

Update of the pilot actions relating to simulations the common sole stock management measures in the North Adriatic area

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The Pilot actions

FAIRSEA Pilot actions are ***demonstrative case studies*** to show the potential effects, ***both at local and on a wider spatial scale***, induced by ***management actions***.

- ◆ case studies intend to explore, ***through a simulation approach***, which are the more suitable pathways to achieve sustainability objectives for ecological, economic and social fisheries components.
- ◆ ***the pilot actions provide feedback and advice*** on the ***ecological, economic and social impacts*** at local and at a wider scale in the medium/short terms.

Pilot Actions – First results from scenario simulations

Inputs
from MPS
and IOF



INSTITUTE OF OCEANOGRAPHY AND FISHERIES SPLIT

- trammel netters in Istria county

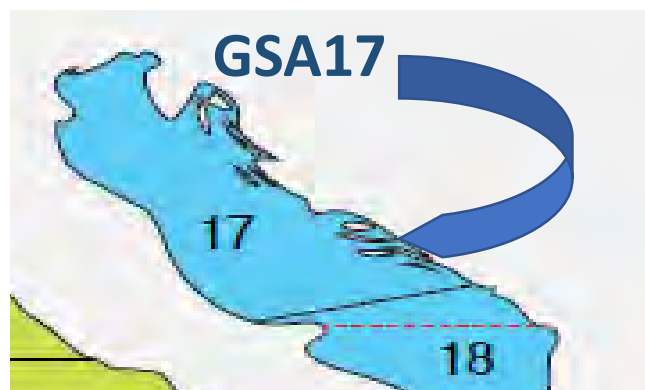
target species:
common sole,
Solea solea

Inputs from
Assam and
CNR-Irbim



- beam trawlers in Marche region

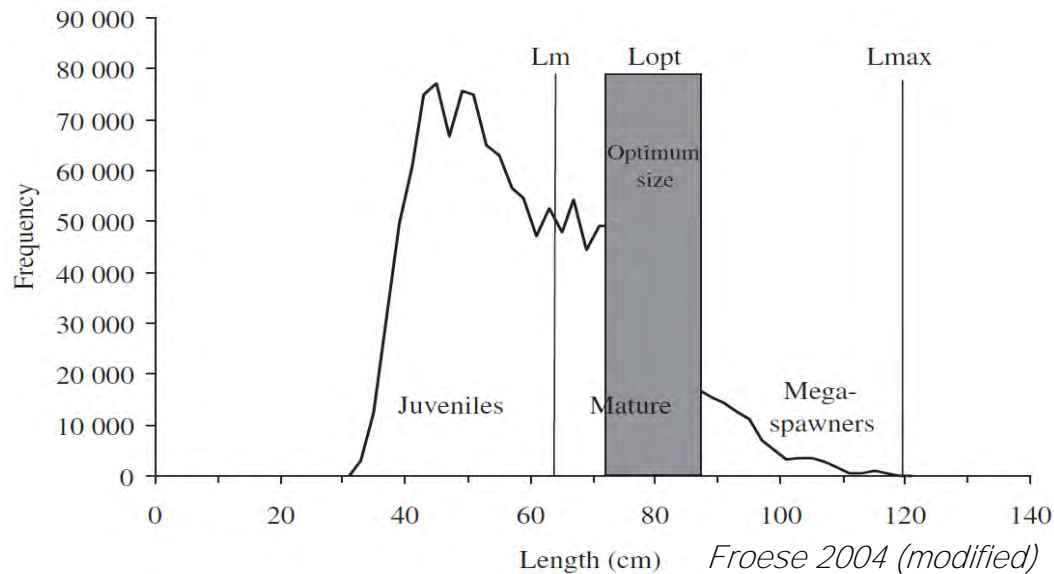
Fisheries



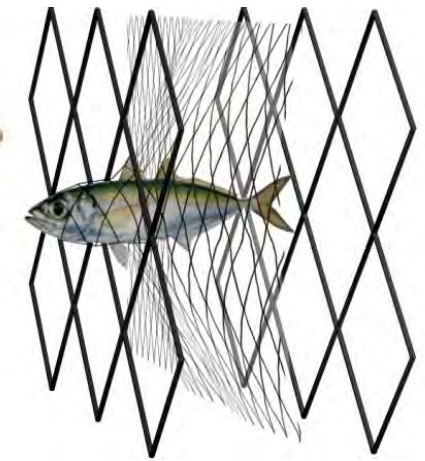
First explorative results
from some test scenarios

Simulations using bioeconomic modelling – BIOECO

Improving the exploitation pattern – the **technical** approach



The minimum mesh size for the inner net is 40mm, and the proposal is to increase the mesh size to 42mm



