Deriving blue ling abundance indices from industry haul by haul data

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Background

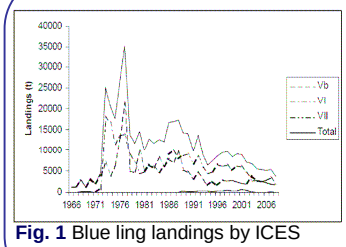

Fig. 1 Blue ling landings by ICES area1965-2008 (ICES, WWGDEEP, 2009)

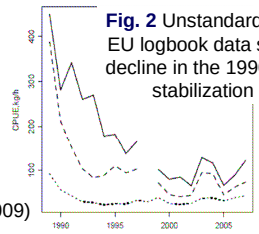

Fig. 2 Unstandardized CPUE from EU logbook data suggest a strong decline in the 1990s, followed by a stabilization at low level

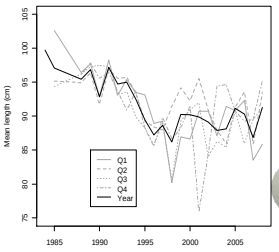

Fig. 3 Mean length in landings

Data from deep-water trawlers tallybooks were used to standardise blue ling Landings per Unit of Effort (LPUEs).

The data covered the years 1992-2008 with more extensive data for the period 2000-2007. For each haul, landings by species, tow duration, depth and location were reported.

LPUEs were estimated from Generalised Additive Models (GAMs) with depth, vessel, statistical rectangle and zone by year as explanatory variables.

Landings were modelled by a Tweedie distribution, a compound Poisson distribution, which allows to handle data with many zeros.
LPUEs were estimated in five areas **(Fig. 4)** for different subsets including or not the spawning season, when blue ling aggregates, or considering tows where blue ling was only a bycatch **(Fig. 8)**.

The results indicated that blue ling LPUEs have been mainly stable over the past decade. This is consistent with stable mean length in the landings **(Fig. 3)**. The decrease in mean length in the early period corresponds to a period of higher landings.

Haul by haul data are suitable to derive abundance indices for deep-water fisheries assessment.

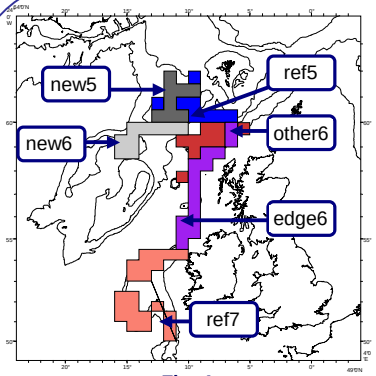

Fig. 4
Trends in LPUE were not the same over the whole fishery area. therefore, the fishing grounds were divided into 6 more homogeneous units.

Data

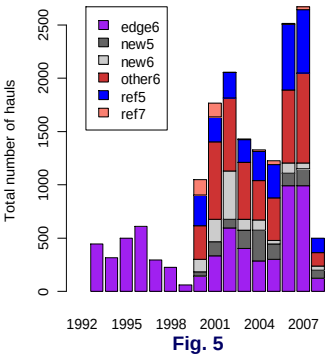

Fig. 5
In the tallybooks, there was more data in areas edge6, other6 and ref5. Blue ling catches were rare in area ref7

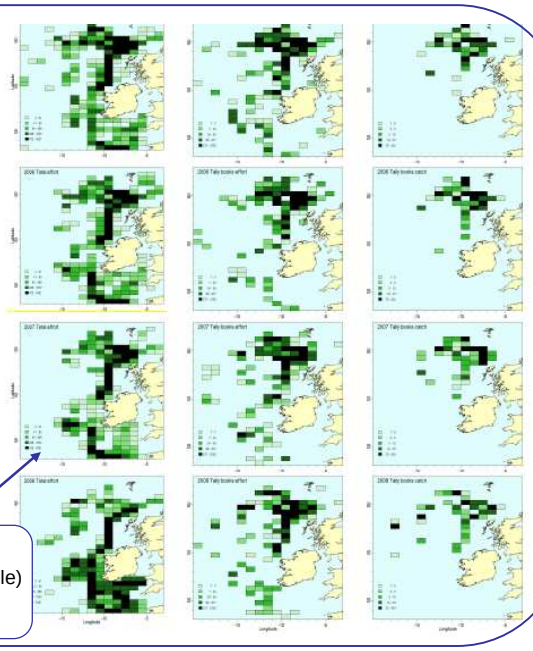

Fig. 6

Total effort of the French deep-water fleet (left), effort reported in tallybooks (middle) and blue ling catch in tallybooks (right). The tallybook dataset is representative of the whole fleet. Blue ling is not caught in the south of the fishing area

Results

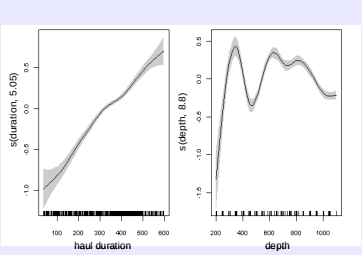

Fig. 7 The catch by haul increased almost linearly with haul duration. The depth effect was mainly flat in the 400-1100 m depth range

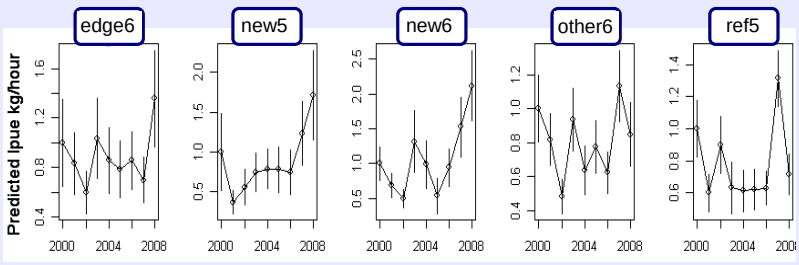

Fig. 8 Standardized LPUEs from tallybooks showed mainly stability for 2000-2008. With different temporal variations by area (here LPUEs are standardized to 1 in 2000).

Acknowledgment
We thank the producers organisation PROMA/PMA and the fish owning company EURONOR for providing access to the tallybooks. This study has been carried out with financial support from the Commission of the European Communities, specific RTD programme *Based Bio-Economy*" *KBBE-2008-1-4-02,* DEEPFISHMAN, Management and monitoring of deep-sea fisheries and stocks, Grant agreement no.: 227390.

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