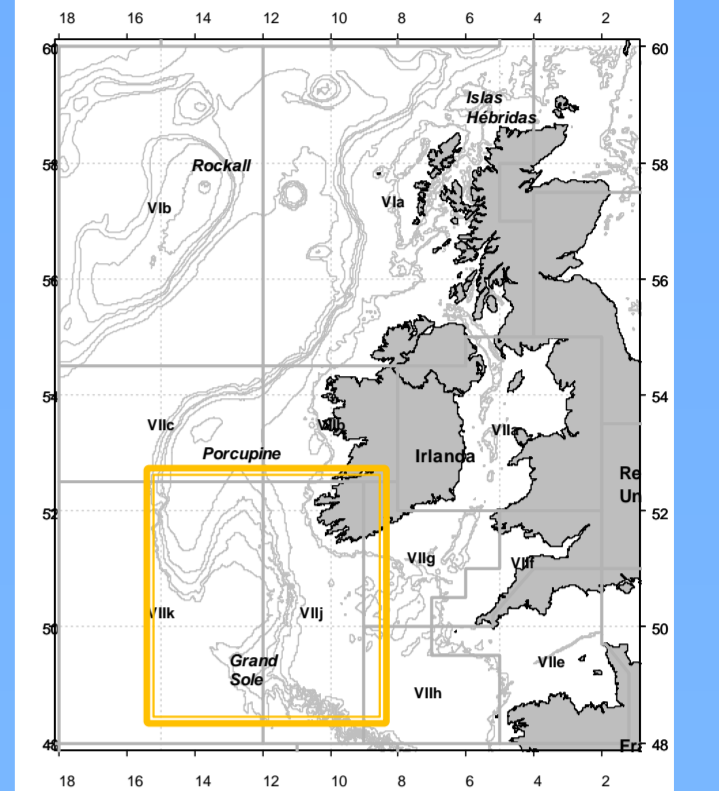


## Gran Sol fishing ground trawl fishery

Spanish otter bottom trawlers in European North Western Waters operate mainly in ICES 7 area called 'Gran Sol fishing ground'. 12 vessels target demersal species, namely megrim, monkfish and hake. This métier (OTB\_DEF\_70-99\_0\_0 is reported to have discard rates of quota species: megrim, European hake, haddock, horse mackerel, mackerel, blue whiting and boardfish. Main reasons for discarding are quota restrictions and undersized fish. Gadids (haddock and cod) with no quota are considered 'choke species' in this fishery in the framework of the 'Landing obligation'. The scientific evidence indicated that an increase in selectivity is not easily achievable in the short term, and the 'de minimis exemption of Landing obligation' was apply to this fishery.

Especie	Alfa3	Desembarques (Tn)	Descartes (Tn)	Tasa de descarte
<i>Melanogrammus aeglefinus</i>	HAD	4.5	1019.4	99.6
<i>Trachurus trachurus</i>	HOM	0.8	955.2	99.9
<i>Merluccius merluccius</i>	HKE	899.5	904.8	50.1
<i>Lepidorhombus whiffiagonis</i>	MEG	2491.0	801.1	24.3
<i>Scomber scombrus</i>	MAC	0.0	577.5	100.0
<i>Micromesistius poutassou</i>	WHB	0.0	541.9	100.0
<i>Capros aper</i>	BOC	0.0	521.1	100.0
<i>Lophius budegassa</i>	ANK	1362.8	312.4	18.6
<i>Lepidorhombus boscii</i>	LDB	312.3	250.6	44.5
<i>Phycis blennoides</i>	GFB	8.1	158.3	95.1

Annual mean catches (Tn/year) from fishery observer data raised to fishing effort for the métier OTB\_DEF\_70-99\_0\_0 in ICES 6 and 7. Landings, discards and estimated discard rates.



## CASE STUDY: REDUCTION OF UNWANTED CATCH

A series of fishing trials 'RAPANSEL' have been carried out by IEO and Fishers organization 'OPPF4' to study experimental codends with the objective to decrease the catch for gadids and juveniles of target species:

In May and June 2019, a selectivity trial RAPANSEL2019 was carried out. The selectivity of the fishery was evaluated by testing 4 different codends by the 'Alternate hauls method'. The trial carried out a study comparing the fishing selectivity characteristics between the two normal regulatory codends of diamond mesh of 80 and 100 mm mesh size and two experimental 'multimesh' codends equipped with a panel of 150 mm square mesh size, mounted on the upper half of the codend 4 and 6 meters away from the end of the codend. This experimental codend is constructed with a posterior section of 4-meter of 80 mm diamond mesh size and an anterior section of 7-meter T90 mesh of 100 mm mesh size.

