Stock Annex: Seabass (*Dicentrarchus labrax*) in divisions 8.c and 9.a (southern Bay of Biscay and Atlantic Iberian waters)

Stock specific documentation of standard assessment procedures used by ICES.

Stock:	Seabass
Working Group:	Working Group for the Bay of Biscay and the Iberic waters Ecoregion (WGBIE)
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A. General

Seabass for the 8.a-b area is considered in 2012 as data poor species, in category 5.2.0

A.1. Stock definition

Bass *Dicentrarchus labrax* is a widely distributed species in northeast Atlantic shelf waters with a range from southern Norway, through the North Sea, the Irish Sea, the Bay of Biscay, the Mediterranean and the Black Sea to North-west Africa. The species is at the northern limits of its range around the British Isles and southern Scandinavia.

Stock structure of sea bass in the Atlantic has been reviewed by WGNEW 2012 and IBP-NEW 2012 based on evidence from genetics studies, tagging studies, distribution of commercial catches and similarities in stock trends between areas, drawing also on extensive information contained in previous WGNEW and ICES SGBASS reports.

IBP-NEW considers that stock structure remains uncertain, and recommends further studies on seabass stock identity, using conventional and electronic tagging, genetics and other individual and population markers (e.g. otolith microchemistry and shape), together with data on spawning distribution, larval transport and VMS data for vessels tracking migrating bass shoals, to confirm and quantify the exchange rate of seabass between sea areas that could form management units for this stock. Such information is critical to support development of models to describe the spatial dynamic of the species under environmental drivers (e.g. temperature and food). Such a modelling work is being carried out in France in the framework of a PhD study (R. Lopez).

The pragmatic view of IBP-NEW 2012 is to structure the baseline stock assessments into four units:

- Assessment area 1. Sea bass in ICES areas 4.b-c; 7.d; 7.e, 7.h; 7.a, 7.f-g (lack of clear genetic evidence; concentration of area IV bass fisheries in the southern North Sea; seasonal movements of bass across ICES Divisions). Relatively data-rich area with data on fishery landings and length/age composition; discards estimates and lengths; growth and maturity parameters; juvenile surveys, fishery LPUE trends.

- Assessment area 2. Sea bass in Biscay (ICES Sub area 8.a-b). Available data are fishery landings, with length compositions from 2000; discards from 2009; some fishery LPUE.
- Assessment area 3. Sea bass in 8.c and 9.a (landings, effort, discards)
- Assessment area 4. Sea bass in Irish coastal waters (6.a, 7.b, 7.j). Available data: Recreational fishery catch rates; no commercial fishery operating.

Fishery landings of sea bass are extremely small in Irish coastal waters of 7.a and 7.g and the stock assessment for assessment area 1will not reflect the sea bass populations around the Irish coast, which may be more strongly affiliated to the population in area 4 off southern, western and Northern Ireland.

A.2. Fishery

General description

Spanish and Portugese vessels represent almost of the total annual landings in the area 9.a and 8.c. Commercial landings represent 772 tons in 2011. A peak of landings is observed in the early 90's reaching more than 1000 tons, and lowest landings (637 tons) have been observed in 2004. Artisanal fisheries are mainly observed in this area. Off Portugal, estimated total landings of sea bass (hereafter refers only to European sea bass) average 421 tons for the period 1986-2012. Landings had a maximum of 610 tons in 1989, followed by a slight decrease and another increase to a second maximum of 633 tons in 2006. Most landings come from the polyvalent mixed fishery (80-99%) using mostly gill nets (GNS_DEF_80-99_0_0), trammel nets (GTR_DEF_>=100_0_0) and long-line or hand-line (LLS_DEF_0_0_0). The landings by purse seiners and trawlers represent a small amount.

Relatively little historical data are available on recreational fisheries although several European countries are now carrying out surveys to meet the requirements of the EU Data Collection Framework and for other purposes (ICES WKSMRF 2009, PGRFS 2010 & 2011, WGRFS 2012; Herfault *et al*, 2010, Rocklin et al, 2012 in prep, Van der Hammen & De Graaf, 2012).

