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**SUMMARY OF THE STATUS OF DEMERSAL STOCKS IN THE NORTHERN AREA OF
THE EASTERN CENTRAL ATLANTIC (CECAF)**

SUMMARY

The fifth meeting of the FAO/CECAF Working Group on the Assessment of Demersal Resources - northern subgroup, was held in Tenerife, Spain, from 6 to 15 June 2017.

The main objective of this Working Group is to contribute to the improvement of the management of demersal resources in northwest Africa through the assessment of the state of stocks and fisheries to ensure optimal and sustainable use of resources in African coastal countries.

The study area of the Working Group is the northern zone of CECAF - between Cape Spartel and southern Senegal. For reasons of heterogeneity, the species and stocks assessed by the Working Group were divided into four groups: shrimp, cephalopods, hake and other demersals.

For each of these groups, information is provided on fisheries, management plans and sampling intensity, biological characteristics, stock identity, trends in catches and fishing effort, indices of abundance, stock assessment, recommendations and management measures, and future research.

Twenty-six stocks/units were analyzed and the results were discussed. The applied models provided satisfactory results for 19 of them, of which nine are over-exploited, seven are fully exploited and three are not fully exploited. For seven stocks, modeling results from available data were inconclusive. Although the model did not provide reliable results for these stocks, other information from fisheries and scientific surveys indicates that many of them are overexploited. The results of the evaluations confirm the conclusions of the 2010 and 2013 meetings, namely that most of the stocks assessed are overexploited.

INTRODUCTION

1. The FAO/CECAF Working Group on the Assessment of Demersal Resources in the Northern Area of CECAF was held in Tenerife, Spain, from 6 to 15 June 2017.
2. The main objective of this Working Group is to contribute to the improvement of the management of demersal resources in northwest Africa through the assessment of the state of stocks and fisheries to ensure sustainable use of these resources for the benefit of coastal countries.
3. The results of the analyses are presented in four subgroups: shrimp, cephalopods, hake and other demersal fish. A total of 26 stocks and groups of species were analyzed by the Working Group.
4. The meeting was funded by FAO and the EAF-NANSEN Programme and organized by the Spanish Institute of Oceanography (IEO) through the Oceanographic Center of Tenerife, Spain.
5. The study area of the Working Group is the northern zone of CECAF located between Cape Spartel and southern Senegal.
6. Twenty-two researchers from five countries in the subregion and FAO participated in the meeting. The Working Group was chaired by Said Benchoucha of INRH, Morocco.

Methodologies

Global models

7. As in previous years, the main evaluation model used by the Working Group was the dynamic version of Schaefer's 1954 model. When the model provides inconclusive results for a stock or when stocks cannot be assessed due to limited data, the Working Group adopts recommendations based on previous assessments and trends in available data. In addition, for the first time a new model named Catch MSY (CMSY) was used to evaluate the stock of black hake. This model was recently developed for the case of limited data fisheries.
8. The data used are annual or quarterly estimates, if possible, of total catches, by stock, as well as indices of stock abundance. In general, the Working Group uses abundance indices from offshore scientific surveys or commercial CPUEs, although the reliability of some of these parameters must always be verified.

Analytical models

9. For some stocks, it was possible to use models based on lengths. The length-frequency cohort analysis (length composition analysis [LCA], Jones, 1984) was used to assess the current level of F (fishing mortality rate), as well as the mode of fishing exploitation in recent years. Length-based Recruit model was then used on these estimates to calculate the F_{\max} and $F_{0.1}$ Biological Reference Points. LCA and Yield-per-recruit models were applied on Excel worksheets.

Projections

10. To evaluate the current state of inventories and estimate model parameters, an Excel spreadsheet was used to run a dynamic version with an error estimator (Haddon, 2001). The model has been adapted to the data using Excel's nonlinear optimization function, Solver (FAO, 2012). For these projections, a five-year period was used.
11. All projections used the stock status of the last year of the available data series as a starting point. Proposals for future management strategies have been formulated based on changes in fishing

mortality and/or catches taking into account the estimates of the last available year data.

12. For each stock, two scenarios were considered. The first is the status quo, which considers future returns and stock changes in the case where the coefficient of fishing mortality remains unchanged from the data set used for the previous year's assessments. The second scenario takes into account the change in fishing mortality corresponding to the recommended catch level for the following year for each stock.

