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Scientific, Technical and Economic Committee for Fisheries (STECF) – Monitoring the Performance of the Common Fisheries Policy (STECF-Adhoc-25-01)

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Abstract

Commission Decision of 25 February 2016 setting up a Scientific, Technical and Economic Committee for Fisheries, C(2016) 1084, OJ C 74, 26.2.2016, p. 4–10. The Commission may consult the group on any matter relating to marine and fisheries biology, fishing gear technology, fisheries economics, fisheries governance, ecosystem effects of fisheries, aquaculture or similar disciplines. This report deals with the monitoring of the performance of the Common Fisheries Policy.

1 SCIENTIFIC, TECHNICAL AND ECONOMIC COMMITTEE FOR FISHERIES (STECF) – Monitoring the Performance of the Common Fisheries Policy (STECF-Adhoc-25-01)

This advice was provided to the Commission on 04 April 2025.

1.1 Background provided by the Commission

Article 50 of the Common Fisheries Policy (CFP; Regulation (EU) No 1380/2013 of the European Parliament and of the Council of 11 December 2013) stipulates: "The Commission shall report annually to the European Parliament and to the Council on the progress on achieving maximum sustainable yield and on the situation of fish stocks, as early as possible following the adoption of the yearly Council Regulation fixing the fishing opportunities available in Union waters and, in certain non-Union waters, to Union vessels."

1.2 Request to the STECF

STECF is requested to report on progress in achieving MSY objectives in line with the Common Fisheries Policy.

1.3 STECF comments

To address the agreed Term of Reference, the STECF Adhoc Expert Working Group (STECF-EWG-Adhoc-25-01) was convened between January and March 2025 to compile available assessment outputs and conduct the extensive analysis required to prepare the annual CFP monitoring report.

The expert group presented a comprehensive report (STECF-EWG-Adhoc-25-01) accompanied by several detailed annexes to PLEN 25-01 providing:

1. Design-based indicators by ecoregions.
2. Numerical retrospective and historical performance analysis of model-based indicators.
3. Sensitivity analysis of model-based indicator F/F_{MSY} to the inclusion of surplus production models.
4. Model-based indicators input data and outputs.

The supporting electronic annexes include:

1. CFP monitoring protocols as agreed by STECF PLEN 23-03 (STECF, 2023).
2. URL links to electronic annexes referring to the reports and stock advice sheets underpinning the analysis.
3. R material for processing the data and produce indicators for the Northeast Atlantic.
4. R material for processing the data and produce indicators for the Mediterranean and Black Seas.
5. R material for computing the indicators.

The report and electronic annexes are available on https://stecf.ec.europa.eu/reports/cfp-monitoring_en.

STECF acknowledges that the report is clear and well laid out, comprehensively describing the analysis conducted by the experts and cataloguing the changes made in the approach since the previous report (STECF-EWG-Adhoc-24-01). STECF further notes that this is the

second year that version 5.0 of the CFP protocol (Gras et al., 2023) as agreed by PLEN 23-03 (STECF, 2023), was applied.

STECF observes that the CFP monitoring protocol defines two types of indicators that are based on individual stock assessments:

- design-based indicators: those indicators display the raw number of stocks that fulfil some criteria (e.g. the yearly number of stocks below FMSY), without applying any statistical model
- model-based indicators are derived from a state-space model that averages the situation across stocks (e.g. the model-based indicator of F/FMSY averages the F/FMSY of the different stocks considered).

STECF notes that to better understand the results from the model-based indicators such as F/F_{MSY} time series, the STECF-EWG-Adhoc-25-01 report includes additional plots comparing the model-based indicators and the distribution of underlying data. STECF recalls that model-based indicators conceal a large diversity of situations among stocks, and as such STECF considers that the new plots to display model-based indicators and underlying data are valuable additions to the CFP monitoring report.

The STECF-EWG-Adhoc-25-01 report sets out the results of the analyses separately for the Northeast Atlantic (NE Atlantic) and the Mediterranean & Black Seas (Sections 3 and 4, respectively). Based on these results, progress towards achieving MSY objectives are summarised below. In the report, “Northeast Atlantic” refers to stocks in FAO Area 27 inside and outside EU waters, and “Mediterranean & Black Seas” refers to stocks in FAO Area 37 inside EU waters. Additionally, at the request of EUROSTAT, an overview of all the stocks in European waters is also presented (Section 5 of the STECF-EWG-Adhoc-25-01 report).

For the NE Atlantic (FAO area 27), the most recently published ICES stock assessments carried out up to (and including) 2024 incorporating data up to 2023 were downloaded from the ICES website on 22 January 2025. For the Mediterranean & Black Seas (FAO area 37), the information was extracted from the STECF Mediterranean Expert Working Group repositories comprising the most recently published assessments carried out up to 2024 with data up to 2023, and from the GFCM quantitative stock assessment online STAR files comprising the most recently published assessments carried out up to 2024 with data up to 2022 in most of the cases and up to 2023 in some cases. As in previous reports, the Mediterranean and Black Sea dataset was thus trimmed a year before the NE Atlantic, i.e. 2022.

Methodological considerations

Performance perception revision

STECF notes that for the last two years, the analysis has shown a revision of previous CFP performance perception compared to what was presented in the reports until 2023, which can be explained by the factors detailed in the following paragraphs. This year’s analysis is focused on the trends presented in the results and not on precise quantitative results of the model-based indicators. Furthermore, model-based indicators at EU waters level have not been commented on, although they are presented in the STECF-EWG-Adhoc-25-01 report.

In recent years, STECF has highlighted increasing instability in model-based indicators. This results from various factors such as changes in the sampling frame, changes in stock assessment models used to compute indicators, or the inclusion of shared stocks which are

less influenced by the CFP. Indeed, more stock assessments are available, covering stocks with contrasted exploitation histories, and with alternative stock assessment models being used, such as surplus production models. For example, in the current exercise, 15 stocks (over 66 in the stock panel) were assessed with a surplus production model in the Med & Black Sea, whereas there were only two in the 2020 exercise (STECF EWG-Ad-hoc 20-01). STECF considers that, while monitoring the number of stocks for which stock assessments and estimated reference points are available is a relevant indicator of the coverage of the scientific advice, the systematic inclusions of new stocks in model-based and design-based indicators as soon as they meet the protocol criteria, might increase the instability of those indicators from one year to the next, and impair a consistent monitoring of the CFP performance. All these aspects have contributed to a change in perception in recent years, which will require STECF to revisit and discuss the process used to monitor the implementation of the CFP for future evaluations.

Scaling issues of model-based indicators

- *scaling issues due to the change in protocol*

STECF notes that the CFP monitoring protocol was recently changed. 2025 is only the second year in which the revised protocol has been applied andhindsight on the new protocol is still limited. In this context, STECF-EWG-Adhoc-25-01 carried out a historical performance analysis to explore the changes in perception due to the new protocol. As last year, it shows that while temporal trends are similar, the new protocol estimates lower levels of F/F_{MSY} and higher B/B_{2003} compared to the protocol used until 2023. This is especially true in the Mediterranean and Black Seas, (Figures 32 and 33 in the STECF-EWG-Adhoc-25-01 report) with substantially lower values of F/F_{MSY} and higher values of B/B_{2003} with the new protocol.

- *scaling issues due to the change in the dataset*

STECF notes that as agreed in the protocol the stocks included in the analysis change every year based on the most recent data availability. STECF further notes that, as noted above, in recent years the number of stocks that are assessed using surplus production models has increased. The latest revision of the protocol already clarified that only quantitative assessments with tuning indices (survey indices or, if not available, CPUE time series) could be included in the analysis, excluding in particular catch-only assessment methods (Gras et al., 2023). However, this still leaves in a large diversity of methods, and STECF observes for example that there are conceptual differences in F_{MSY} estimates from age-structured models and from surplus production models. STECF-EWG-Adhoc-25-01 report includes a sensitivity analysis to study the integration of stocks assessed with surplus production models. The results indicate that while trends in model-based indicators remain similar, the inclusion of surplus production models leads to lower F/F_{MSY} values. Given the expected continued increase in the number of stocks assessed using surplus production models, STECF observes that their impact in the calculation of model-based indicators should be further monitored and studied. STECF further notes that that the sensitivity analysis suggests that the inclusion of surplus production models also brings potential scaling issue, though seemingly of more limited magnitude than scaling resulting from the change of protocol.

- *implication of those scaling issues*

In summary, STECF underlines that the same changes in perception were highlighted last year and that they may result both from the change of protocol and from the change in the dataset.
STECF considers that this indicates that while temporal trends are robust, the absolute values are not. Care should thus be taken when comparing the values of F/F_{MSY} and B/B_{2003} to specific thresholds (e.g. comparison to 1).

In this context, STECF considers that there is a need for further and recurrent discussions on methodological aspects of the protocol.

Finally, STECF reminds that model-based indicators are average of fishing mortality and biomass trends across stocks of very different sizes and landings volume. As a consequence, a small stock with low catches or biomass has the same weight as a large stock with large catches. STECF also reminds that the CFP does not aim to achieve its MSY objectives on average, values that are monitored by model-based indicators, but to achieve these objectives for all stocks. Therefore, STECF considers that this might be best monitored by design-based indicators.

Trends towards reaching the MSY objective in the Northeast Atlantic and Mediterranean & Black Seas

The overview below describes the trends in fishing pressure observed in the NE Atlantic and the Mediterranean & Black Sea for the periods 2003 to 2023 and 2003 to 2022, respectively. It applies to the stocks with an analytical assessment and with associated reference points included in the reference list (sampling frame) of stocks for these areas.

Overview of stock status with respect to reference points

- *Northeast Atlantic*

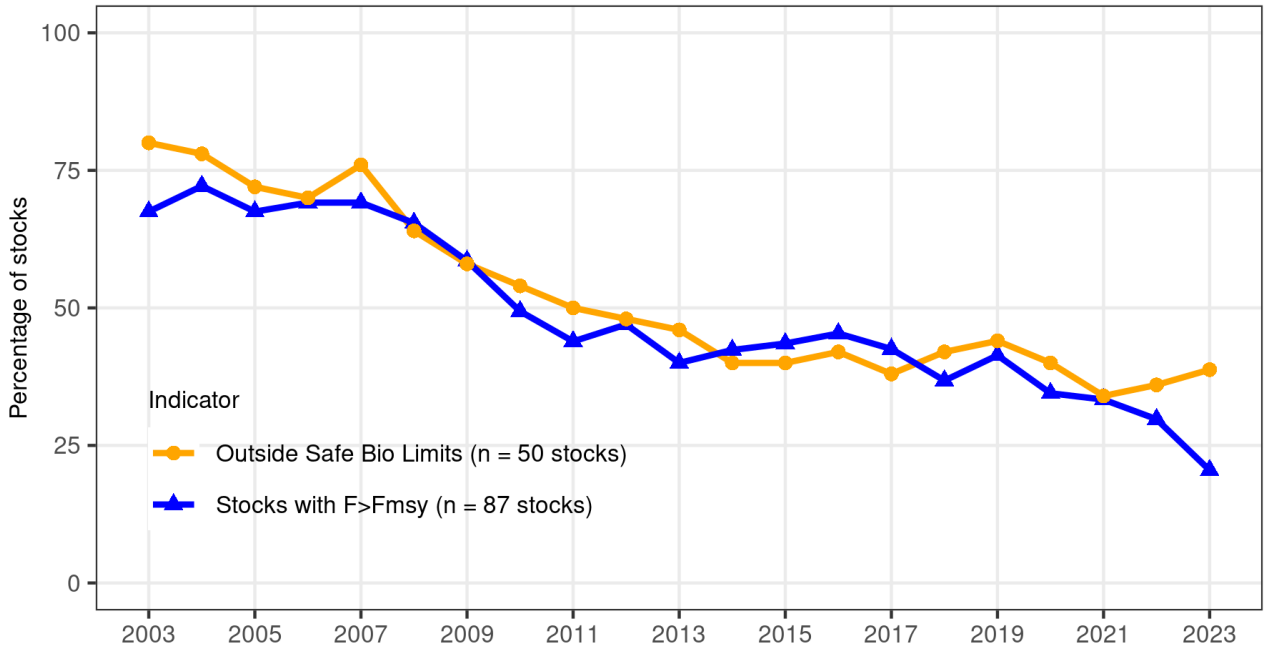
The indicators provided in STECF-EWG-Adhoc-25-01 report show that in the NE Atlantic (both EU and non-EU waters), the stock status has significantly improved since 2003 (Figure 1) but that some stocks are still exploited above F_{MSY}.

Among the stocks included in the analysis (Table 2, in STECF-EWG-Adhoc-25-01 report), the proportion of stocks with $F>F_{MSY}$ (blue line) has decreased from around 67% (2003) to 20% in 2023. The proportion of stocks outside safe biological limits ($F>F_{PA}$ or $B<B_{PA}$, yellow line, Table 5 in the STECF-EWG-Adhoc-25-01 report), computed for the 50 stocks for which both reference points were available, follows a similar decreasing trend, from 80% in 2003 to 39% in 2023.

STECF observes a divergence in the trends of stocks outside Safe Biological Limits and stocks with $F>F_{MSY}$ (Figure 1) in the last two years. This is related to three stocks (sol.27.20-24, sol.27.8ab, whg.27.6a) for which biomasses have fallen below Bpa since 2021 although their F remain below F_{MSY}, and one stock for which fishing mortality has overshot Fpa in 2023 (mac.27.nea).

While this inconsistency of trends is thus caused by a limited number of stocks (two in 2022 and two more in 2023), STECF considers that this divergence may convey important signals and should be monitored in the future.

Figure 1. Trends in stock status in the NE Atlantic 2003-2023. Two calculated proportions (as percentage) are presented: blue line: the proportion of stocks with F>F_{MSY} (out of a total of 87 stocks) and yellow line: the proportion of stocks outside safe biological limits SBL (F>F_{PA} or B<B_{PA}) (out of a total of 50 stocks).



Source: Own elaborations based on ICES data.

Combining these two calculated proportions (Table 1), STECF notes that in 2023, 10 stocks that were exploited below F_{MSY} were still outside safe biological limits, and four stocks inside safe biological limits were still exploited above F_{MSY}. In addition, 36 stocks had an unknown status with regards to safe biological limits. For the last known year, of the 87 stocks considered, only 30% (26 stocks) were neither exploited below F_{MSY} nor outside safe biological limits, suggesting that the objective in Art. 2.2 of the CFP[1] has not been met.

Table 1. Number of stocks with F>F_{MSY}, or FF_{MSY}, and inside (F≤F_{PA} and B≥B_{PA}) and outside (F>F_{PA} or B<B_{PA}) safe biological limits (SBL) in 2023 in the NE Atlantic (both EU and non-EU waters). Unknown SBL refers to stocks whose status regarding SBL could not be assessed.

	Below F_{MSY}	**Above F_{MSY}**
Inside SBL	26	4
Outside SBL	10	10
Unknown SBL	33	4

Source: Own elaborations based on ICES data.

STECF observes that the overall improvement in the status of the stocks at the NEA level might hide contrasted situations among and within ecoregions. For example, the trends in the

1 "*In order to reach the objective of progressively restoring and maintaining populations of fish stocks above biomass levels capable of producing maximum sustainable yield, the maximum sustainable yield exploitation rate shall be achieved by 2015 where possible and, on a progressive, incremental basis at the latest by 2020 for all stocks*".

number of stocks within safe biological limits (Figure 6 of STECF-EWG-Adhoc 25-01 report) seem to be stable in recent years in the Celtic Sea, but the number of stocks for which both $F<F_{MSY}$ and $B>B_{MSY}$ (Figure 8 of STECF-EWG-Adhoc 25-01 report) seem to be decreasing.

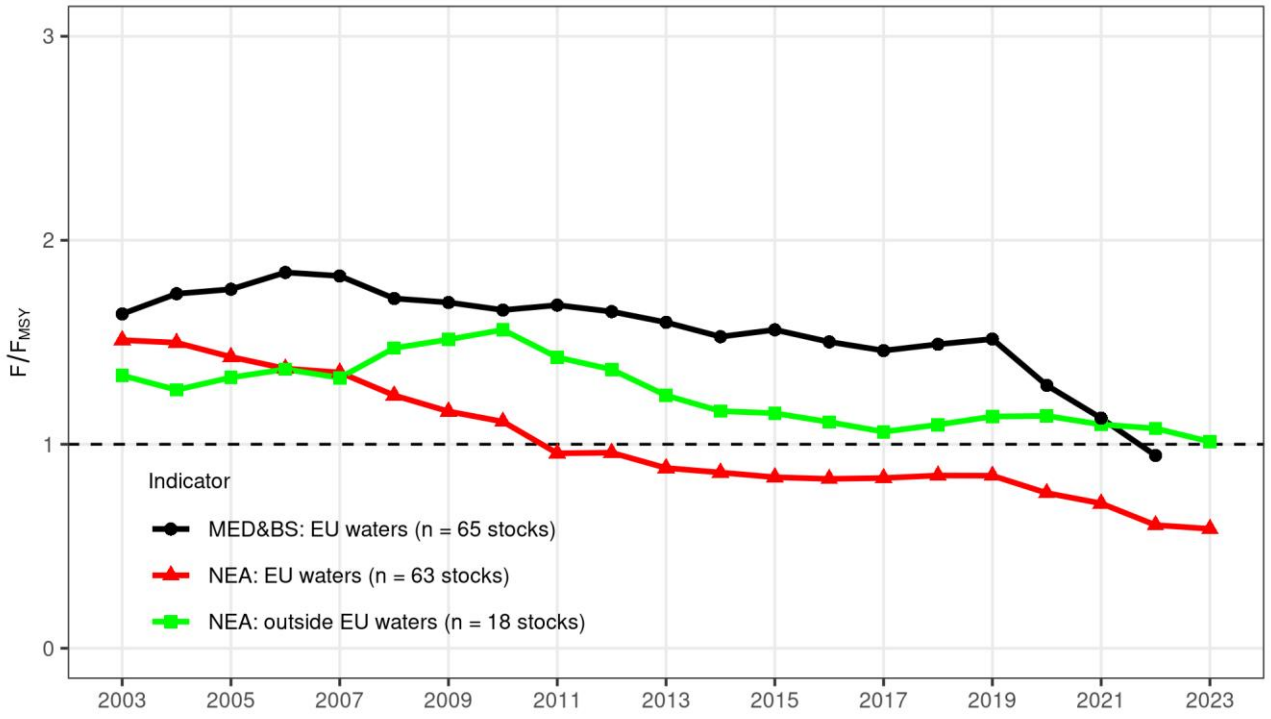
- *Mediterranean & Black Seas*

For the Mediterranean & Black Seas, the number of stocks assessed and for which data is available, has varied from year to year and assessment results for some stocks do not extend back to the earlier part of the time series. For 30 stocks, both F_{MSY} and B_{MSY} are available for 2022, of which 9 were calculated during the STECF Western Mediterranean stock assessment working group (EWG 24-12 and EWG 24-02), and 21 were estimated by GFCM.

STECF notes that Safe Biological Limit reference points are not available in the Mediterranean assessments, so the analysis was restricted to comparisons to MSY. Among the stocks for which F_{MSY} was available (Table 26, in STECF-EWG-Adhoc-25-01 report), the proportion of exploited above F_{MSY} has decreased from around 75% in 2004 to more than 50% in 2022.
STECF notes that, as agreed in the recent methodological EWG for defining reference points (EWG 24-02), $F_{0.1}$ was used as a proxy for F_{MSY} for most of these stocks and consequently, the biomass at $F_{0.1}$ is used here as a proxy for B_{MSY}. STECF-EWG-Adhoc-25-01 report presents indicators on the number of stocks exploited above F_{MSY} and on the number of stocks with F above F_{MSY} or SSB below B_{MSY} (STECF-EWG-Adhoc-25-01 report).

Overall trends in the fishing pressure: Ratio of F/F_{MSY}
As agreed by STECF PLEN 23-03 (STECF, 2023), STECF-EWG-Adhoc 25-01 computed the trends in fishing pressure using a state-space model as implemented in the R package JARA (Winker et al., 2019), tailored to the needs of CFP monitoring.The model-based results for the NE Atlantic (inside and outside EU waters), Mediterranean and Black Seas and for all EU waters are displayed in Figures 9, 11 and 28 of the STECF-EWG-Adhoc-25-01 report. Trends in the median values for F/FMSY are summarised in Figure 2 over the time-series for the NE Atlantic inside and outside EU waters and for the Mediterranean and Black Sea.

Figure 2. Trends in fishing pressure 2003-2023. Three model-based indicators F/F_{MSY} are presented: red line which represents 63 stocks with appropriate information in the NE Atlantic EU waters; green line for 18 stocks also located in the NE Atlantic but outside EU waters; and black line for the 65 stocks from the Mediterranean Sea & Black Seas.

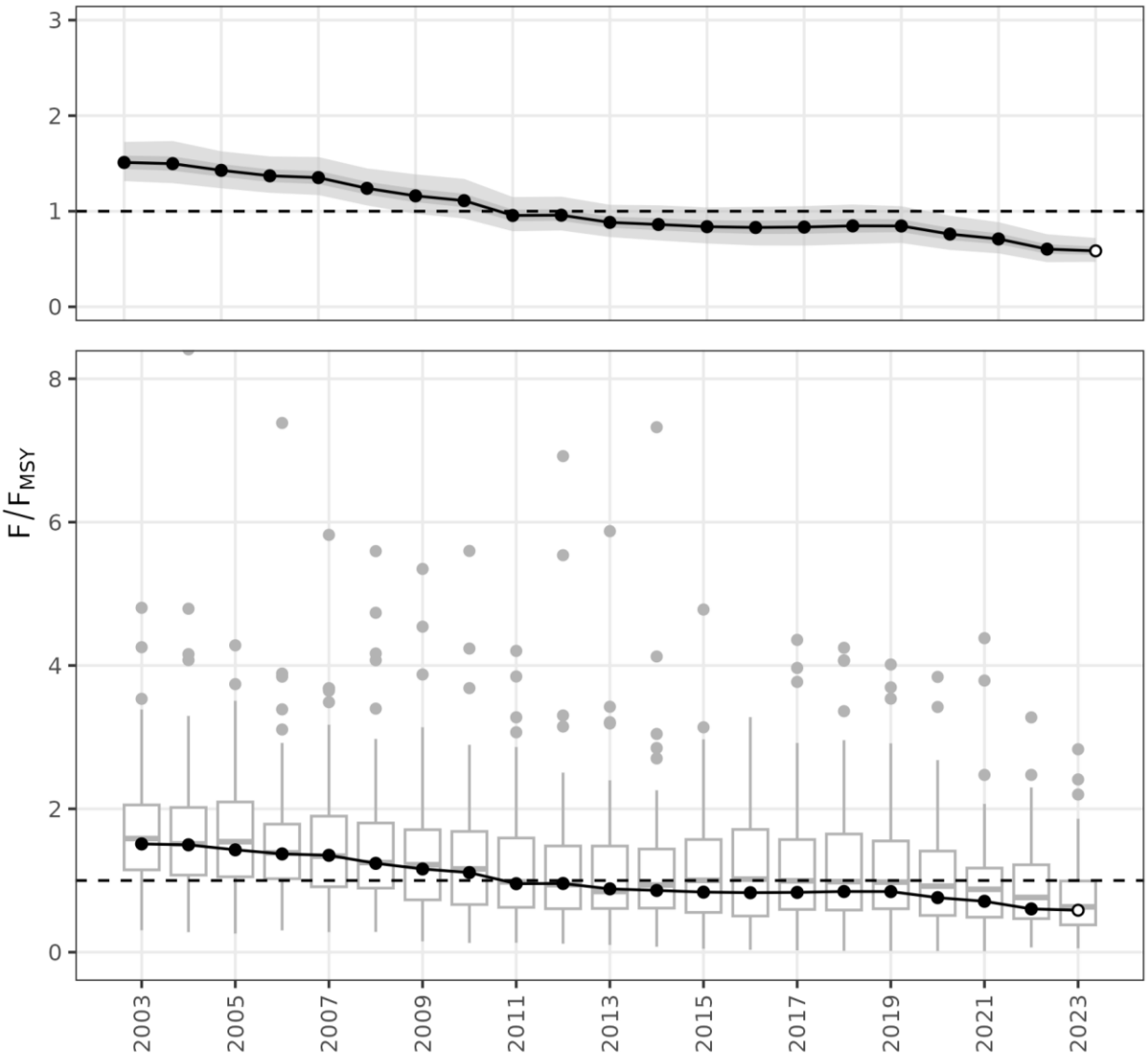


Source: Own elaborations based on ICES, GFCM and STECF data.

- *Northeast Atlantic*

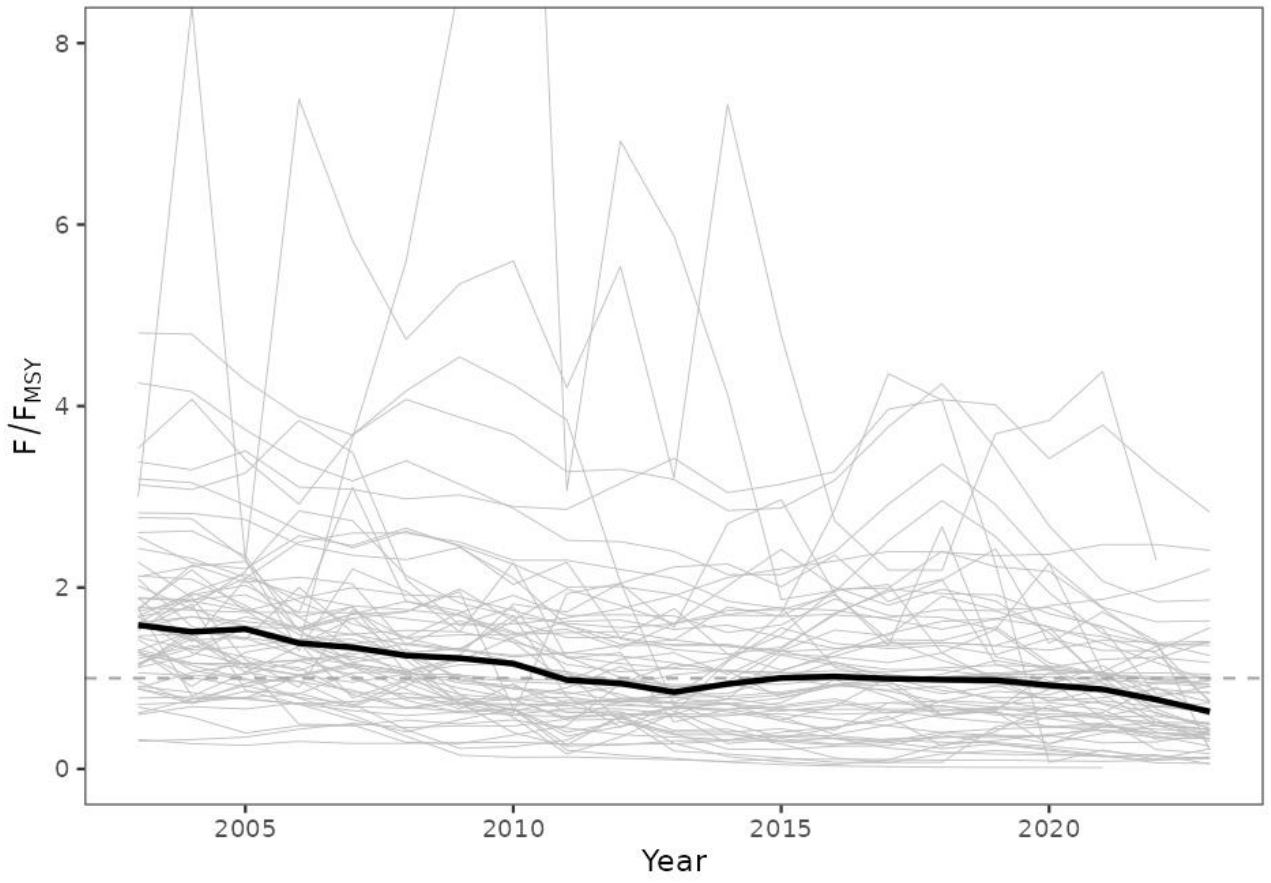
In the NE Atlantic EU waters, the model-based indicator of fishing pressure (F/F_{MSY}, based on 63 stocks with appropriate information – Figure 9 in the STECF-EWG-Adhoc-25-01 report) shows a gradual downward trend over the period 2003-2023 (Figures 2 and 3). This is consistent with the observed trends in the raw data (Figure 3). STECF notes that while the average value is below 1 in the last year, some stocks still have a very high F/F_{MSY} value (Figure 4).

Figure 3. Trend in model-based F/F_{MSY} in the NE Atlantic EU waters (based on 63 stocks - top panel). The dark line and points stand for the model-based indicator and the grey ribbon for the associated 95% confidence interval. The bottom panel displays the model-based trend in F/F_{MSY} (solid black lines and dots) while the boxplots show the distribution of the observed data. The range of the y-axis on the bottom panel was restricted to [0-8] to better see the trends, however one stock in 2010 has a F/F_{MSY} greater than 15.



Source: Own elaborations based on ICES data.

Figure 4. Observed trends in F/F_{MSY} for each stock in the NE Atlantic EU waters (63 stocks). Each grey line corresponds to a single stock. The black line corresponds to the yearly median of those data. The range of the y-axis was restricted to [0-8] to better see the trends, however one stock in 2010 has a F/F_{MSY} greater than 15. The dashed grey line indicates the F/F_{MSY}=1 ratio.



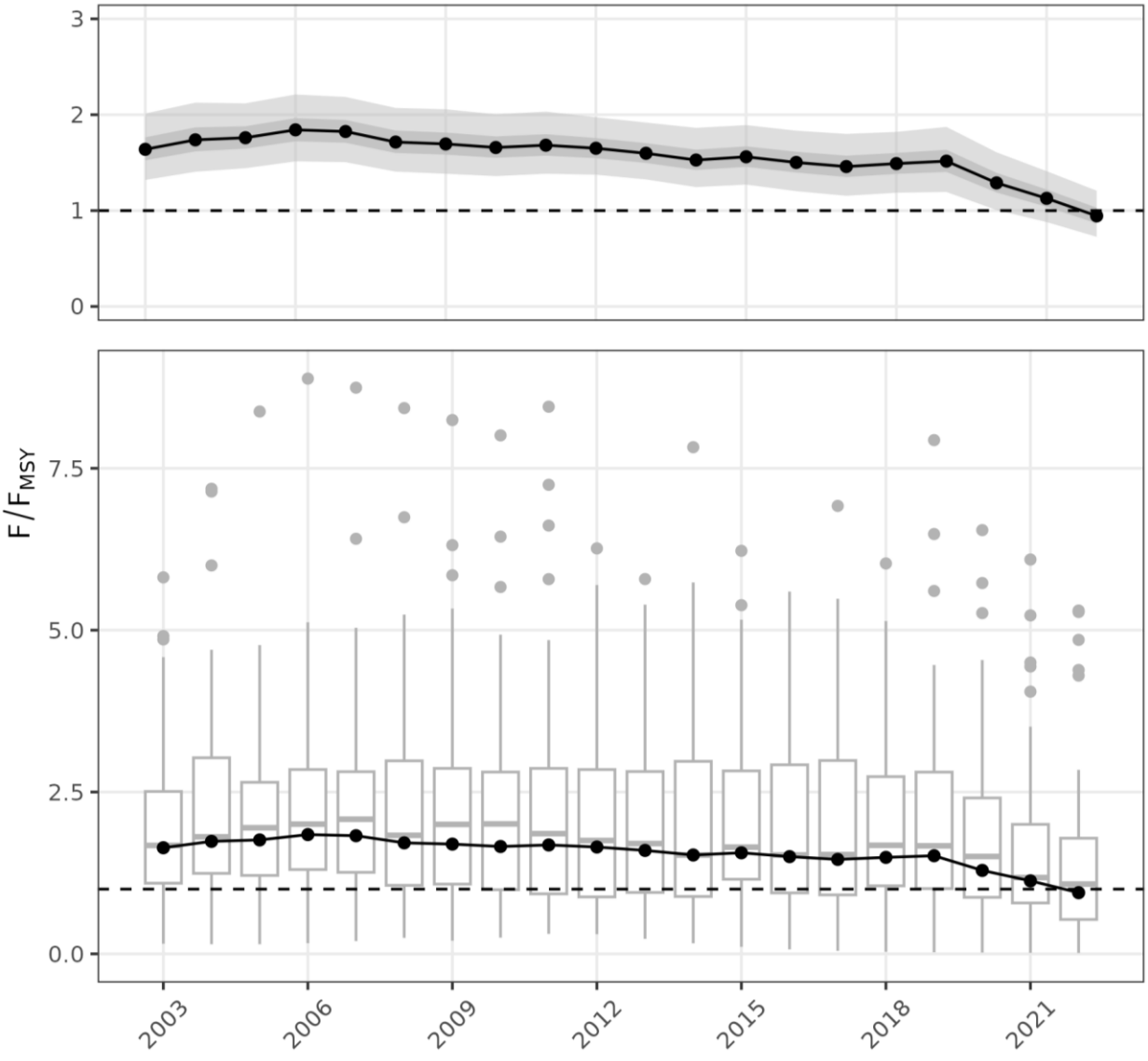
Source: Own elaborations based on ICES data.

The same model-based indicator was computed by the STECF-EWG-Adhoc-25-01 expert group for an additional set of 18 stocks located in the NE Atlantic outside EU waters (Figure 11 in the STECF-EWG-Adhoc-25-01 report). A first decreasing phase happened from 2003 to 2013. That was followed by a phase of less steep decrease until 2019. The decrease became again more pronounced over the years 2019-2022 and the ratio has now been stable over the last two years (Figure 2).

- *Mediterranean and Black Seas*

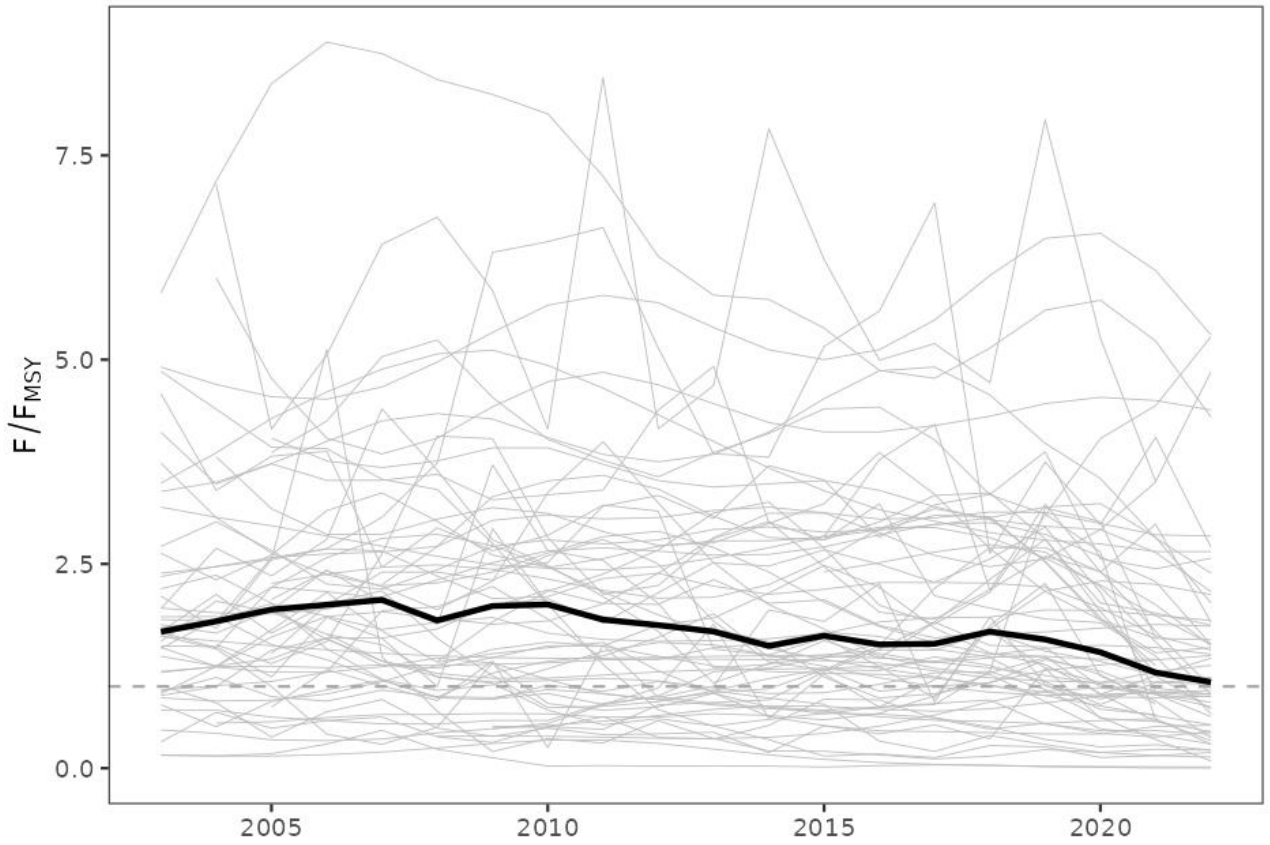
The results presented show a decrease of F/F_{MSY} since 2011 and a sharp decrease in the F/F_{MSY} values in the Mediterranean and Black Sea in the last three years (Figure 3). However, it is not clear which driving factors are leading or affecting the estimated pattern. STECF is not in a position to assess whether this change will confirm into a longer-term positive trend in the near future. However, STECF notes that the trend is also visible in the raw data (Figure 4). Moreover, STECF notes that some stocks still have extremely high F/F_{MSY} values (Figure 4).

Figure 5. Trend in model-based F/F_{MSY} in the Mediterranean and Black Seas (based on 65 stocks-top panel). The dark line and points stand for the model-based indicator and the grey ribbon for the associated 95% confidence interval. The bottom panel displays the model-based trend in F/F_{MSY} (solid black lines and dots) while the boxplots show the distribution of the observed data.



Source: Own elaborations based on GFCM and STECF data.

Figure 6 Observed trends in F/F_{MSY} for each stock within MED&BS. Each grey line corresponds to the result of one specific stock assessment. The black line corresponds to the yearly median of those data. The dashed grey line indicates the F/F_{MSY}=1 ratio.



Source: Own elaborations based on GFCM and STECF data.

