

Annex II

SocioEconomic Simulation of Management Scenarios for the Development of Italian Demersal Trawl Fishery Management Plans for the 2025–2030 Period

Authors: Accadia P., Malvarosa L., Paolucci C., Sabatella R.

NISEA

Expected economic and social impacts

The expected impacts deriving from the main management measures have been estimated using the economic model reported in the methodological section of the main document.

The socio-economic impact assessment model is a dynamic simulation model that assesses the changes resulting from the implementation of the measures proposed in the management plans. Based on biological estimates relating to the trend of the target species, the economic model made it possible to estimate the trend of total landings for the scenarios relating to the different reductions in fishing effort and the related economic value.

The variations in landings over time, a variable dependent on the model, are a function of changes in fishing effort. The input data required by the economic model therefore concerns the fishing effort (in terms of GT and vessel days), the composition of landings and revenues by species and the level of costs. The starting point for the estimation of landings is the variations in catches as simulated by the biological model.

These analyses are usually developed both in the ex-ante phase to derive a simulation of the effects of the management measures, and in the ex-post phase to verify their real impact.

In an ex-ante analysis, as the current one, the results of simulations are compared with the *Reference Points* (RP) proposed for the economic and social indicators reported in the previous paragraph through a *Traffic Light* approach, where the results in terms of unsustainability (in red), reasonable sustainability or acceptable (in orange) and the values that distinguish high sustainability (in green) are identified. For details, see Table 1.

The traffic light representation of the main socio-economic indicators allows, in fact, an immediate comparison between different sectors and geographical areas and offers a summary of the short

and long-term economic trend of Italian fishing by GSA (Accadia and Spagnolo, 2006). Through their comparison with appropriate RPs or threshold values, it is in fact possible to obtain a temporal and spatial evaluation of the fisheries sector, so much so that their use has become an indispensable management tool both nationally and internationally (Mannini and Sabatella, 2015; STECF, 2015; MiPaft, 2018), particularly useful in the ex-ante evaluation phase of management measures (Malvarosa et al., 2019). Threshold values can be associated with a critical condition or with an optimal condition of the *fishery* (Caddy and Mahon, 1995). In the first case, a limit is identified that must be avoided, the *Limit Reference point* (LRP), while in the second a goal to be achieved for the system, the *Target Reference point* (TRP).

Table 1 shows the main economic and social indicators and the reference RPs, with an indication of the *reference ranges*, for all the segments covered by the Plan.

Table 1. *Economic and social indicators, reference points and of ranges by indicator.*

<i>Dimension</i>	<i>Indicators</i>	<i>Reference Points</i>	<i>Range RPs/ Traffic light approach</i>
Economic	NPM	10	NPM < 0%
			0% ≤ NPM ≤ 10%
			NPM > 10%
	CR/BER	1	CR/BER ≤ 1
			CR/BER > 1
Social	GVA/FTE	Baseline=average value 2020-22	GVA/FTE < baseline
			baseline ≤ GVA/FTE ≤ baseline+10%
			GVA/FTE > baseline+10%
	FTE		FTE < baseline

			baseline <= FTE <= baseline+10%
			FTE > baseline+10%

Legend:

UNSUSTAINABLE
REASONABLY SUSTAINABLE/ACCETABLE
VERY SUSTAINABLE

Specifically, simulations were conducted for the following fleet segments:

1. Trawl fleets (DTS) active in:
 - Western Mediterranean seas, GSAs 9, 10 and 11
 - Adriatic, in GSAs 17 and 18
 - Ionian Sea, in GSA 19
 - Strait of Sicily, GSA 16
2. Beam trawler fleets (TBB) active in:
 - Adriatic, GSA 17

There are 4 simulated scenarios, specifically:

1. S0: Status quo
2. S1: 3% reduction of F
3. S2: 5% reduction of F
4. S3: Achievement of FMSY for the most vulnerable species showing the highest value of the ration $F/F_{msy}(F_{weak} - F_{msy_transition})$

The following sections report the expected results (deriving from the simulations) for the economic and social indicators, with the relative evaluation according to the *Traffic Light approach*, for the different scenarios and fleet segments covered by the Management Plans.

