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The Red seabream fishery in the Strait of Gibraltar: update of the available information from the fishery statistics and some considerations about the current knowledge on the target species growth.

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Abstract

This paper presents the available information of the Red seabream (Pagellus bogaraveo) fishery in the Strait of Gibraltar and updates the documents presented in previous years with the information from the last analyzed year, 2012. The document presents data about landings, LPUE, length frequencies and also some biological information about the species growth which should be useful to fishery management considerations.

1. Introduction and fishery description

Since the earlies 1980´s an artisanal fishery targeted to the red seabream (*Pagellus bogaraveo*, namely "*voraz*") have been developing along the Strait of Gibraltar area (ICES IXa south). This fishery has already been broadly described in previous Working Documents presented to the ICES WGDEEP (Gil *et al*., 2000; Gil & Sobrino, 2001, 2002 and 2004; Gil *et al*., 2003, 2005, 2006, 2007, 2008, 2009, 2010, 2011 and 2012). Spanish red seabream fishery in the Strait of Gibraltar is almost a monospecific fishery with one clear target species which represents the 74% from the total landed species which constitutes a fleet component by itself (Silva *et al*., 2002).

The Instituto Español de Oceanografía (IEO) began the study and the fishery monitoring following the request from the Fishermen Corporations. In 2006, 2008, 2010 and 2012 different assessment trials were attempted within the ICES WGDEEP (ICES, 2006, 2008, 2010 and 2012).

The main objective of this paper is to provide an updated summary of the available fishery information and some considerations about the growth of this deep-water species in ICES area IX to the 2013 ICES WGDEEP meeting.

2. Material and methods

Fishery information was gathered for the period 1983-2012 from the sale sheets: monthly landings, monthly number of sales and the number of days in which those sales were carried out. Moreover, from the beginning of the IEO monitoring, June 1997, an *ad hoc* monthly length samplings from the different commercial sizes are carrying out to estimate the landings length distribution (Gil *et al*., 2000).

R software was quite helpful to draw growth curves and integrated recaptures information in it. So observed growth from tag-recapture experiences were compared with the expected ones from three different VBGF estimated by means of otoliths readings results: ALK 1997-1999 (FISHPARM software) and ALK 2003-2009 (FISHPARM software and Bayesian von Bertalanffy growth model with Schnute parameterization).

3. Results and discussion

- Landings data: Figure 1 shows a continuous increase of the landings to a maximum in 1994. Since 1994 landings have gone decreasing till 2002, except in 1996 and 1997. Then, from 2003 onwards it shows an increasing trend till reached the highest value of the last years in 2009, followed by a new decrease till last year, with the lowest value of the recent years. However Morocco landings from the same fishing grounds are not included.

- LPUEs and CPUEs: Fishing effort increases too till 2009 (Figure 2). It is important to emphasize that the effort unit chosen (number of sales) cannot be too appropriate as do not consider the missing effort. Thus, in the years when the resource is not so abundant the missing effort increases substantially (fishing vessels with no catches, so no sale sheet were recorded). So, the LPUE trend from the decline of the fishery, 1997, should be interpreted with caution because it cannot be a real image of the resource abundance but even so the decreasing trend since 2010 is quite clear.

- Length frequencies:

The fishery resource suffers a decrease of the landed mean length (Figure 3) mainly from 1995 to 1998. It is necessary to point out that species probably does not have a homogeneous geographic and bathymetric distribution related to their length. This fact could explain the different landed mean length between the main landing ports, Tarifa and Algeciras. The mean length of the landings gets progressively increasing from 1999 onwards, but along the last years the trend varies increasing again from 2006 on in both ports. However the median value from these years remains under the mean in every case. The mean length from both landing ports became lower since 2010. Nowadays there is not minimum landing size adopted for the area.

- Biological information: No new biological information is available. Figure 4 draws the size increment between tag and recapture dates from the twelve longest lived samples. In every case observed values are below than the expected in the VBGF functions from otoliths readings. So, it seems that readings may be overestimated and some hyaline rings are uncounted and/or missing. Thus, age and growth based on otolith readings should be revised and further work is needed.

4. Main conclusions

Figure 1 is clear enough. There is no evidence of the fishery sustainability at the current levels. Landings and mean length decreasing since 2010 remember a similar history in the middle 1990s. Besides, because of its particular biology the Red seabream may be especially sensitive to overfishing. Fish ageing has an important role in fisheries assessment and management. Typically, fisheries based on slow growing species could be subject to growth overfishing. The use of biased age estimation criterion may have important consequences. Besides, underestimating growth is likely to result also in underestimate of stock´s productivity; a stock with a fast growth rate might recover faster than be expected from low biomass levels, and vice versa. Improving the precision in the absence of accuracy cannot, under any account, guarantee data quality (de Pontual *et al*., 2006). Therefore, considerable effort should be made to improve the precision of age data through workshops on ageing (i.e. ICES WKAMDEEP next October).

