Report of the 4th Meeting of the

Mediterranean Planning Group for Methodological Development

(PGMed)

Data Collection Framework (DCF)
Commission Regulation n. 199/2008,
Commission Decision 949/2008

Lisbon, 1st - 6th March 2010

Meeting Report

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ANNEXES

1. Background

During the 2006 Regional Coordination Meeting for the Mediterranean area (RCMMed 2006) the creation of a Planning Group for the Mediterranean (PGMed 2007) was recommended, as a forum similar to the ICES Planning Group on Commercial Catch, Discards and Biological Sampling (PGCCDBS) for discussing methodological matters related to data collection referring particularly to the Mediterranean area.

During the 4th RCM Med (RCMMed 2007) it was clarified that PGMed operates under the umbrella of the RCM Med, and it was recommended that the chairman of the PGMed participates to the RCM Med. The need for maintaining strong links with the General Fisheries Commission for the Mediterranean (GFCM) and the ICES PGCCDBS was strongly supported.

Following the proposal of the 2006 3rd Liaison Meeting, the first meeting of the PGMed was arranged to take place jointly with the 2007 PGCCDBS meeting in Malta (5th – 9th March 2007).

Although organized in an autonomous group, it was agreed among all scientists that the contact and cooperation between the Mediterranean area and the ICES area (PGCCBDS) should be promoted and maintained.

The link between the two planning groups (PGs) will be maintained through:
(i) the inclusion of each group's report as an annex of the other;
(ii) the organization of parallel meetings;
(iii) the organization of joint plenary for generic issues;
(iv) the organization of joint workshops.

2. Introduction

The 4th Meeting of the Mediterranean Planning Group for Methodological Development (PGMed) was arranged in parallel with the ICES Planning Group of Commercial Catches, Discards and Biological Sampling (ICES PGCCDBS) in Lisbon from the 1st – 6th March, 2010. The conduction of parallel meetings between the two groups ensured the link between them.

The 2010 PGMed was attended by 4 Mediterranean Member States (Spain, France, Italy, and Malta). Unfortunately for this meeting 5 Mediterranean Member states including Greece, Cyprus, Slovenia, Bulgaria and Romania were not represented during the meeting. The lack of these member states affected negatively the progress of the meeting; first due to lack of data from some of these Mediterranean and Black Sea countries and secondly certain proposals were made without the input from these

member states. The list of participants and the terms of reference are provided in Annex I & II respectively.

The Group revised and approved the Terms of Reference (Annex II) proposed during the 2009 RCM Mediterranean & Black Sea (RCM Med&BS 2009) and as endorsed by the Liaison meeting 2009 (RCM Med&BS 2009).

The agenda was planned in order to have a common plenary of both PGMed and PGCCDBS groups during the first two days and separate sessions dealing with the specific Mediterranean ToRs (Annex II) in the remaining days. A short summary of the issues addressed during the common session with, which are also relevant to the Mediterranean, are reported in the Annexes from III to XI and as listed below:

Annex III Workshop on Age Estimation of European hake (*Merluccius merluccius*) [WKAEH]

Annex IV Workshop on Age Reading of Red mullet (*Mullus barbatus)* and Striped mullet (*Mullus surmuletus)* [WKACM]

Annex V Workshop on the Age Reading of Anchovy (*Engraulis encrasicolus)* [WKARA]

Annex VI Mackerel (*Scomber scombrus*) otolith exchange

Annex VII European Age Readers Forum – Sharepoint

Annex VIII Workshop on crustaceans (*Aristeus antennatus, Aristaeomorpha foliacea, Parapenaeus longirostris, Nephrops norvegicus*) maturity stages [WKMSC]

Annex IX Web Services for support of Growth and Reproductions Studies (WebGR)

Annex X Workshop on Methods to Evaluate and Estimate the Precision of Fisheries Data used for Assessment [WKPRECISE]

Annex XI Workshop on Methods for merging metiers for fishery based sampling [WKMERGE]

3. Terms of Reference as prepared by the Liaison meeting 2009

1) Conduct a ranking system for the whole Mediterranean area in view of the regional approach in sampling. MS have to provide catch, effort and value data by metier according to the template in the guidelines which will be distributed before the PGMED 2010 meeting. The data will be used to undertake ranking of metier at level 6.

In order to identify the major metiers present in the Mediterranean Region, the ranking system described in the DCF (EC 949/2008) was applied. The data on landings, effort and value for the different countries was collated. Data was available from Italy, France, Spain, Malta and Cyprus. Unfortunately data from Greece and Slovenia in the

Mediterranean Area and from Bulgaria and Romania in the Black Sea area was not available. For the Mediterranean area, the lack of data from Greece may have skewed the analysis since Greece has a considerable contribution towards landings, effort and value in the Mediterranean.

The ranking system was performed at the regional level using as reference the values of the year 2007. The metier cells (excluding 'Misc' metiers) were first ranked according to their share in the total commercial landings (tons) (Table 1). Thereafter the shares were cumulated, starting with the largest, until a cut-off level of 90% was reached. Mètiers which did not belong to the top 90% in terms of total effort, value or landing were removed from the final table.

Table 1 – Results of the ranking system at a cut-off level of 90%, based on Catches (t) 2007 for the Mediterranean region and segmented according to Appendix VII of EC 949/08

Level 4	Level 5	Level 6	Total (t)	Catches (%)
Bottom otter trawl [OTB]	Demersal species	>=40	78832.80	20.63
Purse seine [PS]	Small pelagic fish	>=14	78458.73	20.53
Bottom otter trawl [OTB]	Mixed demersal species and deep water species	>=40	52146.09	13.65
Pelagic pair trawl [PTM]	Small pelagic fish	>=20	49966.38	13.08
Boat dredge [DRB]	Molluscs		32650.76	8.55
Midwater otter trawl [OTM]	Mixed demersal and pelagic species	>=20	18416.44	4.82
Trammel net [GTR]	Demersal species	>=16	16493.36	4.32
Set gillnet [GNS]	Demersal species	>=16	11682.20	3.06
Drifting longlines [LLD]	Large pelagic fish	(a)	10801.91	2.83

The ranking was then repeated according to the total value of the commercial landings (€) (Table 2) and the total effort in days at sea (table 3).

Table 2 – Results of the ranking system at a cut-off level of 90%, based on Value (million €) 2007 for the Mediterranean region and segmented according to Appendix VII of EC 949/08

Level 4	Level 5	Level 6	Total (million €)	Value (%)
Bottom otter trawl [OTB]	Mixed demersal species and deep water species	>=40	450.00	28.4
Bottom otter trawl [OTB]	Demersal species	>=40	288.00	18.21
Purse seine [PS]	Small pelagic fish	>=14	128.00	8.13
Pelagic pair trawl [PTM]	Small pelagic fish	>=20	116.00	7.32
Trammel net [GTR]	Demersal species	>=16	113.00	7.15
Set gillnet [GNS]	Demersal species	>=16	111.00	7.04
Boat dredge [DRB]	Molluscs		95.72	6.05
Drifting longlines [LLD]	Large pelagic fish	(a)	86.35	5.46
Set longlines [LLS]	Demersal fish	(a)	51.14	3.23

Table 3 – Results of the ranking system at a cut-off level of 90%, based on Effort (days at sea) 2007 for the Mediterranean region and segmented according to Appendix VII of EC 949/08

Level 4	Level 5	Level 6	Total	% Effort
Trammel net [GTR]	Demersal species	>=16	527220	24.95
Set gillnet [GNS]	Demersal species	>=16	416148	19.69
Bottom otter trawl [OTB]	Demersal species	>=40	277763	13.14
Bottom otter trawl [OTB]	Mixed demersal species and deep water species	>=40	271400	12.84
Set longlines [LLS]	Demersal fish	(a)	135009	6.39
Boat dredge [DRB]	Molluscs		86053	4.07
Pots and traps [FPO]	Demersal species	(a)	78220	3.70
Purse seine [PS]	Small pelagic fish	>=14	60985	2.89
Drifting longlines [LLD]	Large pelagic fish	(a)	51039	2.42

The results of the ranking system show that on a Regional level, 11 metiers were selected (Table 4). Boat dredge, Bottom otter trawl, drifting longlines, purse seine, set gillnets and trammel nets were selected by all the three ranking procedures i.e. landings, value and effort, making these metiers extremely important for the Mediterranean region.

Table 4 – Mètiers selected by the ranking systems based on landings , value and effort 2007 for the Mediterranean region and segmented according to Appendix VII of EC 949/08.

Level 4	Level 5	Level 6	Selected by ranking system			
Boat dredge [DRB]	Molluscs		**ALL**			
Bottom otter trawl [OTB]	Demersal species	>=40	**ALL**			
Bottom otter trawl [OTB]	Mixed demersal species eep water species	>=40	**ALL**			
Drifting longlines [LLD]	Large pelagic fish	(a)	**ALL**			
Purse seine [PS]	Small pelagic fish	>=14	**ALL**			
Set gillnet [GNS]	Demersal species	>=16	**ALL**			
Trammel net [GTR]	Demersal species	>=16	**ALL**			
Pelagic pair trawl [PTM]	Small pelagic fish	>=20			**Catches**	**Value**
Set longlines [LLS]	Demersal fish	(a)		**Effort**		**Value**
Pots and traps [FPO]	Demersal species	(a)		**Effort**		
Midwater otter trawl [OTM]	Mixed demersal and pelagic species	>=20			**Catches**	

2) For the metiers which are exploiting a shared stock and selected by the ranking system the number of sampling trips by metier at the GSA level can be determined. MS should bring the data on catches, effort, value and stock related variables by GSA of the shared stocks. Data on the fishing pattern of the fleet fishing on shared stocks in respective GSAs should also be provided. A template will be distributed before the meeting.

From the available data and participants, the group examined two case studies where a shared stock and metier exist. In the Gulf of Lion (GSA 7) stock of hake (*Merluccius merluccius*) and red mullet (*Mullus barbatus*) are shared by France and Spain and exploited by the shared metier bottom otter trawl targetting demersal species (OTB Demersal). In the Strait of Sicily the metier OTB mixed demersal species and deep water species is shared by Italy and Malta targetting also hake and red mullet.

The group examined the share of landings and effort (2008 data) for the shared metiers and the number of sampling trips by each member state of the respective metier. Tables 5 and 6 shows the % landings and effort for each country together with the estimated number of trips to be sampled based on the proportion of landings and effort by each member state. The table also shows the current number of sampling trips by each respective member state.

Table 5 - Share of landings and effort in the Gulf of Lion (GSA 7) by France and Spain and the allocation of sampling trips by each respective member state.

