

Study on the evaluation of specific management scenarios for the preparation of multiannual management plans in the Mediterranean and the Black Sea:

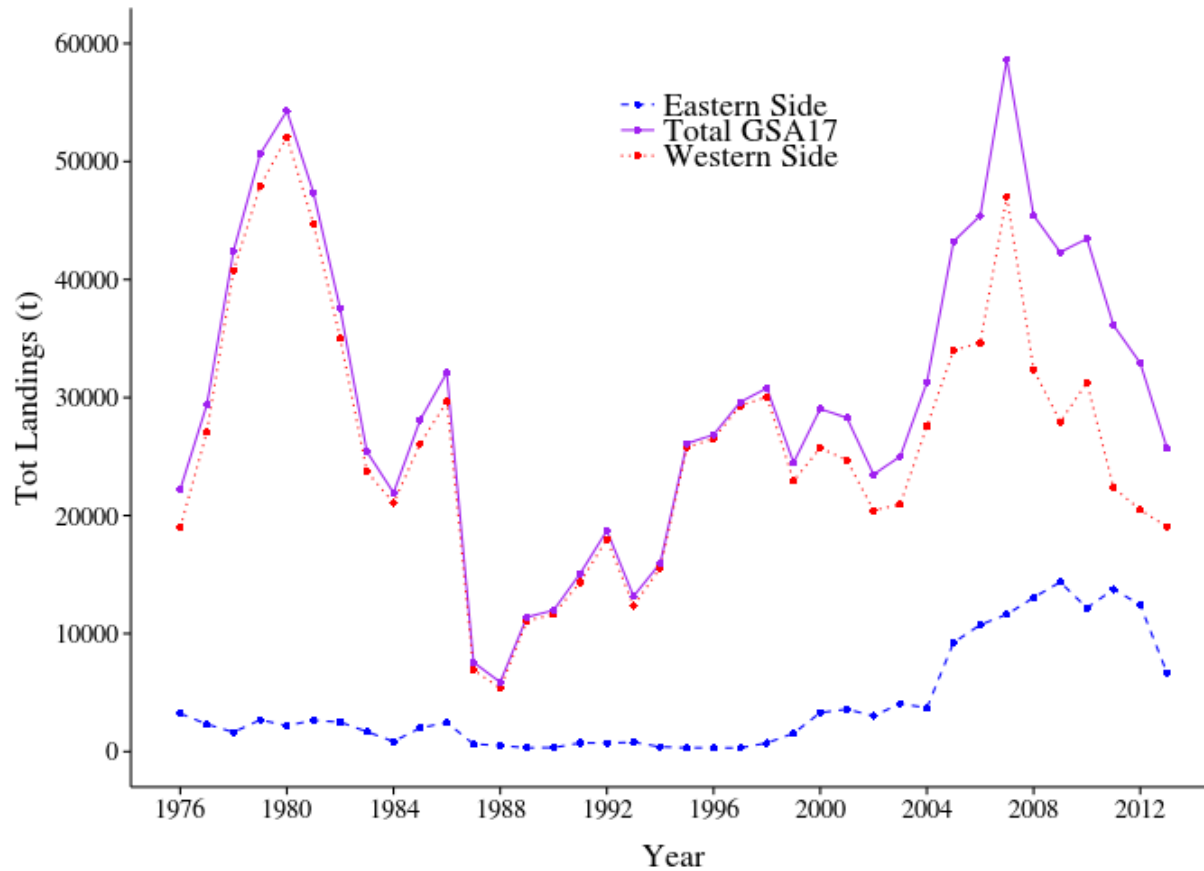
THE ADRIATIC SEA CASE STUDY

Carpi P., Bitetto I., Accadia P., Facchini M.T., Lembo G., Santojanni A., Spedicato MT.