STECF notes that the number of stocks considered in computing the indicator has been varying over time, as some stocks have been added and others have been revised in terms of stock boundaries (e.g. covering more GSAs).
As highlighted during the last STECF CFP monitoring analysis (STECF PLEN 24-01), many of these recently integrated stocks are small pelagic stocks, which due to changes in local market conditions following reduced growth of the fish in some GSAs (e.g., GSA7, Gulf of Lions), have experienced reduced fishing pressure in the last ten years. STECF considers that this might have, at least partially, contributed to the sharp reduction of the observed F/F_{MSY} in recent years. However, as illustrated in Figure 7, this is not reflected by the trend in the Biomass indicator which is not showing any increase. STECF notes that fishing effort measures were implemented in several GFCM recommendations and the WestMed Multiannual Management Plan in the late 2010s / early 2020s . However, STECF considers that the observed trends in fishing effort (STECF EWG 24-12 for the WestMed) cannot solely explain the rapid drop of F/F_{MSY} in the last few years. STECF has carried out some exploratory analysis to investigate which stocks were driving the observed decline in F/F_{MSY} trend but considers that further work is needed to draw any firm conclusions.

As reported in TOR 6.5 of the PLEN 24-01 report, the inconsistency of the decreasing trend in F/F_{MSY} and the flat trend in the Biomass indicator could be due to a reduction in the catches coupled to a lack of reaction in the biomass which results in a lower F but not a higher SSB.
In conclusion, a decreasing trend in F/F_{MSY} seems to be taking place in the Mediterranean and Black Seas. However, given the previously mentioned scaling issues, STECF suspects that the order of magnitude as predicted by the model may be overly optimistic. Moreover, STECF highlights that many stocks still display extremely high F/F_{MSY} values (Figure 3).

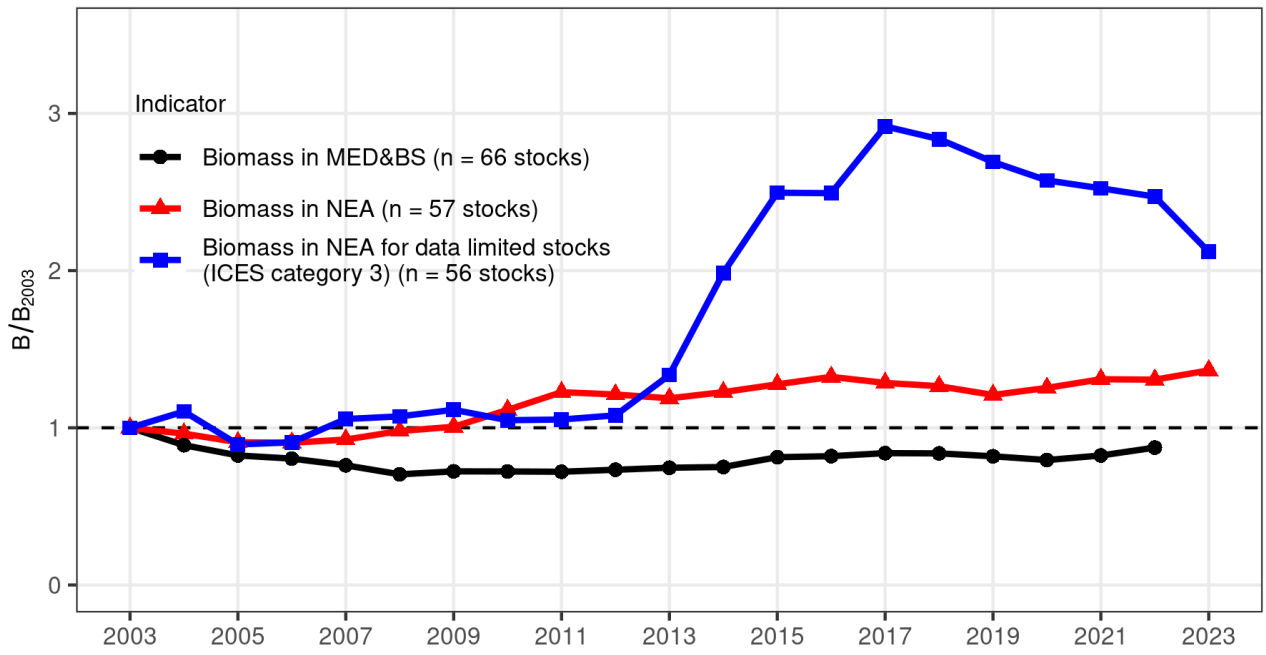
Trends in Biomass

The model-based results for the NE Atlantic (EU waters), the Mediterranean and Black Seas and for data-limited stocks in the NE Atlantic (ICES "category 3" stocks) are provided in Figures 13, 24 and 15 respectively of the STECF-EWG-Adhoc 25-01 report. Trends in the median values for biomass over time are summarised in Figure 7 below. STECF notes there is a large uncertainty around this indicator, especially when disaggregated by ecoregions (e.g. see Figure 25 in the STECF-EWG-Adhoc-25-01 report).

The model-based indicator for the trend in biomass shows a general increase over time since 2007 in the NE Atlantic (EU waters only - Figures 13 of the STECF-EWG-Adhoc-25-01 report) for assessed stocks (ICES categories 1 and 2 stocks). However, STECF notes that this general increasing trend hides a diversity of situations among ecoregions, with an increase in the BoBiscay & Iberia ecoregion and for widely distributed species, but more stable trends in other ecoregions, with even possibly a slight decrease since 2016 in the Celtic Seas. Furthermore, for data limited stocks from NE Atlantic (ICES category 3 stocks – Figure 15 of the STECF-EWG-Adhoc-25-01 report), STECF observes that after a stable period until 2012 and an increase till 2017, the recent trend suggests a decrease in biomass. STECF, further notes a high level of uncertainty around the trends.

In the Mediterranean & Black Seas, the biomass was slightly higher at the beginning of the time series, but declined until 2008, after which it remained stable or increased slightly (Figure 7). As for the NE Atlantic, this overall trend hides a diversity of patterns per ecoregions. Despite the overall reduction of F/F_{MSY}, the biomass does not seem to increase in most ecoregions, except in the Western Med where an increase is observed (Figure 25 of the STECF-EWG-Adhoc-25-01 report).

Figure 7. Trends in the model-based indicators of stock biomass scaled to 2003. Three indicators are presented: red line for the NE Atlantic EU waters (57 stocks); black line for the Mediterranean & Black Seas (66 stocks); and blue line for data-limited stocks in NE Atlantic (ICES category 3, 56 stocks).

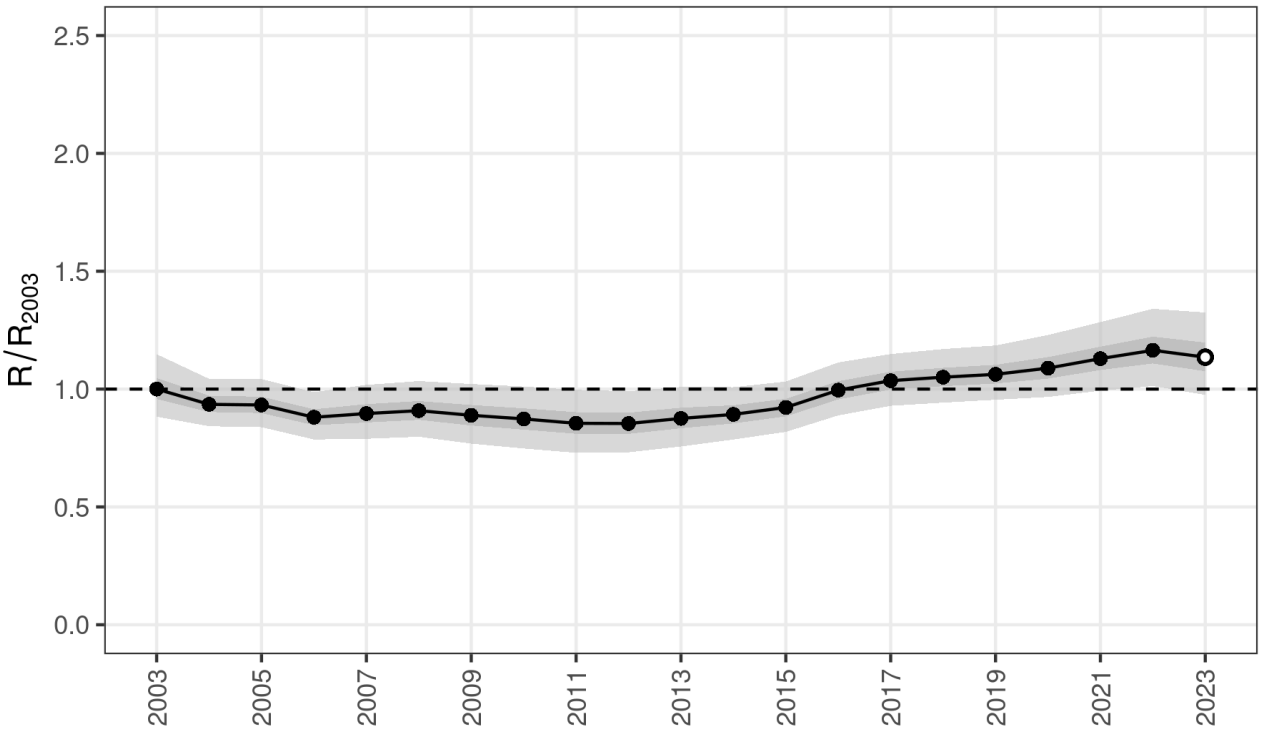


Source: Own elaborations based on ICES, GFCM and STECF data.

Trends in Recruitment

The model – based results for the trend in decadal recruitment is given in Figure 16 in the STECF-EWG-Adhoc-25-01 report. This indicator aims to identify long-term trends of recruitment for all stocks and is calculated over a twenty-year moving average. For example, the decadal recruitment for 2019 for a single stock is the ratio between the average recruitment from 2010 to 2019 over the average recruitment from 2000 to 2009 (see Gras et al., 2023 for more details). The model output values are displayed in Figure 8. The average decadal recruitment indicator shows a decreasing trend until 2011 and an inversion afterwards, the maximum being reached in 2022. STECF observes that this indicator aims to detect long-term changes in recruitment and as such, smooths short term variations that could have occurred over the last years. In this context, STECF reminds that recent lower recruitments reported in various stocks (e.g. sol.27.78ab, her.27.20-24, her.27.3a47d) cannot be depicted with this decadal recruitment indicator. STECF suggests that the development of an additional indicator aiming to detect short-term changes of recruitment might be relevant to detect early signs of changes in ecosystem.

Figure 8. Trend in model-based decadal recruitment indicator scaled to 2003 in the NE Atlantic area (based on 58 stocks).



Source: Own elaborations based on ICES data.

Coverage of the scientific advice

Coverage of biological stocks by the CFP monitoring

The analyses of progress in achieving the MSY objective in the NE Atlantic include all stocks with advice provided by ICES that are at least partially inside EU waters. According to the ICES database accessed for the analysis, ICES provided scientific advice for 247 biological stocks included in EU waters (at least partially). Of these, 120 stocks (49%) are data limited (ICES category 3 and above, Table 2).

Table 2. Total number of stocks assessed by ICES for different stock categories in different areas. Note that not all of these stocks are considered of EU relevance (Gras et al. 2023) Therefore, the numbers are higher than those used in the CFP monitoring analysis.

	ICES Stock Category						Total
	1	2	3	4	5	6	
Arctic Ocean	3	2	2	0	0	0	7
Azores	0	0	2	0	1	0	3
Baltic Sea	7	3	7	0	0	0	17
Bay of Biscay & Iberia	14	9	14	0	6	3	46
Celtic Seas	27	3	15	1	12	9	67
Greater North Sea	26	4	12	2	6	3	53
Iceland, Greenland and Faroes	19	1	4	0	1	1	26
Widely	8	1	7	0	4	8	28
Total	104	23	63	3	30	24	247

Source: Own elaborations based on ICES data.

The present CFP monitoring analysis for the NE Atlantic is focused on stocks with a TAC and for which estimates of fishing mortality, biomass and biological reference points are available. As detailed in the STECF-EWG-Adhoc-25-01 report, not all indicators can be calculated for all stocks in all years. The adhoc group was able to compute indicators for 87 category 1 and 2 stocks respectively depending on indicators, years, and areas, and 56 category 3 stocks (Table 2 in the STECF-EWG-Adhoc-25-01 report). All together, these stocks represent a large share of catches. However, STECF notes that there is still a significant number of biological stocks present in EU waters that are not included in the sampling frame of the CFP monitoring analysis.

In the Mediterranean and Black Seas basin, STECF notes that, despite the recent increase in the number of stocks available, there is still a need to increase the coverage of stocks in the CFP monitoring analysis to increase the representativeness of the indicator values for the Mediterranean and Black Sea.

Coverage of TAC regulation by scientific advice

STECF notes that 162 TACs (combination of species and fishing management zones) in the EU waters of the NE Atlantic are derived using the agreed sampling frame (Gras et al. 2023) with six additional TACs added since 2023 (STECF-EWG-Adhoc-25-01). STECF underlines that in many cases, the boundaries of the TAC management areas are not aligned with the biological limits of stocks used in ICES assessments. Therefore, the adhoc group computed an indicator of advice coverage, where a TAC is covered by a stock assessment when at least one of its divisions matches the spatial distribution of a stock for which reference points have been estimated from an ICES full assessment. Based on this indicator, 54% of the 162 TACs are covered, at least partially, by stock assessments that provide estimates of F_{MSY} (or a proxy), 46% by stock assessments that have B_{PA}, with 23% covered by stock assessments that provide estimates or proxies of MSY $B_{trigger}$ (Table 17 of STECF-EWG-Adhoc-2025). Additionally, STECF notes that, using this index, some TACs can be considered as covered if they relate to: (i) part of a given management area, (ii) several assessments contributing to a single TAC (e.g. Nephrops functional units in the North Sea) or (iii) scientific advice covering a different (but partially common) area (e.g. whiting in the Bay of Biscay). Such an approach

overestimates the spatial coverage of advice (i.e. the proportion of TACs based on a single and aligned assessment) and means that many TACs are still not covered by scientific advice based on F_{MSY} reference values.

1.4 STECF conclusions

STECF concludes that the analyses carried out in the STECF-EWG-Adhoc-25-01 report comply with the agreed protocol and provide a comprehensive and informative overview of the performance towards achieving the MSY objectives of the CFP.

Regarding the progress made in the achievement of F_{MSY} in line with the CFP, STECF concludes that the latest results indicate a reduction in overall fishing mortality and a general increase in stock biomass in the NE Atlantic over the period 2003-2023. However, this overall picture hides a diversity of situations in different ecoregions, and an even greater diversity at the stock scale, some of which are still subject to very high levels of fishing pressure. In the Mediterranean and Black Seas, STECF concludes there are indications that fishing mortality has decreased since 2019, although no substantial increase in biomass has been observed.

STECF concludes that several stocks remain in a state of overfishing and/or outside safe biological limits in both North-East Atlantic and Med & Black-Sea. Thus, it can be concluded that the CFP objective that aims to ensure that all stocks are above biomass levels capable of producing maximum sustainable yield, has still not been achieved.

While acknowledging the recent increase in the number of stocks included in the analysis, STECF concludes that for many stocks, key reference points (B_{PA}, F_{PA}, F_{MSY} or B_{MSY}) are yet to be defined. STECF therefore supports the ongoing work in ICES, GFCM and STECF EWGs to further increase the number of stocks with such key reference points.

STECF concludes that continued and recurrent discussions of the method and outcomes of the CFP monitoring exercise could contribute to a further improvement of the protocol. As previously concluded by STECF, such discussions should address inter alia, the inclusion of surplus production models, the choice of mean estimator, the inter-annual variability arising from the changing number of stocks included in the analysis, additional recruitment indicators and selectivity indicators, the better accounting of the increasing diversity of stocks available for the monitoring exercise (in terms of life history traits, size, associated landings, stock assessment methods).

STECF concludes that the outcome of the discussions would inform potential amendments to the current protocol with respect to certain technical/statistical aspects of the analysis ahead of the next 2026 CFP monitoring exercise. STECF therefore suggests that such discussions are held during the July plenary (PLEN 25-02) with the aim of: (1) proposing amendments of the protocol to be included for the 2026 exercise, and to (2) develop a roadmap prioritising tasks and needs for those amendments and for a future version of the protocol.

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REPORT TO THE STECF

EXPERT WORKING GROUP ON MONITORING THE PERFORMANCE OF THE COMMON FISHERIES POLICY (EWG-ADHOC-25-01)

Virtual meeting, January-March 2025

This report does not necessarily reflect the view of the STECF and the European Commission and in no way anticipates the Commission's future policy in this area

1 Introduction

Article 50 of the EU Common Fisheries Policy (Regulation (EU) No 1380/2013) states:
“The Commission shall report annually to the European Parliament and to the Council on the progress of achieving maximum sustainable yield and on the situation of fish stocks, as early as possible following the adoption of the yearly Council Regulation fixing the fishing opportunities available in Union waters and, in certain non-Union waters, to Union vessels.”
To fulfil its obligations to report to the European Parliament and the Council, each year, the European Commission requests the Scientific, Technical and Economic Committee for Fisheries (STECF) to compute a series of performance indicators and advise on the progress towards the provision of article 50.
In an attempt to make the process of computing each of the indicators consistent and transparent and to take account of issues identified and documented in previous CFP monitoring reports, a protocol (Gras et al., 2023) was adopted by the STECF (STECF, 2023a). In this protocol, (i) the modelling framework to compute the model-based indicators is based on a state-space model as implemented in the R package JARA (Winker et al., 2019) and (ii) the procedure to include Mediterranean stocks has been simplified to include all quantitative assessments available from GFCM and STECF.
An ad hoc Expert Group comprising experts from the European Commission’s Joint Research Centre (JRC) was convened from January to March 2025 to compute the performance indicator values according to the agreed protocol (Gras et al., 2023) and to report to the STECF plenary meeting scheduled for 24-28 March 2025.

1.1 Terms of Reference for the ad hoc EWG-25-01

The Expert Group is requested to report on progress in achieving MSY Objectives in line with CFP.

2 Data and Methods

2.1 Data sources

The data sources used are referring to waters of the EU in FAO areas 27 (North East Atlantic and adjacent seas) and 37 (Mediterranean and Black Seas). The Mediterranean Sea included FAO Geographical SubAreas (GSA) 1, 2, 5, 6, 7, 8, 9, 10, 11, 15, 16, 17, 18, 19, 20, 22, 23, 25, and 29. The northeast Atlantic included the ICES subareas “3”, “4”, (excluding Norwegian waters of division “4.a”), “6”, “7”, “8”, “9”, and “10”.

2.1.1 Stock assessment information

For the northeast Atlantic (NEA; FAO area 27), the information was downloaded from the ICES website (https://standardgraphs.ices.dk/stockList.aspx) on 22 January 2025, comprising the most recent published assessments carried out up to and including 2024. Thorough data quality checks, corrections and formatting were carried out by JRC experts to ensure the information downloaded was in agreement with the summary sheets published online (online Annex 1 and 2, https://stecf.jrc.ec.europa.eu/reports/cfp-monitoring).
For the Mediterranean region (FAO area 37), the information was extracted from the STECF Mediterranean Expert Working Group repositories (https://stecf.jrc.ec.europa.eu/reports/medbs) comprising the most recent published assessments carried out up to 2024 and from GFCM stock assessment forms (https://www.fao.org/gfcm/data/star/en/) comprising the most recent published assessments carried out up to 2024.
The table reporting the URLs for the report or advice summary sheet for each stock is available online (online Annex 1, https://stecf.jrc.ec.europa.eu/reports/cfp-monitoring).

2.1.2 Management units information

For the NEA, management units are defined by Total Allowable Catches (TAC). These are annual fishing opportunities for a species or a group of species in a Fishing Management Zone (FMZ). The information regarding the TACs in 2016 was downloaded from the FIDES reporting system. Subsequently, this information was cleaned and processed to identify the FMZ of relevance to this work, as well as the ICES rectangles they span to (Gibin, 2017; Scott et al., 2017a; Scott et al., 2017b). This work was done once in 2017 and has not been updated since. Nevertheless, in 2025, as in the previous two years, all category 1 and 2 EU stocks that were dropped due to the absence of stock-specific TACs in 2017 were manually checked to assess whether in 2022-2024 there was a TAC in place, in which case they were added to the analysis and kept in this year’s analysis. EU category 1 and 2 skate and ray stocks managed as a stock complex under a combined TAC were not included in the analysis.

2.2 Methods

The methods applied and the definition of the sampling frames followed the protocol (Gras et al., 2023; Gibin et al., 2017) agreed by STECF (2023a). The updated protocol is presented in electronic Annex 1 and the R code used to run the analysis can be found in electronic Annex 2 for the Northeast Atlantic and electronic Annex 3 for the Mediterranean and Black Seas.

2.3 Points to note

- Stocks assessed with biomass dynamic models do not provide a value for F_{PA} although they may provide a B_{PA} proxy ($0.5 \cdot B_{MSY}$). Consequently, these stocks cannot be used to compute Safe Biological Limits (SBL; Section 3.2.2)
- The state-space model (JARA) used to compute model-based indicators uses a shortened time series, starting in 2003, instead of the full time series of available data.

This has the advantage of balancing the dataset by removing those years with only a low number of assessment estimates. It has the disadvantage of excluding data.

- Indicators of trends computed with JARA show the average progress of the process they represent, along with their uncertainty in terms of 50% and 95% confidence intervals. In the former case this corresponds to the range between 25% and 75% percentiles, and for the latter between 2.5% and 97.5% percentiles.
- The biomass indicator for stocks assessed with data-limited methods (ICES stock category 3) includes both abundance and biomass indices, with a variety of measurement units. It also includes time series of abundance or biomass relative to their average or a reference point (such as B_{MSY}). As a result, the range of values between stocks in the input dataset is extremely variable.

2.4 Differences from the 2024 CFP Monitoring Report

2.4.1 Northeast Atlantic and adjacent seas

Compared to the dataset analysed in 2024, with relation to category 1 and 2 EU stocks

- 4 stocks were added
  - anf.27.3a46 was benchmarked in 2024 and upgraded from category 3 to 1
  - had.27.6b was benchmarked in 2024 and upgraded from category 3 to 1
  - nep.fu.32 was benchmarked in 2024 and upgraded from category 4 to 1
  - boc.27.6-8 was benchmarked in 2024 and upgraded from category 3 to 1
- No stocks were dropped
- 1 stock changed
  - bli.27.5b67 changed into bli.27.5b6712 now includes ICES division 12

With relation to category 3 EU stocks

- 1 stock was added
  - cod.27.24-32 was downgraded from category 1 to 3
- 6 stocks were dropped that do not appear in the category 1-2 above or were downgraded
  - bzq.27.2628 was benchmarked in 2024 and upgraded from category 3 to 2. However as it has no TAC, it is now excluded from the analysis
  - fle.27.2223 was benchmarked in 2024 and upgraded from category 3 to 2. However as it has no TAC, it is now excluded from the analysis
  - rjc.27.8c was benchmarked in 2023 and upgraded from category 3 to 2. However as it has no TAC, it is now excluded from the analysis
  - rjc.27.9a was benchmarked in 2024 and upgraded from category 3 to 2. However as it has no TAC, it is now excluded from the analysis
  - rjm.27.9a was was benchmarked in 2024 and downgraded from category 3 to 5.
  - rjn.27.9a was benchmarked in 2024 and upgraded from category 3 to 2. However as it has no TAC, it is now excluded from the analysis

- 1 stock changed area of assessment:
    - hom.27.3a4bc7d became hom.27.4bc7d following a benchmark in 2024 and was upgraded from category 3 to 1 but has no MSY reference points. It was therefore excluded from the analysis.

With relation to outside EU waters

- 4 stocks were added
    - aru.27.123a4 was benchmarked in 2024 and upgraded from category 3 to 2
    - cod.27.2.coastS was benchmarked in 2024 and upgraded from category 3 to 2
    - pok.27.1-2 was benchmarked in 2024 and now has MSY approach reference points.
    - cod.21.2.osc was benchmarked in 2023 and now has MSY approach reference points
- 4 stocks were dropped
    - cod.27.1-2 does not have an assessment any more
    - had.27.1-2 does not have an assessment any more
    - her.27.5a was benchmarked in 2024 and now has a harvest rate instead of an F
    - cod.21.1 does not have an assessment any more

As in previous years, non-EU stock pra.27.1-2 was excluded from the dataset to compute the indicator 'F/F_{MSY} outside EU waters' due to its high impact on the scale of the indicator.

2.4.2 Mediterranean and Black Seas

Compared to CFP monitoring 2024 (STECF, 2024), two stocks were dropped from the analysis

- ARA_9_10_11.1_11.2 was downgraded to qualitative assessment
- SBA_25 was assessed in 2022 with reference year 2020 and no update was published since then.

The following stocks changed

- ARA_1 and ARA_2 were merged into ARA_1_2 by STECF-24-10
- MUT_11.1_11.2 changed name to MUT_11

The following stocks were added

- ANE_22 was upgraded from qualitative to quantitative assessment
- ANE_5 was assessed for the first time with a quantitative assessment
- NEP_11 has now an accepted quantitative assessment by STECF-24-10
- PIL_22 was upgraded from qualitative to quantitative assessment
- WHB_6 was assessed for the first time in the last WGSAD with a quantitative assessment

In this year's analysis one stock was assessed using CMSY, EOI_18. This assessment was considered fit for purpose as it included tuning indices and was used for advice.

2.4.3 EU Waters indicators

As in last years' reports (STECF, 2021a, 2022a, 2023b, 2024), an extra section was added to report results for two indicators of fisheries state for all EU Waters (joining FAO areas 27 and 37): one indicator for F/F_{MSY} and one for B/B_{2003}.

3 Northeast Atlantic and adjacent seas (FAO region 27)

3.1 Number of stock assessments available to compute CFP performance indicators

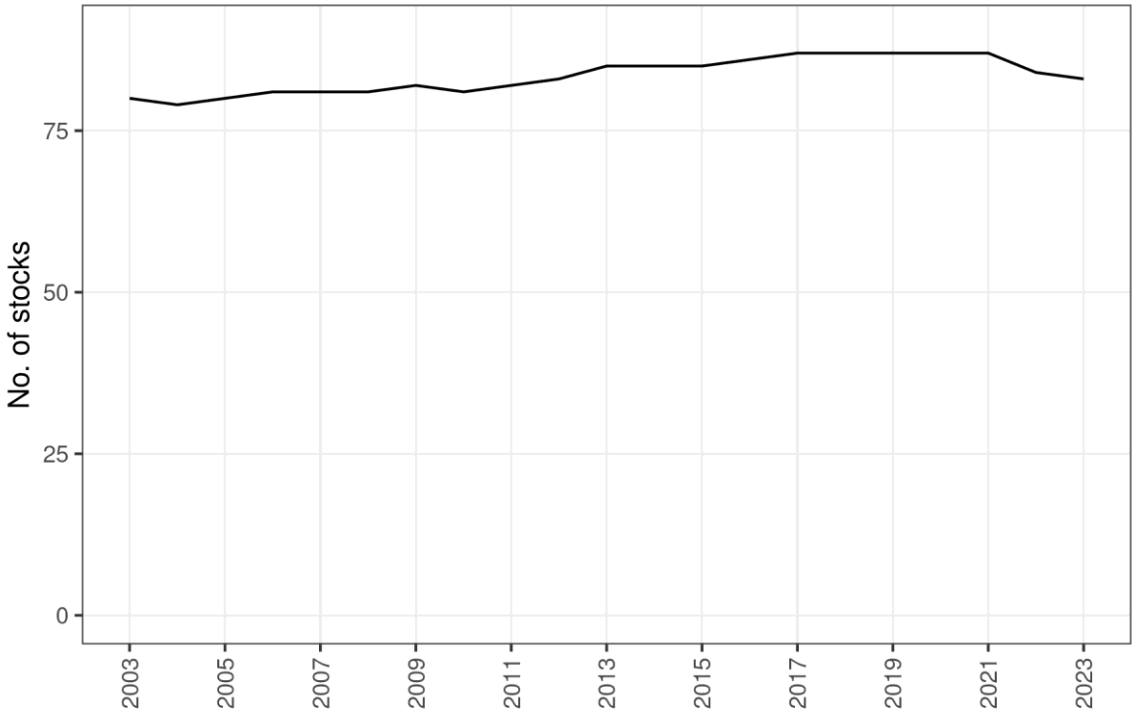
The number of stock assessments with estimates of F/F_{MSY} for the years 2003-2023 for FAO region 27 are provided in Figure 1. The global values as well as the breakdown by Ecoregion are displayed in Table 1. The detailed time series for each category 1 and 2 stocks are presented in Figure 2. Two stocks were given a 3-year advice (nep.fu.25 and nep.fu.2627) and one stock had its 2-year advice rolled over (por.27.nea). As a result, no estimates of F/F_{MSY} were available for the years 2022-2023 for nep.fu.25, nep.fu.2627 and por.27.nea. One stock had a 2-year advice (whg.27.7a), therefore no estimate of F/F_{MSY} was available for this stock for the year 2023. The number of stocks for which F/F_{MSY} was estimated was 87 for 2021, 84 for 2022 and 83 for 2023.
The number of stocks in category 1 and 2 for which an F/F_{MSY} estimate was available increased from 80 to 84 for the time series considered (2003-2023). The highest number of F/F_{MSY} (87) estimates was recorded for the years 2017-2021 whereas the lowest (79) was recorded in 2004 .
Although hom.27.4bc7d is a category 1 assessment and was benchmarked in 2024, it was excluded from the analysed dataset because no MSY reference points were estimated and no management plan was in place.
Among the EU category 1-2 stocks, 17 stocks were excluded because they were not in the agreed sampling frame (absence of stock-specific TACs) (see section 2.1.2)

- rjc.27.8abd (category 2 – under combined skates and rays TAC)
- rjc.27.8c (category 2 – under combined skates and rays TAC)
- rjc.27.9a (category 2 – under combined skates and rays TAC)
- rjn.27.678abd (category 2 – under combined skates and rays TAC)
- rjc.27.3a47d (category 2 – under combined skates and rays TAC)
- rjm.27.3a47d (category 2 – under combined skates and rays TAC)
- rjh.27.4bc7d (category 2 – under combined skates and rays TAC)
- rjn.27.678abd (category 2 – under combined skates and rays TAC)
- rjn.27.9a (category 2 – under combined skates and rays TAC)
- bss.27.4bc7ad-h (category 1 – no TAC)
- bss.27.8ab (category 1 – no TAC)
- bzq.27.2628 (category 2 – no TAC)
- fle.27.2223 (category 2 – no TAC)
- her.27.1-24a514a (category 1 – no TAC)
- pil.27.8abd (category 1 – no TAC)
- pil.27.8c9a (category 1 – no TAC)
- tur.27.3a (category 2 – no TAC)

Stocks ank.27.8c9a, bll.27.3a47de, lez.27.4a6a, lez.27.6b, nep.fu.25, nep.fu.2627, nep.fu.31, nep.fu.32, ple.27.24-32, pol.27.67, por.27.nea, rju.27.7de, aru.27.123a4 (non-EU), cod.27.2.coastS (non-EU) were assessed in the framework of category 1 or 2 using surplus production models. These models provide estimates of F/F_{MSY} and B/B_{MSY} that were used to assess exploitation status (F compared to F_{MSY}) and their exploitation and biomass status (i.e. $F \leq F_{MSY}$ and $B \geq B_{MSY}$). Since B_{PA} is defined as a fraction of B_{MSY} or not at all, and B_{MSY} is not reported as an absolute value, these stocks were not taken into account in the SBL

indicator. Following the protocol, these stocks were included in the F/F_{MSY} model-based indicator but not in the B/B_{2003} model-based indicator.
Stocks her.27.25-2932, pra.27.3a4a were assessed as a category 1 assessment using a length-based assessment providing as output of the assessment a time series of SSB/MSYBtrigger. As a result these stocks were not included in the B/B_{2003} indicator. For pra.27.3a4a, since B_{PA} is defined as a fraction of B_{MSY} or not at all, and B_{MSY} is not reported as an absolute value, these stocks are not included in the SBL indicator.
There are 6 EU stocks managed through the MSY approach with a $B_{escapment}$ strategy. In the cases of stocks san.sa.1r, san.sa.2r, san.sa.3r, san.sa.4, spr.27.3a4, ICES set $MSYB_{escapment}$ at B_{PA}. In the case of nop.27.3a4, which is also managed under the MSY approach with an escapement strategy, a probabilistic method is used to set the catches such as $C_{y+1} = C|(P[SSB<B_{lim}]=0.05)$. B_{lim} and F_{cap} are both estimated and B_{PA} is derived such as $B_{PA} = B_{lim} \cdot \exp(\sigma \cdot 1.645)$. $MSYB_{escapment}$ is not defined.
The management of ane.27.8 is set according to the adopted plan that stipulates that a harvest control rule with 2 biomass trigger points is used. For this stock, ICES report only B_{lim} and the two trigger points as SSB_{mgt} reference points. This stock was included in the analysis considering an escapement strategy using the higher trigger point as $MSYB_{escapement}$.
Out of the 77 stocks with MSY reference points, 41 stocks have $MSYB_{trigger}$ set at B_{PA} levels, 27 stocks do not have a B_{PA} defined, 49 stocks have $B_{PA} = B_{lim} \cdot \exp(\sigma \cdot 1.645)$.
To keep consistency with the new ICES definition, widely distributed stocks are referred to as “Widely” in the figures and tables of this section, and not anymore as “Northeast Atlantic” as in past reports.

Figure 1. Number of stocks in the NE Atlantic for which estimates of F/F_{MSY} are available by year.



Source: Own elaborations based on ICES data.

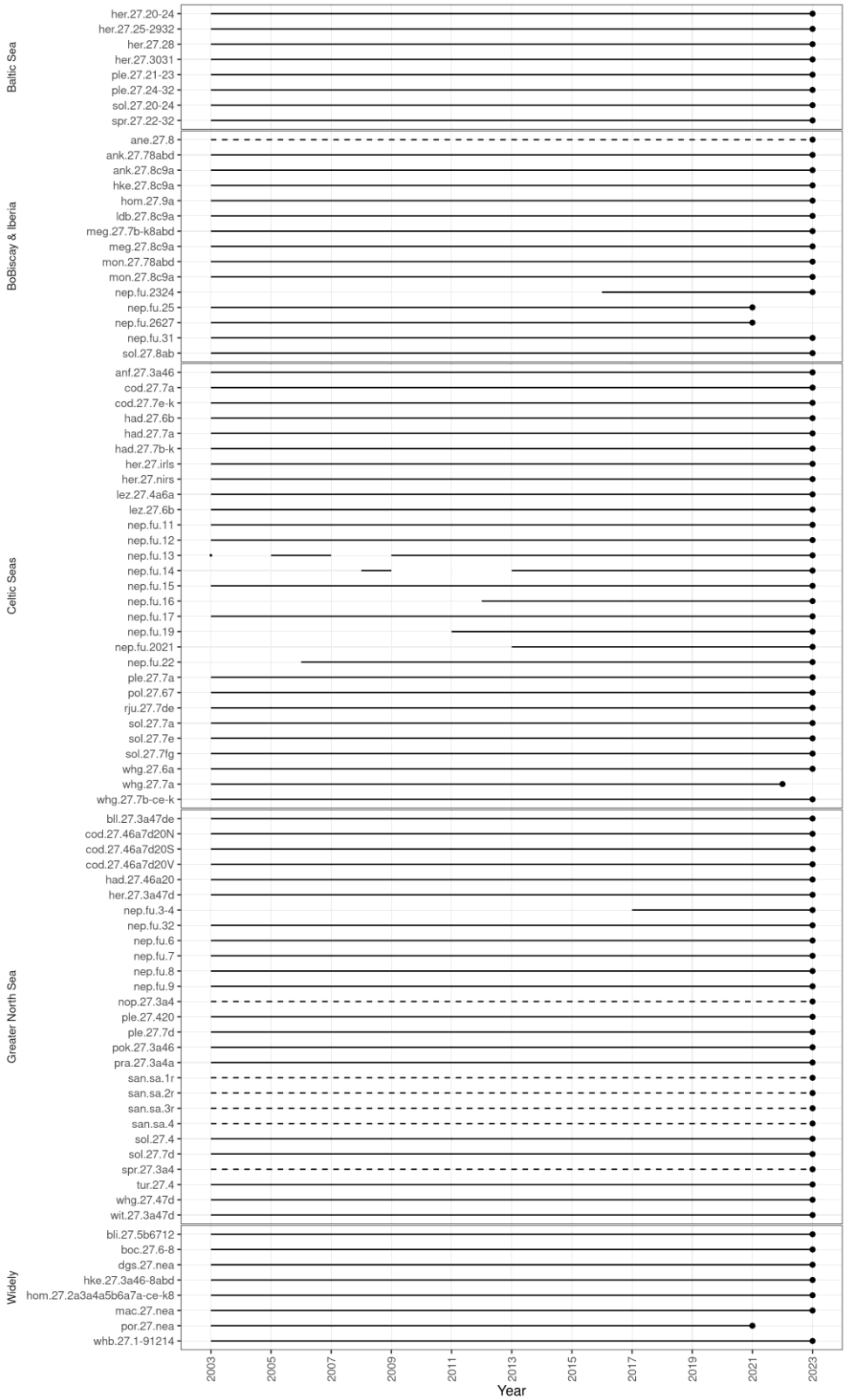
Table 1. Number of stocks in the ICES area for which estimates of F/F_{MSY} are available by ecoregion and year.

EcoRegion	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
ALL	80	79	80	81	81	81	82	81	82	83	85
Baltic Sea	8	8	8	8	8	8	8	8	8	8	8
BoB & Iberia	14	14	14	14	14	14	14	14	14	14	14
Celtic Seas	24	23	24	25	25	25	26	25	26	27	29
G. North Sea	26	26	26	26	26	26	26	26	26	26	26
Widely	8	8	8	8	8	8	8	8	8	8	8

EcoRegion	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
ALL	85	85	86	87	87	87	87	87	84	83
Baltic Sea	8	8	8	8	8	8	8	8	8	8
BoB & Iberia	14	14	15	15	15	15	15	15	13	13
Celtic Seas	29	29	29	29	29	29	29	29	29	28
G. North Sea	26	26	26	27	27	27	27	27	27	27
Widely	8	8	8	8	8	8	8	8	7	7

Source: Own elaborations based on ICES data.

Figure 2. Time series of stock assessment results in the NE Atlantic for which estimates of F/F_{MSY} are available by year. Blank records indicate that no estimate was available for the stock in that year. Stocks managed with an escapement strategy are shown with a dashed line.



Source: Own elaborations based on ICES data.

Table 2. Indicators computed for each stock.

