

Small pelagic species in the Adriatic: State of stocks and implementation of the GFCM multi-annual plan

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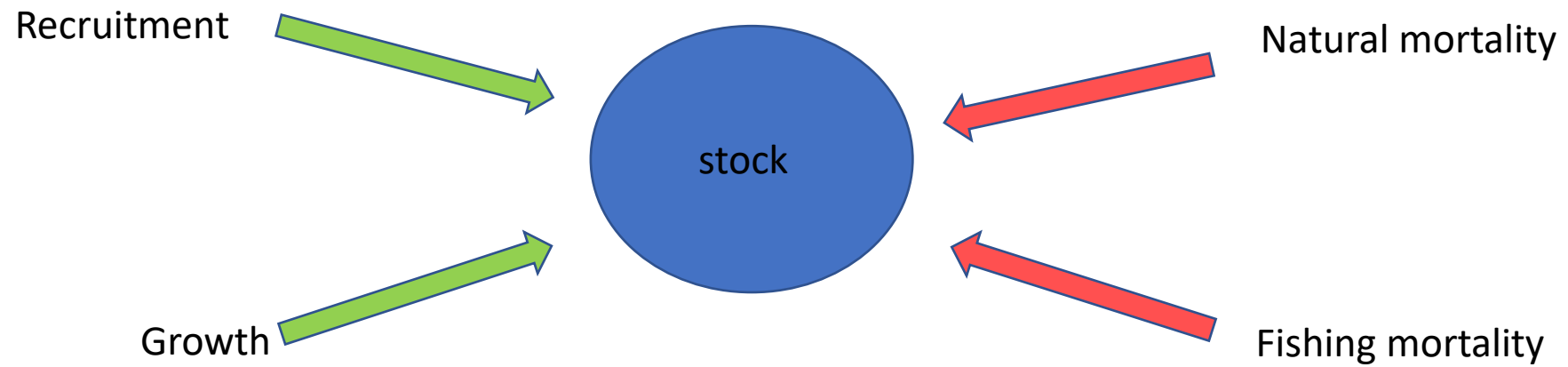
Scientific advisor

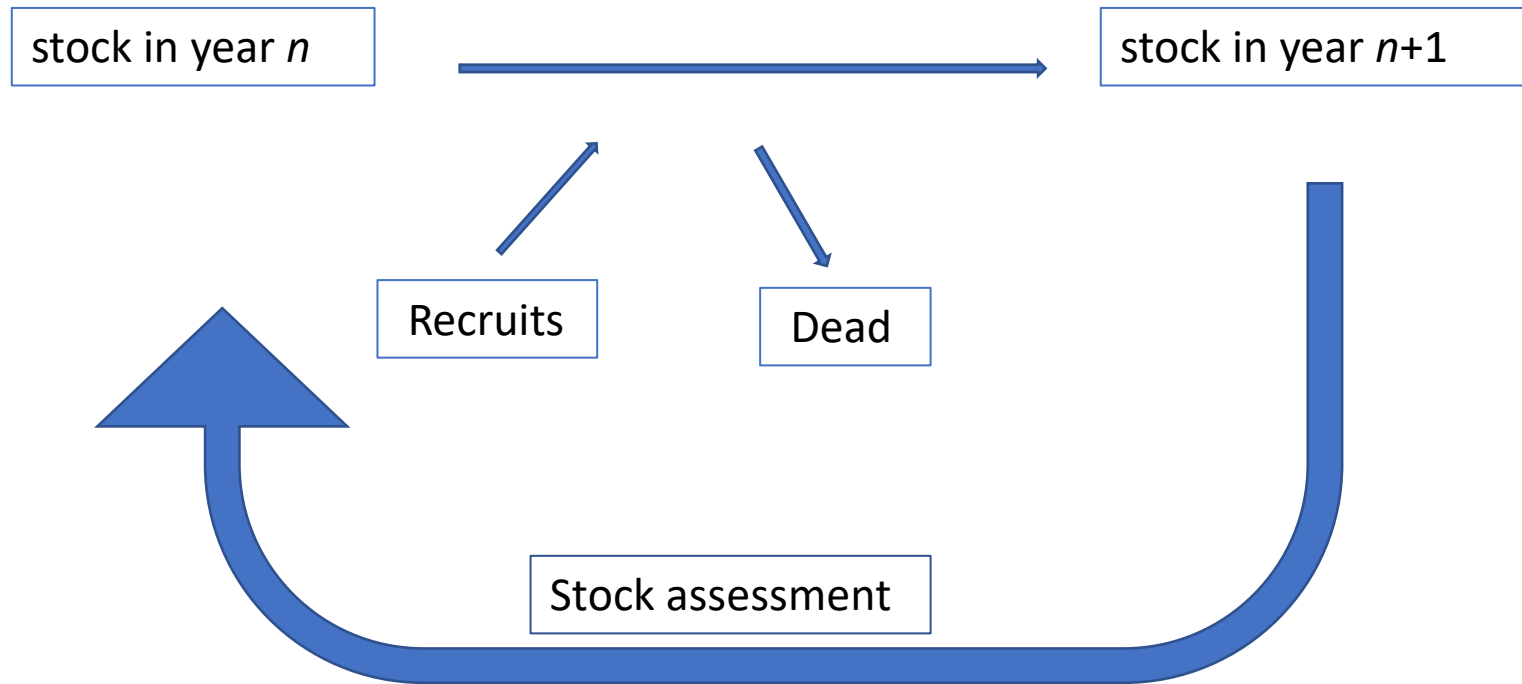
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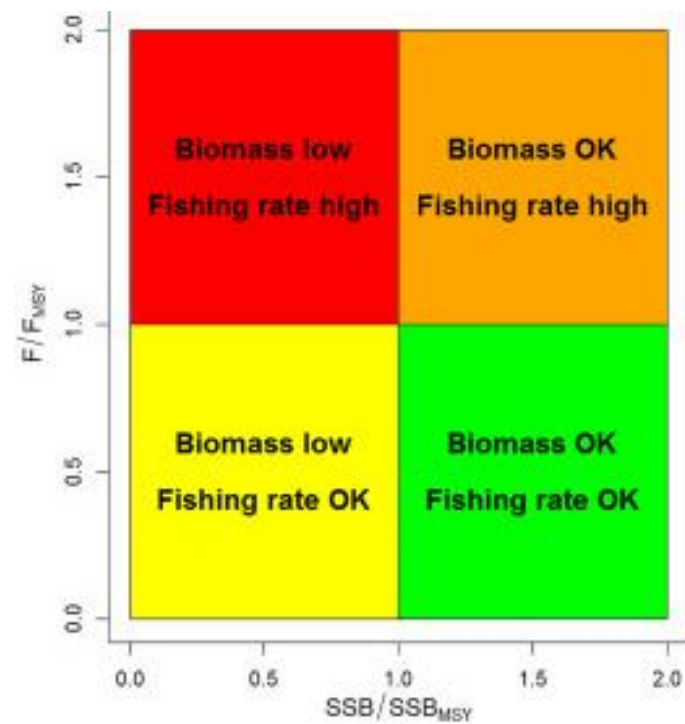
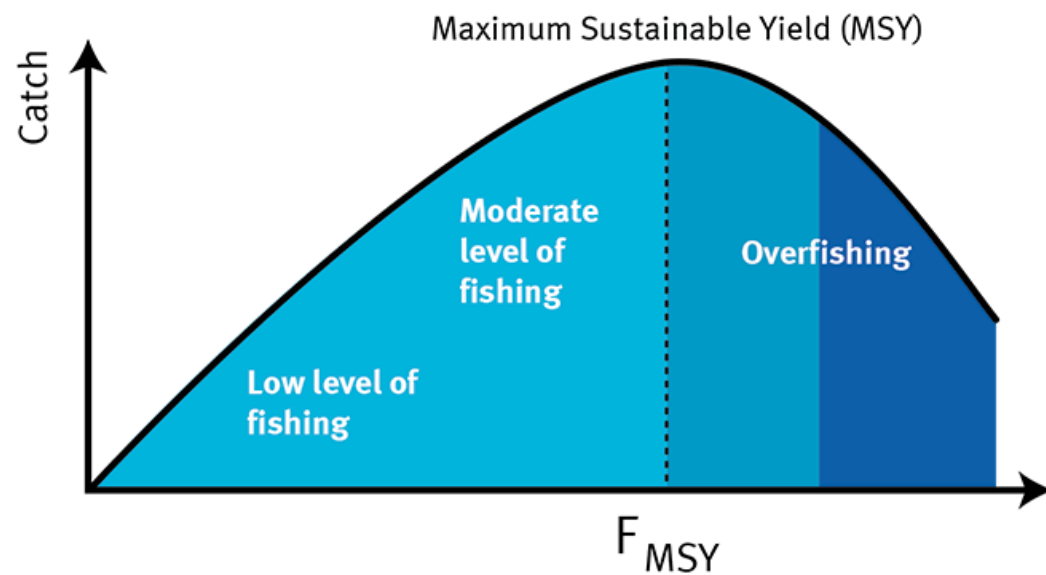
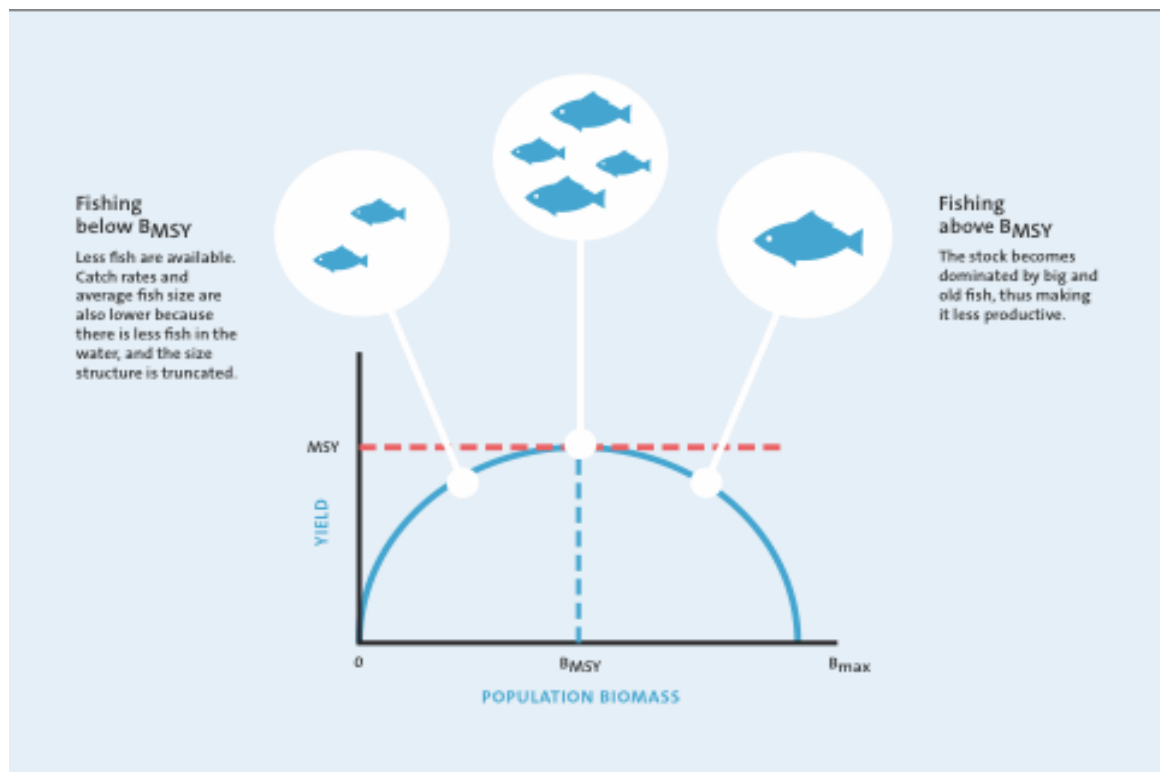