In June and July 2020, a selectivity trial RAPANSEL2020 was carried out. The selectivity of the fishery was evaluated by testing 2 different codends by the 'Alternate hauls method'. The trial carried out a study comparing the fishing selectivity characteristics between the regulatory codend of diamond mesh of 100 mm mesh size (T0\_100\_0\_0) and an experimental codend of diamond mesh of 80mm mesh size equipped with a panel of 180 mm square mesh size (T0\_80\_T45\_05\_180), mounted on the upper half of the codend 5 meters away from the end of the codend.

### METODOLOGY: USED CODENDS

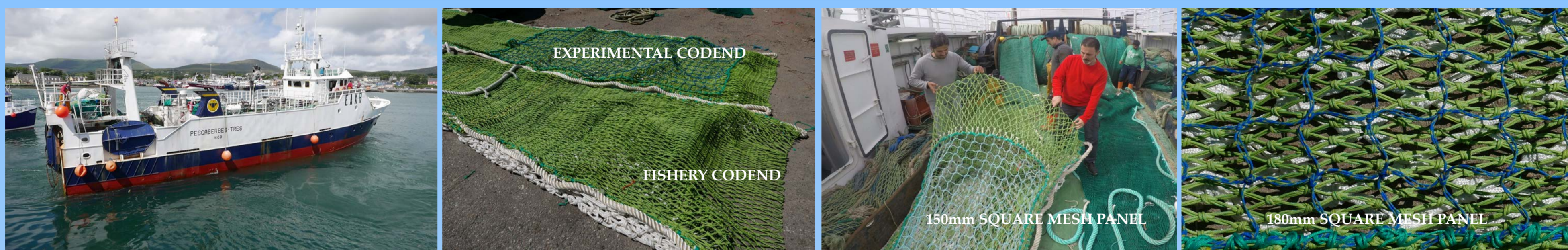
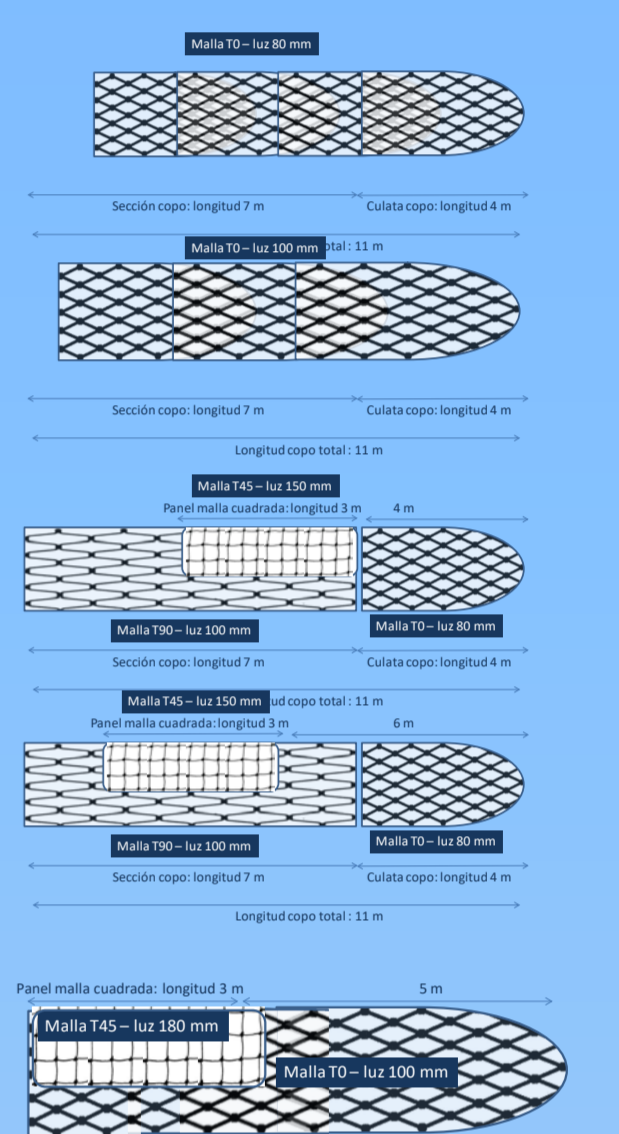
**FISHERY CODEND:** T0\_80\_0\_0  
-Codend mesh T0 size 80mm . No panels