Fish Stocks	Year	above/below Fmsy	in/out SBL	in/out CFP	F/Fmsy trends	Biomass trends	Decadal recruitment trends	Biomass data category 3 trends
ane.27.8	2023	X				X		
ane.27.9aS	2023							X
ane.27.9aW	2023							X
anf.27.3a46	2023	X	X	X	X	X	X	
ank.27.78abd	2023	X	X		X	X	X	
ank.27.8c9a	2023	X		X	X			
aru.27.6b7-1012	2022							X
bli.27.5b6712	2023	X	X		X	X	X	
bll.27.22-32	2022							X
bll.27.3a47de	2023	X		X	X			
boc.27.6-8	2023	X	X		X	X	X	
bsf.27.nea	2023							X
bwp.27.2729-32	2023							X
bzq.27.2425	2023							X
cod.27.21	2023							X
cod.27.22-24	2023							X
cod.27.24-32	2023							X
cod.27.46a7d20N	2023	X	X		X	X	X	
cod.27.46a7d20S	2023	X	X		X	X	X	
cod.27.46a7d20V	2023	X	X		X	X	X	
cod.27.7a	2023	X	X		X	X	X	
cod.27.7e-k	2023	X	X		X	X	X	
dab.27.22-32	2022							X
dab.27.3a4	2021							X
dgs.27.nea	2023	X	X	X		X	X	
fle.27.3a4	2023							X
gfb.27.nea	2023							X

Fish Stocks	Year	above/below Fmsy	in/out SBL	in/out CFP	F/Fmsy trends	Biomass trends	Decadal recruitment trends	Biomass data category 3 trends
ane.27.8	2023	X				X		
gug.27.3a47d	2023							X
gur.27.3-8	2022							X
had.27.46a20	2023	X	X		X	X	X	
had.27.6b	2023	X	X	X	X	X	X	
had.27.7a	2023	X	X	X	X	X	X	
had.27.7b-k	2023	X	X		X	X	X	
her.27.20-24	2023	X	X		X	X	X	
her.27.25-2932	2023	X		X	X		X	
her.27.28	2023	X	X		X	X	X	
her.27.3031	2023	X	X	X	X	X	X	
her.27.3a47d	2023	X	X	X	X	X	X	
her.27.6aN	2023							X
her.27.6aS7bc	2023							X
her.27.irls	2023	X	X		X	X	X	
her.27.nirs	2023	X	X	X	X	X	X	
hke.27.3a46-8abd	2023	X	X		X	X	X	
hke.27.8c9a	2023	X	X		X	X	X	
hom.27.2a3a4a5b6a7a-ce-k8	2023	X	X		X	X	X	
hom.27.9a	2023	X	X		X	X	X	
ldb.27.8c9a	2023	X	X		X	X	X	
lem.27.3a47d	2023							X
lez.27.4a6a	2023	X		X	X			
lez.27.6b	2023	X		X	X			
lin.27.346-91214	2022							X
mac.27.nea	2023	X	X		X	X	X	
meg.27.7b-k8abd	2023	X	X		X	X	X	

Fish Stocks	Year	above/below Fmsy	in/out SBL	in/out CFP	F/Fmsy trends	Biomass trends	Decadal recruitment trends	Biomass data category 3 trends
ane.27.8	2023	X				X		
meg.27.8c9a	2023	X	X		X	X	X	
mon.27.78abd	2023	X	X		X	X	X	
mon.27.8c9a	2023	X	X	X	X	X	X	
mur.27.3a47d	2022							X
nep.fu.11	2023	X		X				
nep.fu.12	2023	X		X				
nep.fu.13	2023	X		X				
nep.fu.14	2023	X		X				
nep.fu.15	2023	X		X				
nep.fu.16	2023	X						
nep.fu.17	2023	X		X				
nep.fu.19	2023	X		X				
nep.fu.2021	2023	X		X				
nep.fu.22	2023	X		X				
nep.fu.2324	2023	X						
nep.fu.25	2021	X		X	X			
nep.fu.2627	2021	X		X	X			
nep.fu.2829	2022							X
nep.fu.3-4	2023	X						
nep.fu.30	2023							X
nep.fu.31	2023	X		X	X			
nep.fu.32	2023	X		X	X			
nep.fu.6	2023	X		X				
nep.fu.7	2023	X		X				
nep.fu.8	2023	X		X				
nep.fu.9	2023	X		X				
nop.27.3a4	2023	X				X	X	

Fish Stocks	Year	above/below Fmsy	in/out SBL	in/out CFP	F/Fmsy trends	Biomass trends	Decadal recruitment trends	Biomass data category 3 trends
ane.27.8	2023	X				X		
pil.27.7	2023							X
ple.27.21-23	2023	X	X		X	X	X	
ple.27.24-32	2023	X		X	X			
ple.27.420	2023	X	X		X	X	X	
ple.27.7a	2023	X	X	X	X	X	X	
ple.27.7d	2023	X	X		X	X	X	
ple.27.7e	2023							X
ple.27.7fg	2023							X
ple.27.7h-k	2023							X
pok.27.3a46	2023	X	X		X	X	X	
pol.27.67	2023	X		X	X			
pol.27.89a	2022							X
por.27.nea	2021	X		X	X			
pra.27.3a4a	2023	X		X	X		X	
raj.27.1012	2021							X
rjc.27.6	2023							X
rjc.27.7afg	2023							X
rje.27.7fg	2023							X
rjh.27.9a	2023							X
rjm.27.67bj	2023							X
rjm.27.7ae-h	2023							X
rjm.27.8	2023							X
rjn.27.3a4	2022							X
rjn.27.8c	2023							X
rjr.27.23a4	2022							X
rju.27.7de	2023	X		X	X			
rng.27.3a	2023							X

Fish Stocks	Year	above/below Fmsy	in/out SBL	in/out CFP	F/Fmsy trends	Biomass trends	Decadal recruitment trends	Biomass data category 3 trends
ane.27.8	2023	X				X		
san.sa.1r	2023	X				X	X	
san.sa.2r	2023	X				X	X	
san.sa.3r	2023	X				X	X	
san.sa.4	2023	X				X	X	
sbr.27.10	2021							X
sbr.27.9	2023							X
sdv.27.nea	2022							X
sho.27.67	2022							X
sho.27.89a	2022							X
sol.27.20-24	2023	X	X		X	X	X	
sol.27.4	2023	X	X		X	X	X	
sol.27.7a	2023	X	X		X	X	X	
sol.27.7d	2023	X	X		X	X	X	
sol.27.7e	2023	X	X		X	X	X	
sol.27.7fg	2023	X	X		X	X	X	
sol.27.8ab	2023	X	X		X	X	X	
sol.27.8c9a	2022							X
spr.27.22-32	2023	X	X		X	X	X	
spr.27.3a4	2023	X				X	X	
spr.27.7de	2023							X
syc.27.3a47d	2022							X
syc.27.67a-ce-j	2022							X
syc.27.8abd	2022							X
syc.27.8c9a	2022							X
syt.27.67	2022							X
tur.27.22-32	2023							X
tur.27.4	2023	X	X	X	X	X	X	

Fish Stocks	Year	above/below Fmsy	in/out SBL	in/out CFP	F/Fmsy trends	Biomass trends	Decadal recruitment trends	Biomass data category 3 trends
ane.27.8	2023	X				X		
usk.27.3a45b6a7-912b	2022							X
whb.27.1-91214	2023	X	X		X	X	X	
whg.27.3a	2023							X
whg.27.47d	2023	X	X		X	X	X	
whg.27.6a	2023	X	X		X	X	X	
whg.27.7a	2022	X	X		X	X	X	
whg.27.7b-ce-k	2023	X	X		X	X	X	
whg.27.89a	2022							X
wit.27.3a47d	2023	X	X		X	X	X	
		87	50	37	63	57	58	56

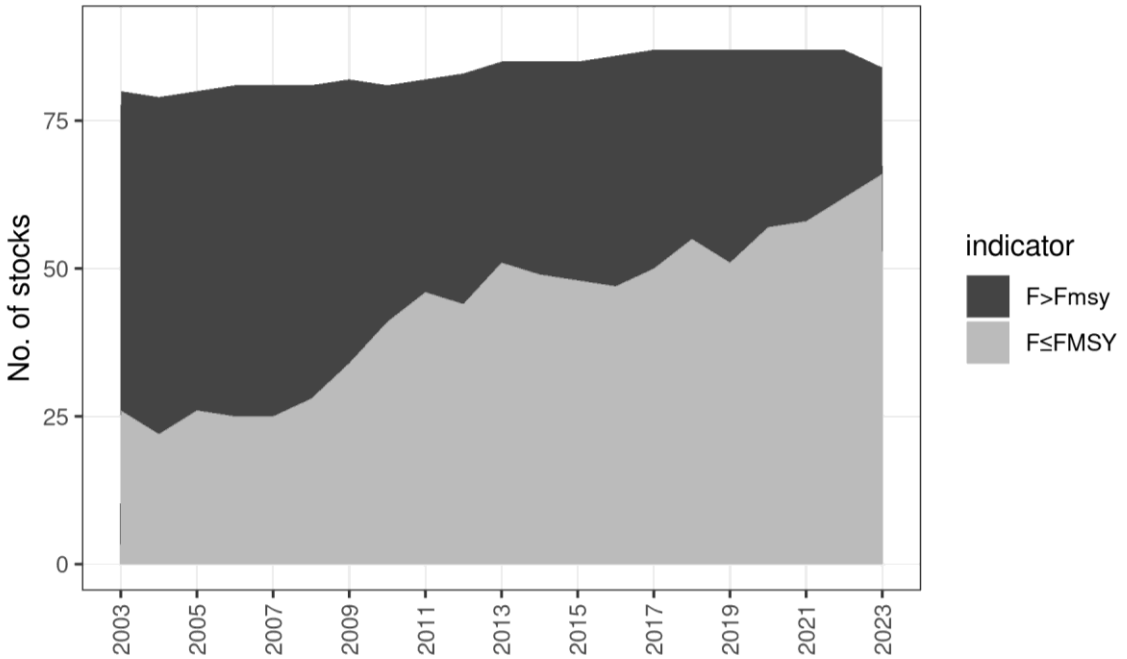
Source: Own elaborations based on ICES data.

3.2 Indicators of management performance

The first set of indicators (Figure 3 to Figure 8 and Table 3 to Table 8) represent the number of stocks with relation to specific thresholds. The second set of indicators (Figure 9 to Figure 17 and Table 9 to Table 16) depicts time trends of indicators computed using a state-space model as implemented in the JARA package (Winker et al., 2019, Gras et al., 2023). Most indicators have a global and a regional depiction (indicators 1-8 and 10).

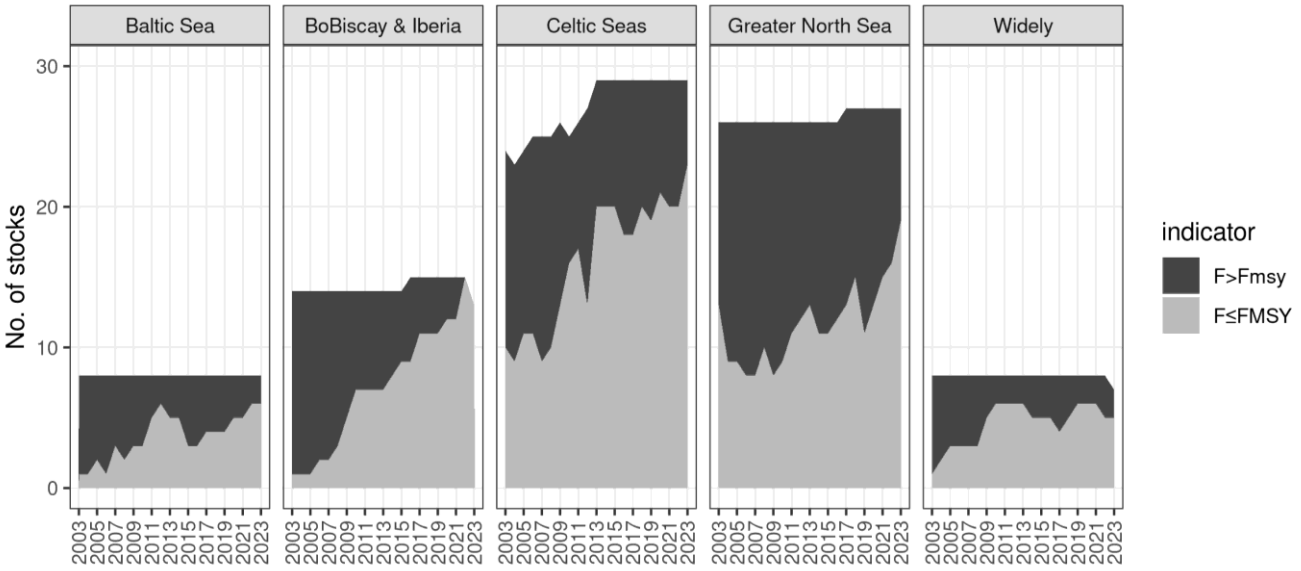
3.2.1 Number of stocks by year where fishing mortality is above/below F_{MSY}

Figure 3. Number of stocks by year for which fishing mortality (F) was above/below F_{MSY} (NEAI1-2).



Source: Own elaborations based on ICES data.

Figure 4. Number of stocks by ecoregion for which fishing mortality (F) was above/below F_{MSY} (NEAI1-2b).



Source: Own elaborations based on ICES data.

Table 3. Number of stocks by ecoregion for which fishing mortality (F) exceeded F_{MSY} (NEAI1).

EcoRegion	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
ALL	54	57	54	56	56	53	48	40	36	39	34
Baltic Sea	7	7	6	7	5	6	5	5	3	2	3
BoB & Iberia	13	13	13	12	12	11	9	7	7	7	7
Celtic Seas	14	14	13	14	16	15	13	9	9	14	9
G. North Sea	13	17	17	18	18	16	18	17	15	14	13
Widely	7	6	5	5	5	5	3	2	2	2	2

EcoRegion	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
ALL	36	37	39	37	32	36	30	29	25	18
Baltic Sea	3	5	5	4	4	4	3	3	2	2
BoB & Iberia	6	5	6	4	4	4	3	3	0	0
Celtic Seas	9	9	11	11	9	10	8	9	9	6
G. North Sea	15	15	14	14	12	16	14	12	11	8
Widely	3	3	3	4	3	2	2	2	3	2

Source: Own elaborations based on ICES data.

Table 4. Number of stocks by ecoregion for which fishing mortality (F) did not exceed F_{MSY} (NEAI2).

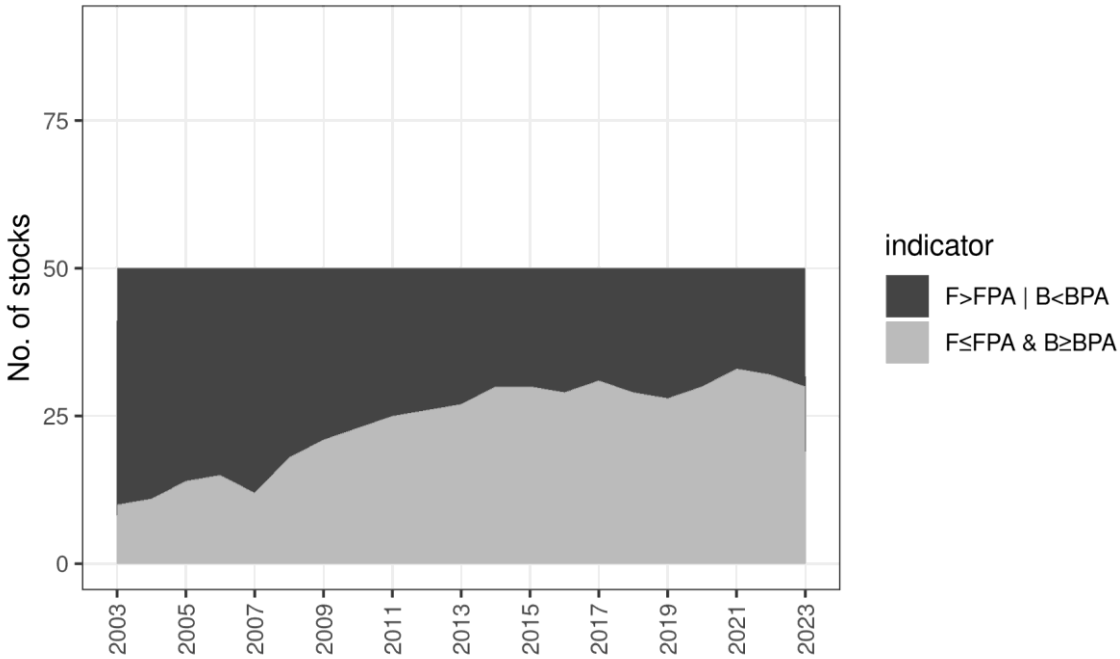
EcoRegion	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
ALL	26	22	26	25	25	28	34	41	46	44	51
Baltic Sea	1	1	2	1	3	2	3	3	5	6	5
BoB & Iberia	1	1	1	2	2	3	5	7	7	7	7
Celtic Seas	10	9	11	11	9	10	13	16	17	13	20
G. North Sea	13	9	9	8	8	10	8	9	11	12	13
Widely	1	2	3	3	3	3	5	6	6	6	6

EcoRegion	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
ALL	49	48	47	50	55	51	57	58	62	66
Baltic Sea	5	3	3	4	4	4	5	5	6	6
BoB & Iberia	8	9	9	11	11	11	12	12	15	13
Celtic Seas	20	20	18	18	20	19	21	20	20	23
G. North Sea	11	11	12	13	15	11	13	15	16	19
Widely	5	5	5	4	5	6	6	6	5	5

Source: Own elaborations based on ICES data.

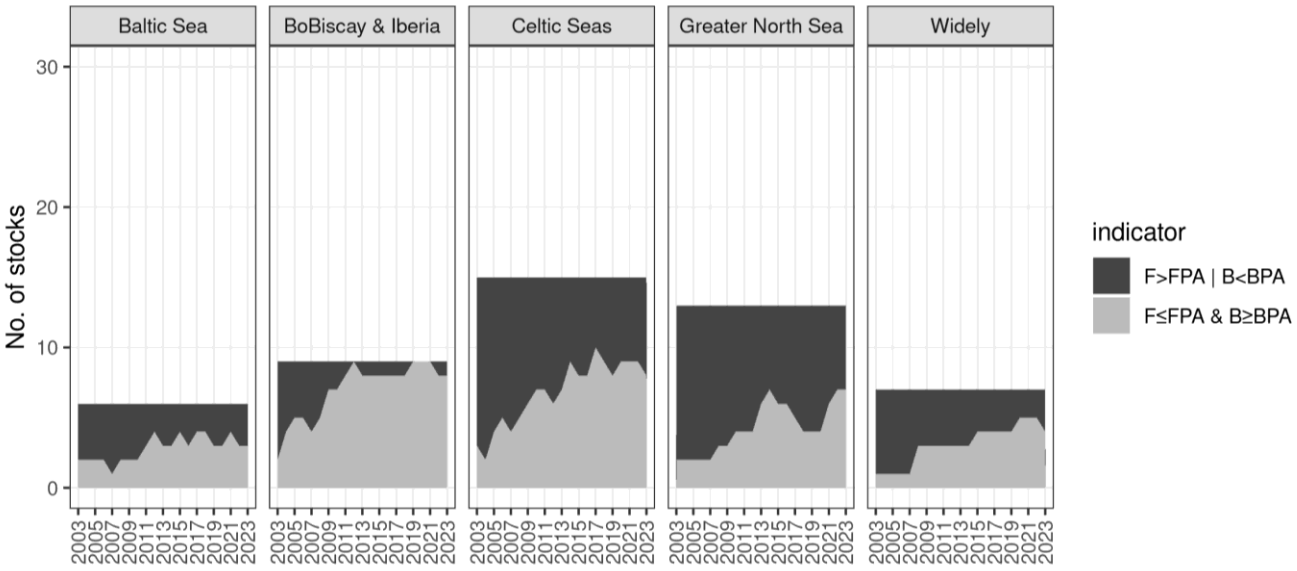
3.2.2 Number of stocks outside or inside safe biological limits

Figure 5. Number of stocks outside/inside safe biological limits by year (NEAI3-4).



Source: Own elaborations based on ICES data.

Figure 6. Number of stocks outside/inside safe biological limits by ecoregion (NEAI3-4b).



Source: Own elaborations based on ICES data.

Table 5. Number of stocks outside safe biological limits by ecoregion (NEAI3).

EcoRegion	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
ALL	40	39	36	35	38	32	29	27	25	24	23
Baltic Sea	4	4	4	4	5	4	4	4	3	2	3
BoB & Iberia	7	5	4	4	5	4	2	2	1	0	1
Celtic Seas	12	13	11	10	11	10	9	8	8	9	8
G. North Sea	11	11	11	11	11	10	10	9	9	9	7
Widely	6	6	6	6	6	4	4	4	4	4	4

EcoRegion	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
ALL	20	20	21	19	21	22	20	17	18	20
Baltic Sea	3	2	3	2	2	3	3	2	3	3
BoB & Iberia	1	1	1	1	1	0	0	0	1	1
Celtic Seas	6	7	7	5	6	7	6	6	6	7
G. North Sea	6	7	7	8	9	9	9	7	6	6
Widely	4	3	3	3	3	3	2	2	2	3

Source: Own elaborations based on ICES data.

Table 6. Number of stocks inside safe biological limits by ecoregion (NEAI4).

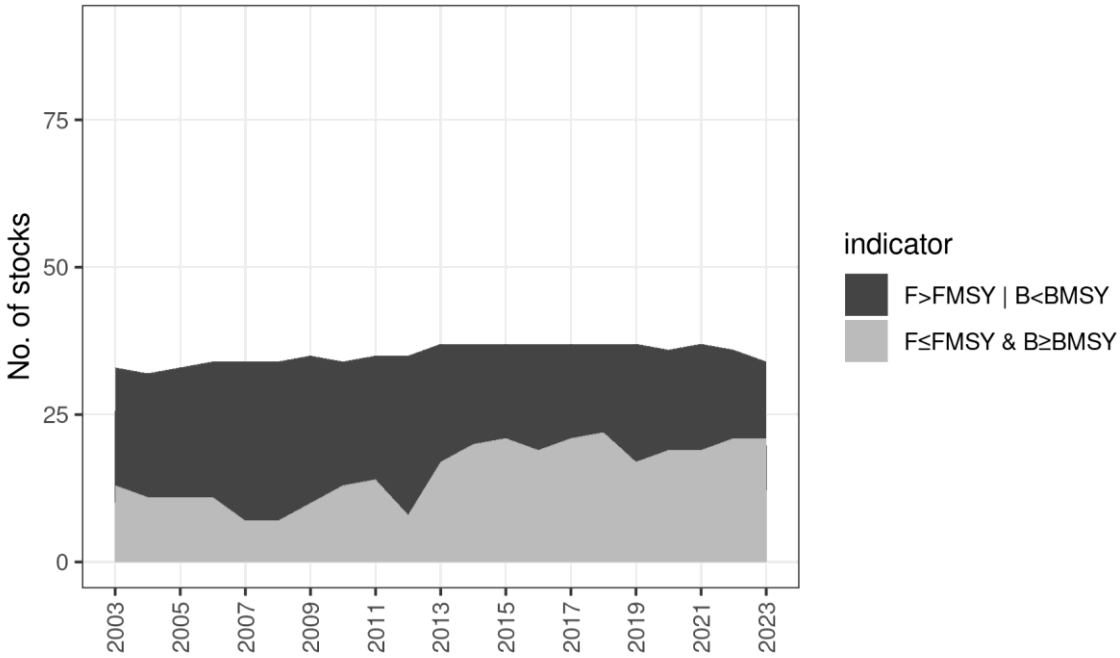
EcoRegion	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
ALL	10	11	14	15	12	18	21	23	25	26	27
Baltic Sea	2	2	2	2	1	2	2	2	3	4	3
BoB & Iberia	2	4	5	5	4	5	7	7	8	9	8
Celtic Seas	3	2	4	5	4	5	6	7	7	6	7
G. North Sea	2	2	2	2	2	3	3	4	4	4	6
Widely	1	1	1	1	1	3	3	3	3	3	3

EcoRegion	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
ALL	30	30	29	31	29	28	30	33	32	30
Baltic Sea	3	4	3	4	4	3	3	4	3	3
BoB & Iberia	8	8	8	8	8	9	9	9	8	8
Celtic Seas	9	8	8	10	9	8	9	9	9	8
G. North Sea	7	6	6	5	4	4	4	6	7	7
Widely	3	4	4	4	4	4	5	5	5	4

Source: Own elaborations based on ICES data.

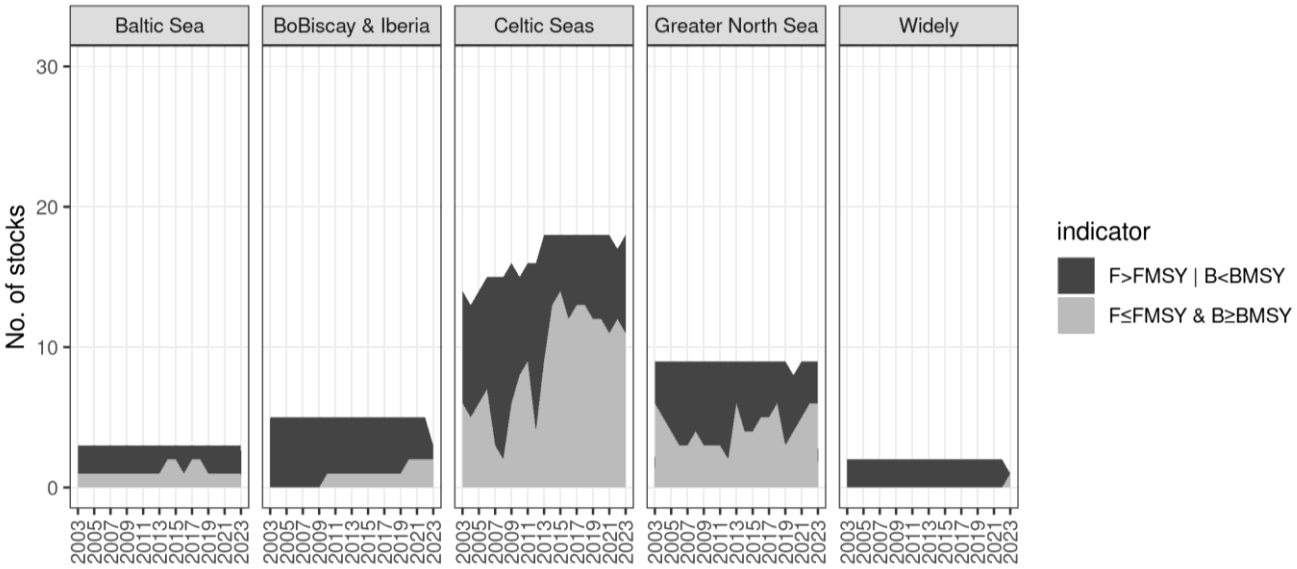
3.2.3 Number of stocks with F>FMSY or SSB<BMSY and number of stocks with F≤FMSY and SSB≥ BMSY

Figure 7. Number of stocks with $F>F_{MSY}$ or $SSB<B_{MSY}$ and number of stocks with $F\leq F_{MSY}$ and $SSB\geq B_{MSY}$ (NEAI5-6).



Source: Own elaborations based on ICES data.

Figure 8. Number of stocks with $F>F_{MSY}$ or $SSB<B_{MSY}$ and number of stocks with $F\leq F_{MSY}$ and $SSB\geq B_{MSY}$ by ecoregion (NEAI5-6b).



Source: Own elaborations based on ICES data.

Table 7. Number of stocks with $F>F_{MSY}$ or $SSB<B_{MSY}$ by ecoregion (NEAI5).

EcoRegion	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
ALL	20	21	22	23	27	27	25	21	21	27	20
Baltic Sea	2	2	2	2	2	2	2	2	2	2	2
BoB & Iberia	5	5	5	5	5	5	5	4	4	4	4
Celtic Seas	8	8	8	8	12	13	10	7	7	12	9
G. North Sea	3	4	5	6	6	5	6	6	6	7	3
Widely	2	2	2	2	2	2	2	2	2	2	2

EcoRegion	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
ALL	17	16	18	16	15	20	17	18	15	13
Baltic Sea	1	1	2	1	1	2	2	2	2	2
BoB & Iberia	4	4	4	4	4	4	3	3	3	1
Celtic Seas	5	4	6	5	5	6	6	7	5	7
G. North Sea	5	5	4	4	3	6	4	4	3	3
Widely	2	2	2	2	2	2	2	2	2	0

Source: Own elaborations based on ICES data.

Table 8. Number of stocks with $F \leq F_{MSY}$ and $SSB \geq B_{MSY}$ by ecoregion (NEAI6).

EcoRegion	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
ALL	13	11	11	11	7	7	10	13	14	8	17
Baltic Sea	1	1	1	1	1	1	1	1	1	1	1
BoB & Iberia	0	0	0	0	0	0	0	1	1	1	1
Celtic Seas	6	5	6	7	3	2	6	8	9	4	9
G. North Sea	6	5	4	3	3	4	3	3	3	2	6
Widely	0	0	0	0	0	0	0	0	0	0	0

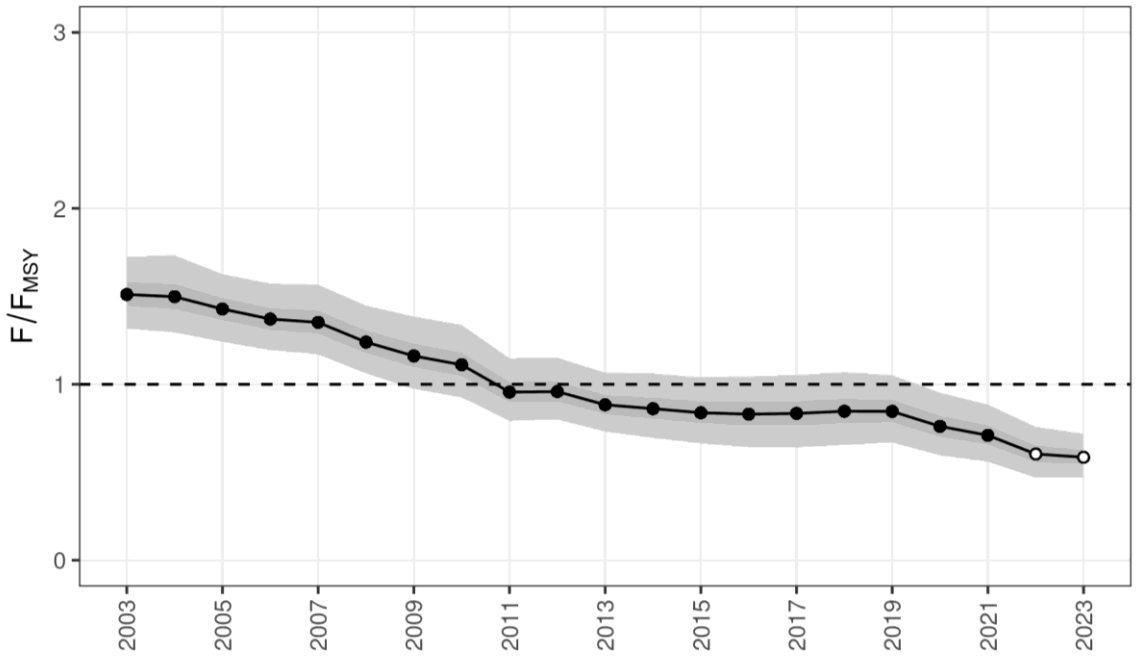
EcoRegion	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
ALL	20	21	19	21	22	17	19	19	21	21
Baltic Sea	2	2	1	2	2	1	1	1	1	1
BoB & Iberia	1	1	1	1	1	1	2	2	2	2
Celtic Seas	13	14	12	13	13	12	12	11	12	11
G. North Sea	4	4	5	5	6	3	4	5	6	6
Widely	0	0	0	0	0	0	0	0	0	1

Source: Own elaborations based on ICES data.

3.2.4 Trend in F/F_{MSY}

The ratio F/F_{MSY} has decreased over the years 2003-2023 from 1.51 to 0.59 (Figure 9 and Table 9). A first decreasing phase happened from 2003 to 2013. That was followed by a phase of less steep decrease until 2019. The decrease became more pronounced over the years 2019-2022 and the ratio was stable over the last two years. The ratio's estimate went below 1 from 2011 and the confidence interval was below 1 from 2020 to 2023. It is to be noted that in this indicator and for the first time, 3 stocks had a 3-year advice. For those stocks and following the protocol, F/F_{MSY} values were forecasted for the year 2022 only.

Figure 9. Trend in F/F_{MSY} (based on 63 stocks). Dark grey area shows the 50% confidence interval whereas the light grey shows the 95% confidence interval (NEAI7). The white dots indicate that a one year forecast was used for at least one stock.



Source: Own elaborations based on ICES data.

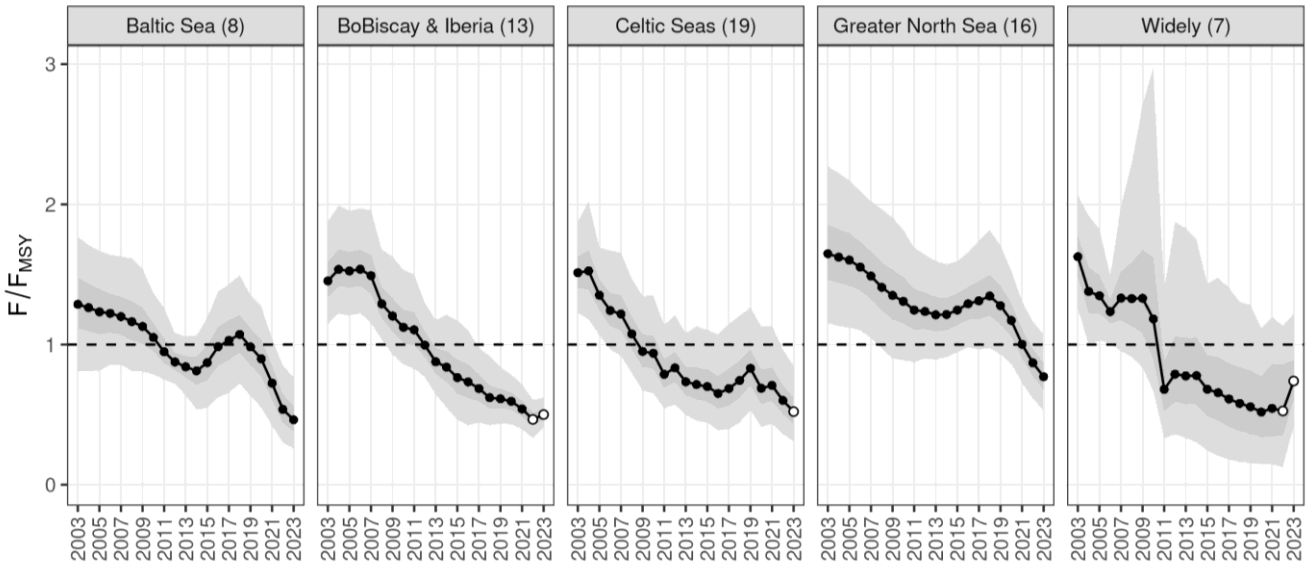
Table 9. Percentiles for F/F_{MSY} by year (NEAI7).

Percentiles	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
2.5%	1.32	1.29	1.24	1.19	1.17	1.06	0.97	0.92	0.79	0.80	0.73
25%	1.44	1.42	1.36	1.31	1.28	1.18	1.09	1.04	0.90	0.90	0.83
50%	1.51	1.50	1.43	1.37	1.35	1.24	1.16	1.11	0.96	0.96	0.88
75%	1.58	1.57	1.49	1.44	1.42	1.31	1.23	1.18	1.02	1.02	0.94
97.5%	1.72	1.73	1.63	1.57	1.57	1.45	1.39	1.34	1.15	1.15	1.07

Percentiles	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
2.5%	0.69	0.66	0.64	0.64	0.65	0.67	0.60	0.56	0.47	0.47
25%	0.80	0.78	0.76	0.76	0.78	0.78	0.70	0.66	0.55	0.54
50%	0.86	0.84	0.83	0.83	0.85	0.85	0.76	0.71	0.60	0.59
75%	0.93	0.91	0.90	0.91	0.92	0.92	0.82	0.77	0.66	0.63
97.5%	1.06	1.04	1.05	1.05	1.07	1.05	0.95	0.89	0.76	0.72

Source: Own elaborations based on ICES data.

Figure 10. Trend in F/F_{MSY} by ecoregion. The number of stocks in each ecoregion are shown between parentheses (NEAI7b). The white dots indicate that a one year forecast was used for at least one stock.



Source: Own elaborations based on ICES data.

Table 10. Trend in F/F_{MSY} by ecoregion (NEAI7b).

EcoRegion	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Baltic Sea	1.29	1.26	1.23	1.22	1.20	1.16	1.13	1.05	0.95	0.88	0.84
BoB & Iberia	1.45	1.54	1.52	1.54	1.49	1.29	1.20	1.12	1.10	1.00	0.88
Celtic Seas	1.51	1.53	1.35	1.24	1.22	1.08	0.95	0.94	0.79	0.83	0.73
G. North Sea	1.65	1.62	1.60	1.55	1.49	1.41	1.35	1.31	1.25	1.24	1.21
Widely	1.63	1.38	1.35	1.24	1.33	1.33	1.33	1.18	0.68	0.79	0.78

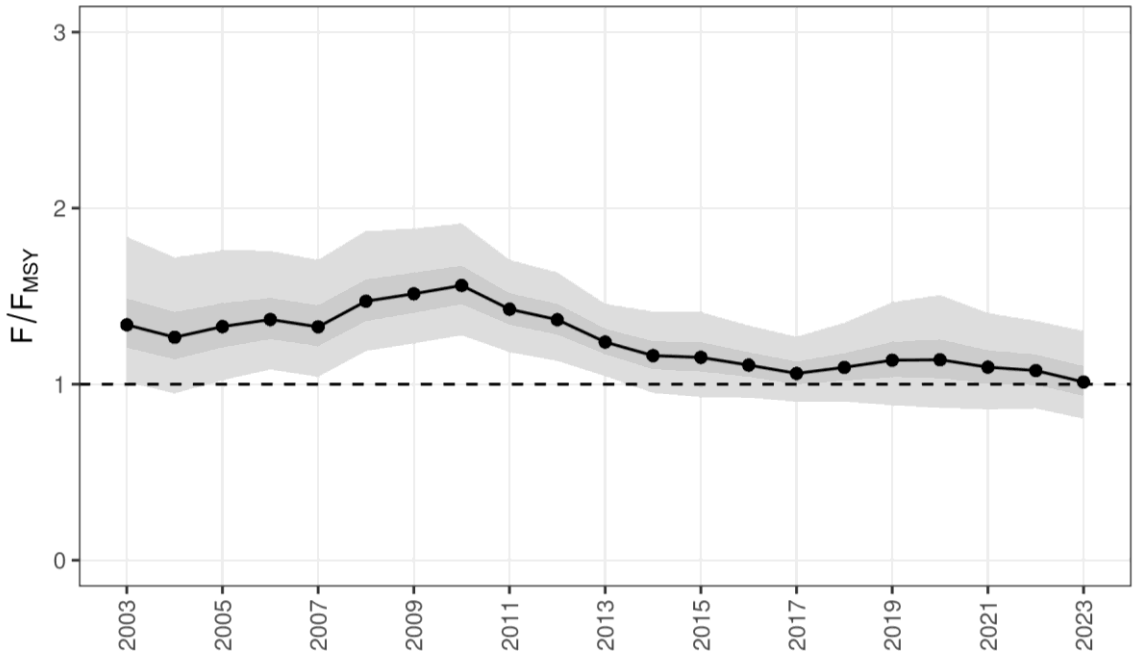
EcoRegion	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Baltic Sea	0.81	0.87	0.98	1.03	1.07	0.98	0.90	0.72	0.54	0.46
BoB & Iberia	0.84	0.76	0.73	0.69	0.62	0.61	0.60	0.54	0.47	0.50
Celtic Seas	0.72	0.70	0.65	0.69	0.74	0.83	0.69	0.71	0.60	0.52
G. North Sea	1.21	1.25	1.29	1.31	1.35	1.28	1.17	1.00	0.87	0.77
Widely	0.78	0.68	0.66	0.61	0.58	0.56	0.52	0.55	0.53	0.74

Source: Own elaborations based on ICES data.