FISH STOCK -> a subpopulation of a single species living in a defined geographic area, sharing similar growth, mortality, and reproductive rates





Stock assessment- different mathematical and statistical tools used to evaluate fish population abundance, biomass, and reproductive rates, allowing fisheries managers to estimate the impact of fishing and environmental factors.



DCF (or DCF-like) data collection for all Adriatic countries

- **Countries**

- Albania
- Croatia
- Italia
- Montenegro
- Slovenia

- **Commercial:**

- Total landing
- Landing by length
- Landing by age
- Mortality (natural, fishing)

- **Survey (MEDIAS):**

- Total biomass
- Total abundance
- Biomass by length/age
- Abundance by length/age



Operational Units*	Fleet (n° of boats)*
ALB_PS_18	27
HRV_PS_17	141
ITA_PS_17 18	22
ITA_PTM_17 18	104
MNE_PS_18	29
SLO_PS_17	4
Total	354



Sardina pilchardus, European Pilchard

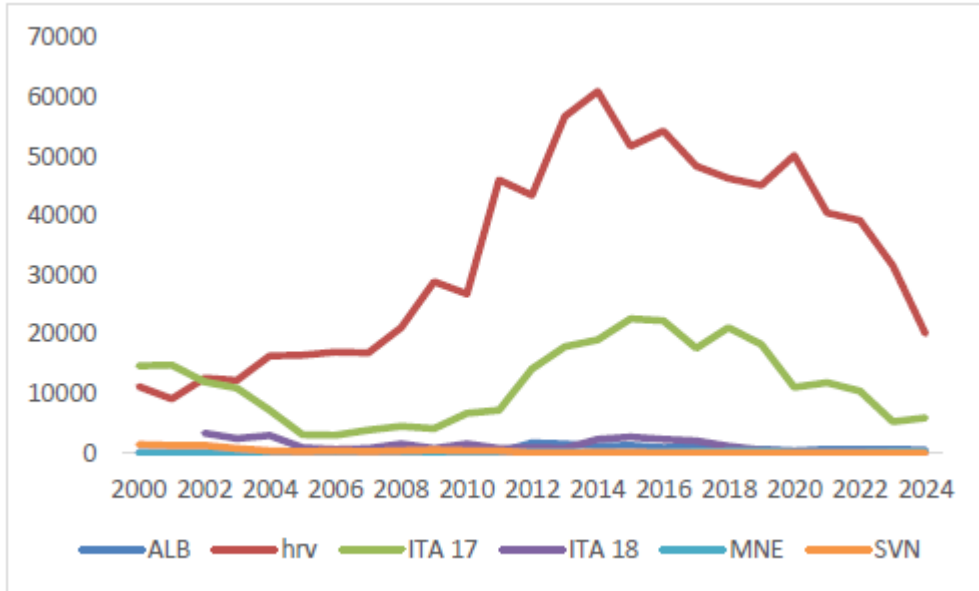


- Benchmarked in 2023 (with 2022 data), updated assessment in 2025
- Model SPiCT (Stochastic surplus production model in continuous time)
- Total landings from all countries from 2000 to 2024
- Biomass index:

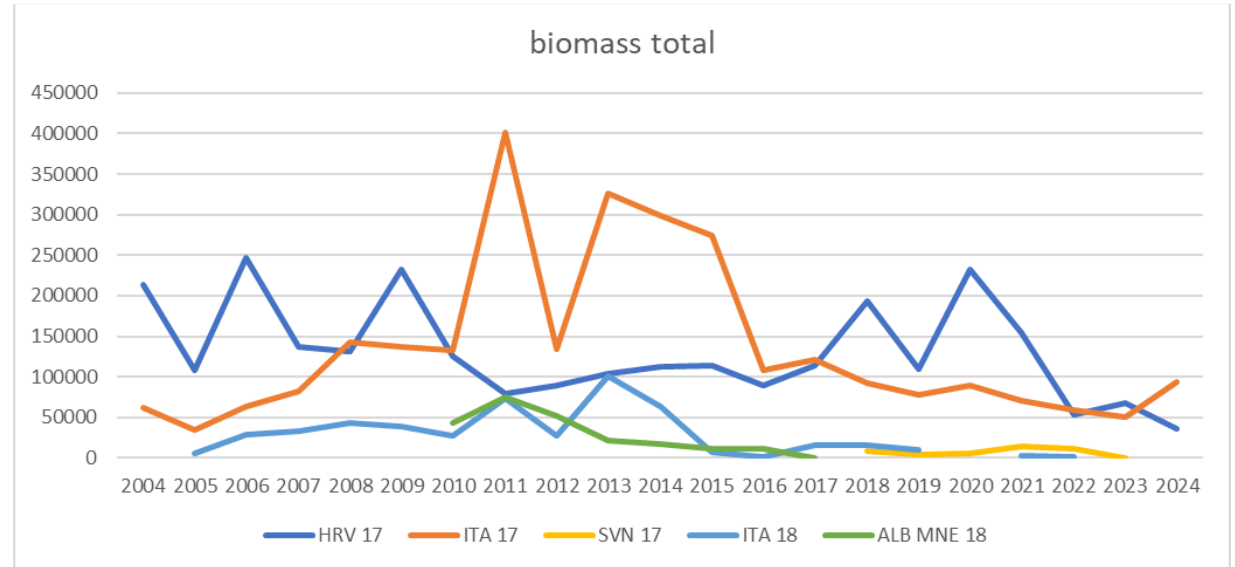
combined JARA index (2004-2014) – all survey data

survey design index (2015-2024) - excluding the inner part of Croatian area in GSA 17 + scaled up (to make two periods comparable)

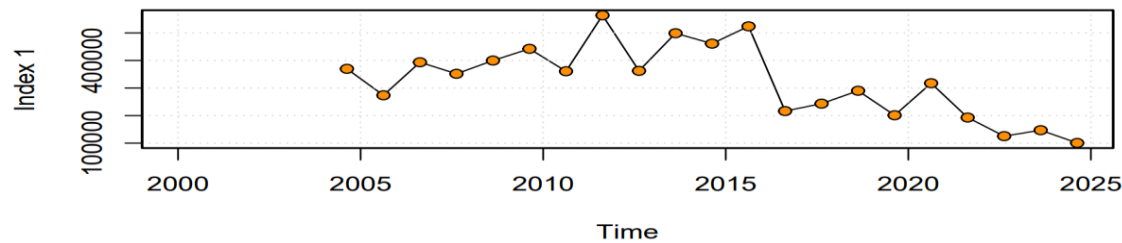
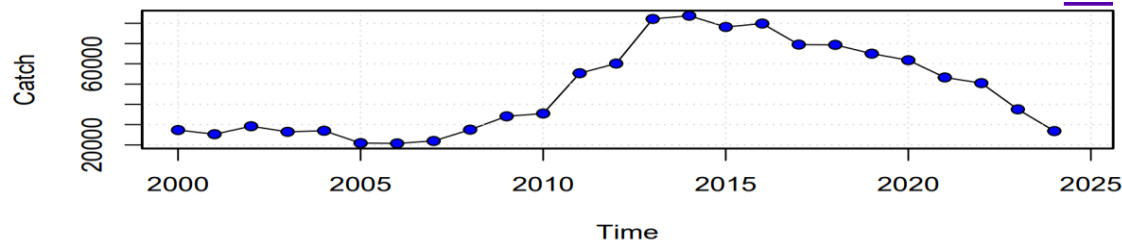
Total landings by country