Reference points for management recommendations

13. The Working Group used the Biological Reference Points (BRPs) adopted by CECAF;
 - **Target reference points:** $B_{0.1}$ and $F_{0.1}$
 - **Limit reference points:** B_{MSY} and F_{MSY}
14. The B_{cur}/B_{MSY} and F_{cur}/F_{MSY} reports were used to assess the current situation with respect to the limit reference points while the $B_{cur}/B_{0.1}$ and $F_{cur}/F_{0.1}$ reports were used to assess the situation relative to the target reference points. A detailed explanation of these reference points is given in the FAO report (FAO, 2006).

Stock status categories:

15. The three assessment categories adopted by the CECAF scientific Working Groups include:
 - **Non-fully exploited:** The stock is in good condition and fishing pressure can be increased without affecting the sustainability. All increases must be seen in the context of the general environmental situation.
 - **Fully exploited:** The fishery operates within the limits of sustainability. Current fishing pressure seems sustainable and can be maintained.
 - **Overexploited:** The fishery is in an undesired state both in terms of biomass and fishing mortality. Fishing pressure should be reduced to allow the stock to grow.

OVERALL REGIONAL TRENDS

Catches

16. The total catch of demersal resources for 2016 analyzed by the Working Group in 2017 was approximately 202 000 tonnes. The total catch of these resources has shown an increasing trend since 2012 and especially in 2016 with an increase of 20 percent compared to 2012 and 7 percent compared to 2015. From 1990 to 2016, the capture of demersal resources has fluctuated around an average of 207 000 tonnes (Table 1, Figure 1).

Table 1: Total catches (tonnes) of major demersal species analyzed in 2017 during the Demersal Working Group subgroup North.

Target species	Catch contributions 2015 (%)	Catch contributions 2016 (%)	Catches 2015 (tonnes)	Catches 2016 (tonnes)	Percentage difference	Average catches (2012-2016) (tonnes)
<i>Octopus vulgaris</i>	45	38	85 319	76 526	-10%	71 620

<i>Sepia</i> spp.	17	15	32 210	29 534	-8%	29 550
<i>Parapenaeus longirostris</i>	4	4	7 255	8 743	21%	9 955
<i>Pseudotolithus</i> spp.	1	2	2 161	3 147	46%	2 346
<i>Loligo vulgaris</i>	6	9	10 673	18 665	75%	11 859
<i>Merluccius</i> spp.	6	8	10 601	16 972	60%	9 668
<i>Pagrus caeruleostictus</i>	2	2	2 980	3 937	32%	3 886
<i>Pagellus bellottii</i>	3	5	6 536	9 440	44%	6 193
<i>Arius</i> spp.	3	3	5 630	5 162	-8%	5 304
<i>Merluccius merluccius</i>	3	3	4 946	5 381	9%	5 293
<i>Sparus</i> spp.	2	2	3 800	4 138	9%	5 204
<i>Plectorhynchus mediterraneus</i>	3	4	6 044	7 708	28%	7 013
<i>Pagellus</i> spp.	2	1	3 070	2 701	-12%	3 423
<i>Dentex macrophthalmus</i>	2	2	3 160	3 594	14%	2 841
<i>Penaeus notialis</i>	1	1	1 226	1 324	8%	1 768
<i>Epinephelus aeneus</i>	1	2	2 161	3 147	46%	2 346
<i>Pagellus acarne</i>	1	1	1 191	1 598	34%	1 126
TOTAL DEMERSAL¹	100	100	188 963	201 717	7%	179 395

¹ (Studied by the Working Group)