OTB Demersal (GSA 7)	Landings (%)	Effort (%)	Sampling trips (%)	Number of sampling trips	
				Estimated based on landings, effort	Current
Spain	12	15	19	17	21
France	88	85	81	95	91

Table 6 - Share of landings and effort in the Strait of Sicily (GSAs 15&16) by Italy and Malta and the allocation of sampling trips by each respective member state.

OTB Demersal (GSA 15&16)	Landings (%)	Effort (%)	Sampling trips (%)	Number of sampling trips	
				Estimated based on landings, effort	Current
Italy	98	97	89	73	67
Malta	2	3	11	2	8

The group recognised that the current allocation of sampling trips by each member state is very similar to the estimates based on landings and effort and hence the group does not recommend any adjustements to the number of sampling trips by each respective member states for both shared metiers.

3) Undertake a review of the bibliography on discards by metier to determine if the discard behaviour by metier is acceptable. PGMed should advice RCM 2010 if this table should be revised for a particular metier.

Table 3.3.4 of the RCM Med&BS report was reviewed in order to determine if the discard behaviour by metier is acceptable or not. Minor changes were made to the table with the exception of the inclusion of new miscellaneous metiers presented during the meeting by some member states. The suggested changes made are in bold, italics and should be address by the next RCMMed&BS 2010 (Varna, 16-21 May 2010).

Table 7 - Change made during the PGMed 2010 on table 3.3.4 of the RCM Med&BS 2009 on the discard behaviour by metier

METIER CODING	METIER NAMING	DISCARDS BEHAVIOUR
DRB_MOL_0_0_0	Boat dredge for molluscs	No
FPN_LPF_0_0_0	Stationary uncovered pound nets for large pelagic	No
FPO_DEF_0_0_0	Pot and Traps for demersal species	No
FYK_CAT_0_0_0	Fyke nets for eels	No
FYK_DEF_0_0_0	Fyke nets for demersal species	No
GND_DEF_0_0_0	Driftnets for demersal fish	should provide ref.
GND_SPF_0_0_0	Driftnets for small pelagic fish	should provide ref.
GNS_DEF_360-400_0_0	Set gillnets for demersal fish	YES ***(Black sea)***
GNS_DEF_>=16_0_0	Set gillnets for demersal fish according meshsize regulation	should provide ref.
GNS_SLP_>=16_0_0	Set gillnets for small and large pelagics according meshsize regulation	should provide ref.
GTR_DEF_>=16_0_0	Set trammel nets for demersal species according meshsize regulation	should provide ref.
LA_SLP_14_0_0	Lampara nets according meshsize regulation	***No***
LHP-LHM_FIF_0_0_0	Hand and Pole lines for finfish	No
LHP-LHM_CEP_0_0_0	Hand and Pole lines for cephalopods	No
LLD_LPF_0_0_0	Drifting longlines for large pelagic	YES
LLS_DEF_0_0_0	Set longlines for demersal fish	should provide ref.
LTL_LPF_0_0_0	Trolling lines for large pelagic	No
OTB_DEF_>=40_0_0	Bottom otter trawl for demersal species	YES
OTB_DWS_>=40_0_0	Bottom otter trawl for deep water species	YES
OTB_MDD_>=40_0_0	Bottom otter trawl for mixed demersal and deep water species	YES
OTM_MPD_>=13_19_0_0	Pelagic trawl according meshsize regulation	YES
OTM_MPD_>=20_0_0	Midwater otter trawl for mixed demersal and pelagic species	YES
PS_LPF_14_0_0	Purse seine for large pelagic	should provide ref.
PS_SPF_>=14_0_0	Purse seine for small pelagics according meshsize regulation	should provide ref.
PTM_SPF_>=20_0_0	Pelagic pair trawl for small pelagic species	YES
SB-SV_DEF_0_0_0	Beach and boat seines for demersal species	should provide ref.
TBB_DEF_0_0_0	Beam trawl for demersal trawling	YES
MISC	Miscellaneous metiers (defined at national level)	depending on the gear
MISC_HAR	***Misc. Harpoon for large pelagics***	***No***
MISC_PS_FAD	***Purse seine_with a Fish Aggregating Device (FAD)***	***No***
MISC GTN	***Combined gillnet/trammel net for demersal and pelagic fish***	***should provide ref.***

4) Update the work conducted in the RCM Med&BS 2009 for large pelagic species on sampling of length and stock related variables by using data for 2009. The results will be presented to the RCM 2010 and will be evaluated to be used for the next phase of the DCF, that is the 2011-2013 period.

The tables made by RCM Med&BS 2009 for sampling of large pelagics for length and stock related variables (age, weight, sex and maturity) were reviewed. The 2008 landing data for the dolphinfish *Coryphaena hippurus* was obtained from most countries and updated while for the other species data from the PGMed report 2009 (2008 data) was used after being reviewed and agreed by the participants.

Large pelagic length sampling

The number of fish to sample for length of large pelagics (*Thunnus thynnus, Sarda sarda, Xiphias gladius, Thunnus alalunga, Coryphaena hippurus*) per country for regional sampling was reviewed and new tables have been proposed. With respect to the 2009 landing data for all the large peagics this was not made available during the meeting for most countries and the group therefore decided to use 2008 data as a reference year to propose a new set of tables for length sampling of large pelagics in line with the regional approach (Tables 8,9,10,11).

Table 8 - Number of specimens of swordfish (*Xiphias gladius*) proposed in the NP 2010 for length sampling and numbers of specimens to be collected by each MS following the regional sampling approach.

Member state	**No. of fish proposed in the NP**	**Landings 2008**	**Proportion of Landings (2008)**	**No. of fish proposed to sample PGMED 2010**
Cyprus	10	67	0.01	13
Spain	75	2095	0.26	398
France	0	14	0.00	3
Greece	280	989	0.12	188
Italy	900	4549	0.57	864
Malta	250	260	0.03	49
Slovenia	0	0	0.00	0
Total	1515	7974	1	1515

Table 9 - Number of specimens of albacore (*Thunnus alalunga*) proposed in the NP 2010 for length sampling and numbers of specimens to be collected by each MS following the regional sampling approach

Member state	No. of fish proposed in the NP	Landings 2008	Proportion of Landings (2008)	No. of fish proposed to sample PGMED 2010
Cyprus	50	209	0.08	47
Spain	45	238	0.09	53
France	0	1	0.00	0
Greece	40	15	0.01	3
Italy	440	2104	0.82	470
Malta	0	5	0.00	1
Slovenia	0	0	0.00	0
Total	575	2572	1.00	575

Table 10 - Number of specimens of dolphinfish (*Coryphaena hippurus)* proposed in the NP 2010 for length sampling and numbers of specimens to be collected by each MS following the regional sampling approach

Member state	No. of fish proposed in the NP	Landings 2008	Proportion of Landings (2008)	No. of fish proposed to sample PGMED 2010
Cyprus	0	0	0.00	0
Spain	0	35	0.01	21
France	0	0	0.00	0
Greece	0	0	0.00	0
Italy	1000	2213	0.89	1336
Malta	500	237	0.10	143
Slovenia	0	0	0.00	0
Total	1500	2485	1.00	1500

Table 11 - Number of specimens of bonito (*Sarda sarda)* proposed in the NP 2010 for length sampling and numbers of specimens to be collected by each MS following the regional sampling approach

Member state	No. of fish proposed in the NP	Landings 2008	Proportion of Landings (2008)	No. of fish proposed to sample PGMED 2010
Cyprus	0	0	0.00	0
Spain	84	458	0.19	67
France	0	34	0.01	5
Greece	200	587	0.24	86
Italy	70	1323	0.55	194
Malta	0	7	0.00	1
Slovenia	0	0	0.00	0
Total	354	2410	1.00	354

For bluefin tuna length sampling the numbers agreed upon by the RCM Med&BS 2009 were not changed, however these are listed in table 12 for ease of reference.

Table 12 - Number of specimens of bluefin tuna (*Thunnus thynnus*) proposed in the NP 2010 for length sampling and numbers of specimens to be collected by each MS following the regional sampling approach

Year 2008	PURSE SEINE			LONGLINE			HANDLINE/TRAPS			TOTAL NUMBER OF FISH TO SAMPLE
Length Sampling	Production (tons)	MS %	nb. fish to sample RCM 2009	Production (tons)	MS %	nb. fish to sample RCM 2009	Production (tons)	MS %	nb. fish to sample RCM 2009	
France	0	0	0	134	10	110	0	0	0	110
Malta	2954	43	2423	165	12	136	0	0	0	2559
Spain	1527	22	1252	804	59	662	6	2	5	1919
Cyprus	643	9	527	5	0	4	0	0	0	531
Italy	939	14	771	216	16	178	149	60	123	1071
Greece	417	6	342	50	4	41	93	38	77	460
Caged in other country by France	210	3	172	0	0	0	0	0	0	172
Caged in other country by Italy	221	3	181	0	0	0	0	0	0	181
Total	6911	100	5669	1374	100	1131	248	100	204	**7004**

Large pelagic stock related variables sampling

The number of fish to sample for stock related variables (age, weight, sex and maturity) for large pelagics per country for regional sampling was reviewed and adjusted. For stock related variables when there were a low number of samples per country these were divided among other countries with a high number of samples. This was done in order to avoid a member state having to sample a low number of fish. For example in table 13, the number of swordfish specimens to be sampled by Cyprus was 8. Since this is a very low number these samples were transferred to Malta. This system was used throughout the regional sampling approach for stock related variables for all the large pelagics (Tables 13-17).

Since for large pelagics stock related variables have to be collected every three year period (EC 93/2010) and sampling will be conducted in 2010, the group recommends that the next sampling period for stock related variables will be conducted in 2013 by all member states simultaneously.

Table 13 - Number of specimens of swordfish (*Xiphias gladius*) proposed in the NP 2010 for sampling of stock related variables and numbers of specimens to be collected by each MS following the regional sampling approach

Member state	No. of fish proposed in the NP 2009	Landings 2008	Proportion of Landings (2008)	No. of fish to sample (RCM 2009)	No. of fish to sample in 2013 (PGMed 2010)
Cyprus	10	67	0.01	8	**0**
Spain	75	2095	0.26	262	**262**
France	0	14	0	2	**0**
Greece	280	989	0.12	124	**124**
Italy	900	4549	0.57	569	**569**
Malta	250	260	0.03	33	**43**
Slovenia	0	0	0	0	**0**
Total	1515	7974	1	997	**997**

Table 14 - Number of specimens of albacore (*Thunnus alalunga*) proposed in the NP 2010 for sampling of stock related variables and numbers of specimens to be collected by each MS following the regional sampling approach.