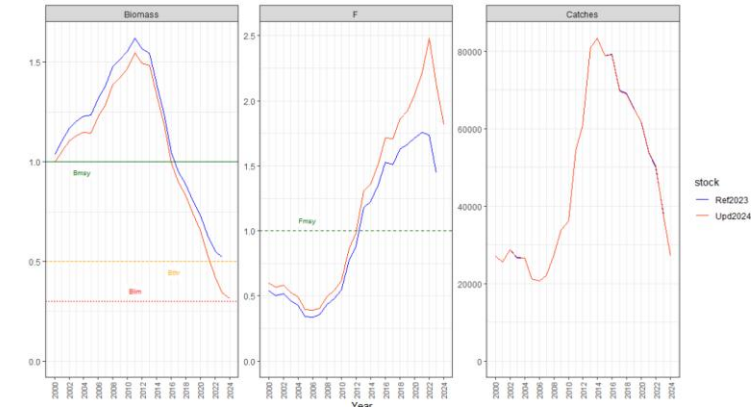
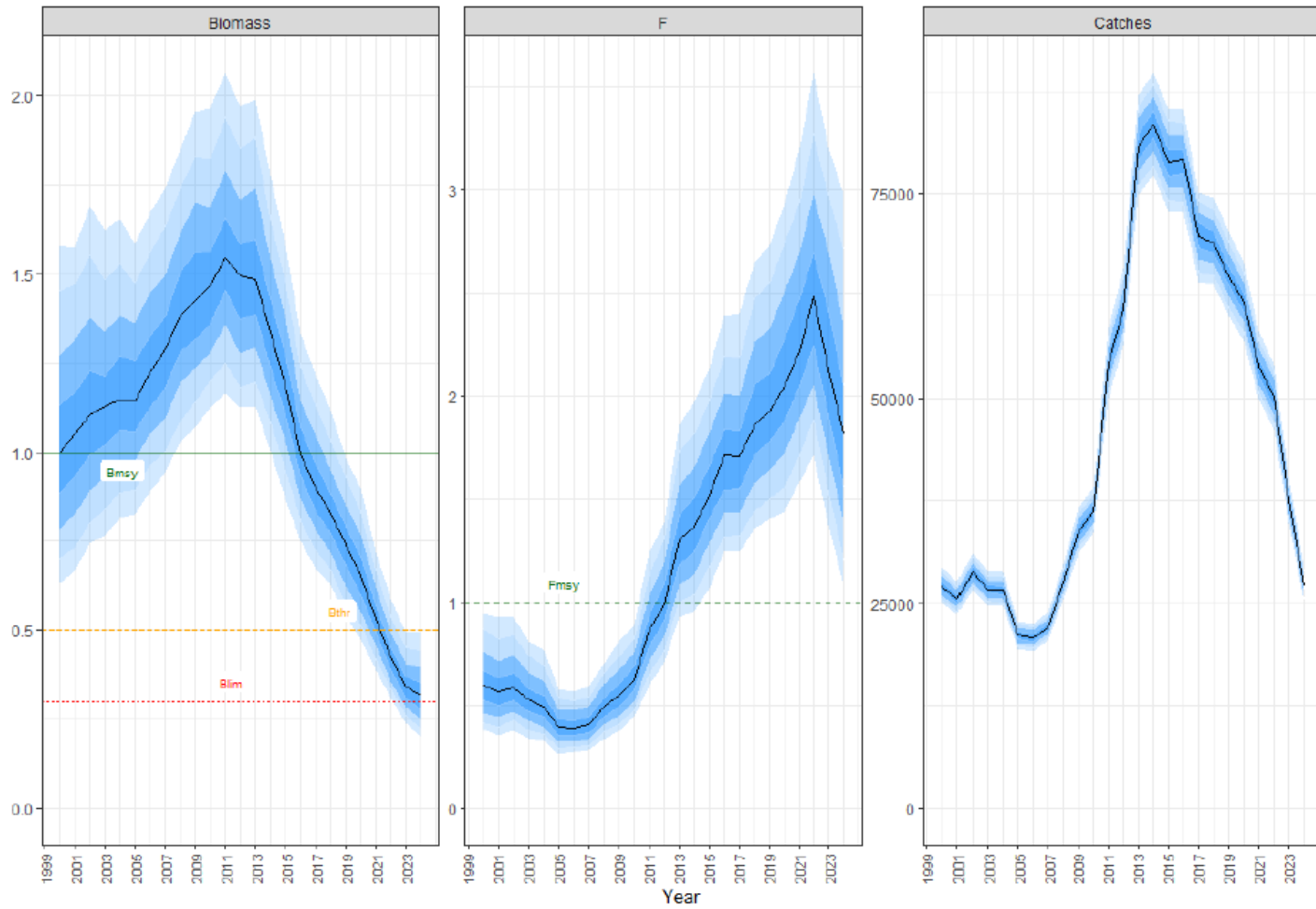


Biomass by acoustic



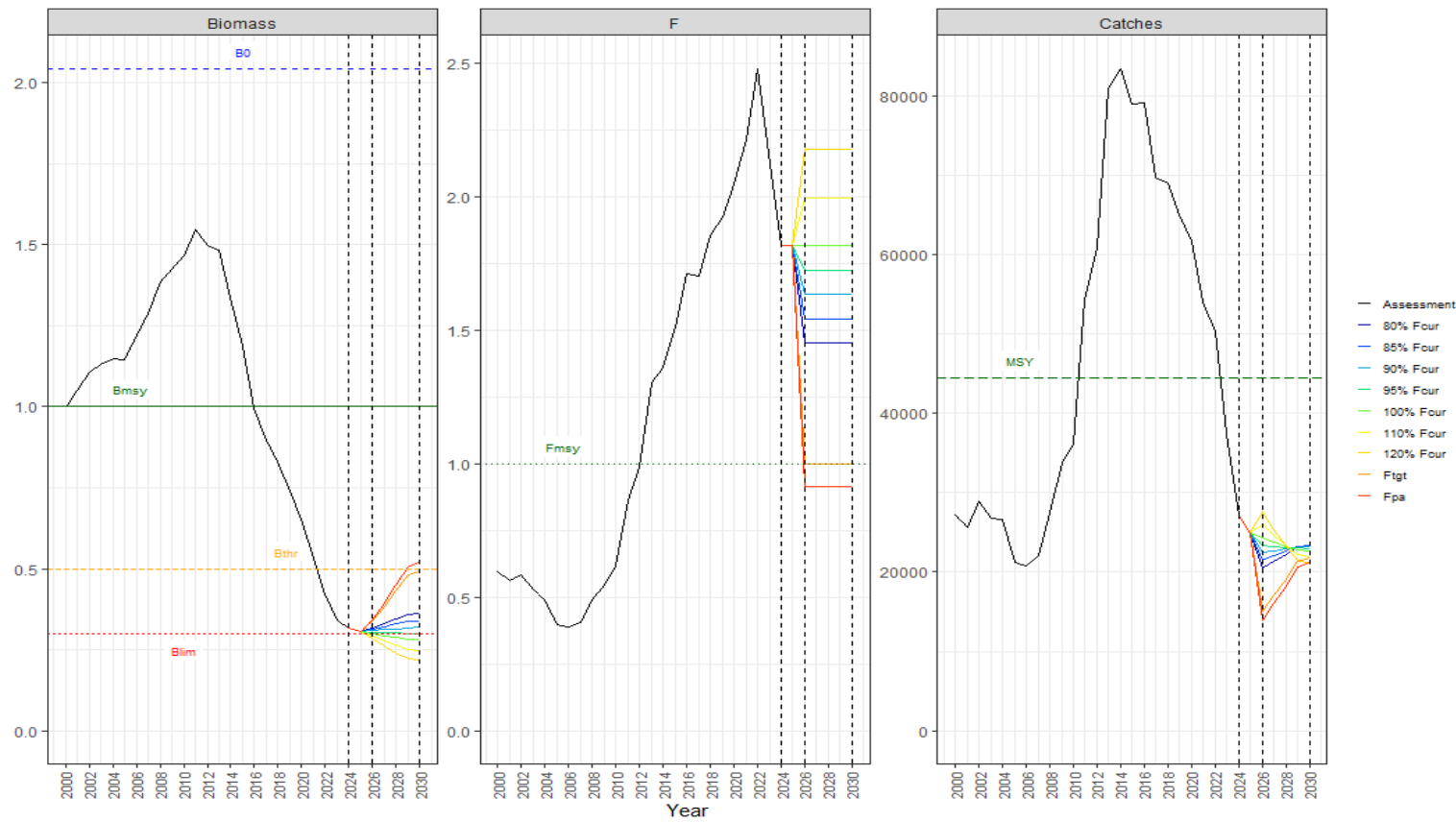
Input data for assessment:





Change from previous year

GSA	Species	Reference year	Method	Current Levels	Reference Points	Quantitative Status	Percentage of F reduction*	Stock Status	Scientific Advice
17,18	Sardina pilchardus	2024	SPiCT		Fmsy Bmsy Bpa Blim	F/Ftarget = 1.82, ↑ B/Btarget = 0.32, ↓ B/Bthreshold = 0.63, ↓ B/Blimit = 1.05 ↓	45.04%	Overexploited and in overexploitation	Reduce fishing mortality immediately