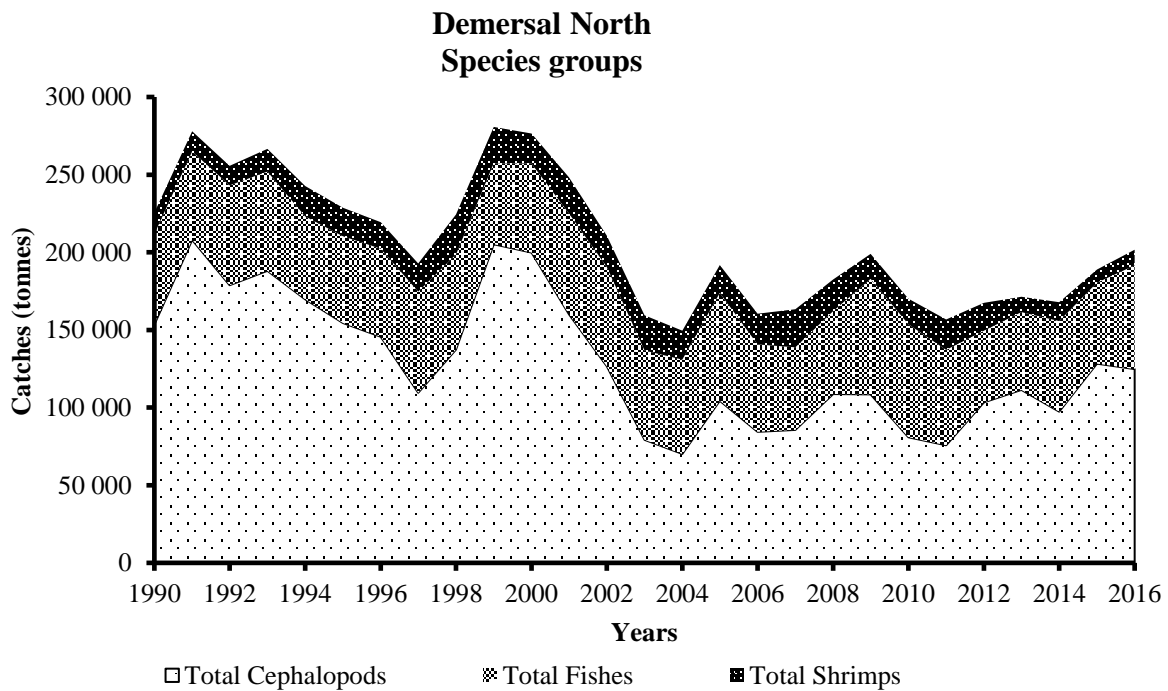


Figure 1: Total catch of demersal species groups studied in 2017 by the CECAF Demersal Working Group subgroup North.

17. The most important group of species in the region in terms of catches is cephalopods (Figure 1), particularly octopus (*Octopus vulgaris*) which accounted for about 45 percent of the total demersal catch during the period studied, and 38 percent in 2016. The total catch of octopus has decreased, with some fluctuations, from 159 000 tonnes in 1999 to 66 000 tonnes in 2012 before gradually increasing to around 76 500 tonnes in 2016 (Figure 2). The annual catch of cuttlefish (*Sepia spp.*) showed an overall decreasing trend before 2004 then a fluctuation around 20 000 tonnes between 2005 and 2011 and around 29 000 tonnes over the recent period 2012-2016. Catches of squid (*Loligo vulgaris*) show a strong increase, from 3 000 tonnes in 2006 to 19 000 tonnes in 2016, with an average of 12 000 tonnes in the last five years.

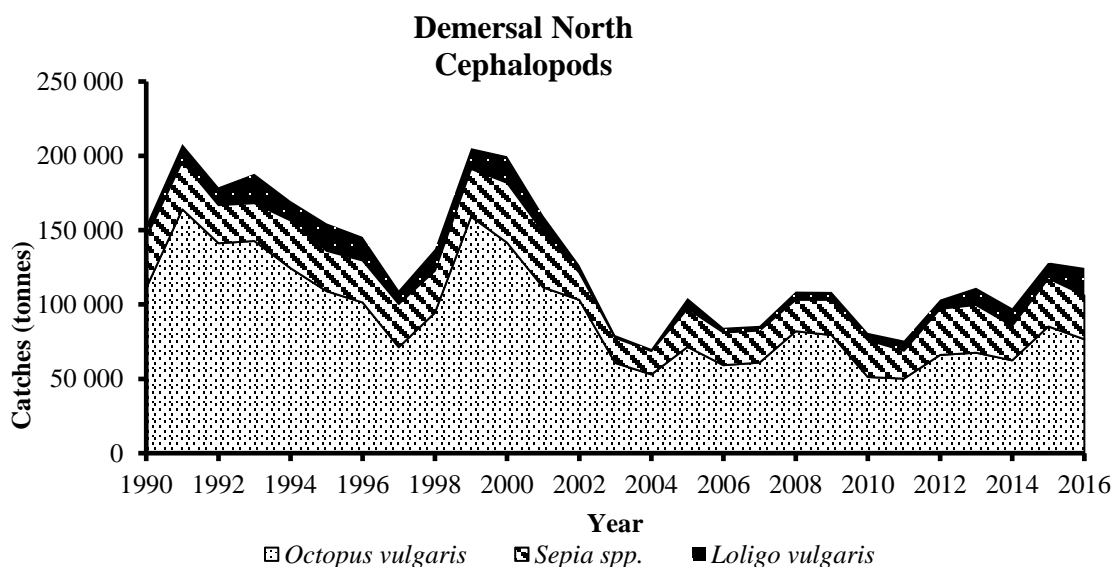


Figure 2: Captures of cephalopods in the northern zone of CECAF over the period 1990-2016.