Member state	No. of fish proposed in the NP 2009	Landings 2008	Proportion of Landings (2008)	No. of fish to sample (RCM 2009)	No. of fish to sample in 2013 (PGMed 2010)
Cyprus	50	209	0.08	26	**29**
Spain	45	238	0.09	30	**30**
France	0	1	0	0	**0**
Greece	40	15	0.01	2	**0**
Italy	440	2104	0.82	263	**263**
Malta	0	5	0	1	**0**
Slovenia	0	0	0	0	**0**
Total	575	2572	1	321	**321**

Table 15 - Number of specimens of dolphinfish (*Coryphaena hippurus)* proposed in the NP 2010 for sampling of stock related variables and numbers of specimens to be collected by each MS following the regional sampling approach.

Member state	No. of fish proposed in the NP 2009	Landings 2008	Proportion of Landings (2008)	Nb. of fish to sample (RCM 2009)	Nb. of fish to sample in 2013 (PGMed 2010)
Cyprus	0	0	0	0	**0**
Spain	45	35	0	0	**0**
France	0	0	0	0	**0**
Greece	0	0	0	0	**0**
Italy	1000	2213	1	12	**1183**
Malta	500	237	0	1	**146**
Slovenia	0	0	0	0	**0**
Total	1500	2485	1	**1328**	**1328**

Table 16 - Number of specimens of bonito (*Sarda sarda*) proposed in the NP 2010 for sampling of stock related variables and numbers of specimens to be collected by each MS following the regional sampling approach

Member state	No. of fish proposed in the NP 2009	Landings 2008	Proportion of Landings (2008)	Nb. of fish to sample (RCM 2009)	Nb. of fish to sample in 2013 (PGMed 2010)
Cyprus	0	0	0	0	**0**
Spain	84	458	0.19	23	**25**
France	0	34	0.01	2	**0**
Greece	200	587	0.24	29	**29**
Italy	70	1323	0.55	66	**66**
Malta	0	7	0	0	**0**
Slovenia	0	0	0	0	**0**
Total	354	2410	1	120	**120**

For Bluefin tuna, the table proposed for length sampling in the RCM 2009 was not changed and adopted by the group. For the stock related variables when there were a low number of samples per country these were divided among other countries with a high number of samples. Furthermore the number of fish to sample was also amended by moving the number of samples from: 'Caged in third country by MS' to the respective MS. In the case of bluefin tuna since the stock is exploited by different metiers the number of samples to be collected by each member state was stratified by metier.

Table 17 Number of specimens of bluefin tuna (*Thunnus thynnus*) proposed in the NP 2010 for sampling of stock related variables and numbers of specimens to be collected by each MS following the regional sampling approach.

	PURSE SEINE				**LONGLINE**				HANDLINE/TRAPS			
Member State	Production (tons)	MS (%)	No. fish to sample	**No. of fish to sample in 2013 (PGMed 2010)**	Production (tons)	MS (%)	No. fish to sample	**No. of fish to sample in 2013 (PGMed 2010)**	Production (tons)	MS (%)	No. fish to sample	**No. of fish to sample in 2013 (PGMed 2010)**
France	0	0	0	**26**	134	10	17	**17**	0	0	0	0
Malta	2954	43	369	**369**	165	12	21	**22**	0	0	0	0
Spain	1527	22	191	**191**	804	59	101	**101**	6	2	1	0
Cyprus	643	9	80	**80**	5	0	1	**0**	0	0	0	0
Italy	939	14	117	**146**	216	16	27	**32**	149	60	19	20
Greece	417	6	52	**52**	50	4	6	**0**	93	38	12	12
Caged in third country by France	210	3	26	**0**	0	0	0	**0**	0	0	0	0
Caged in third country by Italy	221	3	28	**0**	0	0	0	**0**	0	0	0	0
Total	6911	100	864	**864**	1374	100	172	**172**	248	100	31	31

5) Assess the CV of large pelagics for length. Each MS should bring data to the meeting following a predefined template.

The precision, in terms of Coefficient of Variation (CV) of the Length Frequency Distributions (LFDs) for large pelagics was estimated by metier. The CV was assessed using the methodology described by Vigneau and Mahevas (2004). This method allows to estimate the precision, in terms of coefficient of variation (CV) for each length class and for the whole LFD at metier level.

The group examined the data available during the meeting and decided to calculate the Coefficient of Variation (CV) for Bluefin tuna (*Thunnus thynnus*) at Regional level, including the Surface Longline metier (SLL) for the years 2006 & 2007 and Purse Seine (PS) metier for 2007. The data used from the PS metier was derived from the tuna farms during harvesting. An attempt was also made to calculate the CV for 2007 by joing the two metiers, SLL & PS. For SLL 2007 and PS 2007 an attempt was also made to estimate the CV for the separate modes obtained in the respective LFDs.

The CV was also calculated for two other species, swordfish (*Xiphias gladius*), with data derived from the Surface Longline metier and dolphinfish (*Coryphaena hippurus*), with data derived from surrounding nets using Fish Aggregating Devices (FAD) metier.

Since data at trip level was not available the strata for the estimation of the CV were defined as the respective countries. For Bluefin tuna and swordfish, 5 cm length classes were used, while for dolphinfish 1 cm length classes were used. The CV was calculated for 90% of the number of individuals (by removing the tails – 5% on each side) according to the EC 949/2008. In most of the cases the LFD showed a bimodal distribution and consequently in some cases, (as described above) CV was calculated separately for the 2 modes. The results of the analysis can be seen in table 18, with LFD of the species examined in ANNEX XII

Table 18 Species by year and metier for which the CV for length was estimated. Note the large number (N) of length measurements available.

Species	**Year**	**Metier**	**Length Class**	**N**	**CV Vigneau and Mahevas (2004)**		
					All LFD	Mode1	Mode2
Thunnus thynnus	2006	SLL	5 cm	3707	0.64	0.02	0.76
Thunnus thynnus	2007	SLL + PS	5 cm	22478	0.4		
Thunnus thynnus	2007	SLL	5 cm	4607	0.39		
Thunnus thynnus	2007	PS	5 cm	17871	0.36	0.26	0.34
Xiphia gladius	2007	SLL	5 cm	15258	0.47		
Coryphaena hippurus	2007	FAD	1 cm	819	0.47		

The group noted that the CV estimates are dependant on the length class used. For example length classes of 2 cm may give significantly different CVs from length classes of 5 cm. The 5 cm length class used for tuna and swordfish was adopted durig the analysis as it is the length class

established by the RFMO (ICCAT). For large species, estimating CVs with small interval length classes may give very high CVs.

The results show that although a large number of fish were measured, in some cases 17871 fish (*T. thynnus* 2007 PS), the CVs were still considerably high (36%). When estimates of the CVs were made on the separate modes, the CVs obtained for them were still high. The length data when two metiers (*T. thynnus* 2007 SLL+PS) were combined the CV obtained was again very high.

Due to the short time available during the meeting the group could not pursue the analysis further. However the group would like to recommend that the estimation of precision (CVs) for large pelagic species is analysed further by

i) gathering data at trip level and using this data as the primary stratum for estimating CVs
ii) develop a methodology to estimate CVs for large pelagics and the current methodologies which have been developed for demersal species may not apply to large pelagics. However this has to be analysed further after the estimation of CVs with data at trip level as decribed in point (i) above.

7) The Liaison meeting recommends PGMed to better specify the perimeter of the study on the compilation of the GFCM task I for management purposes, in complimentary of SGMED provisions. PGMed to discuss the utility of this study and to provide a detailed description and terms of reference.

After lengthy discussion about this TOR the group agreed to propose a workshop to develop guidelines to convert DCF biological, economic and transversal data to GFCM Task I. The details and terms of reference can be found in Annex XIII

8) Propose workshop and studies to be evaluated by the RCM 2010.

One workshop was proposed on the guidelines to fill in the GFCM task I data matrix as explained above.

An otolith and scale exchange was also proposed in collaboration with the PGCCDBS. The exchange will involve a new set of *M. barbatus* otoliths from the Mediterranean new sets of *M. surmuletus* otoliths from the Mediterranean, the Gulf of Biscay and the English Channel in order to detect differences between areas. PGCCDBS recommends a small exchange in 2011 in order to clarify the ageing in these species and to compare age reading from otoliths and scales (PGMED). Kélig Mahé (France) will act as coordinator.

A scale exchange was also proposed for sea bass (*Dicentrarchus labrax*) and *Sparidae* spp. Several institutes are currently using scales for the routine age reading of species such as sea bass,

and sea bream. Scales are used for age determination of Sparidae spp. in the Mediterranean. A comprehensive exchange was recommended to identify if there are any issues with using scales for

age determination. The exchange will be organised during 2010-11. The coordinator will identify which species are currently being read using scales and will incorporate a maximum of five of these species in the exchange. France will act as coordinator for the exchange and the potential workshop.

An Angler (*Lophius piscatorius*) and black-bellied angler (*L. budegassa*) otolith exchange took place in 2001 and the last black-bellied angler (*L. budegassa*) otolith exchange took place in 2004. Landa *et al.* (2008), however, noted that previously used ageing criteria are not accurate. Small exchanges are therefore recommended for 2011, when new ageing criteria are expected. There is ongoing research to establish if a new protocol should be established when using illicia to estimate age. Full exchanges of otoliths and illicia are therefore recommended for 2011 new ageing criteria are expected. The co-ordinator has still to be confirmed.

9) AOB – Elasmobranches sampling

The Communication from the Commission to the European Parliament and the Council of 5 February 2009 on a European Community Action Plan for the Conservation and Management of Sharks (EC-APCMS, COM-2009-40) has recommended the collection of reliable and detailed species-specific quantitative and biological data concerning commercial fisheries involving catches of Chondrichthyans (hereinafter referred to as "sharks").

The group discussed the issue and agreed that the collection of sharks' biological variables (i.e. length frequency distribution) will be associated to the metier-related variables following the concurrent sampling approach.

Most of the proposed species in the new Appendix VII (actually the list presents 47 species of sharks and rays) of the EC 93/2010, are rare and with a sporadic and not confirmed presence in the Mediterranean area. During the period 2011-2013 all shark species will be collected concurrently for length. No stock-based sampling will be added if metier based sampling fails to provide the appropriate precision for length distributions.

In table IIIC5 the list of species to be sampled will be included together with the required precision level. However some cells were labelled as N/A (Not Applicable) since the minimum number of specimens to be sampled to achieve the required precision cannot be known '*a priori'* since no length samples are available for these species. Furthermore since most of the species are rare the number of samples recorded will be extremely low and hence the minimum number to achieve the precision target cannot be reached.

