

DEEPFISHMAN

**A FP7 Project: Management and Monitoring of Deep-sea Fisheries
and Stocks**

WP2 – Template for Case Study Reports

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Section 4: Inventory of the fisheries, biological, biodiversity, vulnerable marine ecosystem (VME¹) and socio-economic data currently available for management and monitoring purposes.

These data are to be collated by the Case Study Leader and made available to and stored on the DEEPFISHMAN data archive held by Ifremer for use during the project. Ifremer will shortly be circulating a data-exchange format. Data not subject to confidentiality restrictions will be stored at the end of the project on a web-based library similar to PANGEA.

Section 5: Review of known and likely impact of the fisheries on deep-water biodiversity.

Section 6: Review of current and historical management and monitoring procedures. SWOT (Strength and weaknesses, Opportunities and threats) and gap analysis of past and present scientific projects and data collection programmes in terms of fulfilling the data requirements for adequate management and monitoring regimes

Section 7: Review of the key uncertainties about the biology, data and management of your stock and any other issues relevant to DEEPFISHMAN

Reminders

1. Please enter all answers in this document and include references in answers, where appropriate. CS leaders are required to keep all the headers and formatting in the document and write "not relevant" or "none" where there is nothing to say.
2. For Case Study 2: French mixed demersal trawl fishery – substitute fishery for stock in all questions where appropriate. For specific questions on biology etc please include data and information for the main target stocks of the fishery.
3. It is expected that Case Study Leaders will have to carry out data mining in key areas e.g. for historical fisheries data and for socio-economic data.

¹ For a definition of VMEs please see FAO TECHNICAL CONSULTATION ON INTERNATIONAL GUIDELINES FOR THE MANAGEMENT OF DEEP-SEA FISHERIES IN THE HIGH SEAS Rome, 4–8 February and 25–29 August 2008
<ftp://ftp.fao.org/docrep/fao/011/i0605t/i0605t00.pdf>

Section 1: Biological parameters with up to date description of the current knowledge of life history pattern, stock structure and status

1.1 General information

1.1.1 Name of stock: **Red (blackspot) seabream (*Pagellus bogaraveo*) in the Strait of Gibraltar (ICES Sub-area IX)**

1.1.2 Please include map of the spatial area inhabited by your stock (include depth contours and topographical features). **Figure 1 shows the Strait of Gibraltar area where *P. bogaraveo* (yellow points) was fished since 1983.**

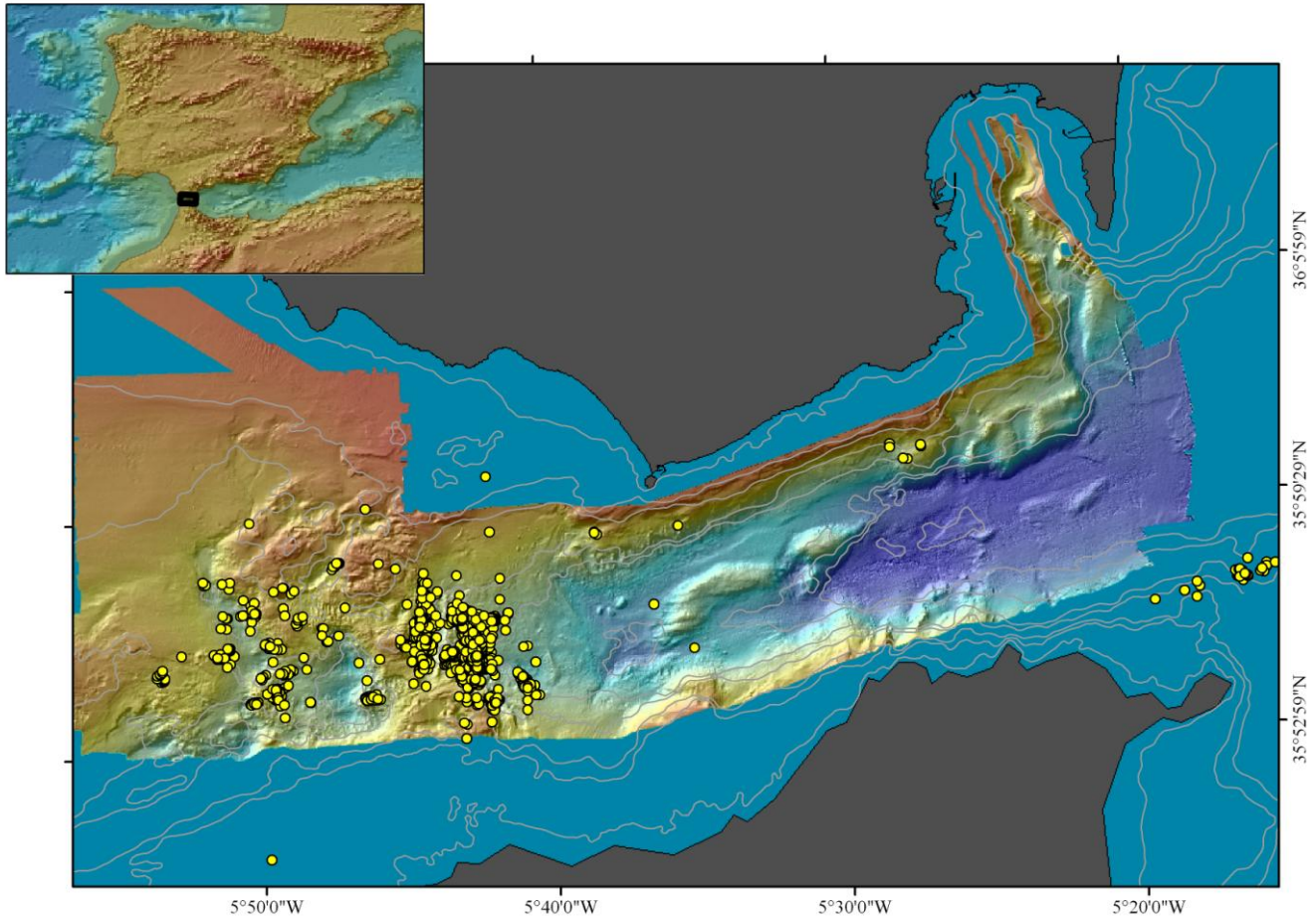


Figure 1. Strait of Gibraltar “voracera” fleet fishing grounds.

1.1.3 What is the depth range inhabited by the adult stock? **The red seabream is found in the NE Atlantic, from South of Norway to Cape Blanc, in the Mediterranean Sea, and in the Azores, Madeira, and Canary Archipelagos (Desbrosses, 1938). Adults inhabit depths ranging around 300-700 m. The vertical distribution of this species varies according to individual size (Desbrosses, 1938; Guegen, 1974; Silva *et al.*, 1994 and Gil, 2006).**

1.1.4 Name the scientific organisation and Working Group responsible for carrying out stock assessments and providing scientific advice: **ICES Working Group on the Biology and assessment of deep Sea Fisheries resources (ICES WGDEEP). In 2010 an assessment exercise was also by attempt by Moroccan colleagues (only with Morocco landings) in the CGPM. There is a true intention of a next meeting between Spanish and Moroccan scientist for compare assessments and analyse possibilities about an unique exercise.**

1.1.5 Name the Fisheries Management Organisation(s) responsible for managing the stock and supported fisheries. **European Union (within the frame of the Common Fisheries Policy) and National, Regional and Local Administrations.**

1.1.6. Is the management unit the same as the stock assessment unit? If not please explain why. **Not really. The case study management unit (Strait of Gibraltar) considered only a small part of the area IX (stock assessment unit), but its landings arise almost the 70% of the whole.**

1.2 Stock identity and status

1.2.1 Describe and review the scientific basis used to identify and delineate the stock. As indicated in the ICES WGDEEP, stock limits are generally determined not only by biological considerations but also by agreed boundaries and coordinates. Thus, ICES considered three different components for this species: a) areas VI, VII, and VIII; b) area IX (where the case study fishery take place) and c) area X. This separation does not pre-suppose that there are three different stocks of red (blackspot) seabream, but it offers a better way of recording the available information (ICES WGDEEP Report 2008).

1.2.2 Is this robust? If not what studies are required to identify and delineate the stock more robustly? Available information, particularly genetics and tagging, seems to support the current assumption of three assessment units: VI – VIII, IX and X (ICES WGDEEP Report 2006). However possible links between red seabream from the Azorean region with the southern Subarea IX, Moroccan waters, Sahara Bank and Subareas VI+VII+VIII and the northern part of Division IXa have not been studied extensively.

1.2.3 Describe and review any past or ongoing studies of stock identity. The inter-relationships of the red seabream from areas VI, VII, VIII and the northern part of area IXa and their migratory movements within these areas have been observed by tagging methods and seasonal migrations have been reported (Gueguen, 1974).

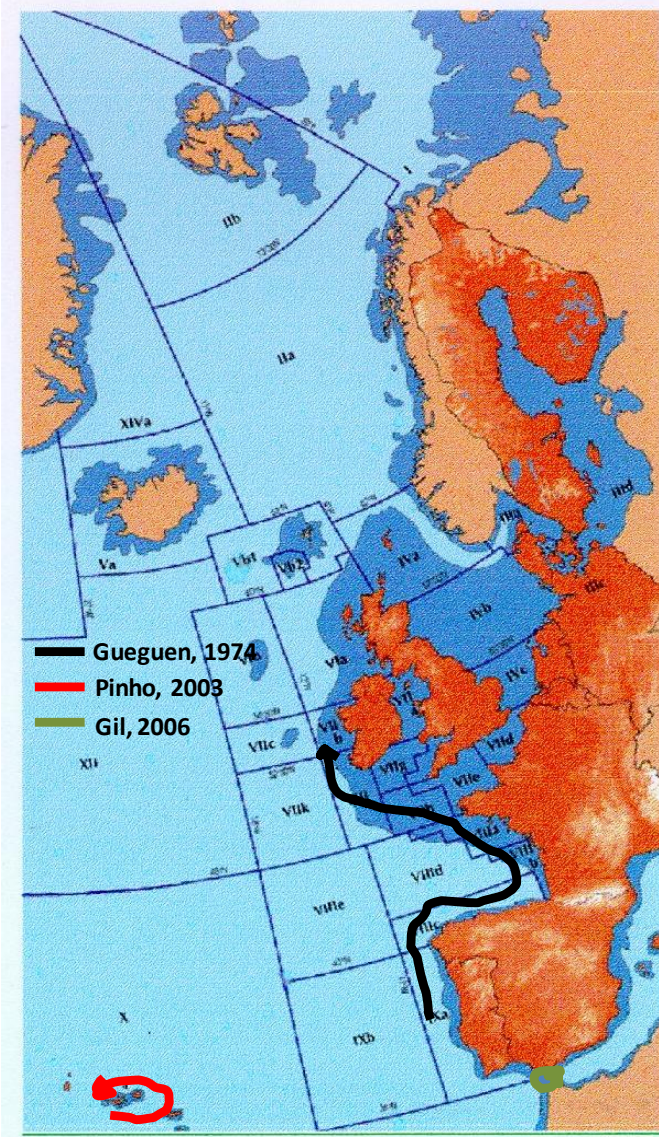


Figure. Red seabream tagging surveys

A tagging programme was also carried out in sub-area Xa (Azores Islands). Based on the results obtained up to now, no significant movements between areas (coastal, banks, seamounts) have been reported but local seasonal migrations are observed (Pinho, 2003).

More recently, tagging has been done also in the Strait of Gibraltar (south part of ICES area IXa), where the majority of the fishery currently occurs. No significant movements are reported, although local migrations are also observed: feeding grounds are distributed along the entire Strait of Gibraltar and the species seems to remain in this area as a resident population (Gil, 2006).

Genetic studies show that there are no differences between populations from different ecosystems within the Azores region (East, Central and West group of Islands and Princess Alice Bank) but there are genetic differences between Azores and mainland Portugal (Stockley *et al.*, 2005).

In 2007, Piñera *et al.* suggests no significant genetic differences are present along Spanish coasts (Mediterranean and Atlantic areas).

Viral studies of *P. bogaraveo* are currently carry out by the Santiago de Compostela University. First analysis used tissue samples of spleen, kidney and brain of 33 fish from the strait of Gibraltar fishery. Only 2 fishes were completely free of viruses (6%). The remaining 31 were positive for one or more viruses. Only 1 fish was positive for betanodavirus. Betanodaviruses are classified in four different genotypes which seem to be a certain geographical distribution. Genomic sequencing of the PCR (Polymerase Chain Reaction) products obtained from the red seabream could give some clues about the distribution of the fish populations analyzed.

Unfortunately, due to the low viral load, only one PCR product was sequenced and the results obtained are not conclusive (Bandín, *pers. com.*).

1.2.4 Are there any stocks of this species adjacent to the Case Study stock? **Yes, in the case of the Strait of Gibraltar red seabream also inhabit in Morocco waters. In fact recaptures of Tagged fishes were also notified by Morocco fishermen.**

Southern Alboran Sea (GFCM Sub-Area3) – FAO Western Mediterranean Region Balearic Division (Subarea 37.1.1) (37.1.1)

Morocco coastal (CECAF Division 34.1.1) – FAO Morocco Coastal Division (Subarea 34.1.1)

1.2.5 Is it suspected that immigration/emigration is occurring from/to areas outside the stock area? If so please describe. **Yes, juveniles show significant displacements from Southmediterranean breeding areas toward the Strait of Gibraltar, where the fisheries take place (Sobrino and Gil, 2001 and Gil, 2006).**

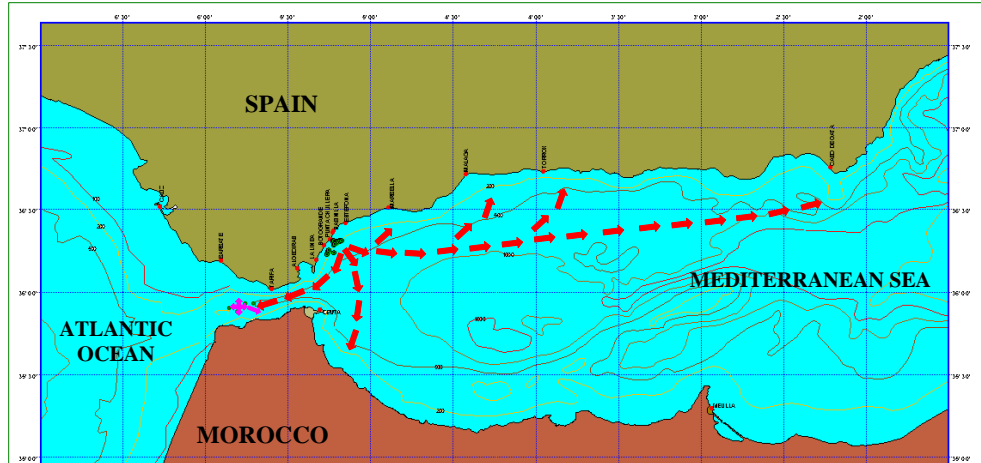


Figure 3. Location and movements from the red (blackspot) seabream tagged samples (Gil, 2006).

