

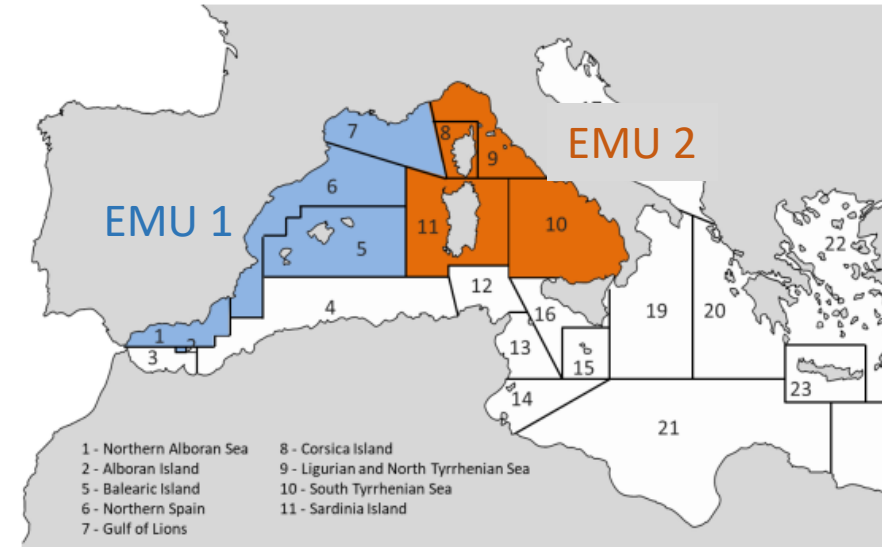
Evaluation of the fishing effort and catch
regime
for demersal fisheries in the western
Mediterranean Sea (part XI)
(EWG-23-11).

STECF EWG 23-11, 25 - 29 of September 2023

Cecilia Pinto and Ralf Doering
10th of April 2024

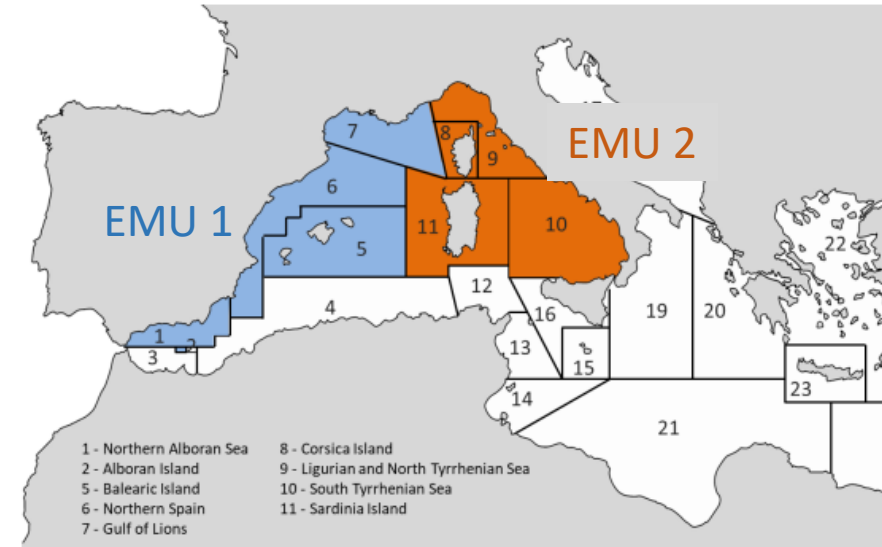
Overview of the Western Mediterranean Management Plan (2019/1022)

- The Commission adopted the MAP proposal in 2018
- The European Parliament and Council reached an agreement in 2019
- Annual effort quotas are set by the Council, since 01.01.2020
- The main characteristics of the regime are as follows:

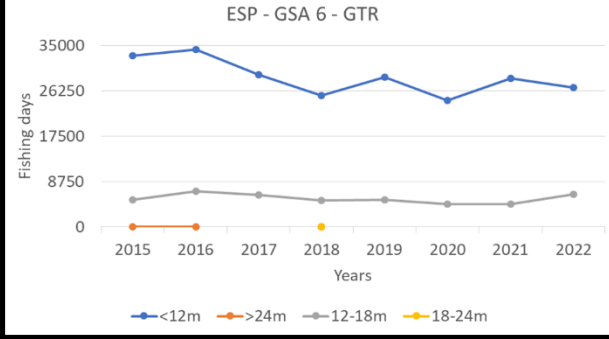
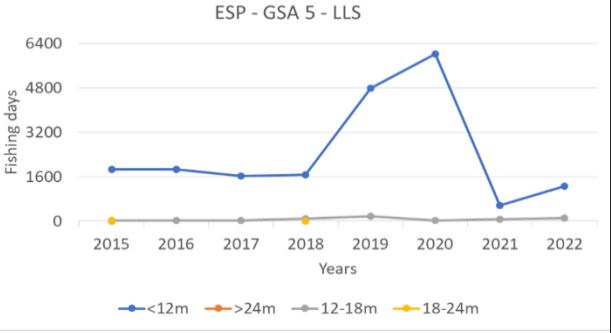
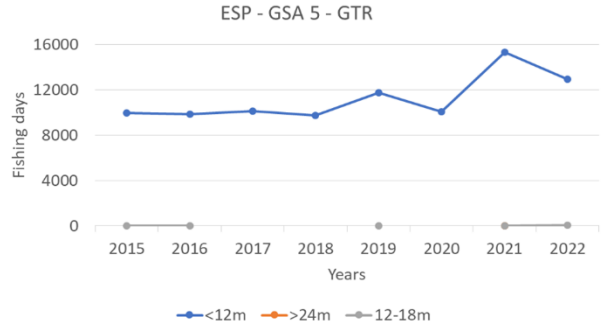
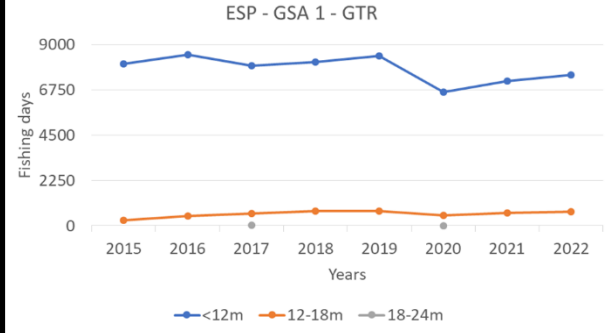
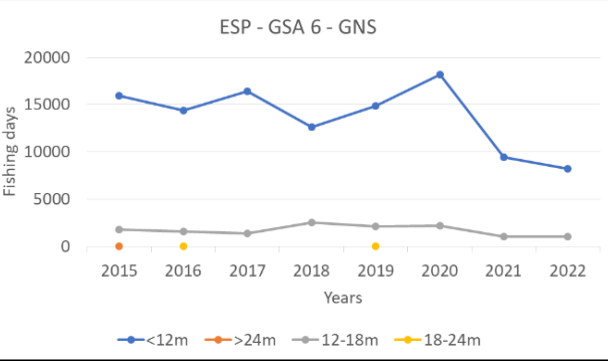
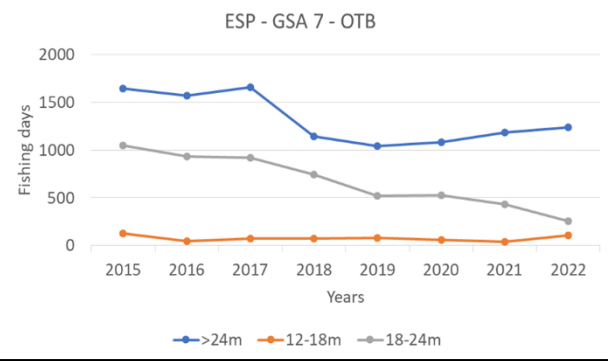
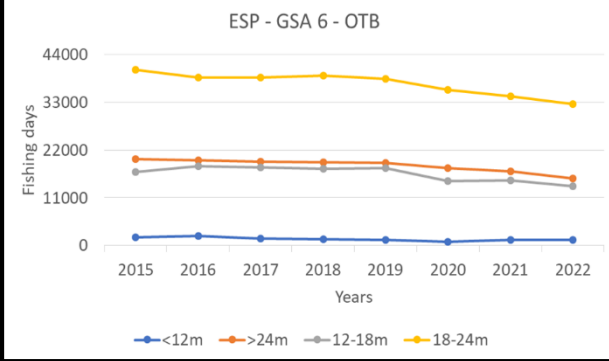
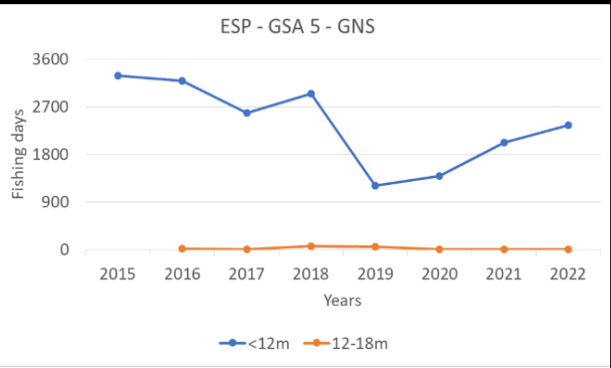
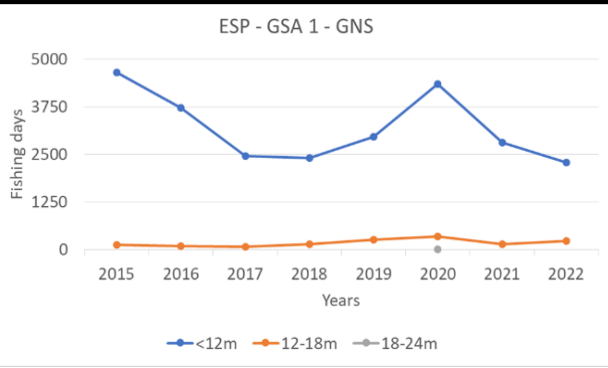
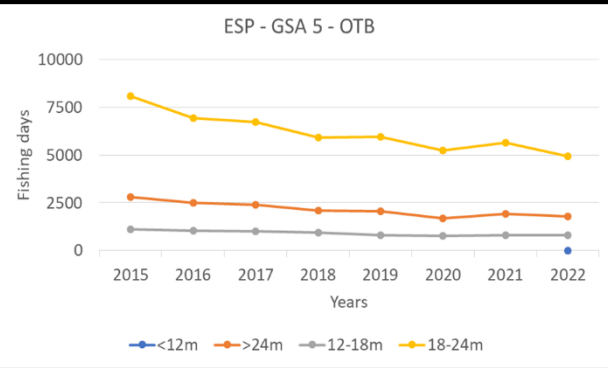
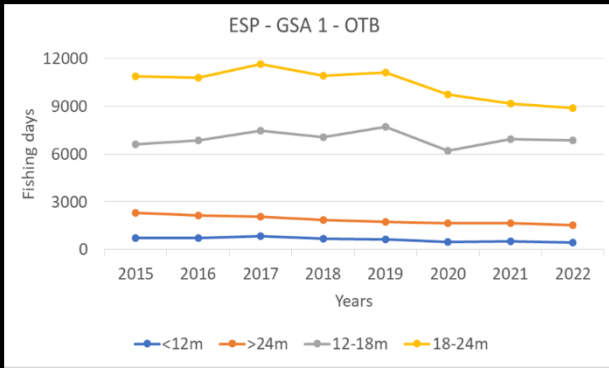