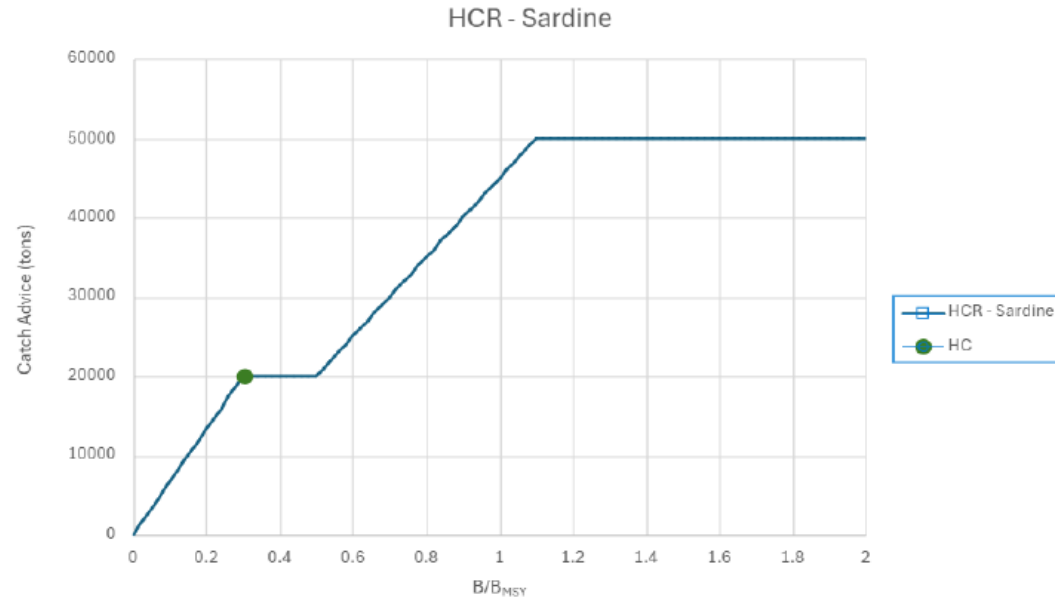
Short term (2026) and long term (2030) forecast

scenario	C2026	F2026/Fmsy	B2026/Bmsy	B2026/	B2026/Bthr	B2026/Blim
80% Fcur	20460.4	1.454	0.317	0.317	0.633	1.055
85% Fcur	21457.7	1.545	0.313	0.313	0.625	1.042
90% Fcur	22425.7	1.635	0.309	0.309	0.617	1.028
95% Fcur	23365	1.726	0.305	0.305	0.609	1.015
100% Fcur	24276.2	1.817	0.301	0.301	0.601	1.002
110% Fcur	26016.4	1.999	0.293	0.293	0.586	0.976
120% Fcur	27650.8	2.181	0.285	0.285	0.571	0.951
Ftgt	15010.4	0.999	0.338	0.338	0.676	1.127
Fpa	13941.9	0.917	0.342	0.342	0.684	1.14

scenario	C2030	F2030/Fmsy	B2030/Bmsy	B2030/	B2030/Bthr	B2030/Blim
80% Fcur	23355.1	1.454	0.361	0.361	0.723	1.205
85% Fcur	23309.1	1.545	0.34	0.34	0.679	1.132
90% Fcur	23175.4	1.635	0.319	0.319	0.638	1.063
95% Fcur	22964.6	1.726	0.299	0.299	0.599	0.998
100% Fcur	22686.2	1.817	0.281	0.281	0.562	0.936
110% Fcur	21961	1.999	0.247	0.247	0.494	0.824
120% Fcur	21061.8	2.181	0.217	0.217	0.435	0.724
Ftgt	21844.7	0.999	0.492	0.492	0.984	1.64
Fpa	21177.4	0.917	0.519	0.519	1.039	1.731

Sardine

parameterized with Btr1 at Blim, Btr2 at BPA, and Btrig3 = 1.1 BMSY, while Cmin is set at 20.000 tonnes and Cmax at 50.000 tonne



HCR Input

B_{y+1} / B_{MSY} 0.308

Output

20000 t

Output values refer to the direct implementation of HCRs without further interpretation of other provisions of the Recommendation related to setting the annual catch limits.

Engraulis encrasicolus, European Anchovy



- Benchmarked in 2020 with 2019 data (updated assessment in 2025)
- Model SAM (The state-space assessment model)
- Total landings from all countries from 2000 to 2024
- Age data by each country
- Biomass index (4):

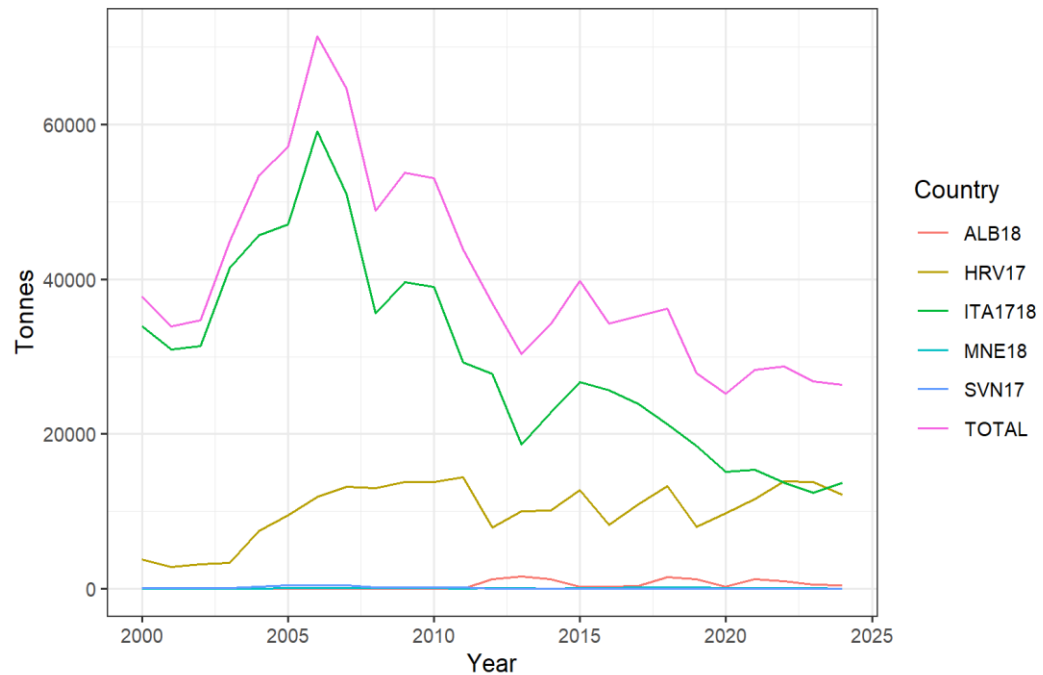
EU MEDIAS GSA 17 West (Italy and Slovenia) (2004-2014), survey carried out in September, numbers-at-age, only age 0 and 1 considered;

EU MEDIAS GSA 18 West & East (Italy, Albania and Montenegro) (2004-2014), survey carried out in summer, numbers-at-age, only age 1 and 2 considered;