Malta, November 10th 2015

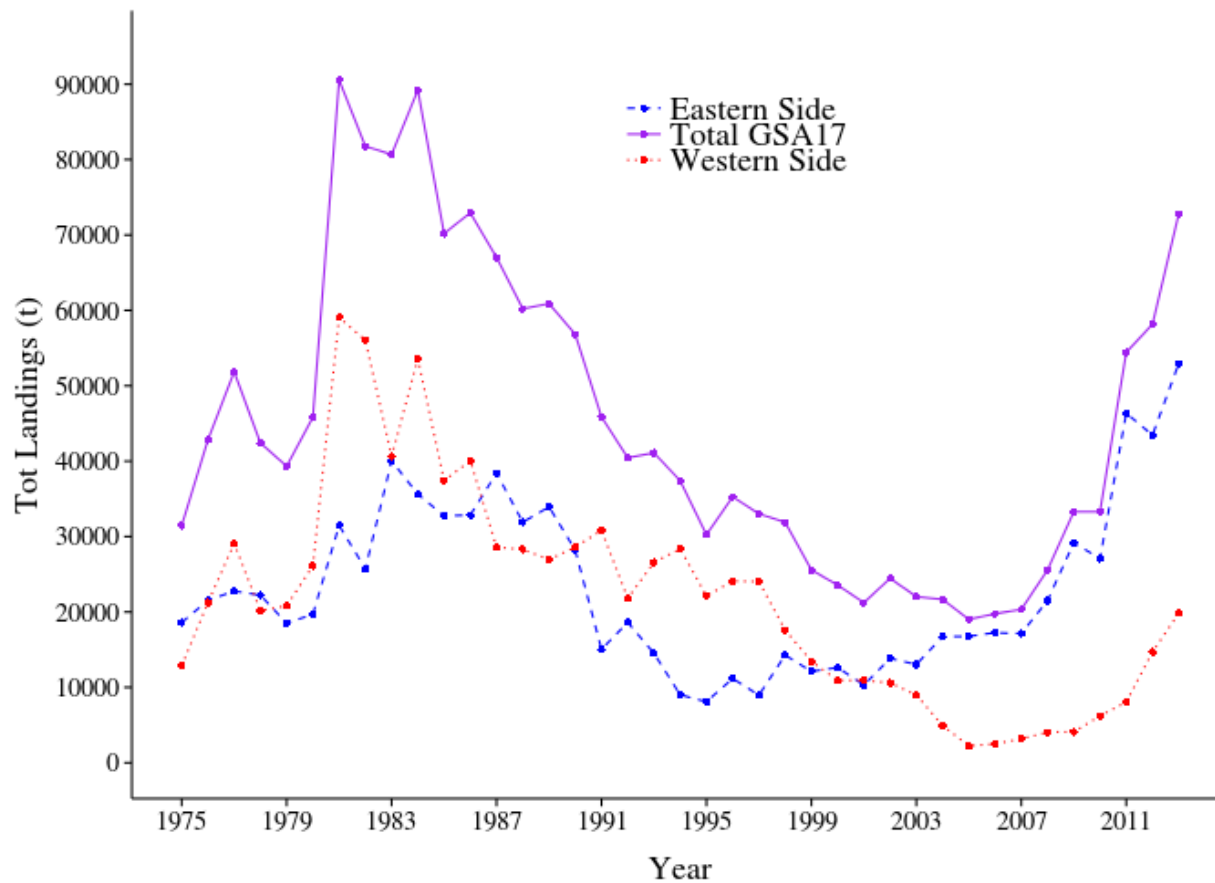


Landings: ANCHOVY

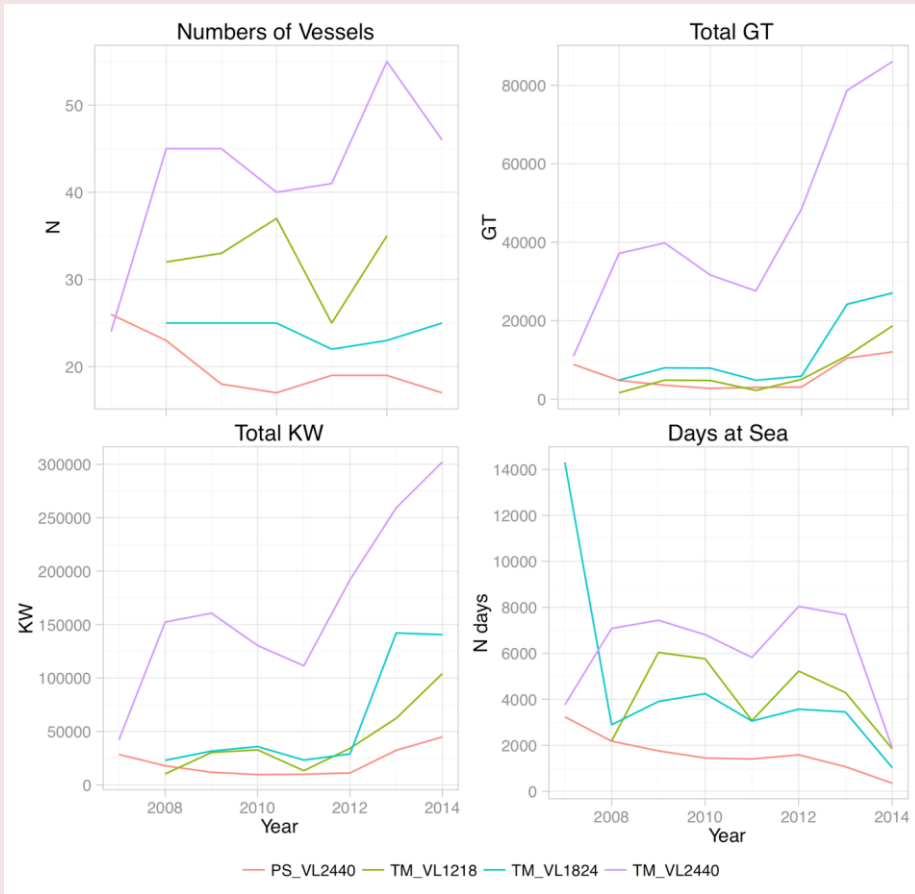




Landings: SARDINE

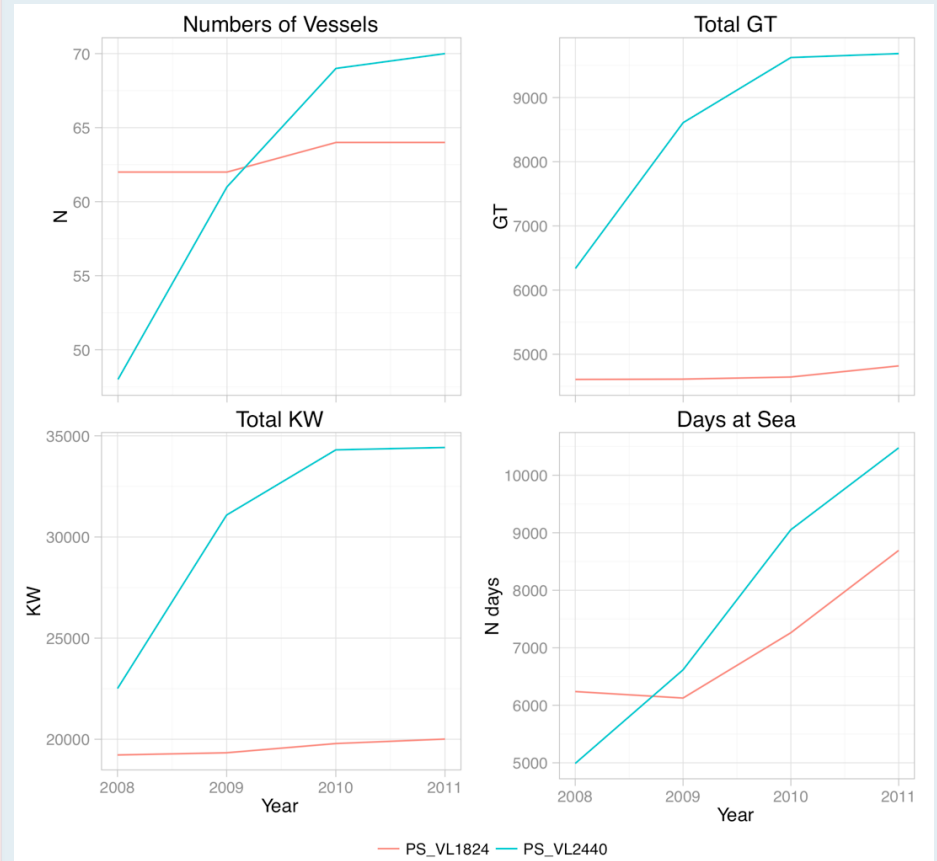


Trends of capacity and effort