3.2.5 Trend in F/F_{MSY} for stocks outside EU waters

The model used in section 3.2.5 was also used with data derived from stocks assessed by ICES and spanning across areas that fall primarily outside EU waters in FAO region 27 (Figure 11 and Table 11). The analysis was based on 18 stocks for which individual F/F_{MSY} trajectories are presented in Figure 12. Throughout the time series, the ratio exhibited a slight decreasing trend from 1.34 to 1.01. The ratio was >1 throughout the time series and it reached its minimum value in 2023 at 1.01. The confidence interval of the indicator overlapped with 1 in 2004 and from 2014 to the end of the time series.

Figure 11. Trend in F/F_{MSY} for stocks outside EU waters (based on 18 stocks). Dark grey zone shows the 50% confidence interval whereas the light grey zone shows the 95% confidence interval (NEAI7out).



Source: Own elaborations based on ICES data.

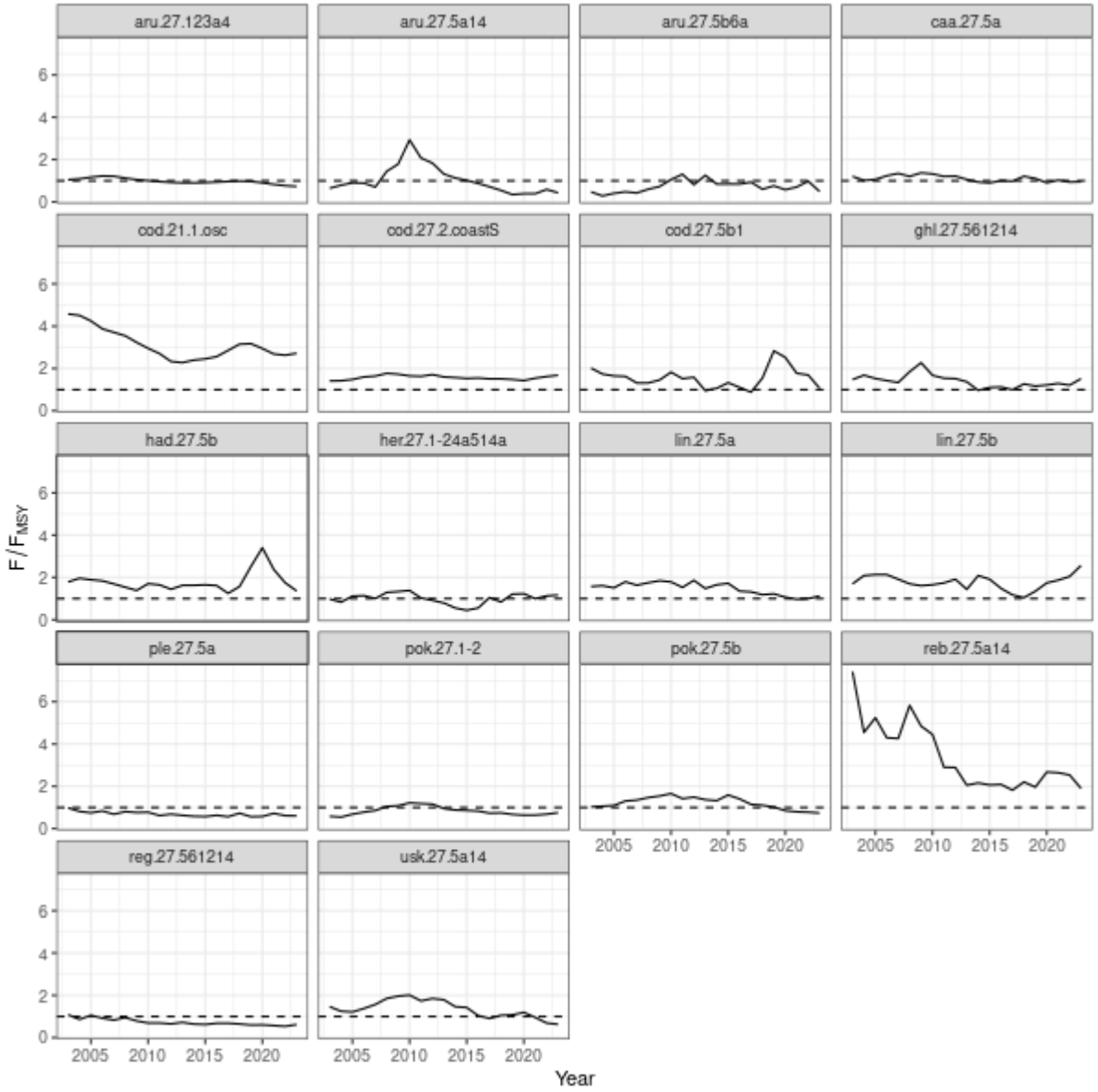
Table 11. Percentiles for F/F_{MSY} for stocks outside EU waters (NEAI7out).

Percentiles	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
2.5%	1.01	0.95	1.02	1.08	1.04	1.19	1.23	1.28	1.18	1.13	1.04
25%	1.21	1.14	1.21	1.26	1.22	1.36	1.41	1.45	1.34	1.28	1.17
50%	1.34	1.27	1.33	1.37	1.33	1.47	1.51	1.56	1.43	1.37	1.24
75%	1.49	1.41	1.46	1.49	1.45	1.59	1.63	1.67	1.52	1.46	1.31
97.5%	1.84	1.72	1.76	1.76	1.71	1.87	1.89	1.92	1.71	1.64	1.46

Percentiles	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
2.5%	0.95	0.93	0.92	0.90	0.90	0.88	0.86	0.86	0.86	0.80
25%	1.08	1.07	1.04	1.00	1.02	1.04	1.03	1.00	1.00	0.93
50%	1.16	1.15	1.11	1.06	1.10	1.14	1.14	1.10	1.08	1.01
75%	1.24	1.24	1.18	1.13	1.18	1.24	1.25	1.19	1.17	1.10
97.5%	1.42	1.41	1.34	1.27	1.35	1.47	1.51	1.41	1.36	1.30

Source: Own elaborations based on ICES data.

Figure 12. Trend in F/F_{MSY} of single stocks from outside EU waters. The dashed line is set at 1 (i.e. where $F=F_{MSY}$).

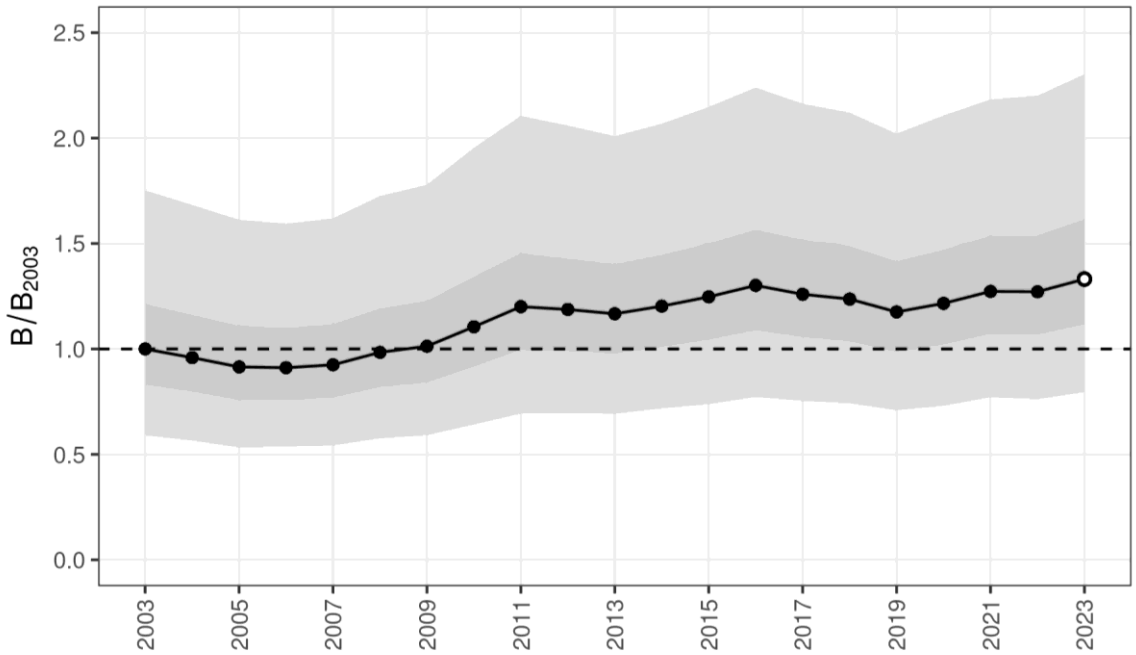


Source: Own elaborations based on ICES data.

3.2.6 Trend in SSB (relative to SSB in 2003)

From a global perspective, the ratio B/B_{2003} increased through the analysed period (2003-2023) to reach 1.37 (Figure 13 and Table 12). The ratio reached values >1 from 2009 to the end of the time series. Although the ratio followed an increasing trend overall, three periods of decrease can be seen (2003-2006; 2011-2013; 2016-2019). The maximum of the time series was reached in 2023. The ratio's confidence interval overlaps with 1 throughout the time series.

Figure 13. Trend in SSB relative to 2003 (based on 57 stocks). Dark grey zone shows the 50% confidence interval whereas the light grey zone shows the 95% confidence interval (NEAI8). The white dot indicates that a one year forecast was used for at least one stock.



Source: Own elaborations based on ICES data.

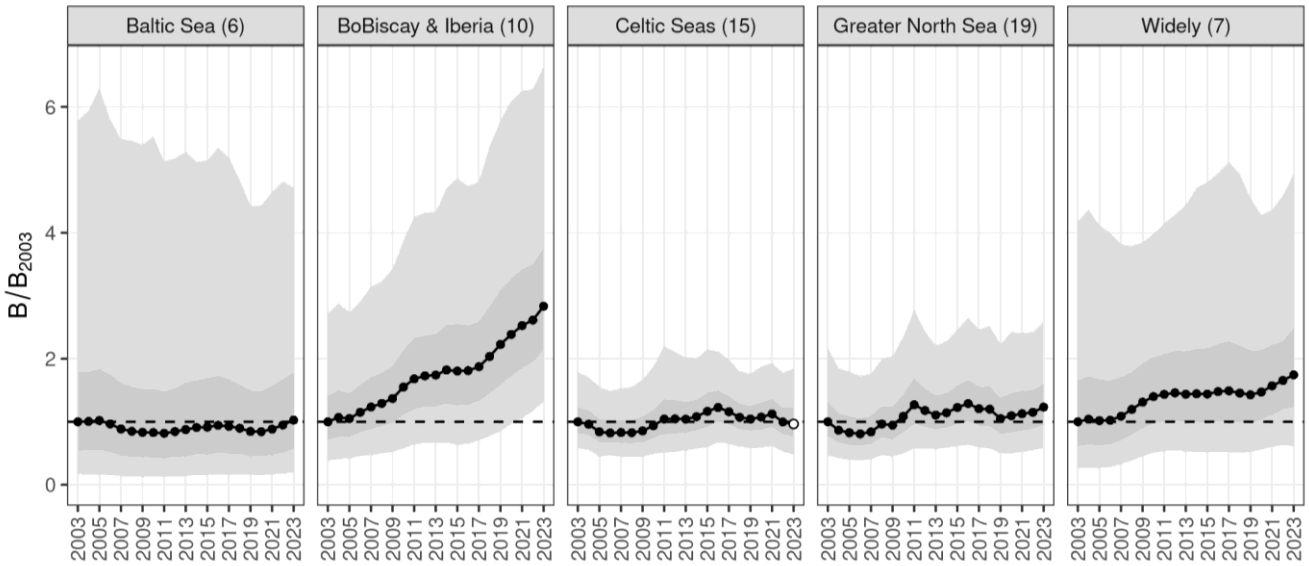
Table 12. Percentiles for SSB relative to 2003.

Percentiles	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
2.5%	0.59	0.57	0.53	0.54	0.55	0.58	0.59	0.65	0.71	0.71	0.70
25%	0.83	0.79	0.75	0.75	0.77	0.81	0.83	0.92	1.01	1.00	0.99
50%	1.00	0.96	0.91	0.91	0.93	0.98	1.01	1.11	1.23	1.21	1.19
75%	1.20	1.16	1.10	1.09	1.11	1.18	1.21	1.34	1.48	1.45	1.42
97.5%	1.72	1.65	1.56	1.54	1.56	1.66	1.72	1.91	2.11	2.05	1.99

Percentiles	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
2.5%	0.73	0.76	0.79	0.77	0.75	0.72	0.75	0.79	0.78	0.80
25%	1.02	1.06	1.10	1.07	1.06	1.01	1.04	1.09	1.08	1.13
50%	1.23	1.28	1.32	1.29	1.26	1.21	1.25	1.31	1.31	1.37
75%	1.47	1.53	1.58	1.54	1.52	1.44	1.50	1.56	1.56	1.63
97.5%	2.04	2.13	2.21	2.14	2.13	2.03	2.12	2.19	2.20	2.31

Source: Own elaborations based on ICES data.

Figure 14. Trend in SSB relative to 2003 by ecoregion. The number of stocks in each ecoregion are shown between parentheses (NEAI8b). The white dot indicates that a one year forecast was used for at least one stock.



Source: Own elaborations based on ICES data.

Table 13. SSB relative to 2003 by ecoregion.

EcoRegion	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Baltic Sea	1.00	1.01	1.02	0.97	0.89	0.85	0.83	0.83	0.82	0.84	0.88
BoB & Iberia	1.00	1.07	1.05	1.15	1.23	1.29	1.37	1.55	1.68	1.73	1.74
Celtic Seas	1.00	0.96	0.84	0.82	0.83	0.83	0.85	0.94	1.04	1.05	1.04
G. North Sea	1.00	0.87	0.83	0.81	0.84	0.96	0.95	1.09	1.27	1.18	1.11
Widely	1.00	1.04	1.02	1.02	1.09	1.20	1.31	1.40	1.43	1.46	1.44

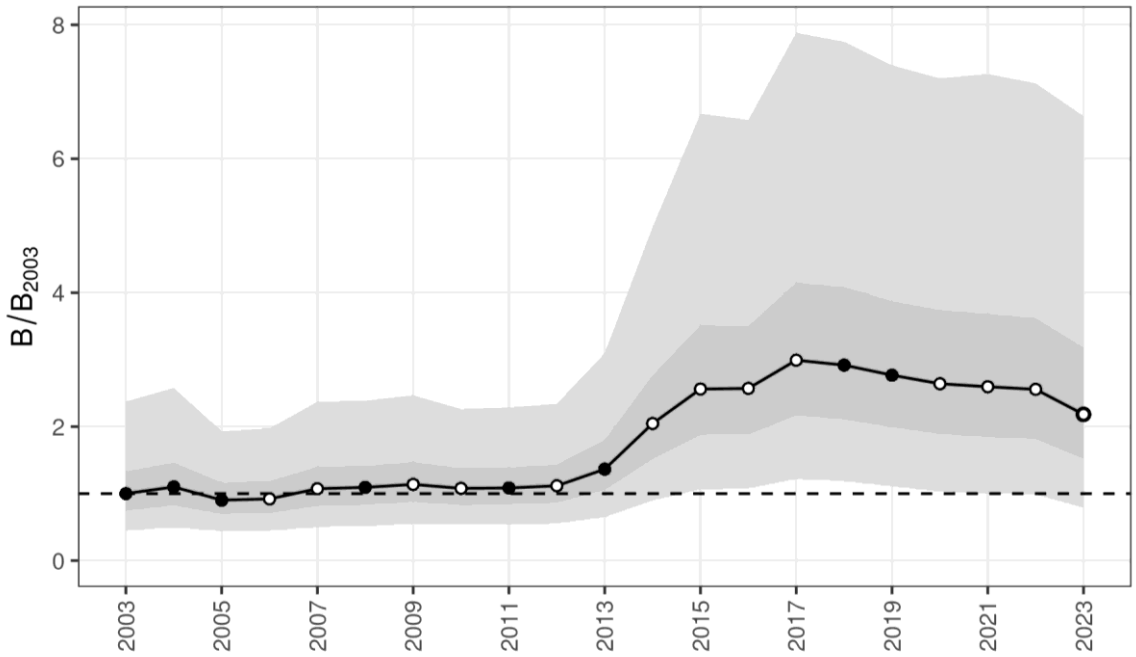
EcoRegion	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Baltic Sea	0.91	0.92	0.94	0.93	0.90	0.85	0.84	0.88	0.95	1.03
BoB & Iberia	1.82	1.81	1.81	1.87	2.04	2.23	2.39	2.53	2.61	2.84
Celtic Seas	1.08	1.17	1.23	1.16	1.07	1.04	1.07	1.12	1.00	0.97
G. North Sea	1.14	1.23	1.29	1.21	1.20	1.05	1.10	1.13	1.15	1.23
Widely	1.44	1.44	1.48	1.49	1.46	1.43	1.47	1.57	1.66	1.74

Source: Own elaborations based on ICES data.

3.2.7 Trend in stock size relative to stock size in 2003 for data-limited stocks

The ratio B/B_{2003} for category 3 stocks inside EU waters (Figure 15 and Table 14) was first fluctuating around 1 from 2003 to 2012. This was followed by a period of steep increase over 2012-2017 when it reached 2.92, the maximum value of the time series. After 2017, a linear decrease is observed to reach 2.12 in 2023. The lower bound of the confidence interval was <1 except in years 2015-2019. This indicator should be interpreted with caution since the input data is a mix of various units that are barely comparable. The absolute values are also quite heterogeneous explaining the large confidence interval observed. A number of 1-year forecasts have been done due to missing values in the time series.

Figure 15. Trend in biomass or abundance indices relative to 2003 for data limited stocks (ICES category 3; based on 56 stocks). Dark grey zone shows the 50% confidence interval whereas the light grey zone shows the 95% confidence interval (NEAI12). The white dots indicate that a one year forecast was used for at least one stock.



Source: Own elaborations based on ICES data.

Table 14. Percentiles for biomass or abundance indices relative to 2003 for ICES category 3 stocks.

Percentiles	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
2.5%	0.45	0.49	0.44	0.44	0.49	0.50	0.53	0.52	0.52	0.54	0.64
25%	0.75	0.83	0.69	0.70	0.81	0.82	0.86	0.81	0.82	0.85	1.02
50%	1.00	1.10	0.89	0.91	1.06	1.07	1.11	1.05	1.05	1.08	1.34
75%	1.35	1.48	1.16	1.18	1.38	1.40	1.45	1.35	1.36	1.39	1.75
97.5%	2.42	2.62	1.91	1.97	2.38	2.37	2.42	2.23	2.23	2.26	3.03

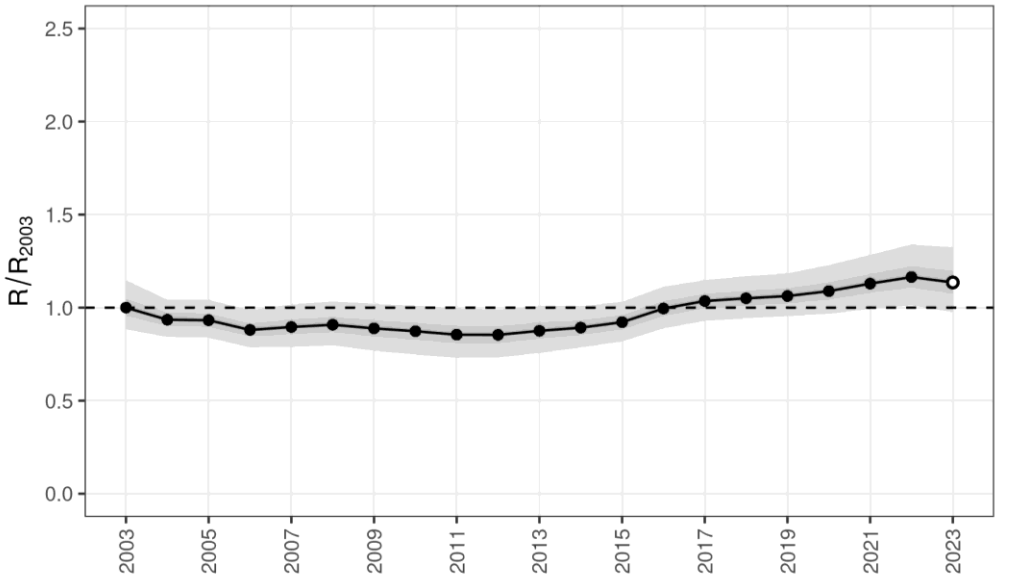
Percentiles	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
2.5%	0.86	1.04	1.05	1.18	1.14	1.07	0.98	0.95	0.93	0.74
25%	1.48	1.82	1.82	2.10	2.03	1.91	1.82	1.77	1.74	1.46
50%	1.99	2.50	2.49	2.92	2.84	2.69	2.57	2.52	2.47	2.12
75%	2.70	3.46	3.43	4.07	3.98	3.78	3.64	3.59	3.51	3.11
97.5%	5.02	6.66	6.54	7.96	7.88	7.49	7.37	7.26	7.13	6.64

Source: Own elaborations based on ICES data.

3.2.8 Trend in recruitment relatively to recruitment 2003

The estimated average decadal recruitment for category 1 and 2 stocks (Figure 16 and Table 15) followed a decreasing trend from 2003 to 2012 where it reached the minimum of the time series (0.85). From 2012 to the end of the time series the decadal recruitment increased steadily and reached the maximum of the time series in 2022 (1.16). The confidence interval of the decadal recruitment was estimated below 1 in 2012 (the upper limit of the CI was estimated to be <1) and above 1 in 2022 (the lower limit of the CI was estimated to be >1). It should be noted that several category 1 and 2 stocks were omitted due to them being assessed using biomass dynamic models. This trend might reflect an increase in stock production although the characteristic of the indicator, a decadal ratio, makes it difficult to interpret.

Figure 16. Trend in decadal recruitment scaled to 2003 (based on 58 stocks). Dark grey zone shows the 50% confidence interval whereas the light grey zone shows the 95% confidence interval (NEAI10). The white dot indicates that a one year forecast was used for at least one stock.



Source: Own elaborations based on ICES data.

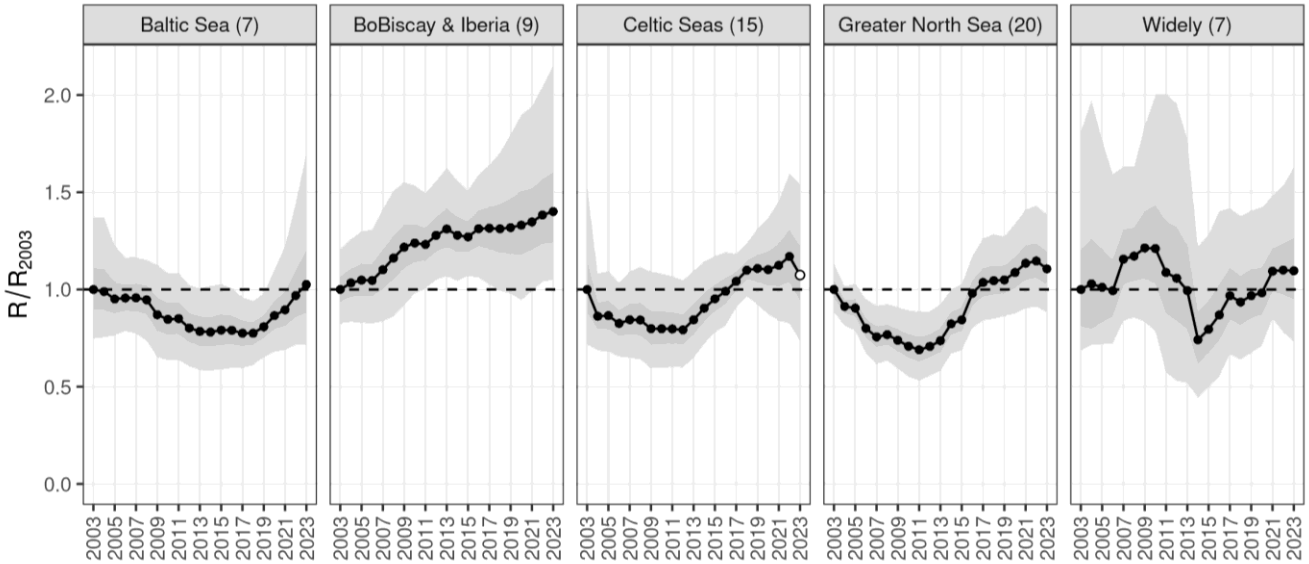
Table 15. Percentiles for decadal recruitment scaled to 2003.

Percentiles	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
2.5%	0.88	0.84	0.84	0.79	0.79	0.80	0.77	0.75	0.73	0.73	0.76
25%	0.96	0.90	0.90	0.85	0.86	0.87	0.85	0.83	0.81	0.81	0.83
50%	1.00	0.94	0.93	0.88	0.90	0.91	0.89	0.87	0.85	0.85	0.88
75%	1.05	0.97	0.97	0.91	0.94	0.95	0.93	0.92	0.90	0.90	0.92
97.5%	1.15	1.04	1.04	0.99	1.02	1.03	1.02	1.01	1.00	0.99	1.01

Percentiles	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
2.5%	0.79	0.82	0.89	0.93	0.94	0.95	0.97	0.99	1.01	0.98
25%	0.85	0.88	0.96	1.00	1.01	1.02	1.04	1.08	1.11	1.08
50%	0.89	0.92	1.00	1.04	1.05	1.06	1.09	1.13	1.16	1.14
75%	0.93	0.96	1.03	1.07	1.09	1.10	1.14	1.18	1.22	1.20
97.5%	1.01	1.03	1.11	1.15	1.17	1.19	1.23	1.28	1.34	1.32

Source: Own elaborations based on ICES data.

Figure 17. Trend in decadal recruitment scaled to 2003 by ecoregion. The number of stocks in each ecoregion are shown between brackets (NEAI10b). The white dot indicates that a one year forecast was used for at least one stock.



Source: Own elaborations based on ICES data.

Table 16. Decadal recruitment scaled to 2003 by ecoregion.

EcoRegion	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Baltic Sea	1.00	0.99	0.95	0.96	0.96	0.95	0.87	0.85	0.85	0.80	0.78
BoB & Iberia	1.00	1.03	1.05	1.05	1.10	1.16	1.22	1.24	1.23	1.28	1.31
Celtic Seas	1.00	0.86	0.87	0.83	0.84	0.84	0.80	0.80	0.80	0.79	0.84
G. North Sea	1.00	0.91	0.90	0.80	0.76	0.77	0.74	0.71	0.69	0.71	0.74
Widely	1.00	1.03	1.01	0.99	1.16	1.17	1.21	1.21	1.09	1.06	0.99

EcoRegion	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Baltic Sea	0.78	0.79	0.79	0.77	0.78	0.81	0.87	0.90	0.97	1.03
BoB & Iberia	1.28	1.27	1.31	1.32	1.31	1.32	1.33	1.35	1.38	1.40
Celtic Seas	0.90	0.95	0.99	1.04	1.10	1.11	1.10	1.12	1.17	1.07
G. North Sea	0.82	0.84	0.98	1.04	1.05	1.05	1.09	1.13	1.15	1.11
Widely	0.74	0.80	0.87	0.97	0.94	0.97	0.98	1.09	1.10	1.10

Source: Own elaborations based on ICES data.

3.3 Indicators of advice coverage

The indicator of advice coverage provides the number of stocks for which the reference points F_{MSY}, F_{PA}, $MSYB_{trigger}$, and B_{PA} are available (Table 17). It also provides the number of TACs that are set by the European Commission. This figure has increased since 2023 (STECF, 2023b) with the addition of por.27.nea, rju.27.7de, hom.2a3a4a5b6a7a, bll.27.3a47d, bli.27.5b6712 and boc.27.6-8.

Table 17. Coverage of TACs by scientific advice (ICES category 1 and 2).

	No of stocks	No of TACs	No of TACs based on stock assessment	Fraction of TACs based on Stock Assessments
F_{MSY}	87	162	87	54%
$MSYB_{trigger}$	43	162	37	23%
F_{PA}	53	162	74	46%
B_{PA}	72	162	87	54%

Source: Own elaborations based on ICES data.

4 Mediterranean and Black Sea

Between 2003 and 2009 the number of available stock assessment increased from 44 to 64. In 2022, 66 stock assessments were available. This number dropped to 41 in 2023 (Figure 18 and Figure 19) due to the 3-year advice cycle in GFCM. As for the Northeast Atlantic, this year's analyses for the Mediterranean and Black Sea were conducted using the last protocol to monitor the Common Fisheries Policy performances (Gras et al., 2023). The overall increase in number of stock assessment outputs is also due to the quantitative information made publicly available by GFCM through the STAR files (https://www.fao.org/gfcm/data/star). The high variability in stock assessment outputs at the start of the time series makes the interpretation of the indicators challenging. With such differences in the number of stocks assessed in the early part of the time series, the trends in the indicators and the trend in the number of stocks available are confounded. It is to be noted that in the Black Sea ecoregion, some stocks (SPR_29 and WHG_29) now have new assessments with shorter time series than in previous years. The number of stock assessments used to compute indicators in the Mediterranean and Black Sea basin were 65 and 66 for F/F_{MSY} and B/B_{2003} indicators respectively (Table 18).

Table 18. Stocks used for F/F_{MSY} and B/B_{2003} indicators.

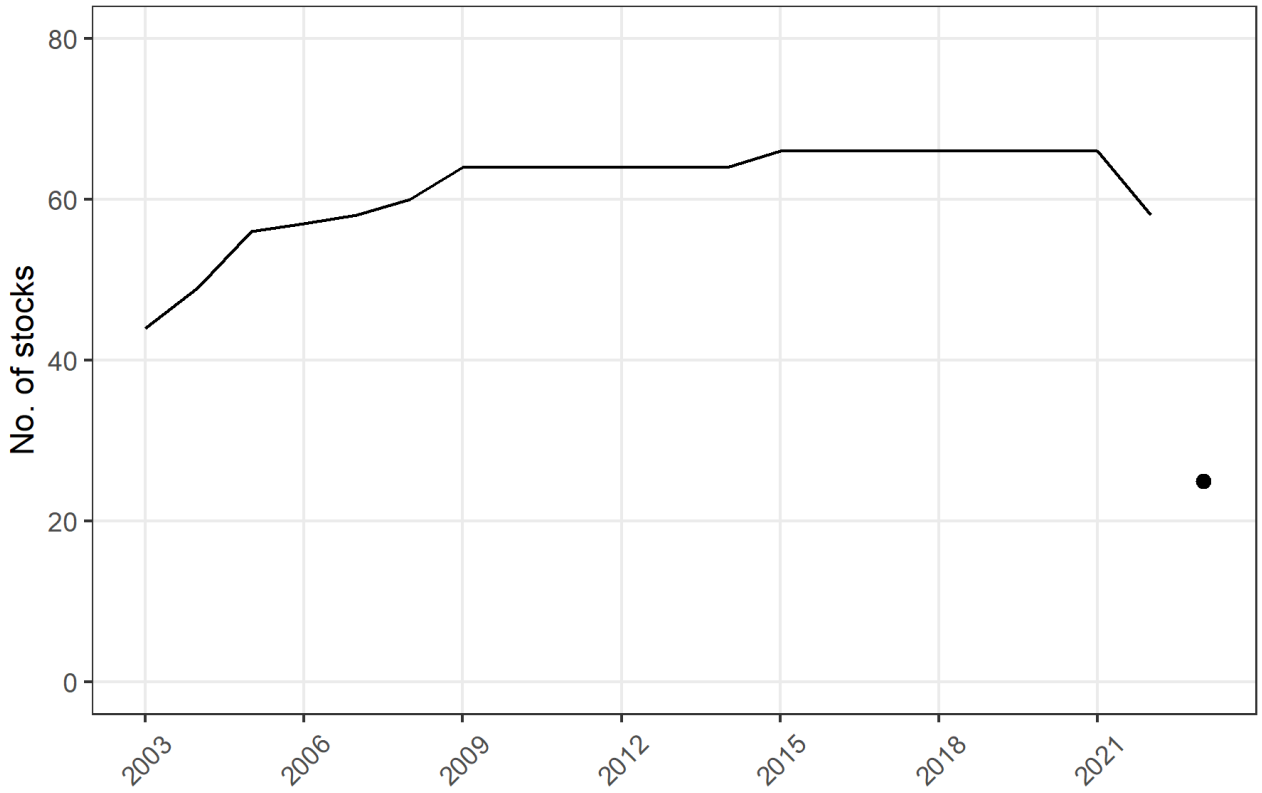
F/F_{MSY}						
ANE_16	ANE_17_18	ANE_22	ANE_29	ANE_5	ANE_6	ANE_7
ANE_9	ARA_1_2	ARA_18_19_20	ARA_5	ARA_6_7	ARS_12_13_14_15_16	ARS_18_19_20
ARS_8_9_10_11	CTC_17	DGS_29	DPS_1	DPS_12_13_14_15_16	DPS_17_18_19_20	DPS_5_6_7
DPS_8_9_10_11	EOI_18	HKE_1_5_6_7	HKE_12_13_14_15_16	HKE_17_18	HKE_19	HKE_20
HKE_22	HKE_8_9_10_11	MTS_17	MUR_15_16	MUR_5	MUT_1	MUT_10
MUT_11	MUT_15	MUT_16	MUT_17_18	MUT_19	MUT_20	MUT_22
MUT_25	MUT_29	MUT_6	MUT_7	MUT_9	NEP_11	NEP_15_16
NEP_17_18	NEP_5	NEP_6	NEP_9	PIL_16	PIL_17_18	PIL_22
PIL_6	PIL_9	RPW_29	SBR_1_3	SOL_17	SPR_29	TUR_29
WHB_6	WHG_29					
B/B_{2003}						
ANE_16	ANE_17_18	ANE_22	ANE_29	ANE_5	ANE_6	ANE_7
ANE_9	ARA_1_2	ARA_18_19_20	ARA_5	ARA_6_7	ARS_12_13_14_15_16	ARS_18_19_20
ARS_8_9_10_11	CTC_17	DGS_29	DPS_1	DPS_12_13_14_15_16	DPS_17_18_19_20	DPS_5_6_7
DPS_8_9_10_11	EOI_18	HKE_1_5_6_7	HKE_12_13_14_15_16	HKE_17_18	HKE_19	HKE_20
HKE_22	HKE_8_9_10_11	MTS_17	MUR_15_16	MUR_5	MUT_1	MUT_10
MUT_11	MUT_15	MUT_16	MUT_17_18	MUT_19	MUT_20	MUT_22
MUT_25	MUT_29	MUT_6	MUT_7	MUT_9	NEP_11	NEP_15_16
NEP_17_18	NEP_5	NEP_6	NEP_9	PIL_16	PIL_17_18	PIL_22
PIL_6	PIL_7	PIL_9	RPW_29	SBR_1_3	SOL_17	SPR_29
TUR_29	WHB_6	WHG_29				

Source: own elaborations based on GFCM and STECF data.

Over the years 2009-2022, the number of available stock assessment outputs is more stable with only two time series starting in 2015. The state-space model as implemented in the JARA package without back cast provided some estimates of the variance associated with the analysis. The indicator values are presented in Figure 22 to Figure 28, and Table 22 to Table 25. The number of stock assessment outputs available for the Mediterranean and Black Seas is displayed in Figure 18.

Due to the reduced number of stock assessment outputs available for 2023, the indicator presented in Figure 18 was plotted as a continuous line from 2003 to 2022 and 2023 is depicted as a separate point to indicate the reduced number endorsed stock assessments for that year.

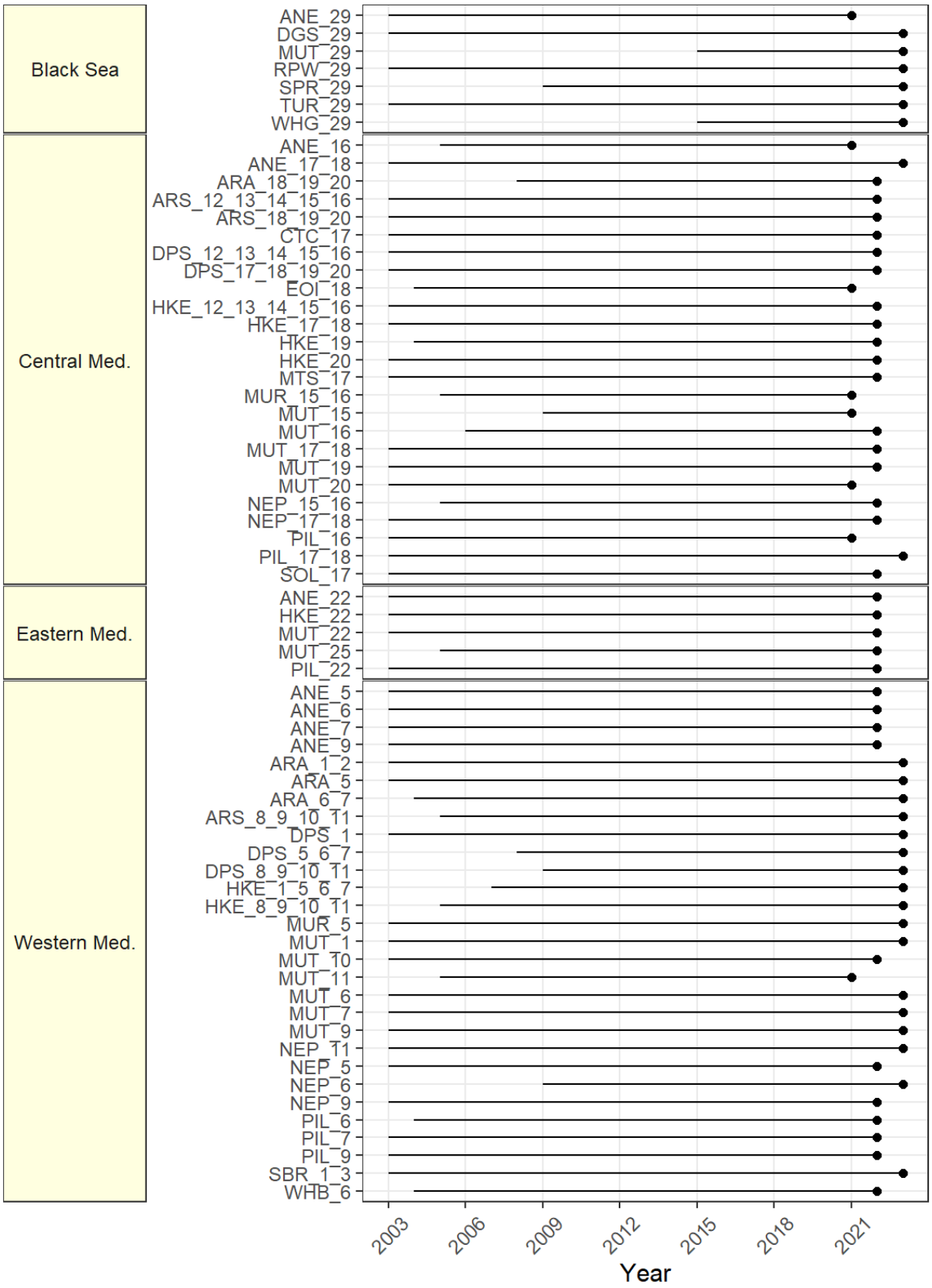
Figure 18. Number of stock assessments available in the Mediterranean and Black Sea.