18. Catches of the offshore pink shrimp (*Parapenaeus longirostris*) showed a decreasing trend, from 15 000 tonnes in 2006 to less than 9 000 tonnes in 2016 with an average of around 10 000 tonnes in the last 5 years. Catches of southern pink shrimp (*Penaeus notialis*) have declined over the last ten years, from 5 000 tonnes in 2006 to around 1 300 tonnes in 2016 with an average of 1 700 tonnes in the last 5 years (Figure 3).

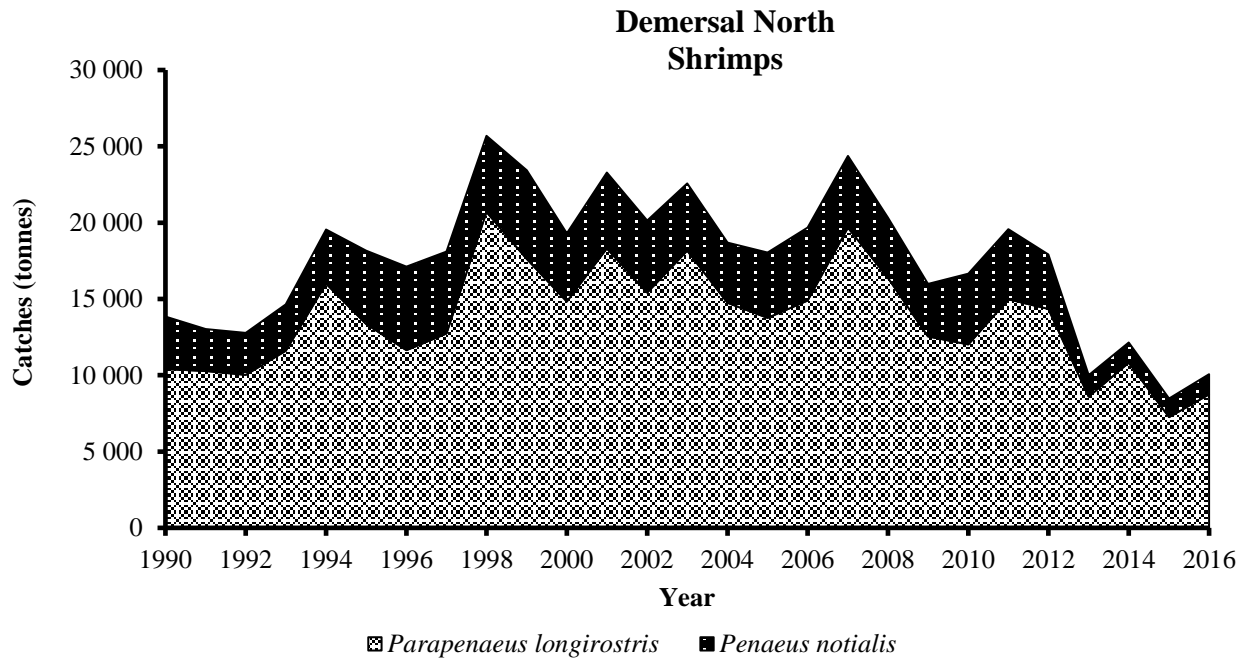


Figure 3: Shrimp catches in the northern zone of CECAF (1990-2016).

19. Catches of black hake (*Merluccius polli* and *Merluccius senegalensis*) increased from 9 000 tonnes in 2006 to around 17 000 tonnes in 2016, while those of white hake (*Merluccius merluccius*) increased from 6 000 tonnes in 2006 to 5 000 tonnes in 2016. The catch of other demersal fish species represents 22 percent of demersals analyzed by the Demersal Working Group subgroup North in 2017. Catches of these species averaged around 50 000 tonnes between 1990 and 2016, with an average of about 40 000 tonnes in the last five years (Figure 4).