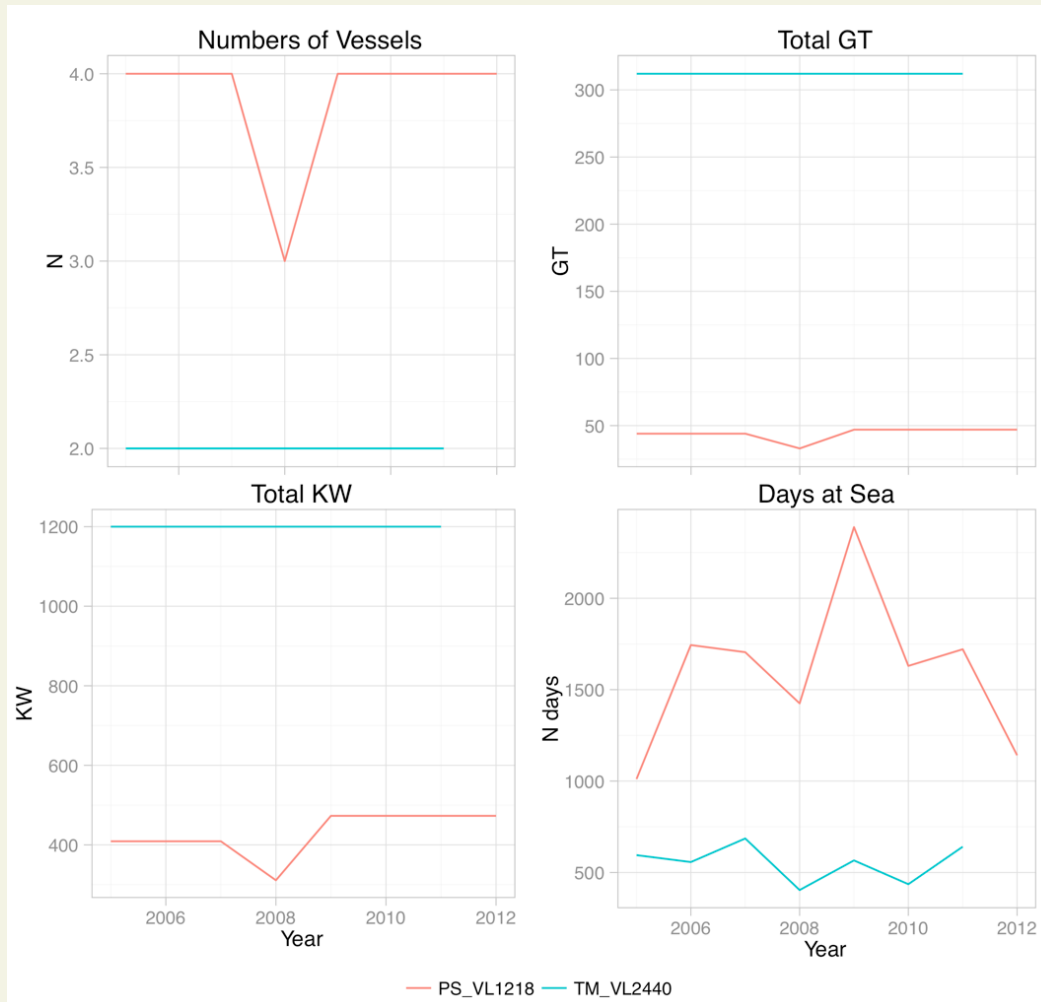
Italy

Croatia



Trends of capacity and effort

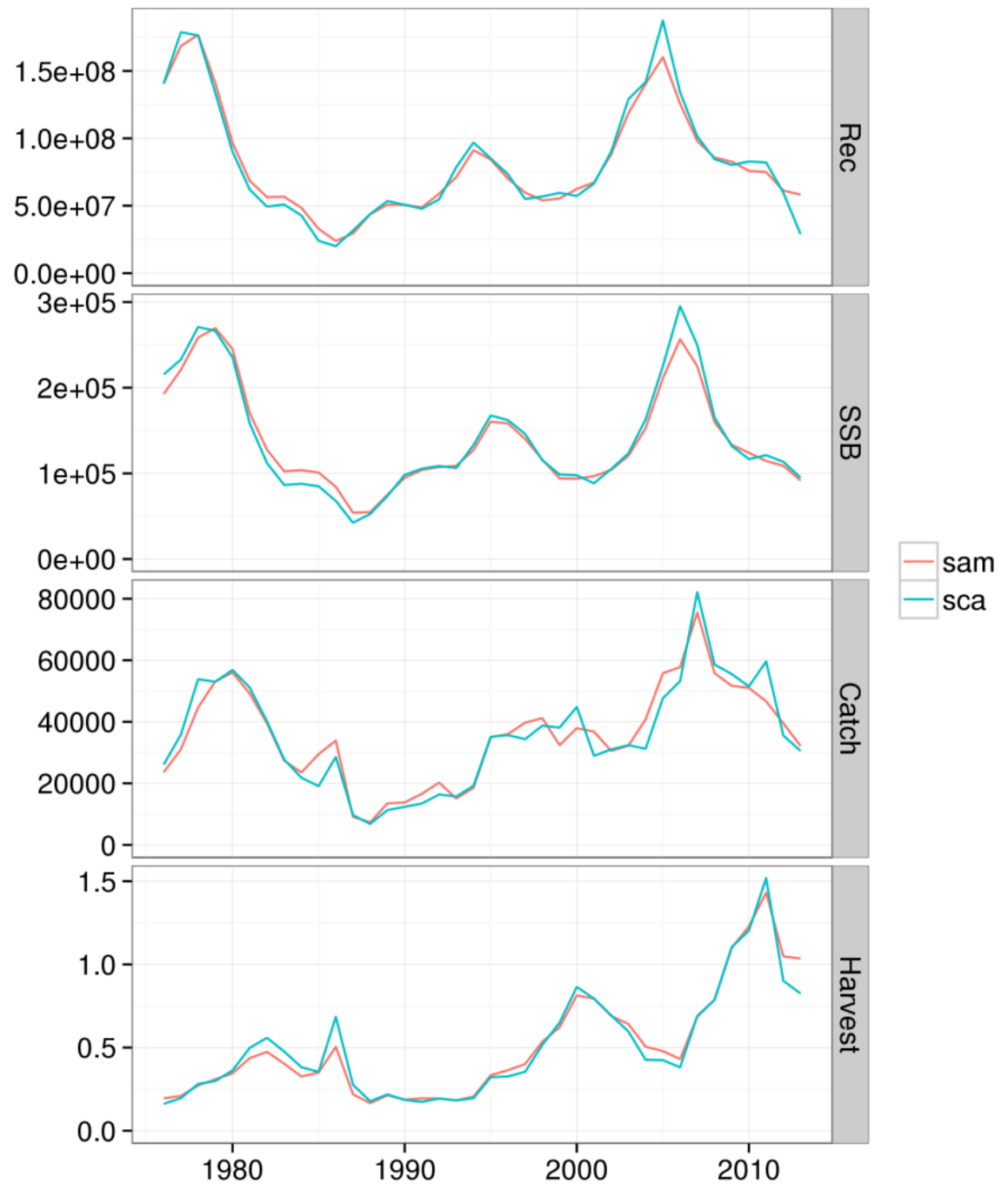
Slovenia





Stock assessment results for **Anchovy** stock in the Adriatic Sea.