Source: own elaborations based on GFCM and STECF data.

As in STECF-Adhoc-24-01 the updated results of Sardine in GSA 7 (PIL_7) are used only for the biomass indicator as the stock was assessed using a two-stage biomass model which provides only harvest rates and not F estimates.

Figure 19. Time-series of stock assessments available from both STECF and GFCM for computation of model based CFP monitoring indicators for the Mediterranean and Black Seas.



Source: own elaborations based on STECF and GFCM data.

Table 19. Stocks used in the 2024 CFP monitoring analysis.

EcoRegion	Final Data Year	Stock	Updated	Source	New Stock
Black Sea	2021	ANE_29	2023	GFCM	No
Black Sea	2023	DGS_29	2024	GFCM	No
Black Sea	2023	MUT_29	2023	GFCM	No
Black Sea	2023	RPW_29	2024	GFCM	No
Black Sea	2023	SPR_29	2024	GFCM	No
Black Sea	2023	TUR_29	2024	GFCM	No
Black Sea	2023	WHG_29	2024	GFCM	No
Central Med.	2021	ANE_16	2022	GFCM	No
Central Med.	2023	ANE_17_18	2024	GFCM	No
Central Med.	2022	ARA_18_19_20	2023	GFCM	No
Central Med.	2022	ARS_12_13_14_15_16	2023	GFCM	No
Central Med.	2022	ARS_18_19_20	2023	GFCM	No
Central Med.	2022	CTC_17	2023	GFCM	No
Central Med.	2022	DPS_12_13_14_15_16	2023	GFCM	No
Central Med.	2022	DPS_17_18_19_20	2023	GFCM	No
Central Med.	2021	EOI_18	2022	GFCM	No
Central Med.	2022	HKE_12_13_14_15_16	2023	GFCM	No
Central Med.	2022	HKE_17_18	2024	GFCM	No
Central Med.	2022	HKE_19	2023	GFCM	No
Central Med.	2022	HKE_20	2023	STECF	No
Central Med.	2022	MTS_17	2023	GFCM	No
Central Med.	2021	MUR_15_16	2023	STECF	No
Central Med.	2021	MUT_15	2022	GFCM	No
Central Med.	2022	MUT_16	2024	GFCM	No
Central Med.	2022	MUT_17_18	2024	GFCM	No
Central Med.	2022	MUT_19	2023	GFCM	No
Central Med.	2021	MUT_20	2022	GFCM	No
Central Med.	2022	NEP_15_16	2023	STECF	No
Central Med.	2022	NEP_17_18	2023	STECF	No
Central Med.	2021	PIL_16	2022	GFCM	No
Central Med.	2023	PIL_17_18	2024	GFCM	No
Central Med.	2022	SOL_17	2023	GFCM	No
Eastern Med.	2022	ANE_22	2023	GFCM	Yes
Eastern Med.	2022	HKE_22	2023	STECF	No
Eastern Med.	2022	MUT_22	2023	GFCM	Yes
Eastern Med.	2022	MUT_25	2022	GFCM	No
Eastern Med.	2022	PIL_22	2023	GFCM	Yes
Western Med.	2022	ANE_5	2023	GFCM	No
Western Med.	2022	ANE_6	2023	GFCM	No
Western Med.	2022	ANE_7	2023	GFCM	No
Western Med.	2022	ANE_9	2023	GFCM	No
Western Med.	2023	ARA_1_2	2024	STECF	No
Western Med.	2023	ARA_5	2024	STECF	No
Western Med.	2023	ARA_6_7	2024	STECF	No

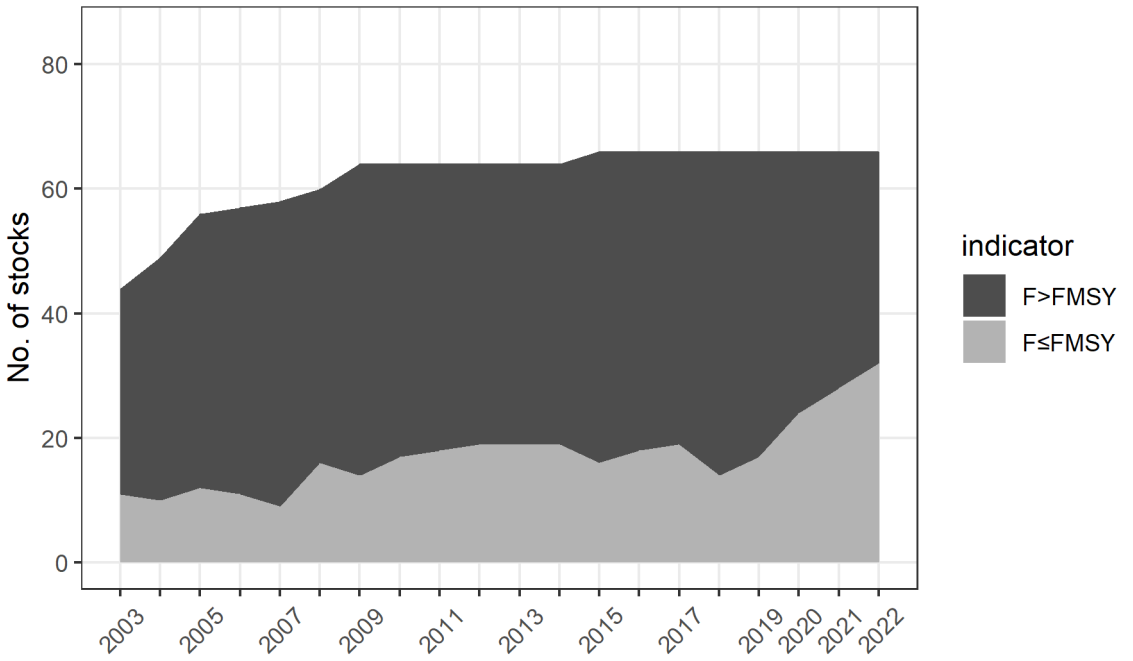
Western Med.	2023	ARS_8_9_10_11	2024	STECF	No
Western Med.	2023	DPS_1	2024	STECF	No
Western Med.	2023	DPS_5_6_7	2024	STECF	No
Western Med.	2023	DPS_8_9_10_11	2024	STECF	No
Western Med.	2023	HKE_1_5_6_7	2024	STECF	No
Western Med.	2023	HKE_8_9_10_11	2024	STECF	No
Western Med.	2023	MUR_5	2024	STECF	Yes
Western Med.	2023	MUT_1	2024	STECF	No
Western Med.	2022	MUT_10	2023	GFCM	No
Western Med.	2021	MUT_11	2022	GFCM	No
Western Med.	2023	MUT_6	2024	STECF	No
Western Med.	2023	MUT_7	2024	STECF	No
Western Med.	2023	MUT_9	2024	STECF	No
Western Med.	2023	NEP_11	2024	STECF	Yes
Western Med.	2022	NEP_5	2022	GFCM	No
Western Med.	2023	NEP_6	2024	STECF	No
Western Med.	2022	NEP_9	2023	GFCM	No
Western Med.	2022	PIL_6	2023	GFCM	No
Western Med.	2022	PIL_7	2023	GFCM	No
Western Med.	2022	PIL_9	2023	GFCM	No
Western Med.	2023	SBR_1_3	2024	GFCM	No
Western Med.	2022	WHB_6	2023	GFCM	Yes

Source: STECF and GFCM data.

4.2 Indicators of management performance

4.2.1 Number of stocks by year where fishing mortality is above/below F_{MSY}

Figure 20. Number of stocks by year for which fishing mortality (F) was above/below F_{MSY} (MEDI1-2).



Source: own elaborations based on GFCM and STECF data.

Table 20. Number of stocks for which fishing mortality exceeded and did not exceed F_{MSY}.

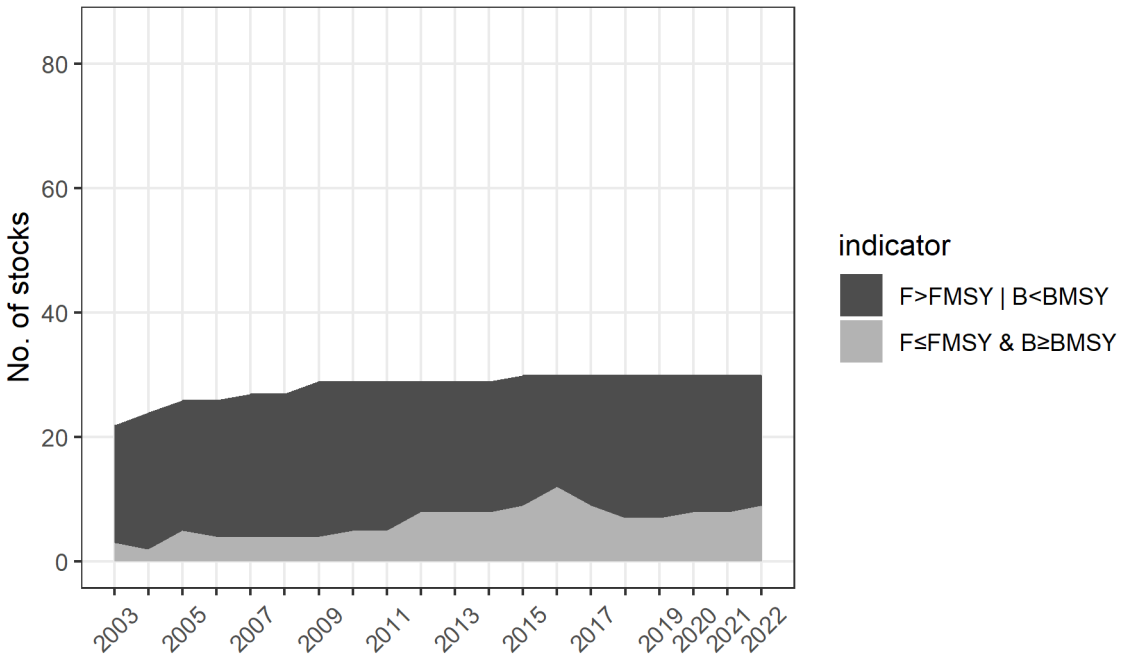
Status	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
$F > F_{MSY}$	33	39	44	46	49	44	50	47	46	45	45
$F \leq F_{MSY}$	11	10	12	11	9	16	14	17	18	19	19

Percentiles	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
$F > F_{MSY}$	45	50	48	47	52	49	42	38	34	-
$F \leq F_{MSY}$	19	16	18	19	14	17	24	28	32	-

Source: own elaborations based on GFCM and STECF data.

4.2.2 *Number of stocks with F>F_{MSY} or B<B_{MSY} and number of stocks with F≤F_{MSY} and B≥B_{MSY}*

Figure 21. Number of stocks with F>F_{MSY} or B<B_{MSY} and number of stocks with F≤F_{MSY} and B≥B_{MSY} in the Mediterranean and Black Seas (MEDI5-6).



Source: own elaborations based on GFCM and STECF data.

Table 21. Number of stocks with F>F_{MSY} or B<B_{MSY} and number of stocks with F≤F_{MSY} and B≥B_{MSY}.

Status	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
F>F_{MSY} or B<B_{MSY}	19	22	21	22	23	23	25	24	24	21	21
F ≤ F_{MSY} and B≥B_{MSY}	3	2	5	4	4	4	4	5	5	8	8

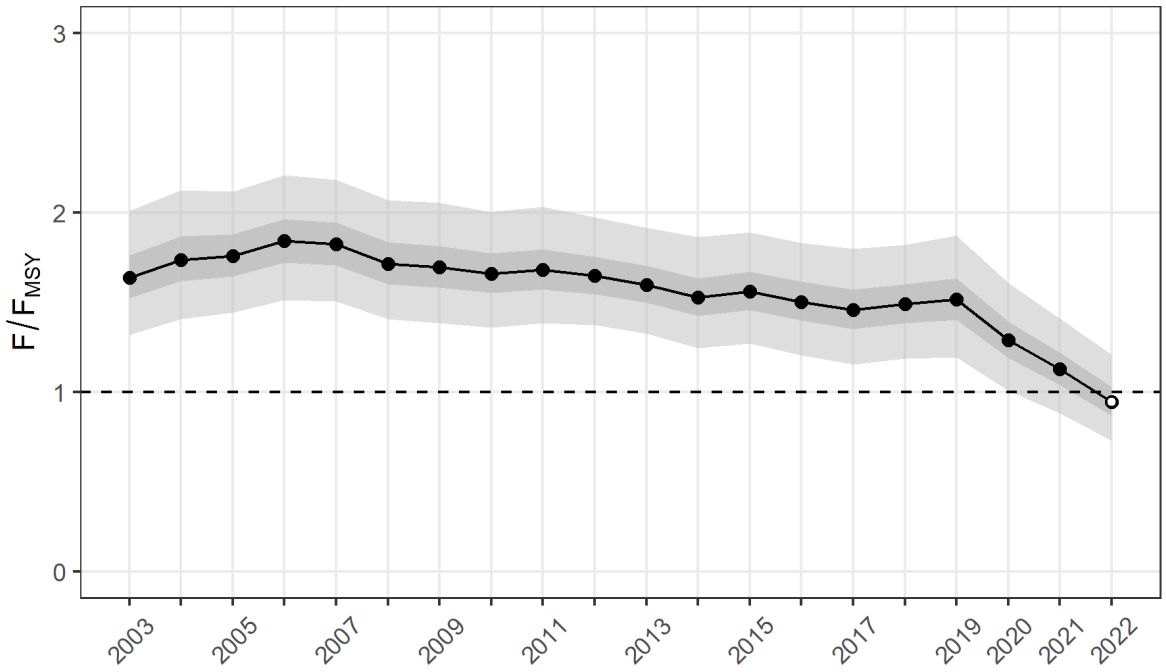
Percentiles	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
F>F_{MSY} or B<B_{MSY}	21	21	18	21	23	23	22	22	21	-
F ≤ F_{MSY} and B≥B_{MSY}	8	9	12	9	7	7	8	8	9	-

Source: own elaborations based on GFCM and STECF data.

4.2.4 Trend in F/F_{MSY}

This indicator was computed using a state-space model as implemented in the R package JARA (Winker et al, 2019; and see Gras et al., 2023 for additional details on the settings). Model outputs for F/F_{MSY} are displayed in Figure 22 and Table 22. The middle point value increased from 1.64 to 1.84 over the years 2003-2006. From 2007 to the end of the time series, the F/F_{MSY} estimates have decreased to reach 0.94. It is to be noted that the middle point of this indicator reaches for the first time levels <1. However the upper level of the confidence interval remains >1. The declining trend has been steeper in the last three years (2019-2022), with F/F_{MSY} decreasing from 1.52 to 0.94. Regional indicators (Table 23) also show a reduction in exploitation rates from 2018 to 2022 across all ecoregions. The trend observed this year in the Black Sea is more erratic than in last year's indicator. This is likely due to two of the seven assessed stocks relying on shorter time series, with data from 2003 to 2015 not used for assessments this year (see Figure 23 for details).

Figure 22. Trend in F/F_{MSY} (based on 65 stocks). Dark grey zone shows the 50% confidence interval; the light grey zone shows the 95% confidence interval. The white dot indicates that a one year forecast was used for at least one stock.



Source: own elaborations based on GFCM and STECF data.

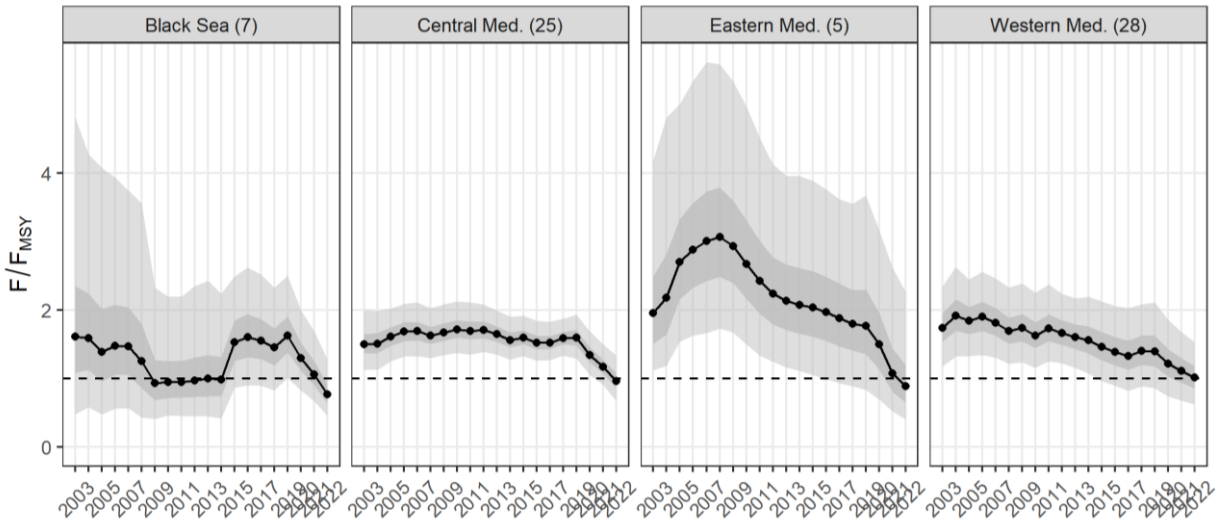
Table 22. Percentiles for F/F_{MSY}.

Percentiles	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
2.5%	1.32	1.41	1.44	1.51	1.51	1.41	1.38	1.36	1.38	1.37	1.33
25%	1.52	1.62	1.65	1.72	1.71	1.60	1.58	1.55	1.57	1.55	1.50
50%	1.64	1.74	1.76	1.84	1.82	1.71	1.70	1.66	1.68	1.65	1.60
75%	1.76	1.87	1.88	1.96	1.95	1.83	1.81	1.77	1.80	1.76	1.70
97.5%	2.01	2.13	2.12	2.21	2.18	2.07	2.06	2.00	2.03	1.97	1.92

Percentiles	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
2.5%	1.25	1.27	1.20	1.15	1.19	1.19	1.01	0.88	0.73	-
25%	1.42	1.46	1.40	1.35	1.38	1.40	1.19	1.04	0.87	-
50%	1.53	1.56	1.50	1.46	1.49	1.52	1.29	1.13	0.94	-
75%	1.64	1.67	1.61	1.57	1.60	1.63	1.39	1.22	1.03	-
97.5%	1.86	1.89	1.83	1.80	1.82	1.87	1.61	1.41	1.21	-

Source: own elaborations based on GFCM and STECF data.

Figure 23. Trend in F/F_{MSY} by ecoregion. The number of stocks in each ecoregion are shown between parentheses.



Source: own elaborations based on GFCM and STECF data.

Table 23. F/F_{MSY} by ecoregion.

EcoRegion	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Black Sea	1.61	1.59	1.42	1.48	1.46	1.26	0.95	0.95	0.95	0.98	1.00
Central Med.	1.50	1.51	1.61	1.68	1.69	1.63	1.67	1.72	1.69	1.71	1.65
Eastern Med.	1.96	2.17	2.70	2.88	2.99	3.07	2.93	2.67	2.43	2.24	2.13
Western Med.	1.74	1.92	1.84	1.90	1.83	1.70	1.73	1.63	1.74	1.67	1.60

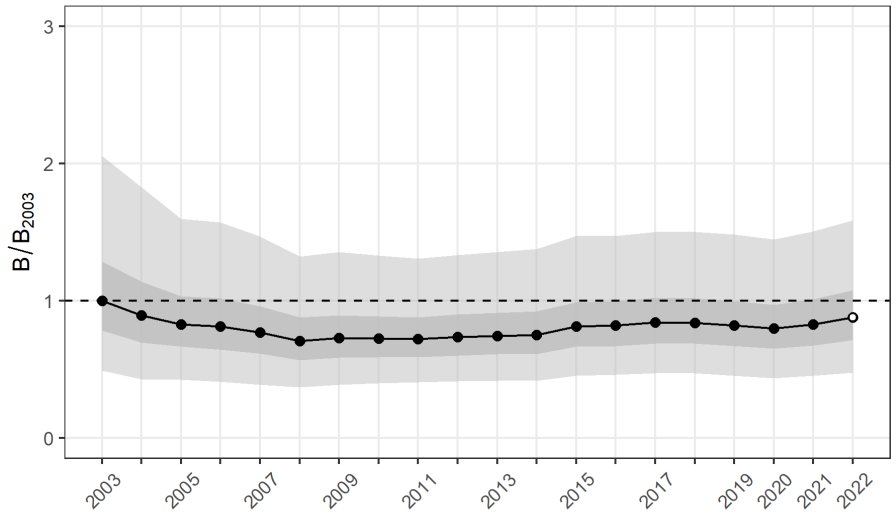
EcoRegion	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Black Sea	1.00	1.52	1.60	1.56	1.47	1.61	1.30	1.05	0.77	-
Central Med.	1.56	1.60	1.52	1.52	1.59	1.59	1.34	1.17	0.96	-
Eastern Med.	2.08	2.04	1.97	1.88	1.80	1.78	1.50	1.08	0.88	-
Western Med.	1.56	1.47	1.39	1.33	1.41	1.40	1.22	1.12	1.01	-

Source: own elaborations based on GFCM and STECF data.

4.2.5 Trend in SSB (relative to SSB in 2003)

This indicator was also computed using a state-space model as implemented in JARA (Winker et al., 2019; see also Gras et al., 2023 for additional details on the settings used). The biomass estimate exhibits a declining trend from 2003 to 2008. This decreasing trend is likely due to the inclusion of stocks having both small SSB estimates and time series starting in 2009 (see Figure 19 for details). From 2008 to 2022, the modelled ratio B/B_{2003} shows an increasing trend from 0.70 to 0.87 (Figure 24 and Table 24). The trends estimated by ecoregion (Figure 25 and Table 25) vary across regions. In the Black Sea, an initial sharp peak with a large percentile range is observed. The confidence intervals exceed the scale, as shown in Figure 25, and this is followed by a substantial decline to levels consistently below the baseline. A dedicated Black Sea plot, which displays the full range of data, is presented in Figure 26. The Central and Eastern Mediterranean exhibit a constant trend with low biomass levels. Meanwhile, the Western Mediterranean stands out with a slight but consistent increase in biomass since 2007.

Figure 24. Trend in SSB relative to 2003 (based on 66 stocks). Dark grey zone shows the 50% confidence interval; the light grey zone shows the 95% confidence interval. The white dot indicates that a one year forecast was used for at least one stock.



Source: own elaborations based on GFCM and STECF data.

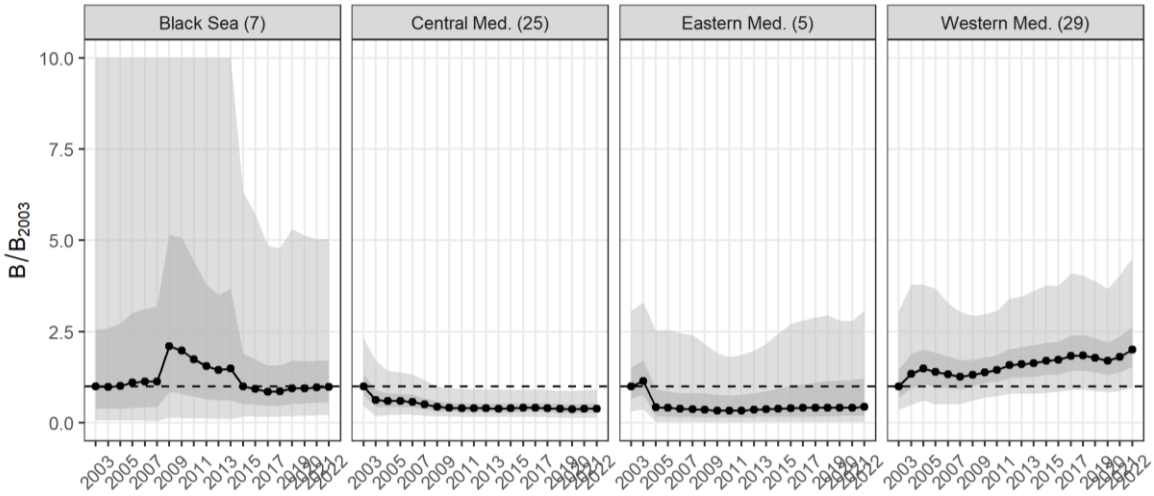
Table 24. Percentiles for SSB relative to 2003.

Percentiles	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
2.5%	0.48	0.42	0.43	0.41	0.39	0.36	0.39	0.40	0.40	0.40	0.41
25%	0.78	0.69	0.66	0.64	0.61	0.56	0.58	0.58	0.58	0.60	0.60
50%	1.00	0.89	0.82	0.81	0.76	0.70	0.72	0.72	0.71	0.73	0.74
75%	1.29	1.14	1.04	1.02	0.96	0.87	0.89	0.89	0.88	0.89	0.91
97.5%	2.07	1.86	1.61	1.58	1.48	1.33	1.37	1.35	1.32	1.35	1.37

Percentiles	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
2.5%	0.41	0.45	0.45	0.46	0.46	0.45	0.43	0.45	0.47	-
25%	0.61	0.66	0.67	0.68	0.68	0.66	0.64	0.67	0.71	-
50%	0.74	0.81	0.81	0.83	0.83	0.81	0.79	0.82	0.87	-
75%	0.92	0.98	0.99	1.01	1.01	1.00	0.97	1.01	1.07	-
97.5%	1.38	1.48	1.47	1.51	1.51	1.50	1.45	1.52	1.61	-

Source: own elaborations based on GFCM and STECF data.

Figure 25. Trend in SSB relative to 2003 by ecoregion. The number of stocks in each ecoregion are shown in parentheses.



Source: own elaborations based on GFCM and STECF data.

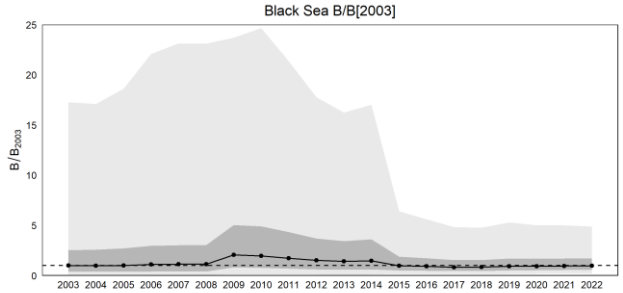
Table 25. SSB relative to 2003 by ecoregion.

EcoRegion	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Black Sea	1.00	0.98	1.01	1.10	1.13	1.13	2.10	1.98	1.73	1.55	1.44
Central Med.	1.00	0.63	0.60	0.59	0.58	0.50	0.43	0.41	0.40	0.39	0.40
Eastern Med.	1.00	1.14	0.43	0.40	0.38	0.37	0.36	0.34	0.33	0.33	0.35
Western Med.	1.00	1.34	1.48	1.39	1.33	1.27	1.32	1.38	1.44	1.57	1.60

EcoRegion	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Black Sea	1.48	0.99	0.93	0.85	0.86	0.93	0.94	0.97	0.99	-
Central Med.	0.39	0.40	0.40	0.41	0.40	0.38	0.37	0.38	0.39	-
Eastern Med.	0.36	0.39	0.40	0.40	0.41	0.41	0.41	0.42	0.44	-
Western Med.	1.63	1.70	1.72	1.84	1.84	1.77	1.70	1.80	2.00	-

Source: own elaborations based on GFCM and STECF data.

Figure 26. Trend in SSB relative to 2003 in Black Sea.

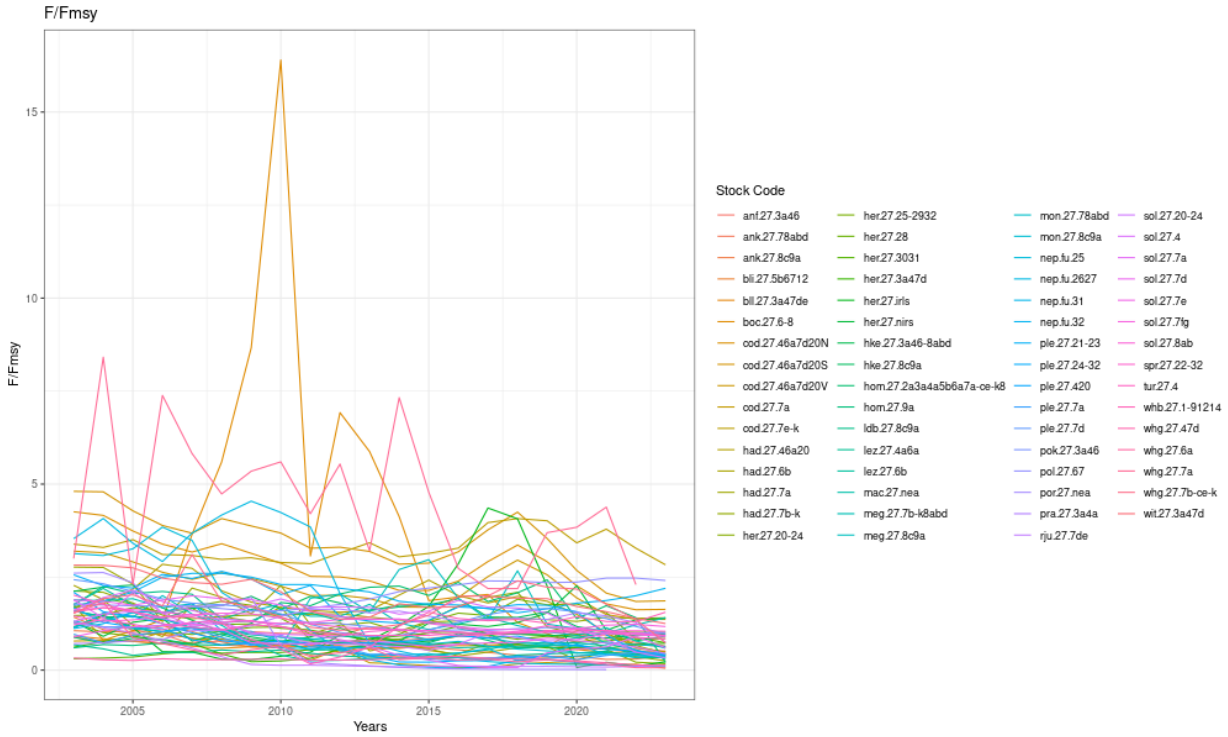


Source: own elaborations based on GFCM and STECF data.

5 European Union Waters

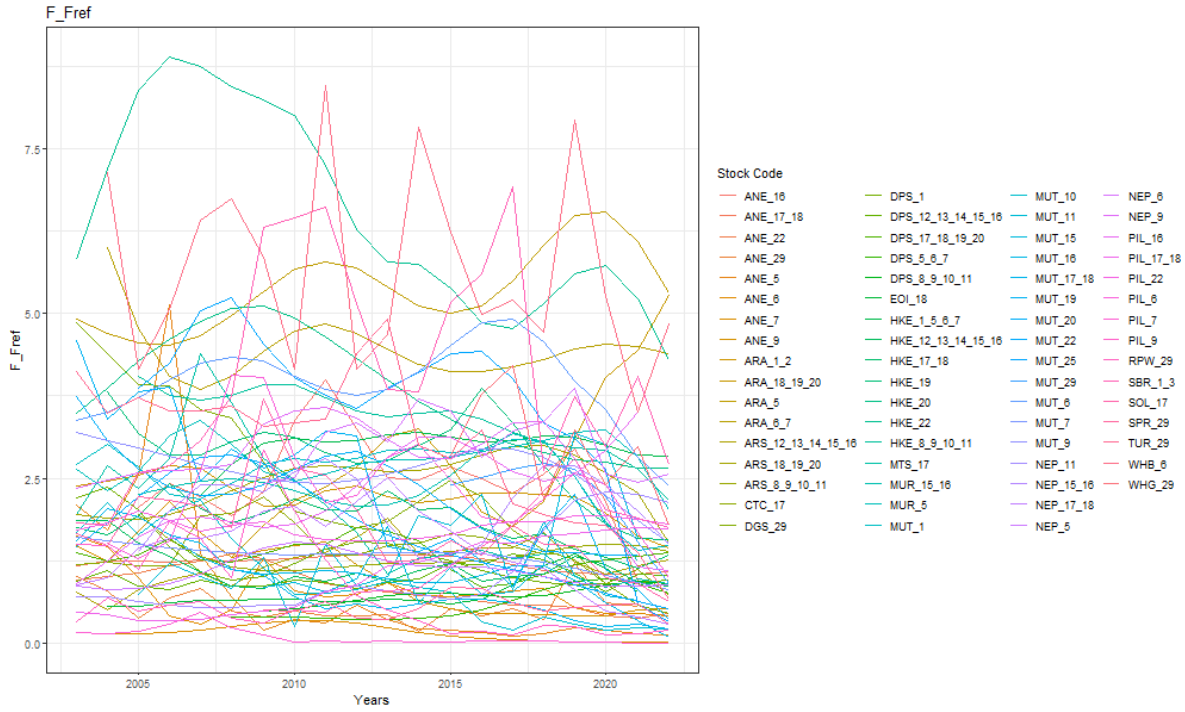
Since 2021, STECF has been requested to provide two indicators of performance for the CFP at European level (STECF, 2021a). The same model as in the individual areas was applied to the Northeast Atlantic and the Mediterranean and Black Seas combined to provide estimates of F/F_{MSY} and B/B_{2003} (indicators 7 and 8 of the protocol). For the purpose of deriving this index, the Northeast Atlantic and the Mediterranean and Black Seas datasets were pooled together and used as input data (Figure 27, Figure 28, Figure 29 and Figure 30). The time window was reduced by one year (2003-2022) in comparison to the Northeast Atlantic analysis as the Mediterranean and Black Seas dataset stops in 2022.

Figure 27. Individual trajectories of all stocks used to estimate the F/F_{MSY} indicator for the Northeast Atlantic.



Source: own elaborations based on ICES data.

Figure 28. Individual trajectories of all stocks used to estimate the F/F_{MSY} indicator for the Mediterranean and Black Seas.



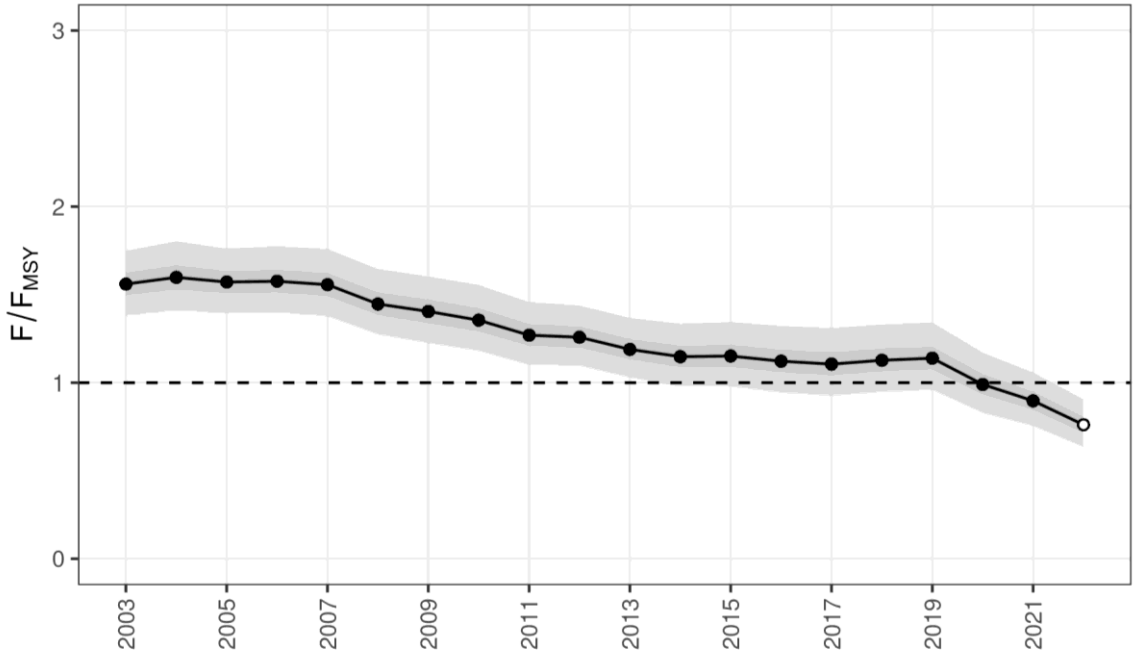
Source: own elaborations based on GFCM and STECF data.

5.1 Indicators of management performance

5.1.1 Trend in F/F_{MSY}

Trends in F/F_{MSY} in EU Waters (FAO 27 and 37) exhibited a decreasing trend from 2003 to 2022 (Figure 29) from 1.56 to 0.76 (Table 26). The ratio decreased from 2003 to 2017 when it reached 1.11. A slight increase is then observed to reach 1.14 in 2019. At the end of the time series a linear decrease is observed and the ratio reached the final value of 0.76 in 2022. It is to be noted that in 2022 the upper bound of the ratio's confidence interval is <1.