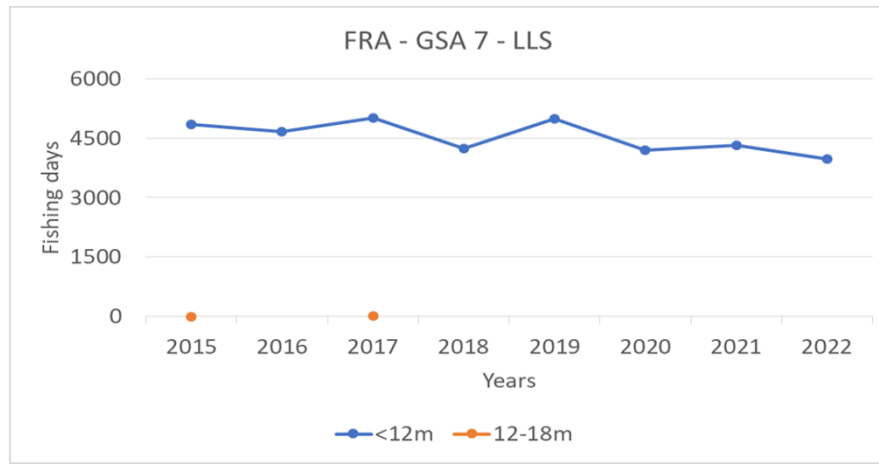
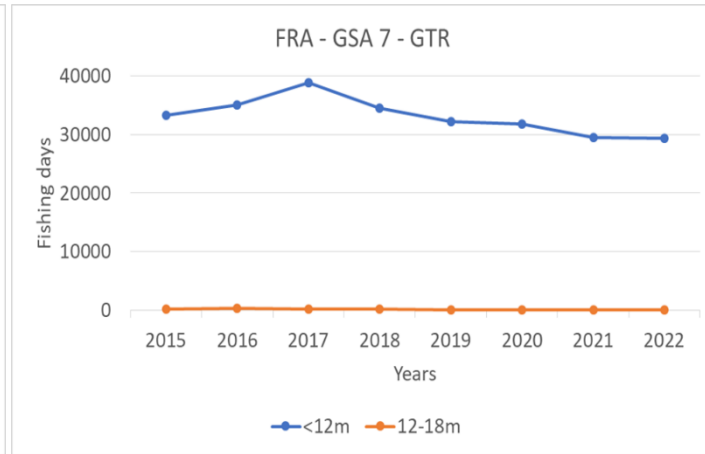
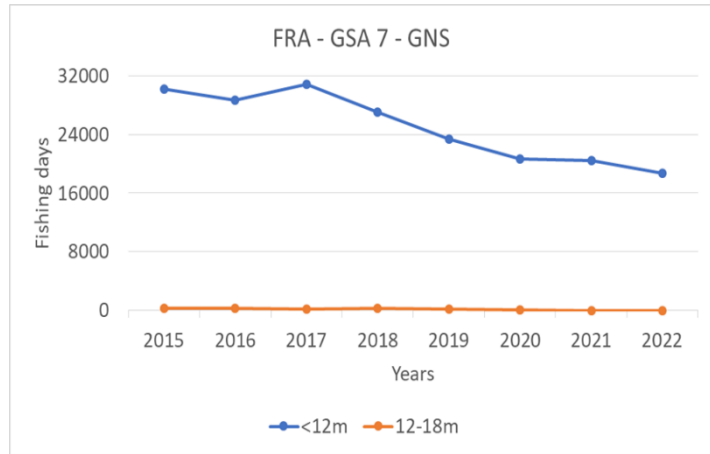
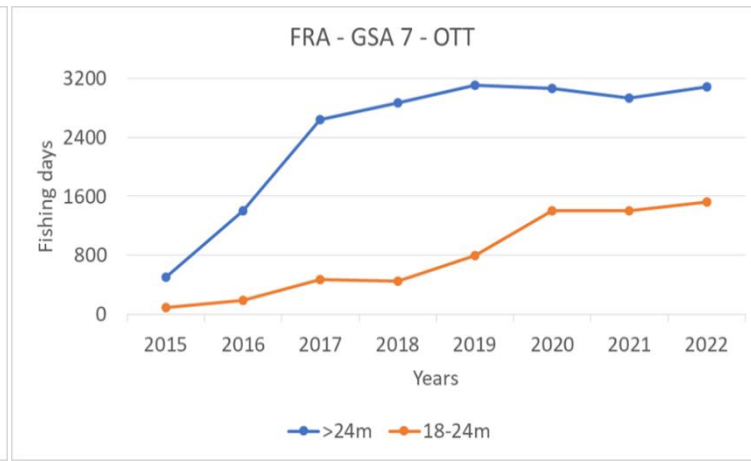
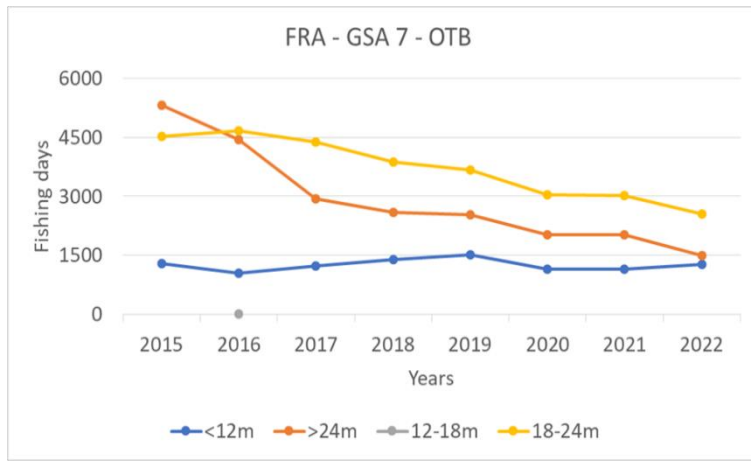
Overview of the Western Mediterranean Management Plan (2019/1022)

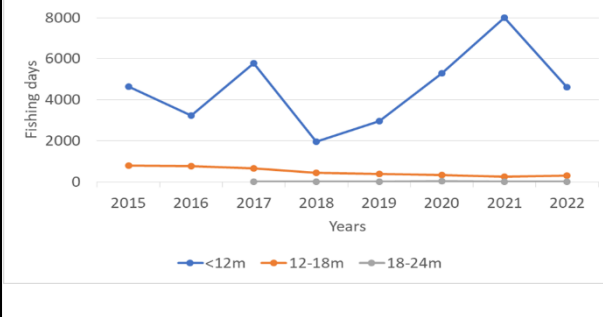
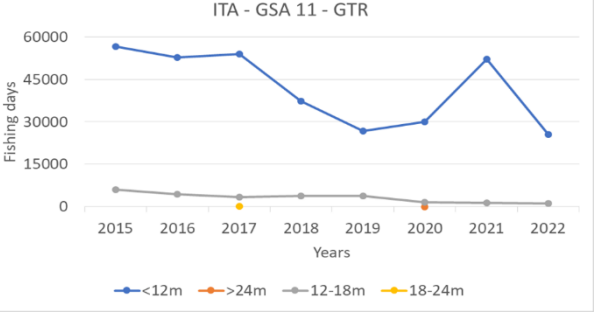
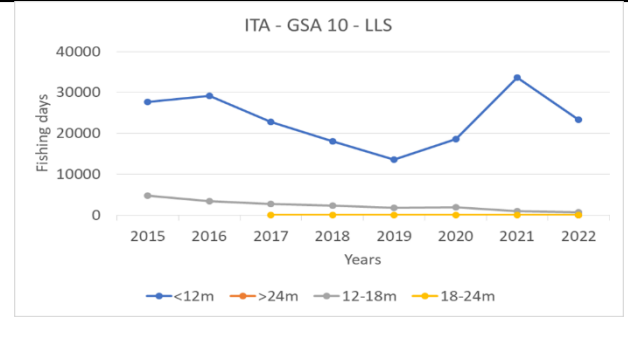
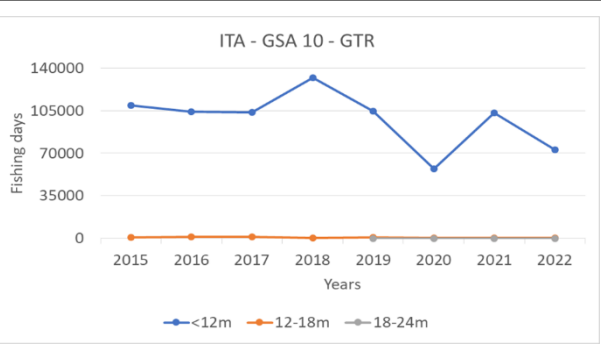
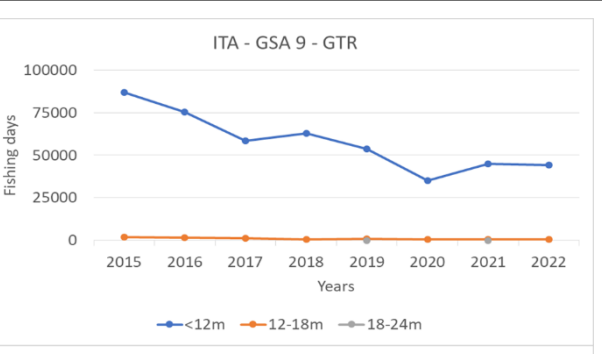
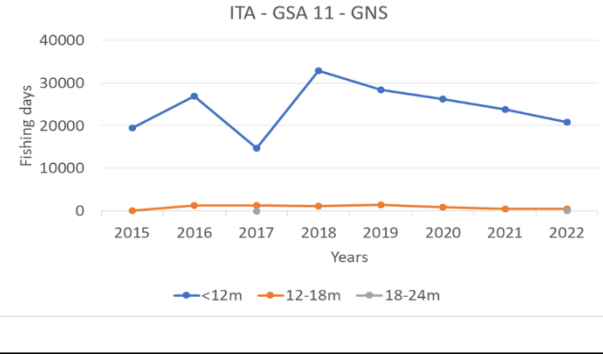
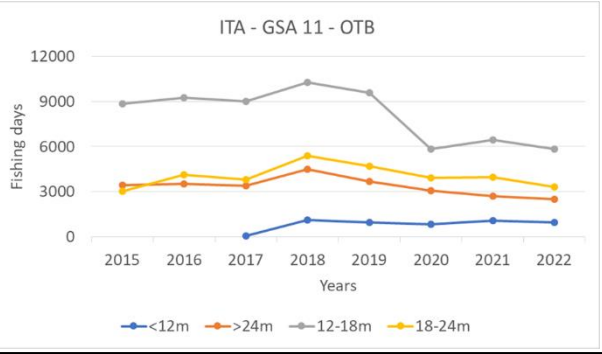
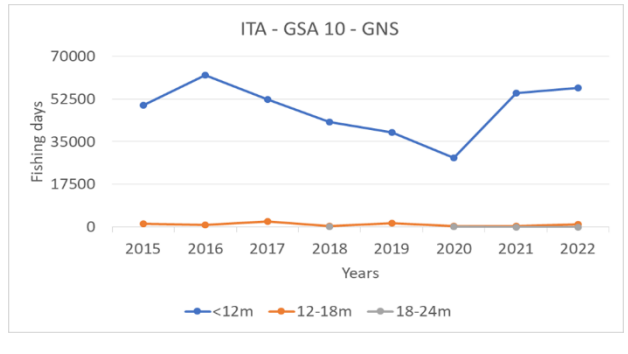
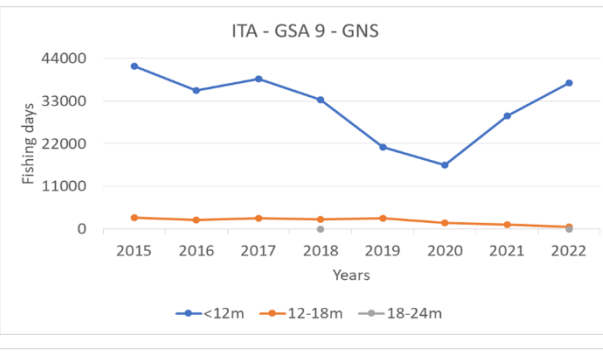
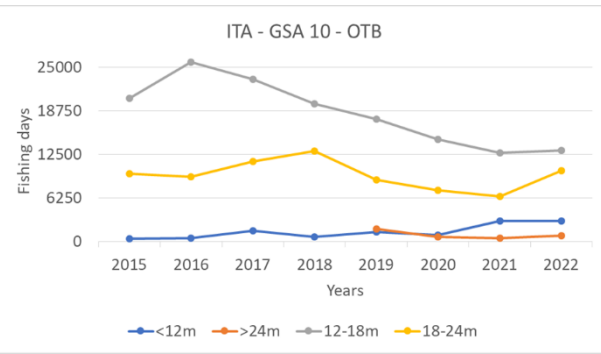
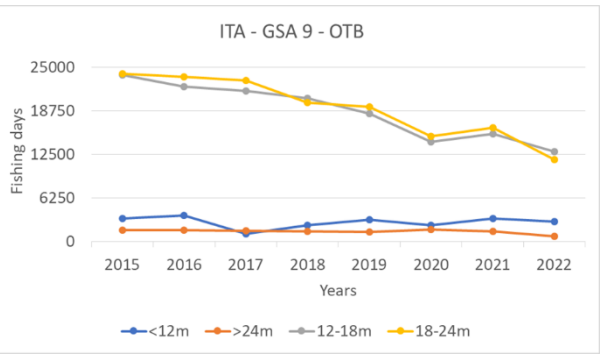
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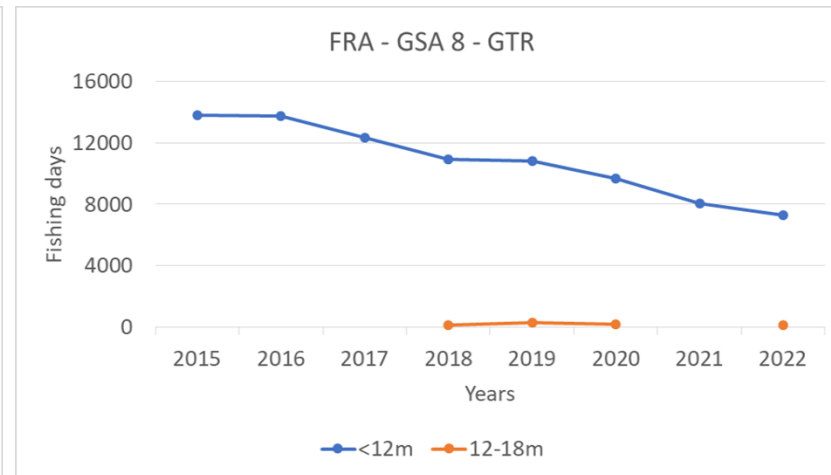
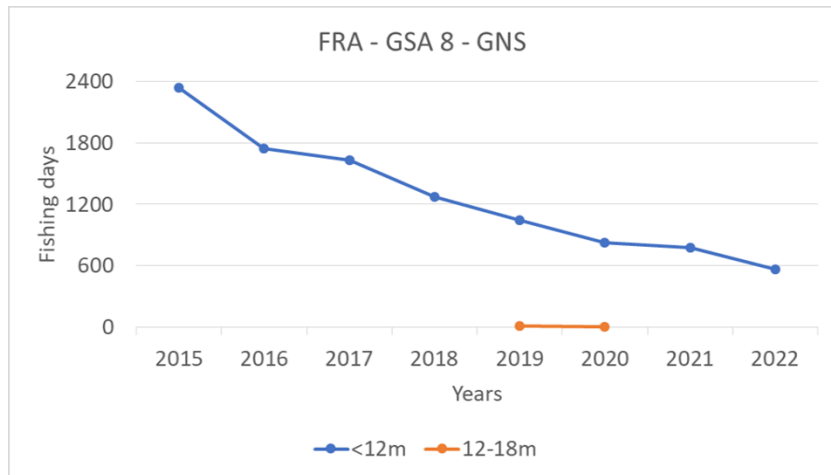
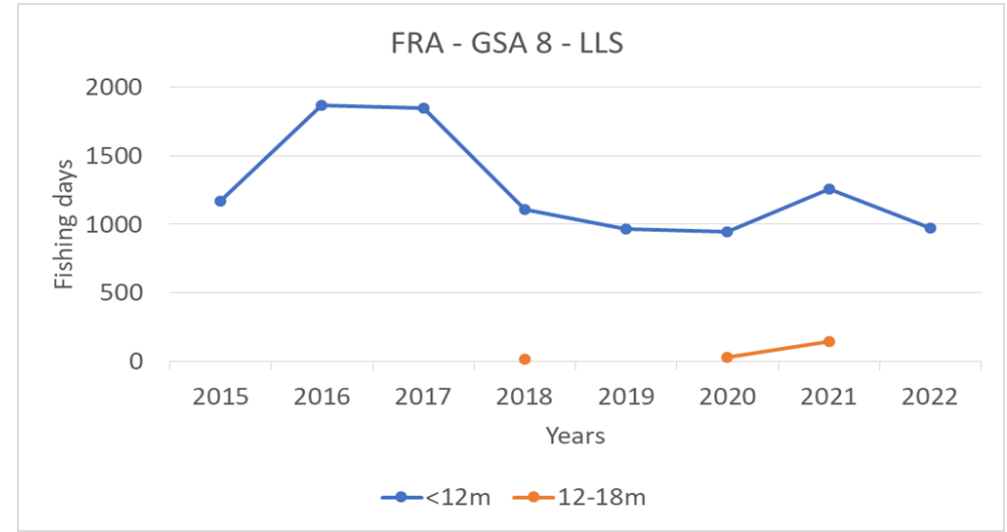
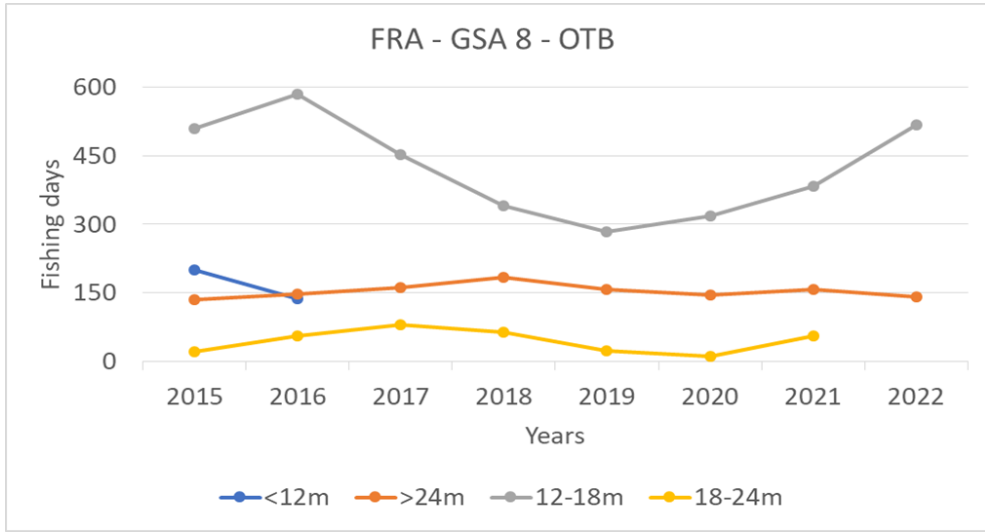


