联合国粮食及农业组织 | Food and Agriculture Organization of the United Nations | Organisation des Nations Unies pour l'alimentation et l'agriculture | Продовольственная и сельскохозяйственная организация Объединенных Наций | Organización de las Naciones Unidas para la Alimentación y la Agricultura | منظمة الأغذية والزراعة للأمم المتحدة

FISHERY COMMITTEE FOR THE EASTERN CENTRAL ATLANTIC

SCIENTIFIC SUB-COMMITTEE

Tenth Session

Mindelo, Cabo Verde, 29 September–02 October 2025

REPORT OF THE FAO/CECAF WORKING GROUP ON THE ASSESSMENT OF DEMERSAL RESOURCES – SUBGROUP NORTH – 2024

EXECUTIVE SUMMARY

The eighth meeting of the FAO/CECAF Working Group on the Assessment of Demersal Resources - northern subgroup, was held in Agadir, Morocco, from 4 to 12 June 2024. 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. A total of 31 stocks were assessed and some assessments still show uncertainty in the results because of lack of accuracy in the data. However, 15 stocks appear to be overexploited, 3 fully exploited, 5 not fully exploited and no assessment could be done for 8 stocks. The Working Groupe issued management recommendations, referring mainly to catch levels and fishing effort.

Suggested action by the Sub-Committee
The Sub-Committee is invited to: • Take note of the results of the working group; • Discuss and endorse relevant management recommendations; • Advise on priority areas to be addressed under the framework of the working group.

INTRODUCTION

1. The Working Group on the Assessment of Demersal Resources off Northwest Africa was held in Agadir, Morocco, from 4 to 12 June 2024. The meeting was hosted by the *Institut National de Recherche Halieutique* (INRH) in Agadir, Morocco. The FAO Regional Office for Africa and the EAF-Nansen programme provided financial and logistic support to the organization.

2. The overall objective of the Working Group is to contribute to the improved management of demersal resources in Northwest Africa through the assessment of the state of the stocks and fisheries in order to ensure sustainable use of these resources for the benefit of coastal countries.

3. Analysis of the fisheries resources are summarized under four subgroups: hake, other demersal fish, shrimps, and cephalopods. The 2024 Working Group meeting analyzed a total of 31 stocks and/or groups of species.

4. A total of 25 researchers from five different countries in the subregion and the Food and Agriculture Organization of the United Nations (FAO) participated in the meeting. The Working Group was Chaired by Mr Beyah Meisse Habibe of the *Institut Mauritanien de Recherches Océanographiques et de Pêches* (IMROP), Mauritania.

METHODOLOGY

5. Consistent with the methods used over the last few years, the main model used by the Working Group was the dynamic version of the Schaefer (1954) model (Appendix II, FAO, 2012). An Excel spreadsheet implementation of this model, with an observation error estimator (Haddon, 2001), was used. The model was fitted to the data using the non-linear optimizer built into Excel, Solver.

6. The data required are annual estimates (or quarterly estimates if possible) of total catch by stock, as well as reliable stock abundance indices. In general, the Working Group adopted the abundance estimates from the surveys, or from commercial catch per unit of efforts (CPUEs) - even though the reliability of some of these still has to be verified. For some stocks, abundance indices from scientific surveys were available and used as input data for production models instead of CPUEs derived from commercial fisheries.

7. Furthermore, one of the objectives of this year's meeting was to test possible new assessment methods that could broaden the tools available to the Working Group. As a consequence, the models/approaches were tested for some stocks and the CMSY (Froese et al., 2017), SPiCT (stochastic surplus production model in continuous time) (Pedersen and Berg, 2017) and JABBA (Just Another Bayesian Biomass Assessment) (Winker et al., 2018), were also applied for certain stocks.

8. For some stocks, a Length Cohort Analysis (LCA; Jones, 1984) was applied in order to estimate the current F-level and the relative exploitation pattern on the fishery over the last few years. A length-based Yield per Recruit Analysis (Y/R; Thomson and Bell, 1934) was then run on these estimates, to estimate the Biological Reference Points F_{Max} and $F_{0.1}$. Both the LCA and the Yield-per-Recruit Analysis were implemented as Excel spreadsheets.

