Fisheries & Conservation Science

Size distribution of the European sea bass (*Dicentrarchus labrax*) caught around Welsh waters. Preliminary results of the first sampling months (May-August 2013).

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Funded By:

Y Gronfa Pysgodfeydd Ewropeaidd:
Buddsoddi mewn Pysgodfeydd Cynaliadwy
European Fisheries Fund:
Investing in Sustainable Fisheries

Llywodraeth Cymru
Welsh Government

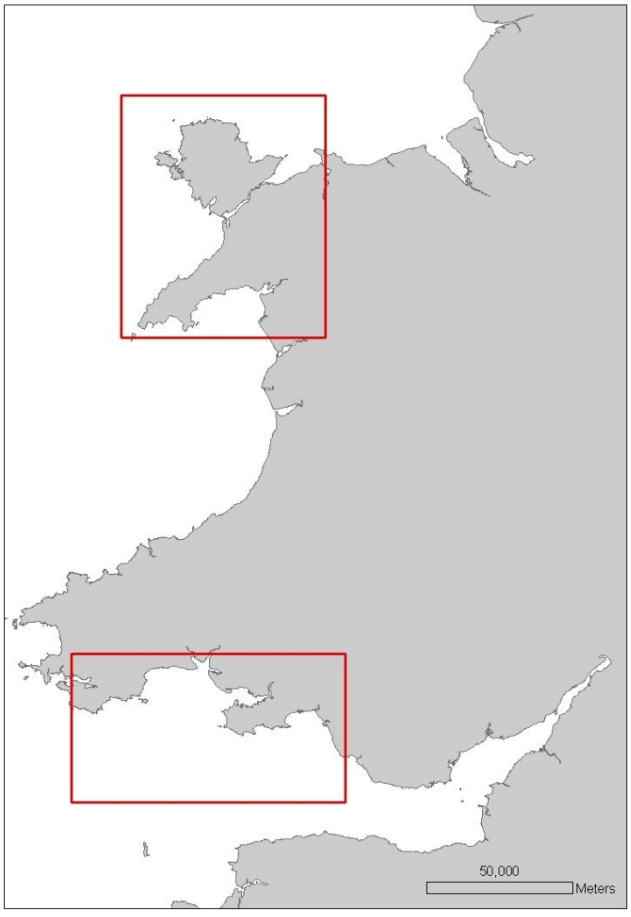
Introduction

European sea bass (*Dicentrarchus labrax*) is a species exploited by both commercial and recreational fishers and the uncertainty about the state of the stock is mainly related to the lack of data on the current biomass extracted and the population structure. One of the aims of the present project is to provide more accurate data on the population structure of the bass stock exploited around Welsh waters and thus to provide an insight into the state of the stock.

Methods

Data collection

A total of 22 fishermen, 15 commercial and 7 recreational, have been involved in the data collection. For each fish caught, each fisherman was asked to collect data on the date and location of the capture, total length, weight, a sample of 10-15 scales and a small biopsy (5x5 mm) of the pectoral fin and all guts. Out of the 22 fishermen involved, 2 provided data on a regular basis, 5 provided data sporadically and 15 have yet to provide data.



To improve the amount of data 6 fish processing industries, 4 in South, 1 in Mid and 1 in North Wales, were also involved. For each bass, data on the date and location of the capture, length and weight were collected as well as a sample of 10-15 scales and a small biopsy (5x5 mm) of the pectoral fin. When possible the guts were also retained. The general fishing areas where the samples come from are presented in Fig. 1. Currently, no samples from Mid Wales have been provided.

Figure 1. General fishing areas of the samples collected.

Preliminary results

From May to August data of 580 fish were provided by fishermen (n = 176) and processing industries (n = 404). Out of the 580 fish recorded, almost all of them had information on date and location of capture, total length and their scales were also sampled. Information on gonads was available for 25% (n = 146) of the total sample. Length frequency distribution by data source (commercial and recreational fishers/processing industries) is shown in Figure 2.