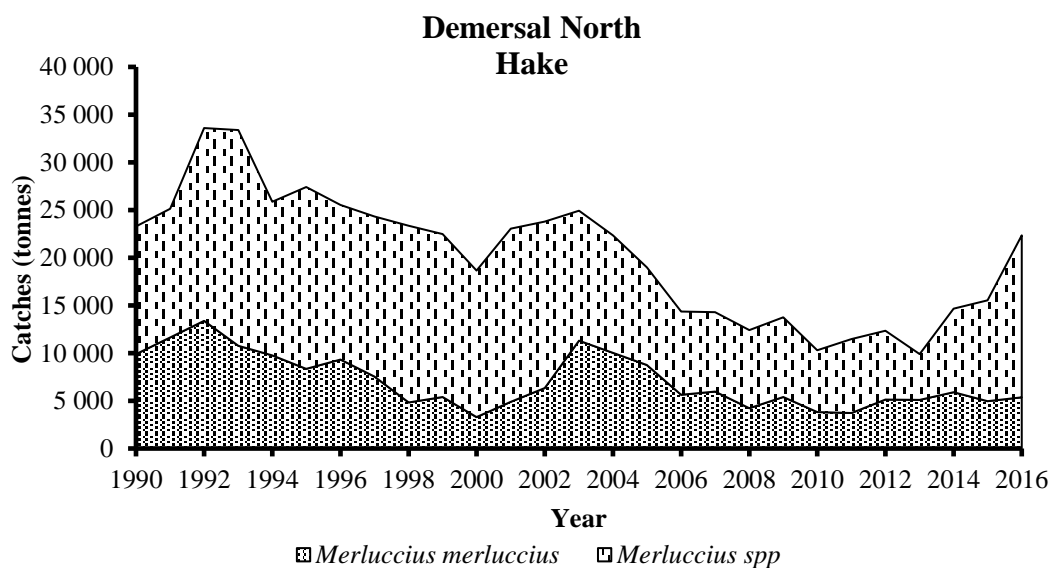


Figure 4: Capture of hake in the northern zone of CECAF (1990-2016).

Scientific surveys for demersal species

20. In Morocco, during the period 2012-2016, the assessment surveys were carried out by the research vessel *Charif Al Idrissi*. Following a fire problem, this vessel was replaced by the research vessel *El Hassni* in June 2015 and then by the research vessel *Al Amire Moulay Abdellah* in 2016. A total of 11 surveys were carried out in the southern zone, and seven in the northern zone.
21. In Mauritania from 2013-2016, six demersal resource assessment surveys were conducted covering the continental shelf and the slope at depths below 600 m during the two major cold hydrological seasons. In addition, twenty-one mini-surveys targeting the octopus stock were conducted aboard the *AL AWAM* research vessel.
22. From 2011 to 2013, the CCLME Project, in collaboration with the EAF-NANSEN project, conducted two ecosystem scientific surveys aboard the research vessel *DR. FRIDTJOF NANSEN* in the waters of Northwest Africa from Guinea in the South to Morocco in the North and Cabo Verde.

ASSESSMENTS

23. The results of the assessments confirm the conclusions of previous meetings (2010 and 2013) that most of the assessed stocks are overfished. A summary sheet of assessment results and management recommendations is given in Table 2. In the same table, a column indicates the management measures recommended by the Demersal Working Group north subgroup in 2013.

Nine stocks are overexploited:

24. Thiof (*Epinephelus aeneus*) in Mauritania-Senegal-Gambia, deep-water rose shrimps (*Parapenaeus longirostris*) in Senegal-Gambia and Morocco, rubber-lip grunt (*Plectrotyrchnus mediterraneus*) in Morocco, southern pink shrimp (*Penaeus notialis*) in Senegal-Gambia, octopus (*Octopus vulgaris*) in Dakhla, common cuttlefish (*Sepia officinalis*) in Dakhla, white hake (*Merluccius merluccius*) in Morocco and seabream (*Pagrus* spp.) in Morocco. It should be noted that the stock status of thiof (*Epinephelus aeneus*) in Mauritania-Gambia-Senegal has improved in comparison with previous assessments of 2004, 2007, 2010 and 2013. Nevertheless, this stock remains overexploited but its status is currently less critical.

Seven stocks are fully exploited:

25. Black hake (*Merluccius* spp.) in Morocco-Mauritania-Senegal-Gambia, red pandora (*Pagellus bellottii*) in Mauritania-Senegal-Gambia, bluespotted seabream (*Sparus caeruleostictus*) in Mauritania-Senegal, axillary seabream (*Pagellus acarne*) in Morocco, the southern pink shrimp (*Penaeus notialis*) in Mauritania, the octopus (*Octopus vulgaris*) in Cape Blanc and the marine catfish (*Arius* spp.) in Senegal-Gambia.