9. In keeping with predefined scenarios using the Schaefer model adjusted to the time series data, medium term projections of future yields and the development of the state of the stocks were carried out using an Excel spreadsheet which allowed the standardization of the data and results of all stocks (Appendix II, FAO, 2012). In addition, for stocks assessed using SPICT and JABBA, projections were made using the internal software packages of the models themselves. For these projections, a period of five years was used (three years for shrimp species).

10. All projections are based on the estimated stock status in the last year of the data available. Future management strategies were defined based on changes in fishing mortality and/or catch with respect to the data estimates of the last available year.

11. For each stock, two scenarios were considered. The first is the status quo which considers future yields and stock development in the case where fishing mortality remains unchanged in relation to that of the data series used for the assessments of the previous year. The second scenario takes into consideration a gradually changes in fishing mortality and/or catches and their effect on the development of the stocks and their abundances for the next three years.

Stock status categories

12. The three categories of assessment adopted by CECAF Scientific Working Groups are:

- **Not-fully exploited:** The stock is in good condition and fishing pressure can be increased without affecting 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 in terms of biomass or/and fishing mortality. Fishing pressure should be reduced to allow the stock to grow.

Management advice

13. The Working group, consistent with CECAF, has adopted the following Biological Reference Points (BRPs):

- **Target reference points:** $B_{cur}/B_{0.1}$ and $F_{cur}/F_{0.1}$
- **Limit reference points:** B_{cur}/B_{MSY} and F_{cur}/F_{MSY}

14. Where:

- $\mathbf{F_{0.1}}$ - The fishing mortality rate at which the slope of the yield – per - recruit curve is only one - tenth the slope of the curve at its origin or 90 percent of F_{MSY}.
- $\mathbf{F_{MSY}}$ -Value of F (and of other characteristics of the stock) where the long-term total yield is maximum.
- $\mathbf{F_{Max}}$ - Consider the long−term yield per recruit, Y/R, as a function of F, for a certain exploitation pattern. F_{Max} is the point of the curve, Y/R against F, where Y/R is maximum.
- $\mathbf{B_{0.1}}$ – is the value of Biomass corresponding to $F_{0.1}$.
- $\mathbf{B_{MSY}}$ – is the value of Biomass corresponding to F_{MSY}.

15. The target reference points indicate what the current situation is like in terms of biomass and fishing mortality compared to the ideal situation for the stocks whereas the limit indicate that the current situation related to what we want to avoid.

16. The more conservative $F_{0.1}$ and $B_{0.1}$ have been selected as target reference points rather than the more traditional F_{MSY} and B_{MSY}, due to the inconsistencies of some data sets, and in line with the precautionary approach.

17. The Working Group estimates the status of the stocks and fisheries in relation to these agreed reference points adopted by CECAF. Whenever possible, the Group made projections of future yields and stock status under different scenarios for future management measures.

18. The management advice for the stocks is given based on the agreed reference points and the projections. Whenever possible, advice for each stock is given both in terms of effort and/or catch levels. Since most of the stocks are shared by two or more countries in the region, the Working Group strongly recommends the reinforcement of regional cooperation in research and management.

RESULTS

19. Overall, 8 out of 31 stocks were found to be within biologically sustainable limits and 15 stocks were found to be overexploited. No formal assessment could be conducted for 8 of the stocks due to a lack of data.

20. The results of the evaluations show that (Table 2):

- **Fifteen stocks were considered overexploited**: *Merluccius merluccius* (Morocco stock), *Merluccius* spp. (stock Morocco, Mauritania, Senegal, Gambia), *Epinephelus aeneus* (stock Mauritania, Senegal, Gambia), *Pagrus caeruleostictus* (Mauritania stock, Senegal), *Plectorhynchus mediterraneus* (Mauritania, Morocco stock), *Pagellus bellotti* (Mauritania, Senegal, Gambia stock), *Pagellus acarne* (Morocco stock), *Brama brama* (stock Mauritania, Morocco), *Parapenaeus longirostris* (stock Morocco), *Octopus vulgaris* (stock Dakhla, Cap Blanc and stock Senegal, Gambia), *Sepia* spp. (Senegal, Gambia stock, Cap Blanc stock), *Loligos vulgaris* (Dakhla stock).
- **Three stocks were considered fully exploited**: *Penaeus notialis* (Senegal, Gambia stock), *Sepia* spp. (Dakhla stock), *Loligo vulgaris* (Cap Blanc stock).
- Five stocks were considered not fully exploited: *Dentex macropthalmus* (Senegal, Gambia), *Plectorhynchus mediterraneus* (Senegal-Gambia stock), *Parapenaeus longirostris* (Mauritania stock and Senegal stock, Gambia), *Aristeus varidens* (Mauritania stock).
- **Eight stocks were not assessed**: *Pagellus* spp (Morocco stock), *Arius* spp. (Senegal, Gambia), *Pseudotolithus* spp. (Senegal, Gambia), *Sparus* spp./*Pagrus* spp.(Morocco), *Sparisoma cretense* (Canary Islands), *Penaeus notialis* (Mauritania), *Aristeus varidens* (Senegal, Gambia), *Loligo vulgaris* (Senegal, Gambia).