Stock related variables

Although we are not obliged to collect stock related variables (since the landings of sharks are less than 200 tons) from fisheries based sampling, data on “stock related variables” (i.e. weight, sex and maturity) will be collected during scientific survey (i.e. for the Mediterranean the MEDITS and the MEDIAS surveys). However the precision target for certain species will be difficult to achieve since most of the species are rare the number of samples recorded will be extremely low.

5. References

- RCMMed 2006. Report of the "3rd Regional Co-Ordination Meeting (RCM) for the Mediterranean Area" Malta, 26-28 April 2006, 51 pp.

- PGMed 2007. Report of the "1st Meeting of the Mediterranean Planning Group for Methodological Development (PGMed)" Malta, 6-8 March 2007, 24 pp.

- RCMMed 2007. Report of the "4th Regional Co-Ordination Meeting (RCM) for the Mediterranean Area" Cyprus, 23-27 April 2007, 90 pp.

- RCM Med&BS 2009. Report of the "6th Regional Co-Ordination Meeting (RCM) for the Mediterranean and Black Sea" Venice,13-17th October, 2009 pp.

- Liaison 2009. Report of the 6th Liaison Meeting between the Chairs of the RCMs, the chair of ICES PGCCDBS, the chair of PGMED, the ICES representative, the Chair of SGRN and the European Commission, Hamburg, February 2009, pp.

- EC 949/2008. Commission Decision (EC) No 2008/949/EC of 2008 adopting a multi annual Community programme pursuant to Council Regulation (EC) No 199/2008 establishing a Community framework for the collection, management and use of data in the fisheries sector and support for scientific advice regarding the Common Fisheries Policy.

- EC 93/2010. Commission Decision (EC) No 2010/93/EC of 2009

ANNEX I – List of Participants

Participant name	Institute	email	Country
Mark Dimech (Chair)	MRRA	mark.dimech@gov.mt	Malta
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Dario Pinello	IREPA	pinello@irepa.org	Italy
Beatriz Guijarro	IEO	beatriz@ba.ieo.es	Spain
Herwig Ranner	EC (DCF)	herwig.ranner@ec.europa.eu	European Commission

ANNEX II - Terms of References PGMED 2010

1) Conduct a ranking system for the whole Mediterranean area in view of the regional approach in sampling. MS have to provide catch, effort and value data by metier according to the template in the guidelines which will be distributed before the PGMED 2010 meeting. The data will be used to undertake ranking of metier at level 6.

2) For the metier which are exploiting a shared stock and selected by the ranking system the number of sampling trips by metier at the GSA level can be determined. MS should bring the data on catches, effort, value and stock related variables by GSA of the shared stocks. Data on the fishing pattern of the fleet fishing on shared stocks in respective GSAs should also be provided. A template will be distributed before the meeting.

3) Undertake a review of the bibliography on discards by metier to determine if the discard behaviour by metier is acceptable. PGMed should advice RCM 2010 if this table should be revised for a particular metier.

4) Update the work conducted in the RCM Med&BS 2009 for large pelagic species on sampling of length and stock related variables by using data for 2009. The results will be presented to the RCM 2010 and will be evaluated to be used for the next phase of the DCF, that is the 2011-2013 period.

5) Assess the CV of large pelagics for length. Each MS should bring data to the meeting following a predefined template.

6) Review the methodology used in the sampling of bluefin tuna and eel recreational fisheries. Every MS should bring a small description of the methodology used.

7) The Liaison meeting recommends PGMed to better specify the perimeter of the study on the compilation of the GFCM task I for management purposes, in complimentary of SGMED provisions. PGMed to discuss the utility of this study and to provide a detailed description and terms of reference.

8) Propose workshop and studies to be evaluated by the RCM 2010.

9) Address issues raised by the LM meeting 2009.

10) AOB

Issues related to elasmobranch sampling

ANNEX III - Workshop on Age Estimation of European hake (*Merluccius merluccius*) [WKAEH]

The workshop was held in Vigo, Spain, 9-13 Nov 2009. It was preceded by an exchange of digital images of otolith sections from 104 tagged fish recovered during all seasons and for which size at recapture ranged between 25 cm and 67 cm, between laboratories involved in the assessment of the hake stocks, for which the aims were:

1. To evaluate the age estimation errors (accuracy and precision) based on a reference collection (otoliths marked with oxytetracycline).

2. To subsequently evaluate the relevance of the ageing method traditionally used to provide ALKs for stock assessment purposes.

3. To inter-calibrate readers, specifying the interpretation differences (annuli positions).

4. To progress in the implementation of quality control and quality assurance (QC/QA) in the labs.

Six calibration exercises were undertaken for and during the workshop where a group of 15 readers participated. Interpretation of tagged material resulted in a general shift towards younger ages (from 0-10 to 1-5 years) for the same otolith/fish collection. This demonstrates the need to develop approaches allowing the integration of a "validated" growth model or age reading errors into the stock assessment model. A preliminary set of guidelines have been established to help the interpretation of otoliths but it will required further refinement using younger and older marked fish to study the structural growth pattern of the otolith. The workshop achieved quite a lot in terms of demonstrating that hake is a much faster growing species than was previously believed and recognised the necessity of working together towards a solution to improve the accuracy and precision of ageing for the assessment. The calibration exercises and general discussions proved positive, by bringing stock assessors, otolith readers and research scientists together, in order to identify the issues and associated consequences of age estimation of hake and to propose some clues to settle this matter.

Recommendations

1. It is recommended to replace the previous criteria for hake estimation with the current evolving guidelines for hake age estimation developed at this workshop. Further research is needed to develop these guidelines to increase the accuracy and precision of ALKs.

2. More validated data is required to increase the understanding of the hake otolith growth pattern. This could be achieved by tagging experiments in different areas, including the Mediterranean Sea, and experiments in controlled conditions. Research on the effects of environmental factors on otolith formation should be supported.

3. It is recommended that assessment readers re-read a common collection of circa 250 otoliths from previous years, using the new age estimation guidelines. This data could be used to investigate possibilities of providing a transition matrix from the old to the new ALKs. Involved participants will include MI, IPIMAR, IEO, IFREMER, AZTI, COISPA, HCMR

4. There should be an annual intercalibration exchange (circa 100 otoliths) in order to check future stability of agreement between age readers. For the next exchange, otoliths from previous workshops should be included in the sample set. These exchanges should be conducted using the new WebGR program which will be available in Jan 2010.
5. Another workshop should be performed in three years to continue promoting standardization of methodologies and practices for age estimation of hake based on the current work done. It is recommended readers continue working and discuss by correspondence.

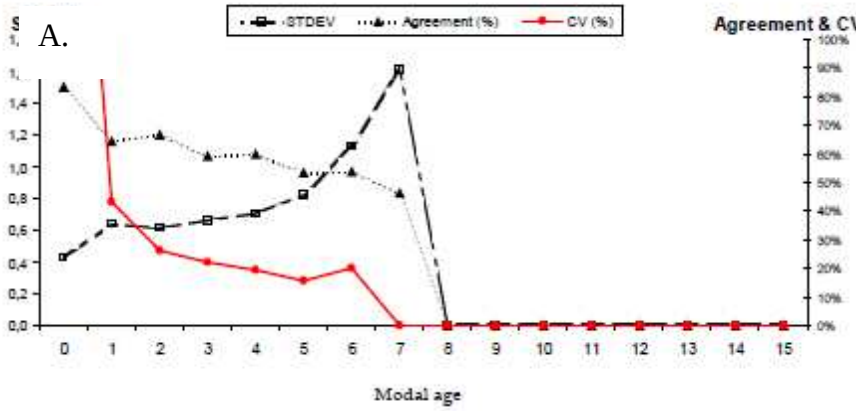
6. Continue work on the analysis of tagging, ‘daily’ ring counting and age readings to: (i) estimate a growth model or, (ii) develop an error transition matrix between ages identified with previous protocol and ages identified with tagged otoliths or daily ring counts. Both approaches would allow the integration of a growth model or age reading errors into the stock assessment model.

7. The work undertaken during this WK could be published as a mono-graphic article or in a publication in the ICES CRR series.

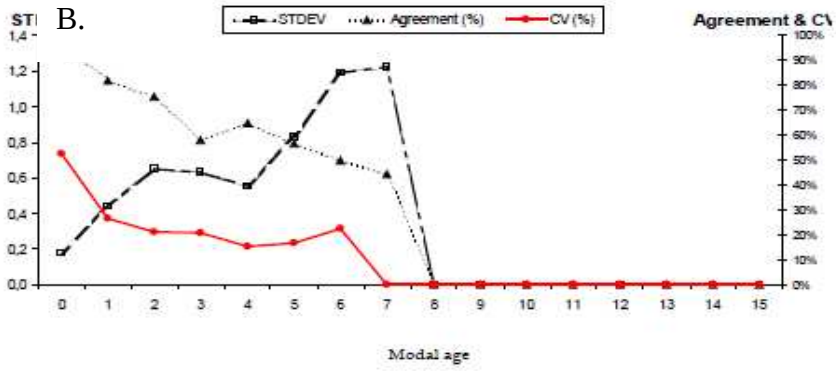
ANNEX IV – Workshop on Age Reading of Red mullet (*Mullus barbatus)* and Striped mullet (*Mullus surmuletus)* [WKACM]

The PGCCDBS meeting in 2009 identified Red mullet (*Mullus barbatus)* and Striped mullet (*Mullus surmuletus)* as two species requiring an ageing workshop to evaluate and improve the age interpretation based on whole otoliths and burnt whole otoliths. 6 European Countries (Greece, Cyprus, France, Italy, Spain & UK) and 11 Institutions (including 29 persons) participated at the exchange and the workshop. The workshop was held in Boulogne sur Mer, France, 30 March - 3 April 2009. Two sets of otoliths were chosen, one (60 otoliths) from the CNR-IAMC collection for *M. barbatus* of the Sicily Channel and another (63 otoliths) from the IFREMER collection for *M. surmuletus* of the Eastern English Channel. These two otolith collections included a large range of lengths and age groups, from various time periods and represented two different geographical areas (Mediterranean-North Atlantic). The results of *M. surmuletus* otolith (whole otolith : agreement : 64.3%, CV : 60.7 ; burnt whole otolith : 71.6, CV : 25.7) and *M. barbatus* (Agreement : 51.6%, CV : 68.5) exchange exercise indicated that ageing of both species could not be considered as easy.

A.



B.



C.