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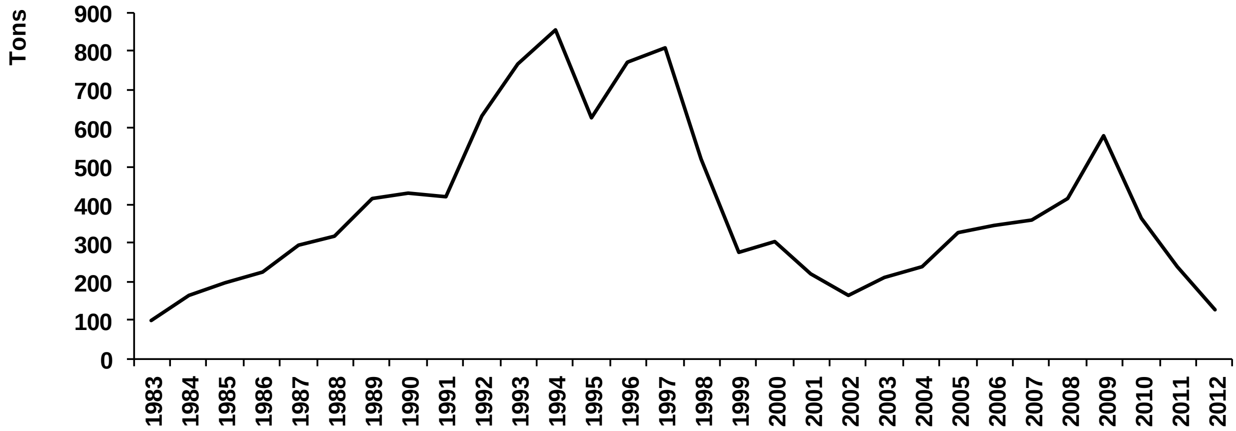

Figure 1. Red seabream Spanish fishery of the Strait of Gibraltar: Landings (1983-2012).

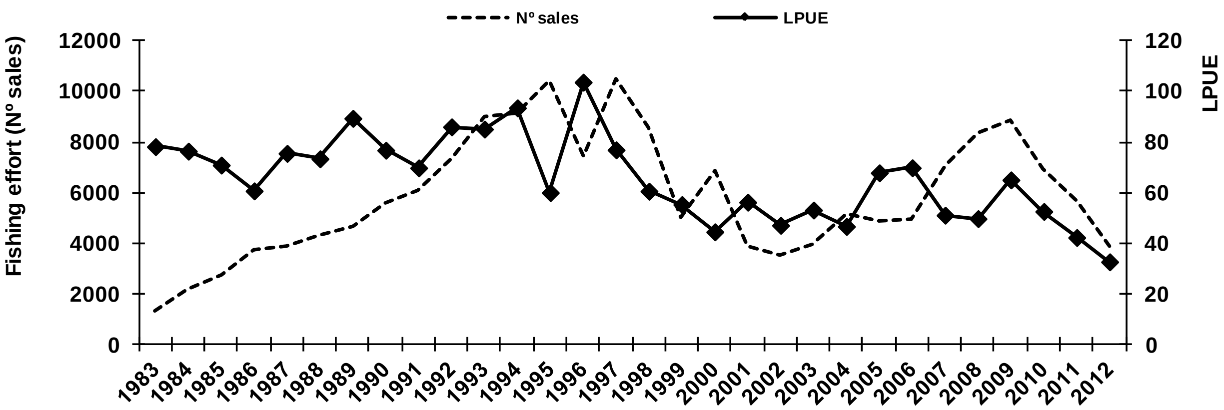

Figure 2. Red seabream Spanish fishery of the Strait of Gibraltar: Evolution of the chosen effort unit (number of sales) and its estimated LPUE (1983-2012).