MANAGEMENT RECOMMENDATIONS

21. The management recommendations depend on the state of the stock analyzed. In case of overexploitation, the working group recommends a reduction in catches ranging from 10 to 45 percent depending on the species and the situation. In some cases, additional measures are suggested (e.g. biological rest, reduction of catches of juveniles, or bycatch). When stocks were found to be within biologically sustainable limits, the Working Group recommended to either maintaining the same level of catches than previous years, limiting them to Maximum Sustainable Yield (MSY) level, or, in certain cases, reducing them as a precautionary measure.

REGIONAL TRENDS

Catch

22. The total catch of demersal resources analyzed by the 2024 Working Group was around 287 000 tonnes in 2023 (Figure 1). Compared to 2022 (239 000 tonnes), demersal resources total catch has increased by 20 percent. The 5-year average catch, from 2019 to 2023, was 256 000 tonnes.

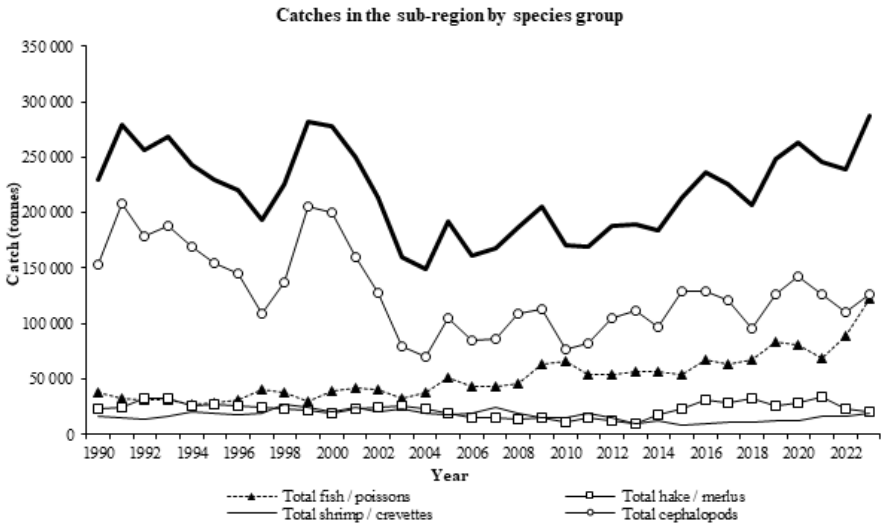

Figure 1. Total demersal species in the subregion by species group and year.

Table 2: Comparative catches between 2019 and 2023 in thousand tonnes.