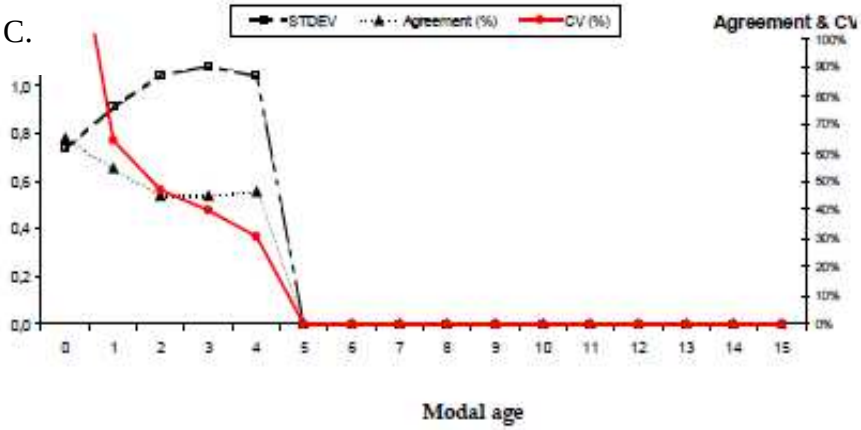


Figure 4.2.1.2 The coefficient of variation (CV%), the percent agreement and the standard deviation (STDEV), from all readers combined, plotted against the MODAL age of the *M. surmuletus (whole otolith : A ; burnt whole otolith : B) and M. barbatus (whole otolith : C)* otoliths age readings.

The agreement was in all cases low and the CV was high, particularly for the Mediterranean set of *M. barbatus* otoliths. Mediterranean age readers gave generally better results for the Mediterranean set of *M. barbatus* otoliths (fact that could be related with their experience on the Mediterranean growth pattern) compared with their north European colleagues. The opposite occurred with the north European set of *M. surmuletus* otoliths.

The sources of bias were:

- Disagreement in the identification of the first annual ring; one group of the readers considered the first ring as the ring of settlement, whereas the majority considered it as the first annual ring.
- Confusion concerning the protocol of reading during the exchange; some of the readers considered as date of birth the 1st of January, whereas others considered as date of birth the 1st of June.
- Confusion concerning the axis of the otolith used for the measurements.
- the poor quality of the images for *Mullus barbatus*

After discussions, a common protocol for interpretation of age has been compiled:

- a blind reading of the otoliths without any information related with the otoliths (e.g. length) except on the date of capture of the specimens.
- consider the 1st of January as date of birth for both species
- hyaline ring at the edge of the otolith during the first semester of the year is considered as annulus.
- hyaline ring at the edge of the otolith during the second semester of the year is not considered as annulus.
- Measurements should be done on the axis derived between the sulcus and the nucleus

The final recommendations of WKACM are:

1. Review the results of the new exchanges and compare with those of the previous workshop
2. Clarify the interpretation of annual rings and use various validation methods (daily increment…)
3. Improve the protocol of the guidelines
4. Create a reference collection of well defined otoliths

ANNEX V - Workshop on the Age Reading of Anchovy (*Engraulis encrasicolus)* [WKARA}

WKARA was held in Mazara del Vallo, Sicily, Italy, 9-13 November 2009. During the meeting, each participant presented the activities carried out in each lab regarding the otolith sampling, storing and reading methods. The presented working documents mainly deal with the annual growth patterns even if some lab (IEO Santander, ISMAR Ancona, IAMC, Mazara) showed studies on micro-increment daily growth as validation tool for first annual ring. In the report section the validation techniques have been also discussed giving some advice in order to encourage these studies. As future work it was also strongly recommended (by the working group) to carry out a specific working group on micro-increments analysis and methodology.

The second step was to present methods and results from the otolith exchange programme carried out from May to October 2009. 14 readers with different levels of experience of anchovy otolith

reading participated in the otolith exchange, from different research institutions from France, Spain, Portugal, Italy and Slovenia and from the different areas concerned. Unfortunately, not all readers of the exchange of otoliths attended this Workshop and other new readers with little experience participated in the workshop. Although all participants read the otoliths in the workshop, only the results of the exchange readers (8 readers participated in both) were taken into account, and the results new participants were excluded from the analysis. 323 otoliths and images were analysed for age assignment, distributed in 7 sets from different anchovy distribution (Atlantic and Mediterranean areas).

For all areas, the average percentage of agreement and CV seemed not to be satisfactory, taking into account the few ages read: most of the anchovy otoliths were not well classified by most of the readers during the 2009 exchange, excluding the results of the readers of the Bay of Biscay (BB readers) in the Bay of Biscay Set (Set A) that were satisfactory. Possibly the success of the Bay of Biscay readers on the set A, compared with the other sets, is because since 1990 exchanges and workshops in Bay of Biscay have been conducted, and there are sufficient criteria for the interpretation of the anchovy otoliths.

The results and the otoliths of the 2009 Anchovy Otolith Exchange were discussed to improve the agreement in the ageing technique and a second reading was made during the meeting. One of the first shared observation based on the otolith exchange programme and by the otolith images from each area, was on the differences in morphology (annual increment patterns) among areas. The readability and the interpretation difficulties changed when we move from oceanic to Mediterranean waters or from the north to the south. These differences among areas could be due to differences in the habitat conditions.

The growth annual pattern was analysed and specific guidelines were provided for the interpretation of growth structures in otoliths.

Sets were selected from two areas for the second reading during the workshop, one where the structure of the otoliths was easier to interpret (set A, Bay of Biscay) and other where the structure of the otoliths was more difficult (set D, Alboran Sea). Comparing the results of the first and the second reading age it is clear a significant improvement for the Biscay of Biscay (set A) in all cases, while there was a light improvement for the Alboran Sea (set D). Based on the exchange programme and on other images from the participating labs, a reference collection of otolith was established, discussed and presented.

During the meeting one question arises which participants tried to examine: What are the consequences of the assumed birth date (1st of January or 1st of June) on the age assignment? And which alternatives could be followed? Tables and examples were produced to explain the meaning of the birth date a-priori assignment and which are the recommendation to avoid misinterpretation and mistakes in the final age assignments. In both cases (1st of January or 1st of June) the age of fish is underestimated or overestimated in relation to the catch date, but sampling fish all the year around would compensate these inconsistencies.

Final Recommendations of WKARA

- In order to support the identification of the 1st annual ring, the otolith radius of the first hyaline ring must be measured and used as a gauge for exclude the first check in ageing older individuals;
- Validation of first annulus has to be done and could be based on the micro-increment daily rings;
- In order to identify when the hyaline/opaque rings are laid down, the otolith edge seasonal evolution should be followed across the year for different age classes and areas;
- A workshop joining readers from the different areas should periodically (3 years) take place;
- This group agreed that any decision concerning the use of the birth date criterion in anchovy age assignment and its consequences in the stock assessment must be preceded by a more detailed analysis of juvenile fish otoliths and a broader discussion in other Working Groups;

- A strong needs rise up from discussions and results of WKARA on planning a standardization meeting on the micro-increment analysis of the European anchovy otolith among Mediterranean and Atlantic partners.

ANNEX VI - Mackerel (*Scomber scombrus)*

A mackerel otolith exchange organised by Marine Scotland-Science (formerly FRS, Scotland) took place during 2008 and 2009. 23 readers from 13 institutes took part in the exchange. Of the 23 readers, 15 were experts (their age estimations are used for assessment purposes) and 8 were non-experts (readers whose age estimations are not used for assessment).

The countries participating in the exchange were Denmark, Spain, France, Faroe, Portugal, Germany, Iceland, Ireland, Netherlands, Norway, UK-England and UK - Scotland.

There were 195 otoliths used in this exchange from ICES sub areas IV, VI, VII, VIII and IX.

The outcomes were assessed separately for the expert group and the non-expert group. The percentage agreement reached by the experts (when considered against the modal age) was between 75% and 45%. CVs ranged from 11 to 23. There was a range of up to 8 years difference between age estimations of a single otolith.

The agreement between readers tended to decline with the age of the fish, reaching 40% and less at ages older than 10 years. The individual bias of readers was highly variable which also lead to a high variability of bias between institutes. Individual biases lead to consistent under- or overestimation of age. More than 90% of individual reader deviations from modal age were ± 1 year. The percentage agreement reached by the non-expert group was lower. Non-expert readers consistently underestimated age when compared to the results of experienced readers.

A workshop on further calibration of age reading between institutes with extended material has been arranged for November 2010.

ANNEX VII - European Age Readers Forum – Sharepoint

Currently the basis of the EARF is available at the following link:
http://groupnet.ices.dk/AgeForum/default.aspx
PGCCDBS established the EARF in response to feedback received from those engaged in age reading across Europe. The objective was to establish a “One Stop Shop” for all those involved in age reading. It was thought that the forum would provide an important resource for training of new age readers, as well as providing opportunities for sharing and discussing existing age reading manuals, establishing standard operating procedures, and standardising preparation and interpretation methods. The forum was initially established as a Google Group, but was subsequently migrated to a more secure Sharepoint site. At the moment, the forum includes the following information:

- The contact details and a mailing list of age reading coordinators as well as those engaged in age reading of fish species in the various European laboratories.
- A calendar of upcoming workshops and also the PGCCDBS meeting details.
- A link to the PGCCDBS documents repository.
- The EFAN Reports
- PGCCDBS guidelines for otolith exchanges and workshops.

The Sharepoint has been established for a year now but has not been used by age readers. Cristina Morgado from the ICES secretariat undertook a questionnaire to try to understand the issues regarding the forum and received 15 responses. The feedback from these replies indicated that 50% of those questioned did not know of the existence of the forum and had therefore never visited the site. However most respondents indicated that they believed the forum is a positive development and would like to see it utilised.

Actions for 2010

- There is a need to highlight the existence of the forum and to encourage participation on the site. PGCCDBS recommends that each member of the PG speak to their age reader coordinators and encourage them to raise awareness of the age readers forum amongst their age readers.
- The PG discussed establishing a "SharePoint team" who would take responsibility for updating the content of the site. PGCCDBS recommends that one person be appointed to monitor the forum and update information. Gráinne Ní Chonchúir from Ireland has volunteered to do this in 2010. This role should be rotated annually, amongst the various laboratories, ensuring the various laboratories become familiar with the forum.
- A suggestion was made to include a link to the WebGR software on the site to help enhance the utility of both. Images can be exchanged and discussed in WebGR and the age reading criteria, manuals and sops can be discussed and exchanged on the forum.
- It was also suggested to include a literature section, with titles for relevant books on age reading topics, as well as references to historic exchange and methodological reports which would also be of interest.
- Ensure all members of the SharePoint are aware that they can be alerted to updates on the site by activating the e mail notification system.
- Details of the location and ownership of Reference collections of both annotated agreed age images and calcified structures should be housed on the forum.
- The forum should be monitor for FAQ's and should respond to demand for different kinds of information.