Fishery management regulations

Seabass are not subject to EU TACs and quotas. Under EU regulation, the MLS of sea bass in the Northeast Atlantic is 36 cm total length (EC regulation 850/98). A variety of national restrictions on commercial fishing for each metier also apply to sea bass. The measures affecting recreational fisheries in Portugal include gear restrictions, a minimum landing size equal to the commercial fishery MLS (36 cm), the total catch of fish and cephalopods by each fisher must be less than 10 kg per day, and prohibition on the sale of catch.

A.3. Ecosystem aspects

This section comes from the IBPNew report and refers to UK studies.

Temperature appears to be a major driver for bass production and distribution (Pawson, 1992). Reynolds *et al*. (2003) observed a positive relationship between annual seawater temperature during the development phases of eggs and larvae of sea bass and the timing and (possibly) abundance of post-larval recruitment to nursery areas. In addition, early growth is related to summer temperature and survival of 0-groups

through the first winter is affected by body size (and fat reserves) and water temperature (Lancaster 1991; Pawson 1992). Prolonged periods of temperatures below 5 - 6°C may lead to high levels of mortality in 0-groups in estuaries during cold winters. As a result, any SSB–recruit relationships may be obscured by temperature effects (Pawson *et al*., 2007a).

Recruitment of sea bass is highly variable, and the fisheries have often in the past been dominated by individual very strong year classes or have been negatively affected by periods of very poor recruitment. Expansion of sea bass populations in the North Sea in the 1990s coincided with a period of ocean warming as well as the growth of the very strong 1989 year class.

B. Data

B.1. Commercial catch

B1.1 Landings data

Data available

Landings series are derived from:

i) Official statistics recorded in the Fishstat database since around the mid-1970s.

ii) Spanish landings for 2007-2011 from sale notes

iii) Portuguese estimated landings from 1986 to 2011 including distinction between *Dicentrarchus labrax* and *punctatus*.

Spanish and Portuguese vessels represent almost of the total annual landings in the area 9.a and 8.c. Commercial landings represent 772 tons in 2011. A peak of landings is observed in the early 90's reaching more than 1000 tons, and lowest landings (637 tons) have been observed in 2004. Artisanal fisheries are mainly observed in this area. Off Portugal, estimated total landings of sea bass (hereafter refers only to European sea bass) average 421 tons for the period 1986-2012. Landings had a maximum of 610 tons in 1989, followed by a slight decrease and another increase to a second maximum of 633 tons in 2006. Most landings come from the polyvalent mixed fishery (80-99%) using mostly gill nets (GNS_DEF_80-99_0_0), trammel nets (GTR_DEF_>=100_0_0) and long-line or hand-line (LLS_DEF_0_0_0). The landings by purse seiners and trawlers represent a small amount.

Quality of official landings data

The official landings data for sea bass available to WGNEW 2013 are subject to several uncertainties that can affect the accuracy of assessments:

- Incomplete reporting of landings in the 1970s and early 1980s when the fisheries were developing;
- Poor reporting accuracy for small vessels that do not supply EU logbooks.

Portugal: With the regulations introduced with the DCF, landings by species are now more accurate, especially since 2006. Additionally, market sampling enabled the estimation of the remaining misidentification and correction of total landings by species. Official landings underestimate total catch to an unknown degree. Landings series for use in the assessment are available from the Portuguese official statistics since 1986.

Landings of sea bass from the ICES division 9.a are reported in three categories: the European sea bass (*Dicentrarchus labrax*, FAO code BSS), the spotted sea bass (*Dicentrarchus punctatus*, FAO code PSU) and also a mix of the above two species under the category *Dicentrarchus* sp. (FAO code BSE). From DCF market sampling it was possible to estimate that the spotted sea bass represents only ca. 2.5% of sea bass species total landings, and produce a time series of corrected landings for *Dicentrarchus labrax*.

Spain: Landings from the sales notes are detailed for the 2007-2011 period. This source of information was chosen as the accuracy of the landings for *D. labrax* improves with respect to logbook data. Main reason seems to be the role of small scale fisheries that do not have to supply logbooks data.

B.1.2 Discards estimates

Portugal: Sea bass discards are recorded by the DCF on-board sampling programme. The Portuguese on-board sampling is not covering the Sea Bass fishing area. No discards are observed.