Species	Catch 2019 (thous. tonnes)	Catch 2020 (thous. tonnes)	Catch 2021 (thous. tonnes)	Catch 2022 (thous. tonnes)	Catch 2023 (thous. tonnes)	% 2023 related to total catch	Average (2019-2023)	Average (1990-2023)
Octopus vulgaris	67 293	71 616	65 435	72 715	64 187	22%	68 249	88 053
Sepia spp.	37 470	48 150	36 962	26 894	42 978	15%	38 755	28 901
Loligo vulgaris	24 398	24 884	25 319	11 944	20 364	7%	21 382	11 680
Parapenaeus longirostris	7 612	6 056	10 477	9 981	11 147	4%	9 054	10 748
Penaeus notialis	4 173	5 827	5 323	6 413	6 910	2%	5 729	4 203
Aristeus varidens	388	416	610	650	575	0%	528	233
Merluccius merluccius	5 453	6 762	7 406	6 738	7 463	3%	6 764	6 920
Merluccius spp.	20 395	21 086	26 486	16 472	12 796	4%	19 547	15 732
Pagellus bellottii	11 275	13 427	11 302	7 180	10 376	4%	10 712	8 320
Pagellus acarne	1 450	1 220	1 835	1 638	5 920	2%	2 413	2 647
Pagellus spp.	1 982	1 437	1 731	1 439	1 905	1%	1 699	2 060
Dentex macrophthalmus	5 438	4 655	6 634	4 119	6 521	2%	5 473	4 451
Pagrus caeruleostictus	10 132	10 250	8 152	7 823	6 887	2%	8 649	6 865
Sparus spp.	2 864	2 710	4 311	2 760	5 939	2%	3 717	2 547
Arius spp.	16 584	18 061	10 907	10 812	12 756	4%	13 824	7 529
Pseudotolithus spp	12 821	11 622	6 048	5 523	5 586	2%	6 795	6 302
Epinephelus aeneus	6 521	5 048	4 844	5 197	5 314	2%	5 385	3 506
Sparisoma cretense	250	212	251	267	287	0.1%	253	207*
Plectorhynchus mediterraneus	13 516	11 760	12 684	41 759	60 499	21%	12 546	6 126
Brama Brama	5 465	5 179	3 079	2 861	2 027	1%	3 722	4 013
Total Demersals	**255 480**	**270 378**	**249 796**	**210 783**	**245 349**	**100%**	**28 044**	**8 405**

*2007-2023 average

23. The most important species group in the region in terms of catch remains cephalopods, specifically octopus (*Octopus vulgaris*); in 2023, this species represented 22 percent of total demersal catches (64 000 tonnes). Catches of octopus were relatively stable in the past five years (2019-2023),

fluctuating around an average value of 68 000 tonnes. Catches of cuttlefish (Sepia spp.), another species group within the cephalopods group, made out 15 percent of total demersal catches in 2023 (42 000 tonnes). Catches fluctuated strongly in the past five years, and had an average of 38 000 tonnes. As regards catches of *Loligo vulgaris*, an increase has been observed from 3 000 tonnes in 2006 to 20 000 tonnes in 2023, whereby an average of 21 000 tonnes has been recorded over the period between 2019 and 2023.

24. The second most important group in the 2023 catches was the demersal fish group. This was mainly due to high catches of the Rubber-lip grunt (*Plectorhynchus mediterraneus*), making out 21 percent of the total catch. Between 2010 and 2021, Rubber-lip grunt catches were stable around 11 000 tonnes and after that they strongly increased to 42 000 tonnes in 2022, reaching 60 000 tonnes in 2023. Catches of the total group of demersal fish species represented 43 percent of the total demersal species analyzed by the 2024 Demersal Working Group. Catches of this group averaged around 51 000 tonnes from 1990 to 2023, with an average of around 88 000 tonnes throughout the 5-year period from 2019 to 2023.

25. Catches of black hake (*Merluccius polli* and *Merluccius senegalensis*) decreased notably from 26 500 tonnes in 2021 to 12 800 tonnes in 2023, while quantities of white hake (*Merluccius merluccius*) increased slightly from 3 800 tonnes in 2010 to 7 500 tonnes in 2023. Hake species represented 7 percent of the total catch in 2023.

26. Catches of deep water rose shrimp *Parapenaeus longirostris* have increased, from 6 000 tonnes in 2020 to 11 100 tonnes in 2023. This is still lower than the average of the total time series (1990-2023), namely 12 700 tonnes. Catches of Southern Pink Shrimp (*Penaeus notialis*) increased from 1 200 tonnes in 2015 to 6 900 tonnes in 2023, with an average of 5 700 tonnes in the last 5 years from 2019 to 2023. Catches of Striped Red Shrimp (*Aristeus varidens*) increased from 198 tonnes in 2019 to 453 tonnes in 2022 followed by a small decrease to 398 tonnes in 2023, with an average of 371 tonnes in the last 5 years from 2019 to 2023.

SURVEYS

27. Morocco carried out ten surveys in 2022 and eleven surveys in 2023 to assess and monitor demersal resources on the Moroccan Atlantic coast between Cap Boujdour (26°N) and Cap Blanc (20°50'N). The surveys were conducted by Research Vessels *Charif Al Idrissi*, *Al Amir Moulay Abdellah* and *Al Hassan Al Marrakchi*.