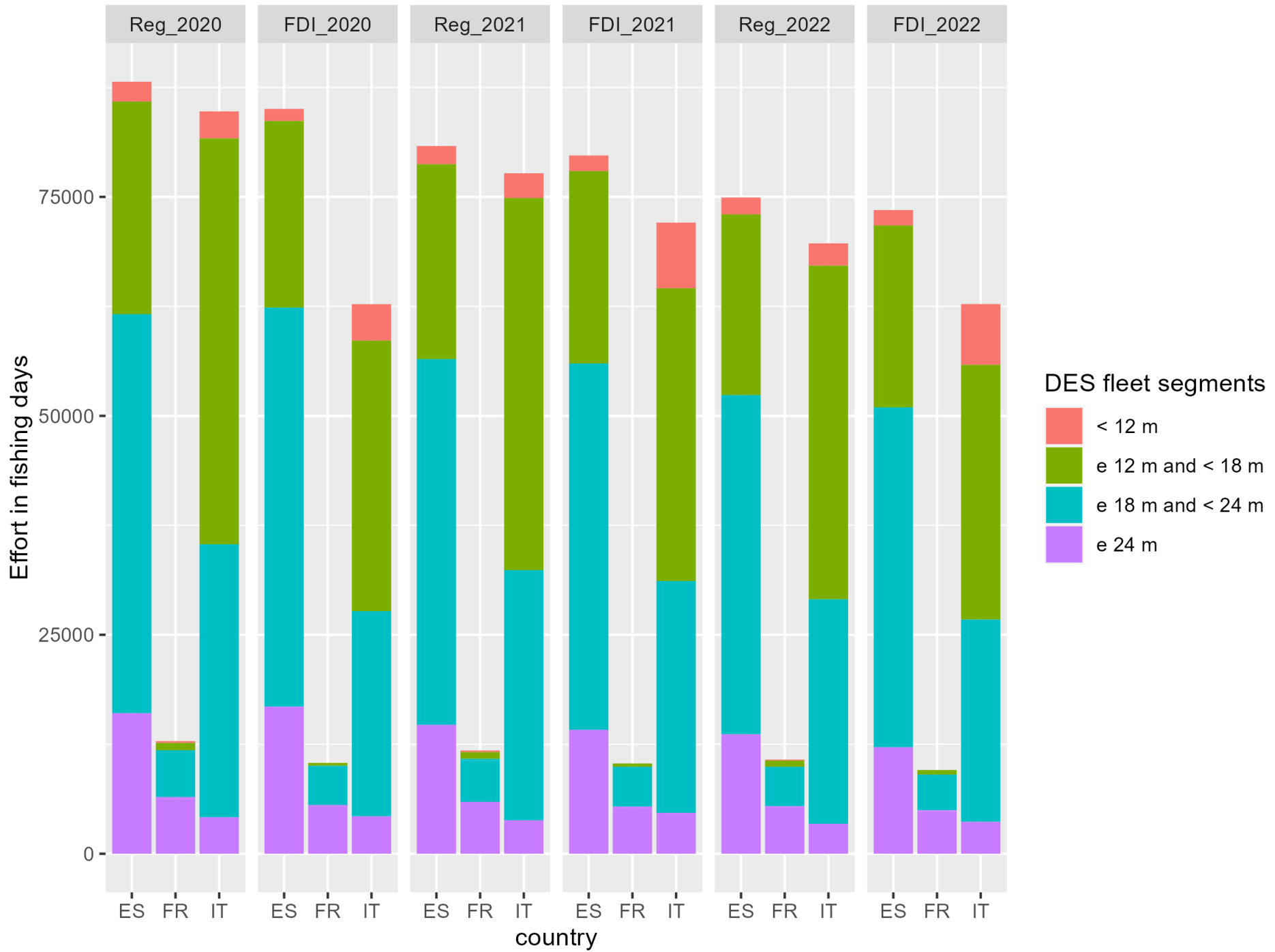
- Effort regime applicable to **all trawl vessels** targeting demersal stocks in EMU 1 (GSA 1-2-5-6-70) and in EMU 2 (GSA 8-9-10-11)
- Two effort groups (**6 species**): coastal fisheries (Hake, Red mullet, Deep-water rose shrimp, Norway lobster); deep water fisheries (Giant red shrimp, Blue and red shrimp)
- **Four fleet segments**: < 12m; 12-18m; 18-24m; and >24m
- **Effort quotas in terms of fishing days**
- Fishing day is limited to 15 hours (from port to port)
- **Baseline: average fishing days between 01.01.2015 and 31.12.2017**
- Implementation of **closure areas** to obtain a 15-25% reduction of total catches of juveniles and spawners (combination of temporal fishing bans and spatial closures)
- Since 2022 implementation of **maximum catch limits** on blue and red shrimp and giant red shrimp and effort limitations on longliners
- **Compensation mechanisms** since 2023

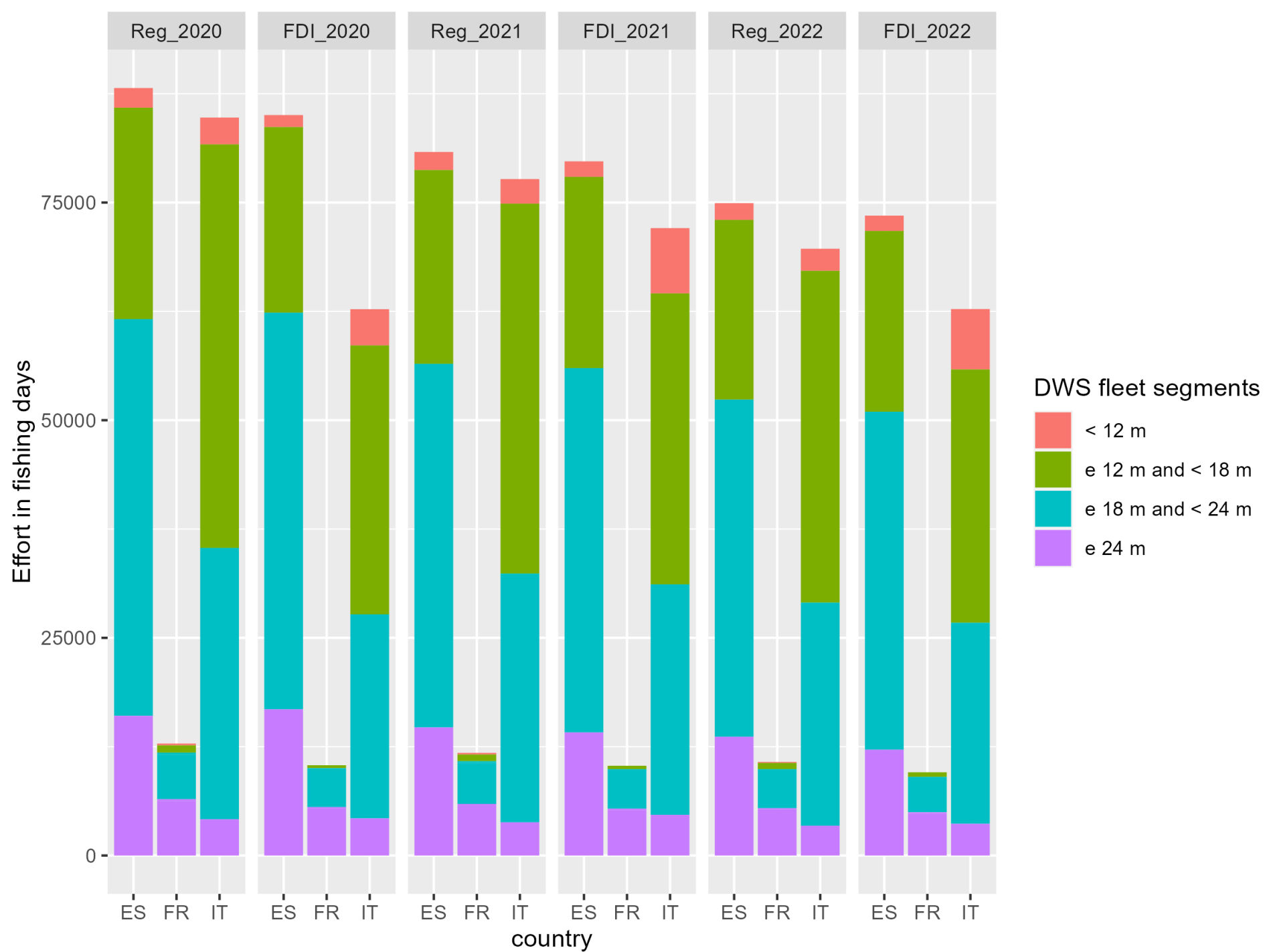












	2020	2021	2022	2023
Spain	10%	7.5%	6%	3,5% **+ 7%***
France	10%	7.5%	4%*	3,5% **
Italy	10%	10%	6%	7%

+

- maximum catch limits on ARA and ARS
- closure areas since 2020 and 2022

*also for Spanish vessels active in GSA 7 in France
 applied to 90% of the **coastal fleet
 ***applied to the deep-water fleet

- For the Fishing Opportunities for 2024, the MAP will be in the final year of the transition period and the legal obligation is to propose the remaining 9,5% effort reduction for trawlers as not all stocks are at MSY.
- There has not been reduction of effort for the other fishing gear than trawlers.

