European Parliament Public Hearing: How to improve selectivity in the context of the discard ban

Development of technical measures to increase selectivity

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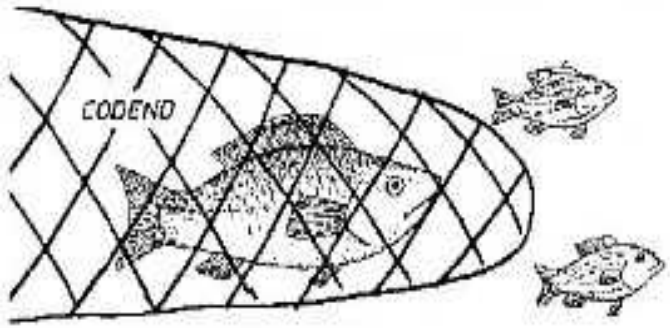
(Brussels, 13th April 2015)

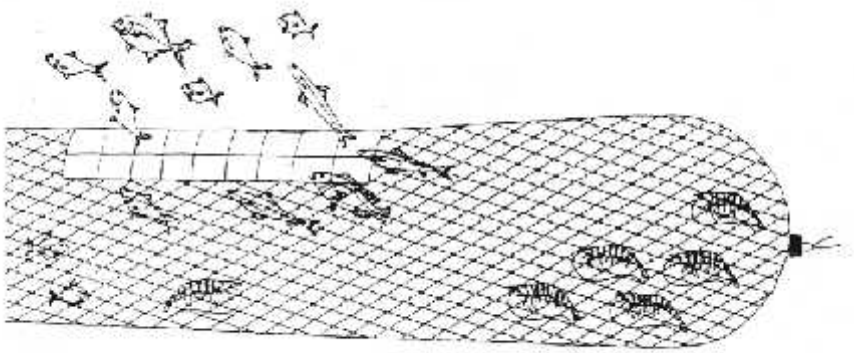
Selectivity

- **Fishing method's ability to target and capture organisms by size and species during the fishing operation allowing non-targets to be avoided or released unharmed.**

  – Size selection is the mechanism by which small fish escape while larger marketable fish are retained

  – Species selection is the mechanism by which non-target fish escape while target are retained, using species features or behavior for the selection





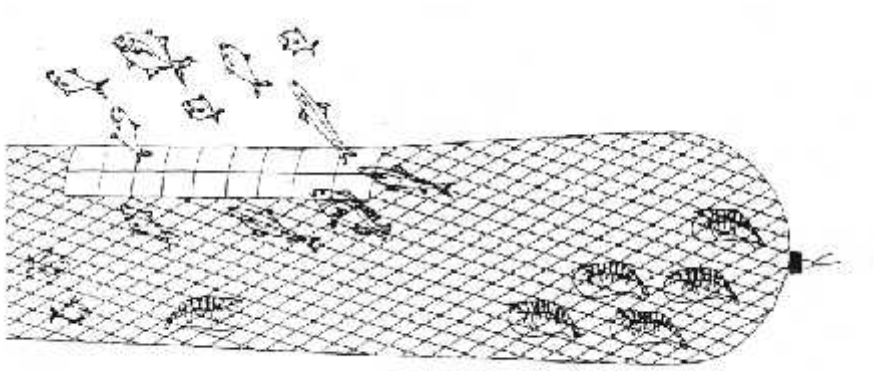
Technical measures

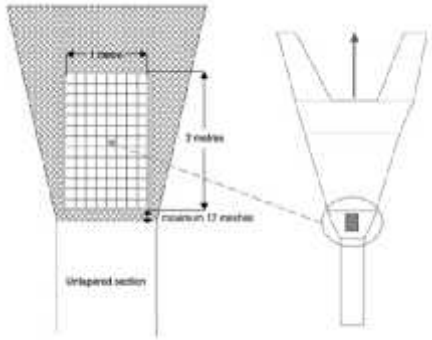
- **A broad set of rules which govern <u>how, where and when fishermen may fish</u>. Their primary goal is to attain sustainable exploitation of commercially exploited stocks and the provision of safeguards for wider ecosystem considerations.**

  – specifications for design and use of gears
  – minimum mesh sizes for nets
  – requirement of selective gears to reduce unwanted catches;
  – minimum landing sizes and minimum conservation sizes
  – closed areas and seasons;
  – limitations on by-catches (catches of unwanted or non-target species)
  – measures to minimize the impact of fishing on the marine ecosystem and environment.

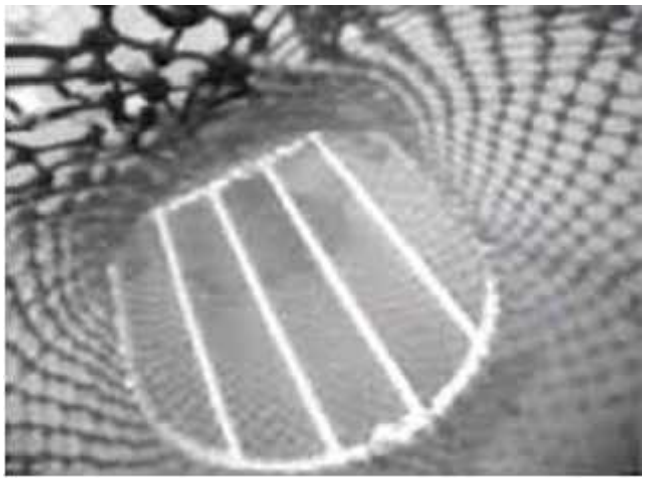
Technical measures focused on gear

- **Active Fishing Gears (trawls, seines, purse seines and dredges)**
  - Escape panels: usually referred to square mesh panels.





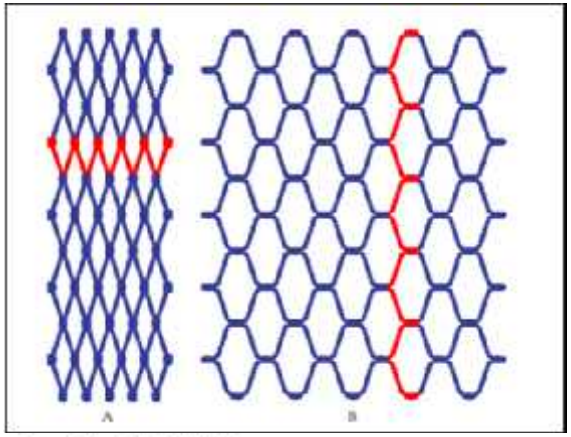
  - Escape grids: Rigid or flexible sorting devices.