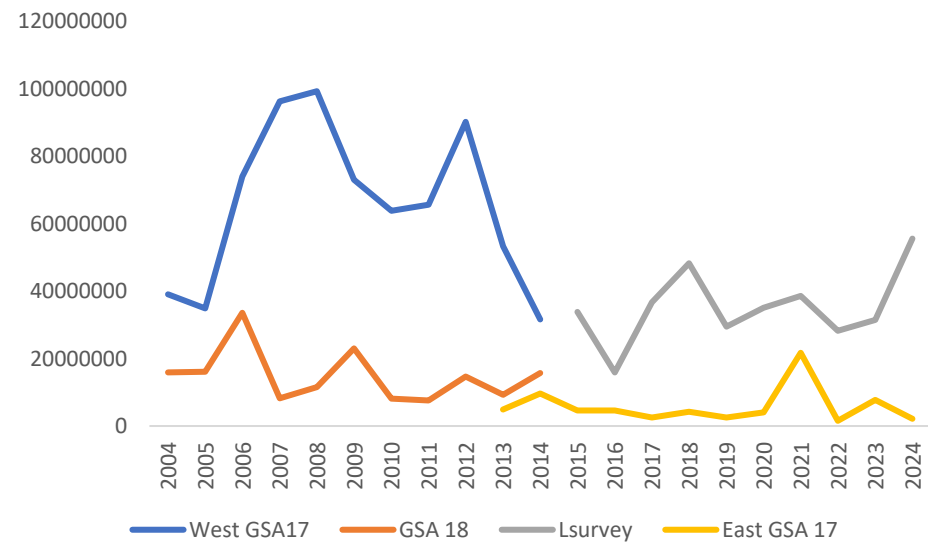
EU MEDIAS Lsurvey (Italy, Slovenia, Albania and Montenegro) (2015-2024), including Italian GSA 17, Slovenia and all GSA 18, survey carried out during summer (June-July), numbers-at-age, only age 1 and 2 considered;

EU MEDIAS Croatia (EchoEast 17) (2013-2024), numbers-at-age, age 0 in 2021 and 2023 was removed.

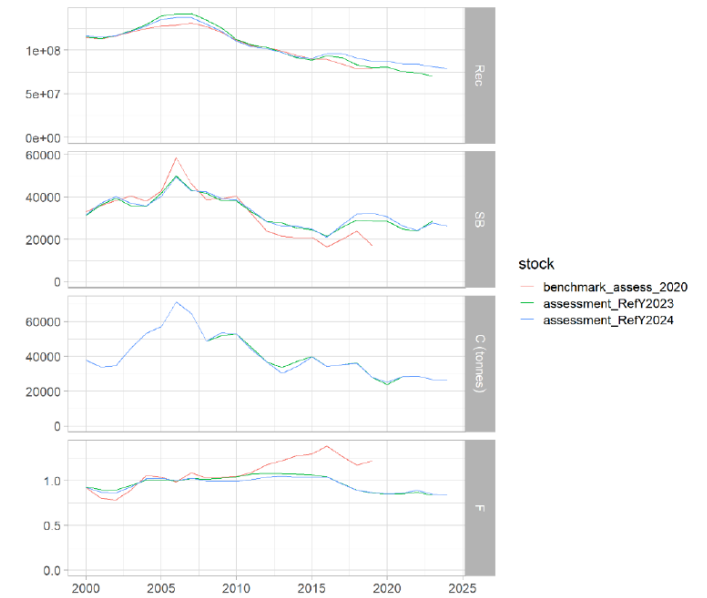
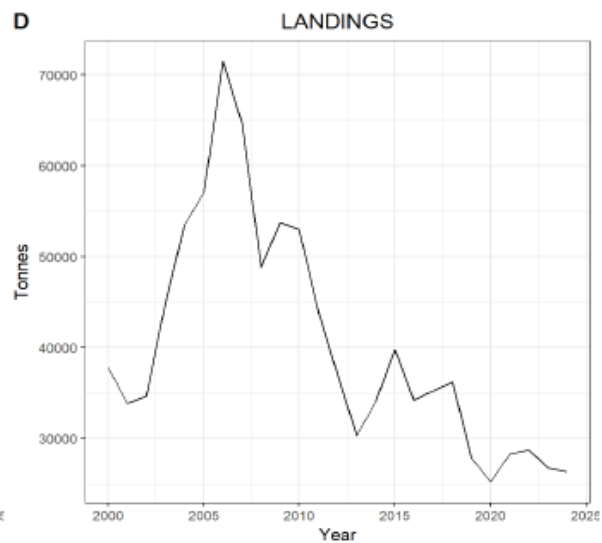
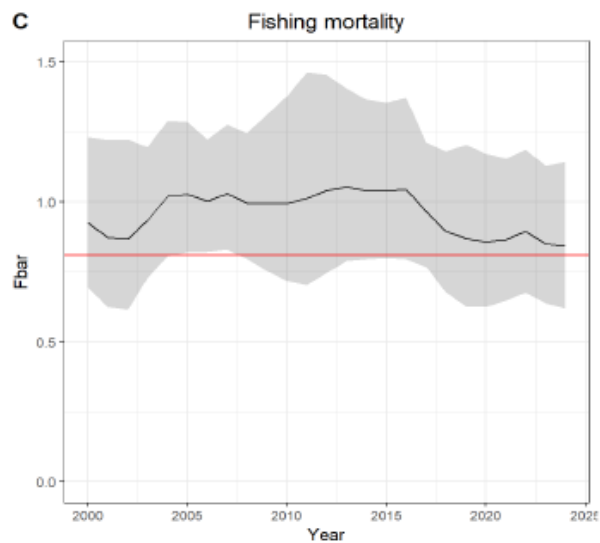
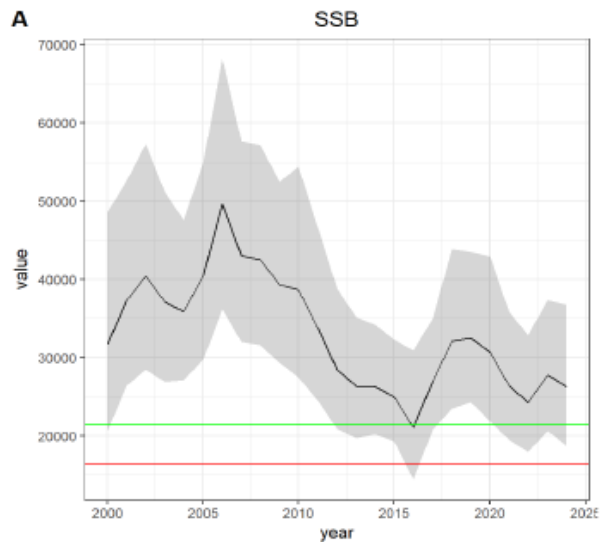
LANDINGS