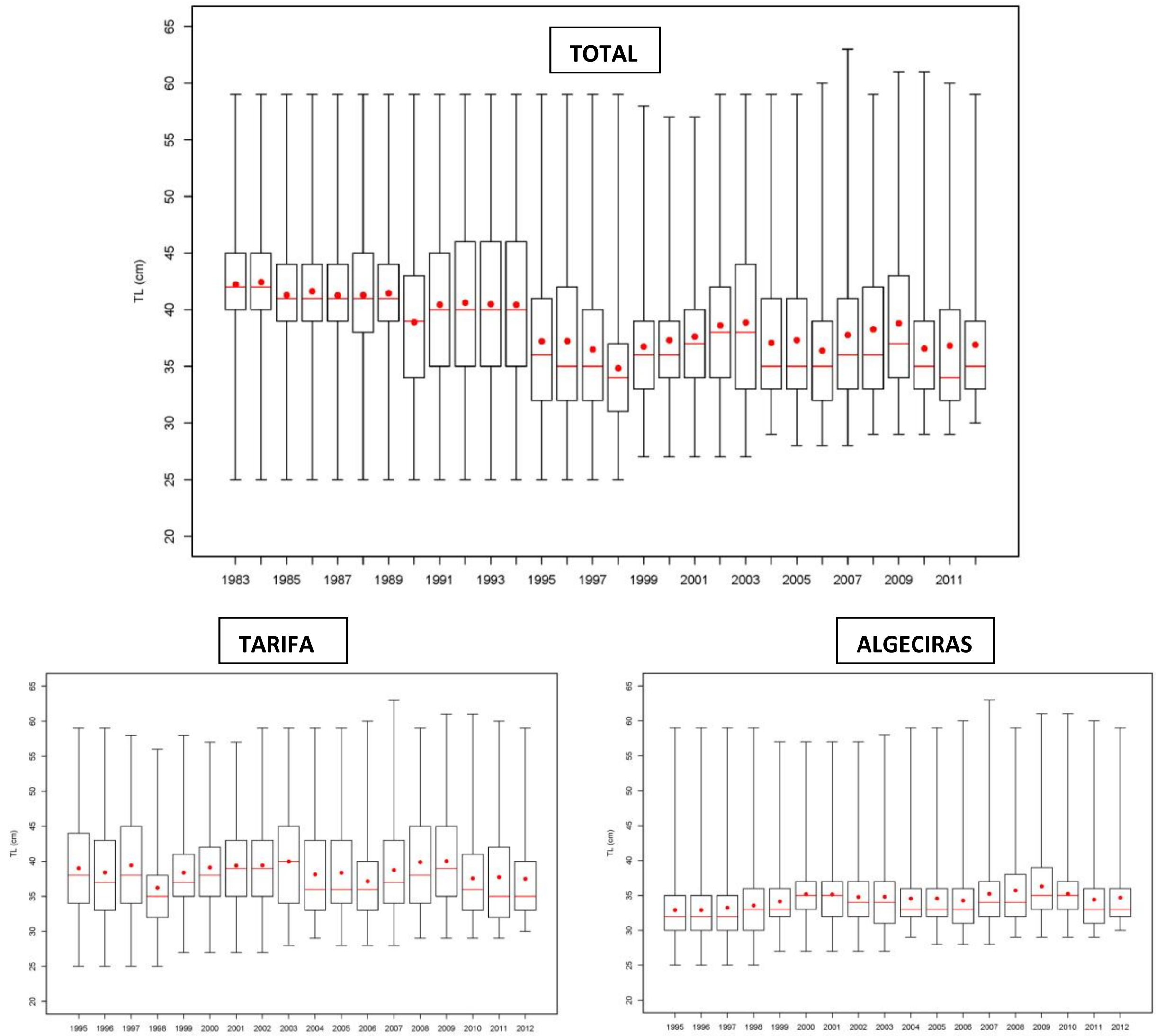

Figure 3. Red seabream Spanish fishery of the Strait of Gibraltar: Evolution of the landings length distribution descriptive statistics.

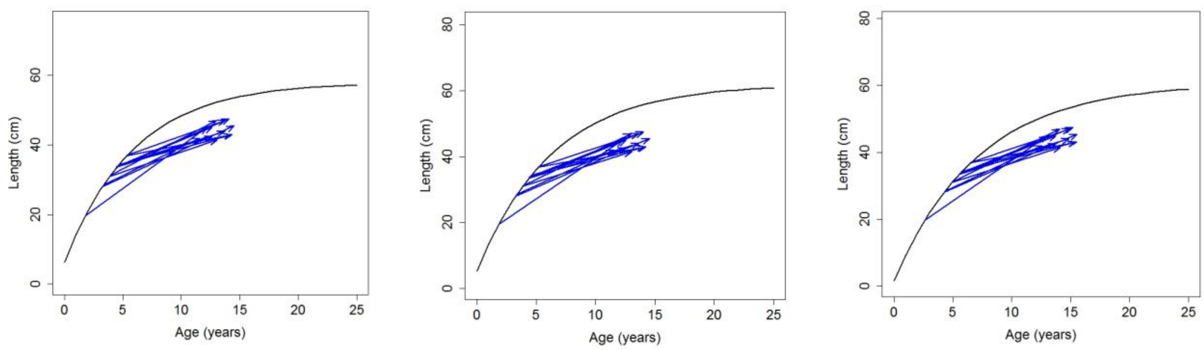

Figure 4. Red seabream of the Strait of Gibraltar: von Bertalanfy growth curves estimated from otolith readings. Straight lines correspond to the 12 long time at sea recaptures (Left: ALK 1997-1999; Center: ALK 2003-2009 FISHPARM soft. and Rigth: ALK 2003-2009 Bayesian fit).