Three stocks are not fully exploited:

26. The deepwater rose shrimp (*Parapenaeus longirostris*) in Mauritania, the common cuttlefish (*Sepia officinalis*) in Cape Blanc and the large-eye dentex (*Dentex macropthalmus*) in Morocco-Mauritania-Senegal.

Seven stocks had inconclusive assessments:

27. The results of the assessments were inconclusive for seven stocks because of their composition (multi-species stocks), leaving the Working Group unable to disaggregate them by species or the difficulty of adjusting the models with the data series available. These are croakers (*Pseudolithus* spp.) in Senegal-Gambia, pandora (*Pagellus* spp.) in Morocco, octopus (*Octopus vulgaris*) in Senegal-Gambia, cuttlefish (*Sepia* spp.) in Senegal-Gambia, and squid (*Loligo vulgaris*) in Dakhla, Cape Blanc and Senegal-Gambia. However, although the model did not provide reliable results for these stocks/species groups, other information from fisheries, scientific surveys and past assessments indicate that these groups of species are likely overexploited.

GENERAL CONCLUSIONS

28. The results of the assessments indicate that several stocks are overexploited.
29. Although data on catches, fishing effort and biological indicators (size frequency, growth, height-weight relationship, Lm50, reproduction etc.) made available to the Working Group have increased in recent years gaps still persist for some species.
30. Reliable catch data are still insufficient for some demersal stocks and in some cases are incomplete for the year 2016. In addition, different catch and CPUE series from other national sources have been made available to the Working Group by some of its members without any explanation of this difference.
31. This year, in accordance with the recommendations of the previous Working Group, data on size compositions of some stocks were provided, improving the possibilities of using size-based methods.
32. The assessment of the state of the stocks and their state of exploitation is highly dependent on estimates of past and current catch levels. As a result, the quality and reliability of the assessments are highly dependent on the reliability of the data made available to the Working Group.
33. Progress has been made in the implementation of the CECAF recommendations by the managers, but it is important to continue the dialogue between the scientists and the heads of the Maritime Fisheries Departments at the level of the CECAF member countries to ensure sustainability and better management of demersal fisheries.




RECOMMENDATIONS




34. Inform managers of the state of concern of some demersal stocks in their countries so that they can implement the recommendations developed by the CECAF Working Groups organized by FAO.
35. To explore the possibility of using alternative models for stock assessment in the CECAF northern region. Explore additional options for cephalopod assessment through a hands-on workshop/training. Monthly data should be prepared before the next meeting to facilitate further analysis.
36. Respect the recommendation of CECAF to encourage countries to prepare all necessary databases for the assessments and to send them to all participants, to FAO and to the Chair of the Working Groups at least one month before the start of the Working Group sessions.
37. Present in a timely manner all data available at the country level to the Working Groups (catches, corresponding effort, abundance indices [scientific or other surveys] and composition in lengths




and ages of catches).




38. Improve the data collection system and undertake regional scientific campaigns for better identification of species and origins of catches.
39. Carry out intercalibration surveys of vessels from different countries and with the R/V *Dr Fridtjof Nansen* during the demersal regional campaign scheduled for 2019.
40. Study the effect of environmental factors on demersal stocks. Not only on short-lived species but also on some long-lived species (hake for example).
41. Bioecological studies of key species should be conducted in the countries of the region and work on otolith analyses and growth should continue, and explore partner options with IEO to extend to other countries and species.
42. Conduct regular national and regional scientific surveys covering all stock distribution areas to obtain more reliable abundance indices for each stock.
43. Carry out intercalibration exercises to evaluate the performance of the trawls of the various research vessels in the region (Morocco, Mauritania and Senegal).
44. Organize regional seminars covering different topics (shared stocks, environmental effects, biology, stock identification, etc.) for members of the Working Groups.
45. Organize a training course on assessment methods with special attention to short-lived species.