Abundances of indexes

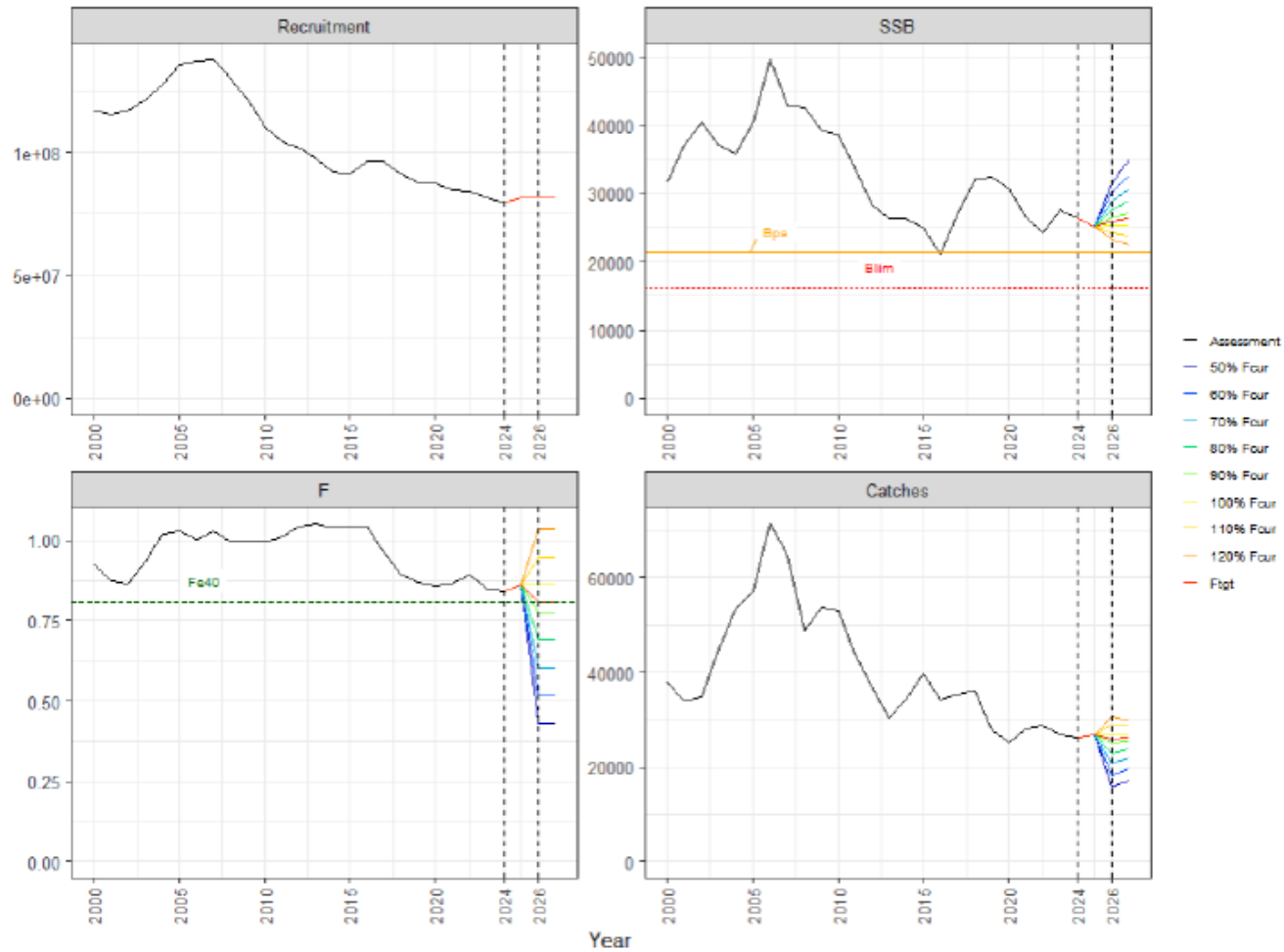


Size/Age	Natural mortality	Proportion of matures
0	2.75	0
1	1.21	1
2	0.89	1
3	0.76	1



Change from previous year

GSA	Species	Reference year	Method	Current Levels	Reference Points	Quantitative Status	Percentage of F reduction*	Stock Status	Scientific Advice
17,18	Engraulis encrasicolus	2024	SAM	$F_c = 0.84$, $B_c = 26263$	$F_{msy} = 0.81$, $B_{pa} = 21400$, $B_{lim} = 16200$	$F/F_{target} = 1.04$ ↑ $B/B_{threshold} = 1.23$, ↓ $B/B_{limit} = 1.62$ ↓	3.64%	Biomass above reference point and in overexploitation	Reduce fishing mortality

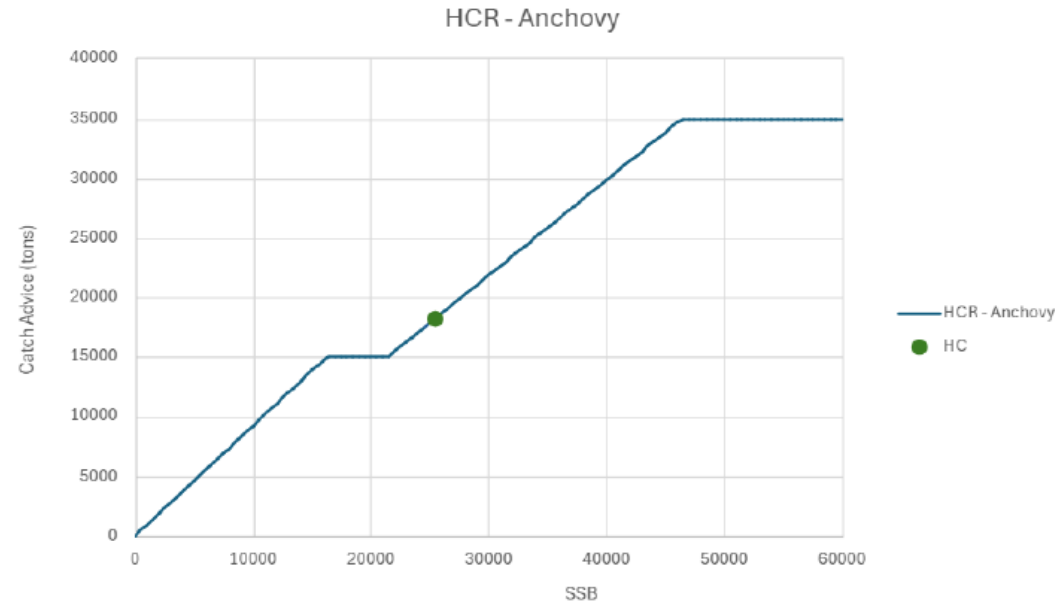


Short term (2026) forecast

Scenario	C2026	F2026	B2026	dB%2026
50% Fcur	15431.9	0.42	31765.1	20.95
60% Fcur	17973.4	0.504	30457.6	15.97
70% Fcur	20362.9	0.588	29204	11.2
80% Fcur	22611.1	0.673	28002	6.62
90% Fcur	24728.1	0.757	26849.4	2.23
100% Fcur	26723	0.841	25744.3	-1.97
110% Fcur	28604.6	0.925	24684.6	-6.01
120% Fcur	30380.5	1.009	23668.6	-9.88
Ftgt	26009.8	0.81	26141.5	-0.46

Anchovy

parameterized with Btr1 at Blim (16 200 tonnes), Btr2 at BPA (21.400 tonnes) and Btr3 at 46.400 tonnes, while Cmin is set at 15.000 tonnes and Cmax at 35.000 tonnes



HCR Input

SSB_{y+1} 25397

Output

18198 t

Output values refer to the direct implementation of HCRs without further interpretation of other provisions of the Recommendation related to setting the annual catch limits.