1.2.6 Have any tagging studies been carried out? If not please state why. If they have please summarise methods used and review results and conclusions. **Migration patterns have been studied using tagging surveys in the Spanish South Mediterranean region and the Strait of Gibraltar (Gil *et al.*, 2001; Sobrino and Gil, 2001). Trap gears were utilised to catch red seabream juveniles in the Mediterranean Sea and adults in the commercial fishery area were caught with the “voracera” gear. Since 1997, 7066 samples were tagged (juveniles + adults) and at the moment 396 recaptures were notified. Recaptures from tagged juveniles show significant displacements from Southmediterranean breeding areas toward the Strait of Gibraltar. However, recaptures from tagged adults did not reflect big displacements, which are limited to feeding movements between the different fishing grounds where the “voracera” fleet works (Gil, 2006).**

1.2.7 Are there any aspects of stock identity knowledge data that [a] impact on assessments and/or [b] affect your ability to provide timely fisheries advice to managers? **Stock units uncertainties and minor Morocco catches in the case of Strait of Gibraltar area should have effects on the current assessments.**

1.2.8 Based on the latest scientific advice for this stock (please append below), what is the current status of the stock? **SSB differences dues to the use, or not, of a plus group does not so important in the recent years. In every case the decreasing trend is clear enough. Current SSB remains in minimums of the whole series (ICES WGDEEP Report 2008).**

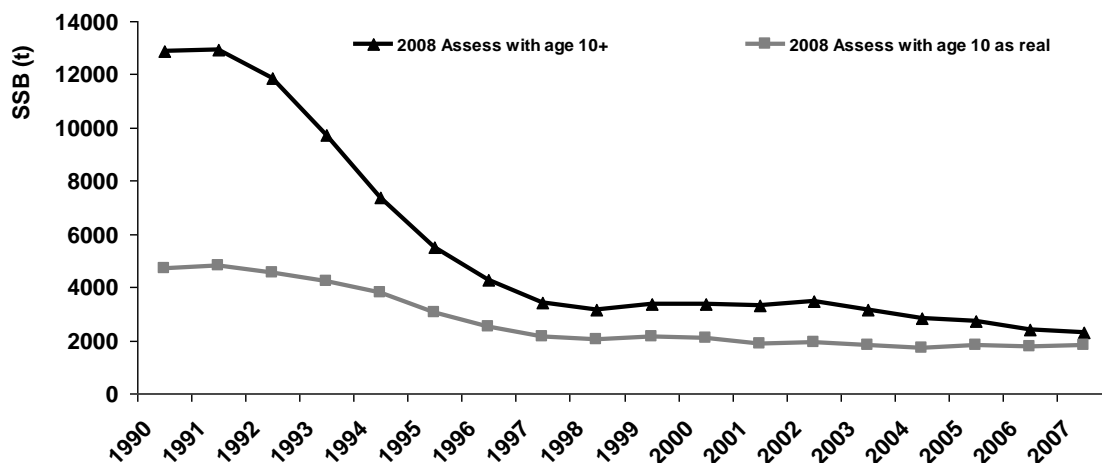


Figure 4. Area IX *P. bogaraveo* SSB trend from the last ICES WGDEPP assessment.

From these results, in the year 2008 ICES recommends that catches in Areas IXa and Xa should be constrained to recent average catches (2003–2007) of 500 t in Area IXa. Also the advice includes a recommendation to collect information that can be used to evaluate a long-term sustainable level of exploitation.

1.2.9 What is the recent historical trend in the stock (increasing, decreasing, stable). **Stable, but at low level.**

1.3 Life history characteristics (LHCs)

1.3.1 Complete the following table citing (1) the most robust information available and (2) any other information available. Please cite the reasons for selecting the former. Cite information by sex & sexes combined, where appropriate. Please document any changes with time.

LHC	Best estimate	Derived from?	Other estimates
Maximum observed length	62	Length distribution	
Maximum observed age	10+	Otoliths reading	
Length at 50% maturity	30.15 cm (♂) and 35.73 cm (♀)	Biological sampling	
Age at 50% maturity	4 years (♂) and 5 years (♀)	Biological sampling and otoliths reading	
Length at recruitment	25 cm	Length distribution	
Age at recruitment	3	VPA assessment	
Growth parameters: (von Bertalanffy parameters: B_0, T_0, L infinity, for example)	$L_\infty=62^*$ $k=0.162$ $t_0=-0.337$	Otoliths reading	Tagging studies
Fecundity, egg size etc			
Natural mortality	0.2	Asumption	Whatever!!!

1.3.2 What are the main gaps in knowledge regarding LHCs? **In general life cycle stages till the recruitment but for its importance on the assessments carried out till now mainly ageing and natural mortality estimates (M).**

1.3.3 Can these gaps be addressed by regular monitoring or are dedicated research initiatives required? Please describe programmes required. **To solve ageing problems otoliths reading workshops should be a good initiative, despite we have not otoliths from the whole series. For natural mortality and first life cycle stages *ad hoc* research programmes are needed.**

1.3.4 Are there any aspects of LHC data (quality, temporal and spatial extent, time series, availability, accessibility, flow) that [a] impact on assessments and/or [b] affect your ability to provide timely fisheries advice to managers? **Obviously the main problem is the uncertainty of the assessment results. ALKs computed from one year must not be applied to samples taken in a different year, because they could give biased results (Westrheim and Ricker, 1978).**

1.4 Life history pattern and general species ecology

- 1.4.1 Reproductive type: is the species gonochoric or hermaphroditic? If hermaphroditic, please describe. **Hermaphroditic: The smallest specimens are mainly males, then an important part of individuals change it sex and became females.**
- 1.4.2 Spawning type: is the species a determinate or batch spawner? Please give details. **Red seabream could consider being a determinate spawning species.**
- 1.4.3 Spawning grounds: are the spawning grounds/areas known? If so please describe and include map. **Spawning seems to take place in the Strait of Gibraltar area, where the fishery is carried out.**
- 1.4.4 Spawning time: when does spawning occur? Does this differ by spawning ground/area? If so please describe. **The spawning season in the Strait of Gibraltar seems to take place during the first quarter of the year (Gil 2006). These estimates coincide with those obtained by Krug (1994) for the Azores Islands (ICES Division X) and with previous studies from Cantabrian Sea by Sánchez (1983), Alcaraz *et al.* (1987) and Castro (1990) in ICES Division VIII.**
- 1.4.5 Early life history: are the early life stages well described and documented in the scientific literature? If so please describe. **There is not so much information, but maybe some recent information can be obtained from culture experiences.**
- 1.4.6 Life stages and habitats: whereabouts in the water column are the various life cycle stages found? **Unknown.**
- 1.4.7 Nursery areas: are there discrete nursery areas? If so please describe and include map. **A brief journey through the species vital history could be: Later the spawning season, currents moves eggs and larvae to both sides of the Strait of Gibraltar. Spends its early years in coastal areas (bays, breakwaters and even inside ports). Later, ventured to move away from these shelter areas. Once recruited to the fishery (since three years) it seems to remain in the Strait of Gibraltar area continuing their growth and taking place other life events as: maturation, spawning, sexual change.....In this area cohabit different ages that originate the distribution of the capture in four commercial categories (as a function of the individuals weight). See figure of tagging experiences above.**
- 1.4.8 Are juveniles and adults associated with particular topographical features and/or sea-bed substrates? If so please describe. **Same as in other species, mainly regards with movements to greater depths with growth.**
- 1.4.9 Recruitment: what is the age and size of recruitment to the fishery? What is the age and size of smallest individuals in scientific cruises? What is known about recruitment variability and its causes? **Only fisheries data can give a little information about this point. Recruits have 3 years old (from VPA assessments) and the minimum length are 25 cm.**
- 1.4.10 Describe other salient aspects of the species life cycle not described above.
- 1.4.11 Feeding: list the main prey items of each life stage and rank in order of consumption rates/importance, where possible. **Difficulties to investigate the species feeding ecology should be considered because we deal with a baited fishery. However ongoing studies revealed that red seabream diet in the Strait of Gibraltar is mainly composed by *Sergia robusta* as main prey while the order teleosts Stomiiformes can be considered as a secondary prey. *Sergia robusta* (IRI= 49.32), larva of *Stomias sp* (IRI=57.33) and *Stomias sp* (IRI=60.65), *Lampanyctus crocodiles* (IRI=60.43) and *Lophogaster typicus* (IRI=59.93) (Gil *pers. com.*).**
- 1.4.12 Predators: list the main predators of each life stage and rank in order of consumption rates/importance, where possible. **No available information about this point but maybe dolphins' predation should be taken into account (personal communication from Ceuta veterinary).**
- 1.4.13 What are the main gaps in knowledge regarding life history patterns and general species ecology? **Off the top of one's head early life stages and also relationships between species and sea bottom (but maybe the gaps should be considered at the end of the Project after a thorough review of the species ecology.**
- 1.4.14 Further data collection/research requirements: can these gaps be addressed by regular monitoring or are dedicated research initiatives required? Please describe programmes required. **Obviously, it depends on the gaps nature.**
- 1.4.15 Are there any aspects of life history pattern and general ecological information and data (quality, temporal and spatial extent, time series, availability, accessibility, flow) that [a] impact on assessments and/or [b] affect your

ability to provide timely fisheries advice to managers. **Once again, main problem is the uncertainty of the assessment results, but till now the exercises attempted does not consider ecological information.**

Section 2: Historical development of the fisheries, including catches and fleets.

2.1 Background information

2.1.1 Please provide the following information on the fleets that are prosecuting/have prosecuted your stock:- If possible please use table below or a separate spreadsheet/data table/database if too large. For EU fleets, please match DCF and/or ICES/InterCatch metiers, using additional sub-categories if necessary.

Nationality	Gear type	Fleet ID for use in tables below and throughout questionnaire ²	Fishery type:- target/mixed fishery/bycatch	If mixed or bycatch what are other or target spp?	Number of vessels	Large scale or artisanal	Time period
Spanish	Lines	SP_1	Target		103 (from 2007 authorized vessel list)	Artisanal	1983-2008

2.1.2 Please describe the historical development and the current activity of each fleet in more detail. **The development of the fishery from 1983 led a progressive increase in the number of boats from 25 in 1983 to a maximum of 129 boats in 1994. Actually the number of boats is around 100.**

2.1.3 What are the main gaps in knowledge regarding the fleets fishing your stock? Please prioritise. **It is important to emphasize that the effort unit chosen cannot be too appropriate as do not consider the missing effort. Thus, in the recent years this missing effort increases substantially (fishing vessels with no catches and precisely why with no sale sheet to be recorded).**

2.1.4 Can these gaps be addressed by regular monitoring? If so, how? **In the case of the Strait of Gibraltar, from 2008 onward a sort of VMS was implemented in the “voracera” fleet, which target red seabream (SP_1). Data availability of this kind of information should improve the effort unit chosen. Unfortunately back from 2008 the missing effort problem remains.**

2.1.5 Please complete the table below on the extent of time-series data of landings and discards data:-

Fleet ID	Time-series of landings data	Time-series of discard data
SP_1	1983-2008	N/A

2.1.6 Does the earliest data available correspond to the start of exploitation of the stock. If not please describe. If earlier data exist please list where these can be found. **Yes, before fishermen in the Strait of Gibraltar went to Morocco for sardine and fish tuna in summer.**

2.1.7 If discard data are not available please indicate by fleet ID if, in your opinion, discards are likely to be significant

Fleet ID	Significant discards?
SP_1	Not relevant, should be consider minor

2.1.8 If mis-reporting or under-reporting is/has been a problem please indicate years in table below:

Fleet ID	Mis-reporting? State years	Under-reporting? State years
SP_1	1995	2009

² e.g. SPAOT – Spanish otter trawlers

2.1.9 Please document available information on gear selectivity by fleet ID. **In the case of the Strait of Gibraltar (SP_1) there is a Thesis about hooks selectivity. Also a paper from Erzini *et al* about selectivity of sparids (including *P. bogaraveo*) in Portuguese waters is available.**

2.1.10 Are there any aspects of data (quality, temporal and spatial extent, time series, availability, accessibility, flow) that [a] impact on assessments and/or [b] affect your ability to provide timely fisheries advice to managers? **Missing effort problem avoid the use of assessment method based on this unit (mainly Production Models).**

Section 3: Review of stock assessments carried out thus far

3.1. General overview

3.1.1 Please complete table below regarding previous assessments:-

Year	Assessment type ³	Assessment method(s) used	Assessment package/ program used	Are input data on DEEPFISHMAN website?	Assessment used for latest scientific advice?	If not, what was latest scientific advice based on?	Reference
2006	Exploratory	VPA	VPAssep Lowestoft	No			2006 ICES WGDEEP Report
2008	Exploratory	VPA	VPAssep Lowestoft	Yes			2008 ICES WGDEEP Report

3.1.2 How is the frequency of assessments linked to the advisory and management cycle? **Every 2 years in the ICES WGDEEP.**

3.2 Input data

3.2.1 For all exploratory assessments or the latest benchmark or update assessment, please list the input data citing length of time-series (where appropriate) and source

1990-2007 VPA separable

Landings (Spain+Portugal) from 1990 to 2007 (ICES WGDEEP). Discards aren't recorded (landings seems to be equal than catches).

Length distribution from the "voracera" fishery of the Strait of Gibraltar raised to the total landings (landings from this fishery are almost the 70% of the total ICES IXa)

Combined ALK (2003-2007) applied to obtain c@a matrix from landings length distribution (from Gil *et al.*, WD 2008).

M=0.2

Maturity ojive: From age 5 all individuals are considered mature.

Proportion of F & M before spawning considered 0

VPA separable analysis runs with weighting default values (6 recent years). These years coincides with the management measures implementation....thus, main assumption of separable model seems to be performed. Age 10 considered as a plus group (10+).

Age 4 selected as reference age for all the analysis (because is the most represented in the c@a matrix)

Selection pattern choice: Option selected is S=0.4

Year fish intensity (F) choice: Option selected is F=0.3

3.2.2 Are there any aspects of data (quality, temporal and spatial extent, time series, availability, accessibility, flow) that [a] impact on assessments and/or [b] affect your ability to provide timely fisheries advice to managers? **Ageing uncertainties and the use of ALKs computed from one year could give biased results.**

3.3 Assessment method(s) used

³ Exploratory, Benchmark (to identify best practise), Update (repeat of previous years' assessment using same method and settings but with the addition of data for another year).