Technical measures focused on gear

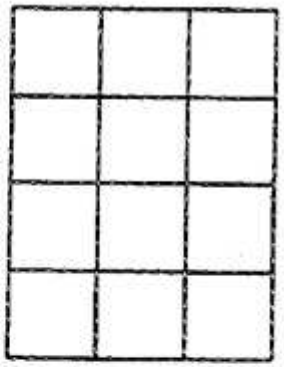
- **Active Fishing Gears (trawls, seines, purse seines and dredges)**

  – Codend different configurations (T90, square mesh, twine thickness & number of twines, number of meshes around).

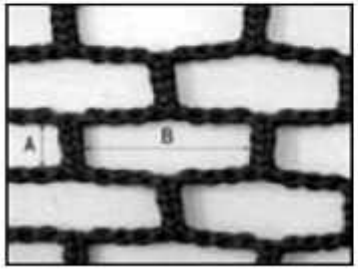


From Moderhak (2005)

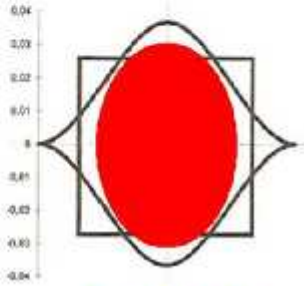
Diamond Mesh



Square Mesh



Rectangular Mesh

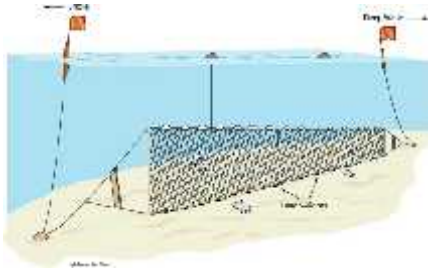


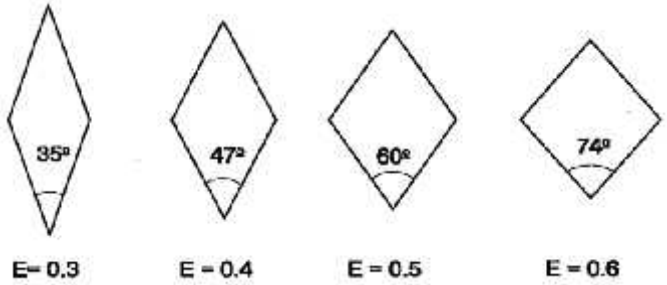
T90 Mesh

From Moderhak (2005)

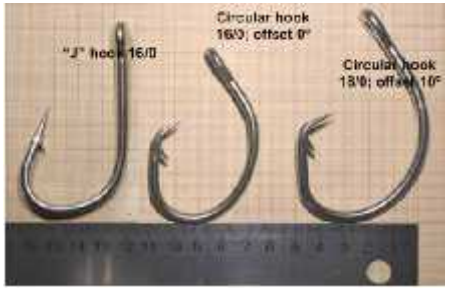
Technical measures focused on gear

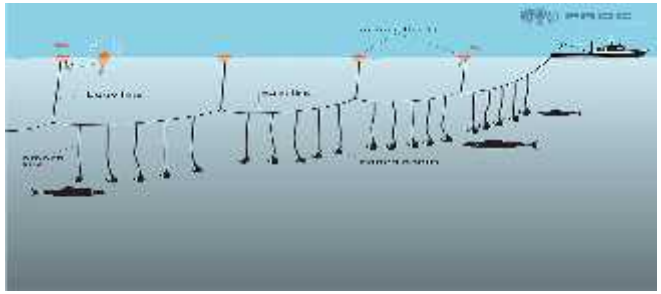
- **Static Fishing Gears (gillnets, longlines and traps)**
  - Mesh size, hanging ratio, soak time (gillnets, trammel & tangle nets)





  - Hook size, bait type and size, soak time (longlines)



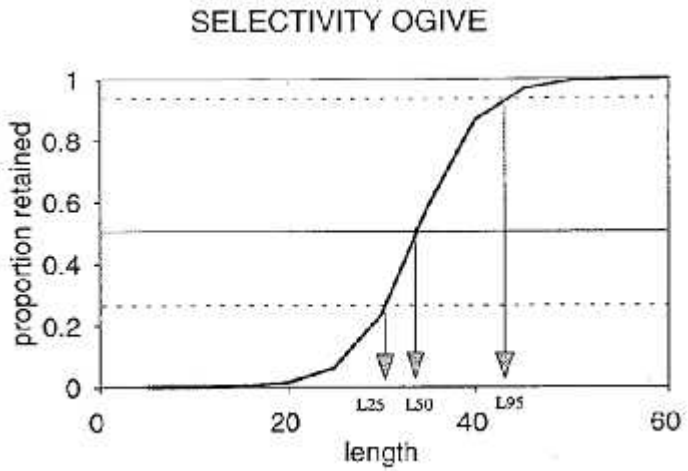


  - Opening, bait type and soak time (pots and traps)