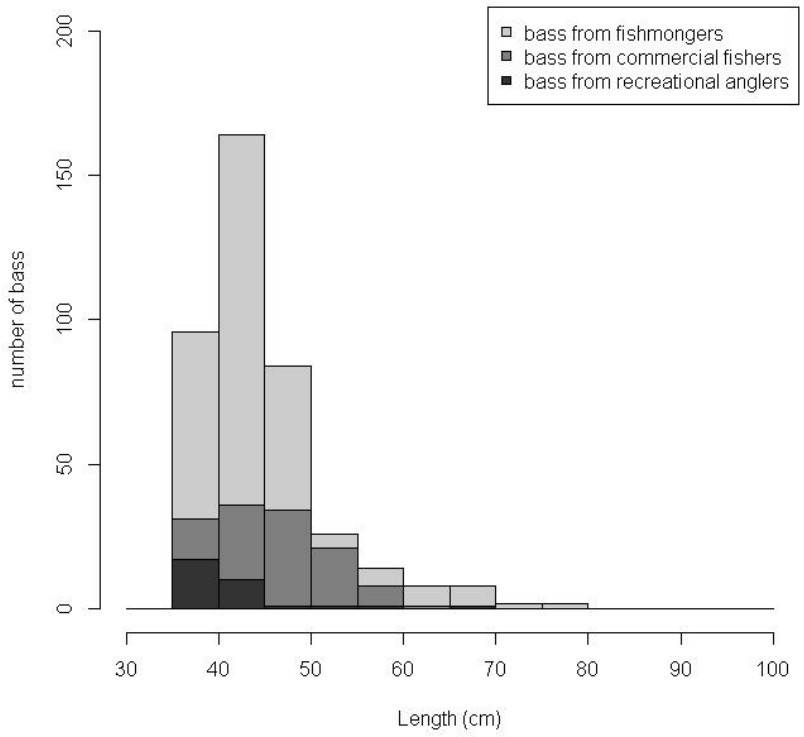
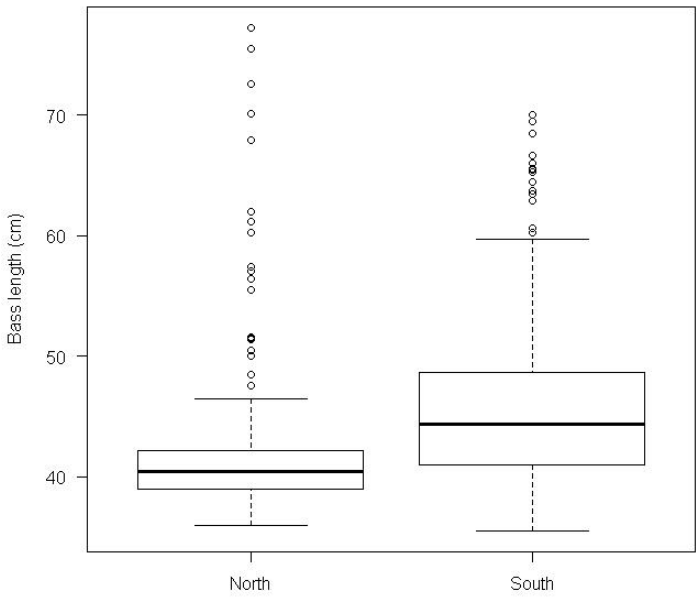


Figure 2. Length frequency distribution of the bass caught by data source.

73% of the bass recorded were line caught (rod and line and longline) and 27% with nets (gillnets and trammel nets).



A first exploratory analysis of the data collected shows a significant difference in the mean body size (total length-TL- in cm) of the bass caught between North (TL: 42.7 ± 7.7 SD) and South (TL: 45.6 ± 6.3 SD) Wales (Mann-Whitney U test, $p<0.001$) (Figure 3).

Figure 3. Box plots showing the distribution of the body size of the bass caught in North and South Wales

Length-weight relationship (Weight = a * Length^b) has been estimated from 464 fish (Figure 4). Differences in the parameters (a and b) between North (a = 0.01420, b = 2.917) and South Wales (a = 0.01135, b = 2.969) have been detected.

Discussion

Most of the bass recorded between May and August were line caught (rod and line and longline) and only a small proportion with nets. Although this difference is partially due to greater involvement of fishers using rod and line it also depends on the different seasonality between rod and line/longline (May-November) and gill nets (September-November). For this reason we expect an increment of the fish caught with nets from early September, at least in the data collected from the fishmongers.

A significant difference of the mean body size of the sea bass caught between North and South has been also detected. Although this effect could be related to the different Minimum Landing Size between North (MLS = 36 cm) and South (MLS = 37.5 cm) Wales, the effect of other variables such as the months/season, the fishing method and the habitat (coastal areas/estuaries/offshore) need to be explored by using appropriate statistical models.

