# Stock Annex; Red Sea bream in Subareas VI, VII and VIII

Stock specific documentation of standard assessment procedures used by ICES.

Stock sbr-678_SA	Red Sea bream (Pagellus bogaraveo) in Subareas VI, VII and VIII;
Working Group	WGDEEP
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Revised by	WGDEEP 2015 /Guzman Diez

## A. General

#### A.1. Stock definition

"Stock limits are generally determined not only by biological considerations but also by agreed boundaries and coordinates. ICES considered three different components for this species: a) Areas VI, VII, and VIII; b) Area IX, and c) Area X (Azores region). This separation does not pre-suppose that there are three different stocks of red (blackspot) sea bream, but it offers a better way of recording the available information" (ICES, 2007).

In fact, the interrelationships of the red (blackspot) sea bream (*Pagellus bogaraveo*) from Subareas VI, VII, and VIII, and the northern part of Division IXa, and their migratory movements within these sea areas have been confirmed by tagging results (Gueguen, 1974). Possible links between red (blackspot) sea bream from the Azores region (Subarea X) with the others areas are not yet fully studied. However, recent studies show that there are no genetic differences between populations from different ecosystems within the Azores region (east, central and west group of Islands, and Princesa Alice bank) but there are genetic differences between Azores (ICES Subarea X) and mainland Portugal (ICES Division IXa) (Stockley *et al.*, 2005). These results, combined with the known distribution of the species by depth and tagging information, suggest that Subarea X component of this stock can be considered as a separate management unit.

#### A.2. Fishery

The fishery in Subareas VI, VII and VIII strongly declined in the mid-1970s, and the stock is seriously depleted. Since 1988 the landings from Subarea VIII represents the 66% and VI and VII the 34% of total accumulated landings. At present red sea bream catches in these areas are almost all bycatches of LLS and OTB fleets. Small artisanal and recreational landings from Bay of Biscay from are not reported to the Working Group.

#### A.3. Ecosystem aspects

The red blackspot sea bream is found in the Northeast Atlantic, from south of Norway to Cape Blanc, in the Mediterranean Sea, and in the Azores, Madeira, and Canary Archipelagos (Desbrosses, 1938; Pinho and Menezes, 2005). Hareide (2002) reported also occasional occurrence of this species along the Mid-Atlantic Ridge (north and south of the Azores).

Red sea bream is a bentho-pelagic species that inhabits various types of bottom (rock, sand, and mud) down to a depth of 900 m. The vertical distribution of this species varies according to individual size, and season of the year. Blackspot sea bream undertakes a vertical spawning migration, with the adults moving from deeper to shallower waters during the spawning season and forming aggregations.

# B. Data

# **B.1.** Commercial catch

Landing series since the middle of the past century has been updated from a table performed in WGDEEP 2004 (Figure 14.2.1), According this source landings *of P. bogaraveo* in Areas VI–VIII were in the order of 10–15 thousand t/year. On the other hand, the official landings reported to the WG since 1988 have been always below 500 t/year (average 211 t/year).

Red sea bream is a very high value species in Spain and discards historically are considered negligible. For first time in the historical series in 2014 Spain reported 2.4 t of discards in the trammelnet fleet in the VIIIc that supposes the 0.9% of the catches in the year.



Figure 14.2.1. Historical series of Red Sea bream landings since 1948 in Northeast Atlantic (Subareas VI, VII and VIII).

#### **B.2.** Biological

*Pagellus bogaraveo* is a protandric hermaphrodite species changing from males to females. Sexing and staging this species may be sometimes problematic because macroscopic scales are not validated with microscopic observations. Red (blackspot) sea bream is considered a slow growing species. Gueguen (1969b) reported a maximum age of 20 years. Natural Mortality of 0.2 estimated by Lorance (2010) was derived from the presumed longevity in the population according the rule M ¼ 4.22/t max , where t is the maximum age in the population derived from data from many populations (Hewitt and Hoenig (2005)). According to this rule the 1% of the population survives to 23 years.

Table 1. Von Bertalanffy growth coefficient for P. bogaraveo for the Bay of Biscay. From Lorance 2010.

K	L	То	N	ICES Area	
0.092	56.8	-2.92		VIII	Walford method from Guéguen (1969b)
0.162	48.3	-0.72	10 186 <sup>a</sup>	VIII	New fit using data from Guéguen (1969b)
0.137	51.4	-0.97	<b>20</b> <sup>b</sup>	VIII	New fit to mean length-at-ages from Guéguen (1969b)
0.209	51.56	-0.53	530	VIIIc	Sánchez (1983)
0.174	53.9	-0.66		VIIIc	Ramos and Cendrero (1967)
0.196	48.06	-0.47		VIIIc	Alcazar et al. (1987)
0.174	54.2	-0.66		VIIIB,c	Castro Uranga (1990)

<sup>a</sup> Size at-age derived from back calculation (Guéguen, 1969b).