**FISHERY CODEND:** T0\_100\_0\_0  
-Codend mesh T0 size 100mm . No panels

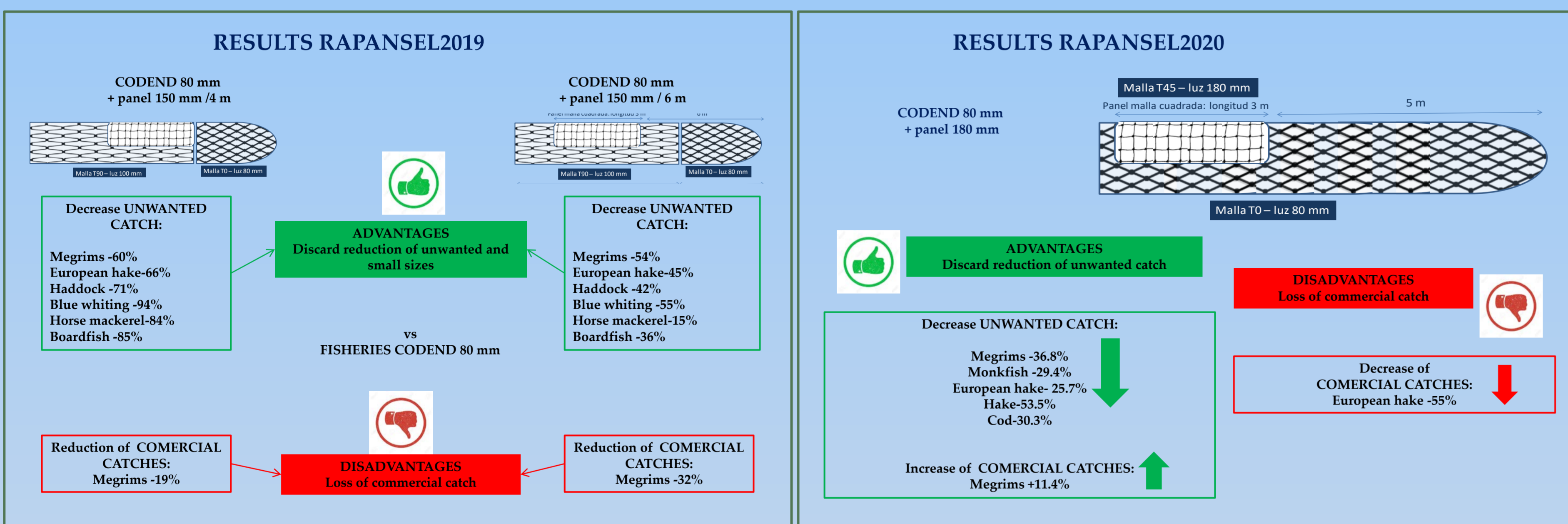
**EXPERIMENTAL CODEND T0\_80\_T45\_04\_150**  
- Mix mesh codend (T45 and T90)  
- Square mesh panel of mesh size 150mm, located at 4 meters of codend end.

**EXPERIMENTAL CODEND T0\_80\_T45\_06\_150**  
- Mix mesh codend (T45 and T90)  
- Square mesh panel of mesh size 150mm, located at 6 meters of codend end.