- 3.3.1 Justification of the method: for exploratory assessments please describe reasons for selecting the method(s) used. Was any guidance available as to the type of method to use? If so please describe. **From the information available is the common methodology used in ICES WGs.**
- 3.3.2 Benchmark: for benchmark assessments please describe agreed best practise and rationale for selection. **Benchmark assessments haven't been carried out yet for the species. Next year is scheduled one before the ICES WGDEEP meeting.**
- 3.3.3 Uncertainty: how is uncertainty addressed in all types of assessments? **None**
- 3.3.4 Multispecies: is your stock included in any multi-species assessments? If so please describe. If not should it? If yes, please describe a suitable way to go forward. **None**
- 3.3.5 Retrospective analyses: do assessments include retrospective analyses? **None**

3.4 **Biological reference points (BRPs):** do you have BRPs for your stock? If so what is the basis? In the table below please detail type and value e.g. MSY 400 t, $F_{0.1}$, MEY etc **None**

Type	Limit	Target	Precautionary	Comments
Biology:				
Economic:				
Social:				
Ecosystem:				
Other (e.g interaction limits with PETs)				

3.5 **Projections:** Do you perform projections of future stock status? **Not, in the ICES WGDEEP context dues to the uncertainties of the assessment.**

- 3.5.1 Do you perform short, medium and/or long-term projections? If so, how is the length of the projection(s) defined and what is/are the length(s)? **Neither**
- 3.5.2 Are projections deterministic or stochastic? **Neither**
- 3.5.3 How is recruitment simulated in the projection/ (historical geometric mean, using S/R model etc) **None**
- 3.5.4 How is stock growth simulated (e.g. exponential survival equation)? **None**
- 3.5.5 How are biological parameters projected (stochastically, mean of last 3 years etc) **None**
- 3.5.6 What reference points are used in the projections? **Neither**
- 3.5.7 Harvest control rules (HCRs) and management strategy evaluation (MSE): does the stock have a pre-defined HCR? If so, please specify. **A Regional Recovery Plan of *P. bogaraveo* related to this Spanish fishery in the Strait of Gibraltar area has been implemented by the Regional Government of Andalucía for 2003-2006. Among the technical measures adopted by this Plan there are: closure of the fishing season during two and half months (15th January - 31st March), minimum size of fish retained or landed (33 cm total length), authorised vessels list, hook size, maximum hooks per line (100), maximum number of lines per boat (30), and maximum number of automatic machines for hauling per boat (3), restricted ports for landing the red seabream catches (only Tarifa and Algeciras)...These management measures are included in next fishing plans.**
- 3.5.8 Has this rule been agreed with all stakeholders? **Yes, in fact is a response to the fishermen's brotherhoods requests after 1997 decreasing landings trend.**
- 3.5.9 Has the rule been simulation tested using MSE? If so please describe methods and outcomes **None**

3.5.10 Is the rule robust to uncertainties within the fishery system? **None**

3.5.11 Do you have an estimate of virgin biomass, if so what is it, how was it derived and how reliable is it? **None, because our starting assessment year is 1990. Besides if we consider estimates from early years as virgin biomass, estimates shows very important differences dues to the last age considerations, plus group or not (Figure 1.2.8).**

3.6 Assessment packages/programs used (e.g. FLR, CEDA, ASPIC, Lowestoft XSA etc)

3.6.1 Were any technical problems encountered, were these resolved and if so how? **Not at all**

3.6.2 Were the packages/programs used suitable for use by scientists with little or no experience of them? **Not at all...better with a little of experience.**

3.6.3 If not, how could they be improved? **Training courses and benchmark assessments workshops**

3.6.4 Were the assessment diagnostics fit for purpose? If not how could they be improved? **OOf..What a question!!! A cliché purpose is the knowledge of the fishery current status and assessment results has too much uncertainty (in the case of red seabream).**

3.6.5 Did you receive any training in the use of the assessment packages/programs? **Yes, within ICES and IEO framework.**

3.7 Quality control/peer review

3.7.1 Were the assessments subjected to quality appraisal and/or peer review and if so how and by whom? **Assessments exercises carried out within the ICES WGDEEP are discussed in plenary. After WGDEEP meeting the report are revised by ACOM.**

3.7.2 What were the outcomes for the latest benchmark/update assessment and for all exploratory assessments? **The SSB decreasing trend is clear enough. Current SSB remains in minimums of the whole series.**

3.7.3 How could assessments be improved in terms of the data used and the methods used? **Hopefully DEEPFISHMAN give us some clues about this topic. From my little knowledge and experience maybe XSA is a good option despite the strong growth assumptions of the use of an unique ALK. Also it should be of great interest test other options, even these are not too used in ICES as Production models, ASPIC...to prevent problems in the age conversions. However, in these cases the problem is the effort unit chosen.**

3.7.4 What additional data and information would be required? **An appropriate effort unit.**

Section 4: Data inventory

The data described below are to be collated by the Case Study Leader and made available to and stored on the DEEPFISHMAN data archive held by Ifremer for use during the project. Ifremer will shortly be circulating a data-exchange format. Data not subject to confidentiality restrictions will be stored at the end of the project on a web-based library similar to PANGEA.

4.1 Fisheries data

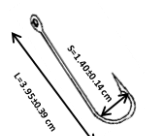
4.1.1 Fleet composition

Are time-series data on the length, age, tonnage (GRT/GT) and power (KW) composition for each fleet ID listed at 2.1.1 above available? If so please append. **Yes, “voracera” fleet (SP_1) technical characteristics are extracted from the Common Fleet Register (CFR) and available in the required format. The list does not include VMS ID because it is not mandatory dues to the small length of the boats.**

4.1.2 Effort data

Please complete the tables below for each fleet ID and append all available time-series data disaggregated by fleet if possible. Please label with (1) an asterisk if data exist but are not available (but state where they exist), (2) leave blank if no data exist at all and (3) label N/K if the existence of data is not known.

For longliners:

Fleet ID	L/L type (vert, horiz etc)	Number of longlines	Hook type and size	Effort (days at sea)	Effort (days fishing)	Effort (soaktime)	GRT/GT of individual vessels
SP_1	Vertical mechanized handline (“voracera”)	Maximum of 30 lines per day (each line attached a maximum of 100 hooks, usually ± 70)	L=3.95 \pm 0.39 cm S=1.40 \pm 0.14 cm 	Maximum 140 days	Maximum 140 days	± 20 min	1.170 - 19.00 (from 2007 authorized vessel list)

Please cite minimum level at which anonymised data in each field can be provided (haul/day/trip/month/year) and add any additional relevant information here (e.g. data source – official logbooks or skippers tallybooks or both). **Data could be provided by trip based on the Fishermen’s brotherhood statistics from 1999 onwards, but confidentiality (anonymised) must be taken into account. From the early years (1983-1997) data could be provided by an aggregated monthly basis.**

4.1.2.1 How could the content, availability and quality of fishing effort data be improved for the fleets fishing your stock? **Currently the effort unit chosen (number of sales) cannot be too appropriate, as do not consider the missing effort (boats with fishing trips but no sales). Thus, in the recent years this missing effort increases substantially. Then recent LPUEs should be interpreted with caution because it cannot be a real image of the resource abundance. Working with VMS data should avoid the missing effort problem but this is a recent option (from 2008 onwards).**

4.1.3 Landings and discards data

4.1.3.1 Please append all available time-series of landings and discard data, disaggregated by fleet ID where possible.

RED (=BLACKSPOT) SEABREAM (*Pagellus bogaraveo*) IX

Year	Portugal	Spain	TOTAL	S. of Gibraltar (SP_1)	%
1983				101	
1984				166	
1985				196	
1986				225	
1987				296	
1988	370	319	689	319	46
1989	260	416	676	416	62
1990	166	428	594	428	72
1991	109	423	532	423	80
1992	166	631	797	631	79
1993	235	765	1000	765	76
1994	150	854	1004	854	85
1995	204	625	829	625	75
1996	209	769	978	769	79
1997	203	808	1011	808	80
1998	357	520	877	519	59
1999	265	278	543	278	51
2000	83	338	421	305	72
2001	97	277	374	220	59
2002	111	248	359	166	46
2003	142	329	471	212	45
2004	183	297	480	241	50
2005	129	365	494	330	67
2006	104	440	544	346	64
2007	185	407	592	362	61
2008	158	443	601	416	69

Table. Red seabream landings in Subarea IX: ICES WGDEEP estimates of landings (in tonnes). Righth side of the Table includes landings from the Strait of Gibraltar (SP_1) and its percentage regards to IX total landings.

4.1.3 VMS data

4.1.3.1 Please complete the table below and append all available time-series of data or VMS plots, disaggregated by fleet ID where possible:-

Fleet ID	Is VMS monitoring mandatory?	Do VMS data exist? State years	Are VMS data available for scientific analysis?	If an EU fleet, has funding for VMS been claimed under the DCF?	Have VMS data been linked with logbook or observer data?	Have they been post-processed to identify fishing gear?	Is a VMS footprint available for each fleet?
SP_1	Yes, but come from the Andalusia Regional Government for the "voracera" fleet.	2008 onwards	Yes, under an agreement	I'm not sure, Andalusia Regional Government is the supporter, but maybe EU funding has been destined for this proposal.	No, but we can link boat by boat with its landings statistics	Not relevant, because all the fleet use the same gear ("voracera"). Test procedures discriminate trip time and other fisheries also.	Yes, we're still working with 2008 data.

4.1.3.2 Please review any analyses of VMS data carried out for fleets fishing your stock. **This year we start working with VMS data. We have an agreement with the Andalusian regional government (Junta de Andalucía) to analyze this kind of data which improve our knowledge about effort allocation and solve the missing effort problem too.**

4.1.3.3 How could the coverage, availability, quality and use of VMS data be improved? **The only way to improve VMS information is by means of well discrimination of soak and trip time. We have information every**

three minutes (remember that we're not dealing with EU VMS) about time, position, speed and direction. We're working in the best algorithm, using several discriminates as speed, boat direction and estimated soak time.

4.1.4 Observer data

4.1.4.1 Please complete the table below on observer activity, where applicable:

Fleet ID	Observer type: enforcement or scientific or both?	If EU vessels – funded under DCF or compliance with EC Deep-water Licensing Reg?	% of vessel trips covered	Sampling Plan /SOP available?	Data made available to stock assessments?
SP_1	Scientific	No, five years observer program were developed through the supporting of different agreements	5 boats * 3 trips per month	Yes	Yes

4.1.4.2 Fisheries data recorded by observers: please complete yes/no and cite time-series in the cells in the table below. Please append all available time-series data disaggregated by fleet ID if possible:

Fleet ID	Species composition of retained catch?	Species composition of discarded catch?	Fishing effort details (see under 4.1.2)	VME spp e.g. corals and sponges etc	PET ⁵ spp	Seabirds	Marine mammals	Turtles
SP_1 (2005-2009)	Yes	Not at all	Yes	No*	No*	No*	No*	No*

*No means that this information is not recorded because the fishery has not interaction with these matters. At least we don't have information of seabirds, marine mammals or turtles accidental catches yet.

4.1.4.3 Are all species in retained and discarded catches recorded? If not please describe by fleet ID. **Yes, at this moment, but our observers programme end this year. "Voracera" fleet (SP_1) observers programme has been funded on the basis of several agreements with different Institutions (mainly Junta de Andalucía). The observers program is not supported under DCR and we have not budget for next years.**

4.1.4.4 Are species ID keys available and are they fit for purpose? **Yes**

4.1.4.5 Are species recorded as presence/absence, by weight or by number? Please describe by fleet ID **Species are recorded by number (including length distribution). Length-weight relationships could be used to transform number to biomass. Thus for the target species, *P. bogaraveo*, we propose $a= 0.014$ and $b= 3.014$ (Gil, 2006). In the case of bycatch species as *Helicolenus dactylopterus*, *Lepidopus caudatus*, *Brama brama*, *Trachurus spp.*, *Phycis spp.* and *Polyprion americanus* length-weight relationships could be taken from bibliography.**

4.1.4.6 Please list fishing effort details recorded by observers on vessels in each fleet. **Observers write down in every haul: position, number of lines and soak time.**

4.1.4.7 Are corals and sponges recorded as presence/absence, by weight or by number? Please describe by fleet ID. **None. As in poin4.1.4.2, none means that this information is not recorded because the fishery has not interaction with these matters. Thus, we don't have information of seabirds, marine mammals or turtles accidental catches yet.**

4.1.4.8 To what taxonomic level are corals and sponges identified? Please describe by fleet ID **None, see above.**

4.1.4.9 Are coral and sponge ID keys available and are they fit for purpose? Please describe by fleet ID **None, see above.**

⁵ PET – protected, endangered or threatened species.

4.1.4.10 Please list any PET spp captured by fleet. What details are recorded? **None, see above.**

4.1.4.11 Please list seabird spp captured by fleet. What details are recorded? **None, see above.**

4.1.4.12 Please list marine mammal spp captured by fleet. What details are recorded? **None, see above.**

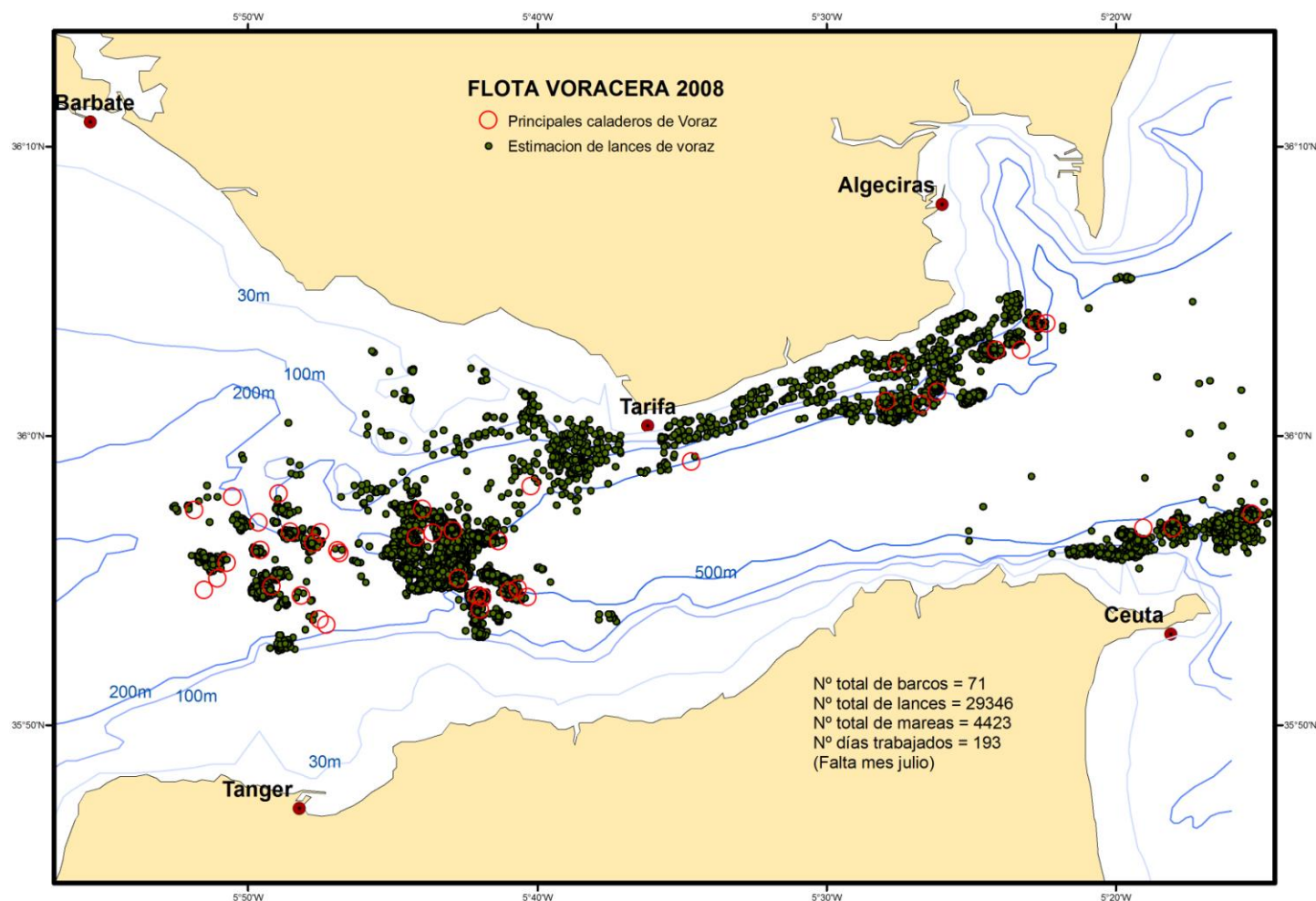
4.1.4.13 Please list turtle spp captured by fleet. What details are recorded? **None, see above.**