	Scenario (priority in grey*)	Trawler effort reduction in 2024**	Compensation mechanism for trawlers**	Post 2025 effort management	Combined catch limits (ARA and ARS) for 2024	post 2025 for catch limits (ARA &ARS)
1	Status Quo*	roll over effort in 2023	No Compensation mechanism	roll over effort in 2023	roll over catch limit 2023	roll over catch limit 2023
2	A*	2024: level of reduction that secures Fmsy by 1 January 2025 for all stocks	No Compensation mechanism	keep at Fmsy	roll over catch limit 2023	roll over catch limit 2023
3	B	9.50%	No Compensation mechanism	Effort to be set at Fmsy from 2025	-7% in 2024"	keep at Fmsy



	Scenario (priority in grey*)	Trawler effort reduction in 2024**	Compensation mechanism for trawlers**	Post 2025 effort management	Combined catch limits (ARA and ARS) for 2024	post 2025 for catch limits (ARA &ARS)
4	C*	9.50%	4% [4 week closure] 2024 & onwards	Effort to be set at Fmsy from 2025	2024: level of reduction that secures Fmsy by 1 January 2025 for all stocks	level of reduction that secures Fmsy from 2025 onwards for all stocks
5	D*	9.50%	4% [Selectivity improvement] 2024 (50% uptake in the fleet) & onwards	Effort to be set at Fmsy from 2025	2024: -5%	level of reduction that secures Fmsy from 2025 onwards for all stocks
6	E*	9.50%	5% [large and over 6mo-temporary closures] 2024 & onwards	Effort to be set at Fmsy from 2025	2024: -7%	level of reduction that secures Fmsy from 2025 onwards for all stocks
7	F	9.50%	4% [4 week closure] 2024 & onwards	Effort to be set at Fmsy from 2025	2024: -7%	level of reduction that secures Fmsy from 2025 onwards for all stocks



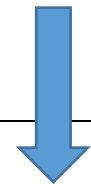
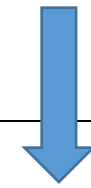
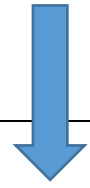
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9	H	9.50%	5% [large and over 6mo-temporary closures] 2024 & onwards	Effort to be set at Fmsy from 2025	2024: -5%	level of reduction that secures Fmsy from 2025 onwards for all stocks
10	I	9.50%	4% [4 week closure] 2024 & onwards	Effort to be set at Fmsy from 2025	2024: -5%	level of reduction that secures Fmsy from 2025 onwards for all stocks
11	J	9.50%	4% [Selectivity improvement] 2024 (50% uptake in the fleet) & onwards	Effort to be set at Fmsy from 2025	2024: -7%	level of reduction that secures Fmsy from 2025 onwards for all stocks
12	K	9.50%	5% [large and over 6mo-temporary closures] 2024 & onwards	Effort to be set at Fmsy from 2025	2024: level of reduction that secures Fmsy by 1 January 2025 for all stocks	level of reduction that secures Fmsy from 2025 onwards for all stocks
13	L*	roll over effort in 2023	4% [Selectivity improvement] 2024 (50% uptake in the fleet) and onwards	roll over effort in 2023 and 100% of the fleet improving gear selectivity in 2025.	roll over catch limit 2023	roll over catch limit 2023

	Scenario (priority in grey*)	Trawler effort reduction in 2024**	Compensation mechanism for trawlers**	Post 2025 effort management	Combined catch limits (ARA and ARS) for 2024	post 2025 for catch limits (ARA & ARS)
1	Status Quo*	roll over effort in 2023	No Compensation mechanism	roll over effort in 2023	roll over catch limit 2023	roll over catch limit 2023

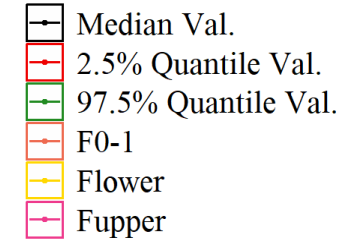
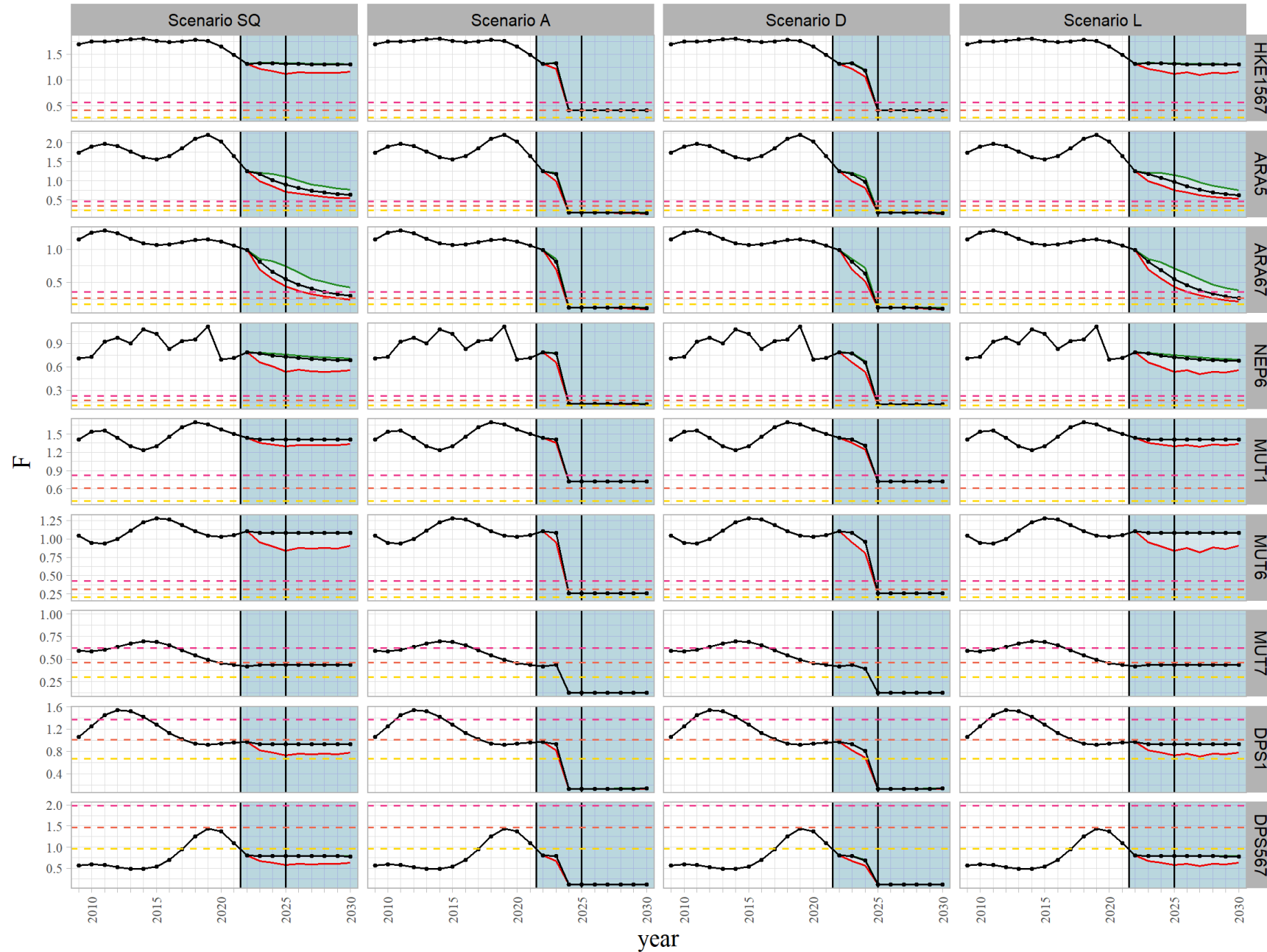
2	A*	2024: level of reduction that secures Fmsy by 1 January 2025 for all stocks	No Compensation mechanism	keep at Fmsy	roll over catch limit 2023	roll over catch limit 2023
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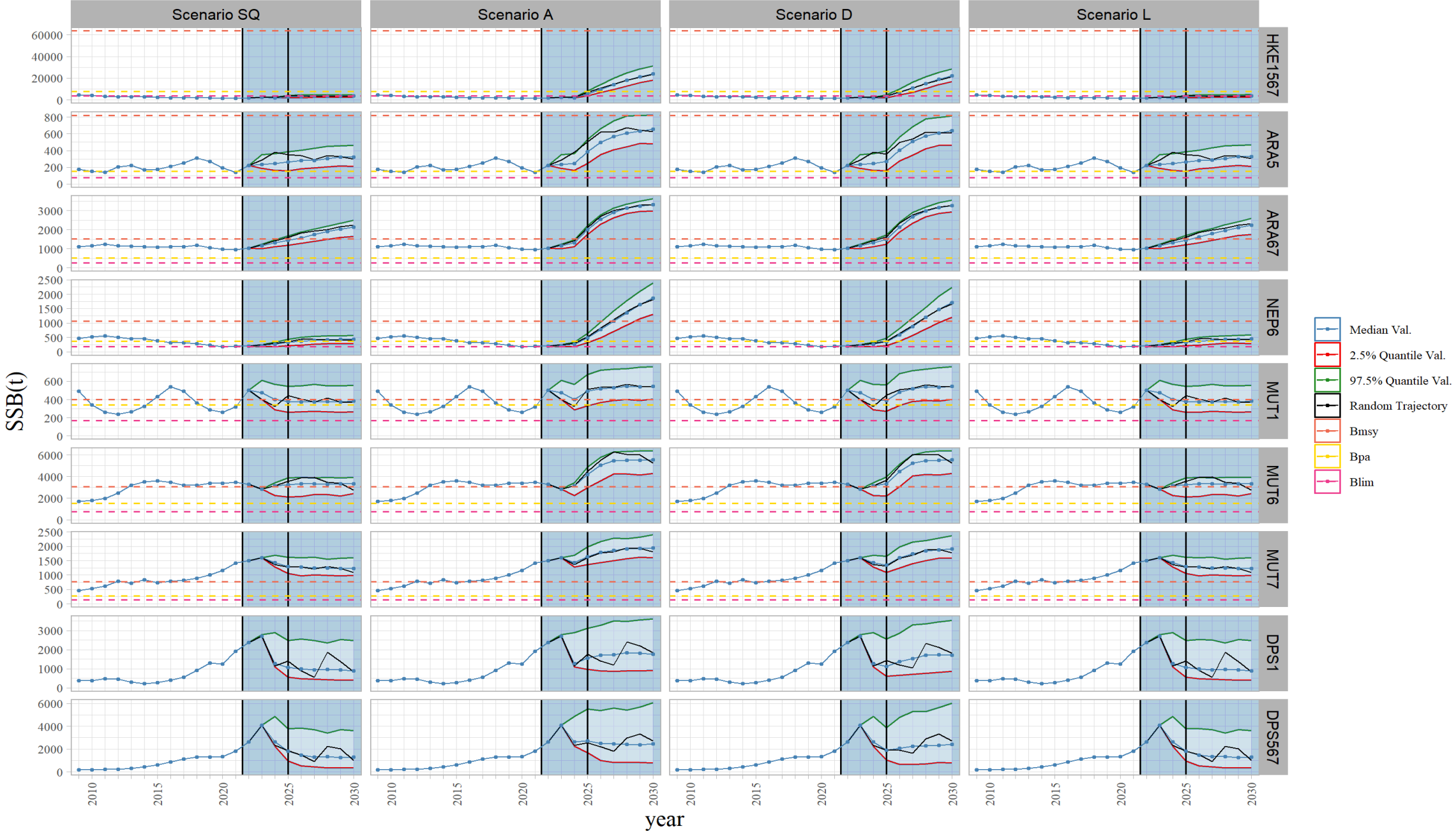
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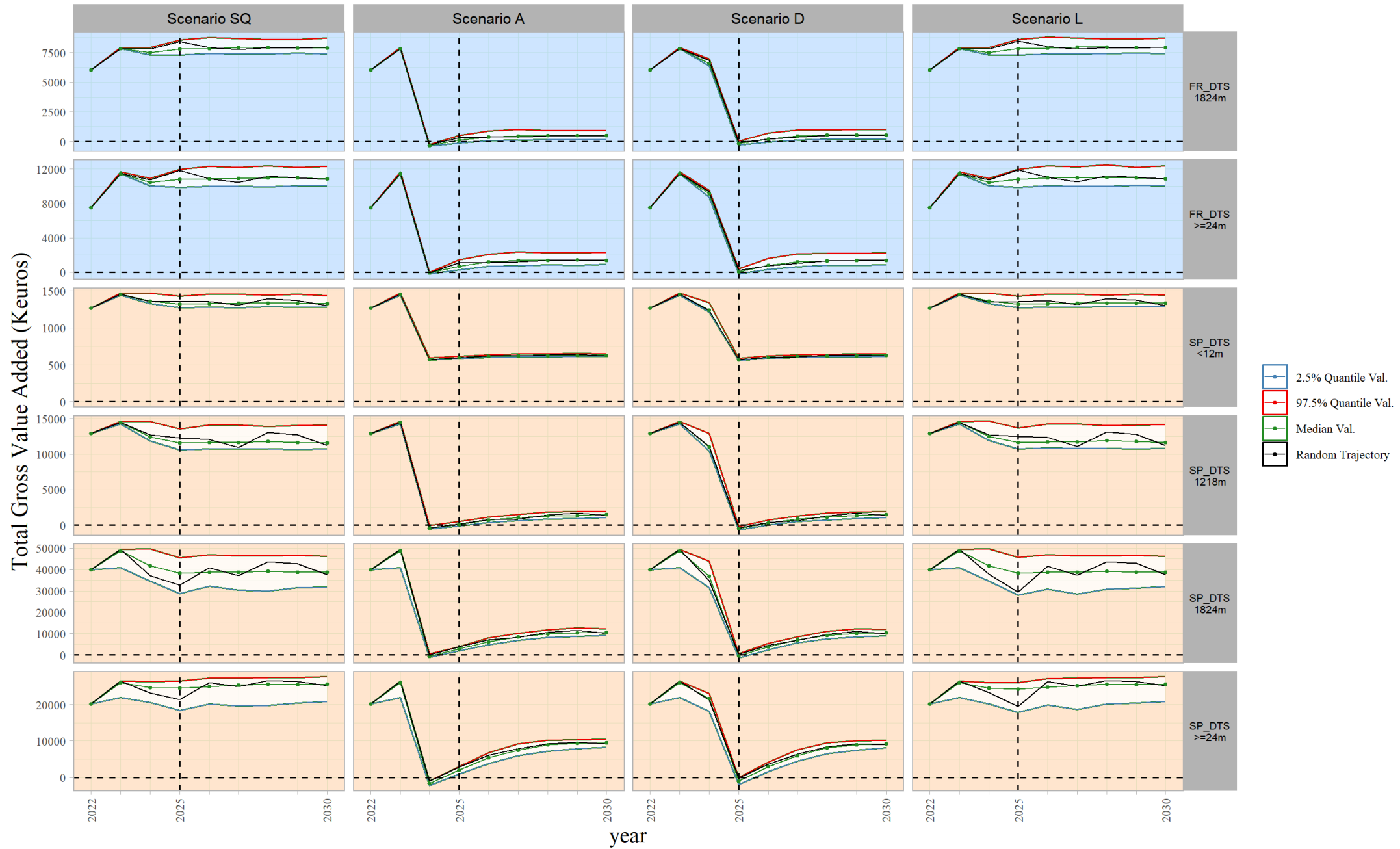
IAM in EMU 1



