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 (CTB_DEF_70-99_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.

**CASE STUDY: REDUCTION OF UNWANTED CATCH**

A series of fishing trials RAPANSEL have been carried out by IEO and Fishers organization ‘OPPFF’ 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 RAPANSEL 2019 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 an experimental codend of diamond mesh of 80 mm 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 4.5 meters away from the end of the codend. This experimental codend is constituted with a posterior section of 4-meter of 80 mm diamond mesh size and an anterior section of 7- meters 190 mesh of 100 mm mesh size. In June and July 2020, a selectivity trial RAPANSEL 2020 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_0) and an experimental codend of diamond mesh of 80 mm mesh size equipped with a panel of 180 mm square mesh-size (T0_80_140_0_0), mounted on the upper half of the codend 5 meters away from the end of the codend.

**RESULTS RAPANSEL 199**

- **Megrims (Lophius budegassa)**: Reduction of 60% in megrim catches. 
- **Haddock (Melanogrammus aeglefinus)**: Reduction of 53.5% in haddock catches.
- **European hake (Merluccius merluccius)**: Reduction of 55% in European hake catches.
- **Other species**: Reduction of 45% in other species catches.

**RESULTS RAPANSEL 2020**

- **Megrims (Lophius budegassa)**: Reduction of 36.8% in megrim catches.
- **Haddock (Melanogrammus aeglefinus)**: Reduction of 53.5% in haddock catches.
- **European hake (Merluccius merluccius)**: Reduction of 25.7% in European hake catches.
- **Other species**: Reduction of 55% in other species catches.

**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 decreasing to 60% of megrims, 72% of European hake, 84% of Horse mackerel, 85 of Boardfish and 71% of Haddock.

**Target species**: For the most important commercial species in the fishery:
- **Megrims**: Reduced by 36.8% (29.6kg/haul).
- **Haddock**: Reduced by 29.4% (5.6kg/haul).
- **European hake**: Reduced by 25.7% (4.2kg/haul).

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

**ANALYSIS**

Discriminability by size: reduction capture of megrim below 25 cm of 45% and hake below 60 gr of 26%.

**ANALYSIS**

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_140_0_0:
- **Haddock**: Reduced by 53.5% (23.7 kg / haul).
- **European hake**: Reduced by 30.3% (2.4 kg / haul).

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 RAPANSEL 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 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.

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