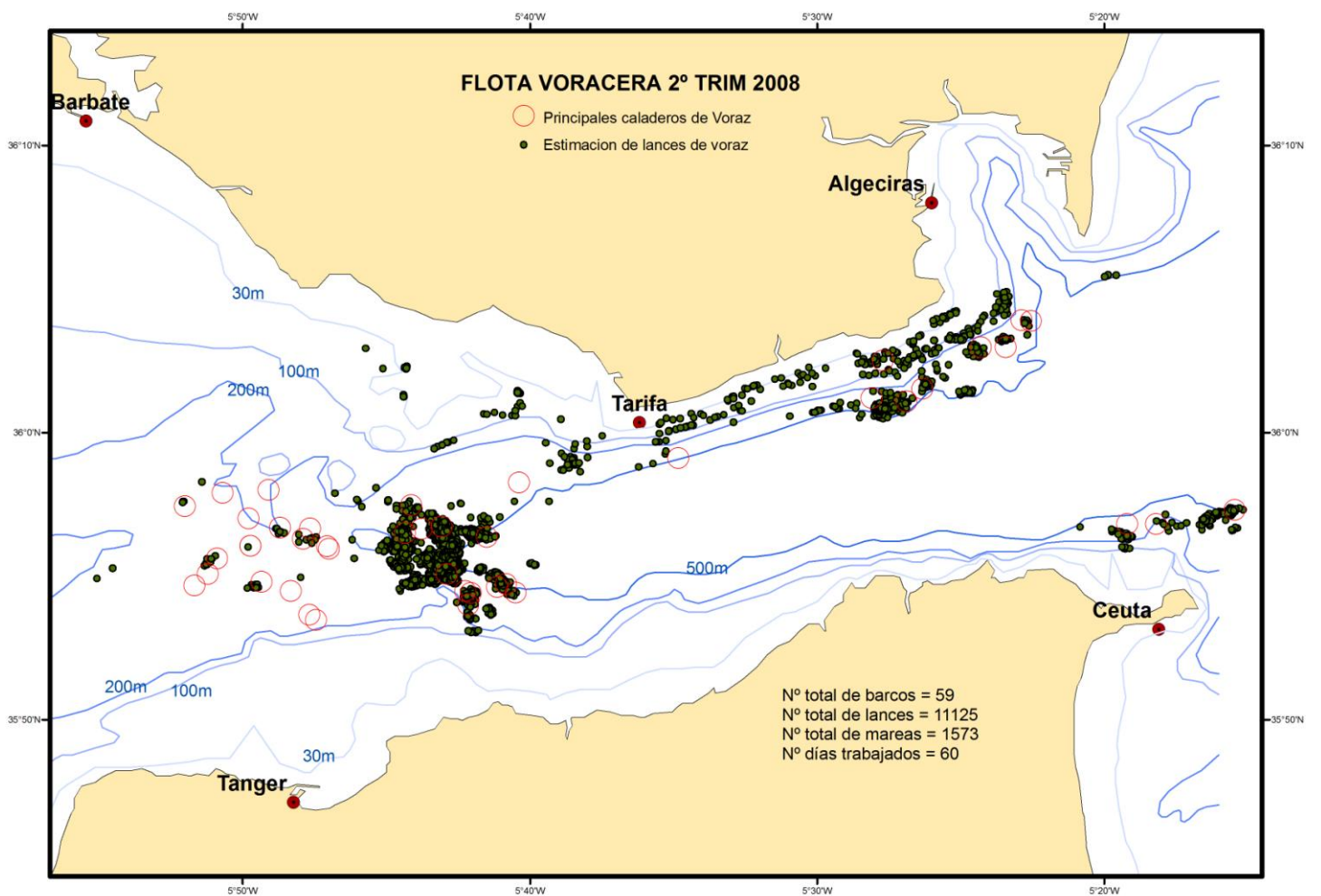
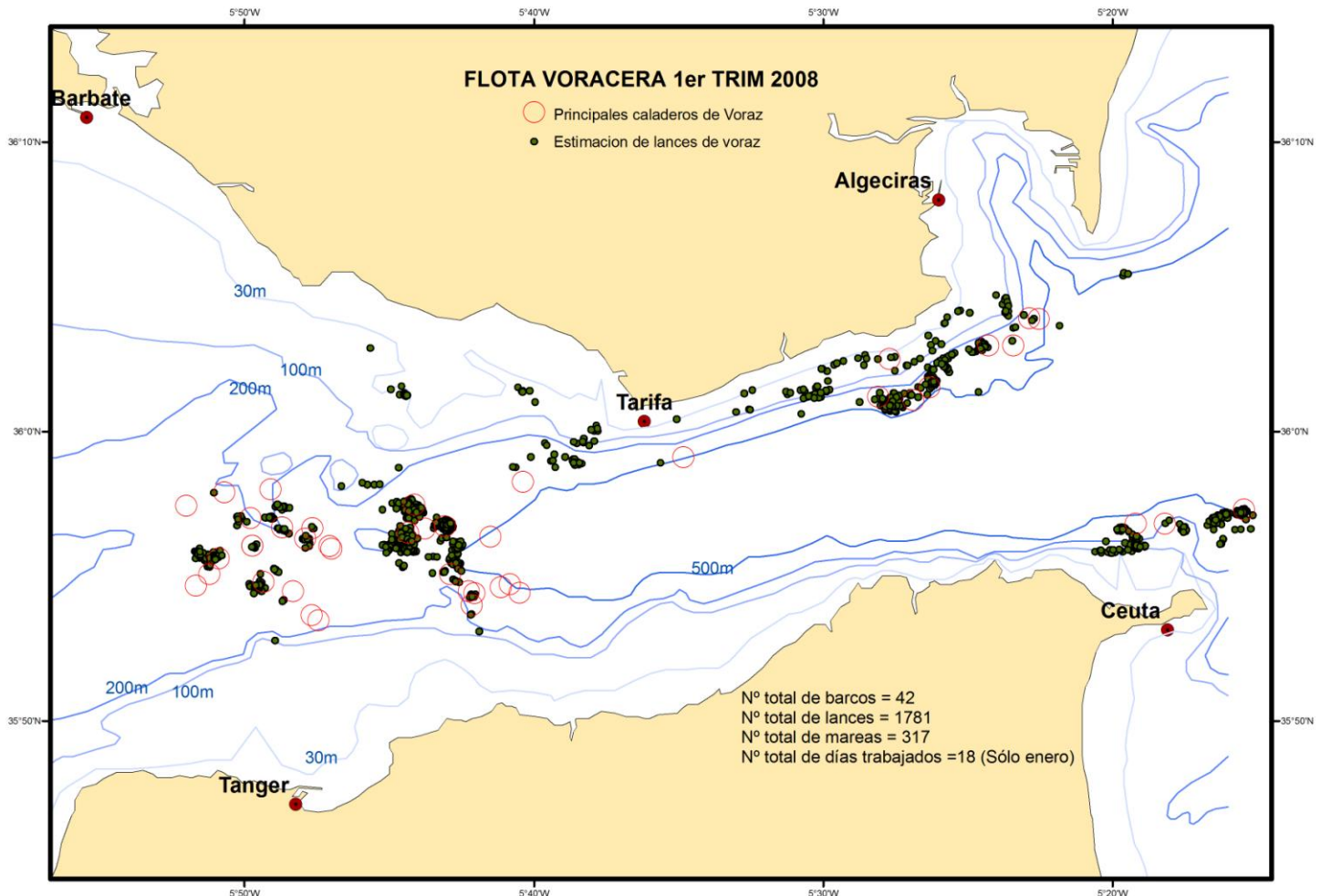
4.1.4.14 How could observer coverage, availability and quality of observer data, and the use of data be improved? **We think that observer programme have enough quality. A good improving should be the covertures' increasing...but, unfortunately observers programme end at the end of this year.**

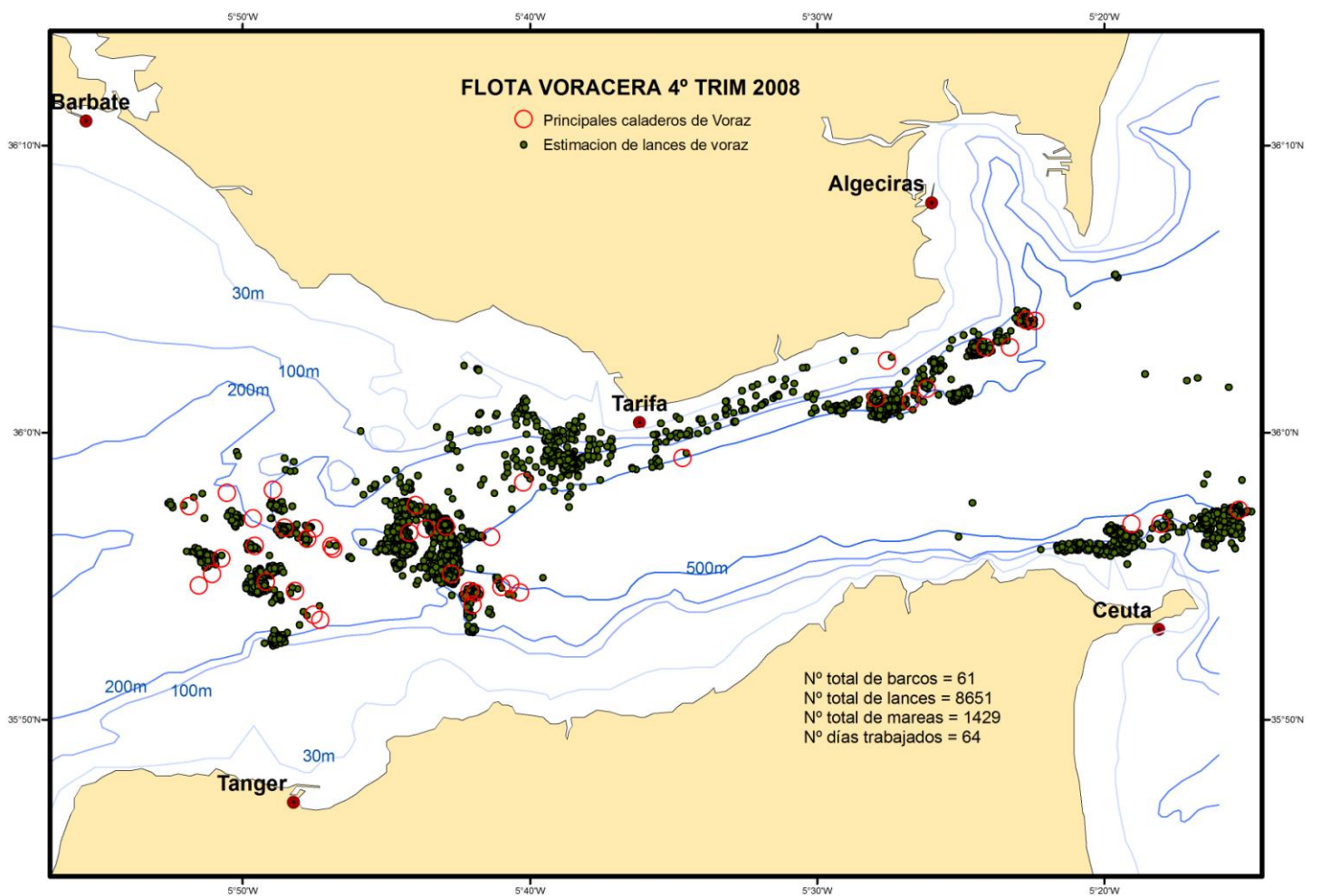
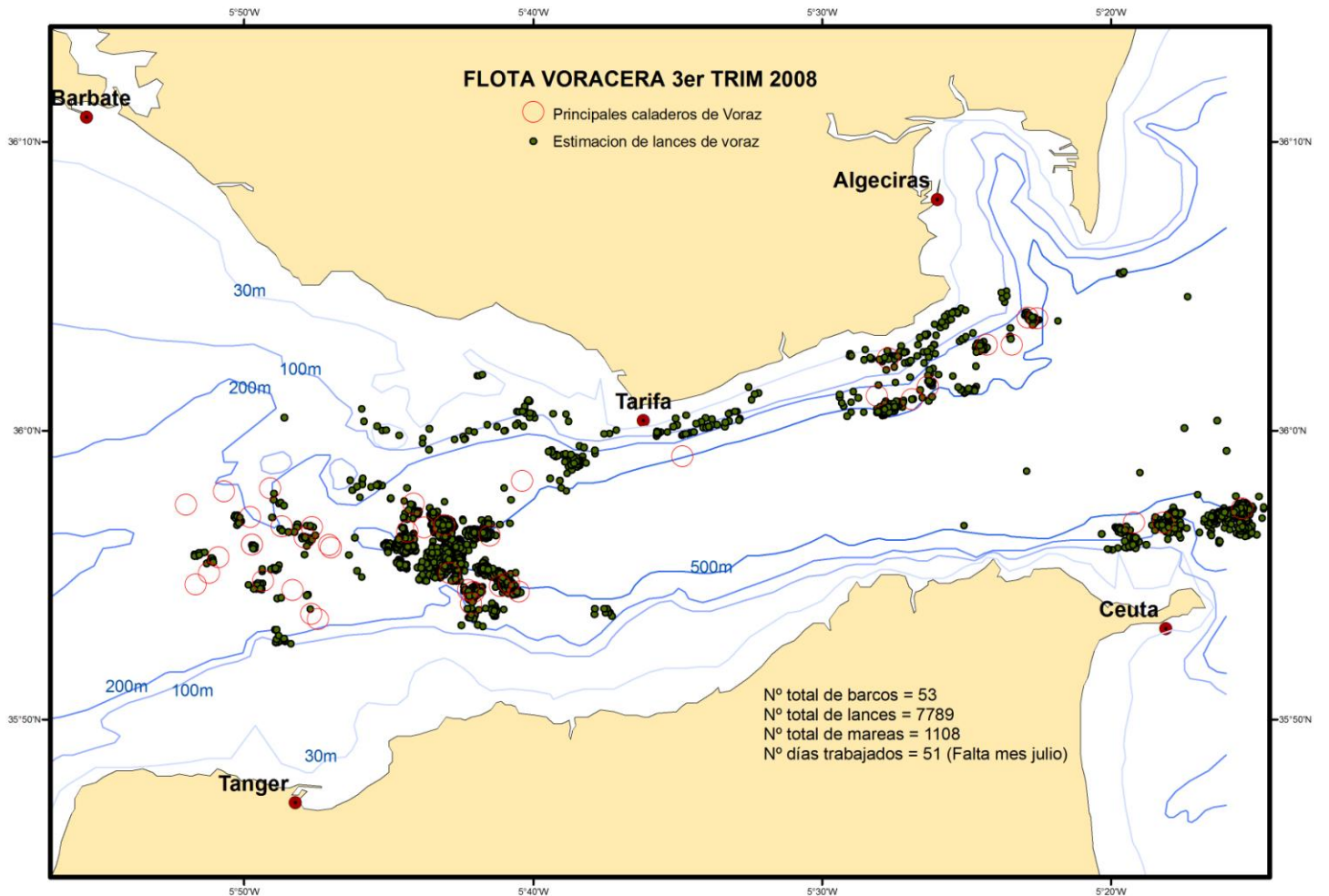
4.1.5 Fishing footprint

4.1.5.1 Does a spatial and temporal fishing footprint of effort exist for each of the fleets fishing your stock? **Yes, in the case of the "voracera" fleet (SP_1) for the 2008 year. Also another previous yearly (2005-2009) footprints could be obtained from the observer programme (5 boats).**

4.1.5.2 If so please describe the data used (VMS, logbook data etc) and include the latest charts. **VMS data were processed taken different parameters into account (mainly time, position, speed and direction) to discriminate soak and trip positions. Thus the presented charts includes only those positions where the algorithm employed consider that a fishing haul was carried out. The first figure belongs to the whole 2008 year and then quarterly figures are also presented.**







Yearly aggregated information about soaking positions from observer programme was also included.