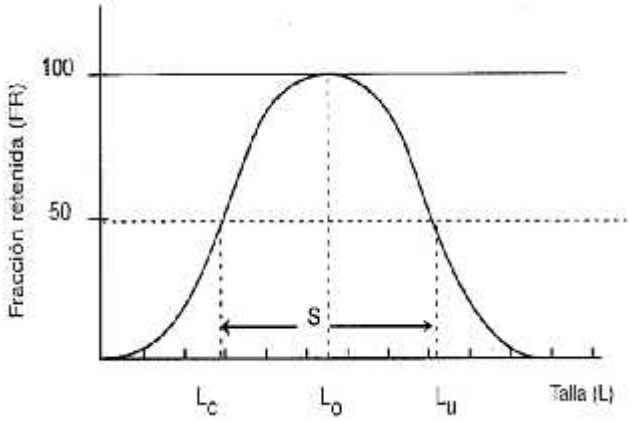
Investigating Technical Measures

- **Gear selectivity, Curves modelling. (Only for size selectivity)**

  – Trawl



  – Gillnets



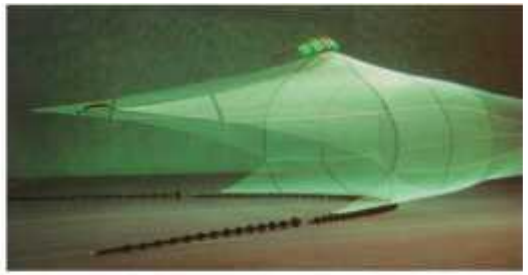
Investigating Technical Measures

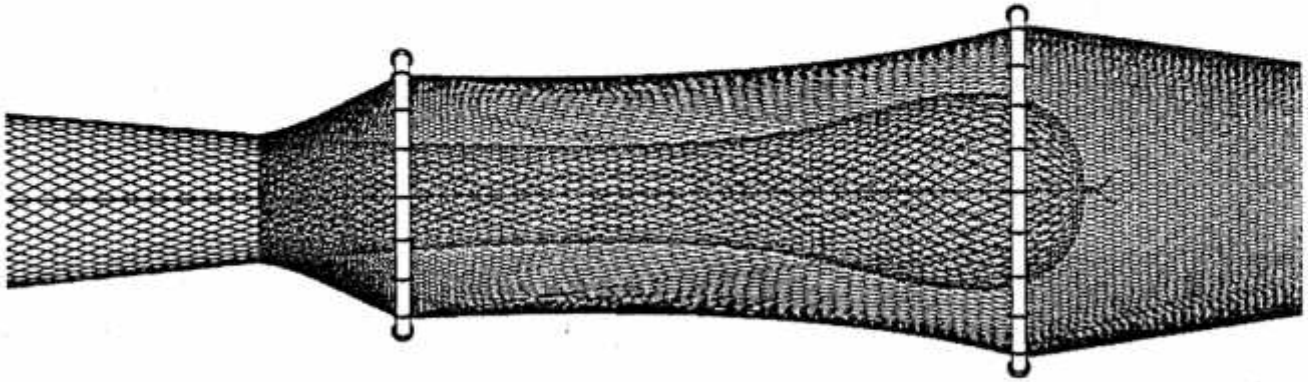
- **Experiments at sea (scientific vessels or commercial vessels)**
- **Costly and complex depending on methodology:**
  - TRAWLING: Direct methods*:
    - Covered codend method (only codend selectivity)
    - Alternate haul method (whole trawl selectivity)
    - Parallel haul method (whole trawl selectivity)
    - Twin trawl method (whole trawl selectivity)
    - Trousers trawl method (whole trawl selectivity)
    - Special selective devices (only device selectivity)
  - GILLNETTING (LONGLINING): Indirect methods by comparing mathematically the catches in simultaneous catches of gillnets of different mesh sizes (or hooks of different sizes).

* From: Wileman et al., 1996.