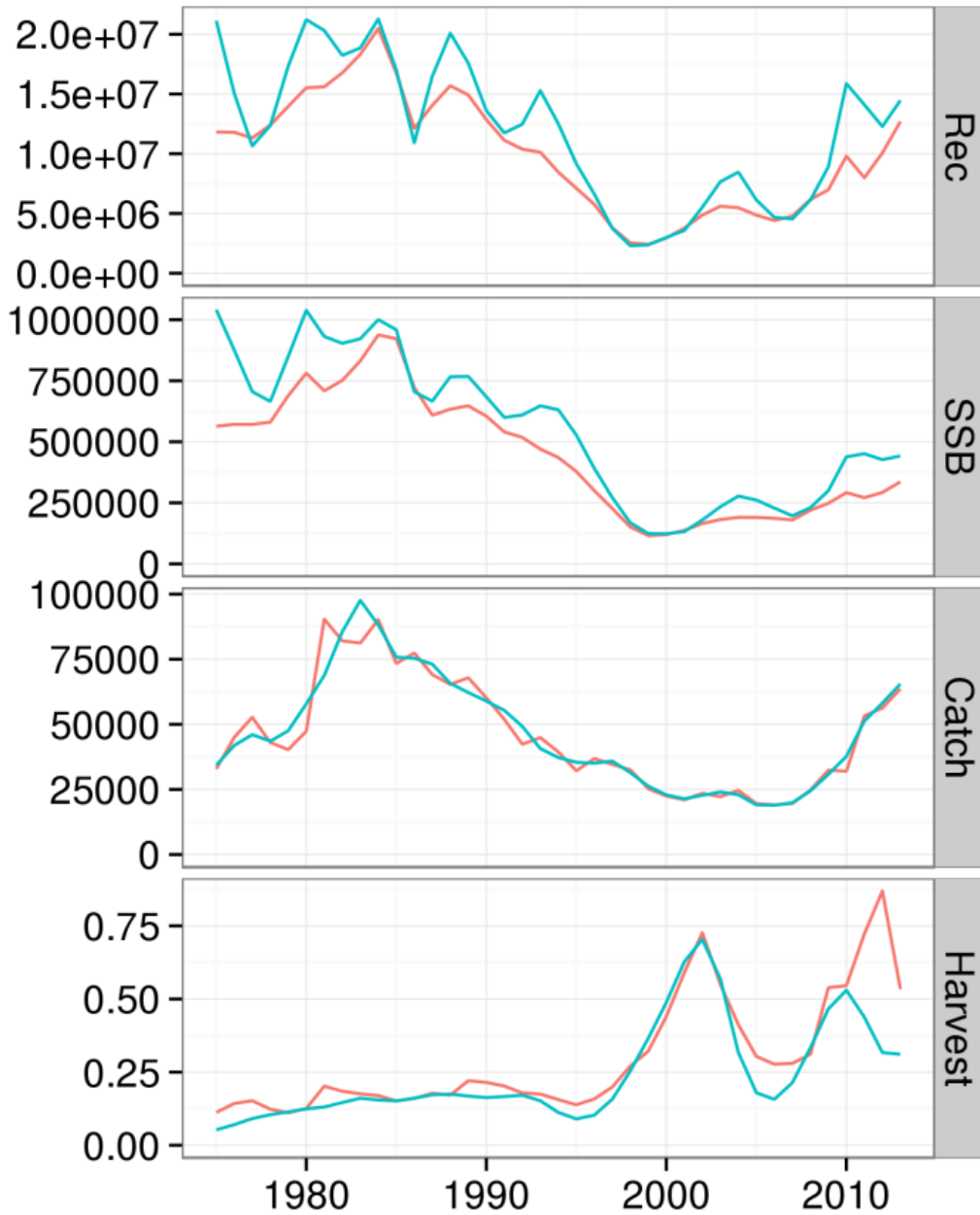
(STECF EWG 15-11, Palma Di
Maiorca, September 2015)





Stock assessment results for **Sardine** stock in the Adriatic Sea.

(STECF EWG 15-11, Palma Di
Maiorca, September 2015)