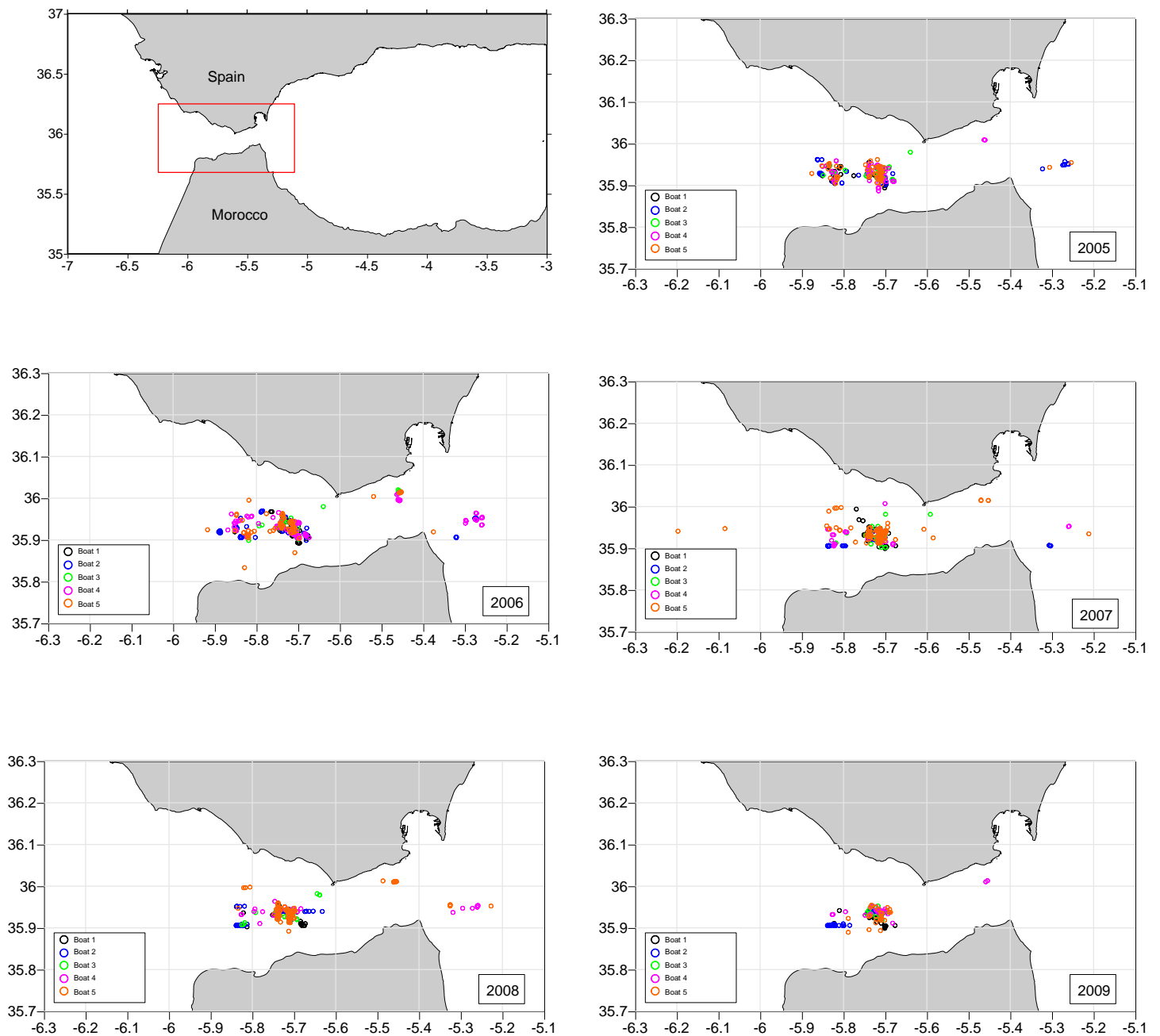


Figure. Red seabream fishery of the Strait of Gibraltar: Yearly soaking positions footprints from observers programme.

4.1.5.3 How has the fishing footprint changed over time for each fleet. **Despite is too soon because we have VMS data processed only for one year, there isn't expected a lot of changes because we deal with only a fleet type ("voracera") in a quite small area (Strait of Gibraltar) with fishing grounds more or less defined (see Figures above).**

4.1.5.4 Is there any information on the distribution of fishing effort by depth strata? If so please describe trends with time. **Information could be extracted from observer programme and also with VMS data, but these should be related with the finest bathymetry possible.**

4.1.5.5 Please describe highest level of resolution and lowest level of disaggregation available for data of position of fishing recorded in logbooks. **None. We have not logbook information. However, we can link landings by boat with its VMS.**

4.1.6 Abundance indices derived from commercial catch and effort data

4.1.6.1 Please list available abundance indices indicating which are and which are not used in assessments. **LPUEs estimates are available for the Strait of Gibraltar fishery. Dues to the missing effort problem LPUEs are not too reliable (mainly in the last years) and assessments by means of this index were not performed yet.**

4.1.6.2. Please include tables and figures of all available indices and append data at the lowest disaggregation level possible (ideally haul by haul)

RED (=BLACKSPOT) SEABREAM
 (*Pagellus bogaraveo*) LPUE information
 from the Strait of Gibraltar fishery (SP_1)

Year	N° sales	LPUE
1983	1289	78
1984	2173	76
1985	2764	71
1986	3705	61
1987	3909	76
1988	4336	73
1989	4653	89
1990	5573	77
1991	6055	70
1992	7330	86
1993	8974	85
1994	9127	94
1995	10398	60
1996	7413	104
1997	10485	77
1998	8559	61
1999	5012	55
2000	6832	45
2001	3907	56
2002	3527	47
2003	3981	53
2004	5151	47
2005	4856	68
2006	4955	70
2007	7064	51
2008	7759	54

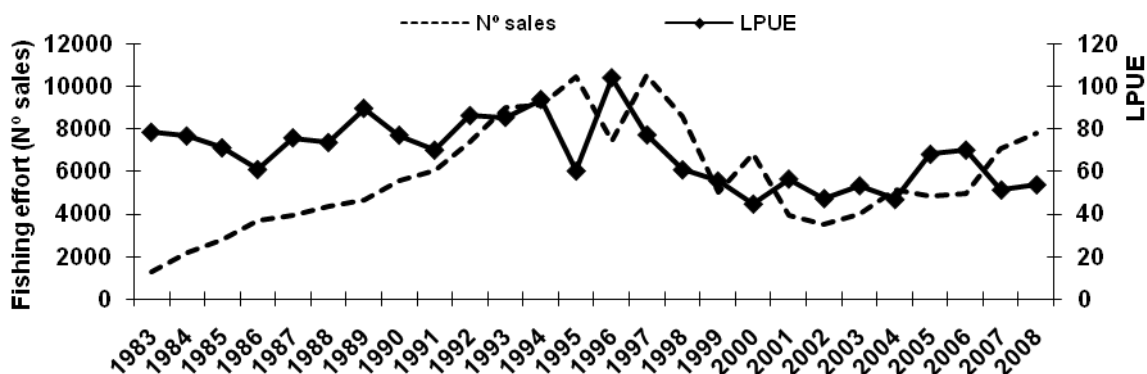


Figure. *P. bogaraveo* of the Strait of Gibraltar: Evolution of the chosen effort unit and estimated LPUE (1983-2008).

4.1.6.3. Please describe how the indices are calculated. Are they standardised and if so please describe method used. **Sadly is a not standardized CPUE which only reflects the quotient between landings and the total number of sales in the fishmarket of the target species.**

4.1.6.4 Please describe strengths and weaknesses of each index and if not used in assessments please explain why. **The effort unit chosen (number of sales) cannot be too appropriate as do not consider the missing effort. Thus, in the recent years this missing effort increases substantially (fishing vessels with no catches and no sale sheet to be recorded). Thus, the LPUE trend in the last years should be interpret with caution because maybe don not reflect a real image of the resource abundance.**

4.1.6.5 How can these indices be improved and are there any potential new indices that can be used in assessments. **Hopefully VMS data improve this question from 2008 onwards. Despite the accuracy of the discriminations made, in the worst scenario we have information about boats at sea instead of a number of sales.**

4.1.7 Information and data made available by fishers, fisher organisations or other stakeholders

4.1.7.1 Please describe any existing data collection programmes in place. **Mainly DCR from EU. IEO has a data collection and sampling programmes to cover DCR requests. Moreover Regional Government (Junta de Andalucía) implements software for the fisheries brotherhoods data computerization (landing and sales prizes). Within the framework of several agreements IEO can access to this data base.**

4.1.7.2 Please list the data and information for each fleet ID and describe if/how it has been used in monitoring and/or assessments. Please append the data at the lowest level of disaggregation possible.

Monitoring:

Information about boats: SP_1 fleet (main technical characteristics)

Information about landings: SP_1 landings (per boat and fishing day, from 1999 onwards)

SP_1 target species (*P. bogaraveo*) length distribution (monthly sampling, from 1998 onwards)

SP_1 target species (*P. bogaraveo*) biological sampling (monthly sampling, from 2003 onwards)

Information about fishing effort: SP_1 sale sheets (from 1983 onwards)

SP_1 fishing days by port (from 1983 onwards)

SP_1 VMS data (from 2008 only)

Assessment: Till now trial assessment was attempted by means of a VPA, joining fishery and biological data. Length frequency distributions were transformed in ages distribution using a combined Age Length Key (obtained from agreed otoliths readings from biological samplings).

4.1.7.3 How could fishers play a stronger role in providing data and information for monitoring and assessments?

Fishermen should be more cooperative and less sceptical about the scientist role. We are not the enemy, or I hope so. Maybe, because their knowledge about the fishery they should collaborate in the assessment exercises (mainly in outputs interpretation phase). Thus, maybe they will realize that good fisheries management requires assessments from the best input data.

4.1.8 Fisheries data in general

4.1.8.1 Are there any aspects of fisheries data (quality, temporal and spatial extent, time series, availability, accessibility, flow) that [a] impact on assessments and/or [b] affect your ability to provide timely fisheries advice to managers.
None

4.2 Fisheries-independent survey data

4.2.1 Please complete the table below for any surveys that are currently carried out or have taken place in the last 10 years and append all available time-series abundance, length and age data at the lowest level of disaggregation possible (ideally haul by haul for catch and effort data): **None.**

4.2.2 For each survey please:

- Describe main aims
- Describe the survey protocol and include map of survey grid
- Describe survey gear used in detail
- If survey does not cover entire area of stock – please explain why.
- Document gear selectivity where appropriate

4.2.3 Are the survey data used in assessments? If so please describe how. If not please explain why. **None**

4.2.4 Please identify strengths and weakness of each survey and identify if and how they could be improved. **None**

4.2.5 If any surveys have been terminated within the last 10 years please explain why. **None**

4.2.6 Are any new surveys being considered? If so please describe. **None**

4.2.7 Please append any survey abundance indices available for your stock (tables and figures) and comment on their strengths and weaknesses and how they could be improved. **None**

4.2.8 Are there any aspects of fisheries-independent survey data (quality, temporal and spatial extent, time series, availability, accessibility, flow) that [a] impact on assessments and/or [b] affect your ability to provide timely fisheries advice to managers. **None**

4.3 Biological data for your stock

4.3.1 Please complete the table below for each fleet/survey inserting in each cell the time series of data available, if quarterly (q) or annual (a), and if collected by observers (O), by market sampling (MS) or both (OMS). Please append all available time-series of quarterly and annual data.

Fleet ID/ Survey ID	Retained or Survey					Discarded				
	Length comp.	Age comp.	Sex comp.	Length & weight at age	Maturity comp.	Length comp.	Age comp.	Sex comp.	Length & weight at age	Maturity comp.
SP_1	Since 1998 (monthly, MS) 2005-2008 (monthly, O)	Since 2003 (a, biological sampling from MS)	Since 2003 (a, biological sampling from MS)	Since 2003 (a, biological sampling from MS)	Since 2003 (a, biological sampling from MS)	None	None	None	None	None

4.3.2 For the most recent assessment, how was total international catch data raised from fleets and what are the strengths and weakness of the current raising regime? **The artisanal longline fishery targeted red seabream along the Strait of Gibraltar area (“voracera” fleet: SP_1) actually covers almost the 70 % of the landings for this species in the Subarea IX (see detailed Table in point 4.1.3).**

4.3.3 If age data are available please describe the age determination materials and methods used. **ALKs were obtained by three agreed otoliths readings collected from 2003 onwards. In the last ICES WGDEEP assessment the combined ALK (2003-2007) was obtained by 1242 three agreed readings from otoliths collected from 2003 onwards. It covers lengths from 24 to 62 cm. Combined ALK comprises ages between 3 and 10.**

4.3.4 How have ages been validated? **Ages are not truly validated yet.**

4.3.5 Are the age data considered to be reliable? **Younger ages are well sampled while the older groups are susceptible to poorer estimates.**

4.3.6 Has there been any ageing workshops for your species? If please review outcomes. **No, but this is a very interesting point to taken into account in the close future. Growth marginal increments should be considered.**

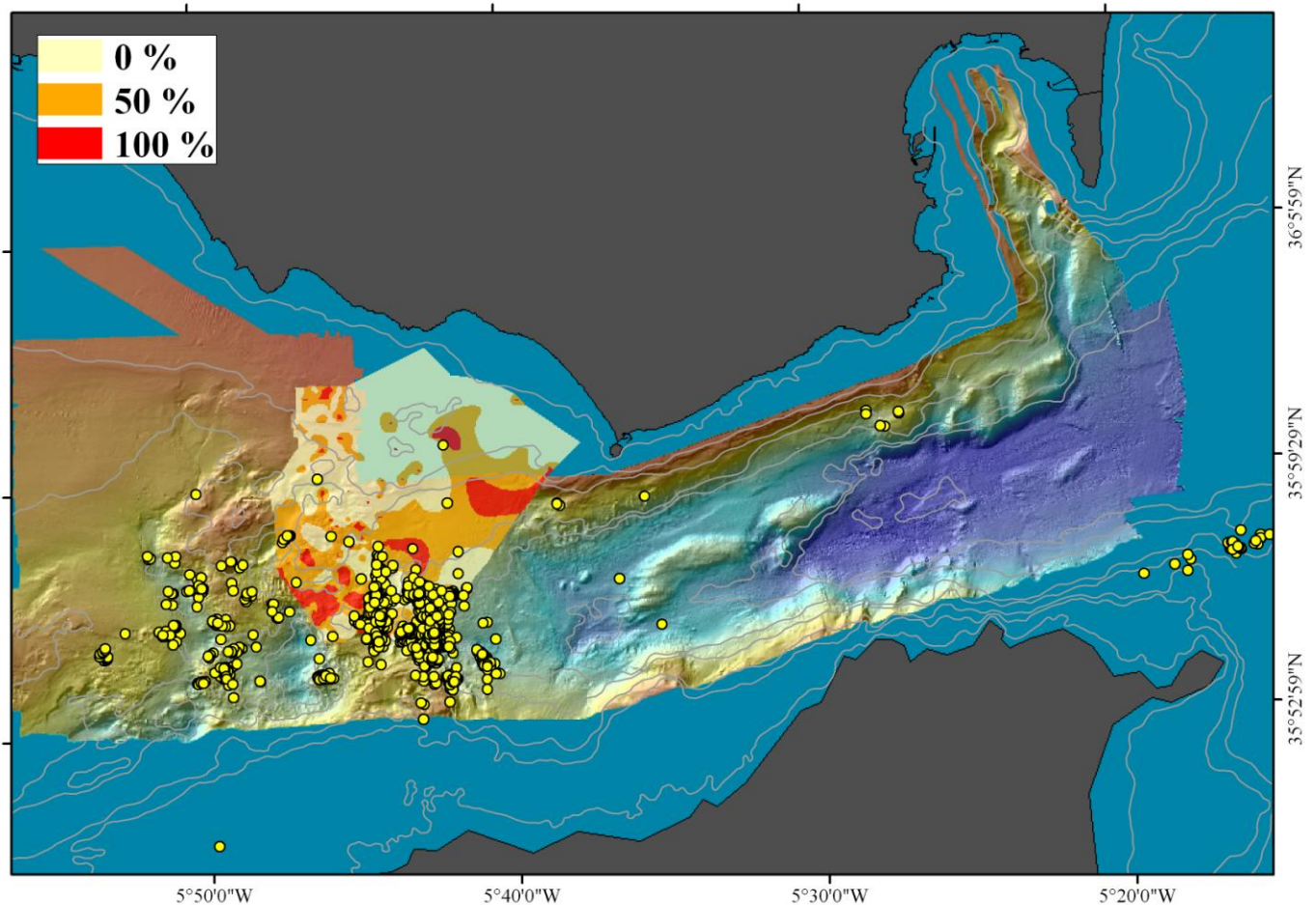
4.3.7 Are there any aspects of data (quality, temporal and spatial extent, time series, availability, accessibility, flow) that [a] impact on assessments and/or [b] affect your ability to provide timely fisheries advice to managers. **The main problem is the uncertainty of the assessment results. ALKs computed from one year must not be applied to samples taken in a different year, because they could give biased results (Westrheim and Ricker, 1978). We must take in mind also the accuracy of the age estimates.**

If we try production models assessments the problem of the missing effort should be considered. LPUEs are not reliable in the recent years.