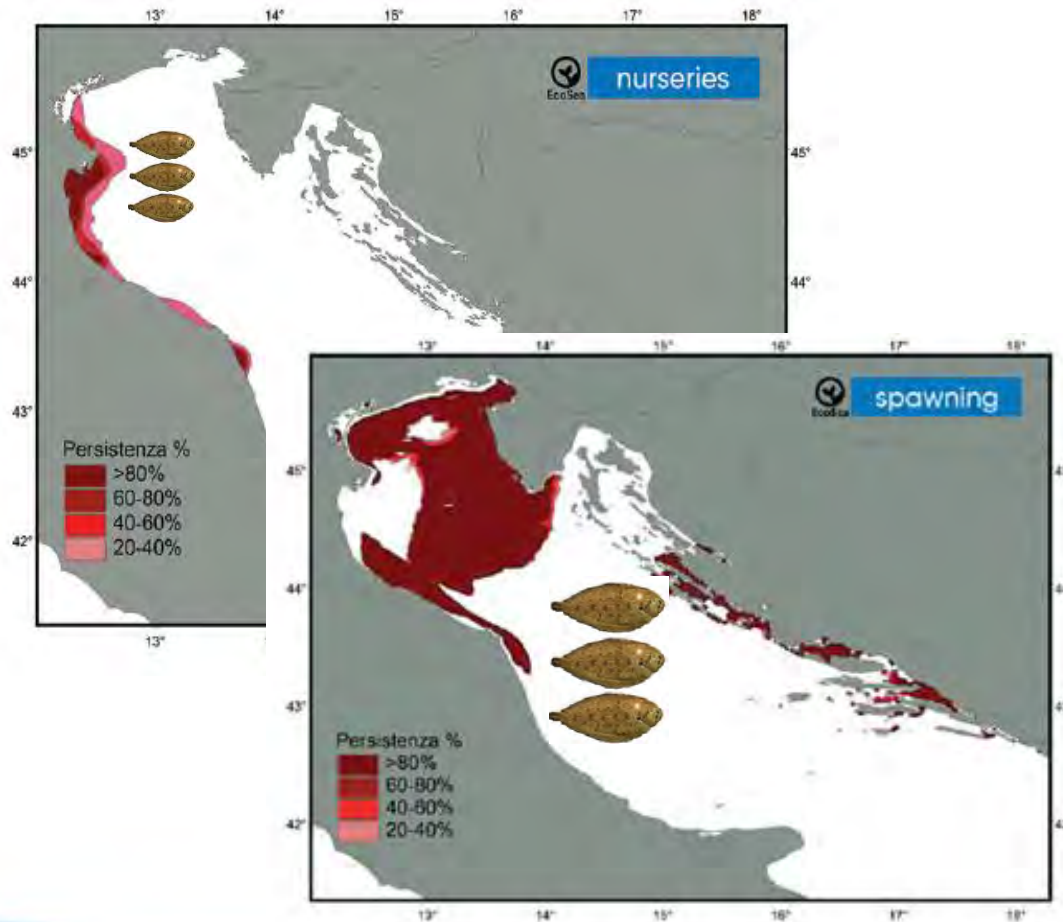
MCRS

- *using more selective gears;*
- *towards defining **best practices** for developing **guidelines** in the region as steps of a **bottom up approach***

Simulations using bioeconomic modelling – BIOECO

Improving the exploitation pattern

considering spatio-temporal closures



*Linking **fishing grounds** (e.g. the more visited) to the beam trawl (TBB) group of vessels by month/season.*

*Combine the information on the fleet behavior with the main **target species** (common sole) **distribution** according to the season and life stages.*

A specific selectivity is associated to each fleet

The Multiannual Management Plan in the Adriatic Sea

Recommendation GFCM/43/2019/5 on a multiannual management plan for sustainable demersal fisheries in the Adriatic Sea (geographical subareas 17 and 18)

PART III

c) for common sole, at 20 cm TL

Technical measures

Minimum conservation reference size

MCRS



Technical measures for beam trawls and trawlers in line with the Italian national decrees in the last years: seasonal ban, additional fishing days on voluntary basis, operational distance from the coast after the mandatory fishing ban.

**Fleets for which the implementation of management measures was simulated:
*trammel netters in Istria county beam trawl in Marche region***

BIOECO – Simulations and Prediction of management scenarios

BIOECO Tools

Stocks dynamic

- Stock1
 - growth, maturity, natural mortality, recruitment
- Stock2
 - ...



BEMTOOL bioeconomic model

Management

- Effort control rules (fishing days, vessels);
- change in gear characteristics and exploitation pattern;
- TAC (external or set according the annual SSB in respect to the reference points);
- Landing obligation



Fleet dynamic

- Fleet1
 - **harvest**: selectivity, fishing mortality, landing, discard;
 - **economic**: revenues, costs, profit, etc...
- Fleet2
 -



Simulations using bioeconomic modelling – BIOECO

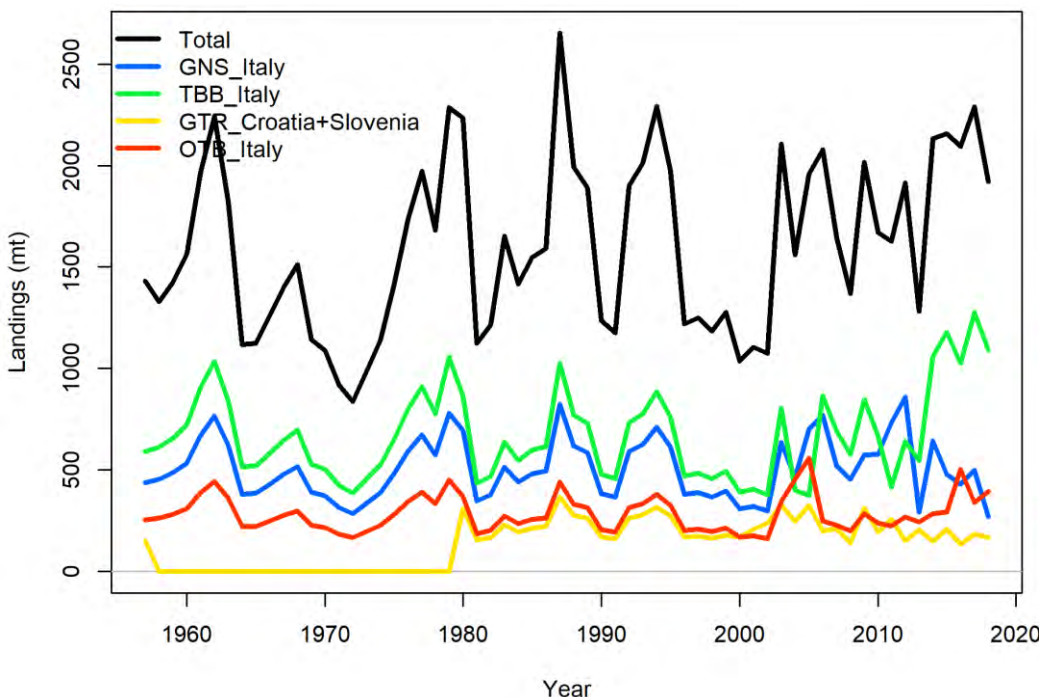
by considering technical interactions and/or spatio-temporal closures.