Table 2- Expected results of the economic and social indicators for the fleets covered by the Management Plan for the Western Mediterranean seas Sea

Scenario	FT_GSA	Net profit margin		
		Baseline	2027	2030
S0	DTS_ALL GSAs	2%	2%	2%
S1		2%	1%	2%
S2		2%	0%	1%
S3		2%	-9%	-7%
Scenario		CR/BER		
		Baseline	2027	2030
S0	DTS_ALL GSAs	1,10	1,09	1,12
S1		1,10	1,04	1,08
S2		1,10	1,00	1,06
S3		1,10	0,70	0,75
Scenario		GVA/FTE		
		Baseline	2027	2030
S0	DTS_ALL GSAs	28.678	40.065	40.914
S1		28.678	42.165	43.787
S2		28.678	43.504	45.806
S3		28.678	57.758	61.157
Scenario		FTE		
		Baseline	2027	2030
S0	DTS_ALL GSAs	1.442	1.359	1.359
S1		1.442	1.241	1.241
S2		1.442	1.166	1.166
S3		1.442	666	666

Table 3- Expected results of the economic and social indicators for the fleets covered by the Management Plan for the Adriatic

Scenario	FT_GSA	Net profit margin		
		Baseline	2027	2030
S0	DTS_ALL GSAs	2%	-2%	-1%
S1		2%	-2%	-1%
S2		9%	-2%	0%
S3		2%	-3%	-1%
S0	TBB_17	-1%	-18%	-17%
S1		-1%	-21%	-20%
S2		-1%	-22%	-21%
S3		-1%	-4%	-1%
Scenario		CR/BER		
		Baseline	2027	2030
S0	DTS_ALL GSAs	1,14	0,92	0,95
S1		1,14	0,92	0,97
S2		1,14	0,91	0,97
S3		1,14	0,88	0,96
S0	TBB_17	0,98	0,38	0,39
S1		0,98	0,34	0,36
S2		0,98	0,31	0,33
S3		0,98	0,83	0,96
Scenario		GVA/FTE		
		Baseline	2027	2030
S0	DTS_ALL GSAs	30.076	31.335	32.490
S1		30.076	34.337	36.285
S2		30.076	36.382	38.816
S3		30.076	41.057	44.645
S0	TBB_17	47.463	30.607	31.327
S1		47.463	30.733	31.858
S2		47.463	30.679	32.112
S3		47.463	58.839	66.723
Scenario		FTE		
		Baseline	2027	2030
S0	DTS_ALL GSAs	1.980	1.887	1.887
S1		1.980	1.723	1.723
S2		1.980	1.618	1.618
S3		1.980	1.397	1.397
S0	TBB_17	192	206	206
S1		192	188	188
S2		192	176	176
S3		192	206	206

Table 4 - Expected results of the economic and social indicators for the fleets covered by the Management Plan for the Ionian sea

Scenario	FT_GSA	MON o NPM		
		Baseline	2027	2030
S0	DTS_19	-5%	-11%	-11%
S1		-5%	-10%	-10%
S2		-5%	-10%	-9%
S3		-5%	-14%	-13%
Scenario		CR/BER		
		Baseline	2027	2030
S0	DTS_19	0,83	0,50	0,50
S1		0,83	0,53	0,56
S2		0,83	0,54	0,59
S3		0,83	0,47	0,50
Scenario		GVA/FTE		
		Baseline	2027	2030
S0	DTS_19	16.877	19.058	19.014
S1		16.877	21.880	22.764
S2		16.877	23.835	25.338
S3		16.877	28.281	29.484
Scenario		FTE		
		Baseline	2027	2030
S0	DTS_19	527	470	470
S1		527	429	429
S2		527	403	403
S3		527	301	301

Table 5 - Expected results of the economic and social indicators for the fleets covered by the Management Plan for the Strait of Sicily