- A multiannual management plan for small pelagic fisheries in the Adriatic Sea was adopted in 2021, establishing a management framework for fisheries targeting sardine (*Sardina pilchardus*) and European anchovy (*Engraulis encrasicolus*) in geographical subareas (GSAs) 17 and 18 for the period 2022–2029.
- Enforces a two-step approach, with a transitional period of three years.
 - Transitional regime in 2022–2024 based on the fixed annual reductions of the total catch of sardine and anchovy (small pelagics).
 - Long-term phase (from 2025) based on the single species annual catch limits based on the status of the stock and adopted HCR.
- Encourages relevant countries to provide active support in improving the quality of scientific advice and in contributing to the management strategy evaluation (MSE) process. This work has been undertaken, resulting in the identification of the most appropriate HCR to be implemented in the long-term phase.
- Determines spatio-temporal closures to protect sardine and anchovy during the spawning periods and in the areas important for the protection of juveniles.
- Imposes capacity limitations in terms of number of vessels, gross tonnage (GT) and power (kW).
- Establishes an inspection scheme to ensure compliance with the conservation and management measures in place.

Recommendation GFCM/44/2021/20 - Spatial and temporal closure

23. During the transitional period, the CPCs shall apply specific temporal closures at the fleet level, not necessarily simultaneous for purse seiners and pelagic trawlers, in view of protecting the stocks during the spawning period. Such closures shall cover the entire distribution of small pelagic stocks in the Adriatic Sea and affect all fleets targeting small pelagics, for no less than 30 successive days per fleet segment. During the closure period, vessels belonging to fleets subject to a closure shall be prohibited to change gear to target small pelagics (such as purse seine to or from pelagic trawl). Such closures shall take place according to the following timeframes: a) from 1 October to 31 March for sardine; and b) from 1 April to 30 September for anchovy.

24. By way of derogation from paragraph 23, such temporal closures may be implemented for periods of no less than 15 successive days for national fleets of less than 15 purse seiners and/or pelagic trawlers actively fishing for small pelagic stocks.

25. During the transitional period, the CPCs shall apply spatial closures to vessels over 12 metre length overall (LOA) for no less than 9 months. Such closures shall cover 30 percent of the territorial or inner waters identified as important for the protection of early-age classes of fish.

26. The CPCs shall communicate to the GFCM Secretariat, not later than 30 April 2022 and thereafter annually, the spatial restrictions, as defined in paragraphs 23 and 25, that they apply in the waters under their jurisdiction with a view to protecting spawning and nursery areas of small pelagic stocks.

Objectives

Ensure that exploitation levels of key stocks are at MSY by the end of 2028

- Prevent an increase in fishing capacity
- Protect nursery and spawning areas and essential fish habitats important for the key stocks
- Contribute to the elimination of discards
- Provide for measures to adjust the fishing capacity while ensuring economically viable fleets without overexploiting marine living resources.

The last management plan for small pelagics in the Adriatic Sea is contained in the Recommendation GFCM/44/2021/20 on a multiannual management. Recommendation GFCM/48/2025/5 on a long-term fishing regime and the establishment of catch limits in 2026 for small pelagic stocks in the Adriatic Sea (geographical subareas 17 and 18) has been enforced and the catch limits for sardine and anchovy for 2026 are established:

Table of 2026 fishing opportunities by contracting party and cooperating non-contracting party for sardine and anchovy in the Adriatic Sea (geographical subareas 17–18)

Species	European Union 2026 (tonnes)	Albania 2026 (tonnes)	Montenegro 2026 (tonnes)
Anchovy	23 808	663	158
Sardine	40 877	743	243

The spatial and temporal closures listed in paragraphs 23 to 26 of Recommendation GFCM/44/2021/20 shall be extended under the long-term management plan until 31 December 2027. The SAC shall re-evaluate, at its twenty-eighth session in 2027, the appropriateness and further extension of such measures from 1 January 2028 until 31 December 2029.

In 2019-2025 Croatian small pelagic fleets was subject to a period of fishing closure for small pelagic fleet targeting spawning of sardine during period January-February of approximate duration of 50 days. In 2024, winter closure season for sardine was from 24 December to 15 February (53 days in continuity). In period from 16 February to 28 February each vessel was limited to maximum 7 fishing days and a maximum total catch of 30t per vessel. In 2025 winter closure season for sardine was in same period as in 2024 (from 24 December to 15 February, 53 days in continuity). In period from 16 February to end of February each vessel was limited to maximum 50t per vessel.

Targeting the spawning period of anchovy in 2019-2023 temporal closure for entire small pelagic fleet was implemented in period from 1 to 30 of May. In 2024 closure period was moved to 26 April to 25 May. In period from 26 May to 31 May, in 2024, each vessel was limited to a maximum total catch of 30 tons per vessel. For 2025 closure period was from 1 to 30 of May.

Also, since 2016 Croatia is implementing spatio - temporal regulation. In 2019 more than 50% of inner water was closed for the period of 7 months area for entire fleet above 12m. For 2020 period of spatio-temporal closure for the same fleet in inner sea was 8 months while in 2021, 2022, 2023, 2024 and 2025 period of closure was 10.5 months (till 15 November).

In addition, in 2025 Croatia introduced complete ban of fishing activities with purse seine net srdelara in additional channel areas in period from 16 October to 15 November and in period from 20 November to 24 December.

Regarding the closure period, **Italy** has been enforcing for years a general regulation concerning the fishing gears and since 1988 a suspension (about 42 days) of fishing activity of pelagic trawlers and purse seiners has implemented in summer. In the most recent years this closure is divided by area, gear and species. In 2024 the observed closure period was implemented as follows:

- Anchovy

- i) Purse seiners operating from Trieste to Monfarlcone harbors: from the 1st of September to the 30th of September
- ii) Purse seiners operating from Venezia to Gallipoli harbors: from the 1st of April to the 30th of April
- iii) Pelagic trawlers operating from Trieste to Rimini harbors: from the 1st to the 30th of August
- iv) Pelagic trawlers operating from Pesaro to Ancona harbors: from the 1st to the 30th of June
- v) Pelagic trawlers operating from San Benedetto del Tronto to Gallipoli harbors: from the 1st of August to the 30th of August

- Sardine

- i. Purse seiners from Trieste to Ancona harbors: from the 20th of February to the 21st of March
- ii. Purse seiners from San Benedetto del Tronto to Gallipoli harbors: from the 1st of March to the 30th of March
- iii. Pelagic trawlers from Trieste to Ravenna harbors: from the 15th of December to the 13th of January
- iv. Pelagic trawlers from Rimini to Gallipoli harbors: from the 1st to the 30th of October

Slovenian authorities monitor the implementation of the measures under the indents a) and b) by regularly checking “InfoRib”, which is information system with data on fishing licenses, all the data from logbooks and landing declarations and data on first sales. Data from logbooks which allow for the control of executed fishing days and caught and landed quantities need to be entered into the “InfoRib” within 24 hours after the end of each fishing trip. Dates for a closure period remain the same: from 17th of March to 31th of March for sardine and 1st to 15th April for anchovy.

In **Montenegro** a closure period of 30 days was observed in 2024 and in 2025 from the 1st to the 30th of April, and from 15th January to 15th February.

Thank You
For Your Attention

Relevant Decisions

- Recommendation [GFCM/47/2024/4](#) on a long-term fishing regime and the establishment of catch limits in 2025 for small pelagic stocks in the Adriatic Sea (geographical subareas 17 and 18), stemming from Recommendation [GFCM/44/2021/20](#)
- Recommendation [GFCM/46/2023/5](#) on the extension of the transitional fishing regime and the establishment of catch limits in 2024 for small pelagic stocks in the Adriatic Sea (geographical subareas 17 and 18), stemming from Recommendation [GFCM/44/2021/20](#)