

## Stock Annex: Alfonsinos (*Beryx spp.*) in subareas 1–10, 12 and 14 (the Northeast Atlantic and adjacent waters)

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<b>Stock:</b>	Alfonsinos
<b>Working Group:</b>	Working Group on Biology and Assessment of Deep-sea Fisheries Resources (WGDEEP)
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<b>Last updated by:</b>	WGDEEP – Mário Pinho

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### A. General

#### A.1. Stock definition

The alfonsinos *Beryx spp.* are deep-water species that occur throughout the world's tropical and temperate waters, in depths from 25 to 1300 meters. The 2004 WGDEEP Report made reference to preliminary genetic results for *B. splendens* suggesting that significant genetic differentiation may occur between populations of the species within the North Atlantic, which may have some implications for future management of the fisheries. No further information is available. Because very little is known about stock structure of these species, the WG has assumed single-stocks of both *B. splendens* and *B. decadactylus* in the North Atlantic.

#### A.2. Fishery

Alfonsinos, *Beryx splendens* and *Beryx decadactylus*, are generally considered as bycatch species in the demersal trawl and longline mixed fisheries targeting deep-water species. For most of the fisheries, the catches of alfonsinos are reported under a single category, as *Beryx spp.* Historical time series by species is only available from the Azores fishery.

From 1988 to 1993 almost only the Azores (Subdivision 10.a) was involved on the fishery (representing 94% of the landings). The Azores deep-water fishery is a multispecies (up to 20 or more) and multigear fishery dominated by the main target species *Pagellus bogaraveo*. This fishery has continued throughout the period from 1994 onwards.

During 1994 to 2000, Russian pelagic trawlers were responsible for high catches in Subdivision 10.b (a seamount fishery on Mid Atlantic Ridge) and some minor landings as bycatch in fisheries targeting other species since 2000.

Other ICES Subareas with important catches from the mixed demersal and deep-water fisheries (mainly trawlers and longliners) are 6 and 7, with an average contribution of around 10%-20% of the total reported catch to ICES during 1996 to 2007 and Areas 8 and 9, which landings averaged around 30% of the total from 1997 to 2007.

### **A.3. Ecosystem aspects**

The Azores (Division 10.a) are considered a “seamount ecosystem area” because of its high seamount density. The deep water fishery in the Azores is mostly a seamount fishery where only bottom longlines and handlines are used (there is a trawl ban area implemented on the Azores EEZ (ICES 10.a2) under the CFP. There are NEAFC regulations of effort in the fisheries for deep-water species and closed areas to protect vulnerable habitats.

## **B. Data**

### **B.1. Commercial catch**

For this species data is available from commercial fisheries reported to ICES for the different ICES Sub areas from 1988 to present. Landings data are usual aggregated by species. More detailed data by species is available from the Azores (Division 10.a). Azorean data from commercial fisheries include landings (auction data) and some effort data from longliners inquires (since 1990), logbooks and observers (from large longliners and for recent years) (WD Pereira, 2006a, 2010a).

Discards from this fishery have been increased in the recent years, due to quota restrictions and minimum length measures. Information on discarding in the Azores has been made available to the WG since 2007 (ICES, 2006, 2010).

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

Length compositions, and biological information including (ageing, weights, sex ratio and maturity) by species have been collected since 2002, analysed and reported to ICES (WD Pereira, 2006b, 2010b).

Considerable general information is available on the life history characteristics of this species.

### **B.3. Surveys**

Annually survey (ARQDAÇO) data is available from the Azores, since 1995. The survey was conducted annually each spring (usually from April to June) since 1995, with exception of the years 1998, 2006 and 2009. The survey followed a stratified design (6 statistical areas and 12 depth strata) and covered the Azores archipelago around the islands, and major seamounts). The survey is design for abundance estimation of red (blackspot) seabream, covering the depth strata from 50 to 600 m. During 2004 this depth was extended to 800m in order to cover the depth range of the species. Additionally depth from 800 to 1200 m is covered in one transect by statistical area for ecological studies. Details of the survey design can be found Menezes *et al.*

(2006) and a resume of the survey design can be found on the ICES WGNEACS 2010 report.

Abundance index time series (computed for the depth range 50-600m) is available by species. For *Beryx splendens* the survey sampled all the species depth habitat, however concerns about the reliability of this index as a proxy of north atlantic stock have been expressed by the WG, because it may be not adjusted to the species behaviour (benthopelagic, highly mobile and aggregative) and the sampled area represented a very small part of the species distribution. Length composition, and several biological data (sex, weight, otoliths and maturity) have been also collected and reported to ICES.

#### **B.4. Commercial CPUE**

Standardised CPUE was presented to ICES in 2006. Since then only nominal CPUE has been available (WD Pereira, 2006c; WD Pereira and Pinho, 2010).

#### **B.5. Other relevant data**

### **C. Assessment: data and method**

#### **D. Short-Term Projection**

#### **E. Medium-Term Projections**

#### **F. Long-Term Projections**

### **G. Biological Reference Points**

#### **Reference points**

Tools available from the WKLIFE were explored for the *Beryx splendens*.last year. The analysis was not performed for *Beryx decadactylus*.

- YPR using FLR code (BHAC). The input parameters:  $L_{\infty}=46.1$ ,  $K=0.12$ ,  $M=0.23$ ,  $c(L_{mat}/L_{inf})=0.65$  and  $c(L_c/L_{inf})=0.45$ .
- Z was estimated from a catch curve applied to the fishery length frequency.
- Froese and Binolhan, 2000 method assuming the mean fishery length composition over the period 1995 to 2010.
- Results from WKLIFE Gislason spreadsheet was applied using an  $L_{max}$  of 53 cm and  $AFC = 6$ .

Results are summarised in the table.

METHOD	AFC	LMAX	LINF	K	TO	AGE MAT	FMAX	F0.1	F20%	F30%	F35%	F40%
Gislason spreadsheet	6	53	55.1	0.24		2,3	1.11	0,42	2	2	2	2
BHAC	6		56,7	0,13	-1,46	4	-	0,3	0.59	0,36	0,28	0,23

Data used for this exercise refers to information published from the area and so results may be valid if we consider the population structure from the Azores as representative of the North Atlantic population. Conflict results are found on the literature, with length of first maturity ranging from 23 cm to 35 cm fork length. We adopt the value of 23 cm.

Gislason method estimate high values for almost of the reference points. The most conservative is the  $F_{0.1}$  equal to 0.42. Bhac estimates suggest values on a range of 0.2 to 0.3, correspondent to  $F_{40}$ ,  $F_{35\%}$  and  $F_{0.1}$ .

No biological reference points have been defined.

## H. Other Issues

### H.1. Historical overview of previous assessment methods

## I. References

- ICES 2006. Report of the Working Group on the Biology and Assessment of Deep-Sea Fisheries Resources. ICES CM 2006/ACFM:28.
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