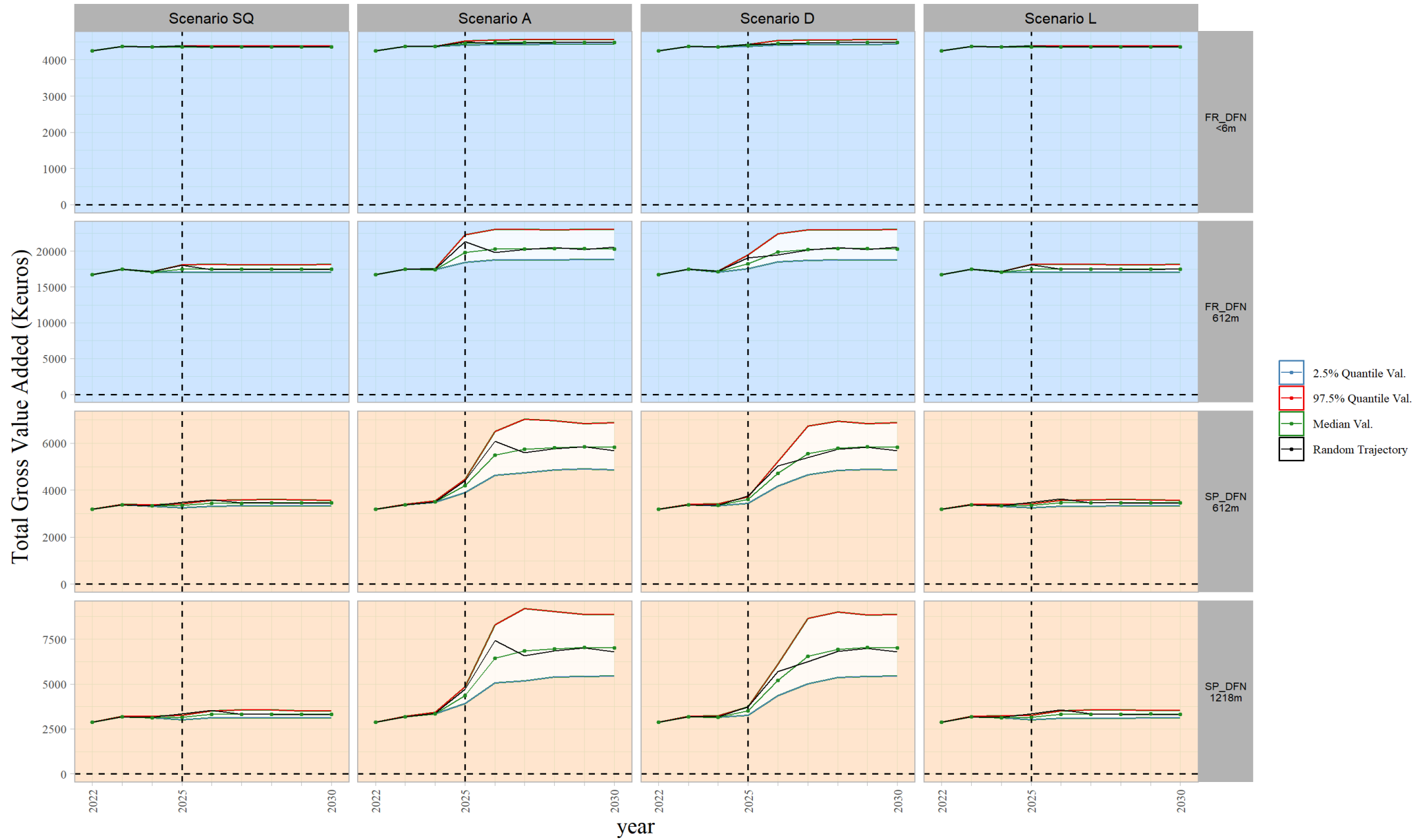
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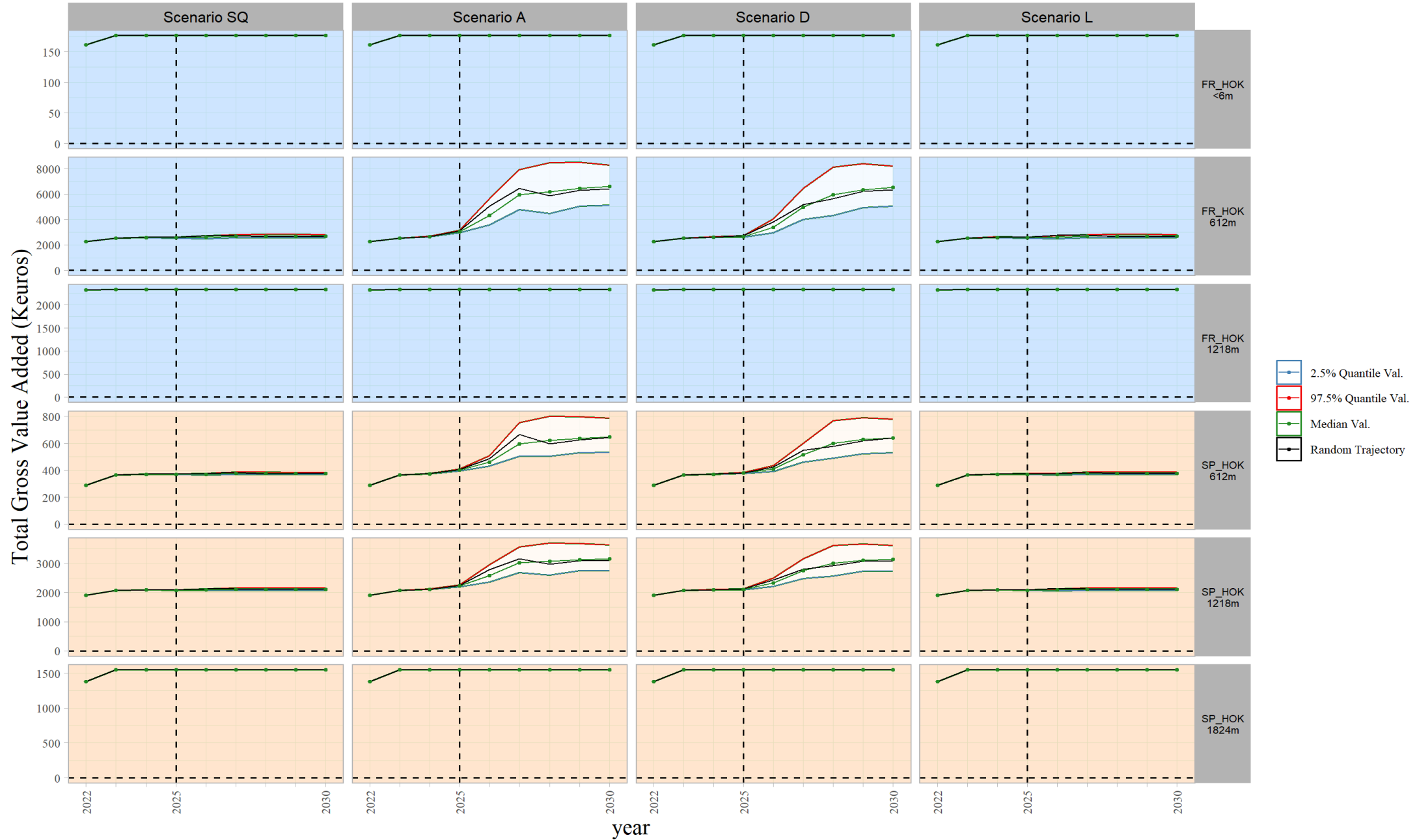
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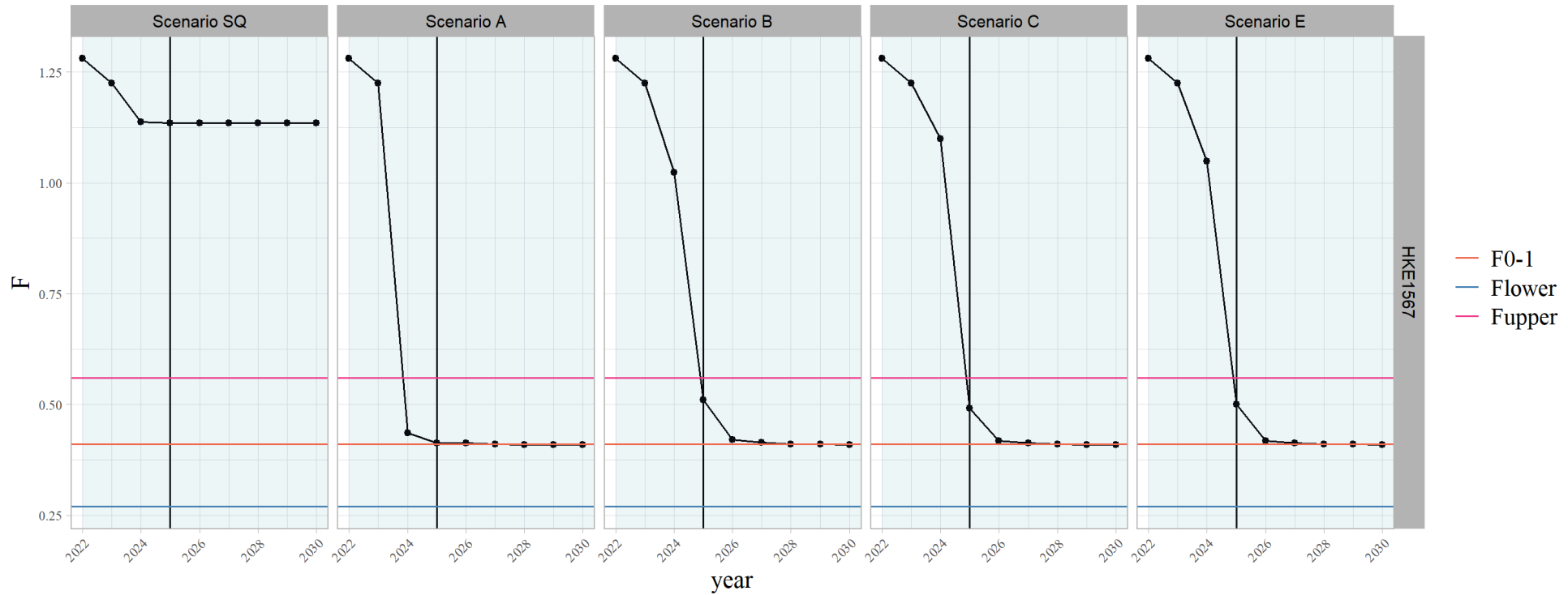
Scenarios	Fleet segments	(Estimated level of profitability) Gross profit margin in 2025	(Estimated level of profitability) Gross profit margin in 2030	% Gross profit margin change between 2022 - 2025	% Gross profit margin change between 2022 - 2030	FTE evolution between 2022 and 2024 (in number of FTE per MS and fishing technique)	FTE evolution between 2022 and 2025 (in number of FTE per MS and fishing technique)	FTE evolution between 2022 and 2030 (in number of FTE per MS and fishing technique)	% of change of FTE between 2022-2025	% of change of FTE between 2022-2030
SQ	FR_DTS	0,14	0,14	96,76	98,27	7,88	7,88	7,88	5,90	5,90
	FR_DFN	0,21	0,21	5,31	5,25	0,00	0,00	0,00	0,00	0,00
	FR_HOK	-0,01	-0,01	-48,11	-65,65	0,00	0,00	0,00	0,00	0,00
	SP_DTS	0,19	0,19	9,76	13,32	-125,58	-172,96	-274,40	-10,92	-17,32
	SP_DFN	0,42	0,43	6,43	8,27	0,00	0,00	0,00	0,00	0,00
	SP_HOK	0,04	0,04	103,67	113,47	0,00	0,00	0,00	0,00	0,00
A	FR_DTS	-0,35	-0,25	-595,66	-452,88	-111,13	-111,13	-111,07	-83,28	-83,23
	FR_DFN	0,22	0,23	12,85	14,38	0,00	0,00	0,00	0,00	0,00
	FR_HOK	0,00	0,08	-112,30	-442,40	0,00	0,00	0,00	0,00	0,00
	SP_DTS	-0,28	-0,03	-266,21	-119,43	-1364,24	-1364,24	-1367,00	-86,13	-86,30
	SP_DFN	0,47	0,53	18,34	33,42	0,00	0,00	0,00	0,00	0,00
	SP_HOK	0,05	0,10	146,30	411,68	0,00	0,00	0,00	0,00	0,00
D	FR_DTS	-0,47	-0,25	-766,42	-450,86	-8,18	-111,12	-111,05	-83,27	-83,22
	FR_DFN	0,21	0,23	8,00	14,36	0,00	0,00	0,00	0,00	0,00
	FR_HOK	-0,01	0,08	-62,15	-437,43	0,00	0,00	0,00	0,00	0,00
	SP_DTS	-0,48	-0,04	-385,74	-122,22	-265,60	-1361,43	-1365,03	-85,95	-86,18
	SP_DFN	0,44	0,53	10,46	33,41	0,00	0,00	0,00	0,00	0,00
	SP_HOK	0,04	0,10	113,45	407,75	0,00	0,00	0,00	0,00	0,00
L	FR_DTS	0,14	0,14	97,13	98,82	7,88	7,88	7,88	5,90	5,90
	FR_DFN	0,21	0,21	5,34	5,29	0,00	0,00	0,00	0,00	0,00
	FR_HOK	-0,01	-0,01	-47,99	-66,37	0,00	0,00	0,00	0,00	0,00
	SP_DTS	0,18	0,19	8,49	13,47	-89,42	-122,33	-269,91	-7,72	-17,04
	SP_DFN	0,42	0,43	6,45	8,34	0,00	0,00	0,00	0,00	0,00
	SP_HOK	0,04	0,04	103,65	113,89	0,00	0,00	0,00	0,00	0,00