Spain: No bass discards were observed for any metier in the 2003-2011 periods.

Quality of discards estimates

Portugal. As sampling is targeted at all species, annual coverage of the sea bass catches is relatively limited. The low numbers of sea bass in retained catches show that the Portuguese on-board sampling is not covering the sea bass fishing area. Nevertheless, the species is of high value and discards are probably negligible.

B.1.3 Recreational catches

Recreational marine fishery surveys in Europe are still at an early stage in development (ICES WGRFS 2012).

Spain

A recreational boat fishing survey was performed in the Basque Country to estimate the total catch of the target species of this fishery. Fishermen were asked about their catches in 2009, and 555 surveys were collected. Sea bass catch data were modeled with a two-step GLM, using type of boat and total boat length as covariables. The results were extrapolated to the total number of boats using an updated census. The estimated catch for seabass was in 2009 was 8183 Kg, with an associated standard error of 149 Kg. It is important to note that this estimation refers only to the fishing performed from boats. In order to estimate total recreational catches of sea bass, anglers fishing from coast and spear fishers need to be included in the survey. In 2012 a pilot study financed by the Data Collection Framework (DCF) was taking place in order to estimate total sea bass catches (taking into account all types of recreational fishing), and it is expected that the results if this study will increase significantly the estimated sea bass catch. Results were not available for WGNEW2013.

Portugal

It is recognized that a pilot study on recreational fishing of sea-bass should be carried out in order to determine the importance of this fishery in Portugal, whether it is necessary to monitor it regularly and if so how the monitoring could be carried out. Recreational fishery data have not been collected due to lack of resources and weak administrative information available. A pilot study addressed to the maritime touristic

operators was implemented in 2010 in order to obtain the quantities of sea bass catches. The results of this study revealed very low quantities of sea bass catches (DCF, 2012).

Quality of recreational catch estimates

Recreational catch estimates from surveys (numbers or tonnes caught per year) are not yet available as time series. The estimates for France are characterised by relatively poor precision. The 2012 ICES Working Group on Recreational Fisheries initiated the development of data quality indicators for recreational fishery survey estimates, however sources and potential magnitude of bias in available estimates were not provided to WGNEW 2013.

B.2. Biological

B.2.1 Length and age compositions of landed and discarded fish in commercial fisheries.

Portugal: In Portugal, quarterly length compositions of sea bass landings from division 9.a are available from DCF concurrent sampling since 2009 for the polyvalent fleet. The number of animals sampled is small, N=2229 for the 4 years (2009 to 2012) and concerned only the area 9.a. The sample rate (trips sampled per tonne landed) was around 0.2 in 2009, 2010 and 2011. Most specimens measured were landed from trammel nets (GTR_DEF_>=100_0_0), gill nets (GNS_DEF_80-99_0_0), and long-line (LLS_DEF_0_0_0). The quarterly length compositions show that recruitment to the fishery is seasonal starting during the second quarter of the year. Length compositions derived from fisheries with the two main gear types show that the fisheries with gill nets and trammel nets catch smaller animals (mean = 48 cm) of a narrow length range, mainly animals between 40 and 55 cm (80%); whereas the line fishery catches animals bigger animals (mean = 51 cm) and of a wider size range. There is no significant trend in the mean length of sea bass over the 4 years period analysed. No age sampling is available

Spain: No data available from Spain for the 8.c, 9.a area

B.2.2 Biological parameters and other research in Iberian waters: weights, maturities, growth

This section provides biological parameters, discussed in a Portuguese Working Document for the ICES Working Group on Assessment of New MoU Species by Ana Moreno and Yorgos Stratoudakis (2013).