4.4 Ecosystem, biodiversity and VME data (see footnote 1 on page 2 for definition of VME)

4.4.1 Background information

4.4.1.1 Please list the known ecosystem types in your stock area (include maps if available). **Cold water corals**



Coral distribution in the Strait of Gibraltar (adapted from Álvarez-Pérez *et al.* in Freiwald and Roberts eds, 2005). Yellow points correspond with “voracera” fleet fishing grounds.

4.4.1.2 If these are not known, are there any research programmes currently underway to identify and delineate ecosystems in your area? If so please describe. **Currently IEO are carrying out DEEPER Project (<http://www.ma.ieo.es/deeper/>) and the Strait of Gibraltar is one of the study areas. One of the observed communities is the Cnidarians (mainly hydroids) with a high diversity and a significant development degree. More surveys should complement and expand the catalogue of this group. Besides, we are surprised about the colonization degree of several “voracera” gear remains (i.e. lines) by these kind of species, hydroids and also corals (see Figure below).**



4.4.2 Data available in support of ecosystem based management.

4.4.2.1 Please complete the following table where data are available and append all available time-series data at the lowest level of disaggregation possible:

Marine Strategy descriptor	Data in support of ecosystem based management	Data source(s)	Are there any data issues?
(1) Biological diversity	Species assemblage composition	Fishery information Observer programme	
	VME -spatial distribution	Álvarez-Pérez <i>et al.</i> in Freiwald and Roberts eds, 2005 and DEEPER project	
	VME – species composition	Álvarez-Pérez <i>et al.</i> in Freiwald and Roberts eds, 2005 and DEEPER project	
	Fishery interactions with VMEs	DEEPER project	
	Presence of PET – spp	Bibliography	
	PET – population biology	Bibliography	
	PET – fishery interactions	None	
(2) Non-indigenous species	Invasive	None	
	Introduced	None	
(3) Populations of commercially exploited fish and shellfish	Addressed in Sections 1, 3, 4	Fishery information Observer programme	
(4) Food webs	Data on prey, predators. Fishery impacts on prey/predators abundance, addressed in 4.4.4	Fishery information	
(5) Eutrophication		None	
(6) Sea-floor integrity	Addressed in 4.4.5 and 4.4.7 below	None	
(7) Hydrographical conditions		Bibliography	
(8) Contaminants in waters/ecosystem	Any data on levels of e.g. metals PCBs	None	
(9) Contaminants in fish and other seafood	Addressed in 4.6.6 below	None	
(10) Properties and quantities of marine litter		Bibliography	
(11) Introduction of energy, including underwater noise		None	

4.4.2.2 Where data are available please describe, review and append⁴.

4.4.2.3 In the area inhabited by your stock are there any research initiatives related to climate change? If so please review (Descriptor 7). **INGRES Project (University of Málaga) and STOCA Project (IEO). The last one is close but not in the area inhabited by the stock.**

4.4.2.4 Has there been any baseline studies on ecosystems in your stock area? If so please describe. **DEEPER Project aims to take in consideration in the close future ecosystem aspects in the area where the red seabream fishery is carried out, Strait of Gibraltar.**

4.4.2.5 Are you aware of any major changes e.g. regime shifts, in ecosystems in your stock area? If so please review. **None**

4.4.2.6 How is the health of ecosystems in your stock area monitored? e.g. size spectra studies, biodiversity studies, diversity indices, presence/absence of indicator species, other indicators etc. Please describe and review (Descriptor 1) **Not yet. Till now only the fisheries health has been taken into account.**

4.4.2.7 Is primary production monitored in your stock area? If so please review. **I'm not really sure.**

⁴ Aspects to be reviewed for each marine strategy descriptor, may be further refined according to the outcome of on-going work from ICES/JRC task groups on these descriptors.

4.4.2.8 Are changes in the spatial and temporal distribution of plankton species monitored? If so please review. **None**

4.4.2.9 Are there any aspects of ecosystem data and knowledge (quality, temporal and spatial extent, time series, availability, accessibility, flow) that [a] impact on assessments and/or [b] affect your ability to provide timely fisheries advice to managers. **Not too relevant at the moment, because the assessment methodology used currently does not include this kind of information. However knowledge improvements give us more scientific advice basis.**

4.4.2.10 Are there any other human activities that impact the ecosystem significantly? If so please describe. **Maritime traffic, submarine cables and accidental fuel spills.**

4.4.3 Protected, Endangered and Threatened (PET) species (part of Descriptor 1)

4.4.3.1 Please list any PET species in your area that interact or could interact with fisheries for your stock. **Not relevant for the case of the red seabream fishery in the strait of Gibraltar, because the fishery do not interact with these species. Anyway the table below shows the list of species which occur in the area included in several protection agreements (Ocaña *et al.*, 2010).**

Phylum	Species	Protection Agreement
Chordata	<i>Polyprion americanus</i>	RL: DD
	<i>Thunnus thynnus</i>	RL: DD / OSPAR: V / UNCLOS: YES / BARCOM: III
	<i>Pagrus pagrus</i>	RL: EN
	<i>Xiphias gladius</i>	RL: DD / UNCLOS: YES / BARCOM: III
	<i>Galeorhinus galeus</i>	RL: VU / UNCLOS: YES
	<i>Isurus oxyrinchus</i>	RL: VU / CMS: II / BERN: II / UNCLOS: YES / BARCOM: III
Cnidaria	<i>Caryophyllia spp.</i>	CITES: II
	<i>Lophelia pertusa</i>	CITES: II / OSPAR: All
	<i>Dendrophyllia cornigera</i>	CITES: II
	<i>Dendrophyllia ramea</i>	CITES: II
	<i>Madrepora oculata</i>	CITES: II
	<i>Errina aspera</i>	CITES: II / BERN: II (Med.) / BARCOM: II
Echinodermata	<i>Ophidiaster ophidianus</i>	BERN: II (Med.) / BARCOM: II
	<i>Paracentrotus lividus</i>	BERN: III / BARCOM: III
Mollusca	<i>Charonia lampas</i>	BERN: II / BARCOM: II
	<i>Ranella olearia</i>	BERN: II (Med.) / BARCOM: II
Porifera	<i>Axinella polypoides</i>	BARCOM: II
<p>RL: IUCN Red List of Threatened Species: EN (Endangered), VU (Vulnerable), DD (Data Deficient) CITES: Convention on International Trade in Endangered Species of Wild Fauna and Flora: Appendix OSPAR: Convention for the Protection of the marine Environment of the North-East Atlantic: Annex UNCLOS: United Nations Convention on the Law of the Sea - Annex I (highly migratory species) BARCOM: Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean (Barcelona Convention): Annex BERN: Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention): Appendix CMS: Convention on Migratory Species: Appendix</p>		

4.4.3.2 Are there currently any research programmes active to identify the presence and extent of these interactions? If so, please review.

4.4.3.3 Please describe any mitigation methods applied to reduce the impact of fishing on PET species.

4.4.3.4 Are there any aspects of PET data and knowledge (quality, temporal and spatial extent, time series, availability, accessibility, flow) that [a] impact on assessments and/or [b] affect your ability to provide timely fisheries advice to managers. Not relevant for the case of the red seabream fishery in the strait of Gibraltar.

4.4.4 Ecosystem modelling (Descriptors 4,5)

4.4.4.1 Is there any ecosystem modelling work carried out in your area? If so please specify the ecosystems studied and the modelling methods used (e.g. ecopath, ecosim etc). **None**

4.4.4.2 Are predator/prey relationships well understood and if not what research is being undertaken? **Not yet. We only have information about *P. bogaraveo* feeding habits.**

4.4.4.3 Is there sampling of stomach contents? If so, how frequently, by whom, and how have the results been used? **Only for *P. bogaraveo*. First, in general, feeding habit of this specie has been little studied. Morato *et al.* (2001) describes the diet of *Pagellus bogaraveo* and *Pagellus acarne* in the Azores and Olaso and Pereda (1986) describe the diet of 22 demersal fish in the Cantabrian Sea including *Pagellus bogaraveo*. In the Strait of Gibraltar fishery, feeding studies presents the difficult of the use of bait (sardine), which should be ignored to describe the feeding habit of the species. A total of 1106 stomachs contents of *Pagellus bogaraveo* were analyzed. Five size ranges were established in 5 cm, according to the commercial size of the blackspot seabream in the Ocean Atlantic. Size ranges were established as follow: 30-35 cm (n=458). 36-40 cm (n=355). 41-45 cm (n=164). 46-50 cm (n=86). 51- 55cm (n=53). A total of 725 stomachs were empty and 381 were fullness. Vacuity index (VI) was 66%. The trophic spectrum is composed of 24 prey taxa, 6 orders, 11 families and 15 species and genera are represented. Despite the trophic spectrum diversity observed, the overall diet is not very diverse: Only has a main prey, *Sergia robusta*. We are preparing a paper about this aspect that have not been published yet (Polonio *et al.*, *in prep.*).**

4.4.5 Fishery interactions (Descriptors 1,6)

4.4.5.1 Please review any gear trials conducted to assess gear/habitat interactions. **None**

4.4.5.2 Has there been any research into environmentally friendly gears? If so please review. **None**

4.4.5.3 Do you have a reporting system for lost and abandoned fishing gear (particularly gillnets)? If so how effective is it and is it supported by interviews with fishers? **None. We have not any information, even from the observer programme. However in some occasions lost gears should occur because colonized gear remains were recover in DEEPER project surveys (see above, point 4.4.1.2).**

4.4.5.4 Are there any lost/abandoned fishing gear retrieval survey/mitigation exercises regularly carried out? If so please review. **None**

4.4.5.5 If bait is used in any of your fisheries, is the bait sourced sustainably? Is its use monitored? If so, how? **None. Sardine bits is the common bait used by the “voracera” fleet. It come from Spanish or Portuguese markets and preserved with salt.**

4.4.5.6. Are there any aspects of data and knowledge relating to fishery interactions (quality, temporal and spatial extent, time series, availability, accessibility, flow) that [a] impact on assessments and/or [b] affect your ability to provide timely fisheries advice to managers? **Not too relevant in this case.**

4.4.6 Pollutants and contaminants (Descriptor 9):

4.4.6.1 Are contaminant levels in your stock species monitored? If so how and by whom? Please review results. **None**

4.4.6.2 Do you assess the ecosystem effects (negative and positive) of marine debris and examine options for its collection and disposal? (Descriptor 10) If so how? **None**

4.4.6.3 Are there any aspects of data and knowledge (quality, temporal and spatial extent, time series, availability, accessibility, flow) that [a] impact on assessments and/or [b] affect your ability to provide timely fisheries advice to managers? **None**

4.4.7 Vulnerable Marine Ecosystems (VMEs) (Descriptor 1)

4.4.7.1 FAO have recently circulated guidelines on VME identification and composition, how have you interpreted these in your stock area? **None**

4.4.7.2 Has any mapping of VMEs been carried out in your stock area? If so, please provide information on location, extent and mapping methods used (multi-beam sonar, ROV, etc). Please attach maps where available. **See Figure 4.4.1.1**

4.4.7.3 Please complete the following table for your stock area:

VME	Present	How Monitored?	Issues?
Seeps			
Vents			
Carbonate mounds			
Corals	Yes	Sampling (DEEPER Project)	
Sponges	Yes	Sampling (DEPER Project)	
Fish components	Yes	Fishery information / Observers programme	
Seamounts			
Others	Bathymetry	Multi beam sonar	

4.4.7.4 If your stock area, or a substantial part of your area, has not been mapped, do you consider it likely that VMEs may exist? If so, have any precautionary measures (e.g. closed areas) been implemented (e.g. to protect seamounts that have not been specifically mapped)? If so please describe. **Yes, the presence of corals (and also sponges) should be mapped despite the absence of interactions with the fishery.**

4.4.7.5 Have you any plans to develop/extend mapping activities with regard to VMEs? If so please describe. **DEEPER Project aims to increase the knowledge about deep sea habitats and its vulnerability along the axis Gulf of Cádiz – Strait of Gibraltar – Alboran Sea. Till now, two surveys (DEEPER 0608 and DEEPER 0609) were developed in the area where the red seabream fishery takes place. The sampling gears were dredge and beam trawl. In the case of the develop of new surveys, it is highly recommended the use of underwater pictures for a better mapping of the seabed.**

4.4.7.6 If management measures have been introduced to protect VMEs, how have these impacted on fishing? **None**

4.4.7.7 Are there any aspects of data and knowledge (quality, temporal and spatial extent, time series, availability, accessibility, flow) that [a] impact on assessments and/or [b] affect your ability to provide timely fisheries advice to managers?

4.5 Socio-economic data

Have socio-economic studies been conducted for the fleets fishing for your stock? Are socio-economic surveys need-specific or are they part of monitoring programmes? If so please complete the table below and answer the remainder of the questions in this section and append data where possible. Please label with (1) an asterisk if data exist but are not available (but state where they exist), (2) leave blank if no data exist at all and (3) label N/K if the existence of data is not known.