	Indicator
	Gross Profit Margin
	>10% - High
	0-10% - Reasonable
	<0% - Weak

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6	E*	9.50%	5% [large and over 6mo-temporary closures] 2024 & onwards	Effort to be set at Fmsy from 2025	 2024: -7%	level of reduction that secures Fmsy from 2025 onwards for all stocks

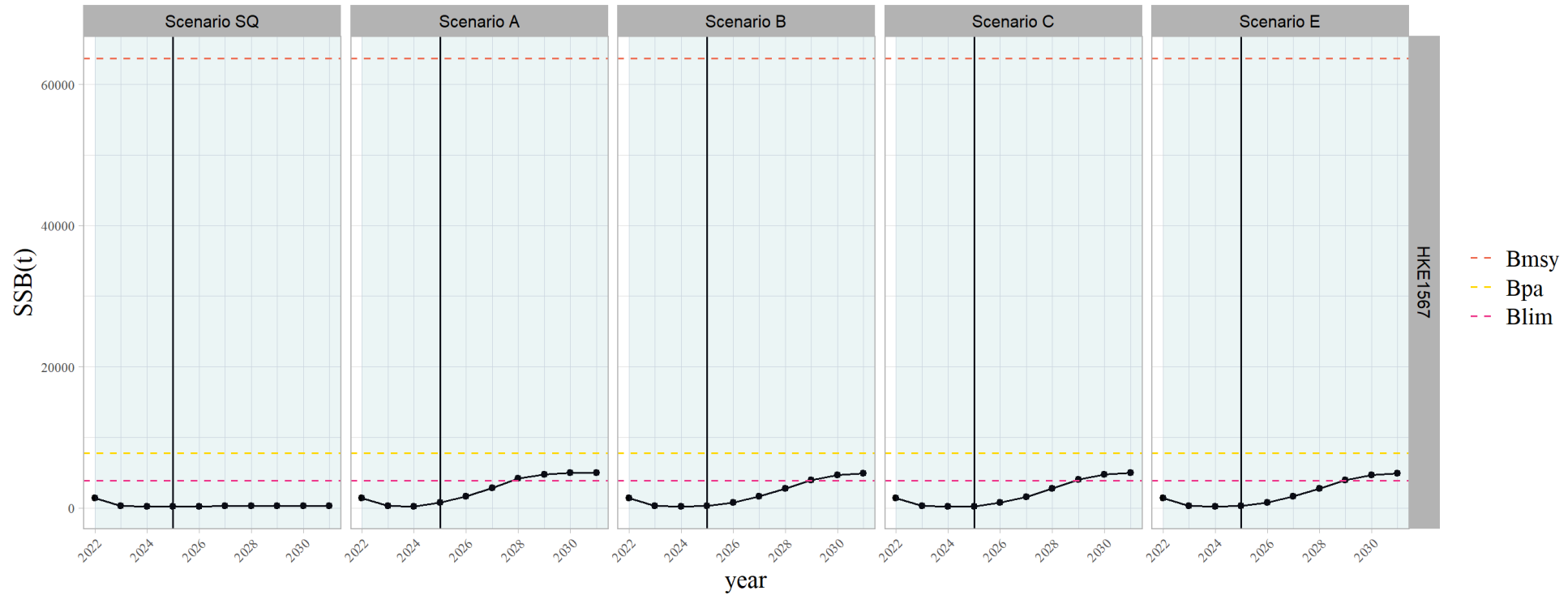
ISIS-Fish in EMU 1






Scenarios		2023	2024	2025+
SQ	effort FR	2023 quota	2023	2023
	closures FR	x	x	x
	4 weeks FR			
	effort ESP DEF	2023 quota	2023	2023
SQ	effort ESP DWS	2023 quota	2023	2023
	closures ESP	x	x	x
	4 weeks ESP	x		
A keep Fmsy	effort FR	2023 quota	control rule	control rule
	closures FR	x	x	x
	4 weeks FR			
	effort ESP DEF	2023 quota	control rule	control rule
A keep Fmsy	effort ESP DWS	2023 quota	control rule	control rule
	closures ESP	x	x	x
	4 weeks ESP	x		
B 9.5%	effort FR	2023 quota	-9.5%	control rule
	closures FR	x	x	x
	4 weeks FR			
	effort ESP DEF	2023 quota	-9.5%	control rule
B 9.5%	effort ESP DWS	2023 quota	-9.5%	control rule
	closures ESP	x	x	x
	4 weeks ESP	x		
C 4 weeks FR 4 weeks reconnected ESP	effort FR	2023 quota	-9.5+4%	control rule
	closures FR	x	x	x
	4 weeks FR		x	x
	effort ESP DEF	2023 quota	-9.5+4%	control rule
C 4 weeks FR 4 weeks reconnected ESP	effort ESP DWS	2023 quota	-9.5%	control rule
	closures ESP	x	x	x
	4 weeks ESP	x	x	x
E large closures rewarded 2024	effort FR	2023 quota	-9.5+5%	control rule
	closures FR	x	x	x
	4 weeks FR			
	effort ESP DEF	2023 quota	-9.5%	control rule
E large closures rewarded 2024	effort ESP DWS	2023 quota	-9.5%	control rule
	closures ESP	x	x	x
	4 weeks ESP	x		



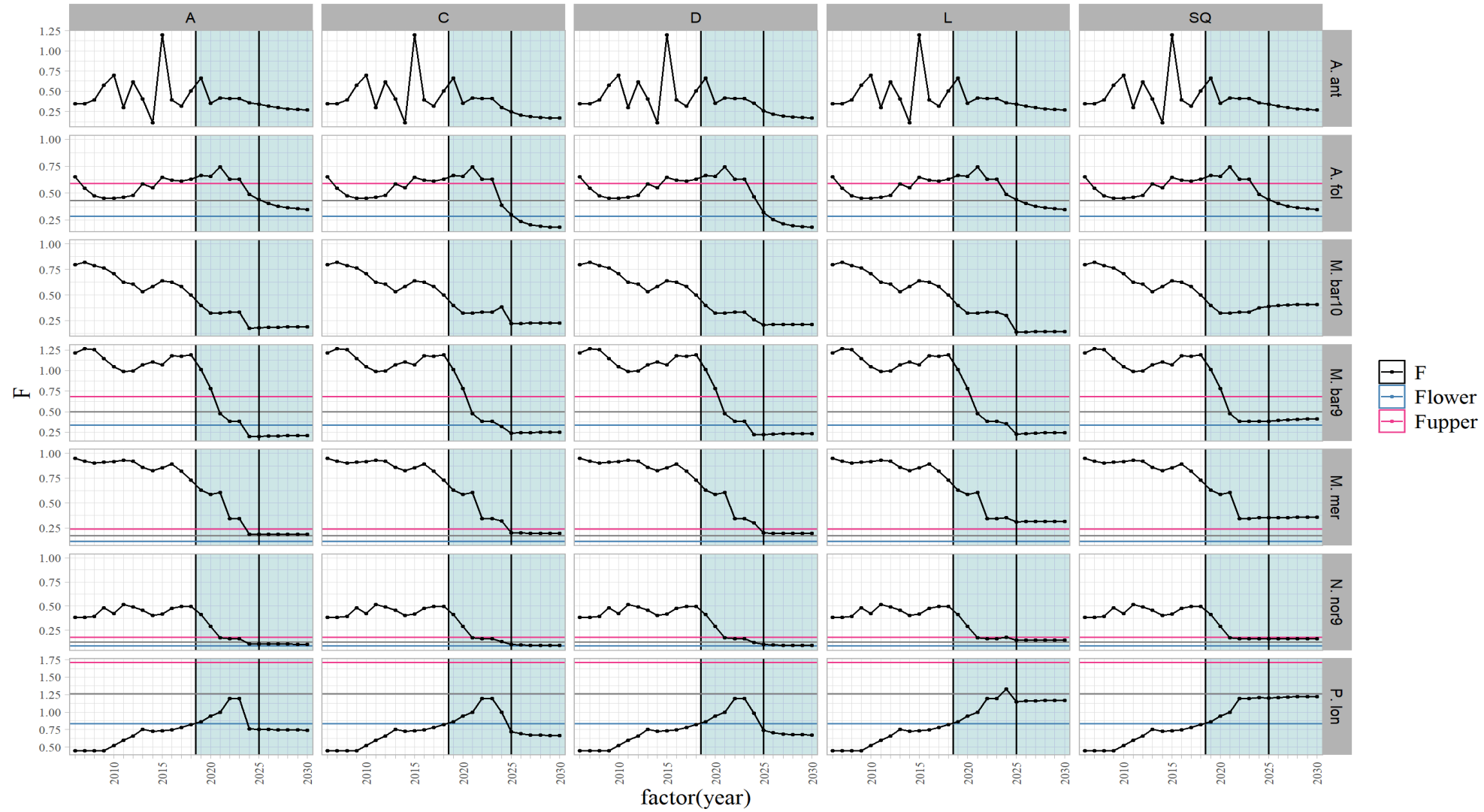
ISIS-Fish in EMU 1

Scenarios		2023	2024	2025+
	effort FR	2023 quota	2023	2023
	closures FR	x	x	x
	4 weeks FR			
SQ	effort ESP DEF	2023 quota	2023	2023
	effort ESP DWS	2023 quota	2023	2023
	closures ESP	x	x	x
	4 weeks ESP	x		
A keep Fmsy	effort FR	2023 quota	control rule	control rule
	closures FR	x	x	x
	4 weeks FR			
	effort ESP DEF	2023 quota	control rule	control rule
	effort ESP DWS	2023 quota	control rule	control rule
	closures ESP	x	x	x
	4 weeks ESP	x		
B 9.5%	effort FR	2023 quota	-9.5%	control rule
	closures FR	x	x	x
	4 weeks FR			
	effort ESP DEF	2023 quota	-9.5%	control rule
	effort ESP DWS	2023 quota	-9.5%	control rule
	closures ESP	x	x	x
4 weeks ESP	x			
C 4 weeks FR 4 weeks reconnected ESP	effort FR	2023 quota	-9.5+4%	control rule
	closures FR	x	x	x
	4 weeks FR (OTB+OTT)		x	x
	effort ESP DEF	2023 quota	-9.5+4%	control rule
	effort ESP DWS	2023 quota	-9.5%	control rule
	closures ESP	x	x	x
4 weeks ESP	x	x	x	
E large closures rewarded 2024	effort FR	2023 quota	-9.5+5%	control rule
	closures FR	x	x	x
	4 weeks FR			
	effort ESP DEF	2023 quota	-9.5%	control rule
	effort ESP DWS	2023 quota	-9.5%	control rule
closures ESP	x	x	x	
4 weeks ESP	x			

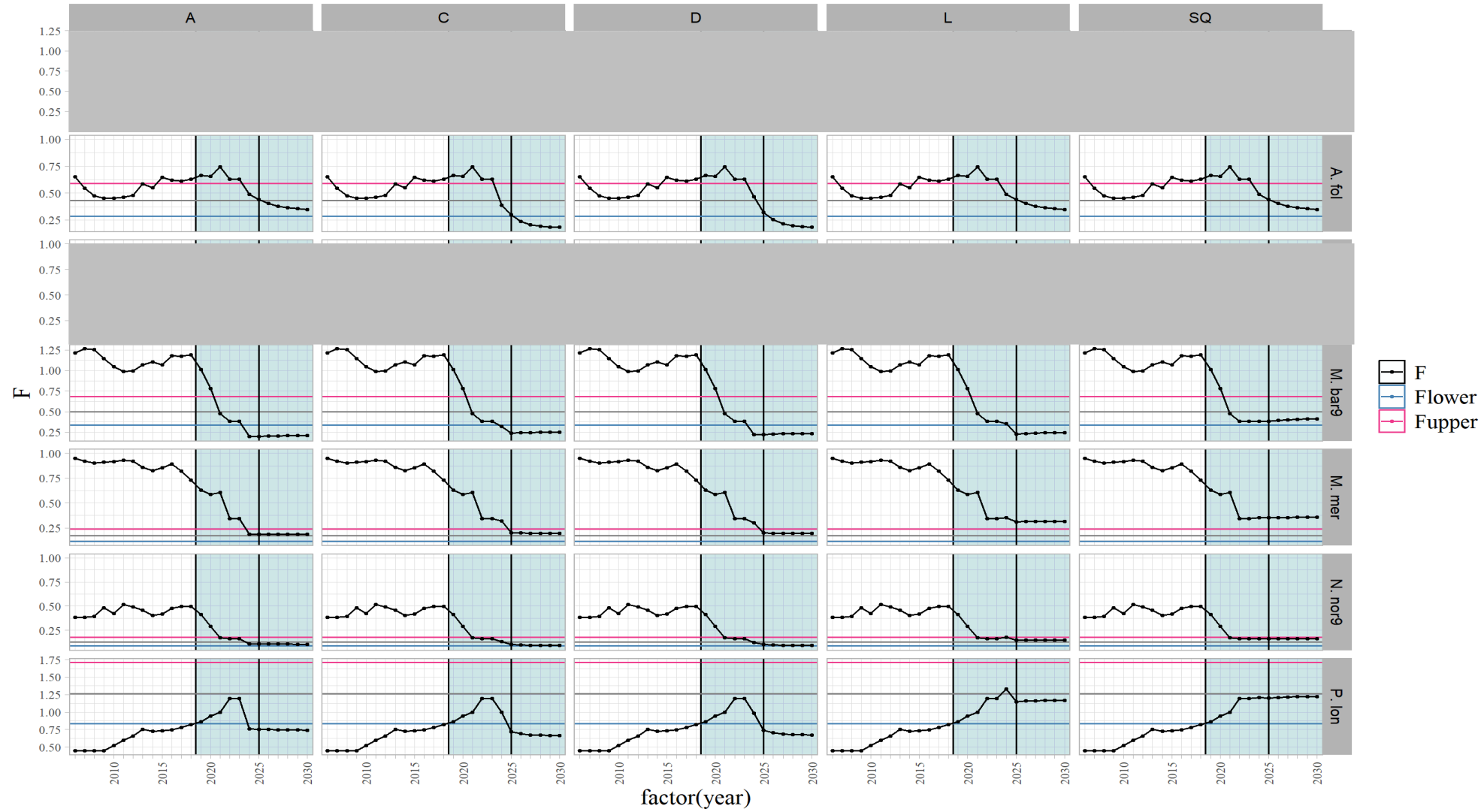


	Scenario (priority in grey*)	Trawler effort reduction in 2024**	Compensation mechanism for trawlers**	Post 2025 effort management	Combined catch limits (ARA and ARS) for 2024	post 2025 for catch limits (ARA & ARS)
1	Status Quo*	roll over effort in 2023	No Compensation mechanism	roll over effort in 2023	roll over catch limit 2023	roll over catch limit 2023
2	A*	2024: level of reduction that secures Fmsy by 1 January 2025 for all stocks	No Compensation mechanism	keep at Fmsy	roll over catch limit 2023	roll over catch limit 2023
4	C*	9.50%	4% [4 week closure] 2024 & onwards 	Effort to be set at Fmsy from 2025	2024: level of reduction that secures Fmsy by 1 January 2025 for all stocks	level of reduction that secures Fmsy from 2025 onwards for all stocks
5	D*	9.50% 	4% [Selectivity improvement] 2024 (50% uptake in the fleet) & onwards	Effort to be set at Fmsy from 2025 	2024: -5% 	level of reduction that secures Fmsy from 2025 onwards for all stocks 
13	L*	roll over effort in 2023	4% [Selectivity improvement] 2024 (50% uptake in the fleet) and onwards	roll over effort in 2023 and 100% of the fleet improving gear selectivity in 2025.	roll over catch limit 2023	roll over catch limit 2023

