COMPARATIVE BIOMASS SPECTRA OF THE LANDINGS FROM SPANISH FLEETS OPERATING IN THE BAY OF BISCAY

Velasco[1*] EM, A Juárez[2], J Rodríguez-Gutiérrez[3], JL Cebrián[4], MA Ámez[3] & M Quinzán[4]

(1) (*) Centro Oceanográfico de Gijón, Avenida Príncipe de Asturias 70 bis, 33212 - Gijón, Spain; eva.velasco@gi.ieo.es

(2) Centro Oceanográfico de Cádiz, Muelle de Levante (Puerto Pesquero), 11006 - Cádiz, Spain

(3) Centro Oceanográfico de Santander, Promontorio San Martín s/n, 39004 - Santander, Spain

(4) Centro Oceanográfico de Vigo, Subida a Radio Faro, 50-52, 36290 - Vigo, Spain

INTRODUCTION

Fisheries management in the EU relies on scientific advice, and is therefore dependent on accurate, relevant and up-to-date data. The current Data Collection Framework (DCF) will run since 2009 until 2013. A new sampling design was implemented: the concurrent sampling strategy, which implies the measure of all species caught during a vessel fishing trip.

This new sampling methodology is been applied to the landings of the Spanish fleets operating in the Bay of Biscay (Divisions VIIIab and VIIIc), recording length data of a representative sample of target and non-target species for all métiers identified.

The data collected over the period 2009-2010 allowed calculating the biomass size spectra of the landings. The analysis of size spectra is a useful tool for describing fish assemblages, based on the fish distribution among size classes notwithstanding the specific identity. Biomass size spectrum models indicate that aquatic size distributions should be characteristic in form and temporally stable in absence of major disturbances (Duplisea *et al*., 1997).

The possibility of using these joint biomass distributions to describe the capture of a particular gear and its application to detect possible changes in future exploitation patterns will be useful for fisheries management and assessment.

MATERIAL AND METHODS

This poster analyses data obtained during IEO market sampling (2009 and 2010). The most abundant species (>95% sampled) were used for the analysis. The number of specimens and length frequencies were compiled for each species at each gear. A total of 268339 individuals (teleosts and elasmobranchs) were measured (total length range: 9 - 169 cm).

Biomass spectra were integrated by plotting the proportion of total biomass, regardless of species, of various size classes, following fisheries methodologies (Duplisea *et al*., 1997; Macpherson & Gordoa, 1996; Magnusen, 2002). To obtain the length-frequency distributions of individual fish species sampled were converted into biomass-at-weight distributions, expressed as weight-at-size, using available length-weight relationships for each species. To facilitate inter-season and -year comparison, these were plotted against $\log_2$ groupings of body weight. The $\log_2$ class value represents the smallest body weight for the class, e.g., weight-class 7 represents all fish within the body weight range of 2^7 to 2^8 g or 128-256 g.

The different gear types studied (Gillnet (GNS), Longlines (LLS), Bottom Otter Trawl (OTB), Purse Seiner (PS) and Bottom pair trawl (PTB) were compared statistically by Kolmogorov–Smirnov test. Seasonal variability of the size spectrum was also studied. The statistical analyses were based on biomass values, not proportional values.

RESULTS

A biomass size spectrum is the distribution of biomass as a function of body size. The different biomass-size spectra performed are used to compare the landed biomass by each gear type.

- Shapes of the total biomass captured by Gillnets and Bottom Otter Trawls were different to the Longlines, Purse Seiners and Bottom Pair Trawl ones (KS test $p<0.05$).

-No inter-annual differences between biomass captured in 2009 and 2010 were observed in any case (KS test $p>0.05$), except for the Bottom Pair Trawl. This differences could be explained by sampling problems in fish markets.

-There were no inter-seasonal differences any case (KS test $p<0.05$), except for the Bottom Otter Trawl, where the winter capture shape is different respect the remaining seasons.

Biomass spectra for different gears of the fish assemblages on the Bay of Biscay. The size classes correspond to the $\log_2$ of weight (numbers indicate the lower boundary of each class)



REFERENCES

Magnunssen E (2002) Demersal fish assemblages of Faroe Bank: species composition, distribution, biomass spectrum and diversity. *Mar Ecol Prog Ser* 238: 211-225.

Duplisea DE, SR Kerr & LM Dickie (1997) Demersal fish biomass size spectra on the Scotian Shelf, Canada: species replacement at the shelfwide scale. *Can J Fish Aquat Sci* 54: 1725-1735.

Macpherson E & A Gordoa (1996) Biomass spectra in benthic fish assemblages in the Benguela System. Mar Ecol Prog Ser 138: 27-32.

ACKNOWLEDGMENTS. This study was funded by the EU within the EU-Data Collection Framework program. The authors would like to thank all staff who participated during sampling work in fish markets.

ISOBAY
XIII International Symposium on Oceanography of the Bay of Biscay.
11-13 April 2012. Santander, Spain.