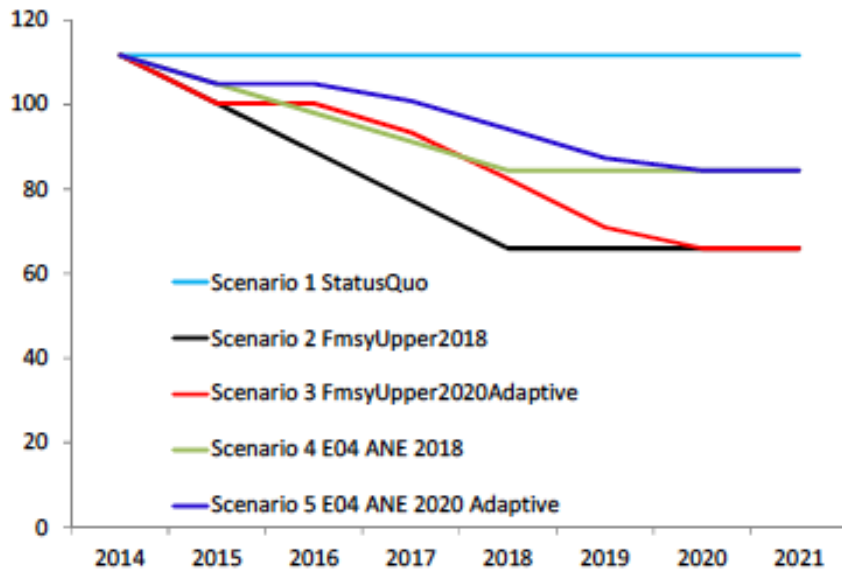


Model scenarios tested for Anchovy and Sardine in the Adriatic Sea

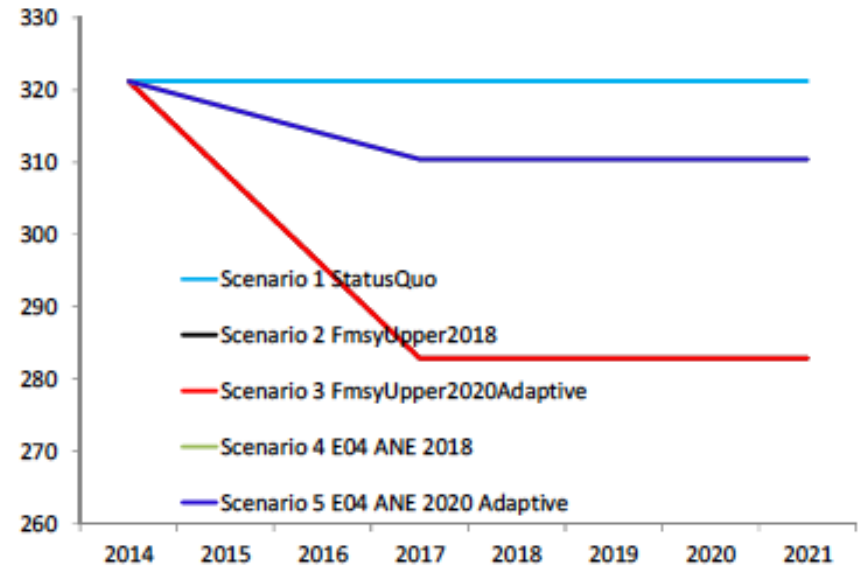
Scenario 1	Status quo to 2020
Scenario 2	Linear reduction towards upper F_{MSY} of anchovy (same target applied also for sardine) in 2018 applied on both activity and capacity, up to 2017, then on the activity only. Application to capacity can be differentiated by fleet.
Scenario 3	Adaptive reduction towards upper F_{MSY} of anchovy (same target applied also for sardine) from 2018 to 2020 applied only on activity. Application to capacity can be differentiated by fleet.
Scenario 4	Linear reduction towards $E0.4$ of anchovy in 2018 applied both to activity and capacity, up to 2017 included, then on the activity only. Application to capacity can be differentiated by fleet.
Scenario 5	Adaptive reduction towards $E0.4$ of anchovy in 2020, from 2018 to 2020 applied only on activity. Application to capacity can be differentiated by fleet.

Effort change (fishing days and number of vessels) related to the different management scenarios.

Average Days Per Vessel

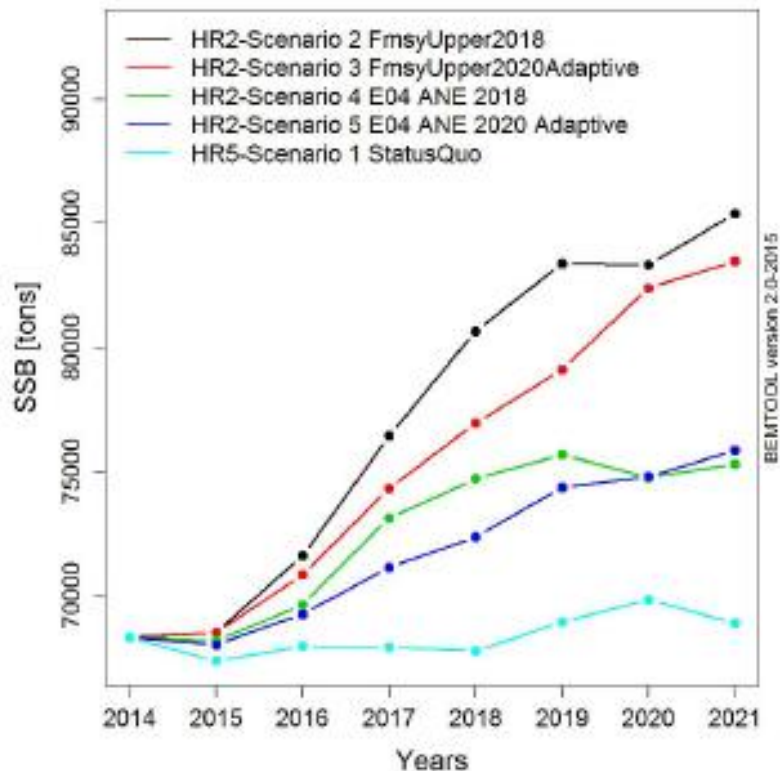


Number of Vessels

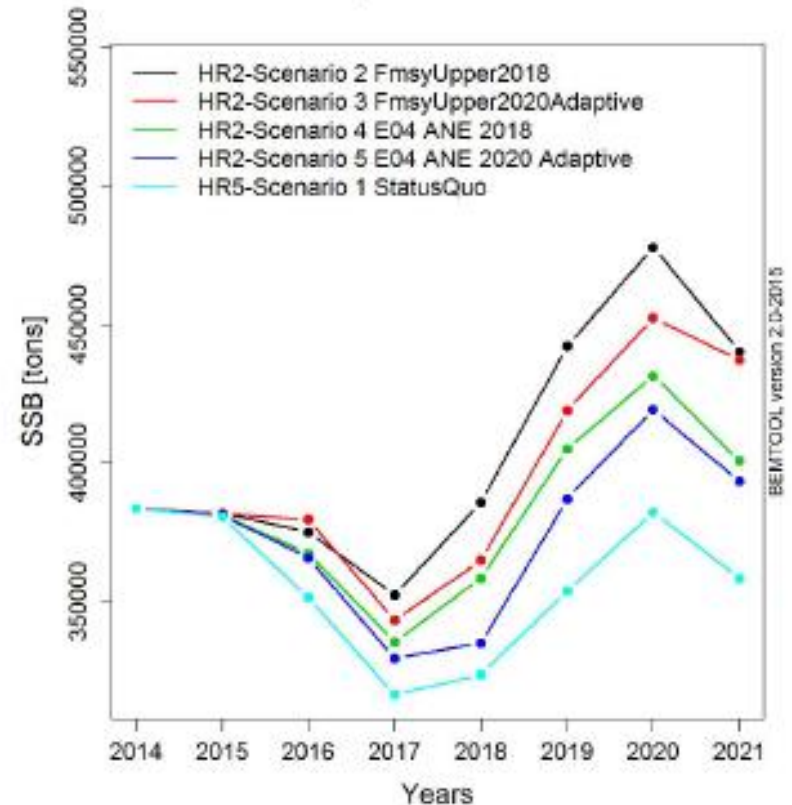


Spawning Stock Biomass (SSB) of anchovy and sardine in GSA 17 and 18: comparison among the management scenarios.