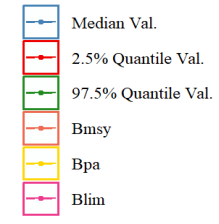
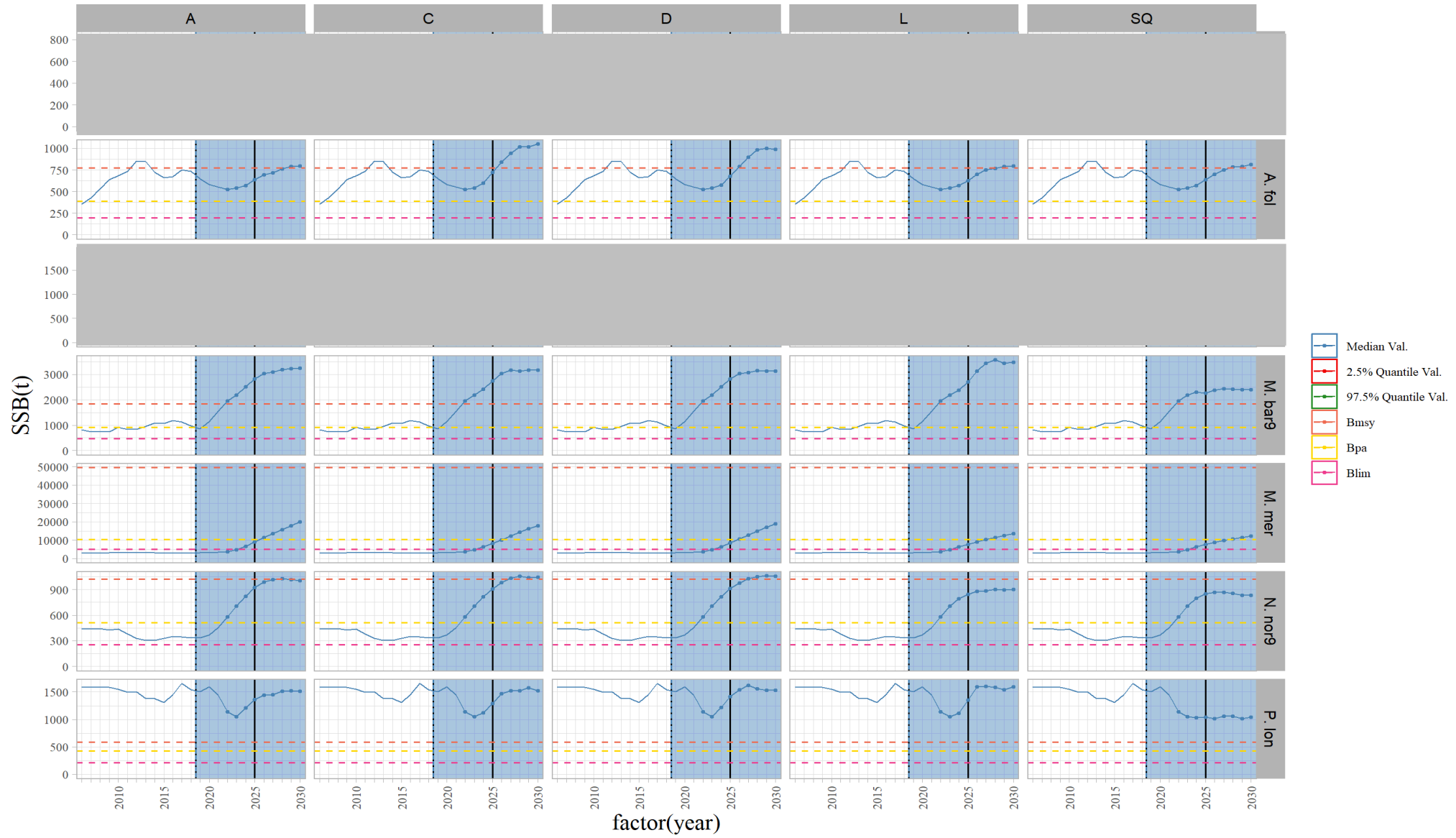
BEMTOOL in EMU 2



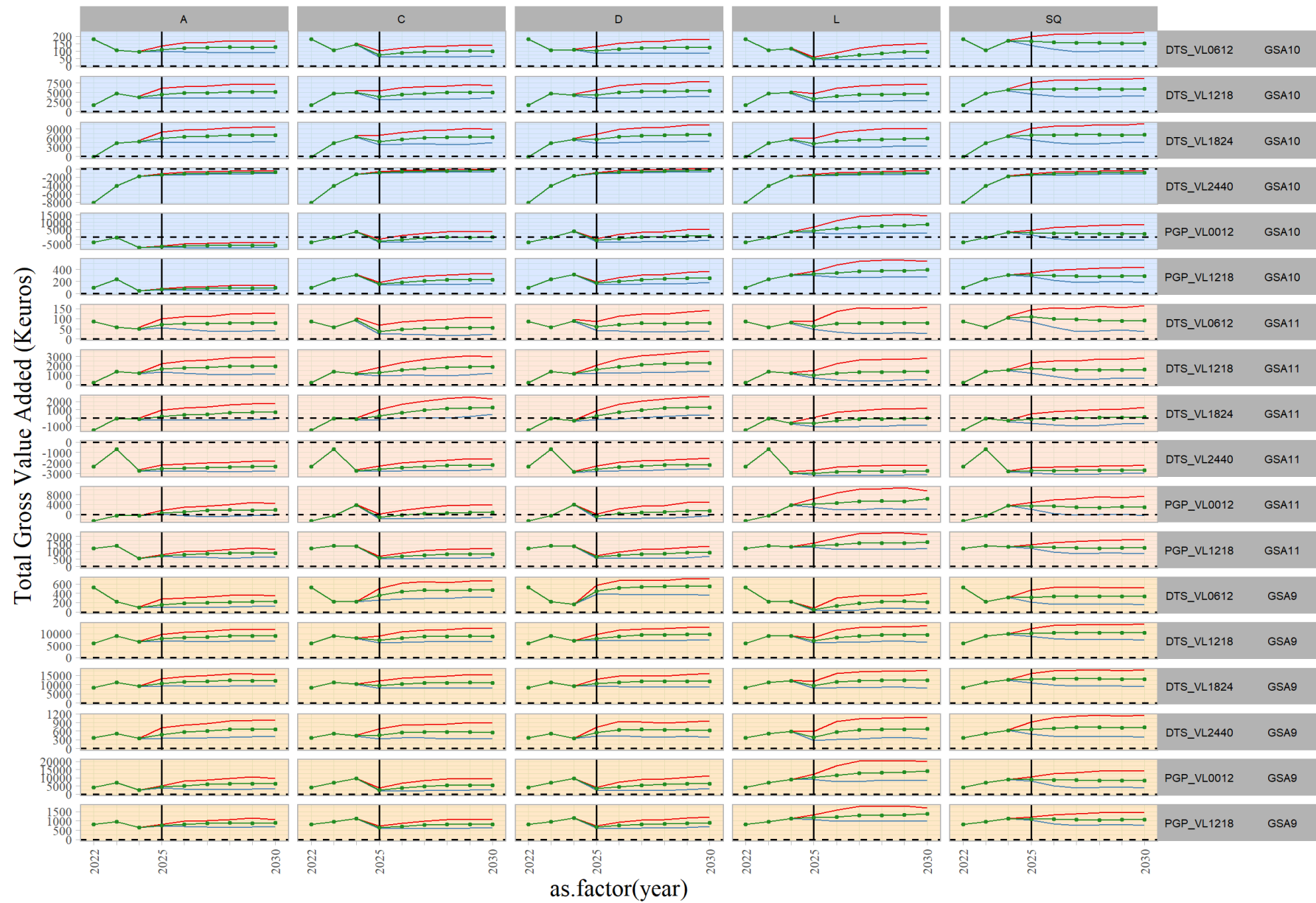
BEMTOOL in EMU 2



BEMTOOL in EMU 2



BEMTOOL in EMU 2

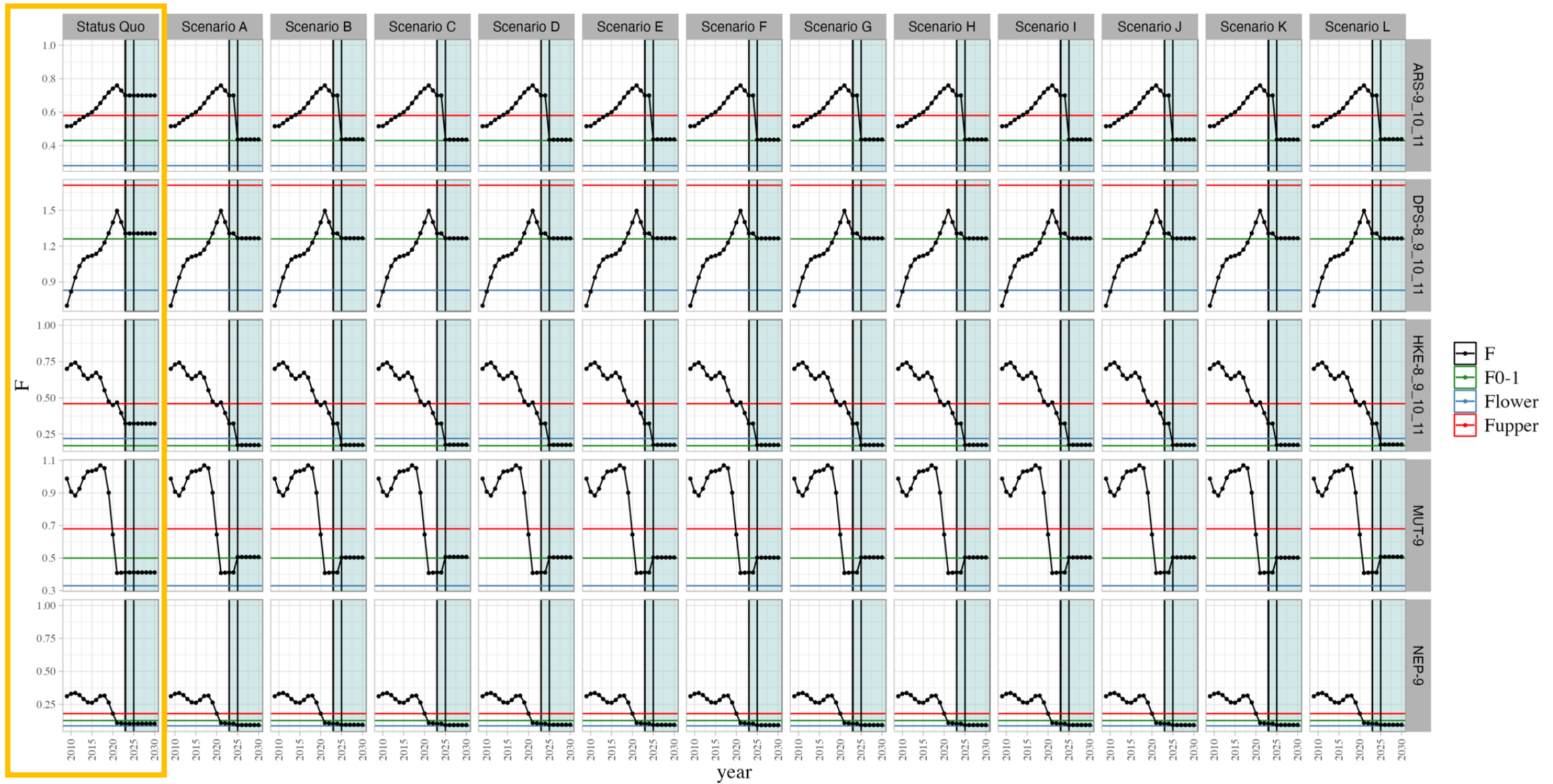


— 2.5% Quantile Val.
 — 97.5% Quantile Val.
 — Median Val.