Table 2: Summary of 2017 assessments and management recommendations






Stock	Catches (tonnes) 2016 (avg. 2012–2016)	* $B_{cur}/ B_{0.1}$	* $F_{cur}/ F_{0.1}$	LCA and Y/R Yield per recruit	Assessments	Management recommendations <i>(a reduction in fishing mortality implies either a reduction in effort or the introduction of measures such as seasonal closure of fishing areas)</i>
Hake <i>Merluccius merluccius</i> Morocco 	5 381 (5 293)	88%	126%	The model gives a very high exploitation rate because of the exploitation of the juveniles.	Overexploited	It is recommended to reduce the current fishing mortality of coastal trawlers targeting juveniles in order to minimize the proportions of juveniles observed in the catches of the last years analyzed.
<i>Merluccius</i> spp. (<i>M. polli</i> and <i>M. senegalensis</i>) Morocco, Mauritania, Senegal and Gambia Whole subregion 	16 972 (9 668)	115%	137%		Fully exploited, but the catch level of the last year is not sustainable by the stock in the short term. This stock has also been evaluated by other models (Bayesian and CMSY which give the same situation as Biodyn).	Given the relatively low level of effort targeting black hake and the bycatch of these species in 2016 (7 076 tonnes), the Working Group recommends that necessary steps be taken to reduce bycatch at average of the 2014-2015 period (3 300 tonnes).
<i>Arius</i> spp. Senegal and Gambia 	8 703 (7 613)	-	-	N/A	Fully exploited (based on CPUE)	The available data would not allow assessments of this stock, for this purpose, as a precautionary measure, the Working Group recommends not to exceed the level of fishing mortality that would allow catches that are average recent years (7 600 tonnes).







Stock	Catches (tonnes) 2016 (avg. 2012–2016)	$*B_{cur}/B_{0.1}$	$*F_{cur}/F_{0.1}$	LCA and Y/R Yield per recruit	Assessments	Management recommendations <i>(a reduction in fishing mortality implies either a reduction in effort or the introduction of measures such as seasonal closure of fishing areas)</i>
<i>Pseudotolithus</i> spp. Senegal and Gambia <i>Pseudotolithus</i> spp. Senegal and Gambia 	7 410 (7 231)	-	-	-	Inconclusive	As the assessment is not conclusive, the Working Group recommends, as a precaution, not to exceed the fishing mortality level of 2016.
<i>Epinephelus aeneus</i> Mauritania, Senegal and Gambia 	6 263 (4 566)	85%	144%	189%	Overexploited	Taking into account the results of the assessments, the Working Group recommends reducing the current fishing mortality.
<i>Pagrus caeruleostictus</i> Mauritania, Senegal 	11 715 (7 653)	116%	114%	N/A	Fully exploited	Based on the results of the assessments, the Working Group recommends not to exceed the current level of fishing mortality.

Stock	Catches (tonnes) 2016 (avg. 2012–2016)	*B _{cur} / B _{0.1}	*F _{cur} / F _{0.1}	LCA and Y/R Yield per recruit	Assessments	Management recommendations <i>(a reduction in fishing mortality implies either a reduction in effort or the introduction of measures such as seasonal closure of fishing areas)</i>
<i>Sparus aurata</i> and <i>Pagrus auriga</i> Morocco 	72 900 (77 676)	-			Overexploited (2013)	<i>Sparus aurata</i> and <i>Pagrus auriga</i> : The available data do not allow evaluations of this stock for this purpose. As a precautionary measure, the Working Group recommends not to exceed the current level of fishing mortality.
<i>Dentex macrophthalmus</i> Morocco, Mauritania and Senegal 	4 398 (4 225)	160%	27%	N/A	Not fully exploited	The Working Group emphasized that this stock could support a slight increase in fishing mortality.
<i>Plectorhynchus mediterraneus</i> Morocco 	7 708 (7 014)	72%	170%	208%	Overexploited	Based on the results of the stock assessment, the Working Group recommends reducing fishing mortality.

Stock	Catches (tonnes) 2016 (avg. 2012–2016)	*B _{cur} / B _{0.1}	*F _{cur} / F _{0.1}	LCA and Y/R Yield per recruit	Assessments	Management recommendations <i>(a reduction in fishing mortality implies either a reduction in effort or the introduction of measures such as seasonal closure of fishing areas)</i>
<i>Pagellus belottii</i> Mauritania, Senegal and Gambia 	9 456 (6 164)	113%	82%	93%	Fully exploited	As a precautionary approach, the Working Group recommends not to exceed the current fishing mortality.
<i>Pagellus acarne</i> Morocco 	1 598 (1 126)	-	-	110%	Fully exploited (LCA)	As a precautionary approach, the Working Group recommends not to exceed the current fishing mortality.
<i>Pagellus</i> spp. Morocco 	2 694 (3 523)	-	-	-	No assessment	The Working Group recommends not to exceed the 2016 fishing mortality.