*investigating the **consequences** of scenarios, to evaluate how **changes/shifts in fishery-driven effects** (e.g. fishing mortality, gear/fleet selectivity) influence **stock and fisheries productivity**.*

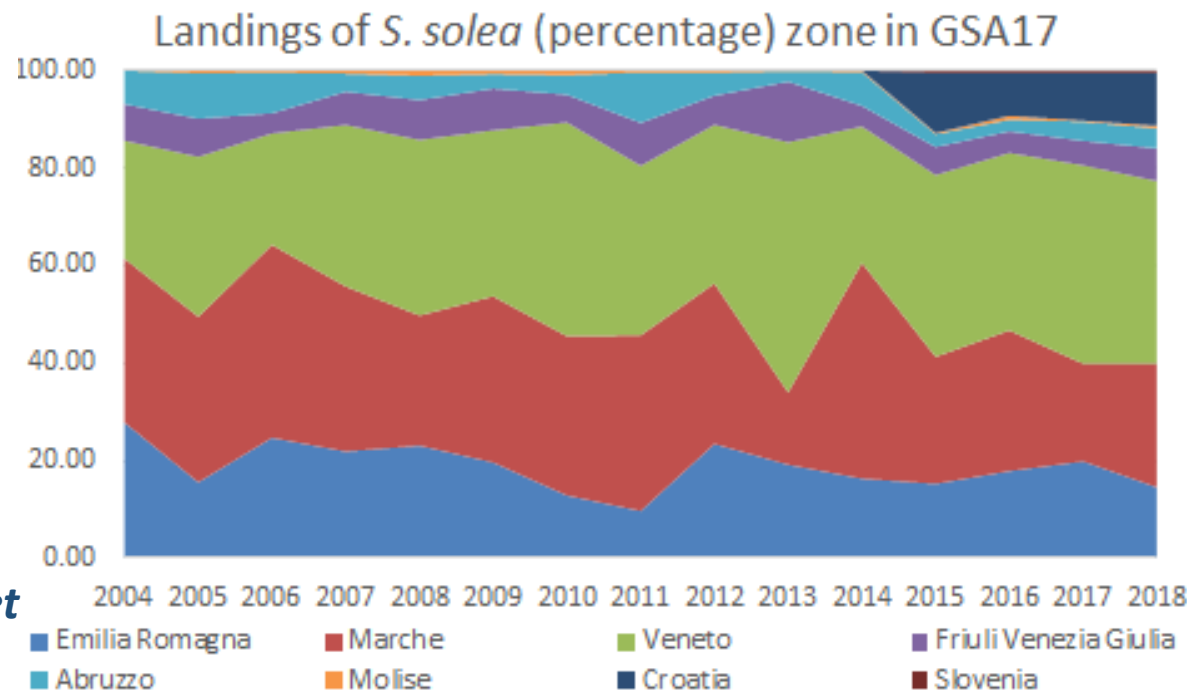
23 interacting fleets, given by the combination of region/country and fishing technique, were included in the bioeconomic model.

Simulations using bioeconomic modelling – BIOECO

Landings by fishing techniques and countries/regions



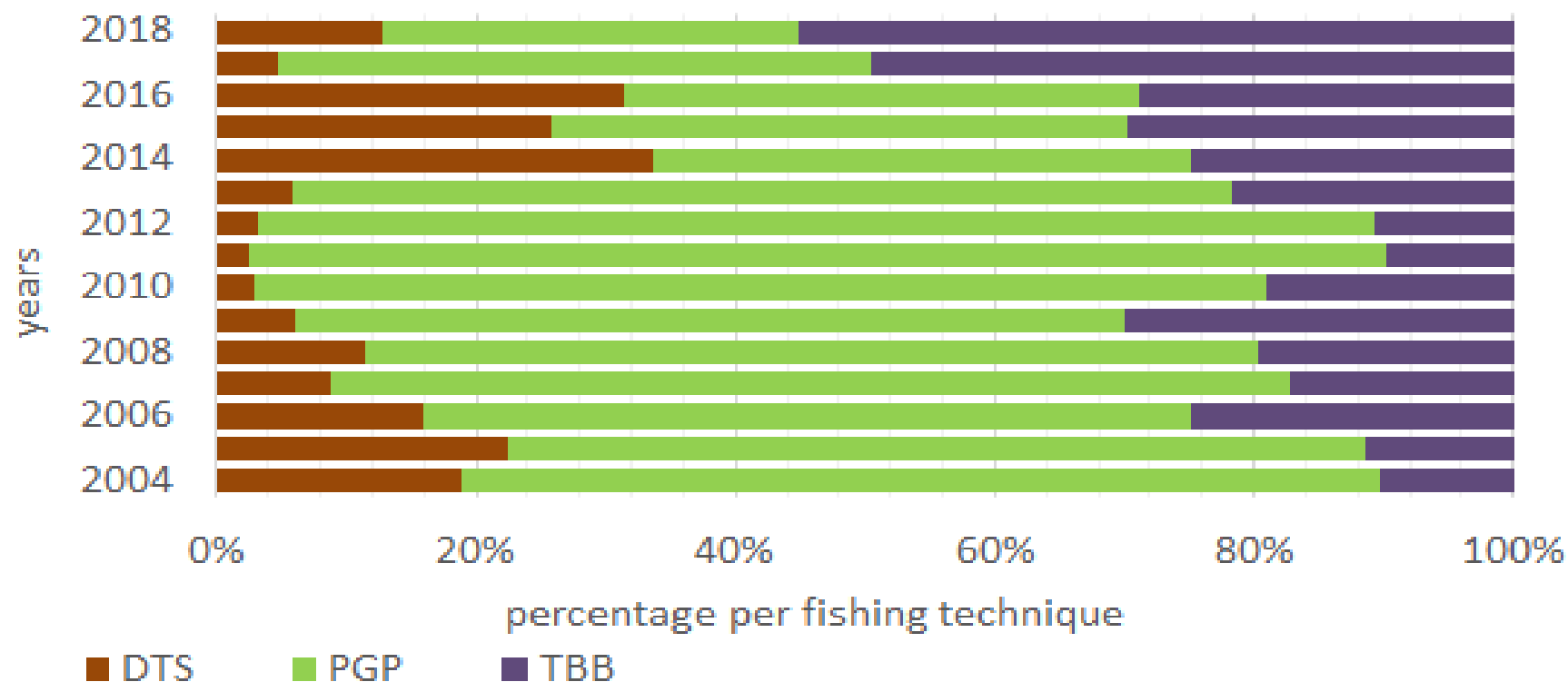
Landings data from the assessment (Scarcella et al., 2019)