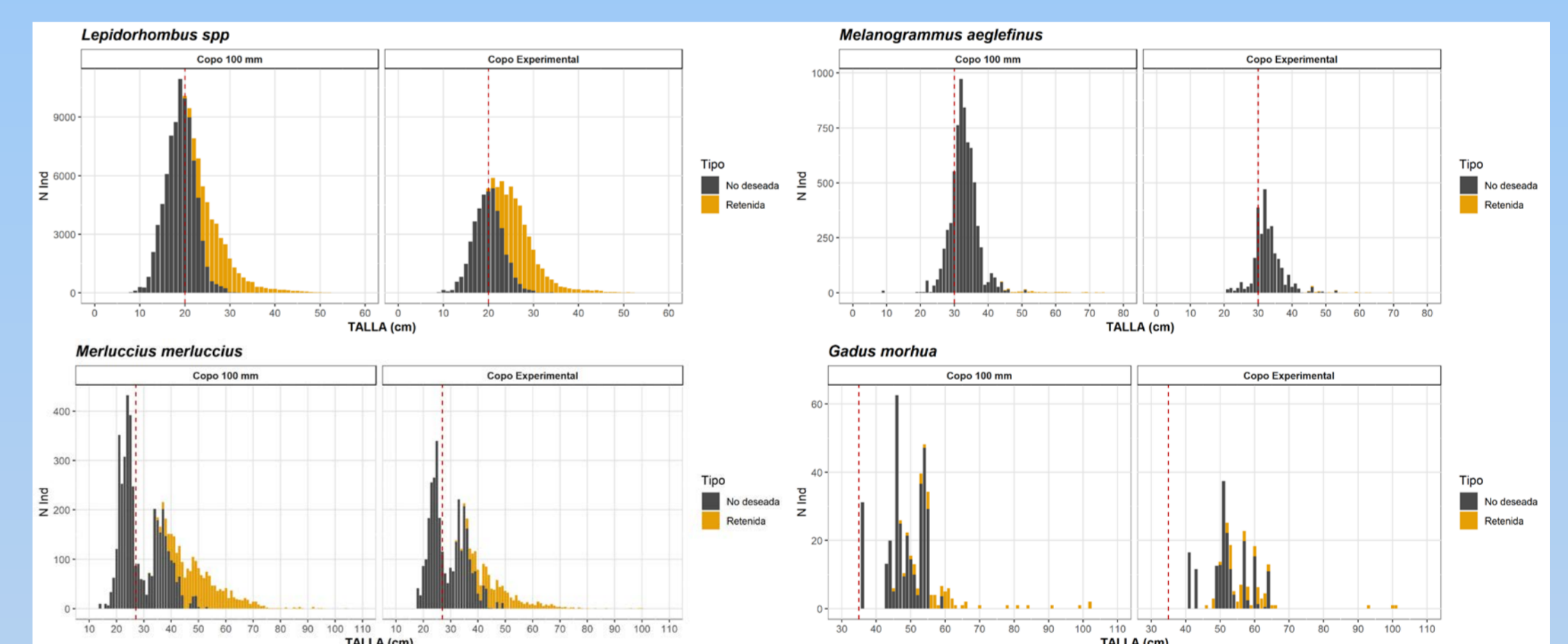
**COPO EXPERIMENTAL:** T0\_80\_T0\_05\_180  
- Codend mesh T0 size 80mm  
- Square mesh panel of mesh size 180mm, located at 5 meters of codend end.



## SPECIES SELECTIVITY (UNWANTED SPECIES)



## SIZE SELECTIVITY (Juveniles)



Distribution size of retained (yellow) and unwanted (dark) catch of Megrims (*Lepidorhombus* sp), European hake (*Merluccius merluccius*), Haddock (*Melanogrammus aeglefinus*) and Cod (*Gadus morhua*) by type of codend

## AN ALTERNATIVE CODEND TO REDUCE DISCARDS?

**RAPANSEL 2019:** The experimental codend equipped with a 150 mm square panel at 4 meters obtained positive results for the reduction of unwanted catch decreasing to 60% of megrims, 72% of European hake, 84% of Horse mackerel, 85 of Boardfish and 71% of Haddock.

**RAPANSEL 2020:** The experimental codend equipped with a 180mm square panel obtained positive results for the reduction of unwanted catch:

**Target species:** for the most important commercial species in the fishery:

- Megrim decreased a 36.8% (29.6kg/haul)
- Monkfish decreased a 29.4% (5.6kg/haul)
- European hake decreased a 25.7% (4.2kg/haul)

\*Increase in the retained catch of commercial megrims of 11.4% (15 kg /haul),

\*In the case of European hake, a decrease of 55% in the Experimental Codend affected all commercial categories.

Differences in selectivity by size: reduction capture of megrim below 25 cm of 45% and hake below 600 gr of 26%

Unwanted catch of **other species:** Differences were observed between the mean unwanted catches of various species with quota, with significant reductions using the experimental codend T0\_80\_T45\_05\_180:

- Haddock decreased by 53.5% (23.7 kg / haul)
- Cod decreased by 30.3% (2.4 kg / haul)

These results indicate that there is a decrease of catch for gadids (haddock and cod) using the codend of 80 mm and a panel of 180 mm of mesh size. Both species are 'choke species' in this fishery.

The data obtained in the RAPANSEL20 indicate that an important fraction of the unwanted catch of the target species with small size escapes through the experimental codend. This codend of 80 mm of mesh size equipped with a panel of 180 mm square mesh could be a possible solution for reducing the discard rates of juveniles of the target species and also of several unwanted species in the fishery such as haddock and cod, minimizing the economic loss of the fishery.