Scenario	FT_GSA	MON o NPM		
		Baseline	2027	2030
S0	DTS_16	0%	7%	7%
S1		0%	6%	7%
S2		0%	5%	7%
S3		0%	14%	14%
Scenario		CR/BER		
		Baseline	2027	2030
S0	DTS_16	1,03	1,26	1,27
S1		1,03	1,20	1,25
S2		1,03	1,16	1,23
S3		1,03	1,57	1,57
Scenario		GVA/FTE		
		Baseline	2027	2030
S0	DTS_16	31.363	43.164	43.444
S1		31.363	44.943	46.782
S2		31.363	46.160	48.907
S3		31.363	54.291	54.058
Scenario		FTE		
		Baseline	2027	2030
S0	DTS_16	1.467	1.379	1.379
S1		1.467	1.259	1.259
S2		1.467	1.183	1.183
S3		1.467	1.338	1.338

REFERENCES

Caddy, J.F. and Mahon, R.(1995). Reference points for fisheries management, FAO Fisheries. Technical Papers, 347.

Malvarosa L., Murillas A., Lehuta S., Nielsen J.R., Macher C., Goti L., Motova A., Doering R., Haraldson G., Accadia P., Hamon K.G., Bastardie F., Maravelias C.D., Mardle S., Thøgersen T. (2019). Sustainability Impact Assessment (SIA) in fisheries: Implementation in EU fishing regions. Marine Policy, 101, 63-79. doi:10.1016/j.marpol.2018.11.039

Mannini A., Sabatella R.F. (eds) (2015) - Annuario sullo stato delle risorse e sulle strutture produttive dei mari italiani. Biol. Mar. Mediterr., 22(Suppl. 1): 358 pp.

MiPAAFT, 2018. Decreto del Direttore Generale n. 26510 del 28 dicembre 2018. Modifica dei Piani di Gestione Nazionale relativi alle flotte di pesca per la cattura delle risorse demersali

nell'ambito delle GSA 9, 10, 11, 16, 17, 18 e 19

<https://www.politicheagricole.it/flex/cm/pages/ServeBLOB.php/L/IT/IDPagina/13693>.

Cristina Silva, Hugo Mendes, Mafalda Rangel, Laura Wise, Karim Erzini, Maria de Fátima Borges, Marta Ballesteros, Jose Luis Santiago, Aida Campos, Jonas Viðarsson, Kåre N. Nielsen (2015), Development of a responsive fisheries management system for the Portuguese crustacean bottom trawl fishery: Lessons learnt, *Marine Policy*, Volume 52, 2015, Pages 19-25, ISSN 0308-597X,

<https://doi.org/10.1016/j.marpol.2014.10.013>. Paz Sampedro, Raúl Prellezo, Dorleta García, José María Da-Rocha, Santiago Cerviño, Julia Torralba, Julia Touza, Javier García-Cutrín, María José Gutiérrez (2017), To shape or to be shaped: engaging stakeholders in fishery management advice, *ICES Journal of Marine Science*, Volume 74, Issue 2, March 2017, Pages 487–498, <https://doi.org/10.1093/icesjms/fsw160>

STECF, 2015. Scientific, Technical and Economic Committee for Fisheries (STECF) – Landing Obligation - Part 6 (Fisheries targeting demersal species in the Mediterranean Sea) (STECF-15-19) 2015. Publications Office of the European Union, Luxembourg, EUR 27600 EN, JRC 98678, 268 pp.

STECF (Scientific, Technical and Economic Committee for Fisheries) (2018) – The 2018 Annual Economic Report on the EU Fishing Fleet (STECF-18-07). Publications Office of the European Union, Luxembourg, 2018, JRC112940, ISBN 978-92-79-79390-5, doi:10.2760/56158

STECF (Scientific, Technical and Economic Committee for Fisheries) (2023) – Assessment of balance indicators for key fleet segments and review of national reports on Member States efforts to achieve balance between fleet capacity and fishing opportunities (STECF-23-13); Caey J. and Vitarnen, J. editors, Publications Office of the European Union, Luxembourg 2024; <https://data.europa.eu/doi/10.2760/958072>, JRC136331