28. In Mauritania, two demersal resource assessment surveys were conducted in 2022 and 2023. Due to the unavailability of research vessel Al Awam, the surveys were conducted on board commercial vessel *Anejah*.

STATE OF STOCKS AND MANAGEMENT RECOMMENDATIONS

29. Table 2 summarises the assessment results and management advice for each stock.

CONCLUSION

30. The Working Group strongly recommends strengthening regional cooperation in research and management. Expectations of fisheries managers for management advice provided by scientists should be discussed with the members of the Working Group, so that they can develop strategies to improve the advice provided.

Table 2: Summary of the assessments and management recommendations by the 2024 Working Group. All advice is based on the results of the production model, unless otherwise indicated.

Stock	Catch in tonnes 2023 (Average 2019–2023)	*$B_{cur}/B_{0.1}$	B_{cur}/B_{MSY}	*$F_{cur}/F_{0.1}$	F_{cur}/F_{MSY}	LCA/Yield per recruit ($F_{cur}/F_{0.1}$)	Assessment	Management recommendations *(A reduction in fishing mortality entails either a reduction in fishing effort, or the introduction of measures such as closed fishing seasons)*
Hake *Merluccius merluccius* Morocco	7 463 (6 764)	97%	107%	146	132%	The model provides a high exploitation rate because of the exploitation of juveniles	Overexploited	The Working Group recommends a reduction in catches to the MSY level (5 300 tonnes) corresponding to a 20 percent reduction compared to the average catch over the last 5 years, allowing the stock to return to the MSY level. Given the level of exploitation observed, the Working Group recommends reducing the catches of juveniles in the coastal trawlers fleet.
Merluccius spp. (*M. polli* and *M. senegalensis*) Morocco Mauritania Senegal Gambia Whole sub-region	12 796 (19 2357)	58%	64%	147%	132%	250%	Overexploited (length cohort analysis (LCA): Overexploitation of large individuals)	The Working Group recommends a gradual reduction in the catch down to 10 700 tonnes which corresponds to a reduction of 45 percent compared to the average catch over the last 5 years, to allow the stock to return to the MSY level. Furthermore, it is recommended to introduce additional measures to reduce fishing mortality, in particular, zoning and spatial-temporal closures to protect spawning and recruitment periods. The Working Group recorded a drop in bycatch of hake, particularly in the pelagic trawler fishery in Mauritania, from 5 174 tonnes in 2021 to 1 314 tonnes in 2023 and an increase in bycatch in Senegalese fisheries. The Working Group recommends further reducing bycatch of Black Hake (4 400 tonnes in 2023) throughout the region.

Stock	Catch in tonnes 2023 (Average 2019–2023)	*$B_{cur}/B_{0.1}$	B_{cur}/B_{MSY}	*$F_{cur}/F_{0.1}$	F_{cur}/F_{MSY}	LCA/Yield per recruit ($F_{cur}/F_{0.1}$)	Assessment	Management recommendations *(A reduction in fishing mortality entails either a reduction in fishing effort, or the introduction of measures such as closed fishing seasons)*
Demersal fish *Epinephelus aeneus* Mauritania Senegal Gambia	5 314 (5 385)	54%	60%	194%	174%	-	Overexploited	The Working Group recommends a gradual reduction in the catch down to 3 200 tonnes, which corresponds to a reduction of 40 percent compared to the average catch over the last 5 years.
Pagrus caeruleostictus Mauritania Senegal	6 887 (8 649)	72%	79%	123%	111%	-	Overexploited	The Working Group recommends a gradual reduction in the catch down to 6 160 tonnes, which corresponds to a reduction of 10 percent compared to the 2023 catch.
Dentex macrophthalmus Mauritania Senegal Gambia	6 521 (5 473)	165%	182%	30%	27%	-	Not fully exploited	A gradual increase in catches can be considered. Given the multi-specific characteristics of the fisheries, as a precautionary measure, it is recommended to remain below MSY (13 200 tonnes).
Plectorhynchus mediterraneus Mauritania Morocco	12 831 (9 643)	80%	88%	167%	151%	175% (Morocco)	Overexploited	The Working Group recommends a reduction in the catch down to 7 700 tonnes, which corresponds to a reduction of 20 percent compared to the average catch over the last 5 years. The LCA model applied to data from Morocco shows a reduction in fishing mortality compared to the last assessment ($F_{cur}/F_{0.1}$=215% in 2021). The Working Group encourages the management initiatives taken (protection of rocky areas, etc.).