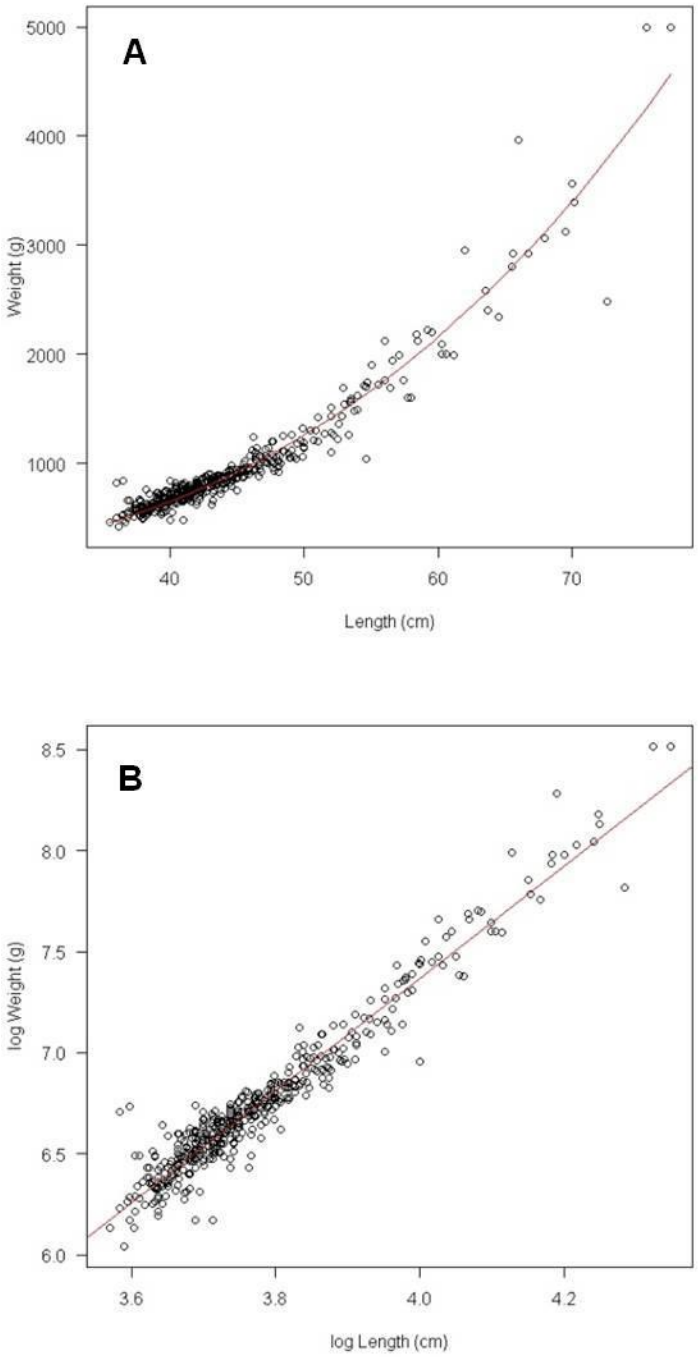


Figure 4. Length-weight relationship (A: exponential, B: log-transformed) for the bass recorded between May and August 2013 (n = 464).

The difference of the parameters *a* and *b* of the length-weight equation between North and South could be related to the different sample size (North, n = 141; South, n = 439) and not to a real difference in growth patterns. Considering all records together, the parameters *a* and *b* (*a*= 0.01215 and *b* = 2.952) are slightly different in respect to those of the bass stocks from the East

and West Channel (a = 0.01240, b = 2.953) and from the Biscay Bay (a = 0.01230, b = 2.955) (www.fishbase.com).

Possible genetic difference between the European stocks will be detected in the next months. In fact, a total of 374 biopsies from the bass caught in Welsh waters have been sent for the genetic analysis (https://aquatrace.eu/index.html) and the results will be available next year.

These preliminary results also show how the involvement of multiple stakeholders is essential not only to increase the sample size of the fish recorded but also to gain a bigger picture of the possible effects of specific management measures. It is essential to continue the survey during at least 1 more fishing season not only to reduce the uncertainty in the key indicators of the stock but also to have a more comprehensive picture of how different management measures would affect the fishermen and the processing industries.

Future work will be focused on:

- Collecting more samples all year round, including also the next fishing season;

- Describing the male/female ratio; identifying the maturity stage by area, month/season and length and estimating the Gonad Somatic Index (GSI)

- Aging the bass recorded and stable isotopes analysis of the collected scales.