Investigating Technical Measures

- **Covered Codend Method**

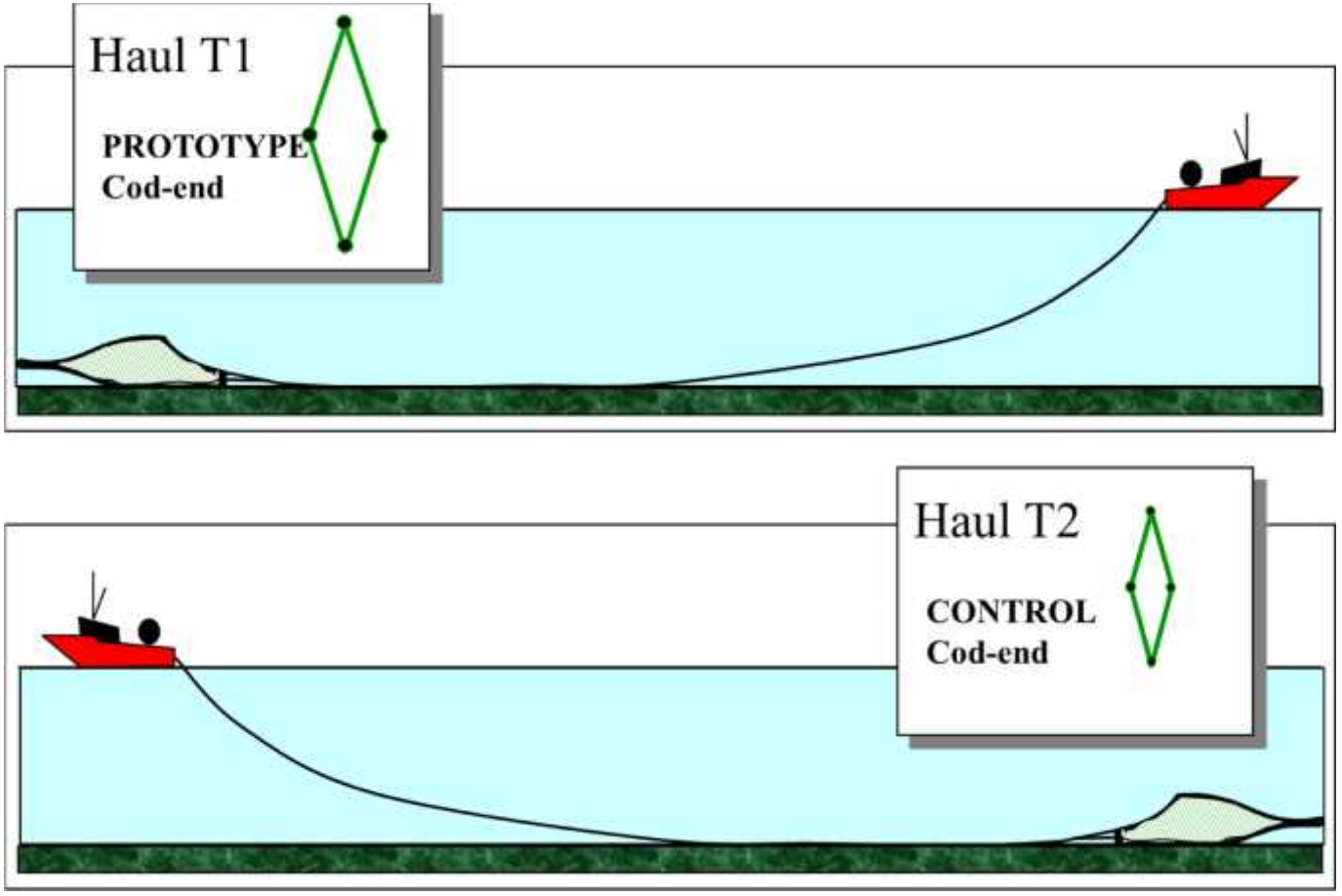




SMALL MESH COVER COD-END

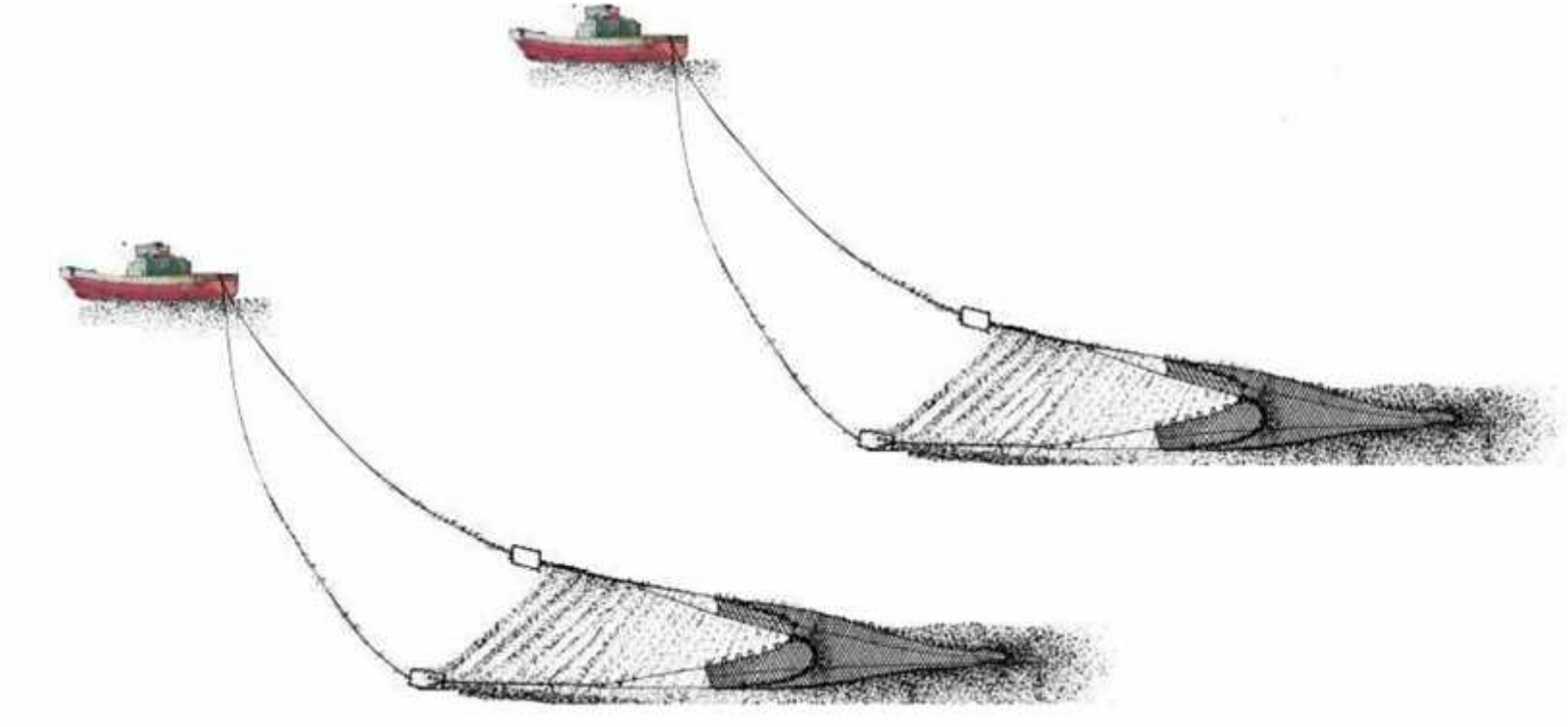
Investigating Technical Measures

- **Alternate Haul Method**



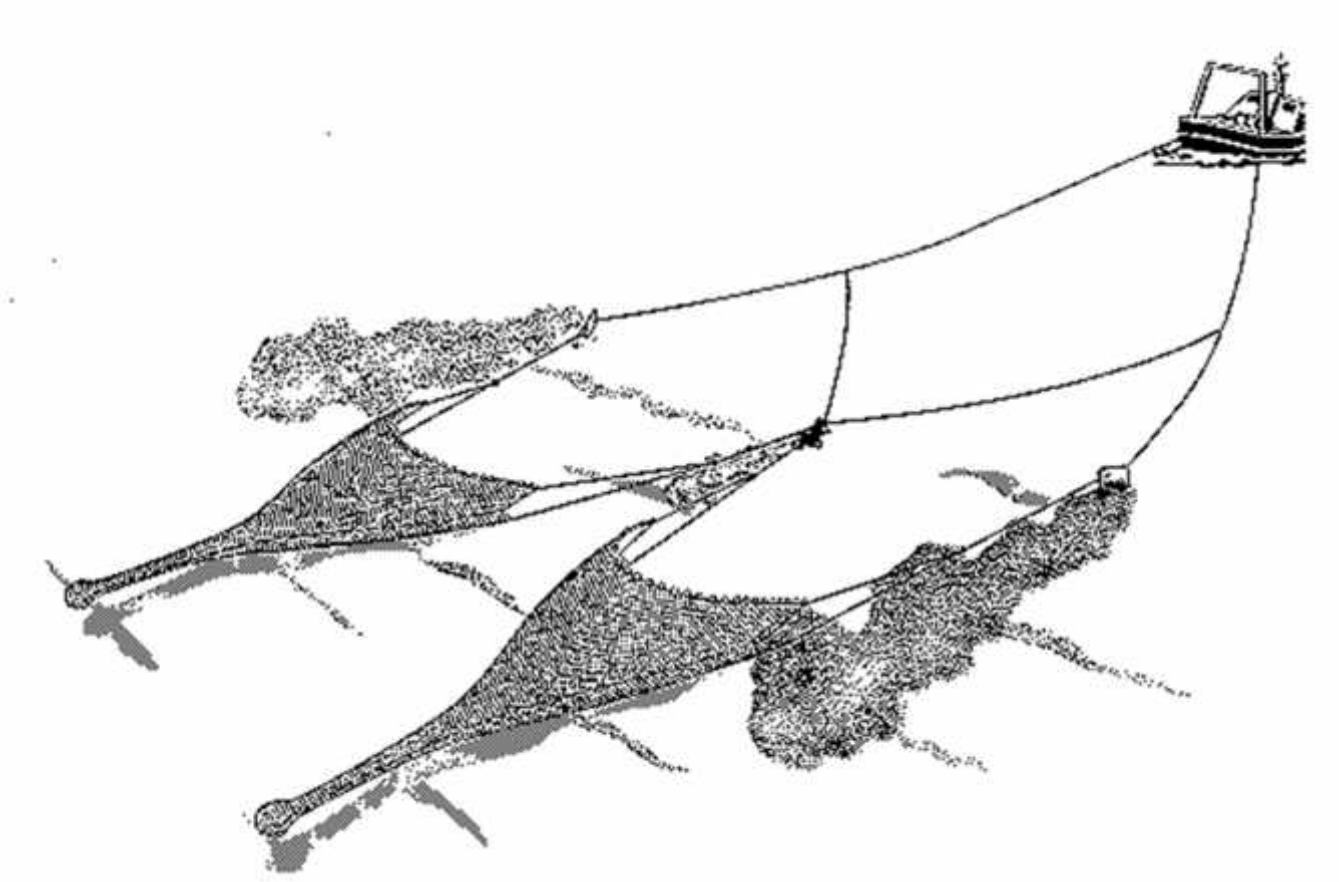