Anchovy SSB forecast

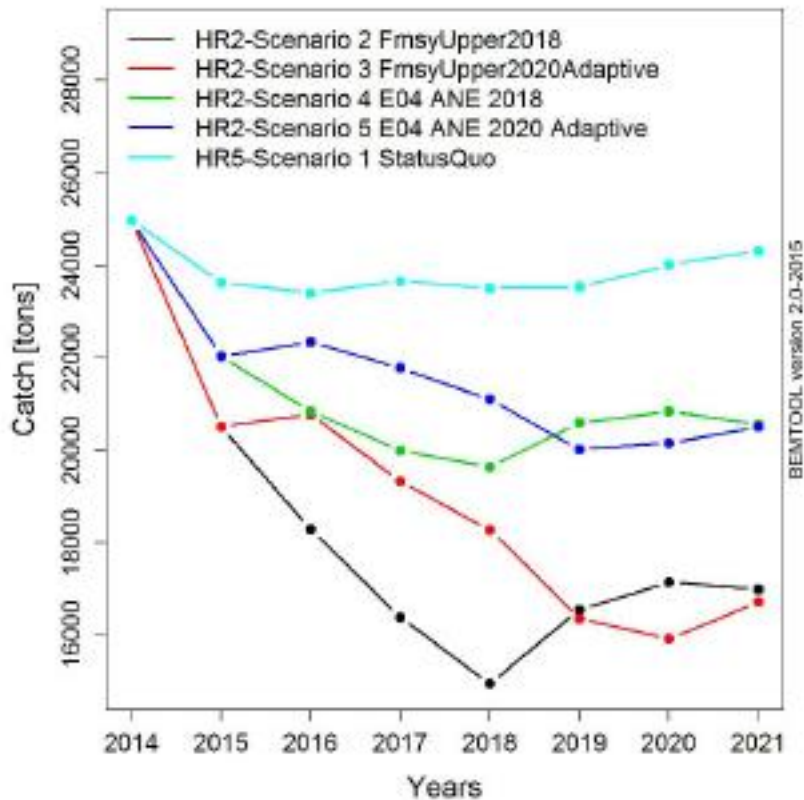


Sardine SSB forecast

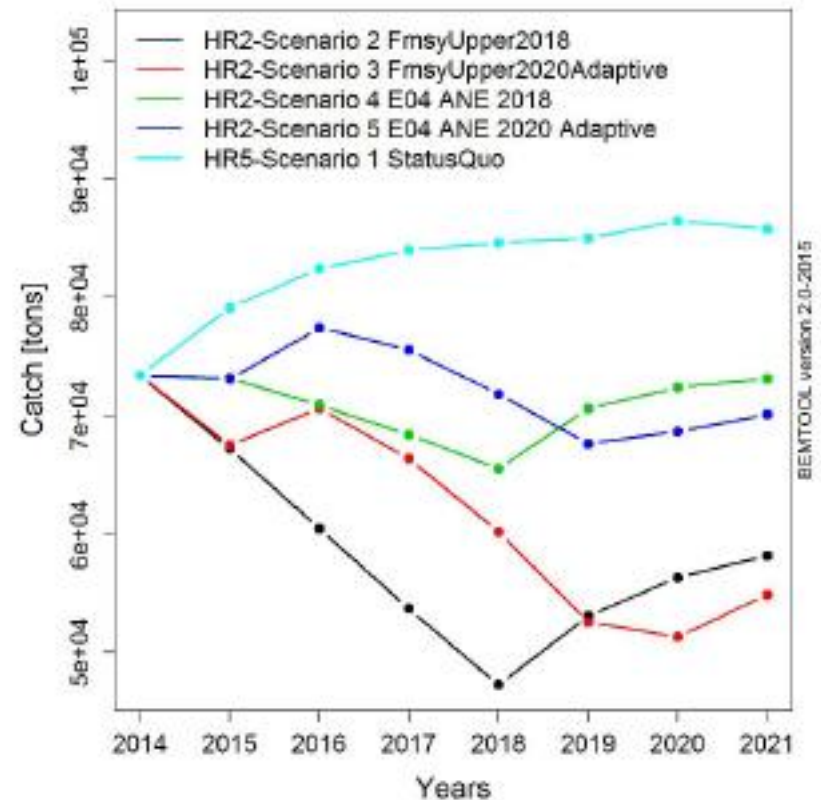


Catch of anchovy and sardine in GSA 17 and 18: comparison among the management scenarios.