Landings data used for comparison and to parameterize the productivity index by fleet

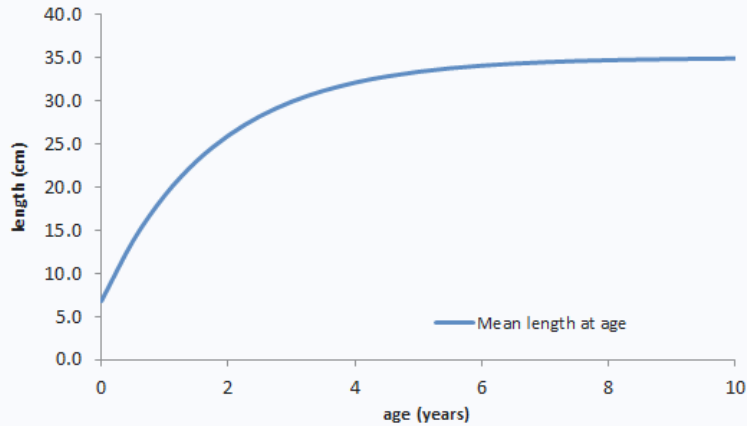
Landings by fishing techniques in the Marche region

Percentage of landings of *S. solea* by fishing technique and year in Marche region

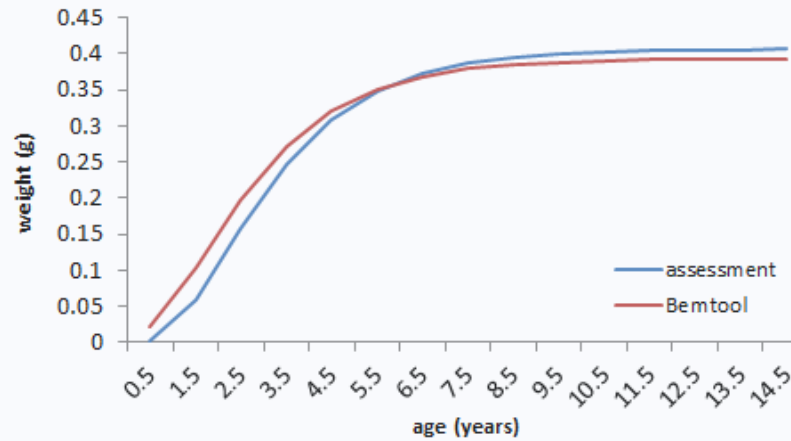


BIOECO – Mimicking stock assessment

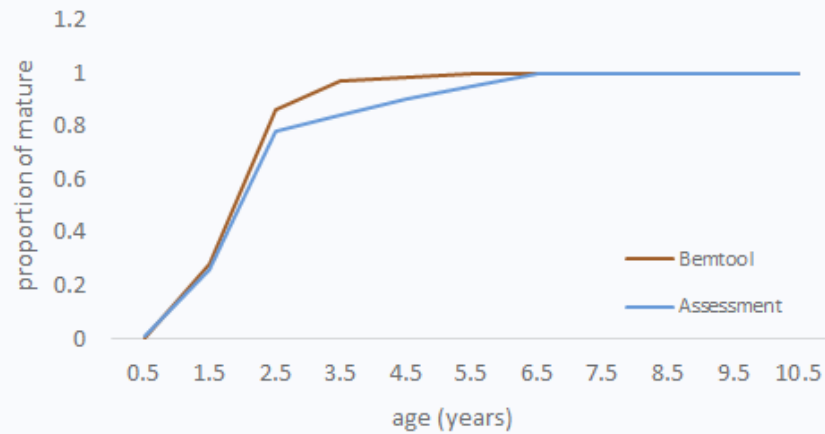
growth curve



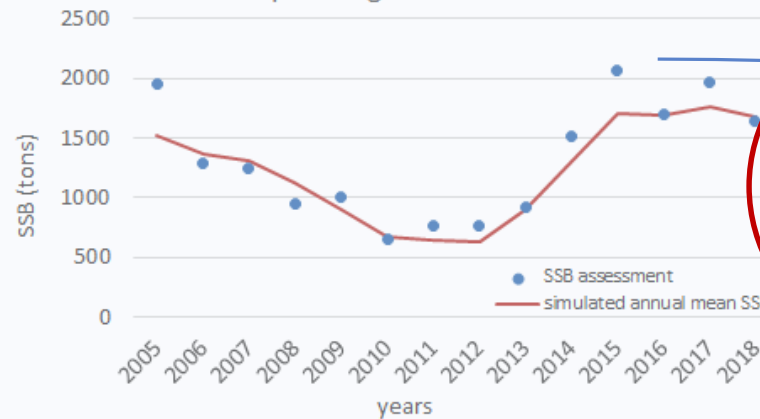
mean weight at age



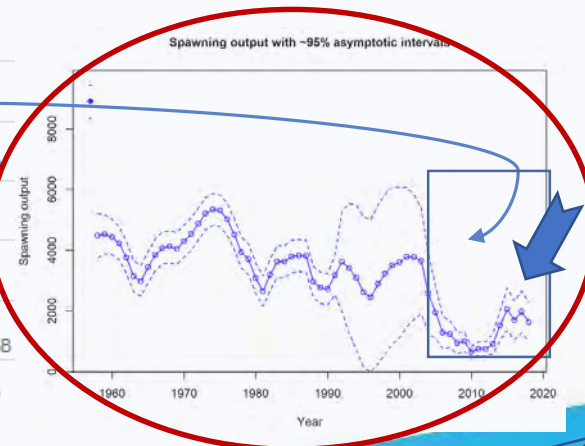
maturity at age



Spawning Stock Biomass



Currently the stock is slightly overexploited with the need to preserve the reproductive potential (Scarcella et al., 2019)