Stock	Catch in tonnes 2023 (Average 2019–2023)	*$B_{cur}/B_{0.1}$	B_{cur}/B_{MSY}	*$F_{cur}/F_{0.1}$	F_{cur}/F_{MSY}	LCA/Yield per recruit ($F_{cur}/F_{0.1}$)	Assessment	Management recommendations *(A reduction in fishing mortality entails either a reduction in fishing effort, or the introduction of measures such as closed fishing seasons)*
Plectorhynchus mediterraneus Senegal Gambia	2 580 (2 903)	153%	169%	39%	35%	-	Not fully exploited	Given the multi-specific characteristics of the fisheries, as a precautionary measure, it is recommended to maintain the catches at the 2023 level (2 500 tonnes)
Pagellus bellottii Mauritania Senegal Gambia	10 376 (10 712)	75%	82%	136%	122%	-	Overexploited	The Working Group recommends a reduction in the catch down to 9 600 tonnes (i.e. 10 percent reduction compared to the average over the last 5 years)
Pagellus acarne Morocco	5 920 (2 413)	66%	72%	247%	223%	-	Overexploited	The Working Group recommends reducing the catch to the sustainable level of 3 300 tonnes.
Pagellus spp. Morocco	1 905 (1 699)	-	-	-	-	-	No assessment	No recommendations
Brama brama Mauritania Maroc	2 027 (3 722)	49%	54%	113%	102%	-	Overexploited	The Working Group recommends not exceeding the catch level of 2 200 tonnes which corresponds to a 40 percent reduction compared to the average catch over the last 5 years.
Arius spp. Senegal Gambia	12 756 (13 824)	-	-	-	-	-	No assessment	No recommendations

Stock	**Catch in tonnes 2023 (Average 2019–2023)**	***$B_{cur}/B_{0.1}$**	**B_{cur}/B_{MSY}**	***$F_{cur}/F_{0.1}$**	**F_{cur}/F_{MSY}**	**LCA/Yield per recruit ($F_{cur}/F_{0.1}$)**	**Assessment**	**Management recommendations** ***(A reduction in fishing mortality entails either a reduction in fishing effort, or the introduction of measures such as closed fishing seasons)***
Pseudotolithus spp. Senegal Gambia	5 586 (6 795)	-	-	-	-	-	No assessment	No recommendations
Sparus spp./*Pagrus* spp. Morocco	5 939 (3 717)	-	-	-	-	-	No assessment	No recommendations
Sparisoma cretense Canary Islands	287 (253)	-	-	-	-	-	No assessment	No recommendations
Shrimps *Parapenaeus longirostris* Morocco	9 552 (7 007)	55%	60%	178%	160%	185%	Overexploited	The Working Group recommends a reduction in the catch down to 6 800 tonnes, which corresponds to a reduction of 20 percent compared to the average over the last three years. Furthermore, it is recommended to strengthen the measures taken to reduce fishing mortality of juveniles.

Stock	Catch in tonnes 2023 (Average 2019–2023)	*$B_{cur}/B_{0.1}$	B_{cur}/B_{MSY}	*$F_{cur}/F_{0.1}$	F_{cur}/F_{MSY}	LCA/Yield per recruit ($F_{cur}/F_{0.1}$)	Assessment	Management recommendations *(A reduction in fishing mortality entails either a reduction in fishing effort, or the introduction of measures such as closed fishing seasons)*
Parapenaeus longirostris Mauritania	300 (485)	177%	194%	6%	5%	-	Not fully exploited	The Working Group concluded that a gradual increase in catches could be considered up to the 2011 catch level (2 500 tonnes).
Parapenaeus longirostris Senegal Gambia	1 295 (1 562)	106%	117%	45%	41%	-	Not fully exploited	The Working Group recommends not exceeding the MSY level (2 600 tonnes)
Penaeus notialis Mauritania	2 283 (1 307)	-	-	-	-	-	No assessment	The model did not provide reliable results with the available data. Despite the improvement in abundance, in the absence of a reliable assessment, and as a precautionary measure, the Working Group recommends not to exceed the current level of catches.
Penaeus notialis Senegal Gambia	4 627 (4 423)	129%	142%	98%	89%	-	Fully exploited	The Working Group recommends reducing catches to the MSY level (3 500 tonnes).
Aristeus varidens Mauritania	177 (157)	148%	163%	51%	46%	-	Not fully exploited	The Working Group recommends not exceeding the MSY level (236 tonnes)