Anchovy – Overall catch forecast

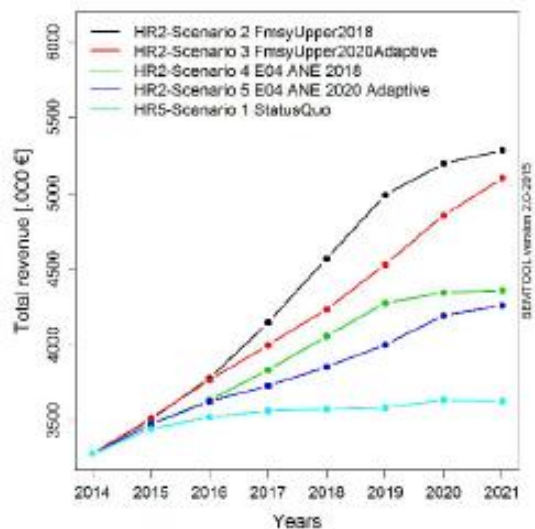


Sardine – Overall catch forecast

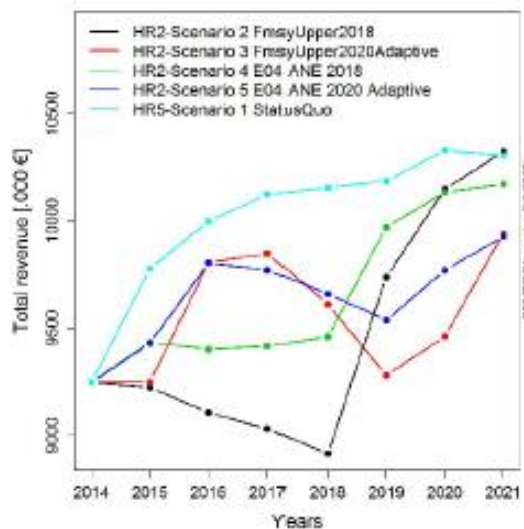


Revenue changes by fleet for the different scenarios

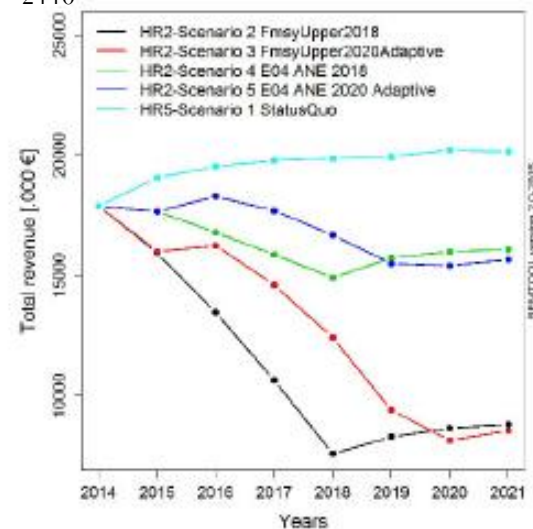
Total revenue – Croatian Purse Seiners – LOA 1218



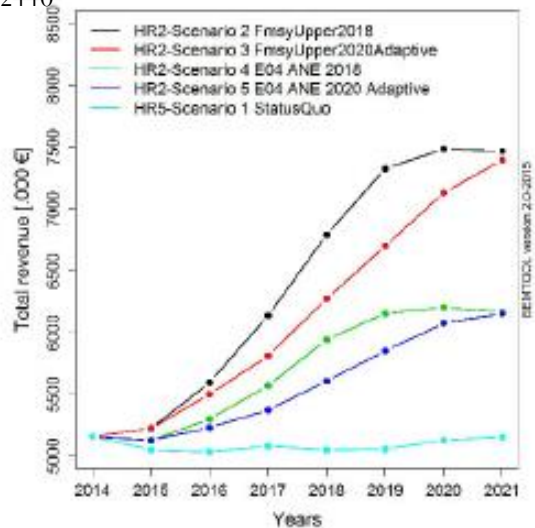
Total revenue – Croatian Purse Seiners – LOA 1824



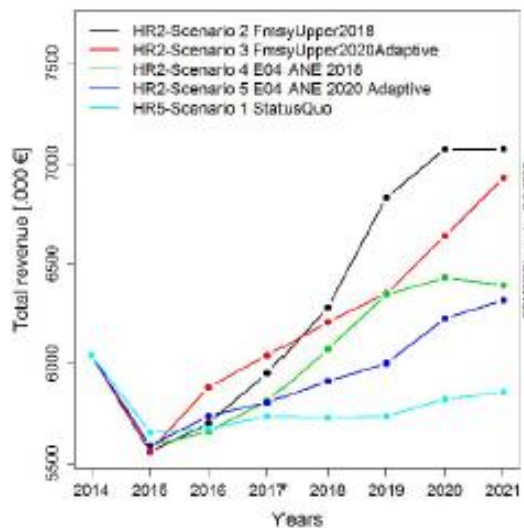
Total revenue – Croatian Purse Seiners – LOA 2440



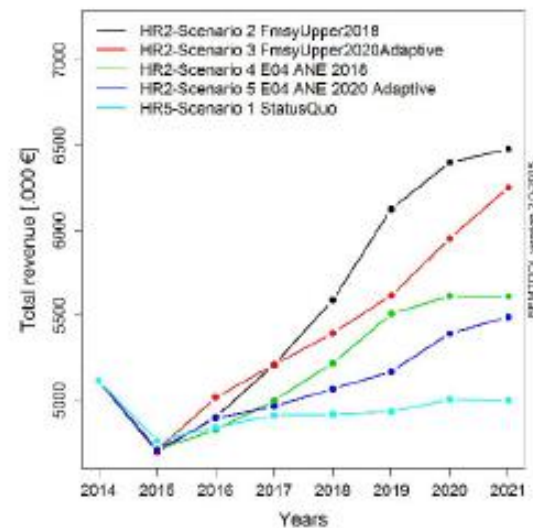
Total revenue – Italian Purse Seiners GSA17– LOA 2440



Total revenue – Italian Trawlers GSA17– LOA 1218

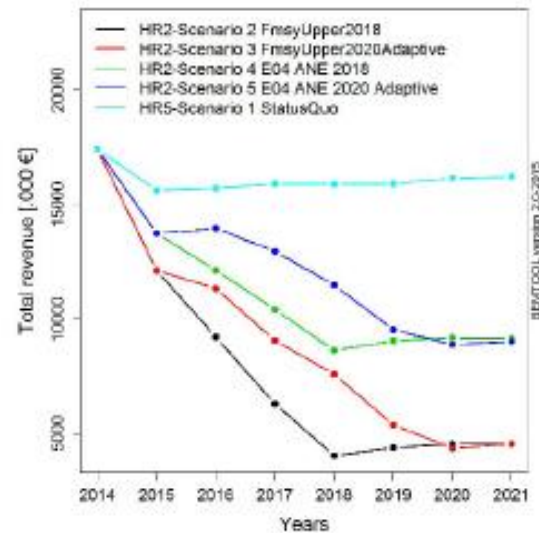


Total revenue – Italian Trawlers GSA17– LOA 1824

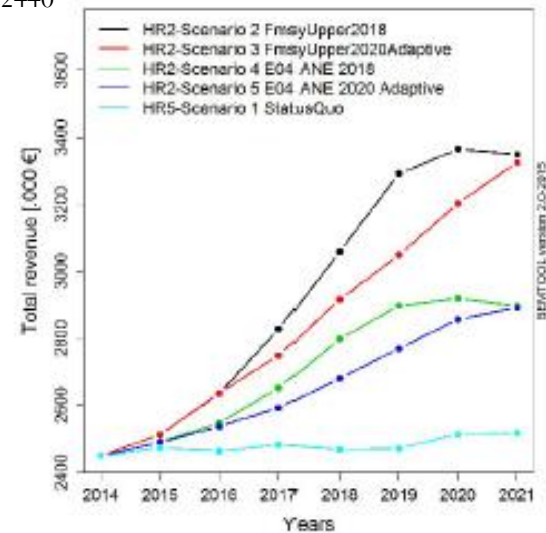


Revenue changes by fleet for the different scenarios

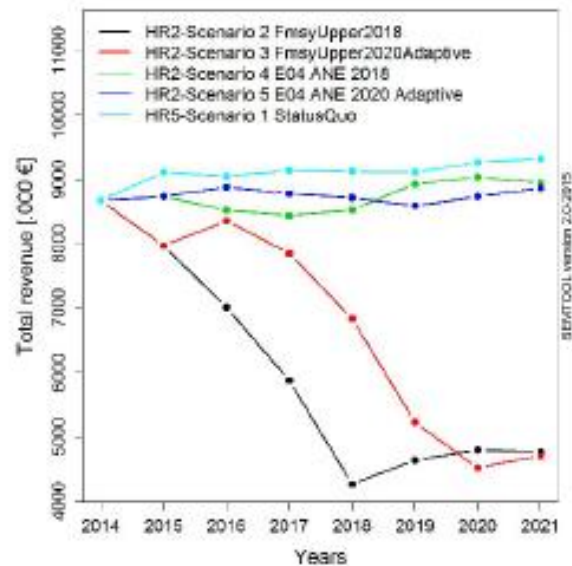
Total revenue –Italian Trawlers GSA17 – LOA 2440