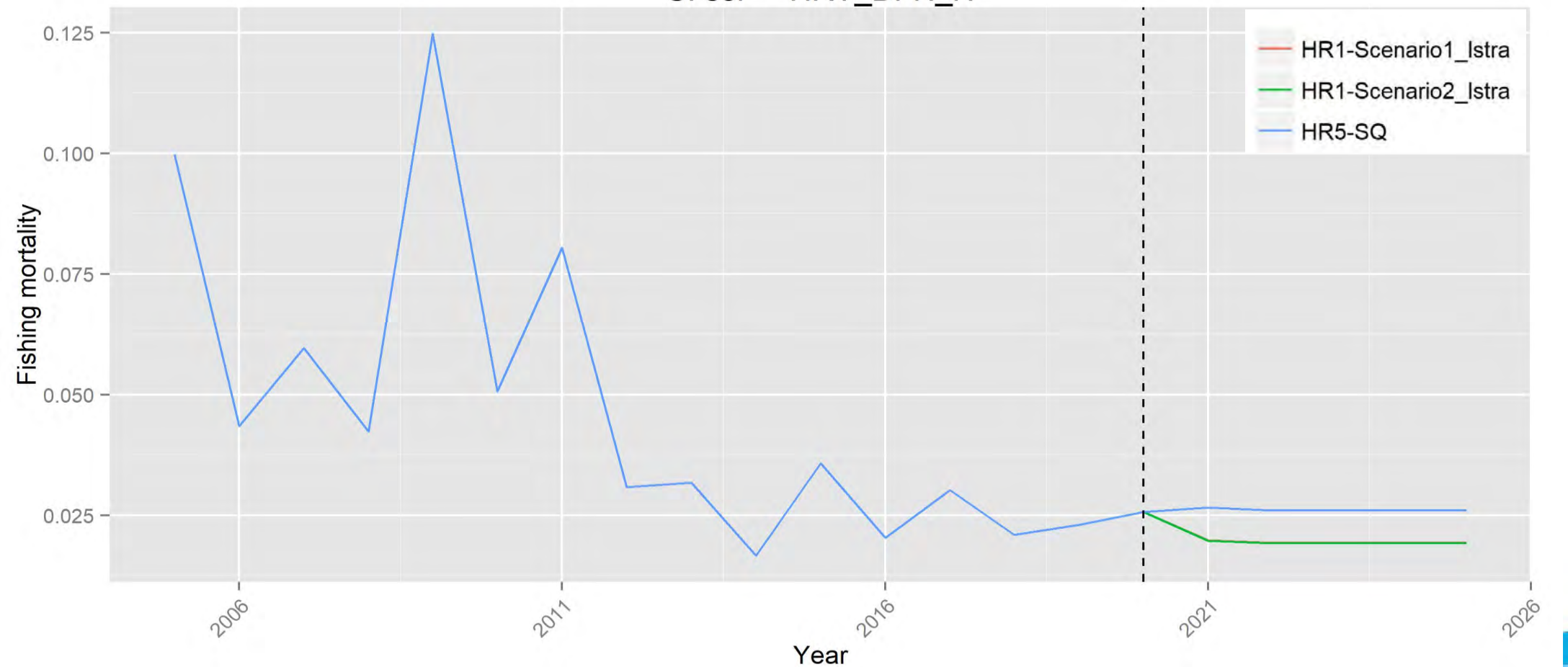


BIOECO – Four Management scenarios + Status Quo

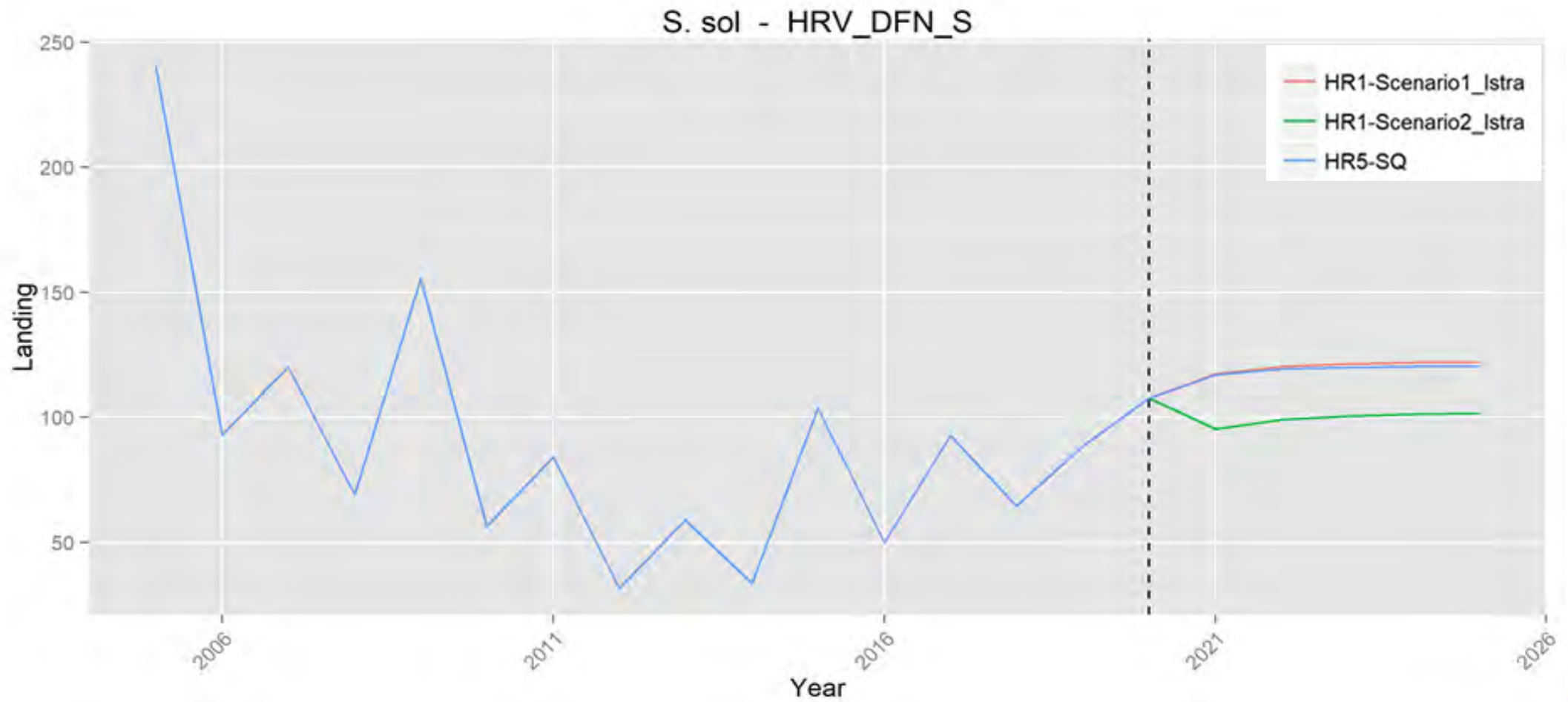
Scenarios	Fishery/Fleet	Measure
Scenario 1-Istria	Croatia DNF Nord	increase mesh size and then length at first capture (2cm)
Scenario 2-Istria	whole Croatia DNF	increase mesh size and then length at first capture (2cm)
Scenario 1-Marche	TBB Marche	improve fleet selectivity, extending the fishing prohibition within 6 nautical miles to December
Scenario 2 Marche	TBB Marche	improve fleet selectivity implementing the fishing prohibition within 9 nautical miles in October, extended to December
Status Quo	All	No changes from the current situation