Figure 29. Trends in F/F_{MSY} (based on 128 stocks, 63 from the Northeast Atlantic and 65 from the Mediterranean and Black Seas). The dark grey zone shows the 50% confidence interval; the light grey zone shows the 95% confidence interval. The white dot indicates that a one year forecast was used for at least one stock.



Source: own elaborations based on ICES, GFCM and STECF data.

Table 26. Percentiles of F/F_{MSY} by year.

Percentiles	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
2.5%	1.38	1.41	1.39	1.40	1.38	1.27	1.22	1.18	1.10	1.10	1.03
25%	1.50	1.53	1.51	1.51	1.49	1.38	1.34	1.29	1.21	1.20	1.13
50%	1.56	1.60	1.57	1.58	1.56	1.45	1.40	1.35	1.27	1.26	1.19
75%	1.62	1.67	1.63	1.64	1.62	1.51	1.47	1.42	1.33	1.32	1.25
97.5%	1.75	1.80	1.76	1.78	1.76	1.65	1.61	1.56	1.46	1.44	1.37

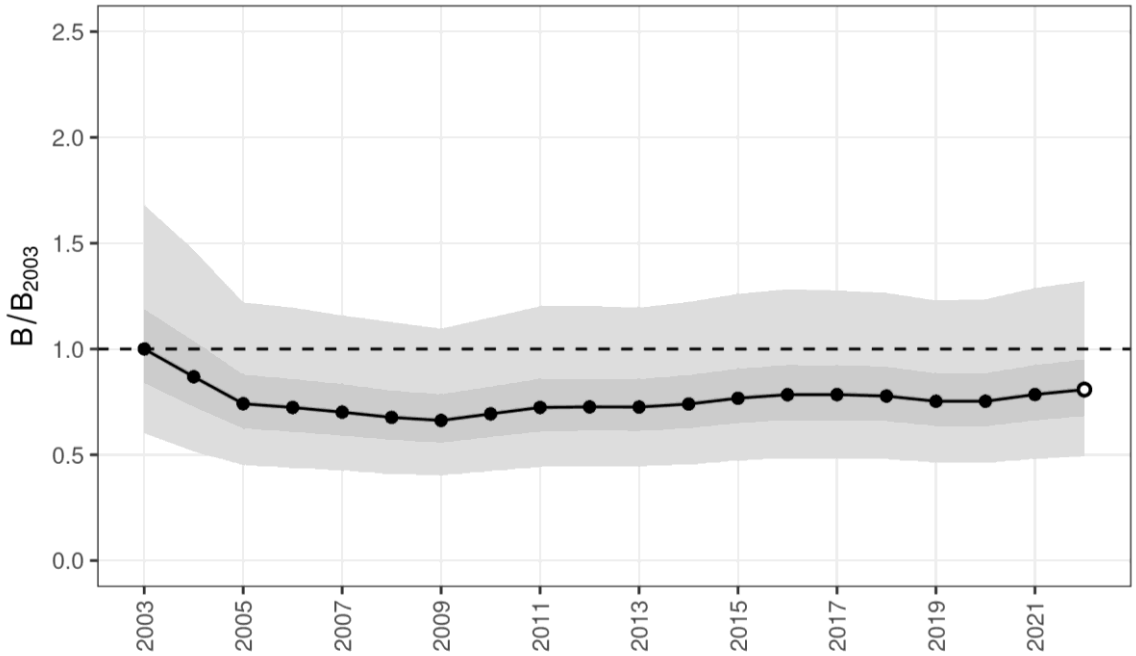
Percentiles	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
2.5%	0.98	0.98	0.94	0.93	0.95	0.96	0.83	0.75	0.63	-
25%	1.09	1.09	1.06	1.04	1.06	1.08	0.93	0.85	0.72	-
50%	1.15	1.15	1.12	1.11	1.13	1.14	0.99	0.90	0.76	-
75%	1.21	1.22	1.19	1.17	1.19	1.20	1.05	0.95	0.81	-
97.5%	1.34	1.35	1.32	1.31	1.33	1.34	1.17	1.06	0.91	-

Source: own elaborations based on ICES, GFCM and STECF data.

5.1.2 Trend in biomass

The trend in B/B2003 was modelled using as input data the category 1 and 2 stock assessment of the NEA as well as the Mediterranean and Black Sea assessments for which an absolute estimation of the biomass was available. Both datasets were pooled together before running the model. Trend in B/B_{2003} decreased over the years 2003-2009 to reach 0.66 (Figure 30 and Table 27). It then followed a slight increasing trend until 2022 when it reached 0.81. It should be noted that the confidence interval of the ratio's estimated overlaps with 1 throughout the time series.

Figure 30. Trends in B/B_{2003} (based on 123 stocks, 57 from the Northeast Atlantic and 66 from the Mediterranean and Black Seas). The dark grey zone shows the 50% confidence interval; the light grey zone shows the 95% confidence interval. The white dot indicate that a one year forecast was used for at least one stock.



Source: own elaborations based on ICES, GFCM and STECF data.

Table 27. Percentiles of SSB relative to 2003.

Percentiles	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
2.5%	0.60	0.52	0.45	0.44	0.43	0.41	0.40	0.42	0.44	0.44	0.45
25%	0.84	0.73	0.63	0.61	0.59	0.57	0.56	0.59	0.61	0.61	0.61
50%	1.00	0.87	0.74	0.72	0.70	0.68	0.66	0.69	0.72	0.73	0.73
75%	1.19	1.04	0.88	0.86	0.83	0.80	0.78	0.82	0.86	0.86	0.86
97.5%	1.68	1.47	1.22	1.20	1.16	1.13	1.10	1.15	1.20	1.20	1.20

Percentiles	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
2.5%	0.45	0.47	0.48	0.48	0.48	0.46	0.46	0.48	0.49	-
25%	0.63	0.65	0.67	0.67	0.66	0.64	0.64	0.66	0.68	-
50%	0.74	0.77	0.78	0.78	0.78	0.75	0.75	0.78	0.81	-
75%	0.88	0.91	0.92	0.92	0.92	0.88	0.88	0.92	0.95	-
97.5%	1.22	1.26	1.28	1.28	1.27	1.23	1.24	1.29	1.32	-

Source: own elaborations based on ICES, GFCM and STECF data.

6 Status across all stocks

Table 28. Stock status for all stocks in the analysis. Columns refer to ecoregion, last year for which the estimate was obtained, stock code description, value for F/F_{MSY} ratio (F ind), if F is lower than F_{MSY} (F Status), if the stock is inside safe biological limits (SBL) (for both indicators F_{PA} and B_{PA}), and if the stock has F below F_{MSY} and SSB above B_{MSY} ($F \leq F_{MSY}$ and $B \geq B_{MSY}$). Stocks managed under escapement strategies do not have an estimate of F/F_{MSY}, their F status is calculated as $MSYB_{escapement}$ over the stock size. Symbol 'Y' stands for 'Yes', 'N' for No and '–' stands for unknown due to missing information.

Region	EcoRegion	Year	Stock	Description	F ind	F status	SBL	CFP
FAO27	Baltic Sea	2023	her.27.20-24	Herring (*Clupea harengus*) in subdivisions 20-24; spring spawners (Skagerrak. Kattegat. western Baltic)	0.17	Y	N	-
FAO27	Baltic Sea	2023	her.27.25-2932	Herring (*Clupea harengus*) in subdivisions 25-29 and 32. excluding the Gulf of Riga (central Baltic Sea)	0.85	Y	-	N
FAO27	Baltic Sea	2023	her.27.28	Herring (*Clupea harengus*) in Subdivision 28.1 (Gulf of Riga)	1.02	N	Y	-
FAO27	Baltic Sea	2023	her.27.3031	Herring (*Clupea harengus*) in subdivisions 30 and 31 (Gulf of Bothnia)	0.74	Y	Y	N
FAO27	Baltic Sea	2023	ple.27.21-23	Plaice (*Pleuronectes platessa*) in subdivisions 21-23 (Kattegat. Belt Seas. the Sound)	0.38	Y	Y	-
FAO27	Baltic Sea	2023	ple.27.24-32	Plaice (*Pleuronectes platessa*) in subdivisions 24-32 (Baltic Sea. excluding the Sound and Belt Seas)	0.11	Y	-	Y
FAO27	Baltic Sea	2023	sol.27.20-24	Sole (*Solea solea*) in subdivisions 20-24 (Skagerrak. Kattegat. western Baltic Sea)	0.45	Y	N	-
FAO27	Baltic Sea	2023	spr.27.22-32	Sprat (*Sprattus sprattus*) in subdivisions 22-32 (Baltic Sea)	1.05	N	N	-
FAO27	BoBiscay & Iberia	2023	ane.27.8	Anchovy (*Engraulis encrasicolus*) in Subarea 8 (Bay of Biscay)	-	Y	-	-
FAO27	BoBiscay & Iberia	2023	ank.27.78abd	Black-bellied anglerfish (*Lophius budegassa*) in Subarea 7 and in divisions 8.a. 8.b. and 8.d (Celtic Seas. Bay of Biscay)	0.51	Y	Y	-
FAO27	BoBiscay & Iberia	2023	ank.27.8c9a	Black-bellied anglerfish (*Lophius budegassa*) in divisions 8.c and 9.a (Cantabrian Sea. Atlantic Iberian waters)	0.39	Y	-	Y
FAO27	BoBiscay & Iberia	2023	hke.27.8c9a	Hake (*Merluccius merluccius*) in divisions 8.c and 9.a; Southern stock (Cantabrian Sea and Atlantic Iberian waters)	0.91	Y	Y	-

FAO27	BoBiscay & Iberia	2023	hom.27.9a	Horse mackerel (*Trachurus trachurus*) in Division 9.a (Atlantic Iberian waters)	0.43	Y	Y	-
FAO27	BoBiscay & Iberia	2023	ldb.27.8c9a	Four-spot megrim (*Lepidorhombus boscii*) in divisions 8.c and 9.a (southern Bay of Biscay and Atlantic Iberian waters East)	0.41	Y	Y	-
FAO27	BoBiscay & Iberia	2023	meg.27.7b-k8abd	Megrim (*Lepidorhombus whiffiagonis*) in divisions 7.bâ€“k. 8.a. 8.b. and 8.d (west and southwest of Ireland. Bay of Biscay)	0.59	Y	Y	-
FAO27	BoBiscay & Iberia	2023	meg.27.8c9a	Megrim (*Lepidorhombus whiffiagonis*) in divisions 8.c and 9.a (Cantabrian Sea and Atlantic Iberian waters)	0.30	Y	Y	-
FAO27	BoBiscay & Iberia	2023	mon.27.78abd	White anglerfish (*Lophius piscatorius*) in Subarea 7 and in divisions 8.a. 8.b. and 8.d (Celtic Seas. Bay of Biscay)	0.64	Y	Y	-
FAO27	BoBiscay & Iberia	2023	mon.27.8c9a	White anglerfish (*Lophius piscatorius*) in divisions 8.c and 9.a (Cantabrian Sea and Atlantic Iberian waters)	0.40	Y	Y	Y
FAO27	BoBiscay & Iberia	2023	nep.fu.2324	Norway lobster (*Nephrops norvegicus*) in divisions 8.a and 8.b. functional units 23 and 24 (northern and central Bay of Biscay)	0.57	Y	-	-
FAO27	BoBiscay & Iberia	2021	nep.fu.25	Norway lobster (*Nephrops norvegicus*) in Division 8.c, Functional Unit 25 (southern Bay of Biscay, northern Galicia)	0.15	Y	-	N
FAO27	BoBiscay & Iberia	2021	nep.fu.2627	Norway lobster (*Nephrops norvegicus*) in Division 9.a, functional units 26 and 27 (Atlantic Iberian waters East, western Galicia, northern Portugal)	0.41	Y	-	N
FAO27	BoBiscay & Iberia	2023	nep.fu.31	Norway lobster (*Nephrops norvegicus*) in Division 8.c. Functional Unit 31 (southern Bay of Biscay. Cantabrian Sea)	0.38	Y	-	N
FAO27	BoBiscay & Iberia	2023	sol.27.8ab	Sole (*Solea solea*) in divisions 8.a and 8.b (northern and central Bay of Biscay)	0.93	Y	N	-
FAO27	Celtic Seas	2023	anf.27.3a46	Anglerfish (*Lophius budegassa*, *Lophius piscatorius*) in subareas 4 and 6 and in Division 3.a (North Sea. Rockall and West of Scotland. Skagerrak. Kattegat)	0.65	Y	Y	Y
FAO27	Celtic Seas	2023	cod.27.7a	Cod (*Gadus morhua*) in Division 7.a (Irish Sea)	0.054	Y	N	-
FAO27	Celtic Seas	2023	cod.27.7e-k	Cod (*Gadus morhua*) in divisions 7.e-k (western English Channel and southern Celtic Seas)	2.83	N	N	-

FAO27	Celtic Seas	2023	had.27.6b	Haddock (*Melanogrammus aeglefinus*) in Division 6.b (Rockall)	0.44	Y	Y	Y
FAO27	Celtic Seas	2023	had.27.7a	Haddock (*Melanogrammus aeglefinus*) in Division 7.a (Irish Sea)	0.25	Y	Y	Y
FAO27	Celtic Seas	2023	had.27.7b-k	Haddock (*Melanogrammus aeglefinus*) in divisions 7.b-k (southern Celtic Seas and English Channel)	1.41	N	Y	-
FAO27	Celtic Seas	2023	her.27.irls	Herring (*Clupea harengus*) in divisions 7.a (south of 52°30'N). 7.g. 7.h. 7.j. and 7.k (Irish Sea. Celtic Sea. and southwest of Ireland)	0.22	Y	N	-
FAO27	Celtic Seas	2023	her.27.nirs	Herring (*Clupea harengus*) in Division 7.a North of 52°30'N (Irish Sea)	1.39	N	N	N
FAO27	Celtic Seas	2023	lez.27.4a6a	Megrim (*Lepidorhombus spp.*) in divisions 4.a and 6.a (northern North Sea. West of Scotland)	0.34	Y	-	Y
FAO27	Celtic Seas	2023	lez.27.6b	Megrim (*Lepidorhombus spp.*) in Division 6.b (Rockall)	0.34	Y	-	Y
FAO27	Celtic Seas	2023	nep.fu.11	Norway lobster (*Nephrops norvegicus*) in Division 6.a. Functional Unit 11 (West of Scotland. North Minch)	0.71	Y	-	Y
FAO27	Celtic Seas	2023	nep.fu.12	Norway lobster (*Nephrops norvegicus*) in Division 6.a. Functional Unit 12 (West of Scotland. South Minch)	0.42	Y	-	Y
FAO27	Celtic Seas	2023	nep.fu.13	Norway lobster (*Nephrops norvegicus*) in Division 6.a. Functional Unit 13 (West of Scotland. Firth of Clyde. Sound of Jura)	0.94	Y	-	Y
FAO27	Celtic Seas	2023	nep.fu.14	Norway lobster (*Nephrops norvegicus*) in Division 7.a. Functional Unit 14 (Irish Sea. East)	0.78	Y	-	N
FAO27	Celtic Seas	2023	nep.fu.15	Norway lobster (*Nephrops norvegicus*) in Division 7.a. Functional Unit 15 (Irish Sea. West)	0.59	Y	-	Y
FAO27	Celtic Seas	2023	nep.fu.16	Norway lobster (*Nephrops norvegicus*) in divisions 7.b. 7.c. 7.j. and 7.k. Functional Unit 16 (west and southwest of Ireland. Porcupine Bank)	0.90	Y	-	-
FAO27	Celtic Seas	2023	nep.fu.17	Norway lobster (*Nephrops norvegicus*) in Division 7.b. Functional Unit 17 (west of Ireland. Aran grounds)	0.84	Y	-	N

FAO27	Celtic Seas	2023	nep.fu.19	Norway lobster (*Nephrops norvegicus*) in divisions 7.a. 7.g. and 7.j. Functional Unit 19 (Irish Sea. Celtic Sea. eastern part of southwest of Ireland)	0.88	Y	-	N
FAO27	Celtic Seas	2023	nep.fu.2021	Norway lobster (*Nephrops norvegicus*) in divisions 7.g and 7.h. Functional Units 20 and 21 (Celtic Sea)	0.84	Y	-	Y
FAO27	Celtic Seas	2023	nep.fu.22	Norway lobster (*Nephrops norvegicus*) in divisions 7.f and 7.g. Functional Unit 22 (Celtic Sea. Bristol Channel)	0.69	Y	-	N
FAO27	Celtic Seas	2023	ple.27.7a	Plaice (*Pleuronectes platessa*) in Division 7.a (Irish Sea)	0.44	Y	Y	N
FAO27	Celtic Seas	2023	pol.27.67	Pollack (*Pollachius pollachius*) in subareas 6 and 7 (Celtic Seas. English Channel)	2.41	N	-	N
FAO27	Celtic Seas	2023	rju.27.7de	Undulate ray (*Raja undulata*) in divisions 7.d and 7.e (English Channel)	0.13	Y	-	Y
FAO27	Celtic Seas	2023	sol.27.7a	Sole (*Solea solea*) in Division 7.a (Irish Sea)	0.60	Y	Y	-
FAO27	Celtic Seas	2023	sol.27.7e	Sole (*Solea solea*) in Division 7.e (western English Channel)	0.91	Y	Y	-
FAO27	Celtic Seas	2023	sol.27.7fg	Sole (*Solea solea*) in divisions 7.f and 7.g (Bristol Channel. Celtic Sea)	1.17	N	Y	-
FAO27	Celtic Seas	2023	whg.27.6a	Whiting (*Merlangius merlangus*) in Division 6.a (West of Scotland)	0.06	Y	N	-
FAO27	Celtic Seas	2022	whg.27.7a	Whiting (*Merlangius merlangus*) in Division 7.a (Irish Sea)	2.30	N	N	-
FAO27	Celtic Seas	2023	whg.27.7b-ce-k	Whiting (*Merlangius merlangus*) in divisions 7.b. 7.c. and 7.e-k (southern Celtic Seas. eastern English Channel)	0.74	Y	N	-
FAO27	Greater North Sea	2023	bll.27.3a47de	Brill (*Scophthalmus rhombus*) in Subarea 4 and in divisions 3.a. 7.d. and 7.e (North Sea. Skagerrak. Kattegat. English Channel)	0.37	Y	-	Y
FAO27	Greater North Sea	2023	cod.27.46a7d20N	Cod (*Gadus morhua*) in Subarea 4. in divisions 6.a and 7.d. and in Subdivision 20 (North Sea. West of Scotland. eastern English Channel. Skagerrak)	1.63	N	Y	-
FAO27	Greater North Sea	2023	cod.27.46a7d20S	Cod (*Gadus morhua*) in Subarea 4. in divisions 6.a and 7.d. and in Subdivision 20 (North Sea. West of Scotland. eastern English Channel. Skagerrak)	1.86	N	N	-

FAO27	Greater North Sea	2023	cod.27.46a7d20V	Cod (*Gadus morhua*) in Subarea 4. in divisions 6.a and 7.d. and in Subdivision 20 (North Sea. West of Scotland. eastern English Channel. Skagerrak)	1.36	N	N	-
FAO27	Greater North Sea	2023	had.27.46a20	Haddock (*Melanogrammus aeglefinus*) in Subarea 4. in Division 6.a. and in Subdivision 20 (North Sea. West of Scotland. Skagerrak)	0.48	Y	Y	-
FAO27	Greater North Sea	2023	her.27.3a47d	Herring (*Clupea harengus*) in Subarea 4 and in divisions 3.a and 7.d; autumn spawners (North Sea. Skagerrak. Kattegat. eastern English Channel)	0.72	Y	Y	Y
FAO27	Greater North Sea	2023	nep.fu.3-4	Norway lobster (*Nephrops norvegicus*) in Division 3.a. functional units 3 and 4 (Skagerrak. Kattegat)	0.56	Y	-	-
FAO27	Greater North Sea	2023	nep.fu.32	Norway lobster (*Nephrops norvegicus*) in Division 4.a. Functional Unit 32 (northern North Sea. Norway Deep)	2.2	N	-	N
FAO27	Greater North Sea	2023	nep.fu.6	Norway lobster (*Nephrops norvegicus*) in Division 4.b. Functional Unit 6 (central North Sea. Farn Deeps)	1.55	N	-	N
FAO27	Greater North Sea	2023	nep.fu.7	Norway lobster (*Nephrops norvegicus*) in Division 4.a. Functional Unit 7 (northern North Sea. Fladen Ground)	0.54	Y	-	Y
FAO27	Greater North Sea	2023	nep.fu.8	Norway lobster (*Nephrops norvegicus*) in Division 4.b. Functional Unit 8 (central North Sea. Firth of Forth)	0.90	Y	-	Y
FAO27	Greater North Sea	2023	nep.fu.9	Norway lobster (*Nephrops norvegicus*) in Division 4.a. Functional Unit 9 (central North Sea. Moray Firth)	0.64	Y	-	Y
FAO27	Greater North Sea	2023	nop.27.3a4	Norway pout (*Trisopterus esmarkii*) in Subarea 4 and in Division 3.a (North Sea. Skagerrak. Kattegat)	-	Y	-	-
FAO27	Greater North Sea	2023	ple.27.420	Plaice (*Pleuronectes platessa*) in Subarea 4 (North Sea) and in Subdivision 20 (Skagerrak)	0.43	Y	Y	-
FAO27	Greater North Sea	2023	ple.27.7d	Plaice (*Pleuronectes platessa*) in Division 7.d (eastern English Channel)	0.97	Y	N	-
FAO27	Greater North Sea	2023	pok.27.3a46	Saithe (*Pollachius virens*) in subareas 4 and 6 and in Division 3.a (North Sea. Rockall and West of Scotland. Skagerrak. Kattegat)	1.01	N	N	-

FAO27	Greater North Sea	2023	pra.27.3a4a	Northern shrimp (*Pandalus borealis*) in divisions 3.a and 4.a East (Skagerrak. Kattegat. northern North Sea in the Norwegian Deep)	0.75	Y	-	N
FAO27	Greater North Sea	2023	san.sa.1r	Sandeel (*Ammodytes spp.*) in divisions 4.b and 4.c. Sandeel Area 1r (central and southern North Sea. Dogger Bank)	-	Y	-	-
FAO27	Greater North Sea	2023	san.sa.2r	Sandeel (*Ammodytes spp.*) in divisions 4.b and 4.c and in Subdivision 20. Sandeel Area 2r (Skagerrak. central and southern North Sea)	-	Y	-	-
FAO27	Greater North Sea	2023	san.sa.3r	Sandeel (*Ammodytes spp.*) in divisions 4.a and 4.b and in Subdivision 20. Sandeel Area 3r (Skagerrak. northern and central North Sea)	-	Y	-	-
FAO27	Greater North Sea	2023	san.sa.4	Sandeel (*Ammodytes spp.*) in divisions 4.a and 4.b. Sandeel Area 4 (northern and central North Sea)	-	N	-	-
FAO27	Greater North Sea	2023	sol.27.4	Sole (*Solea solea*) in Subarea 4 (North Sea)	0.33	Y	Y	-
FAO27	Greater North Sea	2023	sol.27.7d	Sole (*Solea solea*) in Division 7.d (eastern English Channel)	0.94	Y	N	-
FAO27	Greater North Sea	2023	spr.27.3a4	Sprat (*Sprattus sprattus*) in Division 3.a and Subarea 4 (Skagerrak. Kattegat. North Sea)	-	Y	-	-
FAO27	Greater North Sea	2023	tur.27.4	Turbot (*Scophthalmus maximus*) in Subarea 4 (North Sea)	0.84	Y	Y	Y
FAO27	Greater North Sea	2023	whg.27.47d	Whiting (*Merlangius merlangus*) in Subarea 4 and in Division 7.d (North Sea. eastern English Channel)	0.12	Y	Y	-
FAO27	Greater North Sea	2023	wit.27.3a47d	Witch (*Glyptocephalus cynoglossus*) in Subarea 4 and in divisions 3.a and 7.d (North Sea. Skagerrak. Kattegat. eastern English Channel)	1.25	N	N	-
FAO27	Widely	2023	bli.27.5b6712	Blue ling (*Molva dypterygia*) in subareas 6, 7, and 12 and in Division 5.b (Celtic Seas, western Hatton Bank, and Faroes grounds)	0.51	Y	Y	-
FAO27	Widely	2023	boc.27.6-8	Boarfish (*Capros aper*) in subareas 6-8 (Celtic Seas. English Channel. Bay of Biscay)	0.63	Y	Y	-

FAO27	Widely	2023	dgs.27.nea	Spurdog (*Squalus acanthias*) in subareas 1â€“10. 12. and 14 (Northeast Atlantic and adjacent waters)	0.21	Y	Y	Y
FAO27	Widely	2023	hke.27.3a46-8abd	Hake (*Merluccius merluccius*) in subareas 4. 6. and 7 and in divisions 3.a. 8.a. 8.b. and 8.d; Northern stock (Greater North Sea. Celtic Seas. northern Bay of Biscay)	0.97	Y	Y	-
FAO27	Widely	2023	hom.27.2a3a4a5b6a7a-ce-k8	Horse mackerel (*Trachurus trachurus*) in Subarea 8 and divisions 2.a. 3.a. 4.a. 5.b. 6.a. 7.a-c. and 7.eâ€“k (Northeast Atlantic and adjacent waters)	0.21	Y	N	-
FAO27	Widely	2023	mac.27.nea	Mackerel (*Scomber scombrus*) in subareas 1-8 and 14 and in Division 9.a (Northeast Atlantic and adjacent waters)	1.41	N	N	-
FAO27	Widely	2021	por.27.nea	Porbeagle (*Lamna nasus*) in subareas 1-10, 12, and 14 (Northeast Atlantic and adjacent waters)	0.014	Y	-	N
FAO27	Widely	2023	whb.27.1-91214	Blue whiting (*Micromesistius poutassou*) in subareas 1-9, 12, and 14 (Northeast Atlantic and adjacent waters)	1.56	N	N	-
FAO37	Black Sea	2021	ANE_29	European anchovy in GSA(s) 29	0.57	Y	-	-
FAO37	Black Sea	2023	DGS_29	Piked dogfish in GSA(s) 29	0.39	Y	-	-
FAO37	Black Sea	2023	MUT_29	Red mullet in GSA(s) 29	0.48	Y	-	-
FAO37	Black Sea	2023	RPW_29	Papa whelk in GSA(s) 29	2.30	N	-	-
FAO37	Black Sea	2023	SPR_29	European sprat in GSA(s) 29	0.50	Y	-	-
FAO37	Black Sea	2023	TUR_29	Turbot in GSA(s) 29	0.67	Y	-	-
FAO37	Black Sea	2023	WHG_29	Whiting in GSA(s) 29	3.39	N	-	-
FAO37	Central Med.	2021	ANE_16	European anchovy in GSA(s) 16	0.94	Y	-	-
FAO37	Central Med.	2023	ANE_17_18	European anchovy in GSA(s) 17_18	1.03	N	-	-
FAO37	Central Med.	2022	ARA_18_19_20	Blue and red shrimp in GSA(s) 18_19_20	5.28	N	-	-
FAO37	Central Med.	2022	ARS_12_13_14_15_16	Giant Red Shrimp in GSA(s) 12_13_14_15_16	1.26	N	-	-
FAO37	Central Med.	2022	ARS_18_19_20	Giant Red Shrimp in GSA(s) 18_19_20	1.51	N	-	-

FAO37	Central Med.	2022	CTC_17	Common cuttlefish in GSA(s) 17	0.73	Y	-	-
FAO37	Central Med.	2022	DPS_12_13_14_15_16	Deep-water rose shrimp in GSA(s) 12_13_14_15_16	1.03	N	-	-
FAO37	Central Med.	2022	DPS_17_18_19_20	Deep-water rose shrimp in GSA(s) 17_18_19_20	1.38	N	-	-
FAO37	Central Med.	2021	EOI_18	Horned octopus in GSA(s) 18	0.79	Y	-	-
FAO37	Central Med.	2022	HKE_12_13_14_15_16	European hake in GSA(s) 12_13_14_15_16	0.87	Y	-	-
FAO37	Central Med.	2022	HKE_17_18	European hake in GSA(s) 17_18	1.35	N	-	-
FAO37	Central Med.	2022	HKE_19	European hake in GSA(s) 19	1.57	N	-	-
FAO37	Central Med.	2022	HKE_20	European hake in GSA(s) 20	2.65	N	-	-
FAO37	Central Med.	2022	MTS_17	Spottail mantis squillid in GSA(s) 17	0.91	Y	-	-
FAO37	Central Med.	2021	MUR_15_16	Surmullet in GSA(s) 15_16	1.25	N	-	-
FAO37	Central Med.	2021	MUT_15	Red mullet in GSA(s) 15	1.59	N	-	-
FAO37	Central Med.	2022	MUT_16	Red mullet in GSA(s) 16	0.09	Y	-	-
FAO37	Central Med.	2022	MUT_17_18	Red mullet in GSA(s) 17_18	0.22	Y	-	-
FAO37	Central Med.	2022	MUT_19	Red mullet in GSA(s) 19	0.37	Y	-	-
FAO37	Central Med.	2021	MUT_20	Red mullet in GSA(s) 20	1.33	N	-	-

FAO37	Central Med.	2022	NEP_15_16	Norway lobster in GSA(s) 15_16	1.5	N	-	-
FAO37	Central Med.	2022	NEP_17_18	Norway lobster in GSA(s) 17_18	0.30	Y	-	-
FAO37	Central Med.	2021	PIL_16	European pilchard (=Sardine) in GSA(s) 16	3.50	N	-	-
FAO37	Central Med.	2023	PIL_17_18	European pilchard (=Sardine) in GSA(s) 17_18	1.45	N	-	-
FAO37	Central Med.	2022	SOL_17	Common sole in GSA(s) 17	0.63	Y	-	-
FAO37	Eastern Med.	2022	ANE_22	European anchovy in GSA(s) 22	0.45	Y	-	-
FAO37	Eastern Med.	2022	HKE_22	European hake in GSA(s) 22	4.30	N	-	-
FAO37	Eastern Med.	2022	MUT_22	Red mullet in GSA(s) 22	0.53	Y	-	-
FAO37	Eastern Med.	2022	MUT_25	Red mullet in GSA(s) 25	0.34	Y	-	-
FAO37	Eastern Med.	2022	PIL_22	European pilchard (=Sardine) in GSA(s) 22	1.81	N	-	-
FAO37	Western Med.	2022	ANE_5	European anchovy in GSA(s) 5	0.14	Y	-	-
FAO37	Western Med.	2022	ANE_6	European anchovy in GSA(s) 6	0.42	Y	-	-
FAO37	Western Med.	2022	ANE_7	European anchovy in GSA(s) 7	0.014	Y	-	-
FAO37	Western Med.	2022	ANE_9	European anchovy in GSA(s) 9	0.52	Y	-	-
FAO37	Western Med.	2023	ARA_1_2	Blue and red shrimp in GSA(s) 1_2	1.46	N	-	-

FAO37	Western Med.	2023	ARA_5	Blue and red shrimp in GSA(s) 5	4.42	N	-	-
FAO37	Western Med.	2023	ARA_6_7	Blue and red shrimp in GSA(s) 6_7	4.15	N	-	-
FAO37	Western Med.	2023	ARS_8_9_10_11	Giant red shrimp in GSA(s) 8_9_10_11	1.29	N	-	-
FAO37	Western Med.	2023	DPS_1	Deep-water rose shrimp in GSA(s) 1	0.97	Y	-	-
FAO37	Western Med.	2023	DPS_5_6_7	Deep-water rose shrimp in GSA(s) 5_6_7	0.59	Y	-	-
FAO37	Western Med.	2023	DPS_8_9_10_11	Deep-water rose shrimp in GSA(s) 8_9_10_11	0.83	Y	-	-
FAO37	Western Med.	2023	HKE_1_5_6_7	European hake in GSA(s) 1_5_6_7	2.95	N	-	-
FAO37	Western Med.	2023	HKE_8_9_10_11	European hake in GSA(s) 8_9_10_11	1.6	N	-	-
FAO37	Western Med.	2023	MUR_5	Surmullet in GSA(s) 5	1.24	N	-	-
FAO37	Western Med.	2023	MUT_1	Red mullet in GSA(s) 1	1.97	N	-	-
FAO37	Western Med.	2022	MUT_10	Red mullet in GSA(s) 10	0.22	Y	-	-
FAO37	Western Med.	2021	MUT_11	Red mullet in GSA(s) 11	0.66	Y	-	-
FAO37	Western Med.	2023	MUT_6	Red mullet in GSA(s) 6	2.27	N	-	-
FAO37	Western Med.	2023	MUT_7	Red mullet in GSA(s) 7	0.71	Y	-	-
FAO37	Western Med.	2023	MUT_9	Red mullet in GSA(s) 9	1.20	N	-	-

FAO37	Western Med.	2023	NEP_11	Norway lobster in GSA(s) 11	1.92	N	-	-
FAO37	Western Med.	2022	NEP_5	Norway lobster in GSA(s) 5	0.88	Y	-	-
FAO37	Western Med.	2023	NEP_6	Norway lobster in GSA(s) 6	2.33	N	-	-
FAO37	Western Med.	2022	NEP_9	Norway lobster in GSA(s) 9	1.11	N	-	-
FAO37	Western Med.	2022	PIL_6	European pilchard (=Sardine) in GSA(s) 6	0.99	Y	-	-
FAO37	Western Med.	2022	PIL_7	European pilchard (=Sardine) in GSA(s) 7	0.003	Y	-	-
FAO37	Western Med.	2022	PIL_9	European pilchard (=Sardine) in GSA(s) 9	0.19	Y	-	-
FAO37	Western Med.	2023	SBR_1_3	Blackspot (=red) seabream in GSA(s) 1_3	2.04	N	-	-
FAO37	Western Med.	2022	WHB_6	Blue whiting in GSA(s) 6	4.85	N	-	-

Source: own elaborations based on ICES, GFCM and STECF data.

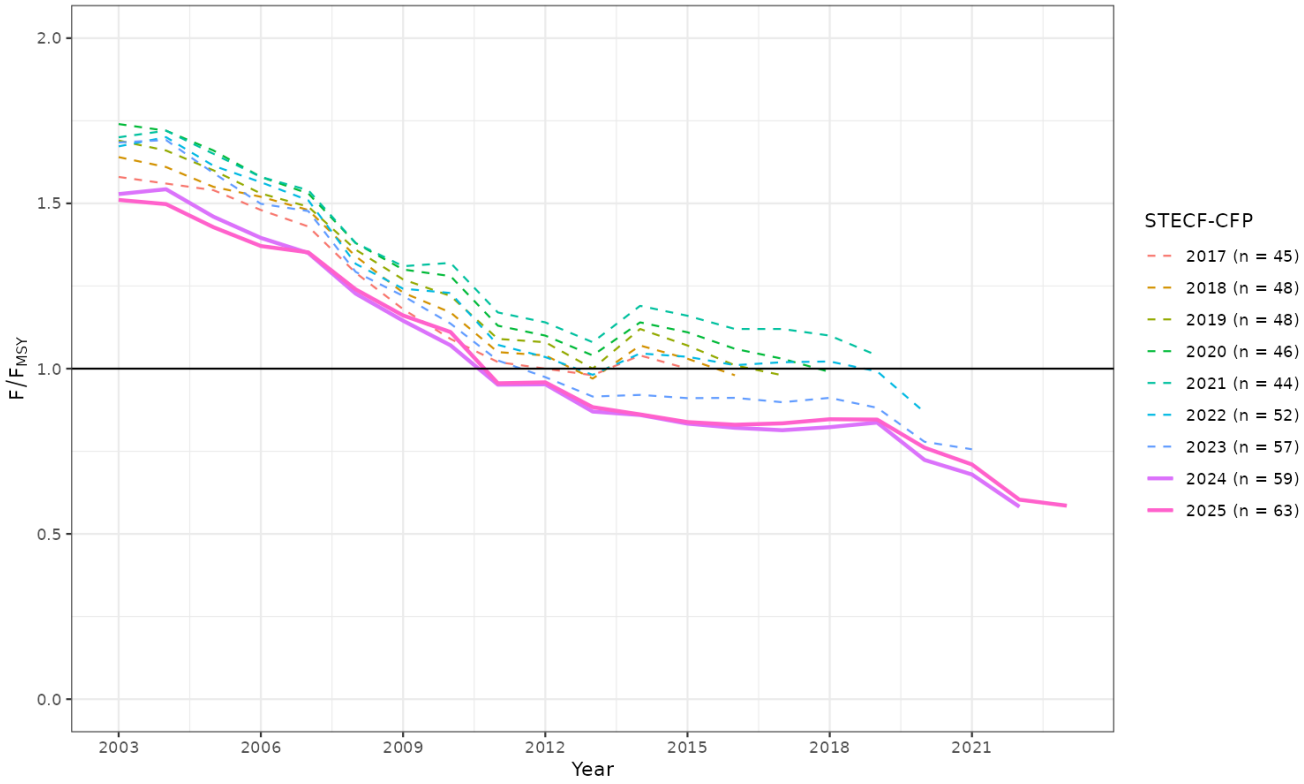
7 Historical Trends

As the number of stocks under consideration changes every year due to the availability of stock assessments, historical retrospectives of both modelled indicators (F/F_{MSY} and B/B_{2003}) for both sea basins were presented (Figure 31-Figure 34). The indicators were grouped by FAO region. The input data were the F and B modelled indicators computed each year for the purpose of monitoring the CFP performance since 2017. It is important to note that the figures present a historical performance analysis (as opposed to a numerical retrospective), i.e. the trend observed in every modelling exercise since 2017 and not running the same model by peeling off one year of data at the end of the time series. It should be noted that trajectories previous to 2024 were estimated using the GLMM approach as it was the standard up until 2023. From 2024 onwards the model-based indicators are computed using a state-space model as implemented in the JARA package (Winker et al., 2019)

In the Northeast Atlantic, the trajectories of both F/F_{MSY} and B/B_{2003} were generally consistent over the years they were computed.
The fishing pressure exhibited a decreasing trend over the period 2003-2023 (Figure 31). The results obtained by the CFP monitoring for the F/F_{MSY} indicators computed from 2017 to 2021 showed a regular upward revision of the time series. That pattern seems to have changed over the following three years (CFP monitoring 2022-2024) with a downward revision of the estimates. The trajectories of F/F_{MSY} in the last two years have been very close. Also, in the last two years' reports a sensitivity analysis highlighted that removing the stocks assessed with a Bayesian Biomass Dynamic Model (BDM) was bringing the estimate up (STECF, 2023b, Annex 5).
The biomass indicator B/B_{2003} exhibited an increasing trend over the period 2003-2021. A downward revision pattern of the indicator seems to be displayed in Figure 32. This downward revision of the trend does not seem to be present anymore but more years of analysis are required to confirm if this pattern has disappeared.