Stock	Catches (tonnes) 2016 (avg. 2012–2016)	*B _{cur} / B _{0.1}	*F _{cur} / F _{0.1}	LCA and Y/R Yield per recruit	Assessments	Management recommendations <i>(a reduction in fishing mortality implies either a reduction in effort or the introduction of measures such as seasonal closure of fishing areas)</i>
<i>Parapenaeus longirostris</i> Morocco 	6 992 (6 917)	38%	199%	400	Overexploited	Given that pink shrimp are fished by the same coastal trawl fleet that also targets white hake, it is recommended that fishing mortality be reduced from 2016 (similar to what was recommended for white hake).
<i>Parapenaeus longirostris</i> Mauritania 	350 (790)	-	-	-	Not fully exploited (2013 assessment)	Given the exceptionally low levels of fishing mortality during the 2012-2016 period, the Working Group considered that an increase could be possible, up to the 2011 catch level, when the fishery was considered sustainable (WG, 2013).
<i>Parapenaeus longirostris</i> Senegal and Gambia 	1 401 (1 918)	56%	85%	-	Overexploited in terms of biomass but current F is less than F _{0.1}	Considering the past overexploitation of biomass in the stock and current fishing mortality below F _{0.1} target fishing mortality, the Working Group recommends not to increase the current level of fishing mortality (2016).

Stock	Catches (tonnes) 2016 (avg. 2012–2016)	*B _{cur} / B _{0,1}	*F _{cur} / F _{0,1}	LCA and Y/R Yield per recruit	Assessments	Management recommendations <i>(a reduction in fishing mortality implies either a reduction in effort or the introduction of measures such as seasonal closure of fishing areas)</i>
<i>Penaeus notialis</i> Mauritania 	343 (314)			-	Fully exploited (2013)	Considering the exceptionally low level of fishing mortality during the 2012-2016 period, the Working Group considers that an increase in catches at the 2011 level would be possible, when the fishery was considered sustainable (WG, 2013).
<i>Penaeus notialis</i> Senegal and Gambia 	981 (1 076)		1	-	Overexploited (2013)	Given that the last assessment (2013) shows overexploitation, the Working Group recommends not to increase the current level of fishing mortality (2016).
<i>Octopus vulgaris</i> Dakhla (26°N- 20°50'N) 	37 918 (38 988)	66%	142%	N/A	Overexploited	The Working Group recommends a reduction in fishing effort for the Dakhla stock.
<i>Octopus vulgaris</i> Cap Blanc (20°N- 16°N) 	34 142 (29 109)	100%	114%	-	Fully exploited	The Working Group recommends not to exceed the 2016 fishing mortality for the Cap Blanc stock.
<i>Octopus vulgaris</i> Senegal and Gambia 	4 466 (4 151)	-		N/A	No assessment	Given the reduction in fishing effort in Morocco and Mauritania in recent years and the improvement in the abundance of both stocks (Dakhla and Cap Blanc), the Working Group recommends: For Senegal-Gambia, as a precaution, not to exceed the current fishing mortality.

Stock	Catches (tonnes) 2016 (avg. 2012–2016)	*B _{cur} / B _{0.1}	*F _{cur} / F _{0.1}	LCA and Y/R Yield per recruit	Assessments	Management recommendations <i>(a reduction in fishing mortality implies either a reduction in effort or the introduction of measures such as seasonal closure of fishing areas)</i>
<i>Sepia</i> spp. Dakhla (26°N- 20°50'N) 	25 464 (23 783)	33%	310%	N/A -	Overexploited	The Working Group recommends reducing the fishing mortality of this species and limiting the catch to the year 2011 (18,000 tonnes).
<i>Sepia</i> spp. Cap Blanc (20°N-16°N) 	1 790 (2 376)	151%	31%	N/A	Not fully exploited	A gradual increase in catches could be envisaged.
<i>Sepia</i> spp. Senegal and Gambia 	2 280 (3 147)	-	-	N/A		As a precaution, the Working Group recommends not to exceed the current fishing mortality.
<i>Loligo vulgaris</i> Dakhla (26°N- 20°50'N) 	15 597 (9 311)	-	-	-	No model adjustment	This species with high commercial value is caught incidentally by the fleets that target the octopus. The improvement observed should not be an opportunity for an unregulated increase in fishing effort. The Task Force recommends: Close monitoring of catches and effort applied to squid. A maintenance of fishing mortality at its current level (2016).
<i>Loligo vulgaris</i> Cap Blanc (20°N-16°N) 	2 920 (2 417)					
<i>Loligo vulgaris</i> Sénégal et Gambie 	148 (132)					