ANNEX VIII - Workshop on crustaceans (*Aristeus antennatus, Aristaeomorpha foliacea, Parapenaeus longirostris, Nephrops norvegicus*) maturity stages [WKMSC

The gonad development pattern and maturity stage recognition are important biological items to be studied in fishery sciences. The WKMSC 2009, held in Messina, Italy from 19-23 October 2009, was aimed to study maturity aspects of the four crustacean species of main commercial values for the Eastern Atlantic and Mediterranean fisheries: *Aristeus antennatus, Aristaeomorpha foliacea, Parapenaeus longirostris* and *Nephrops norvegicus*. In particular the objectives were reviewing the existing maturity scales, defining objective criteria to classify the maturity stages both on micro and macro scale, reaching an agreement on common scales to be used in the future, and figuring out conversion rules between the old and new scales.

Before the Workshop, the researchers involved, belonging to 15 European laboratories, gathered information by species and describe the sexual development and the maturity pattern accepted and used at the present. Researchers provided working documents containing a synoptic presentation of available information for its own laboratory by operative unit or geographical area. Since the laboratories involved in the WKMSC 2009 operate in areas where different bodies are engaged in producing management advices, the Scientific Advisory Committee for GFCM for the Mediterranean, and ICES for the western European coasts, results were given by geographical sub-area (GSA) or area-division, respectively.

More than 24 Working Documents were presented at the Workshop and the presentations are available on the ICES *Share point* web page: http://groupnet.ices.dk/WKMSC2009/default.aspx

During the meeting the participants reviewed the already employed scales. On the basis of the knowledge and experiences gained, histological and macroscopic descriptions of maturity stage were illustrated and discussed. Finally new 5 stage maturity scales for females of each species were proposed. Due to the difficulties to detail maturity condition of gonads in males at macroscopic level, no maturity scales for males were agreed. A reference image collection of females gonads by stage, both at micro and macro level, was built up and included in the report thanks to the contribution of all the participants.

The most important change to the previously adopted scales was related to developing and recovering stages. According to the experience and knowledge of the involved teams, it is impossible to distinguish at present the developing and recovering specimens from only a macroscopic point of view. Although not concerning the ovary maturity stages, it is recommended to record always information on the occurrence of both berried females in *N. norvegicus* and spermatophora in *A. antennatus* and A. *foliacea* females.

The agreed new scales were proposed to be adopted by all Institutes which are involved in European DCF. The need of a common and standardized system for identification and macroscopic classification of maturity stages in the assessment of the fishery resources by the laboratories collecting maturity data, had to be considered as an important priority to optimize DCF. A conversion table from both the historical and presently used scales to the new proposed common scales was also provided.

All WKMSC 2009 participants felt that all the aims of the workshop were attained and suggested future activity/meetings in order to improve standardization among scientists who work in this field.

ANNEX IX - Web Services for support of Growth and Reproductions Studies (WebGR

WebGR (http://webgr.berlios.de) is a European project that aims to develop Open Source software for supporting studies of fish growth and reproduction. In particular it promotes the usage of online services to organize calibration workshops. Calibration workshops have been carried out for a long time between scientists "reading" otoliths to identify individual age, so that all scientists "tune" their interpretation of the ageing protocols. It has recently being extended to also cover identification of maturity stages with gonads. In general it can be applied to all situations where distinct scientists have to discuss the interpretation of a protocol to identify status of biological material. The WebGR website consists of a repository of images, a set of web forms to run a calibration exercise online, a reporting module with the most common statistical analysis and import/export modules to manage images and results. The software has a creative commons license (Open Source) to promote transparency, technology transfer and peer-review; and will allow the scientific community to get involved in further developments, like linkage to statistical analysis engines, or any other specific features. The usage of WebGR to carry out calibration workshops will promote the application of sound statistical analysis to design the experiment and compute workshop results. The results are extracted in a standard format that can be easily sent to scientists doing assessments.
The consortium is constituted by: Laboratório Nacional de Recursos Biológicos – IPIMAR (Portugal) Consortium leader, The Agri-Food & Biosciences Institute (UK), AZTI Tecnalia Foundation (Spain), Federal Agency for Agriculture and Food (Ger-many), Johann Heinrich von Thünen Institute (Germany), Hellenic Centre for Marine Research (Greece), Instituto Español de Oceanografia (Spain), Institut français de recherche pour l'exploitation de la mer (France), Institute for Marine Resources & Ecosystem Studies (The Netherlands), Institute of Marine Research (Norway), Swedish Board of Fisheries (Sweden), Italian Society for Marine Biology (Italy). (For more information please visit http://webgr.berlios.de.)

ANNEX X - Workshop on Methods to Evaluate and Estimate the Precision of Fisheries Data used for Assessment [WKPRECISE

The workshop was held in Copenhagen during 8-11 September 2009 and focused on methods to evaluate the accuracy of fisheries statistics on national level used for assessment. Quantities landed, discards, fishing effort, CPUE and biological data collected from the fisheries. The WKPRECISE workshop focused on sources of variability and on the procedures to estimate the precision of national level fishery statistics (quantities landed, discards, fishing effort, CPUE) and biological data collected from the fisheries. While precision of fisheries statistics can be improved by increasing the sample sizes in data collection programs, this will generally not reduce bias. It was recognized by WKPRECISE that measures of precision estimates based on fisheries data used for assessments only are meaningful for catch sampling programs that obtain representative data. Several national sampling programs were presented and reviewed during WKPRECISE. Discussions focused on survey design requirements and best practises in data collection programs that facilitate the quantification of precision of estimates based on national level fishery statistics (quantities landed, discards, fishing effort, CPUE). Procedures to assess the precision on a national

level of biological data collected from the fisheries were examined. The WKPRECISE documented the complexity of typical fisheries sampling programs, including stratification and further grouping into métiers. Estimators of precision for key parameters must take into account clustering effects that are caused by multi-stage sampling.

The PG Recommends on the basis of this workshop that catch sampling programs should be based on statistically robust survey designs with clear definitions (and documentation) of;

- the sampling frame,
- the primary sampling units (PSUs),
- the stratification schemes employed,
- and the methods used for selecting samples in each stratum.

The statistical estimation of precision requires that representative catch sampling be conducted using probability-based methods (to the extent possible within logistical constraints). Ad-hoc sampling rules out the estimation of precision and should be avoided. The PG also recommends that the precision of estimates of key parameters is given in terms of standard errors or relative standard errors (often referred to as the coefficient of variation for a parameter estimate). In addition, the number of primary sampling units observed along with estimates of the effective sample size for the associated estimate should be given. This is because the variances of key estimates are typically driven by the number of PSUs sampled, and so the effective sample size is usually much smaller than the total number of individuals sampled. If age-length keys (ALKs) are used to estimate age-distributions, then it must be noted that the precision of such estimates cannot be evaluated unless the age-length data are coupled to the primary sampling units from which the age and length data were collected. The accuracy of estimates of age-distributions based on static ALKs that do not take into account the survey design of the catch sampling programs (or ALKs derived from ad-hoc sampling) cannot be assessed.

ANNEX XI - Workshop on Methods for merging metiers for fishery based sampling [WKMERGE]

The WKMERGE was hold in Copenhagen 19-22 January 2010 and was the last workshop in a row of three (WKACCU, WKPRECISE, and WKMERGE). An important role of WKMERGE was to provide theoretical training on the design of robust sampling schemes for at-sea and on-shore sampling of fishing vessels to provide data on metier based biological variables. The workshop covered the main aspects of sampling design including defining objectives; identifying the population to be sampled and suitable frames for accessing primary sampling units; stratification schemes; sample selection schemes including equal and unequal probability methods, and associated estimation procedures. The use and data-needs of model-based estimators were discussed, including the pros and cons of “quota” sampling for model based and design based estimators. Examples of applying vessel list frames for at-sea sampling and area (access point) frames for on-shore sampling were covered in detail, and methods of combining data from both types of frames are included in the WKMERGE report. A primary focus of WKMERGE was the design of sampling schemes that avoid problems of under-sampled and non-sampled strata or domains requiring imputation of missing data. When imputation is required, it should be done at the analysis stage using expert knowledge of the fisheries. Automated procedures for filling missing entries in databases with data “borrowed” from neighbouring samples or strata should be avoided. A major problem is non-accessibility of vessels for sampling at sea or on shore, as the vessels not available for sampling may have a different catch composition and size frequencies than the accessible vessels. Characteristics of the non-accessible vessels should be recorded to allow retrieval of any auxiliary variables shown to be correlated with discarding or size compositions in the sampled vessels (e.g. gear, mesh, area, trip duration etc.).

The PG Recommends on the basis of this workshop:

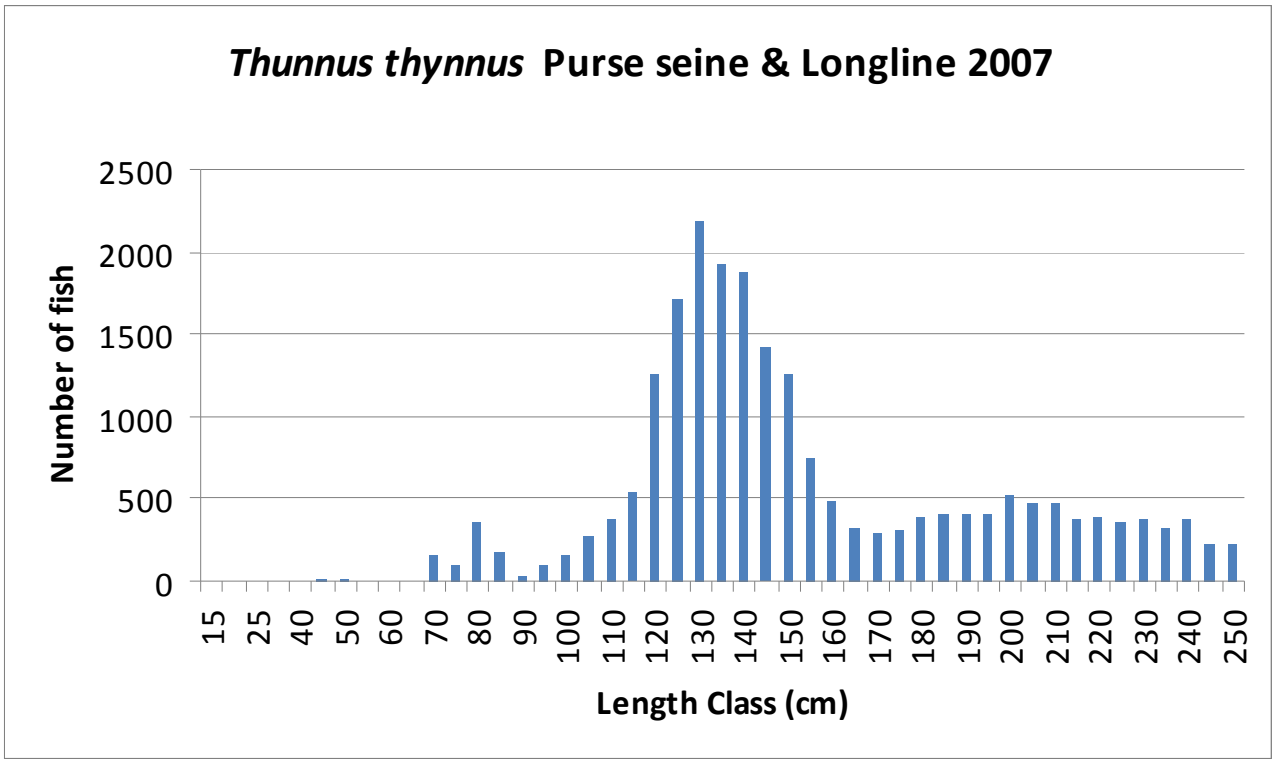
- Primary data held in databases should be real observations and not imputations done manually or with automated routines. Imputation must be carried out external to the data base using transparent and robust methods. If modelling is to be used for imputation (e.g. to fill in gaps for non-accessible vessels), the data collection scheme should ensure that the