Investigating Technical Measures

- **Parallel Haul Method**



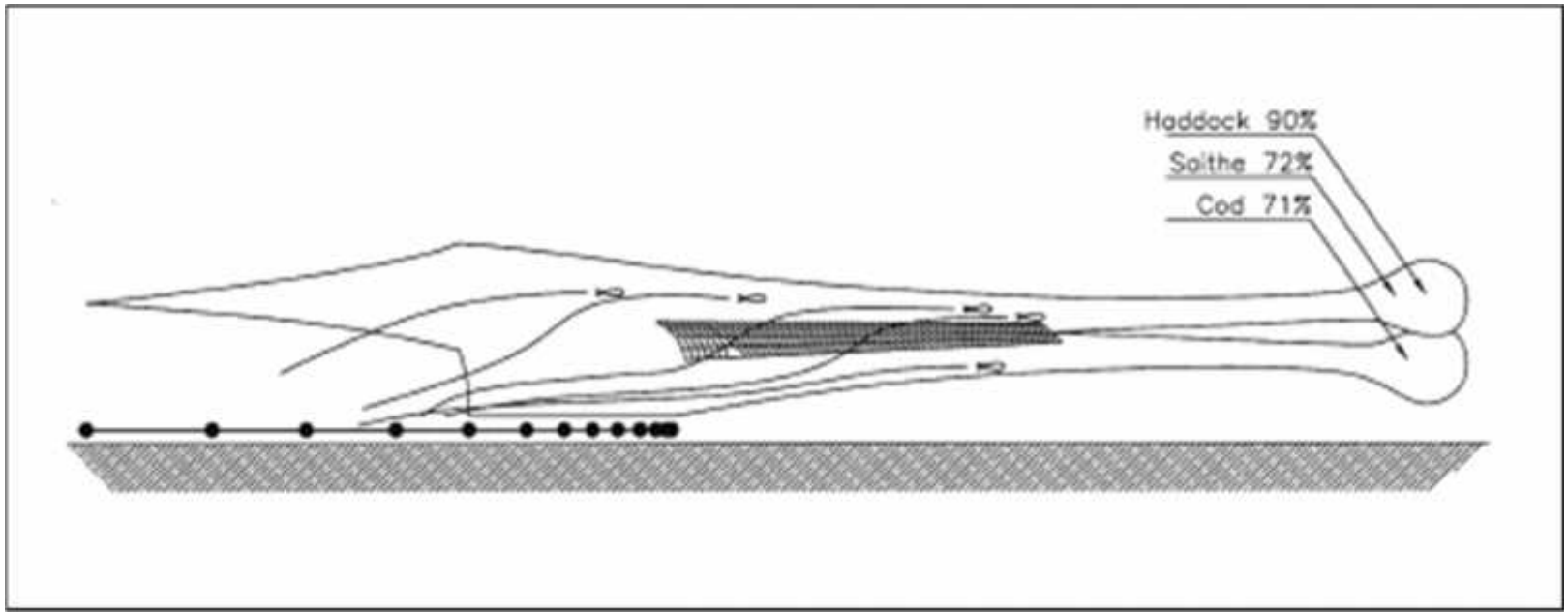
Investigating Technical Measures

- **Twin Trawl Method**



Investigating Technical Measures

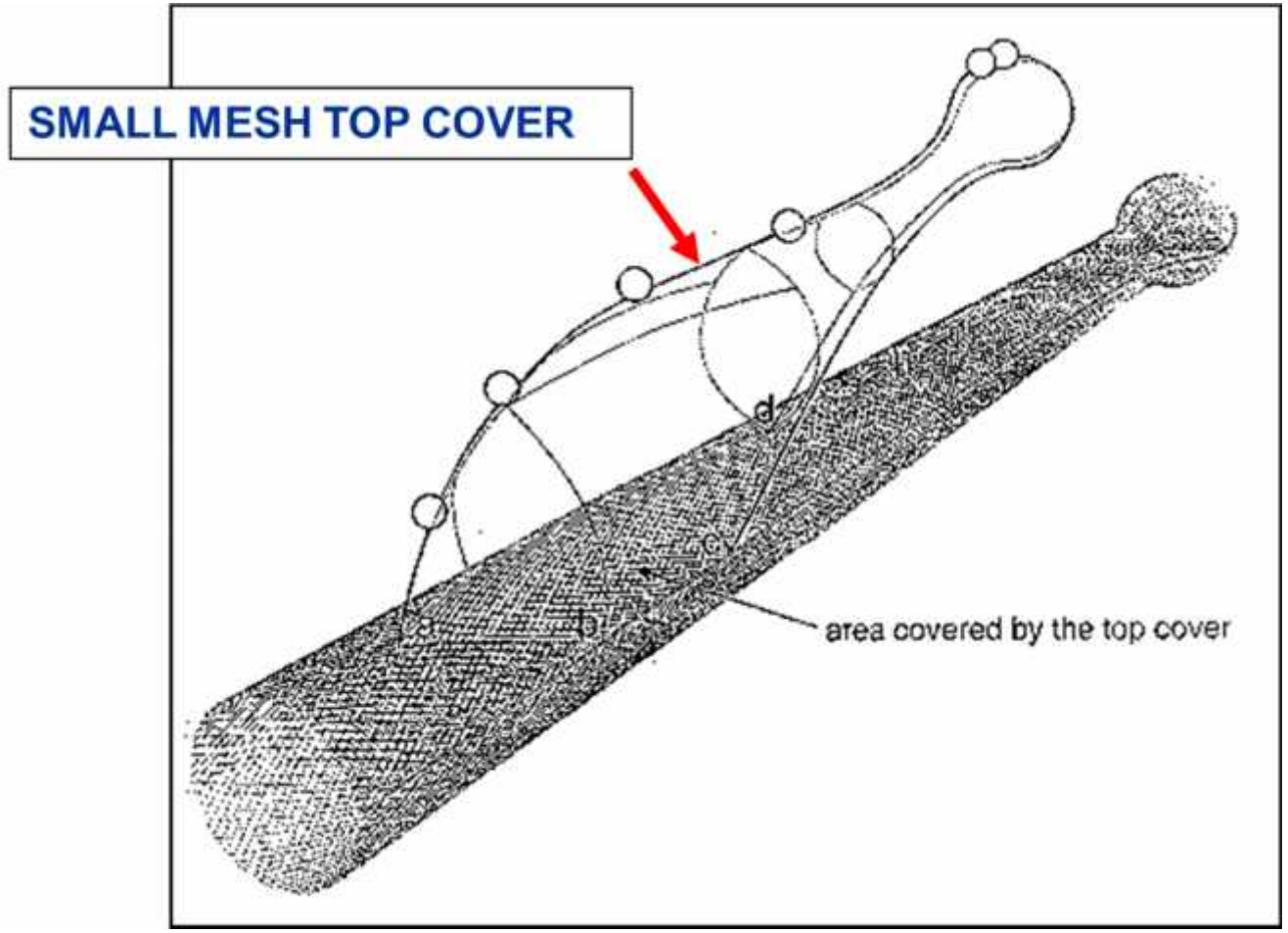
- **Trouser Trawl Method**