Spawning season

Bass spawning is limited within the 9-17o C water temperature range and has a latitudinal gradient in the Atlantic coast of Europe, with season placed progressively later in the year in more northerly latitudes (April-June off Ireland; February-May in the English Channel and eastern Celtic Sea; January-March in the Bay of Biscay and October-January in the Gulf of Cadiz). Based on back-calculated birthdates of juveniles caught in 4 Portuguese estuaries, Vinagre et al (2009) support the above latitudinal trend; successful spawning in SW Portugal seems to concentrate from December to February, becoming progressively later (January to April or February to April) as moving towards estuaries in NW Portugal, although temperature seasonality is not the trigger for this local pattern. An earlier study by Sobral et al (2000) identifies February as the main spawning month for bass off the Ria de Aveiro (NW Portugal), based on the macroscopic staging of gonads from fish caught by “majoieiras” (small bits of old trammel nets fixed perpendicularly on the beach at low tide).

Spawning grounds and seasonal migrations

Off western Portugal (where temperature is not a limiting factor for the definition of potential spawning habitat and continental shelf is narrow), there is no evidence of inshore-offshore migrations (sea bass is almost exclusively caught in the inner shelf and often at depths <10 m), and there is evidence of spawning at very shallow waters (Sobral et al 2000 and blog reports by recreational line fishers operating from land). Additionally, there is evidence of large pre-spawning and spawning aggregations found inshore, as verified by the occasional purse seine sets with up to 3-4 t of sea bass in the catch.

Ontogenetic movements

Off Portugal, there is evidence that juvenile bass colonize transition waters during the summer and stay there for at least the first year (Gordo 1989; Cabral and Costa 2001). Although fish in the second year of life and even third have been found within such protected and semi-enclosed systems, no mature fish have ever been registered there, whereas there is little known on the movements of bass while at sea.

Growth

Off Portugal, there are mean length at age data only for younger age groups (usually from studies with immature fish in estuaries and rias), appointing to intermediate sizes at age between the lower values in more northerly area and higher values in the Mediterranean and Atlantic Moroccan coast (Gordo 1989; Cabral and Costa 2001).

Maturation

In the northern range of the species distribution area, maturity is attained at around 4 - 7 years, which is around 35 cm for males and 42 cm for females. No information is available from Portugal. Nevertheless, Chavanne et al (2008) report from aquaculture experience that males complete maturation in the second year and females in the third (although recognize maturation as a problem for production only for fish reared for more than 3 years); it is thus likely that first maturation off Portugal occurs at intermediate ages between those reported from wild populations at the northern limit of the distribution and those from aquaculture.

B.3. Surveys

Portugal

No sea bass are caught in the Portuguese trawl survey cruises. Nevertheless, juvenile sea bass are regularly caught in surveys within estuaries (e.g. Gordo 1989; Cabral and Costa 2001). Monitoring efforts under the Water Framework Directive (e.g. Ramos et al 2012) could thus be used also to construct series of sea bass recruitment indices, at least in the main nurseries for the species in Portugal (Vasconcelos et al 2008), at no additional cost.

Spain

Information of *Dicentrachus labrax* catches in the series of research surveys conducted by the IEO since 1983 is showed in **Error! Reference source not found.**. There are also a very few seabass caught.

B.4. Commercial LPUE

Spain

LPUE data for Spanish fleets operating in ICES areas 6-8 and landing into Basque Country ports were provided to WGNEW in 2005, and the best indicator of sea bass abundance trends (LPUE) in the period 1994 - 2004 was considered to be from vessels of the 'baka' otter trawl fleet working in Div. 8.a-b, 8.d and landing into the Basque port of Ondarroa. Data for later years were not available to WGNEW. Landings and effort data were provided to WGNEW by Spain, though not in the form of LPUE indices.

Portugal

Commercial catch-effort data was analysed for the Portuguese polyvalent fishery for the years 1995 to 2011 from auction daily landings data. The unit of effort is given as the number of trips that deliver sea bass. There is no apparent trend in the sea bass LPUE for the period analysed, but the unit of measure is probably not reflecting sea bass abundance (**Error! Reference source not found.**14)

Quality of data: Sea bass are a by-catch in most polyvalent fisheries and catchability may drift due to changes in species targeting, areas fished and vessel fishing power. On the other hand, the unit of effort given as the number of trips that deliver sea bass is probably meaningless to reveal abundance

B.5. Other relevant data

C. Assessment: data and method

Data do not allow to conduct an assessment.

D. Short-Term Projection

E. Medium-Term Projections

F. Long-Term Projections

G. Biological Reference Points

H. Other Issues

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