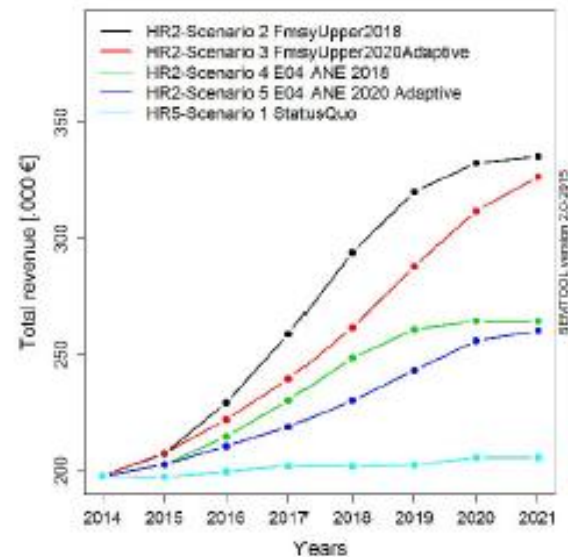
Total revenue – Italian Purse Seiners GSA18 – LOA 2440



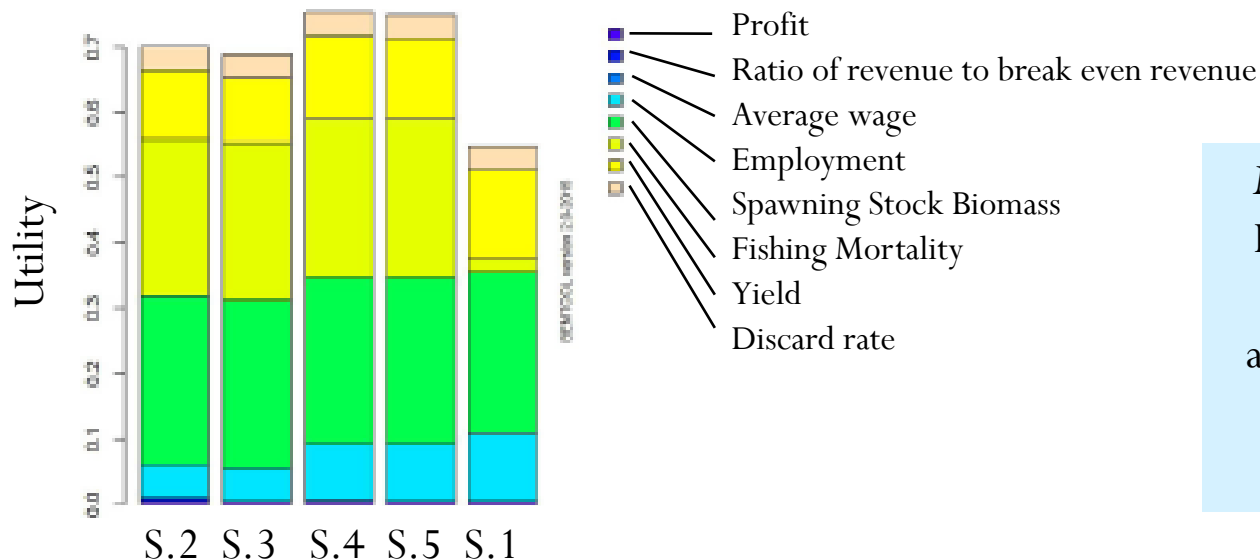
Total revenue –Italian Trawlers GSA18 – LOA 2440



Total revenue Slovenia - Purse seiners – LOA 1218



RESULTS SUMMARY



MCDA results:
Evaluation of the overall utility associated to each management scenario.

Summary table of the performances of the management scenarios expressed as percentage of variation respect to the status quo.

Scenario, year 2021	ALL fleets							
	Salary	CR.BER	Rev.	Emp	Catch Anchovy	Catch Sardine	SSB Anchovy	SSB Sardine
Scenario 2	9.7	17.1	-25.4	-12.8	-30.1	-32.2	24.0	22.8
Scenario 3	6.4	13.2	-27.1	-12.8	-31.3	-36.0	21.2	22.0
Scenario 4	8.7	12.5	-10.6	-3.6	-15.4	-14.7	9.3	11.8
Scenario 5	6.3	9.5	-12.1	-3.6	-15.6	-18.3	10.1	9.8

FINAL CONSIDERATIONS (1)

■ Traffic light approach:

- All the performed scenarios allow to obtain a benefit on the SSB of the 2 stocks under consideration (best performance showed by Scenario 2).
- Adaptive scenarios (Scenario 3 and 5) show minor benefits on a short term for SSB, but also a reduced decrease in landing of the overall catch of both stocks in the short term.

■ Considering all fleets, the catches are decreasing in the short term with a fairly low percentage (around 15%) and revenues are decreasing with a lower percentage (10%), while the economic performance is improving if salary and the indicator CR/BER are considered. The reduction of employees is limited, given the limited amount of scraping (10%).

FINAL CONSIDERATIONS (2)

- On the overall, the best performing scenarios is **Scenario 4** → stable trade off among the different indicators.
- Scenario 2 and 3; highest decrease in catches for the more impacting fleet segments; highest improvement in the SSB.
- **Multi-Criteria Decision Analysis:** scenarios 4 and 5 allow to reach the highest overall utility.
- **Management Strategy Evaluation (MSE):** moving to MSY will result in considerable decrease in catches in the short-term though they will increase and stabilise over the longer-term; the probability of being below Blim will decrease over the time of management.

Thanks for your attention!

Questions?