From: Engas et al. 1998.

Investigating Technical Measures

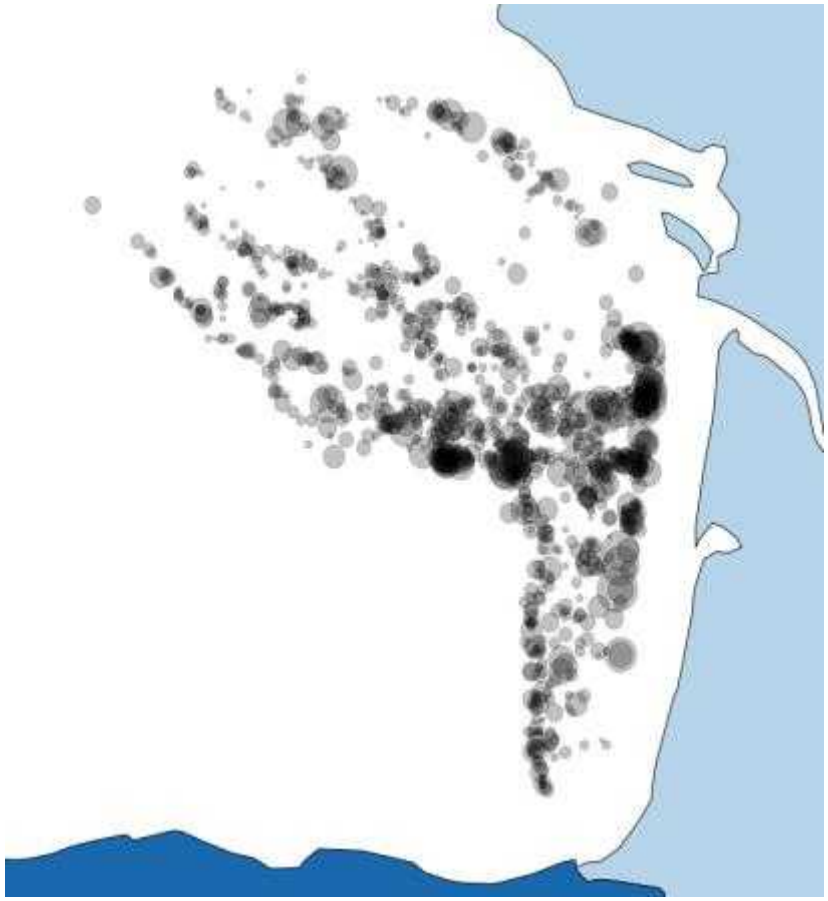
- **Device Selectivity**



A Particular Case Study

Selectivity improvement in the multispecific bottom trawl operating in the Bay of Biscay ICES Division VIIIabd.