Stock	**Catch in tonnes 2023 (Average 2019–2023)**	***$B_{cur}/B_{0.1}$**	**B_{cur}/B_{MSY}**	***$F_{cur}/F_{0.1}$**	**F_{cur}/F_{MSY}**	**LCA/Yield per recruit ($F_{cur}/F_{0.1}$)**	**Assessment**	**Management recommendations** ***(A reduction in fishing mortality entails either a reduction in fishing effort, or the introduction of measures such as closed fishing seasons)***
Aristeus varidens Senegal, Gambia	398 (371)	-	-	-	-	-	No assessment	The Working Group carried out the first attempt to assess the species but the time series used is too short to achieve reliable results. Efforts should be made to expand the data set by retrieving old data (before 2017) and continue collecting data for the upcoming period.
Cephalopods *Octopus vulgaris* Dakhla	25 461 (31 285)	58%	63%	109%	98%	-	Overexploited	Given the significant reduction in fishing effort applied by Morocco in 2022 and the projections indicating an improvement in the state of the stock in the coming years under the status quo scenario, the Working Group recommends maintaining catches at the same level as in 2023 (25 400 tonnes), corresponding to the sustainable catch.
Octopus vulgaris Cap Blanc	36 426 (33 756)	-	75% JABBA	-	162% JABBA	-	Overexploited	The Working Group recommends a reduction in the catch to 29 000 tonnes, which corresponds to a reduction of 20 percent compared to the catch of the last year.
Octopus vulgaris Senegal Gambia	2 300 (3 208)	30%	33%	101%	91%	-	Overexploited	The Working Group noted that a 40 percent reduction is insufficient to improve the status of the stock. Therefore, the Working Group recommends a substantial reduction in fishing mortality and the strengthening of management measures (extending the duration of biological rest, as done in other countries, etc.).

Stock	Catch in tonnes 2023 (Average 2019–2023)	*$B_{cur}/B_{0.1}$	B_{cur}/B_{MSY}	*$F_{cur}/F_{0.1}$	F_{cur}/F_{MSY}	LCA/Yield per recruit ($F_{cur}/F_{0.1}$)	Assessment	**Management recommendations** ***(A reduction in fishing mortality entails either a reduction in fishing effort, or the introduction of measures such as closed fishing seasons)***
Sepia spp. Senegal Gambia	5 786 (6 278)	35%	35%	266%	239%	-	Overexploited	The Working Group recommends a reduction in the catch down to 3 500 tonnes which corresponds to a reduction of 40 percent compared to the average over the last 3 years. Furthermore, the Working Group recommends a substantial reduction in fishing mortality and the strengthening of management measures (extending the duration of biological rest, as done in other countries, etc.).
Sepia spp. Dakhla	33 819 (28 594)	136%	149%	93%	84%	-	Fully exploited (Fcurr/FSYCurr =165%)	The Working Group recommends a reduction in catches down to the MSY level (27 000 tonnes).
Sepia spp. Cap Blanc	4 629 (3 883)	79%	87% JABBA	134%	123% JABBA	-	Overexploited	The Working Group recommends reducing the catch to 3 700 tonnes, which corresponds to a 20 percent reduction compared to the last year's catch.
Loligo vulgaris Senegal Gambia	208 (275)	-	-	-	-	-	No assessment	Catches are highly variable throughout the time series. As a precautionary measure, it is recommended not to increase catches. Furthermore, the Working Group recommends developing standardized abundance indices to assess this stock.
Loligo vulgaris Dakhla	16 512 (17 109)	25%	28%	345%	311%	-	Overexploited	The Working Group recommends a gradual reduction down to 9 800 tonnes corresponding to a 40 percent reduction in the average catch over the last three years.
Loligo vulgaris Cap Blanc	3 644 (3 998)	98%	108%	94%	84%	-	Fully exploited	As a precautionary measure, the Working Group recommends reducing catches to the average of the last three years corresponding to 2 570 tonnes.

-: no assessment

* All reference points refer to production model results, unless specified otherwise