Fisheries socio-economic data	Indicate which fleet IDs	How are the data currently used in MSE and stock/fisheries management?	Are the data available to you? If so please append as a separate document. If not please identify source. Are there any data issues?
Demographics	SP_1: N/K		
Migration	SP_1: N/K		
Sexual equality	SP_1: N/K		
Full-time vs part-time employment	SP_1: N/K		
Sea based employment	SP_1: Estimated (3-5 people per boat)		
Land based employment	SP_1: N/K		

Grey ⁵ market data	SP_1: N/K		
Dependency and distribution links	SP_1: N/K		
Ethnicity data	SP_1: N/K		
Fish consumption	SP_1: N/K		
Export data	SP_1: N/K		
Import data	SP_1: N/K		
CITES	SP_1: N/K		
Capital costs	SP_1: N/K		
Repair costs	SP_1: N/K		
Equipment/gear	SP_1: N/K		
Global markets	SP_1: N/K		
HACCP ⁶	SP_1: N/K		
Catch values	SP_1: Tarifa port (2006-2009)		
Fuel costs	SP_1: N/K		

4.5.1 For each fleet ID please provide/detail/describe:

- 4.5.1.1 A map showing the geographic location of fishing grounds (by season/quarter if spatial pattern changes). **Footprint figures stated above (see point 4.1.5.2) shows year 2008 image (from VMS data) and from observer programme (2005-2009).**
- 4.5.1.2 An estimate of the mean distance from home port to main fishing grounds, by season/quarter if variable. **From VMS data and observer programme. Anyway fishing grounds are very close to main ports, Tarifa and Algeciras (less than 3 hours trip).**
- 4.5.1.3 An estimate of the mean distance from main fishing grounds to landing ports (if different from homeport), by season/quarter if variable. **Not too relevant. There are only two authorized landing ports in the Strait of Gibraltar regulatory area (Tarifa and Algeciras), which coincides with the homeports of the “voracera” fleet.**
- 4.5.1.4 Jurisdiction of fisheries i.e. within national EEZs (please list countries) or in international waters (please indicate RFMO responsible for management). **Spain and Morocco EEZs waters. Fish do not understand these human boundaries neither fishermen. Information available belongs only to Spanish catches (SP_1) and it is yearly assess at ICES.**
- 4.5.1.5 Number of vessels, vessel size in terms of length or GRT (average, min, max and stdev), mean engine power : kW or BHP (average, min, max and stdev). **Technical characteristics are extracted for the boats included in the last authorized vessels list. Maybe engine power should be underestimates because of taxes.**
Length= 9.80, 5.50 – 15.00, 2.14
GRT= 6.36, 1.07 – 19.00, 4.20
HP= 47.23, 11.04 – 132.45, 29.05
- 4.5.1.6 Main type of fishing gear used (please supply as much information as possible). **The “voracera”, a local mechanized hook line baited with sardine, is the gear used by the fleet from Tarifa and Algeciras ports (see Figure below). Fishing is carried out taking advantage of the turnover of the tides in bottoms from 200 to 400 fathoms.**



Figure: Fishermen baiting “voracera” gear hooks (60-80 per line).

⁵ Grey market, that is where fish is distributed without sales records and is opaque to the competent authorities.

⁶ HACCP -Hazard Analysis Critical Control Points – analytical process and EU requirement relating to global trade and food quality.

- 4.5.1.7 An estimate of the average length of trips and the average number of crew per vessel. **Trip lengths are no longer than a day. Generally each boat has a crew of 3-5 people.**
- 4.5.1.8 Total number of fishermen in the fleet, split into full-time/part-time if appropriate, and by gender. **N/K**
- 4.5.1.9 Main type of vessel ownership within the fleet e.g. fishing companies, skipper/owner, co-operative etc. **The common scenario is that the boat owner is also de skipper. If not, the skippers use to be an owner's relative.**
- 4.5.1.10 Total quantity and value of the case study species landed and all species landed in each of the last 3 years. **Red seabream quantities sold and its amounts in Euros from Tarifa port (main landing port of the red seabream fishery of the Strait of Gibraltar: SP_1).**

Tarifa port	2006	2007	2008	2009*
Kilos sold	161,773	278,166	291,005	386,049
Value in €	2,546,262	4,432,593	4,876,842	4,931,804

*Preliminary (only till October)

- 4.5.1.11 Total revenues, costs and profits in each of the last 3 years. **The only available information appears above (point 4.5.1.10).**
- 4.5.1.12 Unionisation or other types of fishermen's association present. **The historical association type is called Fishermen brotherhoods. This organizations could carried out several fishing activity functions as: Where, how and when partners can fish?, safety at sea questions, fish sales responsible in his competence port (fishmarket first sale), referee to solve conflicts between fishermen and, in general, defended the fishing community interests.**
- 4.5.1.13 Main wage structure (e.g. fixed wages or share wages etc). **Weekly share-wages between owner/skipper and crew. Profits are divided in several parts (owner, skipper and crew) and the percentage depends on the responsibility, but first the weekly costs should be paid.**
- 4.5.1.14 Are landings of case study species (1) sold on local market(s) for direct consumption, (2) sold on local markets for processing (3) sold on non-local markets (please describe where) for direct consumption or processing, (4) exported fresh or (5) other (please describe). **Sold fresh in local market but transported to other places of the Iberian peninsula and also other EU countries (mainly Italy).**
- 4.5.1.15 What are the market characteristics (1) open auction, (2) contract, (3) single buyer, (4) other (please describe). **Open auction, but with a restricted (authorized) number of buyers.**
- 4.5.1.16 What were total landings and the average prices for each category above, in each of the last 3 years. **See table in point 4.5.1.10**
- 4.5.1.17 How is the case study species processed (fresh, frozen, salted, cured, canned etc) and in what form? (fillets, wholefish, fishmeal etc). **Fresh and wholefish.**
- 4.5.1.18 What was the total quantity and value of the product produced in each of the last 3 years. **See table in point 4.5.1.10**
- 4.5.1.19 Number and location of processing units and the total number and gender split of employees. **N/K**
- 4.5.1.20 Revenues, costs and profits of processing units in each of the last 3 years. **N/K**
- 4.5.1.21 Please describe any subsidies currently in force. **Closure season (first quarter of the last years) are financed by the Andalusia Regional Government. I'm not quite sure but maybe scrapping and fuel subsidies should be taken into account too.**
- 4.5.1.22 Please supply data on any other issues listed in Table at 4.5

4.5.2 For the country of each fleet ID please provide/detail/describe:

- 4.5.2.1 Proportion of total national employment in (1) catching, marketing, processing etc of all species and (2) catching, marketing, processing of the case study species. **N/K (maybe in National statistics, but in a global perspective instead of focused in the case study)**
- 4.5.2.2 Proportion of total national gross domestic product (GDP) in (1) catching, marketing, processing etc of all species and (2) catching, marketing, processing of the case study species. **N/K (maybe in National statistics, but in a global perspective instead of focused in the case study)**
- 4.5.2.3 Percentage unemployment in (1) total population (2) fishermen in general. **N/K (maybe in National statistics, but in a global perspective instead of focused in the case study)**
- 4.5.2.4 Average annual earnings in (1) total population (2) fishermen in general. **N/K (maybe in National statistics, but in a global perspective instead of focused in the case study)**
- 4.5.2.5 Please describe any immigration/emigration issues impacting on your case study stock. **N/K (maybe in National statistics, but in a global perspective instead of focused in the case study)**

4.5.3 General:

- 4.5.3.1 How are economic and social factors considered in scientific analyses and advice to fisheries management? **Till now, these factors are neither included in biological scientific analyses nor advices.**
- 4.5.3.2 How are socio-economic studies coordinated, and how may they be improved? **N/K**
- 4.5.3.3 What are the priorities for future monitoring, data collection and analysis? **These priorities should be identified by DEEPFISHMAN partners under the project.**
- 4.5.3.4 For EU fleets, are socio-economic data provided under the DCF? Please list. **I do not really know. IEO do not provides this kind of information, but maybe other National Bodies do it (i.e. General Secretary of the Sea)**
- 4.5.3.5 Are there any aspects of data and knowledge (quality, temporal and spatial extent, time series, availability, accessibility, flow) that [a] impact on assessments and/or [b] affect your ability to provide timely fisheries advice to managers?

Section 5: Review of known and likely impact of the fisheries on deep-water biodiversity and VMEs.

- 5.1 Please list below all previous and current studies of biodiversity in the area inhabited by your stock and append time-series data used. **In addition to impacting on vulnerable deep water fish stocks, deep water fisheries often have contact with the seafloor, causing damage and/or destroying important deep water habitats such as cold water coral reefs and associated benthic habitats.**
- 5.2 Please review each study identifying the aims, methods and data used, outcomes and recommendations made. **DEEPER Project**
- 5.3 Have any of these studies related biodiversity trends to fishings impacts? If so please review. **DEEPER Project**
- 5.4 If biodiversity studies have not been carried out are there any existing data that can be used? Please append.
- 5.5 What in you opinion would be the best way forward to investigate the impacts of fishing on biodiversity in your stock area? **Ad hoc surveys. Photographic sampling of epifauna with submarine camera or ROV is especially recommended because the hard bottoms of the Strait of Gibraltar area. Then the photographic sampling could be complemented by dredging certain areas.**
- 5.6 Please list below all previous and current studies of the condition of VMEs in the area inhabited by your stock. **DEEPER Project**
- 5.7 Please review each study identifying the aims, methods and data used, outcomes and recommendations made. **DEEPER Project**

5.8 Have any of these studies investigated the impacts of fishing on VMEs? If so please describe. **Not yet**

5.9 If VME/fishing interaction studies have not been carried out are, what in your opinion would be the best way forward to investigate the impacts of fishing on VMEs in your stock area ?

5.10 Are there any aspects of data and knowledge (quality, temporal and spatial extent, time series, availability, accessibility, flow) that [a] impact on assessments and/or [b] affect your ability to provide timely fisheries advice to managers?

Section 6: Review of current and historical management and monitoring procedures

6.1 Management procedures

6.1.1 Please tick which mechanisms are in **currently** place to manage your stock, fisheries, ecosystems, VMEs and PET species?

Management mechanism	Stock	Fisheries	Ecosystems	VMEs	PETs
Free access (totally unregulated)					
TAC	X	X			
ITQ (individual transferable quotas)					
IQ (individual non-transferable quotas)					
TURF (territorial use of right fishing) ⁷		X			
Effort limitation (gear, days at sea etc)		X			
Licensing		X			
Capacity limits					
Technical Measures		X			
Spatial closures		X			
Temporal Closures		X			
VME Encounter protocols					
PET Encounter protocols					
Others					

6.1.2 What are the possibilities of entry i.e. how and how easily newcomers can enter the fishery? Are there legal, economic or social barriers to entry? **There is a closed list of authorized vessels which has been updated since 1997. Currently, from 2007 the list includes 103 boats.**

6.1.3 Who controls the fishing area, sets the management policies and carries out surveillance (i.e. monitoring and enforcement of fisheries management)? Please describe the monitoring and surveillance methods used. **International, National and local administrations. Management policies could be set by EU, Spanish Government and Andalusia Regional Government (Junta de Andalucía). Enforcement and surveillance are carried out by several national and regional agencies (fish inspection mainly) but it does not work well in the last years (I'm quite disappointed with fishermen about their total absence of "co-responsibility"). The scientific monitoring of fisheries is performed the IEO (landings, length distribution and target species biology).**

6.1.4 Is IUU (Illegal, unregulated and unreported) fishing a problem for your stock? If so please describe. **Maybe in the last year because the landings increase.**

6.1.5 How do you interact with other agencies and fisheries management bodies to combat IUU fishing? **No way.**

6.1.6 Are measures in place in place to track the products of harvested species? If so, please describe and review. **Yes, a sort of quality brand. For the red seabream labeling protected by the trademark "Quality Certified "as well as several National regulations on the identification of fishery products, aquaculture and seafood live, fresh, refrigerated or cooked. Traceability system consists of three basic elements: Labels, traceability proof**

⁷ Rights-based mechanism where right to fish is associated with a specific area where the management authority is at the local (TURF) level.

(which identifies all goods purchased by the buyer) and the local traceability database (which contains computerized details of any sale transaction).

6.1.7 At each level (stock, fisheries etc), please describe any management procedures that have been tried in the past and have not been successful. Please describe why they did not work?

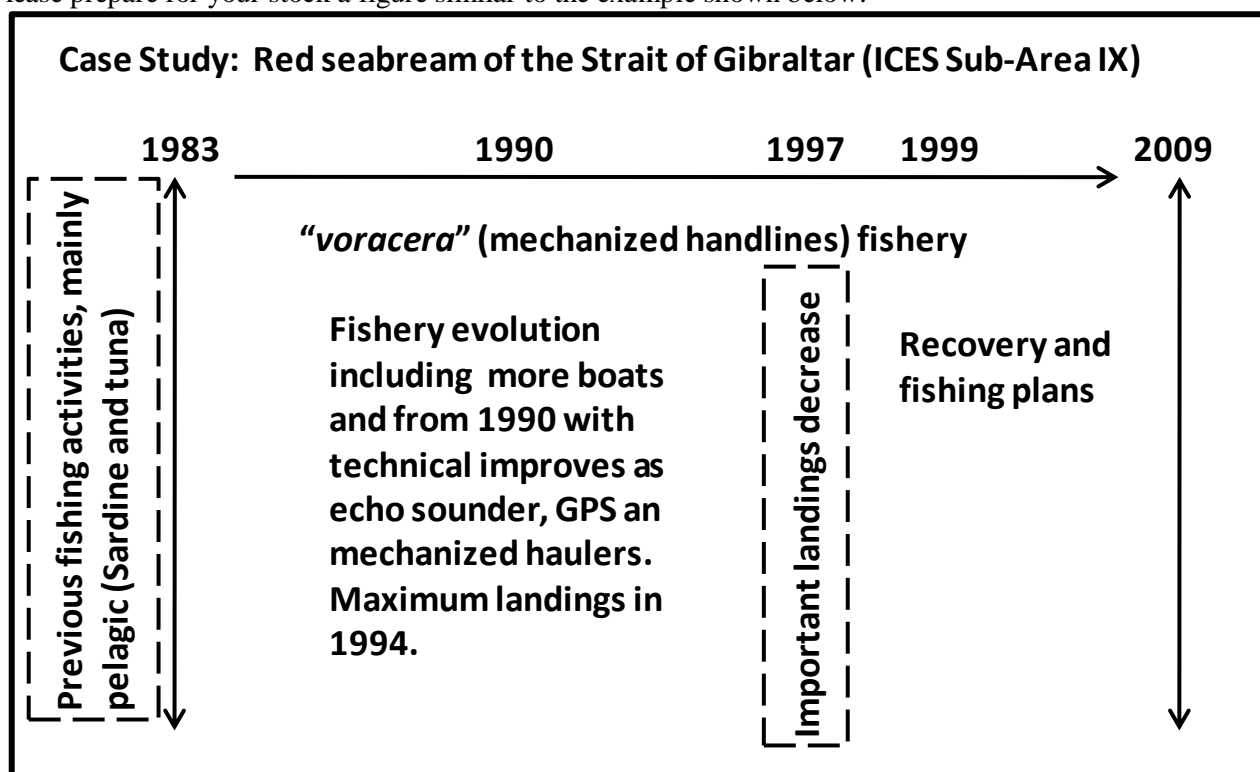
At stock level: Since 2003, a regime of TAC and Quotas has been applied also to the *P. bogaraveo* fishery in ICES Subarea IX. The following table shows a summary of *P. bogaraveo* TAC which is by far never reached in all these years. Thus for 2007 and 2008 a 1080 t TAC was established for whole Subarea IX. This is more than the double of the total landings of the Subarea and still does not seem a relevant constraint. The WGDEEP Group was of the opinion that further management measures, including a reduction in TAC may be appropriate (from 2009 ICES WGDEEP Report).