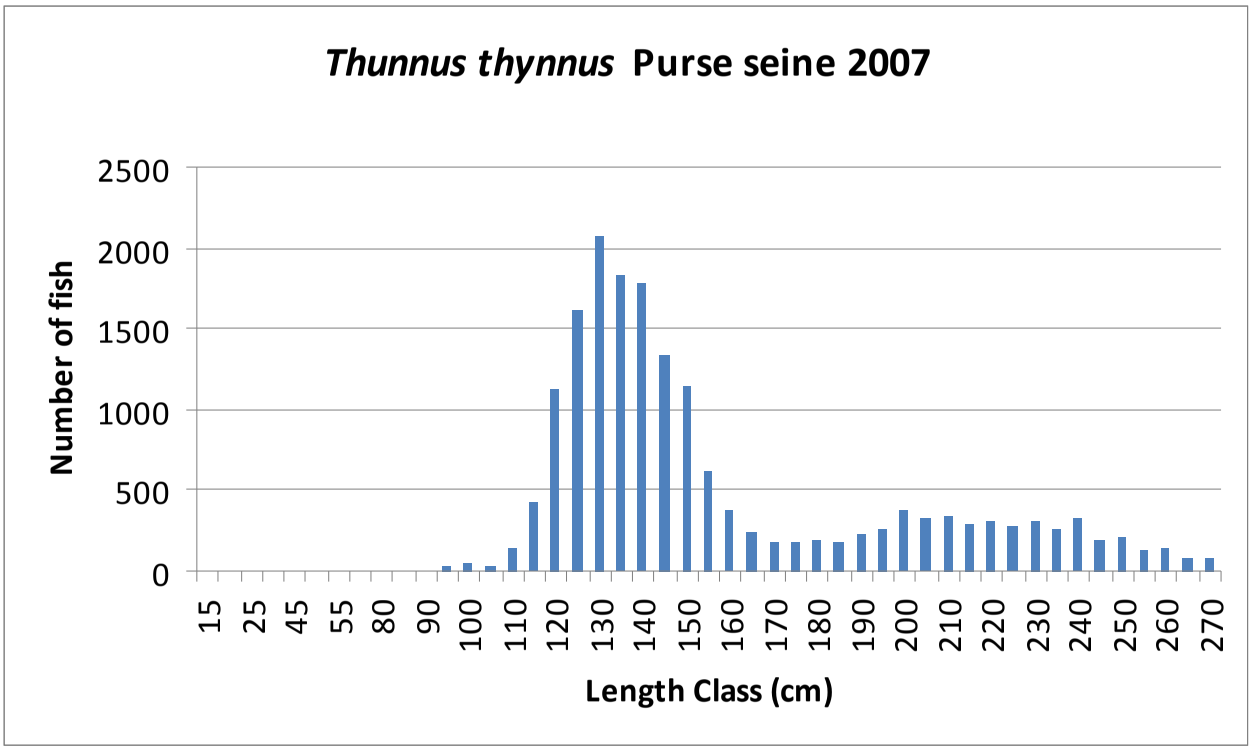
necessary auxiliary data are collected for those vessels. Strata should be defined so that there is controlled sample selection probability. Take necessary steps to achieve representative sampling of fishing trips or vessels within strata using random or systematic (with random element) schemes. Avoid targeted non-random sampling (quota sampling) to reach sample sizes for highly resolved domains (e.g. Level 6 metiers, see Commission Decision 2010/93/EU) present within the primary sampling strata. Sampling schemes should provide the ability to provide data

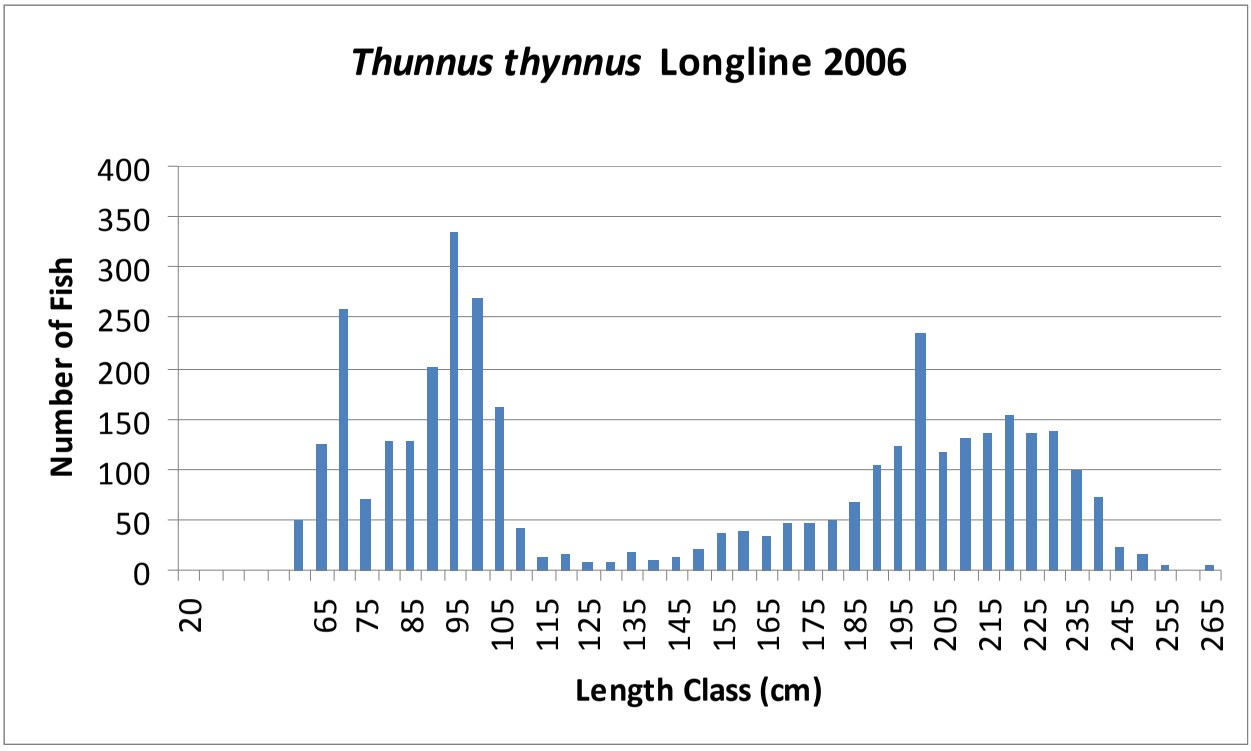
- Formation of a Study Group or EU contract would be appropriate to consider methods and tools for optimisation of sampling schemes between MS to achieve international precision targets and consistent collection of data to allow analysis by domains covering international strata within regions (e.g. metiers) – (conditional on having the data collected on an appropriate basis for input to optimisation schemes).

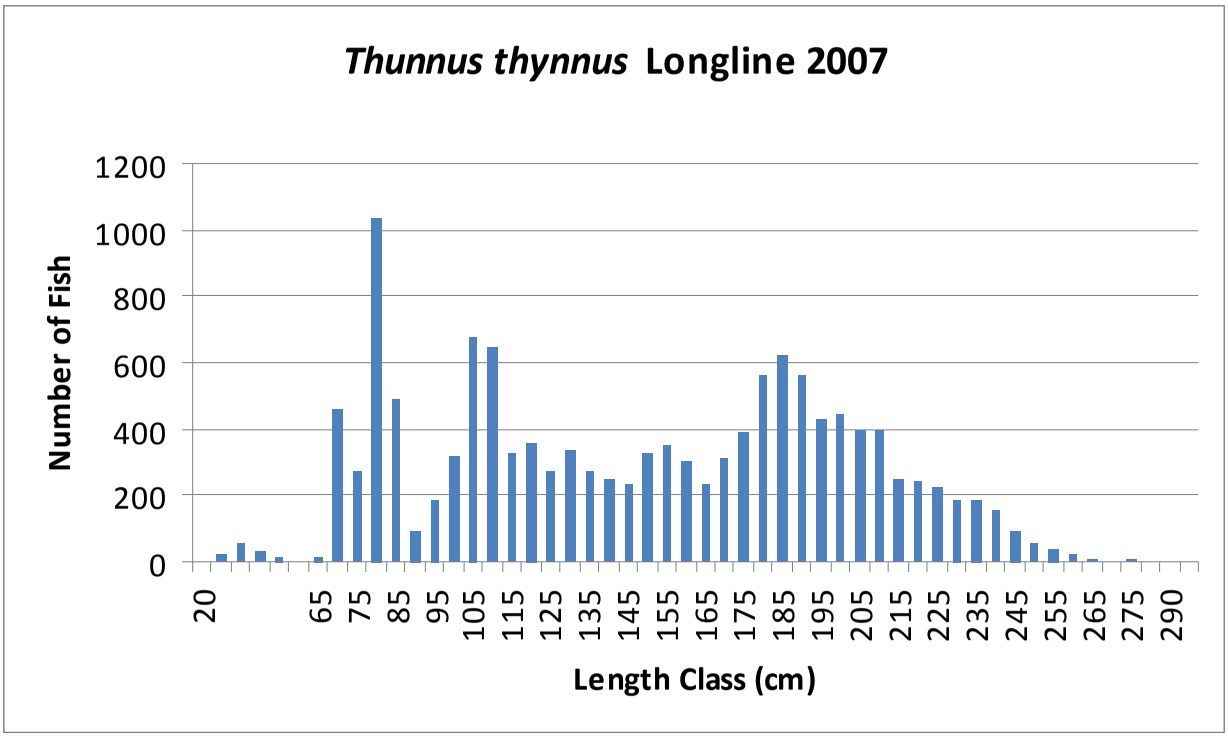
- Further development of data basis and COST tools should aim to cater for different possible sampling designs and associated procedures described in WKMERGE

