation in weight caught by commercial grade between selective and standard gears						
	Undersized	50	40	30	20	10	0
Monkfish				=			
Horse mackerel				=			
Haddock	< 30 cm	-	30-34 cm	35-40 cm	41-48 cm	> 48 cm	-
	-42%	-	=	+41%	+124%	=	-
Hake	< 27 cm	27-36 cm	37-46 cm	47-58 cm	58-65 cm	66-73 cm	> 73 cm
	-69%	-51%	=	+25%	+50%	+56%	+35%
John Dory				-			
Boarfish				-17%			

%: positive result; %: negative result; = : No significant difference; ?: Insufficient or atypical data

Report

The main objective of this case study was to find a more appropriate device than the regulatory 120 mm SMP to reduce undersized haddock catches and maintain commercial catches (especially hake and haddock). It was decided to use 100mm T90 mesh in order to adjust the mesh to the targeted sizes and to increase the selective surface (x 4). The results were very satisfactory: the T90 mesh has allowed small hake and haddock to escape more while improving the marketable catches of these two species. In addition, the T90 allowed a moderate escape of boarfish, the 120 mm PMC being already selective. According to the economic analysis carried out, the increase in marketable catches could allow a 74% increase in hake turnover on the scale of the PO fleet studied (+4% of the total business figure).



Haddock escaping from the panel of 100 mm T90 mesh on MOR BREIZ (among boarfish) - © Cobrenord