Discard Sampling during 2010-2012 in OTB operating in Bay of Biscay



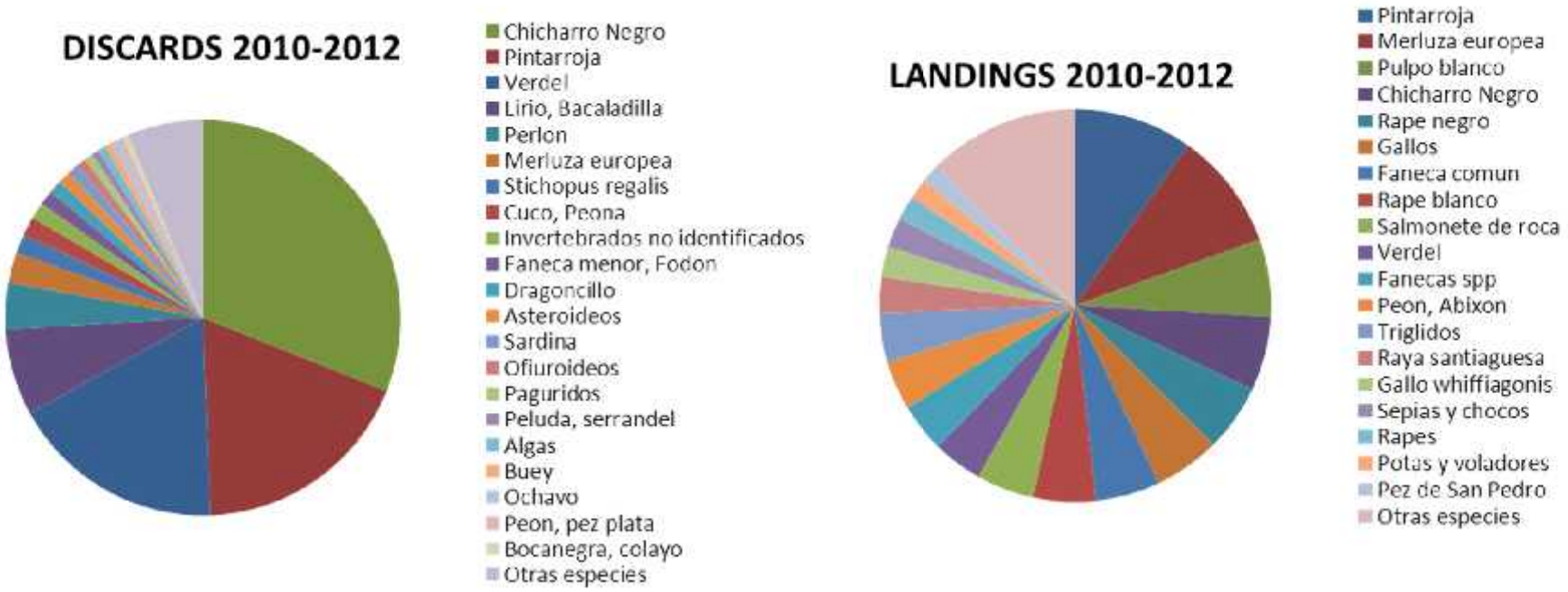
Sampled hauls during 2010-2012. Size proportional to discarded catch (Kg)

Year	Metier	Total trips	Sampled trips	Sampling coverage %
2010	OTB_DEF_>= 70	166	5	3,01%
	OTB_MCF_>= 70	99	2	2,02%
2011	OTB_DEF_>= 70	124	7	5,65%
	OTB_MCF_>= 70	129	7	5,43%
2012	OTB_DEF_>= 70	102	3	2,94%
	OTB_MCF_>= 70	162	11	6,79%

Fishing and Sampling effort by metier (DCF Level 6) during 2010-2012.

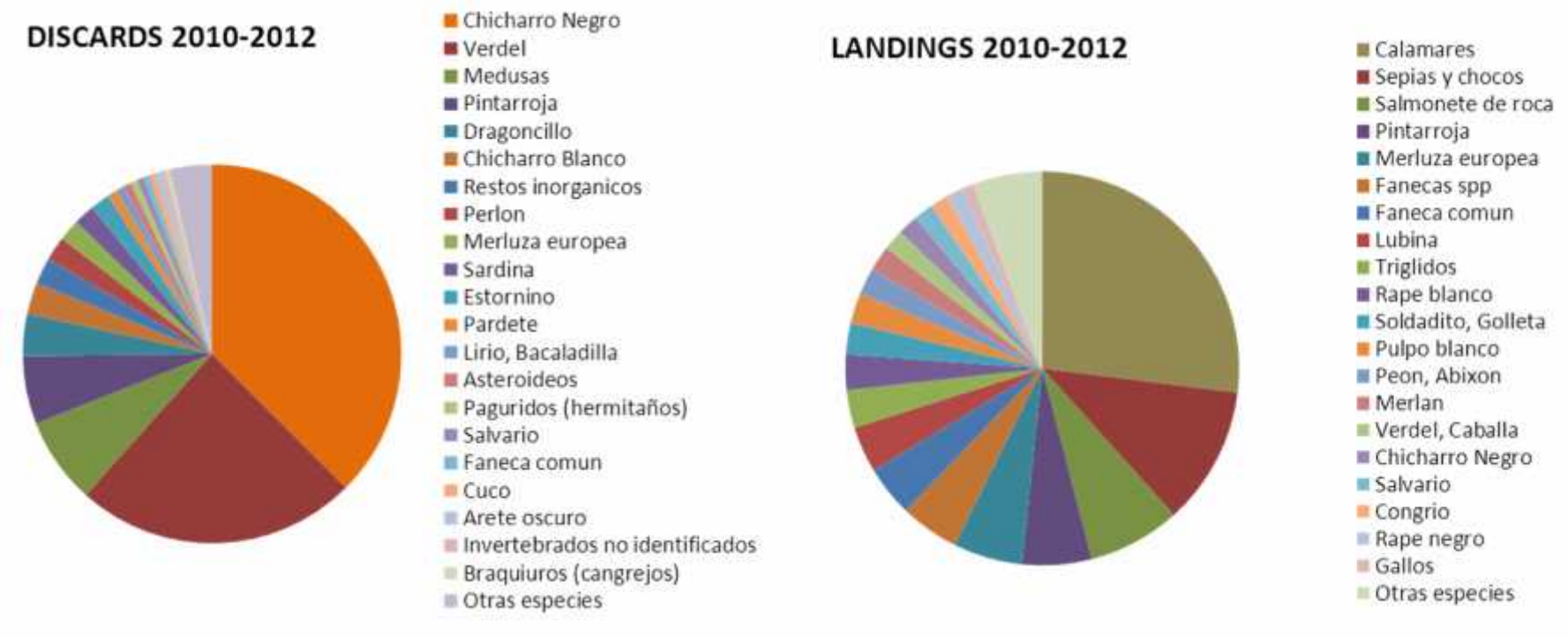
Metier: Demersal

- **Discards:** - Horse mackerel, dogfish, mackerel and blue whiting > 70% of total discarded weight.
  - 78 species; 57 of them included in "**other species**"
- **Landings:** - 67 species. Very mixed-species fishery. Main target species: Hake, Monkfish and Megrim.