BIOECO scenarios – Istria - Fishing mortality trend

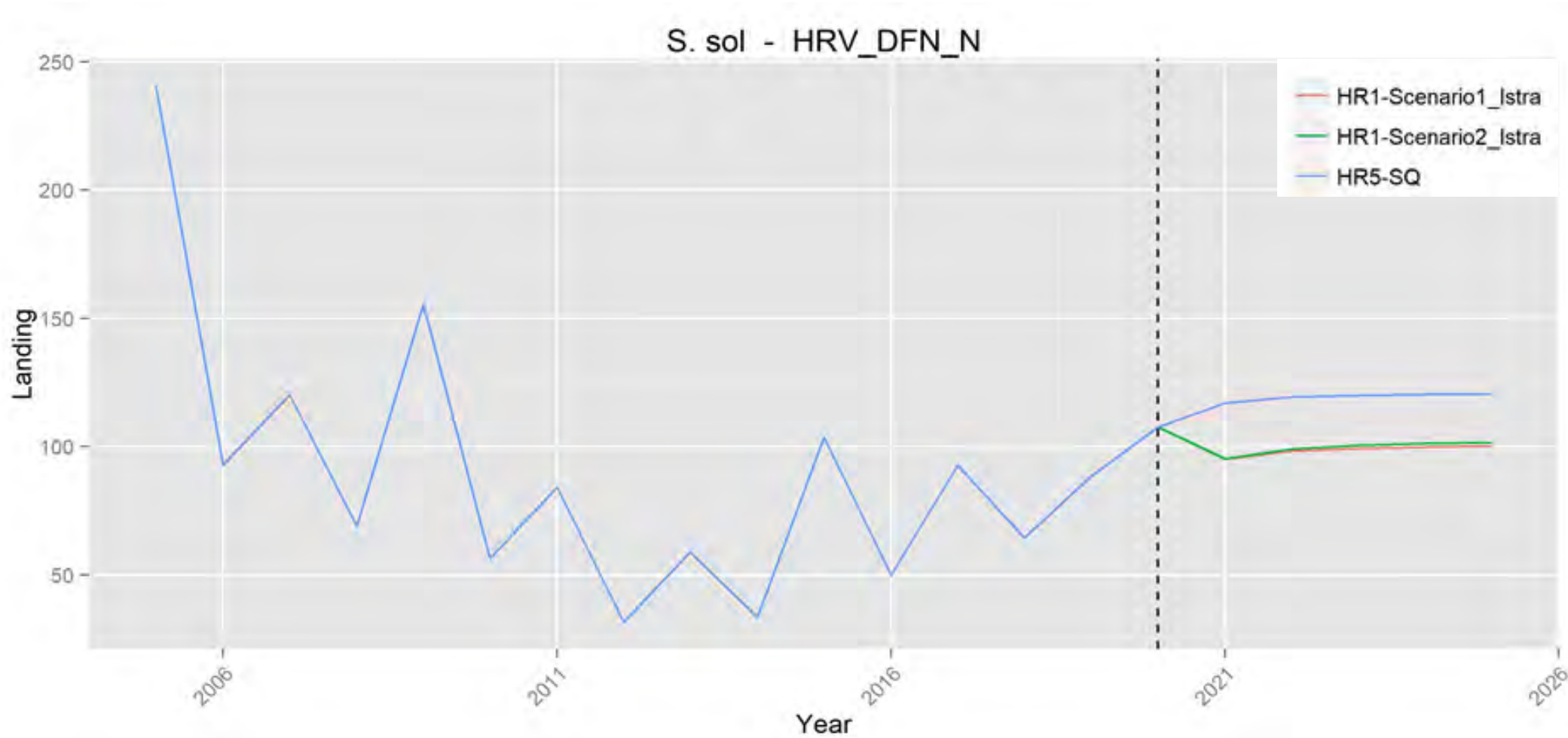
S. sol - HRV_DFN_N



BIOECO scenarios - Istria – Landing trend

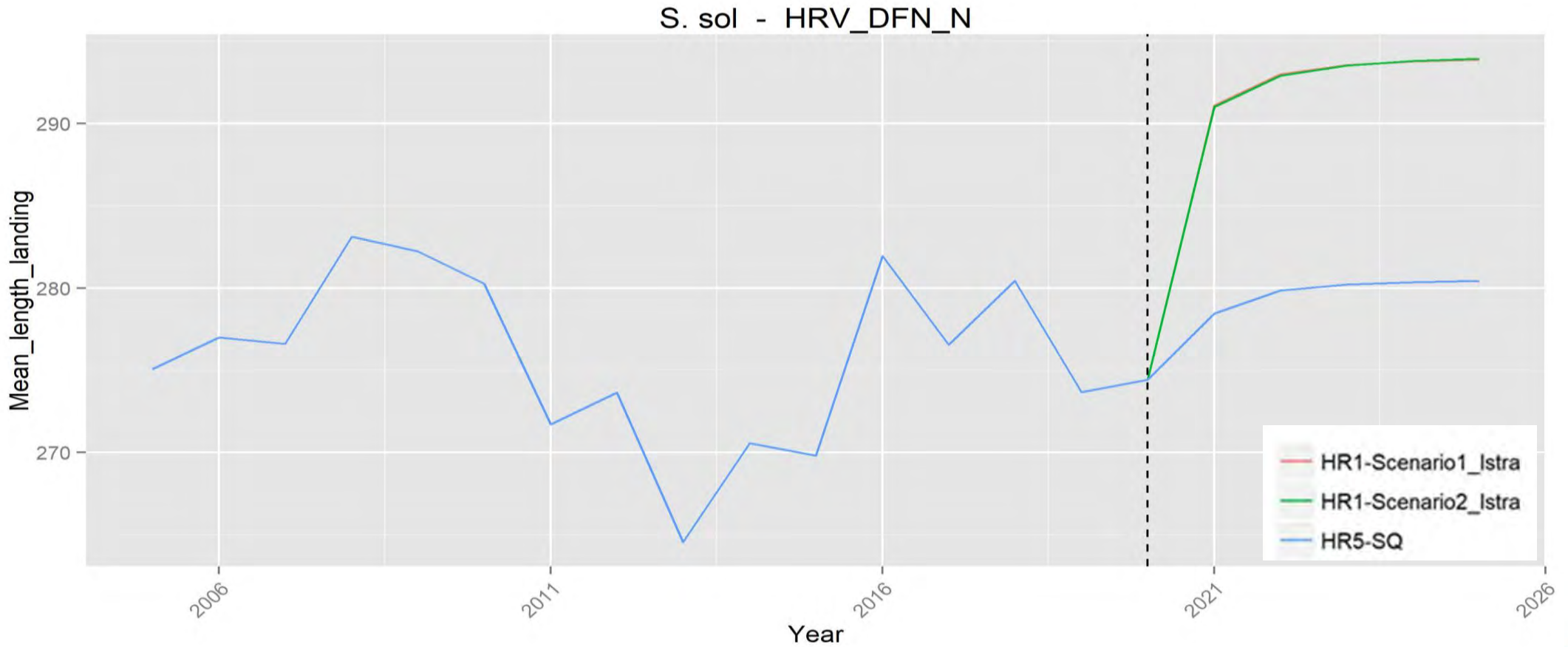