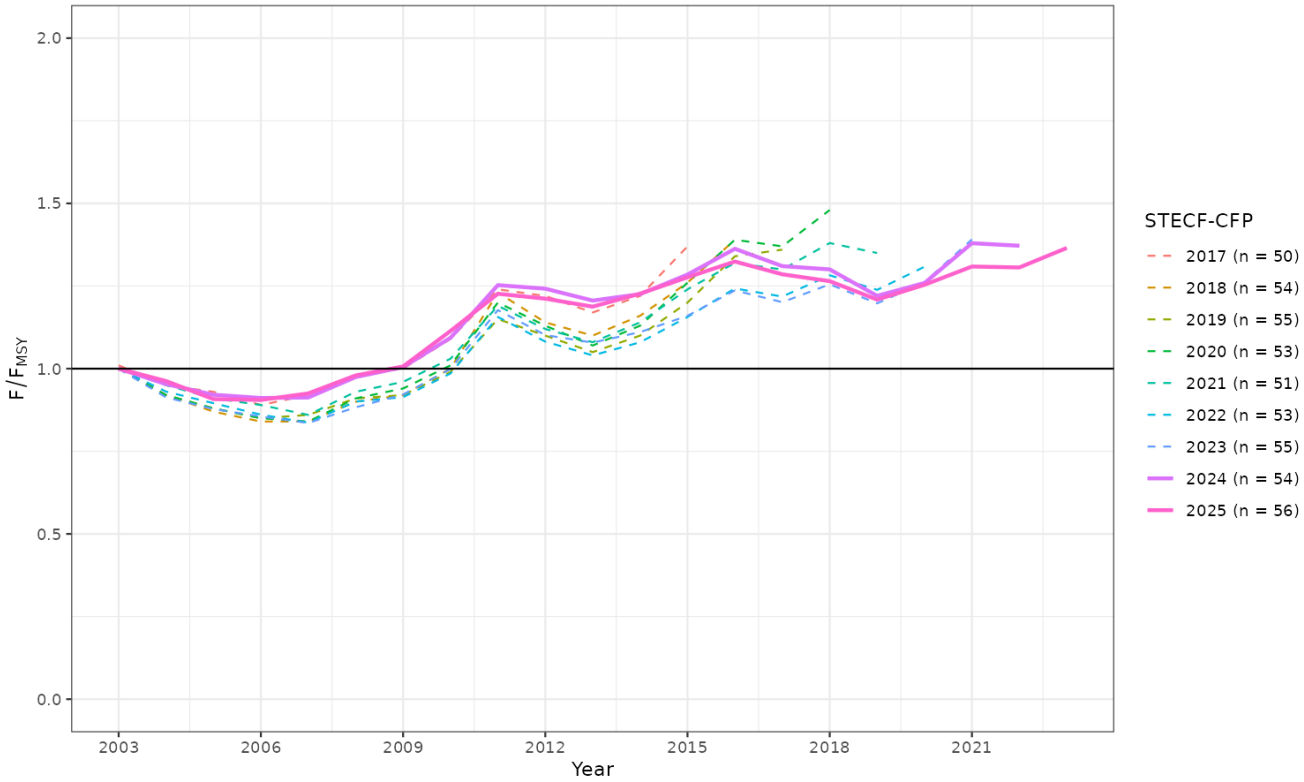
In the Mediterranean and Black Seas, the fishing pressure indicator F/F_{MSY} (Figure 33) does not show a pattern as clear as in the Northeast Atlantic equivalent. However, over the last 6 years (CFP monitoring 2020 to 2025), a downward revision of the time series was observed. It should be noted that the number of stocks included in the analysis since 2023 has significantly increased compared to the previous analysis (34 in 2022, 57 in 2023 and 63 in 2024, 65 in 2025).
The retrospective of the biomass indicator (B/B_{2003}) does not show any obvious pattern since 2017 (Figure 34). However, the indicator shows an important instability from year to year for the period 2017-2023. In the last two years, the indicator has shown similar trajectories.

Figure 31. Historical retrospective reported in STECF CFP monitoring reports since 2017 for F/F_{MSY} in the Northeast Atlantic Area (dashed lines = GLMM and solid line = JARA).



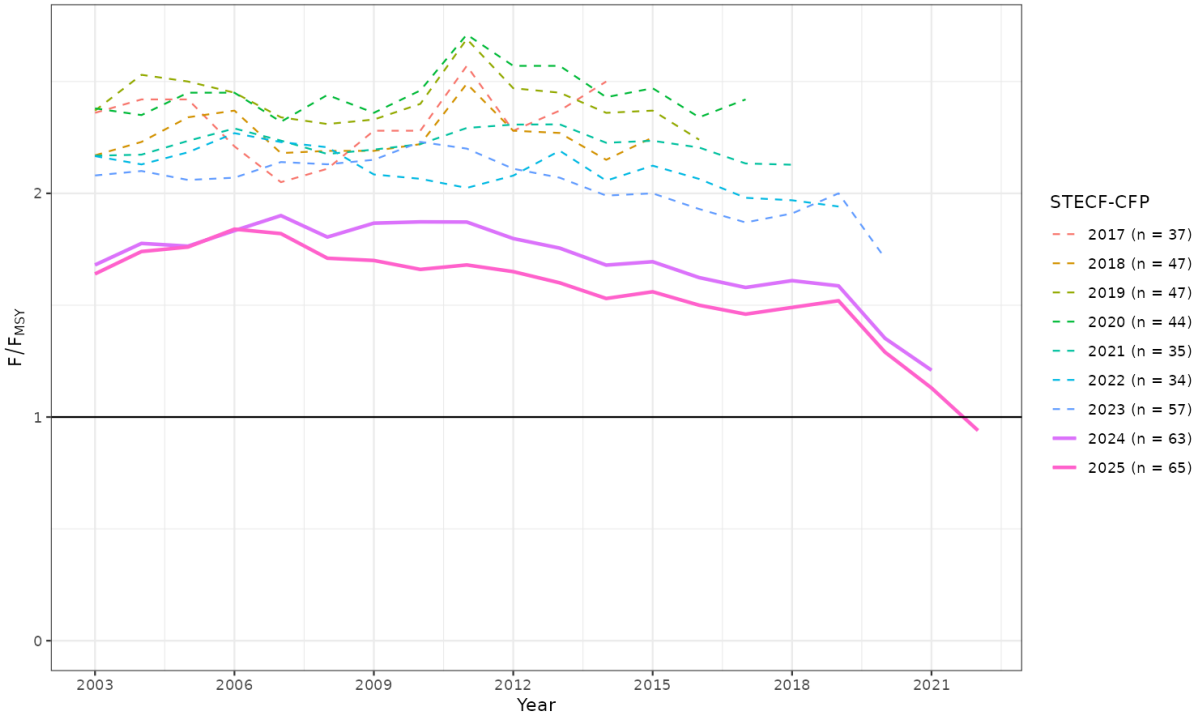
Source: own elaborations based on ICES data.

Figure 32. Historical retrospective reported in STECF CFP monitoring reports since 2017 for B/B_{2003} in the Northeast Atlantic Area (dashed lines = GLMM and solid line = JARA).



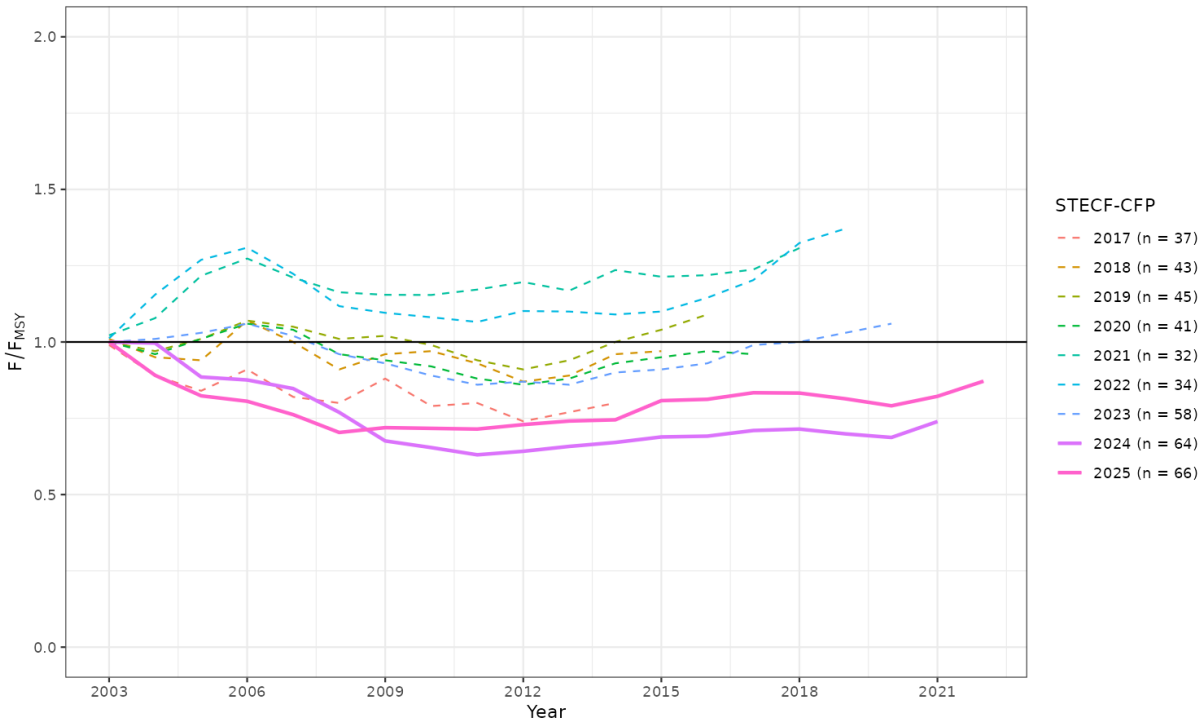
Source: own elaborations based on ICES data.

Figure 33. Historical retrospective reported in STECF CFP monitoring reports since 2017 for F/F_{MSY} in the Mediterranean and Black Seas Area (dashed lines = GLMM and solid line = JARA).



Source: own elaborations based on GFCM and STECF data.

Figure 34. Historical retrospective reported in STECF CFP monitoring reports since 2017 for B/B_{2003} in the Mediterranean and Black Seas Area (dashed lines = GLMM and solid line = JARA).



Source: own elaborations based on ICES, GFCM and STECF data.

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Electronic annexes are published on the meeting's web site on:

- EWG-24-Adhoc-01 – eAnnex 1: CFP monitoring protocols as agreed by STECF PLEN 23-03 (STECF, 2023b)
- EWG-24-Adhoc-01 – eAnnex 2: URL links to electronic annexes referring to the reports and stock advice sheets underpinning the analysis
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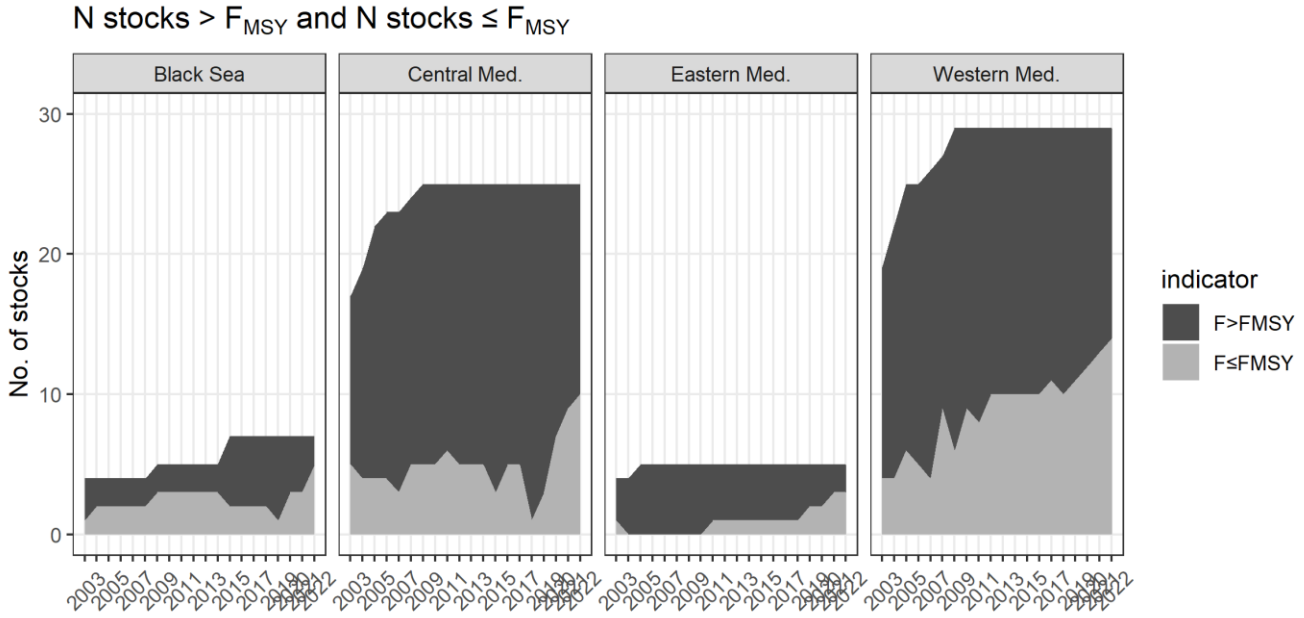
12 Annex 1 – Design-based indicators by ecoregion for the Mediterranean and Black Seas

Since 2023 (STECF, 2023b), B_{MSY} reference points were made available for Mediterranean and Black Seas stocks. It is now possible to produce two design based indicators in relation to the MSY approach.

12.1 Number of stocks by year where fish mortality is above/below F_{MSY}

One is presenting the number of stocks for which F is compared to F_{MSY} (Figure 35). The values used to present the figures are also tabulated (Table 29 and Table 30). This indicator shows that the number of stocks for which $F \leq F_{MSY}$ ranges from 10 to 16 in the period 2003-2019. From 2020 to 2022 that number increased to 29.

Figure 35. Number of stocks by ecoregion for which fishing mortality (F) was above/below F_{MSY} (MEDI1-2b).



Source: own elaborations based on GFCM and STECF data.

Table 29. Number of stocks by ecoregion for which fishing mortality (F) exceeded F_{MSY} (MEDI1).

EcoRegion	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Black Sea	33	39	44	46	49	44	50	47	46	45	45
Central Med.	3	2	2	2	2	2	2	2	2	2	2
Eastern Med.	12	15	18	19	20	19	20	20	19	20	20
Western Med.	3	4	5	5	5	5	5	5	4	4	4

EcoRegion	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Black Sea	45	50	48	47	52	49	42	38	34	-
Central Med.	2	5	5	5	5	6	4	4	2	-
Eastern Med.	20	22	20	20	24	22	18	16	15	-
Western Med.	4	4	4	4	4	3	3	2	2	-

Source: own elaborations based on GFCM and STECF data.

Table 30. Number of stocks by ecoregion for which fishing mortality (F) did not exceed F_{MSY} (MEDI2).

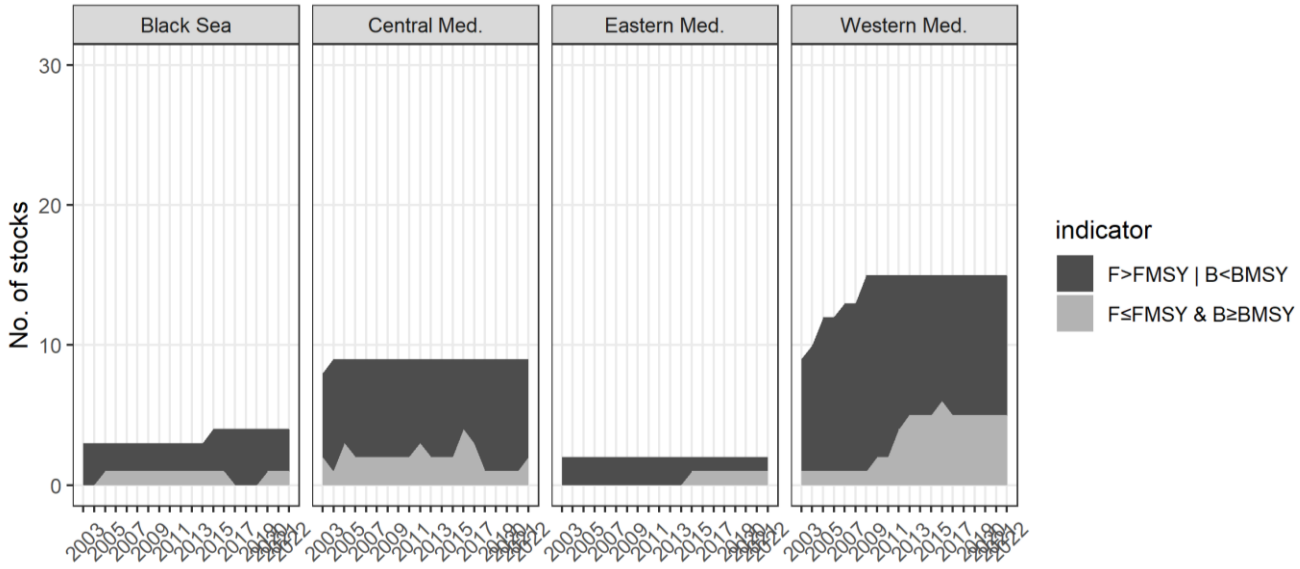
EcoRegion	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Black Sea	11	10	12	11	9	16	14	17	18	19	19
Central Med.	1	2	2	2	2	2	3	3	3	3	3
Eastern Med.	5	4	4	4	3	5	5	5	6	5	5
Western Med.	1	0	0	0	0	0	0	0	1	1	1

EcoRegion	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Black Sea	19	16	18	19	14	17	24	28	32	-
Central Med.	3	2	2	2	2	1	3	3	5	-
Eastern Med.	5	3	5	5	1	3	7	9	10	-
Western Med.	1	1	1	1	1	2	2	3	3	-

Source: own elaborations based on GFCM and STECF data.

12.2 Number of stocks with F>F_{MSY} or SSB<B_{MSY} and number of stocks with F≤F_{MSY} and SSB≥ B_{MSY}

Figure 36. Number of stocks with F>F_{MSY} or B<B_{MSY} and number of stocks with F≤F_{MSY} and B≥B_{MSY} in the Mediterranean and Black Seas (MEDI5-6).



Source: own elaborations based on GFCM and STECF data.

Table 31. Number of stocks with $F>F_{MSY}$ or $B<B_{MSY}$ for the Mediterranean and Black Sea ecoregion (MEDI5).

EcoRegion	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Black Sea	19	22	21	22	23	23	25	24	24	21	21
Central Med.	3	3	2	2	2	2	2	2	2	2	2
Eastern Med.	6	8	6	7	7	7	7	7	7	6	7
Western Med.	2	2	2	2	2	2	2	2	2	2	2

EcoRegion	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Black Sea	21	21	18	21	23	23	22	22	21	-
Central Med.	2	3	3	4	4	4	3	3	3	-
Eastern Med.	7	7	5	6	8	8	8	8	7	-
Western Med.	2	1	1	1	1	1	1	1	1	-

Source: own elaborations based on, GFCM and STECF data.

Table 32. Number of stocks with $F\leq F_{MSY}$ or $B\geq B_{MSY}$ for the Mediterranean and Black Sea ecoregion (MEDI6).

EcoRegion	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Black Sea	3	2	5	4	4	4	4	5	5	8	8
Central Med.	0	0	1	1	1	1	1	1	1	1	1
Eastern Med.	2	1	3	2	2	2	2	2	2	3	2
Western Med.	0	0	0	0	0	0	0	0	0	0	0

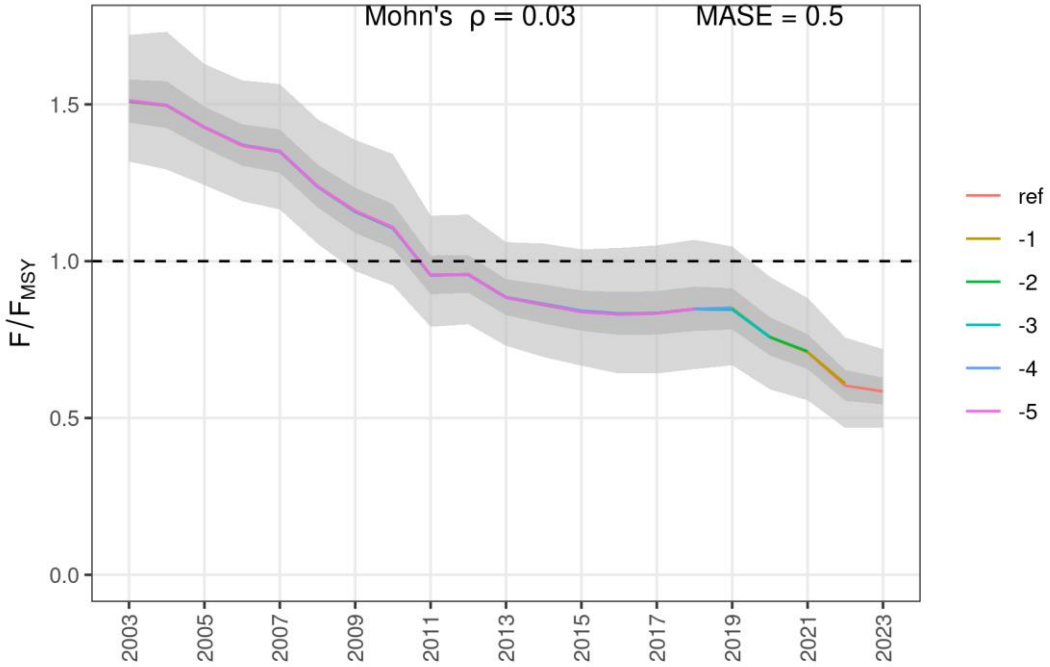
EcoRegion	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Black Sea	8	9	12	9	7	7	8	8	9	-
Central Med.	1	1	1	0	0	0	1	1	1	-
Eastern Med.	2	2	4	3	1	1	1	1	2	-
Western Med.	0	1	1	1	1	1	1	1	1	-

Source: own elaborations based on GFCM and STECF data.

13 Annex 2: Numerical retrospective of model-based indicators

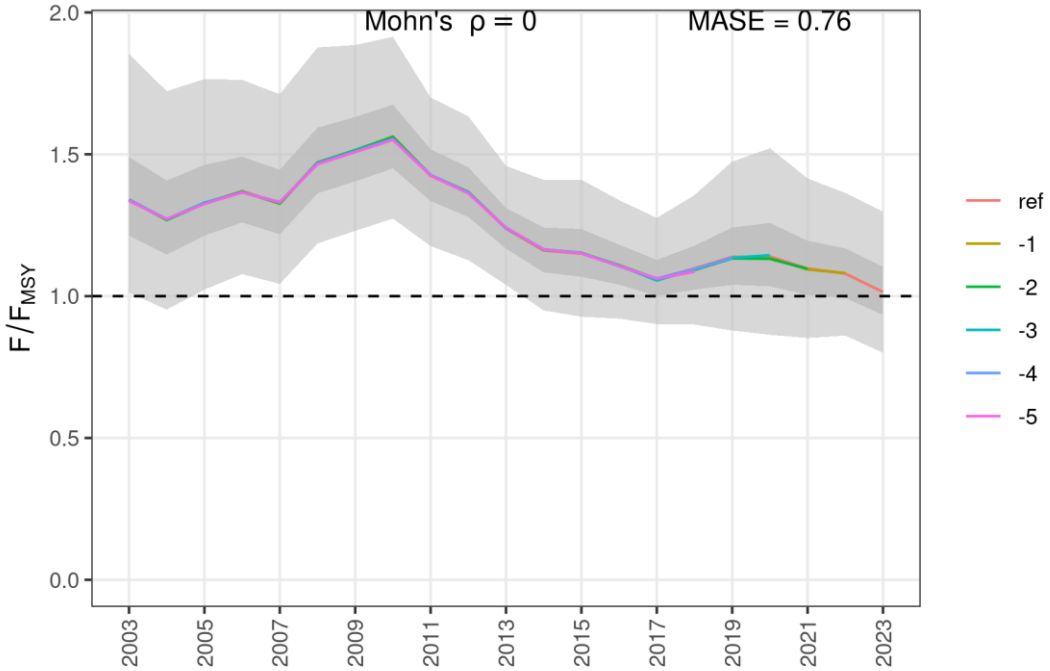
13.1 Northeast Atlantic

Figure 37. Numerical retrospective for the F/F_{MSY} model-based indicators in the NEA.



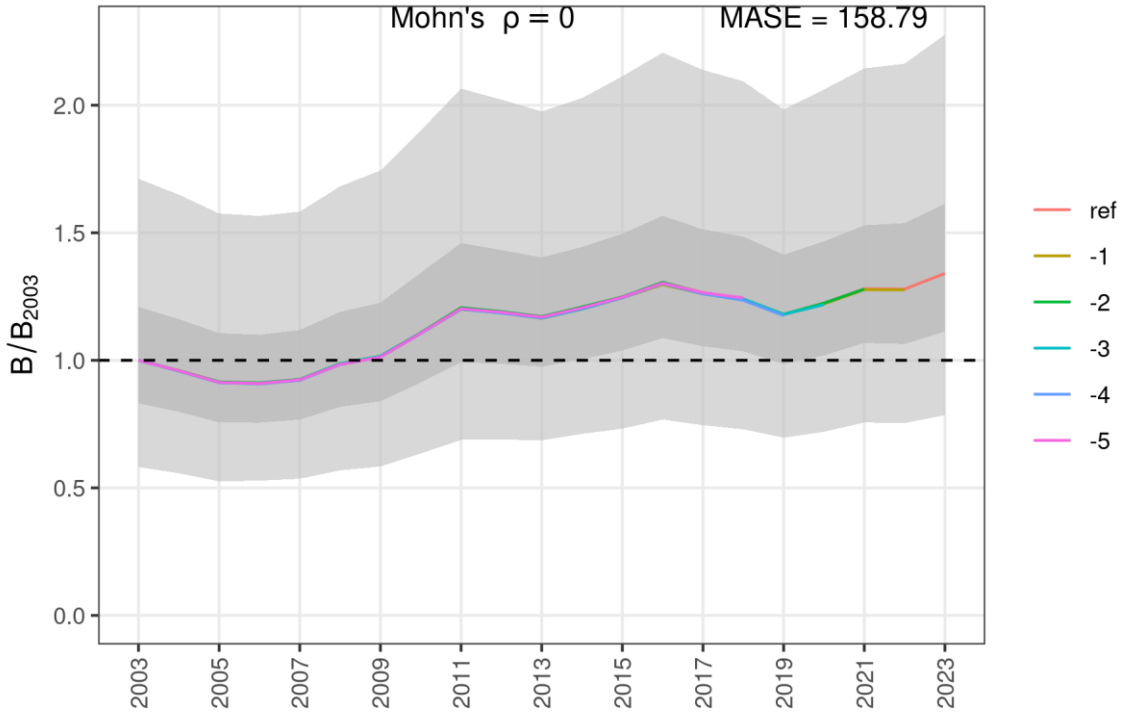
Source: own elaborations based on ICES data.

Figure 38. Numerical retrospective for the F/F_{MSY} model-based indicators for outside EU-Waters stocks in the NEA.



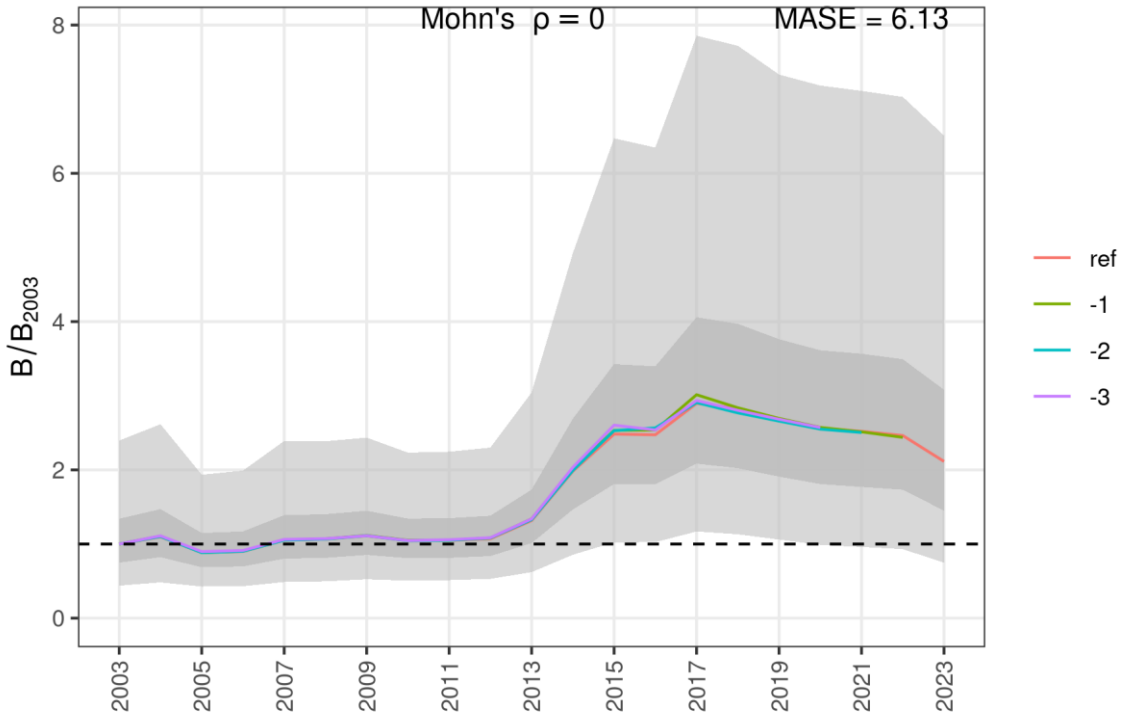
Source: own elaborations based on ICES data.

Figure 39. Numerical retrospective for the B/B_{2003} model-based indicators in the NEA.



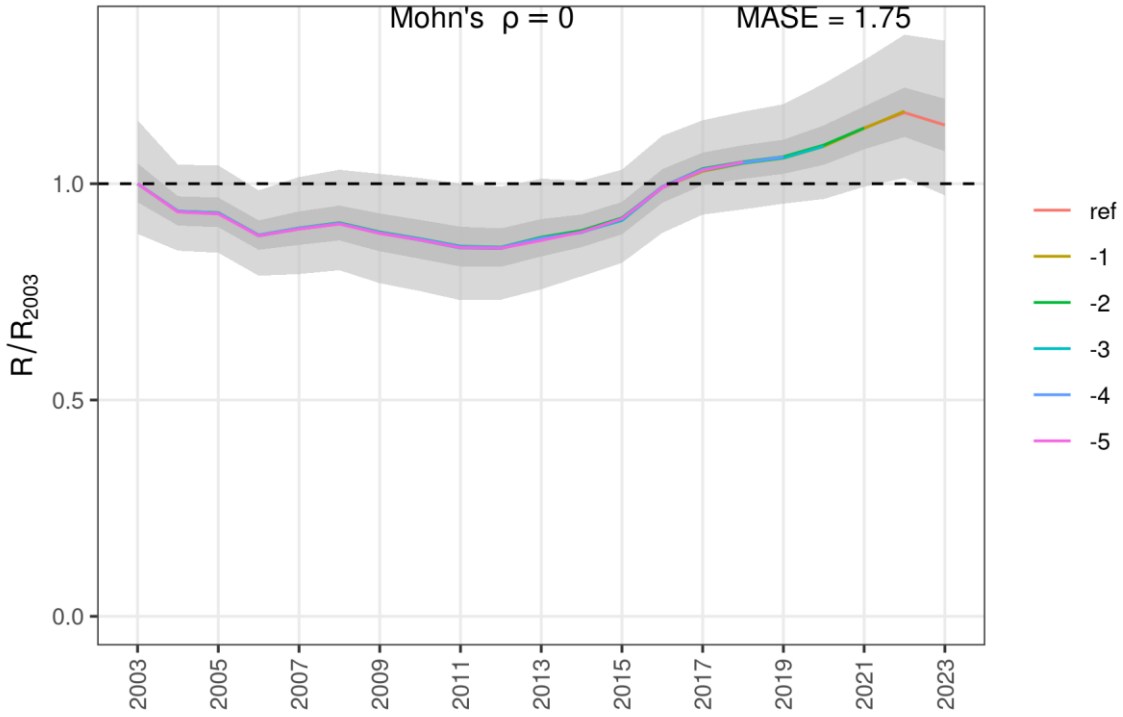
Source: own elaborations based on ICES data.

Figure 40. Numerical retrospective for the B/B_{2003} model-based indicators for category 3 stocks in the NEA.



Source: own elaborations based on ICES data.

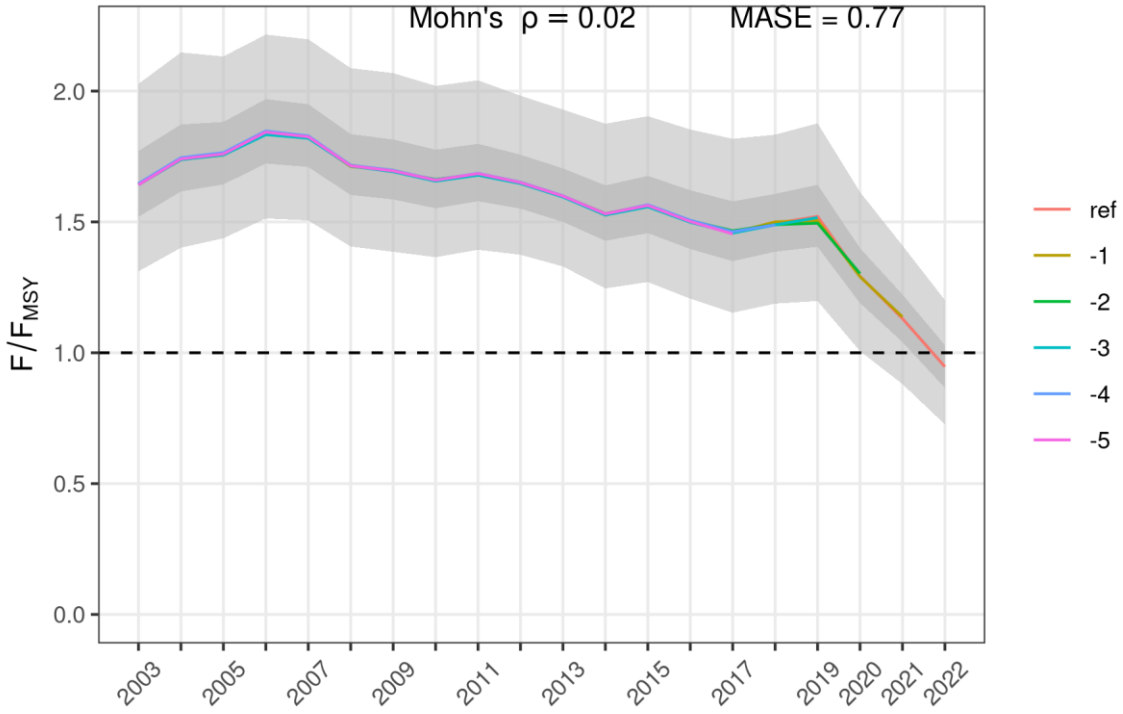
Figure 41. Numerical retrospective for the R/R_{2003} model-based indicators in the NEA.



Source: own elaborations based on ICES data.

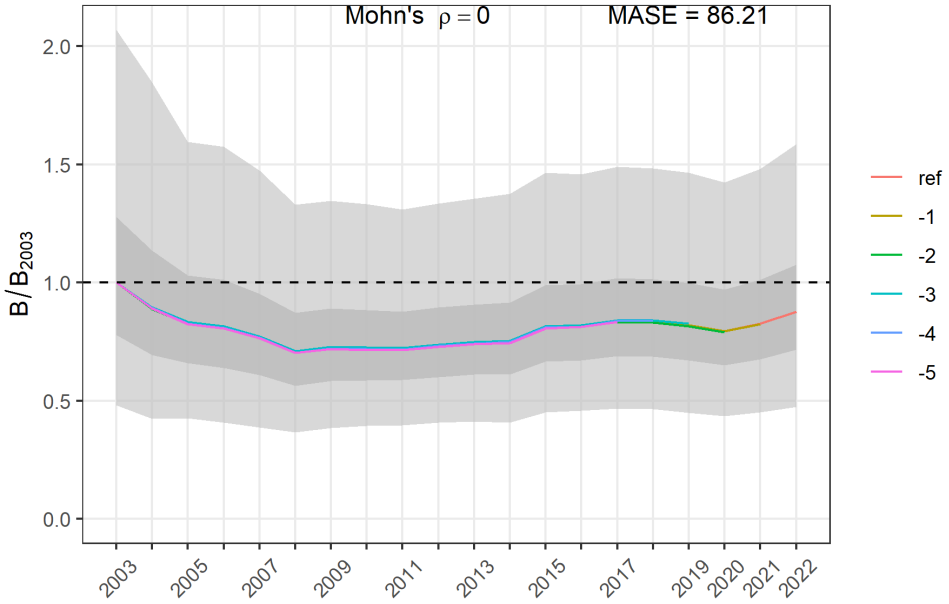
13.2 Mediterranean and Black Sea

Figure 42. Numerical retrospective for the F/F_{MSY} model-based indicators in the Mediterranean and Black Sea.



Source: own elaborations based on GFCM and STECF data.

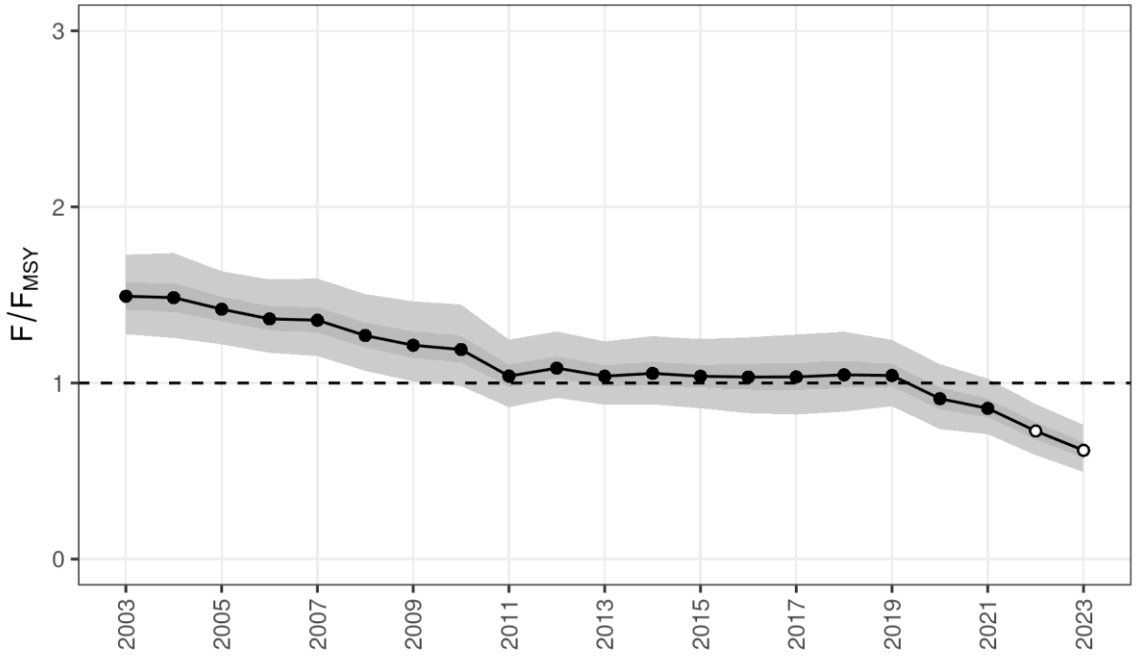
Figure 43. Numerical retrospective for the B/B_{2003} model-based indicators in the Mediterranean and Black Sea.