Metier: Mixed Cephalopod & Demersal

- **Discards:** - Horse mackerel and Mackerel >60% of total discarded weight.
  - 89 species discarded (including invertebrates)
- **Landings:** - European squid, common cuttlefish and striped red mullet ≈ 50% of landings
  - 70 species (including invertebrates)



Fleet situation regarding discards

According to new EU policy and the fleet exploitation pattern referring to discards. Discard ban could be a threat for the fishing activity.

<u>Solutions were needed</u>

In 2008 OPPAO Fishermen Organization required from AZTI to start a project dealing with discard reduction, focused on commercial species. All experiments were carried out in commercial fishing conditions.

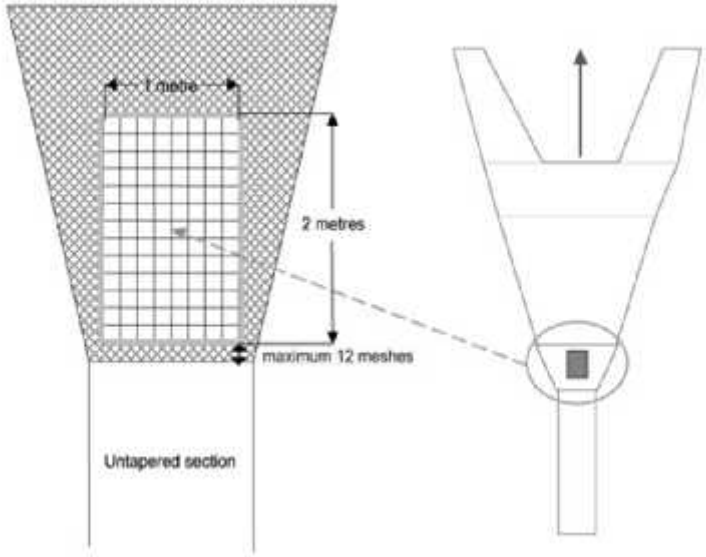
Current fishing system

Codend “Reg. (EC) 494/2002”

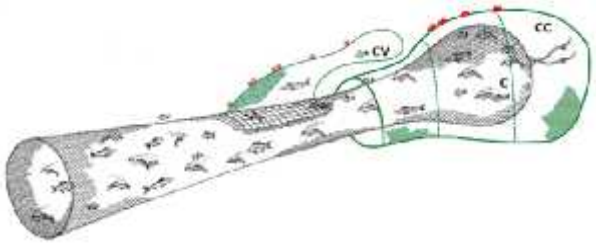
- Material ≤ 6 mm single twine or ≤ 4 mm double twine
- 120 free meshes around
- 100 mm Minimun mesh size or 70 mm mesh size

Selective Device “Reg. (EC) 51/2006”

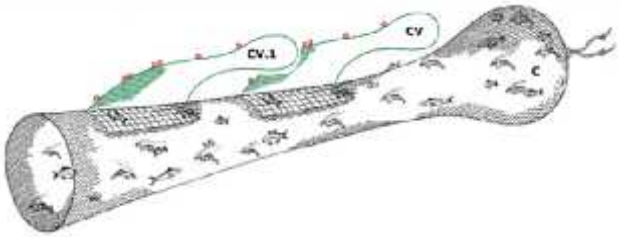
- Square Mesh Panel (SMP) ≥ 2 meter long & ≥1 meter width
- Twine single ≤ 4 mm
- Mesh size ≥ 100 mm
- Set 12 meshes before the codend.



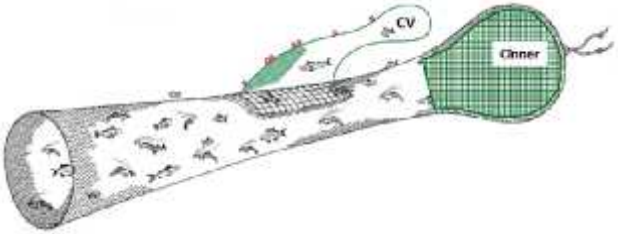
Methodologies used



2009-2011: fish behaviour & trawl selectivity



2011: alternative discard reduction devices



2012: Square Mesh Panel (SMP) effect on escapement

Escapement Results

Cruise 2011

Comparison of escapement between the 2 Square Mesh Panels (100 mm). SMP set 6 meters closer to the entrance of the trawl Vs mandatory SMP

Escapement rate by device position	SMP 6m	Mandatory SMP
Horse mackerel	28,86	71,14
Mackerel	40,23	59,77
Argentine	51,60	48,40
Sardine	37,90	62,10

Escapement Results

Cruise 2012

Escapement rate through SMP window (100 mm)

	Hake		Red mullet		Pout		Anchovy		Blue whiting		Horse mackerel	
	Nº	%	Nº	%	Nº	%	Nº	%	Nº	%	Nº	%
Codend	6.238	96	268	100	498	100	799	38	57.272	65	906	81
SMP (Window)	278	4	1	0	0	0	1.308	62	30.621	35	209	19

Conclusions

- **Multispecific fishery with more than 20 marketable species, some of them without MLS: difficulties to find one single solution to so many species.**
- **Species behaviour & swimming capability is essential for scapement, nevertheless species with low swimming capability (Flat fish species) have been able to escape (passive escapement).**
- **Pelagic species show the highest escapement rate through SMP (Set on the top panel).**
- **Turbidity inside the trawl likely affects the escaping behaviour.**
- **Technical measures for discard reduction should be studied and identifyed at a fishing metier level, after a thorough characterization of the metier.**


Thank you
for your attention