BIOECO Scenarios - Istria – Landing trend

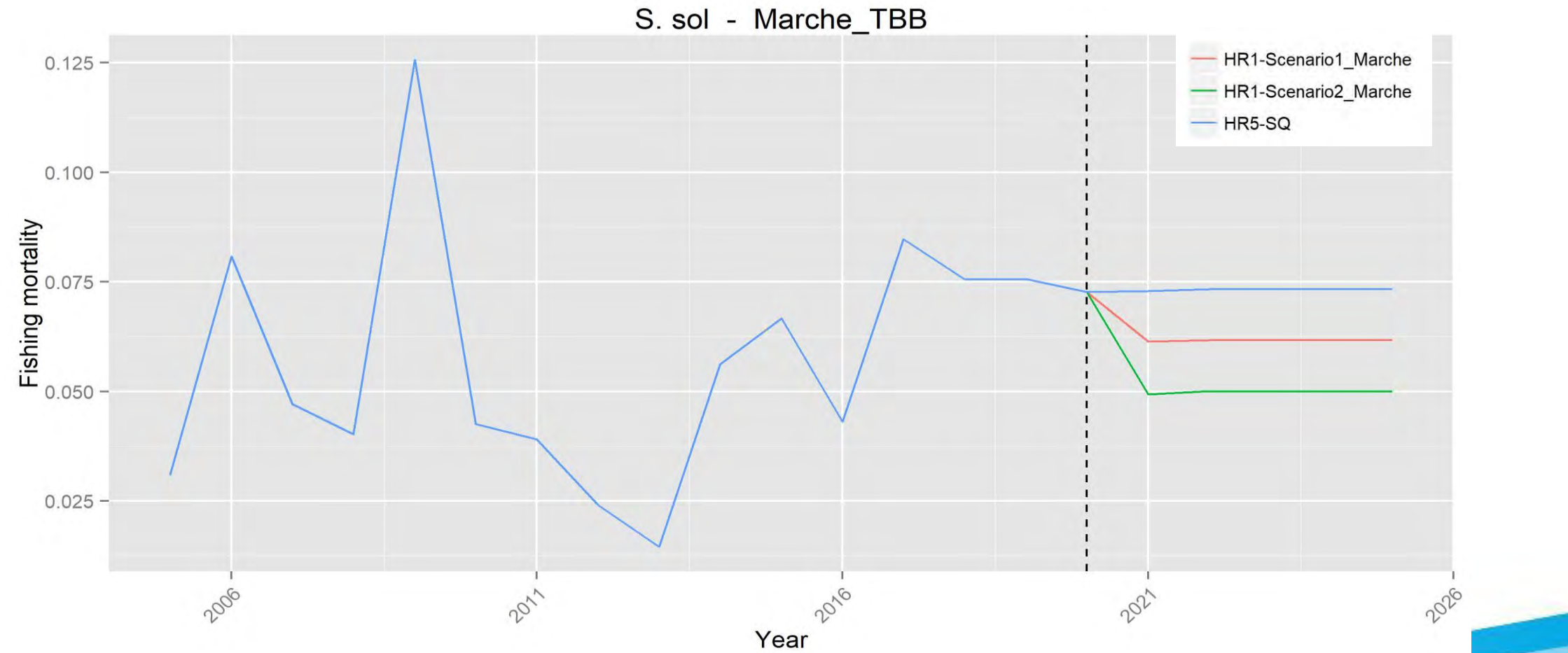


BIOECO scenarios - Istria

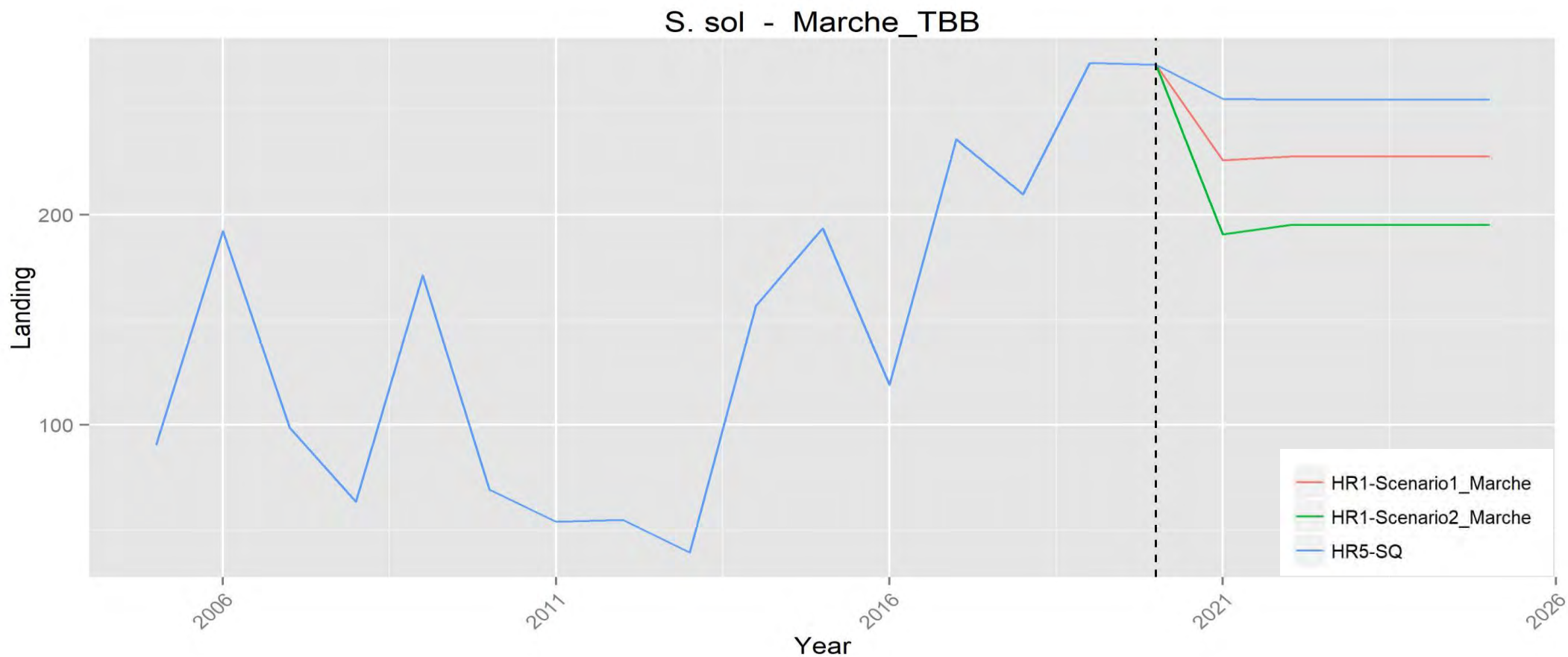