<i>P. bogaraveo</i>		2003-2004		2005-2006		2007-2008	
ICES Subarea.	TAC	Landings	TAC	Landings	TAC	Landings	
IX	1271	471 - 480	1080	494 - 544	1080	592 - 601*	

* Preliminary

At fisheries level: Recovery and Fishing Plans maintains the stock at stable levels but there are not recovery signs yet. Maybe because when the population seems to recover, fishing mortality (landings) increases again (as in other places fishermen use to be a little impatient). Again, I'm quite disappointed with fishermen about their total absence of "co-responsibility".

6.1.8 Please prepare for your stock a figure similar to the example shown below:-



6.2 Management procedures at the stock level

6.2.1 Please describe the management procedures currently in place. EU TACs

6.2.2 What has been the strengths and weakness of these procedures? TACs higher than landings (see 6.1.7). Also there is an "old" ICES advice which said that effort management could be a better way than TACs and quotas to manage some fisheries.

6.2.3 How could they be improved? Better knowledge about stock structure for reliable assessments which should includes uncertainty levels maybe is the first necessary step. While, the precautionary approach should be strictly taken into account till the fishery sustainability is demonstrated.

6.2.4 Should other types of management procedures be considered? Is so please describe and identify expected benefits. As Commissioner Joe Borg said, at the opening of the 2009 ICES Annual Scientific Conference, scientists

would need to interact with stakeholders and governments at regional level to develop ideas about the management of the relevant fisheries in order to achieve the broader goals of the Common Fisheries Policy (CFP). Also the fishing industry should take more responsibility in this framework and in the outcomes of the policy (self management for instance) because those with an intimate knowledge of the fished species and the practices undertaken would have more of a say in how it are managed.

6.3 Management procedures at the fisheries level

6.3.1 Please describe the management procedures currently in place. **Recovery and Fishing Plans for *P. bogaraveo* in the Strait of Gibraltar. The adopted technical measures are: closure of the fishing season during two and half months (15th January - 31st March), minimum size of fish retained or landed (MLS: 33 cm total length), authorised vessels list, hook size, maximum hooks per line (100), maximum number of lines per boat (30), maximum number of automatic machines for hauling per boat (3), restricted ports for landing the red seabream catches (only Tarifa and Algeciras)...and also a more restrictive TAC (270 tons) than the contemplate in EU regulation.**

6.3.2 What has been the strengths and weakness of these procedures? **The total absence of regulations performance, except the seasonal closure. From 2005 onwards landings increase every year and exceed the TAC included in the fishing plans.**

6.3.3 How could they be improved? **Control and enforcement of the management measures.**

6.3.4 Should other types of management procedures be considered? Is so please describe and identify expected benefits. **Same that in point 6.2.4. On the scientist part, new approaches as Management Strategies Evaluation (MSE) should be a way to be considered and developed. Hope advances in this point should be reached under the DEEPFISHMAN Project.**

6.4 Management procedures at the ecosystem level

6.4.1 Please describe the management procedures currently in place. **None**

6.4.2 What has been the strengths and weakness of these procedures?

6.4.3 How could they be improved? **Before improving it would be implemented. The need to continue the move towards an ecosystem approach stills.**

6.4.4 Should other types of management procedures be considered? Is so please describe and identify expected benefits.

6.5 Management procedures relating to VMEs

6.5.1 Please describe the management procedures currently in place. **None**

6.5.2 What has been the strengths and weakness of these procedures?

6.5.3 How could they be improved? **Before improving it would be implemented.**

6.5.4 Should other types of management procedures be considered? Is so please describe and identify expected benefits?

6.6 Management procedures relating to PET species

6.6.1 Please describe the management procedures currently in place. **Marine mammals and turtles international protection laws.**

6.6.2 What has been the strengths and weakness of these procedures?

6.6.3 How could they be improved?

6.6.4 Should other types of management procedures be considered? Is so please describe and identify expected benefits.

6.7 Comparison of management measures introduced against scientific advice

6.7.1 Please complete the following table for your stock and related fisheries. In your opinion has the scientific advice been followed by Management Bodies? Please score 0 (not at all) to 10 (fully adhered to) in column on right. **The table was made only with the information about the EU and regional Total Allowable Catches (TACs).**

Year	Scientific advice	Agreed management measures	Adherence (score 0 to 10)
2000		Fishing Plan	6
2001		Fishing Plan	6
2002		TAC / Fishing Plan	6
2003		TAC / Recovery Plan	6
2004		TAC / Recovery Plan	6
2005	ICES recommends that red seabream can only sustain low rates of exploitation. Fisheries on such species should be permitted only when they are accompanied by programmes to collect data and should expand very slowly until reliable assessments indicate that increased harvests are sustainable	TAC / Recovery Plan	6
2006	ICES recommends that red seabream can only sustain low rates of exploitation. Fisheries on such species should be permitted only when they are accompanied by programmes to collect data and should expand very slowly until reliable assessments indicate that increased harvests are sustainable	TAC / Recovery Plan	5
2007	ICES recommends that red seabream can only sustain low rates of exploitation. Fisheries on such species should be permitted only when they are accompanied by programmes to collect data and should expand very slowly until reliable assessments indicate that increased harvests are sustainable	TAC / Fishing Plan	4
2008	ICES recommends that catches in Areas IXa and Xa should be constrained to recent average catches (2003–2007) of 500 t in Area IXa and to collect information that can be used to evaluate a long-term sustainable level of exploitation	TAC / Fishing Plan	3
2009	ICES recommends that catches in Divisions IXa and Xa should be constrained to recent average catches (2003–2007) of 500 t in Division IXa	TAC / Fishing Plan	0

	and 1050 t in Division Xa and to collect information that can be used to evaluate a long-term sustainable level of exploitation.	
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6.8 Data-poor stocks and the Precautionary Approach

6.8.1 In your opinion, is your stock/fishery data-poor? Please score on a scale 1 (extremely data-poor) to 10 (extremely data-rich). Please justify your scoring. **Despite sound really optimistic the score could be 6, because we have enough data but only for the target species.**

6.8.2 In your opinion have Management Bodies made adequate use of the Precautionary Approach. If they have, please cite examples. If they have not, please cite examples. **I don't think so. Usually management bodies only when the situation is clearly unsustainable....I mean an important decrease of landings. A clear example is this Case of Study: Management procedures start in 1998, after a very clear landings decrease.**

6.9 Ecosystem and socio-economic considerations.

6.9.1 Describe and review how existing managing procedures take into account ecosystem considerations. **None**

6.9.2 How can this be improved? **Development of ecosystem studies to give the basis for it.**

6.10 Stocks under moratorium/collapsed fisheries

6.10.1 Is your stock under moratorium or have fisheries recently collapsed? **No, but there is a Recovery and Fishing Plan.**

6.10.2 If yes, is a Recovery Plan in place? If yes, please describe. **See point 6.3.1**

6.10.3 Please review the strengths and weaknesses of the plan and, if appropriate, please identify how it could be improved. **See point 6.3.2 and 6.3.3**

6.10.4 If a recovery plan is not in place please explain why and express what, in your opinion, is required.

6.11 Stocks managed under a management strategy framework

6.11.1 Is a management strategy framework in place for your stock? If yes please describe. **None**

6.11.2 Please review the outcomes from the most recent Management Strategy Evaluation and describe what effects the outcomes have had on management.

6.12 International Plan of Action (IPOA)

6.12.1 Where applicable do the fisheries for your stock follow IPOA guidelines⁸? If so please describe

6.13 Current/short term (<5 yrs) management issues

6.13.1 What are the main management issues currently facing your stock/fisheries Please prioritise.

Priority	Description of issue	Is issue being addressed? Yes /no
1	Recovery	Not yet
2	Sustainability	Unfortunately not

6.13.2 If the issue is currently being addressed, please describe how, below.

⁸ FAO website: <http://www/fao.org/fishery>

6.13.3 If the issue is only partially or not being addressed please describe what further/additional procedures/measures are required. **More control and enforcement of the management measures.**

6.14 Long-term (>5 yrs) management issues

6.14.1 What are the main management issues currently facing your stock/fisheries? Please prioritise.

Priority	Description of issue
1	Sustainability

6.14.2 Express in your opinion how these issues could be addressed.

6.15 Monitoring procedures

6.15.1 What are the main monitoring issues currently facing your stock/fisheries? Please prioritise.

Priority	Description of issue
1	Assesment difficulties
2	MSE

6.15.2 Express in your opinion how these issues could be addressed.

6.16 Monitoring at sea

For each fleet identified in 2.1.1 with vessels carrying observers:-

6.16.1 Please list and prioritise the problems observers encounter at sea.

6.16.2 How can these problems be addressed?

6.16.3 Is there any coordination of observer sampling plans and observer activity across and between fleets from different Member States and other non-EU countries? If so please review. **None**

6.16.4 Please describe and review any other sea-going monitoring programmes in place. **None**

6.16.5 Please identify the strengths and weaknesses of existing monitoring programmes at sea

6.16.6 How could they be improved?

6.17 Port-based monitoring

For each fleet identified in 2.1.1:-

6.17.1 Please review any port-based sampling schemes, citing % landings/discards coverage, essential data collected and other non-essential data collected?

6.17.2 Please list and prioritise the problems encountered sampling landings/discards from your stock.

6.17.3 How can these problems be addressed?

6.17.4 Is there any coordination of port sampling plans across and between Member States and non-EU countries? If so please review.

6.17.5 Please describe and review any other shore-based monitoring programmes in place

6.17.6 Please identify the strengths and weaknesses of existing shore-based monitoring programmes.

6.17.7 How could they be improved?

6.18 EU Data Collection Framework (DCF)

6.18.1 For each fleet identified in 2.1.1, please list data and information currently collected under the DCF. **DCR National reports**

6.18.2 Please identify the strengths and weaknesses of the EU DCF?

6.18.3 How could it be improved for your stock?

6.19 Gap analysis of past and present scientific projects and data collection programmes

6.19.1 What are the main gaps in scientific knowledge and in data collection programmes. Please prioritise.

Category	Issue
Scientific	<ol style="list-style-type: none">1. Ageing2. Fish ecology3. Ecosystem knowledge
Data collection	<ol style="list-style-type: none">1. Morocco catches2. Seasonal closures

6.20 Fisheries monitoring in general

6.20.1 Are there any aspects of monitoring data and information (quality, temporal and spatial extent, time series, availability, accessibility, flow) that [a] impact on assessments and/or [b] affect your ability to provide timely fisheries advice to managers?

Section 7: Please review the key uncertainties about the biology, data and management for your stock and any other issues relevant to DEEPFISHMAN

One point of view that we must not lose sight is the characteristic hermaphroditism of the species. An annual reproductive cycle is defined for the species by Gil and Sobrino in 2001: The spawning season seems to take place during the first quarter of the year. The smallest specimina are mainly males, maturing at a L50=30.1 cm. Around 32-33 cm length an important part of individuals suffers a sexual inversion. Females maturing at L50=35.1 cm.

Regards the assessments trials, the use of an unique (combined) Age Length Key (ALK) to transform length data into age data for the assessment. Combined ALK must not be applied to samples taken in a different year, because they could give biased results (Westrheim and Ricker, 1978) and does not take into account possible growth differences between years. Combined ALK is obtained by agree age readings since 2003. It comprises ages between 3 and 10. Younger ages are well sampled while the older groups are susceptible to poorer estimates. Results are preliminary and are not validated yet. The oldest age group (10) should be consider as plus group (10+) because at least one sample is recaptured 10 years later from its tagging.

Since 2006 assessment trials were attempted by separable VPA. We don't have enough tuning fleet data series yet. However this should be change 2010 when we can try a XSA exercise (because we fill five years data, 2004-2008, from onboard observers program). But, the first problem remains (use of a combined ALK).

As an alternative the use of Production models, ASPIC...to avoid problems in the age conversions should be problematic because the effort unit chosen. It is important to emphasize that the effort unit chosen cannot be too appropriate as do not consider the missing effort. Thus, in the recent years this missing effort increases substantially (fishing vessels with no catches and precisely why with no sale sheet to be recorded). This way it is advisable to interpret with caution the LPUE trend in the last years because it cannot be a real image of the resource abundance.

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EXECUTIVE SUMMARY

Since the early 1980's an artisanal handline fishery targeted to the red seabream (*Pagellus bogaraveo*, namely "voraz") have been developing along the Strait of Gibraltar area (ICES IXa south). The "voracera", a particular mechanised hook line baited with sardine, is the gear used by the fleet. In the early years of the fishery there were only 25 small while currently the fleet has increased to more than a hundred. The base ports of the boats involved in this fishery are only two: Tarifa and Algeciras (Cádiz, SW Spain).

The fishing is carried out taking advantage of the turnover of the tides in bottoms from 200 to 400 fathoms. Usually landings are distributed in categories due to the wide range of sizes and to market reasons. These categories have varied along the time. Actually this fishery covers almost the 70 % of the landings for the species in the Subarea IX. This fishery has already been broadly described in previous papers and was also the main focus of a PhD Thesis.

An annual reproductive cycle is defined for the target species in this area: The spawning season seems to take place during the first quarter of the year. The smallest specimens are mainly males, maturing at a $L_{50}=30.15$ cm. Around 32.5 cm total length an important part of individuals change sex and become females. Females maturing at $L_{50}=35.73$ cm. Thus, a brief journey through the species vital history could be as follows: Spawning season in the Strait of Gibraltar takes place in the first quarter of the year and eggs drift towards both coasts. Juveniles grow till 12 - 15 cm in the first year and inhabit coastal bays, reefs and even harbors. Along the first three years of life, fish leaves coastal embayment and occupies shallow (less than 200 m) bottoms close to the Strait. After, individuals move to the Strait where they reach maturity at 30 cm (males) and 35 cm (females). Adult feeding grounds are distributed along the entire Strait of Gibraltar and the species seems to remain in this area as a resident population.

Since 2003, EU set up a regime of TAC and Quotas has been applied also to the *P. bogaraveo* fishery in Subarea IX. Moreover, some technical measures have been set up by the Spanish Central Government, in 1998, and by the Regional Government of Andalucía since 1999, in order to regulate the fishing activity and to conserve the resource. More recently a Regional Recovery Plan for *P. bogaraveo* related to this Spanish fishery in the Strait of Gibraltar area has been implemented by the Regional Government of Andalucía for 2003-2008.

The Instituto Español de Oceanografía (IEO) began the study and the fishery monitoring following the request from the Fishermen Corporations in 1997 and all the information available is presented in ICES WGDEEP since 2000. In 2006 and 2008, assessment trials were attempted in this forum. However we have to deal with some difficulties which should be bear in mind. First, the use of an unique (combined) Age Length Key (ALK) to transform length data into age data for the assessment. Combined ALK must not be applied to samples taken in a different year, because they could give biased results and does not take into account possible growth differences between years. Second, since 2006 assessment trials were attempted by separable VPA. We don't have enough tuning fleet data series. However this should be change this year we can try a XSA exercise (because we fill five years data, 2004-2008, from onboard observers program). But, the first problem remains (use of a combined ALK). The use of Production models to avoid problems in the age conversions are not a good alternative because the problem of the effort unit which cannot be too appropriate as do not consider the missing effort. Moreover, another point of view that we must not lose sight is the characteristic hermaphroditism of the species.

Improvements in the data and assessments quality should be a good way to provide the best scientific basis for the fishing resource management in order of its sustainability.

To be revised and agreed under the DEEPFISHMAN Project.