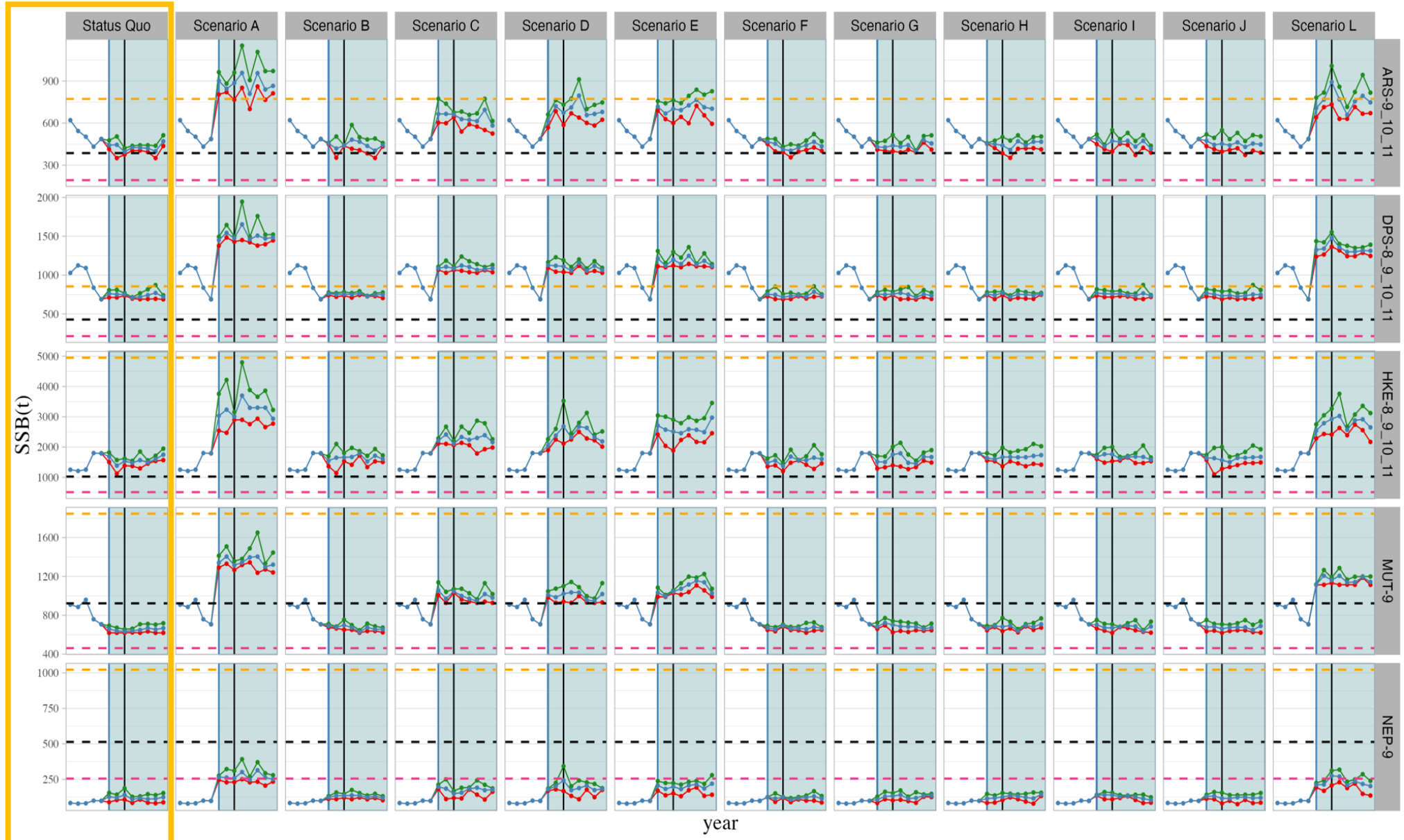
Scenarios	Fleet segments	(Estimated level of profitability) Gross profit margin in 2025	(Estimated level of profitability) Gross profit margin in 2030	% Gross profit margin change between 2020 - 2025	% Gross profit margin change between 2020 - 2030	FTE evolution between 2020 and 2024 (in number of FTE per MS and fishing technique)	FTE evolution between 2020 and 2025 (in number of FTE per MS and fishing technique)	FTE evolution between 2020 and 2030 (in number of FTE per MS and fishing technique)	% of change of FTE between 2020-2025	% of change of FTE between 2020-2030
A	DTS_VL0612	-0.122	-0.081	-87%	-83%	-43	-43	-43	-61%	-61%
	DTS_VL1218	0.251	0.311	9%	15%	-217	-221	-233	-33%	-34%
	DTS_VL1824	0.189	0.240	-4%	1%	-213	-217	-228	-37%	-39%
	DTS_VL2440	-1.326	-1.012	-152%	-121%	-69	-69	-70	-49%	-50%
	PGP_VL0012	-0.357	-0.265	-25%	-16%	-173	-173	-173	-8%	-8%
	PGP_VL1218	0.192	0.234	206%	210%	-153	-153	-153	-71%	-71%
C	DTS_VL0612	-0.062	-0.010	-81%	-76%	-21	-29	-29	-41%	-41%
	DTS_VL1218	0.255	0.318	9%	15%	-58	-239	-253	-35%	-37%
	DTS_VL1824	0.192	0.250	-4%	2%	-100	-233	-244	-40%	-42%
	DTS_VL2440	-1.246	-0.862	-144%	-106%	-58	-71	-72	-50%	-51%
	PGP_VL0012	-0.327	-0.193	-22%	-9%	3191	528	528	25%	25%
	PGP_VL1218	0.163	0.229	203%	209%	-57	-136	-136	-63%	-63%
D	DTS_VL0612	-0.012	0.027	-76%	-72%	-21	-29	-29	-41%	-41%
	DTS_VL1218	0.275	0.332	11%	17%	-58	-237	-253	-35%	-37%
	DTS_VL1824	0.201	0.256	-3%	3%	-100	-231	-244	-39%	-42%
	DTS_VL2440	-1.247	-0.862	-144%	-106%	-58	-71	-72	-50%	-51%
	PGP_VL0012	-0.286	-0.158	-18%	-5%	3191	528	528	25%	25%
	PGP_VL1218	0.181	0.249	204%	211%	-57	-136	-136	-63%	-63%
L	DTS_VL0612	-0.196	-0.085	-94%	-83%	-12	-15	-15	-22%	-22%
	DTS_VL1218	0.166	0.259	0%	9%	153	64	64	9%	9%
	DTS_VL1824	0.129	0.204	-10%	-3%	62	-6	-6	-1%	-1%
	DTS_VL2440	-1.460	-1.046	-165%	-124%	-49	-53	-53	-38%	-38%
	PGP_VL0012	-0.037	0.036	7%	14%	3191	3191	3191	149%	149%
	PGP_VL1218	0.269	0.299	213%	216%	-57	-57	-57	-27%	-27%
SQ	DTS_VL0612	-0.013	-0.018	-76%	-77%	-15	-15	-15	-22%	-22%
	DTS_VL1218	0.259	0.288	9%	12%	64	64	64	9%	9%
	DTS_VL1824	0.191	0.218	-4%	-1%	-6	-6	-6	-1%	-1%
	DTS_VL2440	-1.198	-0.986	-139%	-118%	-53	-53	-53	-38%	-38%
	PGP_VL0012	-0.065	-0.079	4%	2%	3191	3191	3191	149%	149%
	PGP_VL1218	0.259	0.249	212%	211%	-57	-57	-57	-27%	-27%

	Indicator
	Gross Profit Margin
	>10% - High
	0-10% - Reasonable
	<0% - Weak

SMART in EMU 2 - ALL SCENARIOS



SMART in EMU 2

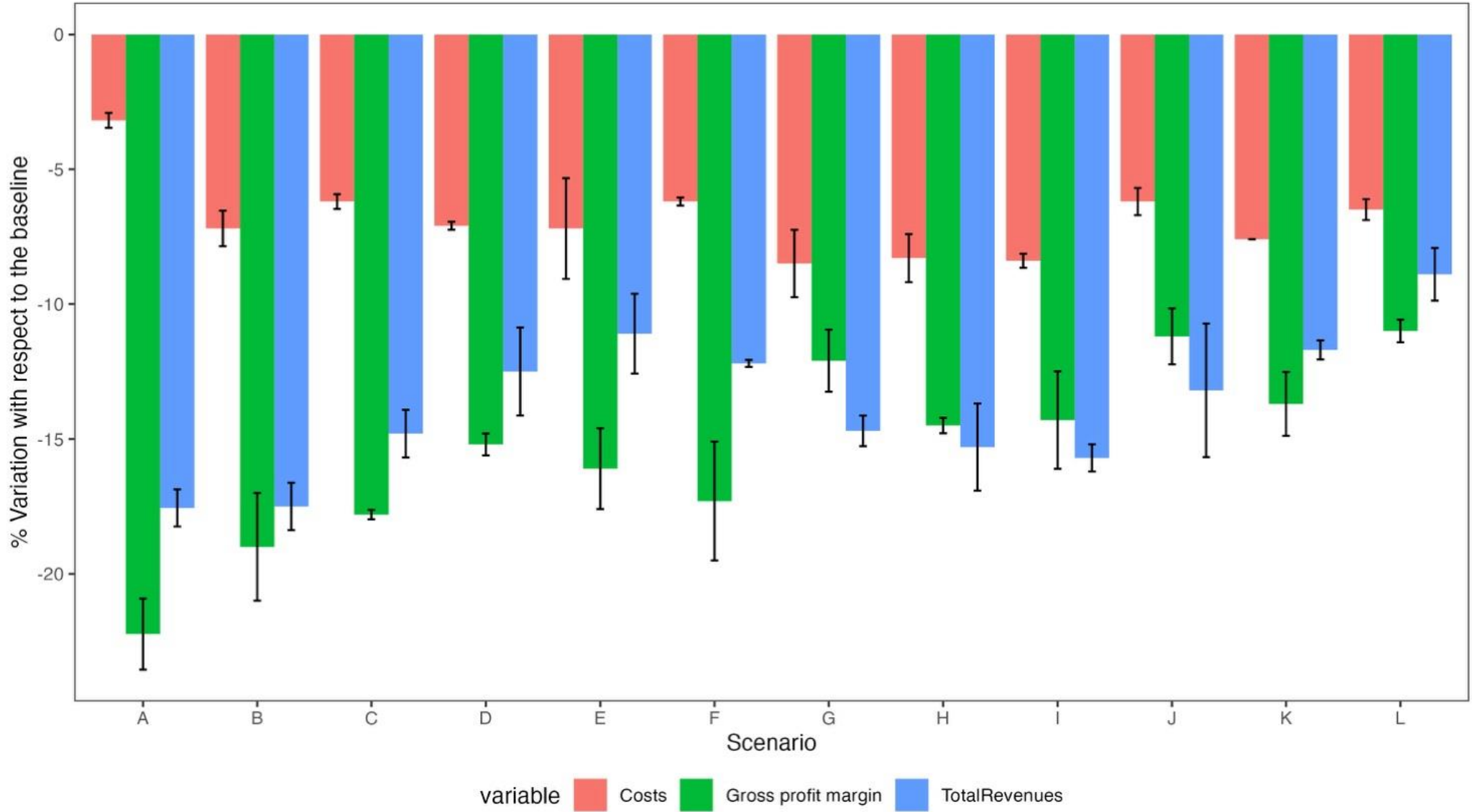


- Median Val.
- 2.5% Quantile Val.
- 97.5% Quantile Val.
- Bmsy
- Bpa
- Blim

SMART in EMU 2

Only for trawlers

Expected economic performance at the entry into force (change between 2022 – 2025)



General limitations :

- ALL MODELS

- stock-recruitment relationships inherited from EWG 23-09 = geometric mean;
- Lack of MEDITS data in EMU 2 in 2022;
- Lack of MUT 10 and ARA 9-10-11 stock assessment;
- Lack of data on subsidies;
- No update of Fmsy through time.

Limitations and models development for the future:

- IAM

- Potential future increases in biomass of non-dynamically modelled species/stocks are not reflected in fleet revenue estimates: almost 80% of the revenues of Spanish trawlers above 24 meters are based on modelled species, whereas for French trawlers above 24 meters, this proportion is only around 30%. For netters and vessels using hooks, these proportions are <10%, so their profits are most likely really underestimated.
- Doubts and concerns about crew cost estimates were expressed in section 6.1.3, and should be taken into account when considering results such as Gross Profit, Gross Profit margin, average salary and CR/BER.

- ISIS-Fish

- Recruitment has been forced to a constant value (average 2018-2022) in projection. The results in terms of population dynamics and stock rebuilding necessarily depend on this assumption. If a stock recruitment actually exists, even faster rebuilding is expected.
- Socio-economic indicators will be corrected.
- Data calls for VMS/logbook data should be planned well in advance.

Limitations and models development for the future:

- BEMTOOL

- A linear relationship between FTE and total fishing days was assumed for simplicity. Nevertheless, this assumption should be verified through a specific analysis on the historical data.
- It is important to note that the scenarios here presented do not consider the adaptation of the catch limit to the status of the stock (e.g. FMSY, SSB) that is expected to change during the application of management measures.

- SMART

- A new version of SMART is being prepared that allows to integrate the activity of passive tools. It will be based on a recent methodology (Henriques et al., 2023) which allows estimating the fishing effort of gillnets and other gear which, historically, are very difficult to model using VMS/AIS data.
- The SMART core team is also planning to develop the economic part of the model.
- The only critical aspect remains the possibility of "closing the loop" and projecting the responses of the stocks (for example their increase in biomass) into the LPUE.

What next?

- Improvements in the harmonization of models' outputs are needed, but how:
 - Expand the 4 models
 - Develop a single dedicated model
 - Move to a different modelling framework
- The meeting with stakeholders (MEDAC/MS) highlighted that their involvement would improve also the modelling application.



EWG 24-01