Source: own elaborations based on GFCM and STECF data.

14 Annex 3 Sensitivity analysis, model-based indicator F/F_{MSY} excluding all the surplus production models

Figure 44. Trend in F/F_{MSY} based on 51 stocks instead of 63 stocks excluding all the assessments run with a surplus production model for the NEA.



Source: own elaborations based on ICES data.

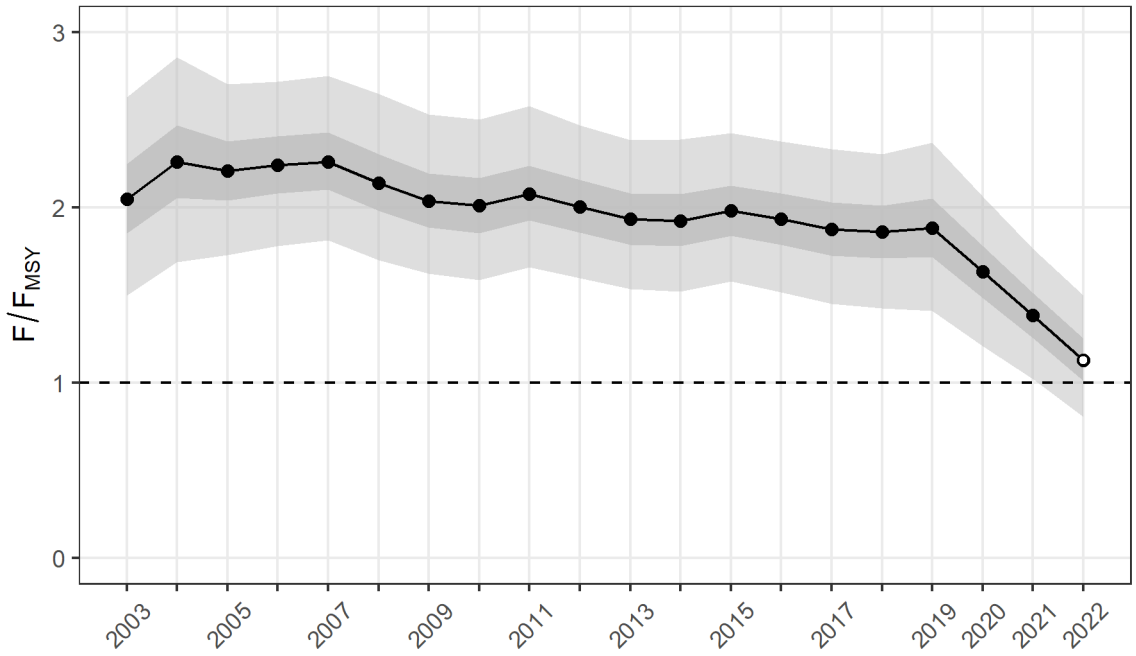
Table 33. Percentiles for F/F_{MSY} excluding all the assessments run with a surplus production model for the NEA.

Percentiles	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
2.5%	1.28	1.25	1.22	1.17	1.15	1.07	1.01	0.98	0.86	0.92	0.88
25%	1.41	1.40	1.35	1.30	1.28	1.20	1.14	1.11	0.97	1.02	0.98
50%	1.49	1.48	1.42	1.36	1.36	1.27	1.21	1.19	1.04	1.08	1.04
75%	1.57	1.57	1.49	1.44	1.43	1.35	1.29	1.27	1.11	1.15	1.10
97.5%	1.73	1.74	1.63	1.59	1.59	1.51	1.46	1.45	1.25	1.29	1.24

Percentiles	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
2.5%	0.88	0.86	0.83	0.82	0.84	0.87	0.74	0.71	0.59	0.49
25%	0.99	0.97	0.96	0.96	0.97	0.98	0.85	0.80	0.68	0.57
50%	1.05	1.04	1.03	1.03	1.05	1.04	0.91	0.86	0.73	0.62
75%	1.12	1.11	1.11	1.12	1.13	1.11	0.98	0.91	0.78	0.67
97.5%	1.27	1.25	1.26	1.28	1.29	1.25	1.11	1.03	0.88	0.76

Source: own elaborations based on ICES data.

Figure 45. Trend in F/F_{MSY} based on 47 stocks instead of 65 stocks excluding all the assessments run with a surplus production model for the Med and Black Seas.



Source: own elaborations based on GFCM and STECF data.

Table 34. Percentiles for F/F_{MSY} excluding all the assessments run with a surplus production model for the Med and Black Seas.

Percentiles	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
2.5%	1.50	1.69	1.73	1.78	1.81	1.70	1.62	1.58	1.66	1.60	1.54
25%	1.85	2.06	2.04	2.08	2.10	1.98	1.89	1.85	1.93	1.86	1.79
50%	2.05	2.26	2.21	2.24	2.26	2.14	2.04	2.01	2.08	2.00	1.93
75%	2.25	2.47	2.38	2.41	2.43	2.31	2.20	2.17	2.24	2.16	2.08
97.5%	2.63	2.86	2.70	2.72	2.75	2.65	2.53	2.50	2.58	2.47	2.38

Percentiles	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
2.5%	1.52	1.58	1.52	1.45	1.42	1.41	1.21	1.02	0.81	-
25%	1.78	1.84	1.79	1.73	1.71	1.72	1.48	1.26	1.01	-
50%	1.92	1.98	1.93	1.88	1.86	1.88	1.63	1.38	1.13	-
75%	2.08	2.13	2.08	2.03	2.01	2.05	1.78	1.51	1.25	-
97.5%	2.39	2.43	2.38	2.33	2.30	2.37	2.06	1.77	1.50	-

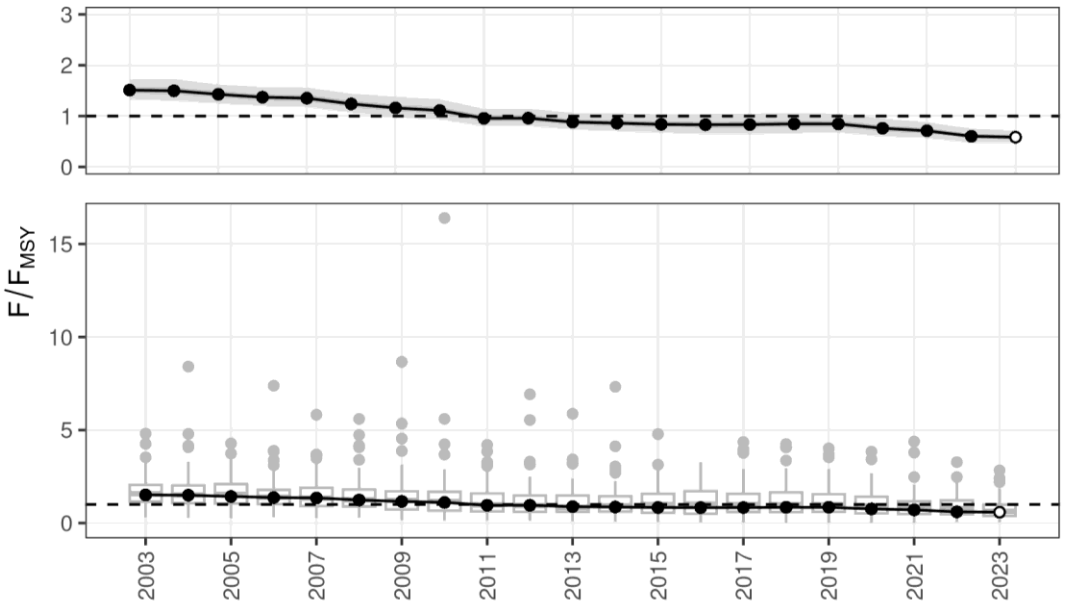
Source: own elaborations based on GFCM and STECF data.

15 Annex 4: Model-based indicators input data and outputs

In this annex, input data (presented as boxplots) and output from the model (solid line) are presented together. Regarding the model-based biomass indicator, standardised input data are not directly comparable with the model output since the model takes absolute biomass as input.

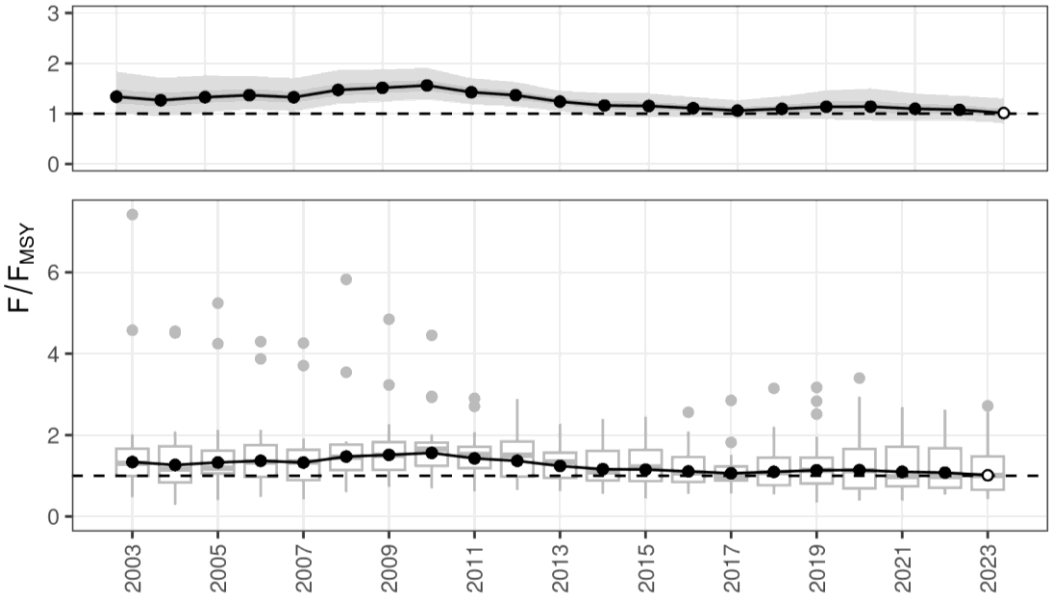
15.1 Northeast Atlantic

Figure 46. Trend in F/F_{MSY} (based on 63 stocks).



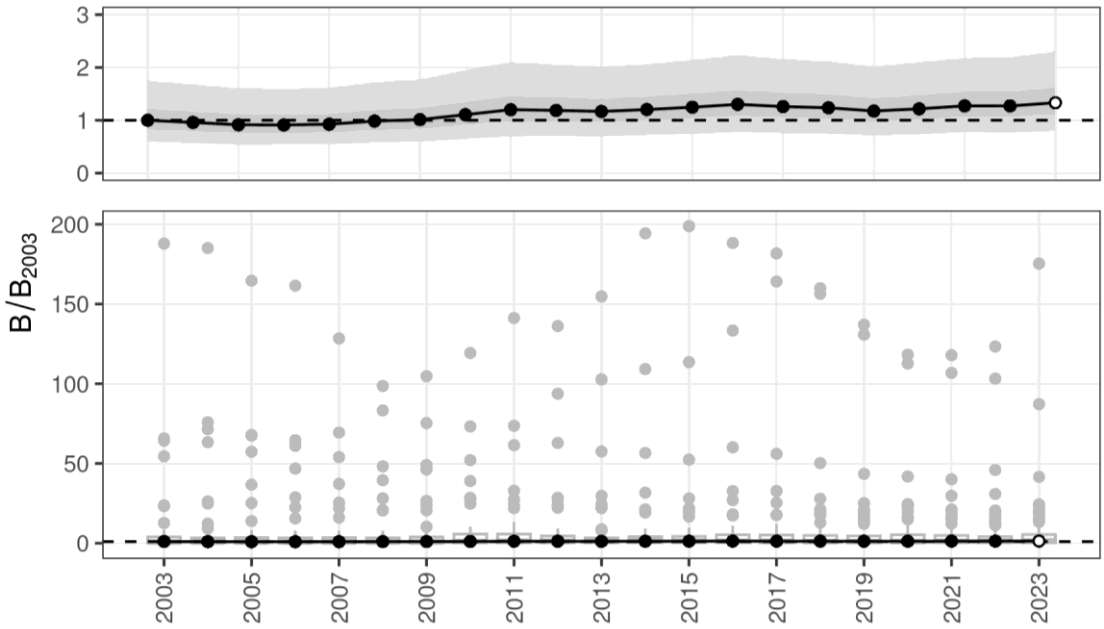
Source: own elaborations based on ICES data.

Figure 47. Trend in F/F_{MSY} for outside EU waters stocks (based on 18 stocks).



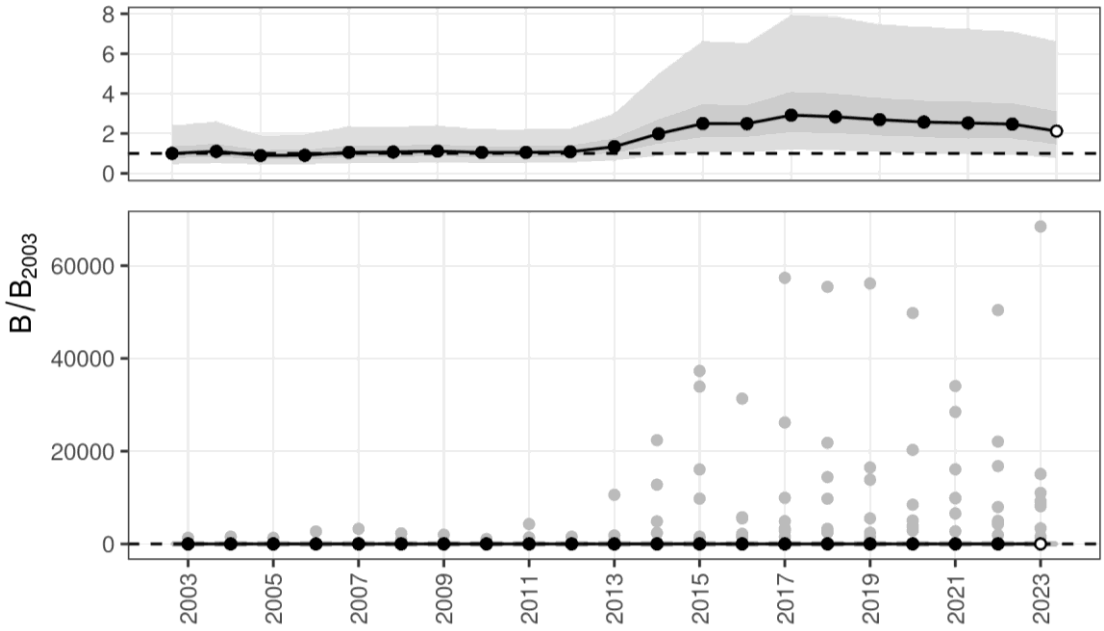
Source: own elaborations based on ICES data.

Figure 48. Trend in B/B_{2003} (based on 56 stocks).



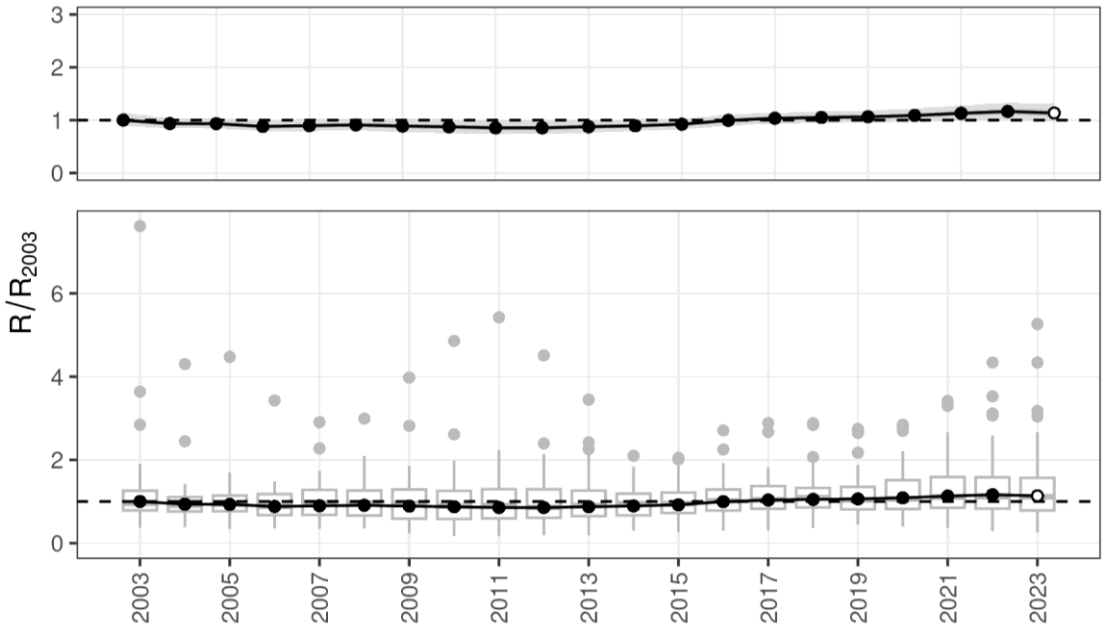
Source: own elaborations based on ICES data.

Figure 49. Trend in B/B_{2003} for category 3 stocks (based on 56 stocks).



Source: own elaborations based on ICES data.

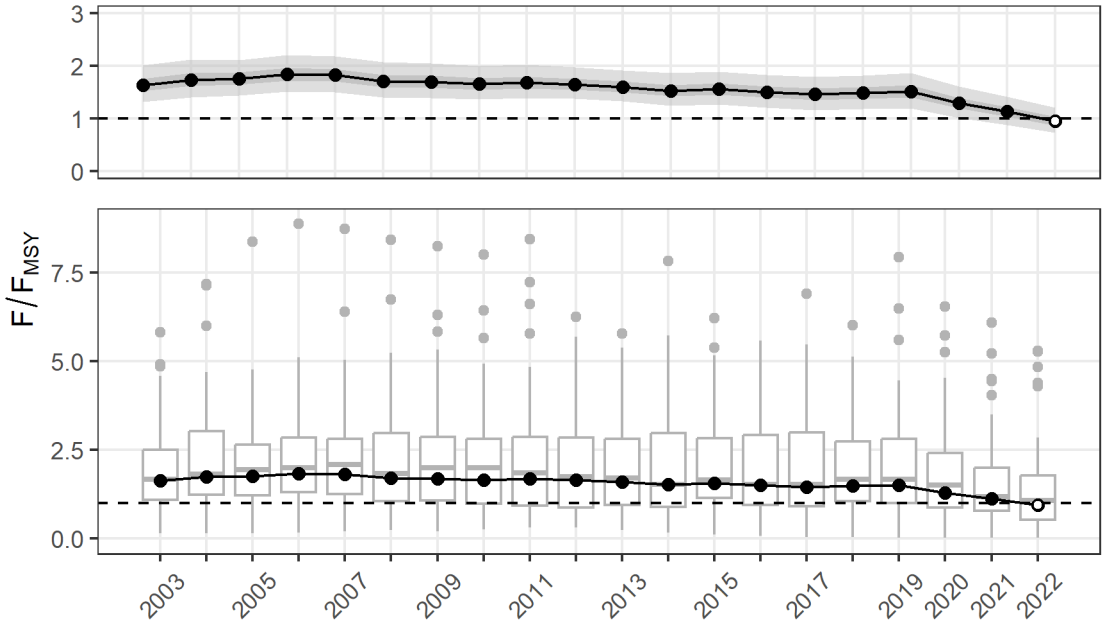
Figure 50. Trend in R/R_{2003} (based on 58 stocks).



Source: own elaborations based on ICES data.

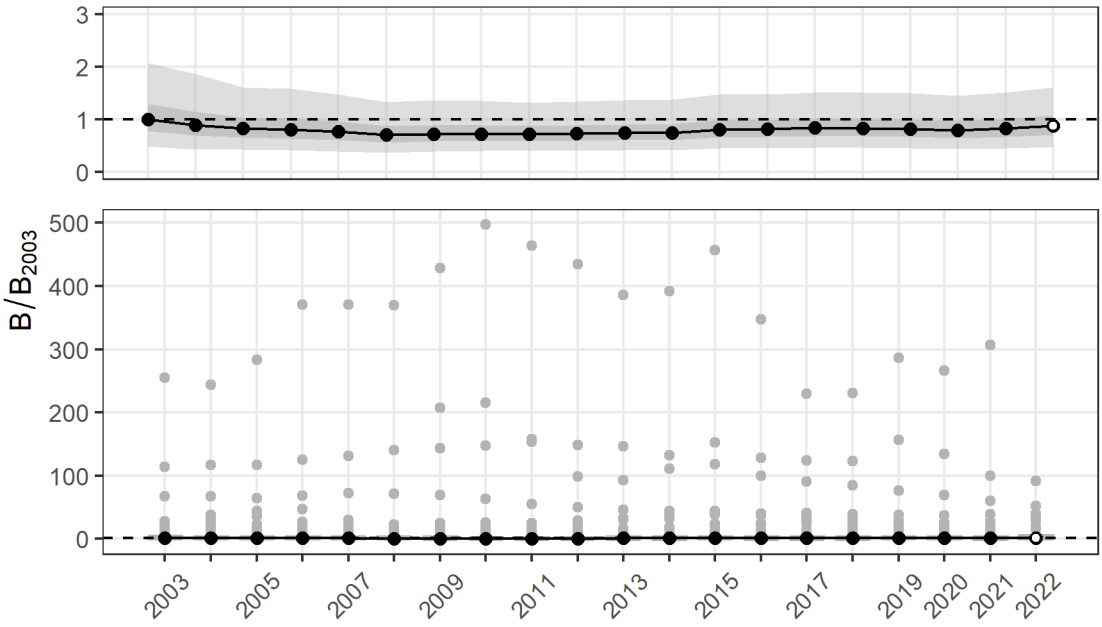
15.2 Mediterranean and Black Seas

Figure 51. Trend in F/F_{MSY} (based on 65 stocks).



Source: own elaborations based on GFCM and STECF data.

Figure 52. Trend in B/B_{2003} (based on 66 stocks).

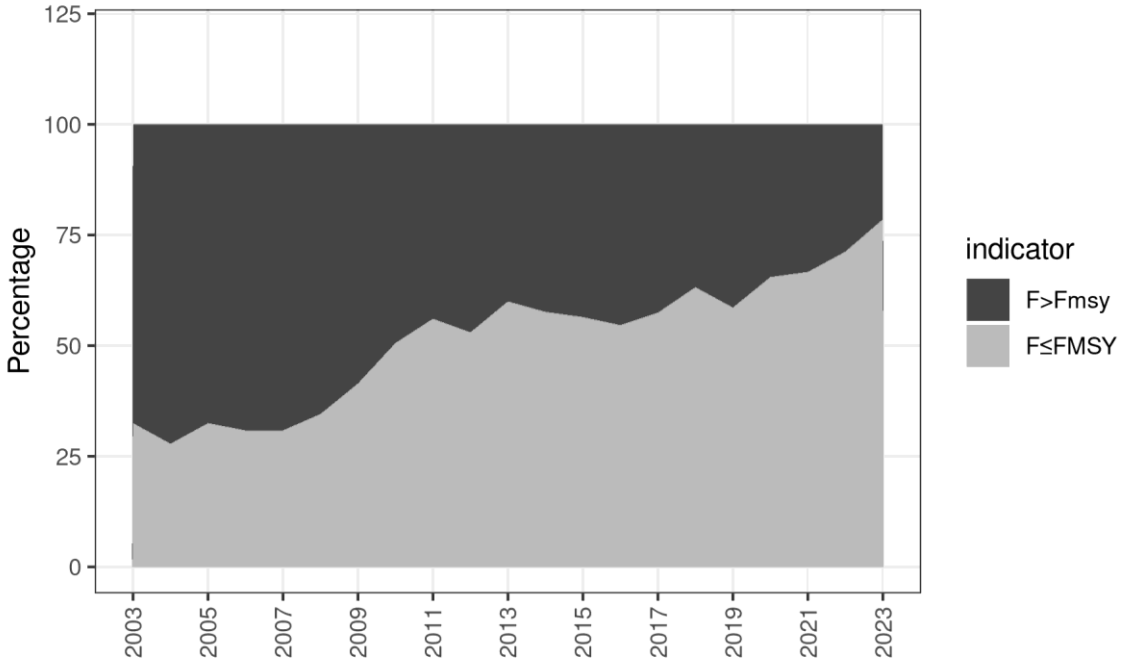


Source: own elaborations based on GFCM and STECF data.

16 Annex 5: Design based indicators in percentage

16.1 Northeast Atlantic

Figure 53. Percentage of stocks by year for which fishing mortality (F) was above/below F_{MSY}.



Source: own elaborations based on ICES data.

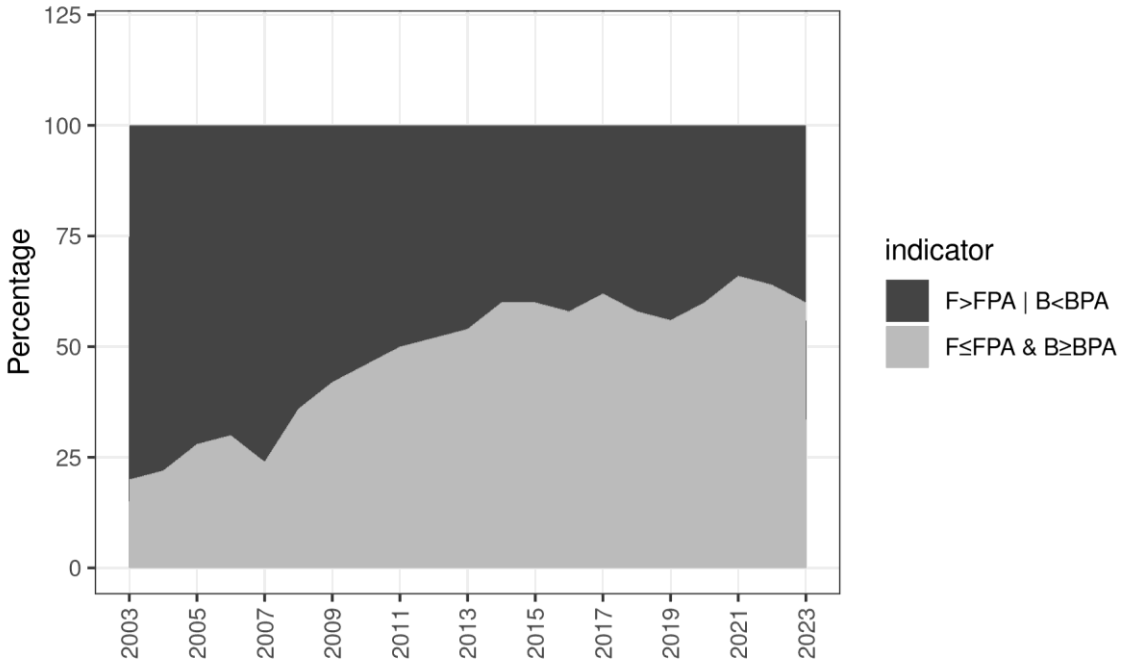
Table 35. Percentage of stocks by year for which fishing mortality (F) was above/below F_{MSY}.

Status	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
$F > F_{MSY}$	68	72	68	69	69	65	59	49	44	47	40
$F \leq F_{MSY}$	33	28	33	31	31	35	41	51	56	53	60

Percentiles	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
$F > F_{MSY}$	42	44	45	43	37	41	34	33	29	21
$F \leq F_{MSY}$	58	56	55	57	63	59	66	67	71	79

Source: own elaborations based on ICES data.

Figure 54. Percentage of stocks outside/inside safe biological limits by year.



Source: own elaborations based on ICES data.

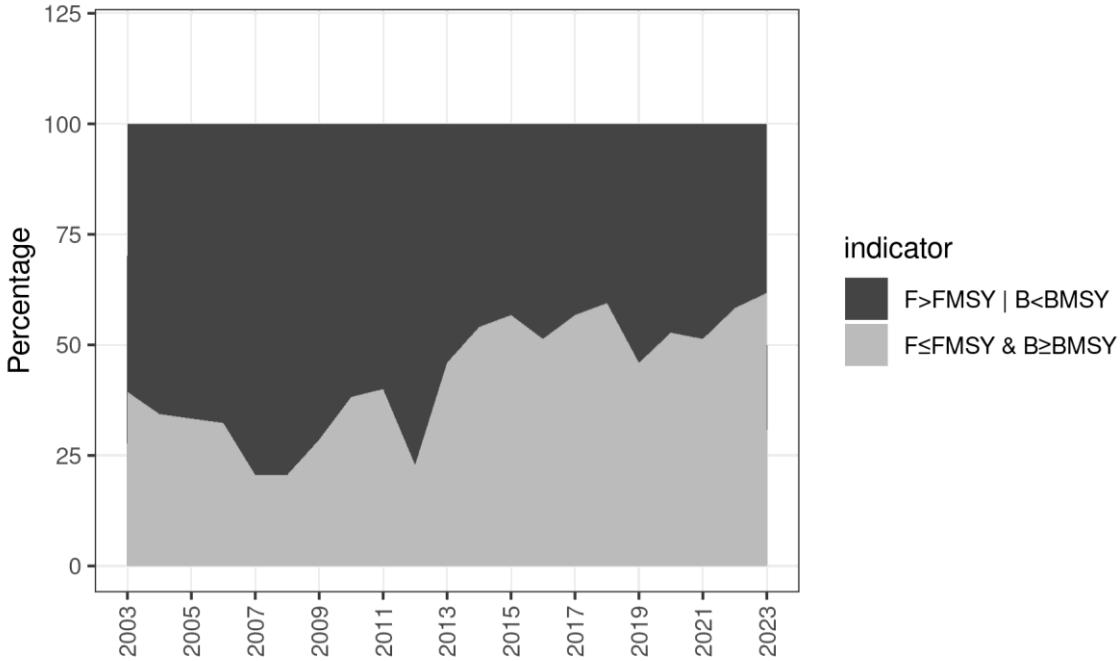
Table 36. Percentage of stocks outside/inside safe biological limits by year.

Status	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
$F > F_{PA}$ or $SSB<B_{PA}$	80	78	72	70	76	64	58	54	50	48	46
$F \leq F_{PA}$ and $SSB \geq B_{PA}$	20	22	28	30	24	36	42	46	50	52	54

Percentiles	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
$F > F_{PA}$ or $SSB<B_{PA}$	40	40	42	38	42	44	40	34	36	40
$F \leq F_{PA}$ and $SSB \geq B_{PA}$	60	60	58	62	58	56	60	66	64	60

Source: own elaborations based on ICES data.

Figure 55. Percentage of stocks with F>F_{MSY} or SSB<B_{MSY} and percentage of stocks with F≤F_{MSY} and SSB≥B_{MSY}.



Source: own elaborations based on ICES data.

Table 37. Percentage of stocks with F>F_{MSY} or SSB<B_{MSY} and percentage of stocks with F≤F_{MSY} and SSB≥B_{MSY}.

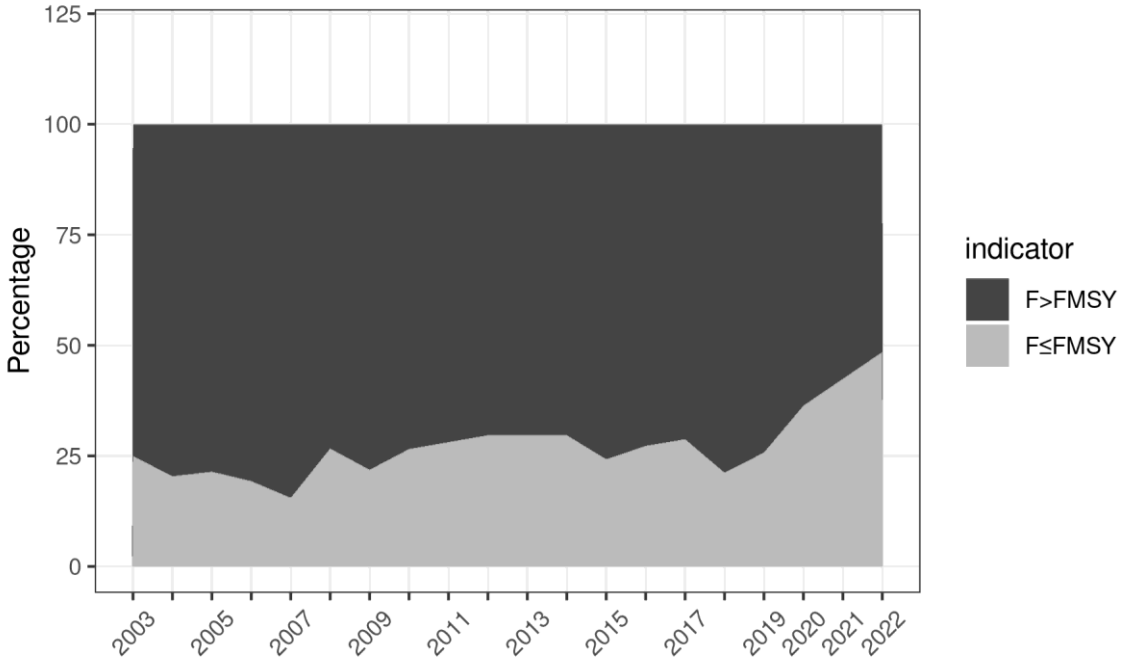
Status	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
F > F_{MSY} or SSB<B_{MSY}	61	66	67	68	79	79	71	62	60	77	54
F ≤ F_{MSY} and SSB≥B_{MSY}	39	34	33	32	21	21	29	38	40	23	46

Percentiles	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
F > F_{MSY} or SSB<B_{MSY}	46	43	49	43	41	54	47	49	42	38
F ≤ F_{MSY} and SSB≥B_{MSY}	54	57	51	57	59	46	53	51	58	62

Source: own elaborations based on ICES data.

16.2 Mediterranean and Black Seas

Figure 56. Percentage of stocks by year for which fishing mortality (F) was above/below F_{MSY}.



Source: own elaborations based on GFCM and STECF data.

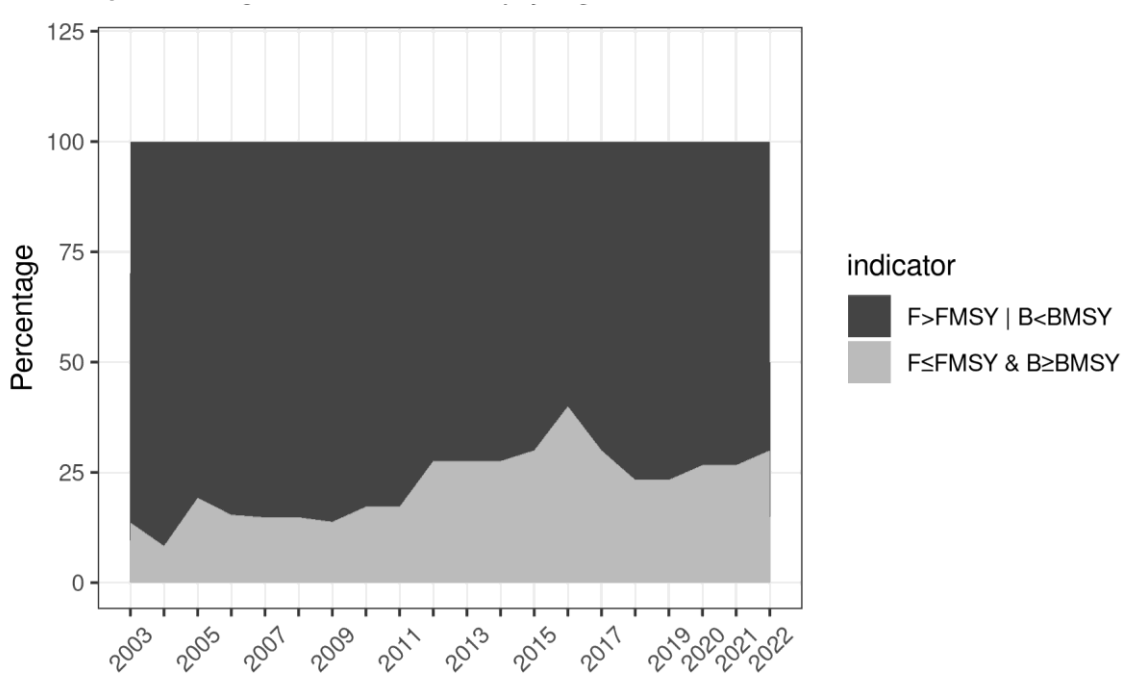
Table 38. Percentage of stocks by year for which fishing mortality (F) was above/below F_{MSY}.

Status	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
$F > F_{MSY}$	75	80	79	81	84	73	78	73	72	70	70
$F \leq F_{MSY}$	25	20	21	19	16	27	22	27	28	30	30

Percentiles	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
$F > F_{MSY}$	70	76	73	71	79	74	64	58	52	-
$F \leq F_{MSY}$	30	24	27	29	21	26	36	42	48	-

Source: own elaborations based on GFCM and STECF data.

Figure 57. Percentage of stocks with F>F_{MSY} or SSB<B_{MSY} and percentage of stocks with F≤F_{MSY} and SSB≥B_{MSY}.



Source: own elaborations based on GFCM and STECF data.

Table 39. Percentage of stocks with F>F_{MSY} or SSB<B_{MSY} and percentage of stocks with F≤F_{MSY} and SSB≥B_{MSY}.

Status	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
F > F_{MSY} or SSB<B_{MSY}	86	92	81	85	85	85	86	83	83	72	72
F ≤ F_{MSY} and SSB≥B_{MSY}	14	8	19	15	15	15	14	17	17	28	28

Percentiles	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
F > F_{MSY} or SSB<B_{MSY}	72	70	60	70	77	77	73	73	70	-
F ≤ F_{MSY} and SSB≥B_{MSY}	28	30	40	30	23	23	27	27	30	-

Source: own elaborations based on GFCM and STECF data.

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