<sup>b</sup> Number of age groups.

#### B.3. Surveys (use the ICES surveys acronym)

At the current level of abundance, the black spot sea bream is rarely caught in the northern surveys by French IBTS (Divisions VIIf,g,h,j; VIIIa,b, and VIId), Irish IGFS (Divisions VIa South and VIIb) and Northern Spanish Shelf Bottom-trawl survey (SP-NGFS) which reflects that the stock remains at very low levels compared to historical abundance.

In two French surveys in 1973 and 1976, conducted with the same protocols as the current western IBTS survey in the Bay of Biscay, red sea bream was caught in significant numbers.

#### **B.4.** Commercial cpue

No effort and commercial cpue data were available to the Working Group.

#### B.5. Other relevant data

None.

# C. Assessment: data and method

Model used:

Catch-trend based assessment

Software used: Not applicable

Model Options chosen: Not applicable

Input data types and characteristics: (table below is just an example; adapt the description of input accordingly)

Туре	Name	Year range	Age range	Variable from year to year
				Yes/No
Caton	Catch in tonnes			
Canum	Catch-at-age in numbers			
Weca	Weight-at-age in the commercial catch			
West	Weight-at-age of the spawning stock at spawning time.			
Мргор	Proportion of natural mortality before spawning			
Fprop	Proportion of fishing mortality before spawning			
Matprop	Proportion mature at age			
Natmor	Natural mortality			

#### Tuning data:

Туре	Name	Year range	Age range
Tuning fleet 1			
Tuning fleet 2			
Tuning fleet 3			

No HCR has been adopted for this stock.

# D. Short-term projection

Not applicable

Model used:

Software used:

Initial stock size:

Maturity:

F and M before spawning:

Weight-at-age in the stock:

Weight-at-age in the catch:

Exploitation pattern:

Intermediate year assumptions:

Stock-recruitment model used:

Procedures used for splitting projected catches:

#### E. Medium-term projections

Not applicable

Model used:

Software used:

Initial stock size:

Natural mortality:

Maturity:

F and M before spawning:

Weight-at-age in the stock:

Weight-at-age in the catch:

Exploitation pattern:

Intermediate year assumptions:

Stock-recruitment model used:

Uncertainty models used:

- 1) Initial stock size:
- 2) Natural mortality:
- 3) Maturity:

- 4) F and M before spawning:
- 5) Weight-at-age in the stock:
- 6) Weight-at-age in the catch:
- 7) Exploitation pattern:
- 8) Intermediate year assumptions:
- 9) Stock-recruitment model used:

## F. Long-term projections

Not applicable

Model used:

Software used:

Maturity:

F and M before spawning:

Weight-at-age in the stock:

Weight-at-age in the catch:

Exploitation pattern:

Procedures used for splitting projected catches:

## G. Biological reference points

WKLIFE has not yet suggested methods to estimate biological reference points for stocks which have only landings data or are bycatch species in other fisheries. Therefore, no attempt was made to propose reference points for this stock.

## H. Other issues

Its peculiar reproductive biology and aggregative distribution makes red sea bream especially vulnerable to fishing.

Because of the sex-changing in red sea bream only the old ages contribute significantly to the production of oocytes. Therefore if young fish that are sexually immature then males are exploited, the proportion of fish reaching the female stage may become very low. It is therefore essential that avoid catching small fish (red sea bream form shoals that can be targeted). This is the reason for the minimum landing size at 35 cm.

In the 1920s and 1930s, it was reported that juveniles were widely distributed on the coasts of Brittany and in the Western Channel French and UK coasts.

# H.1. Historical overview of previous assessment methods (this subsection is optional. See example below.)

Data	2006 assessment	2007 assessment	2008 assessment	2009 assessment
Catch data	Years: 1978-(AY-1)	Years: 1978-(AY-1)	Years: 1978-(AY-1)	Years: 1978-(AY-1)
	Ages: 1-8+	Ages: 1-8+	Ages: 1-8+	Ages: 1-8+
Survey: A_Q1	Years: 1985-AY	Years: 1985-AY	Years: 1985 - AY	Years: 1985 - AY
	Ages: 1-7	Ages 1-7	Ages 1-7	Ages 1-7
Survey: B_Q4	Years: 1996-(AY-1)	Years: 1996- AY-1)	Years: 1996- AY-1)	Years: 1996- AY-1)
	Ages: 1-5	Ages 1-7	Ages 1-7	Ages 1-7
Survey: C	Not used	Not used	Not used	Not used

Summary of data ranges used in recent assessments:

AY: Assessment year

(The historic perspective, as well as all the other section on the stock annex, should only update in a benchmark workshop. If there is any reason to deviate from the stocks annex, this should be explain in the Working Group report and only update this deviation in the historic perspective after consultation with ICES Secretariat and WG Chair).