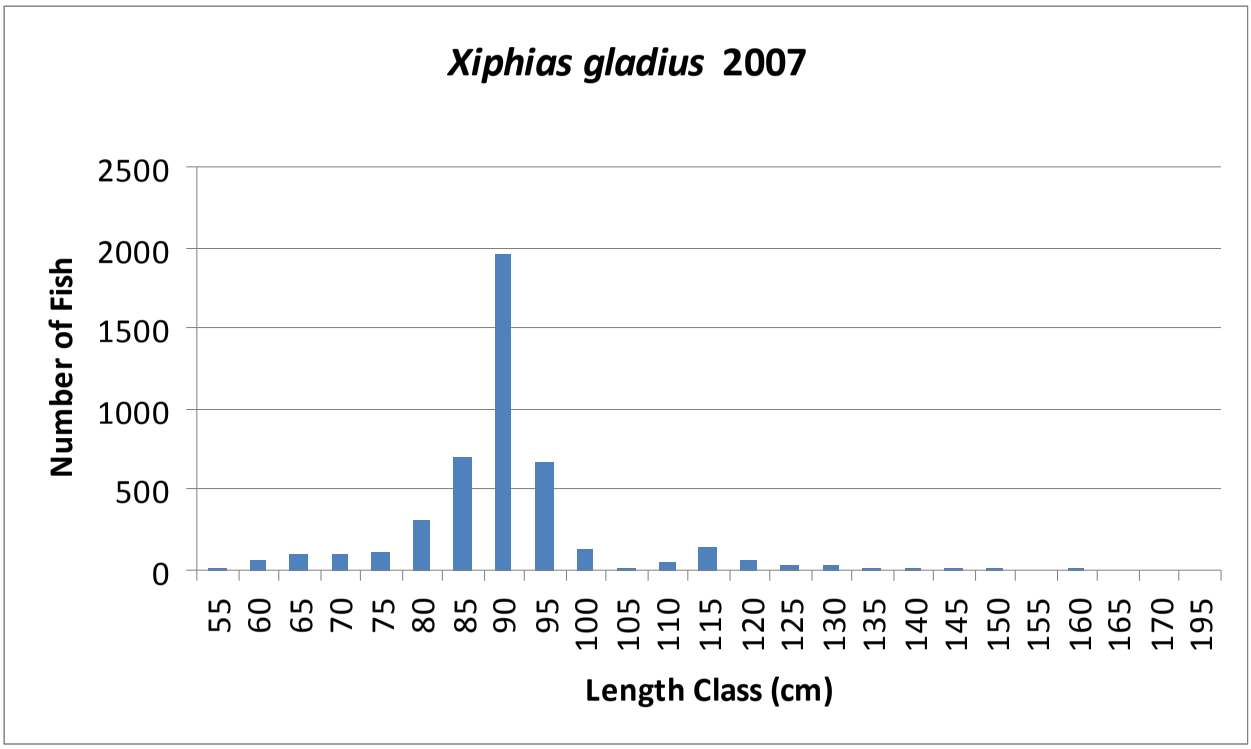
ANNEX XII – Length Frequency Distributions of the Large pelagic species for which precision estimations were conducted




Thunnus thynnus Purse seine 2007
Number of fish
2500
2000
1500
1000
500
0
15 25 45 55 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270
Length Class (cm)


Thunnus thynnus Longline 2006
Number of Fish
400
350
300
250
200
150
100
50
0
20 65 75 85 95 105 115 125 135 145 155 165 175 185 195 205 215 225 235 245 255 265
Length Class (cm)


Thunnus thynnus Longline 2007
Number of Fish
1200
1000
800
600
400
200
0
20
65
75
85
95
105
115
125
135
145
155
165
175
185
195
205
215
225
235
245
255
265
275
290
Length Class (cm)


Xiphias gladius 2007
Number of Fish
2500
2000
1500
1000
500
0
55
60
65
70
75
80
85
90
95
100
105
110
115
120
125
130
135
140
145
150
155
160
165
170
195
Length Class (cm)

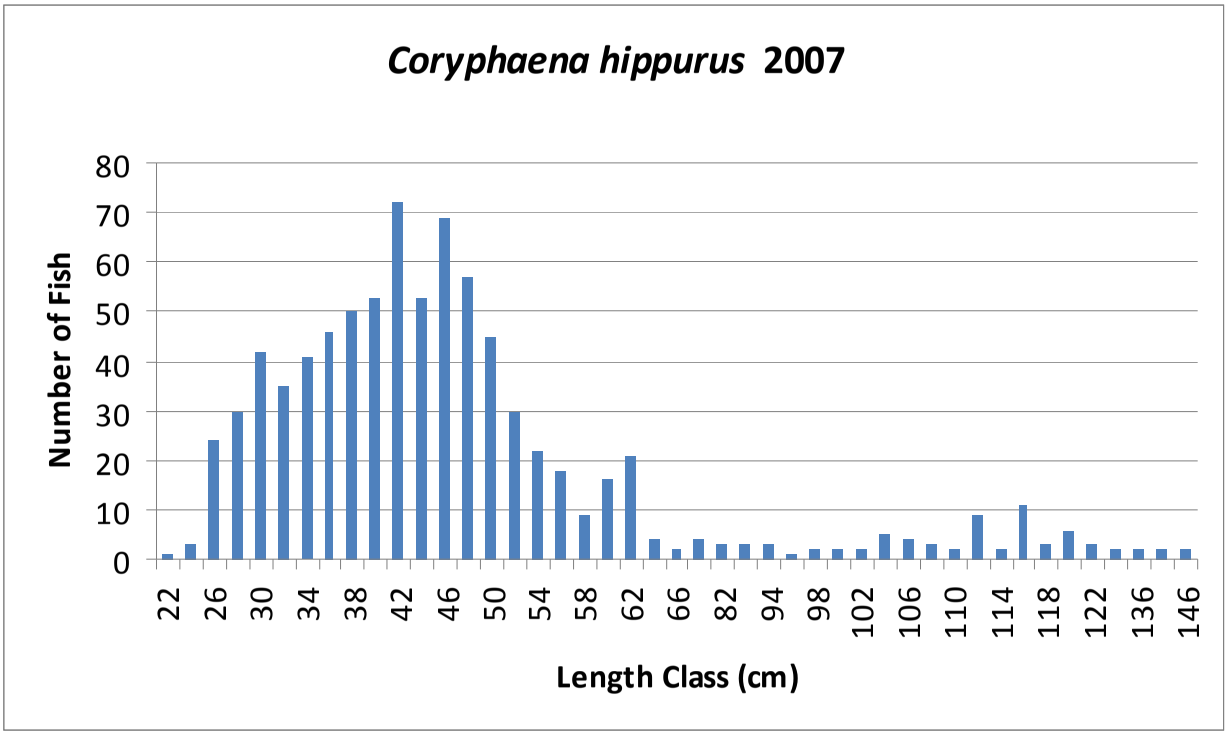

Coryphaena hippurus 2007
Number of Fish
80
70
60
50
40
30
20
10
0
22
26
30
34
38
42
46
50
54
58
62
66
82
94
98
102
106
110
114
118
122
136
146
Length Class (cm)

Table 13 - Number of specimens of swordfish (*Xiphias gladius*) proposed in the NP 2010 for sampling of stock related variables and numbers of specimens to be collected by each MS following the regional sampling approach

A Workshop to develop guidelines to convert DCF biological, economic and transversal data to GFCM Task 1 [WKMed&BSConvert - WKMBSC] (Co-Chairs Joël Vigneau (France) and Dario Pinello (Italy to confirm)) will be held in Corsica (France), [date to be confirmed, 3 days], to:

a) Review DCF and GFCM Task 1 segmentations and comment on their relevance for management purposes.in the Mediterranean and Black Sea supra-region.

b) Review the completeness of reference tables describing biological, transversal and economic data relevant to achieved ad'hoc management objectives defined by both EC and GFCM.

c) Identify gaps or inconsistencies between the two approaches and consequently datasets required by these two international bodies.

d) Propose common understandings and interpretations of the DCF Decision 2010/93/EU and of the resolution GFCM/31/2007/1 to better describe and quantify fishing activities in terms of inputs and outputs for both bio-economic and ecosystemic approaches in the Med&BS supraregion..

c) Develop guidelines to convert DCF biological, economic and transversal data to GFCM Task 1 variables, that EU Member states could adopt for creating homogeneous datasets in response to GFCM Task 1 requirements.

WKMed&BSConvert (WKMBDC) will report for the attention of RCM Med&BS, PGMed, GFCM/SAC by XXXX

6. Supporting Information

PRIORITY:

SCIENTIFIC JUSTIFICATION AND RELATION TO ACTION PLAN:

GFCM (resolution GFCM/31/2007/1) adopted the Task 1 statistical matrix and invited Members to give priority to task 1.1 (capacity by Fleet Segment) and Task 1.2 (fishing activity descriptors and resources exploited by Operational Units) and to gradually implement the components Task 1.3 (economic variables), 1.4 (effort variables) and 1.5 (biological variables) in the future.
At present the GFCM resolution GFCM/31/2007/1 gave priority to task 1.1 and 1.2 since these are relatively easy to compile when compared to tasks 1.3, 1.4 and 1.5, mostly due to the large and complex data requirements for the latter tasks. The Workshop will analyse the feasibility of the compilation of the entire GFCM Task 1 statistical matrix using past DCR-DCF data. One important aspect of the study will be to produce guidelines and protocols for Member states in order to incorporate the DCF data into the entire GFCM task 1 data matrices, to anticipate eventual inconsistencies and any methodological issues.
The success of the workshop will require expertise on characteristics of the various fisheries, fleet segments and fishing activities operating in the Med&BS supraregion, in terms of economics, biology and fishing tranversal data, but also from scientists involved in both DCF and GFCM Task 1 approaches.

RESOURCE REQUIREMENTS:

PARTICIPANTS: Biologists, Economists, and Experts on transversal data from EU Med&BS MS, GFCM Task1 experts

SECRETARIAT FACILITIES:

FINANCIAL:

LINKAGES TO ADVISORY COMMITTEES: RCM Med&BS, EU, GFCM/SAC