trend of mean length of sole in the landing



BIOECO scenarios - Marche – Fishing mortality trend

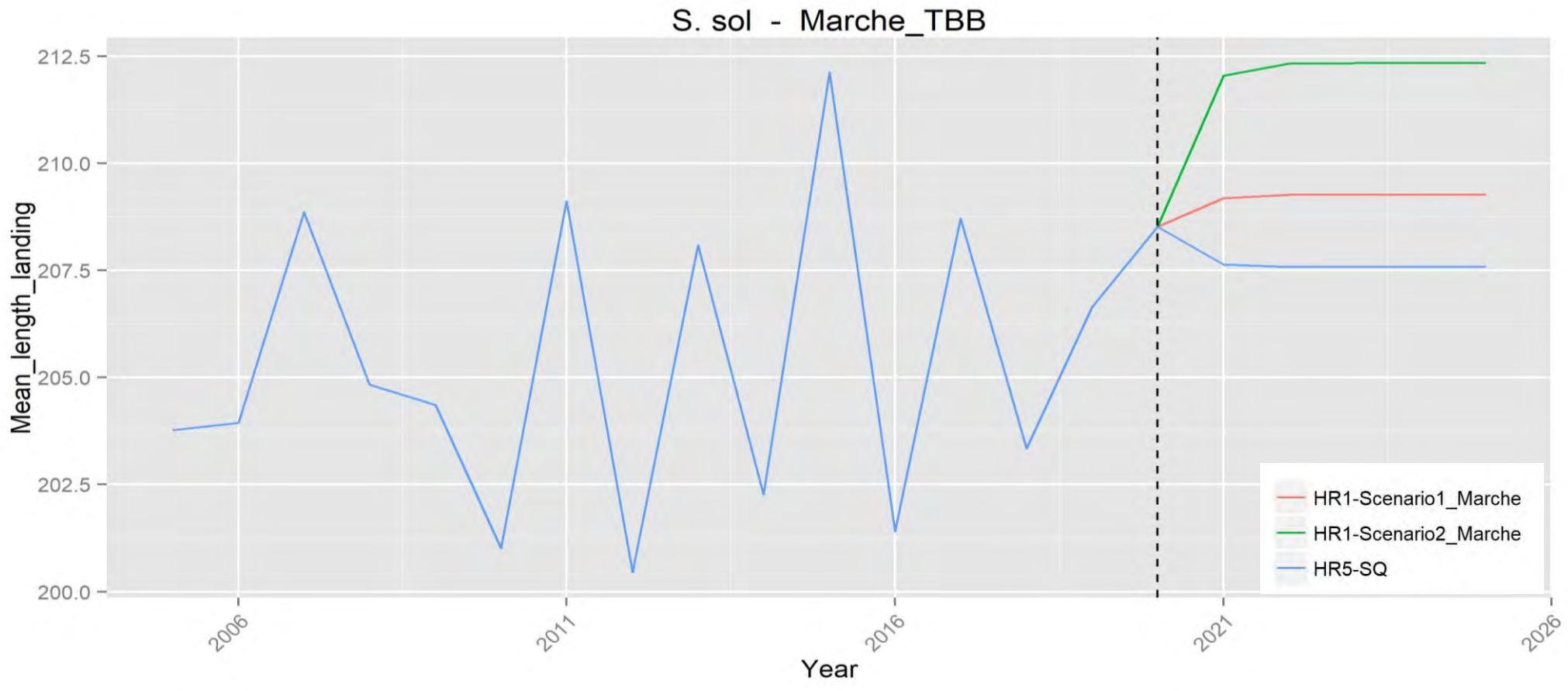


BIOECO scenarios – Marche – trend of TBB Landing

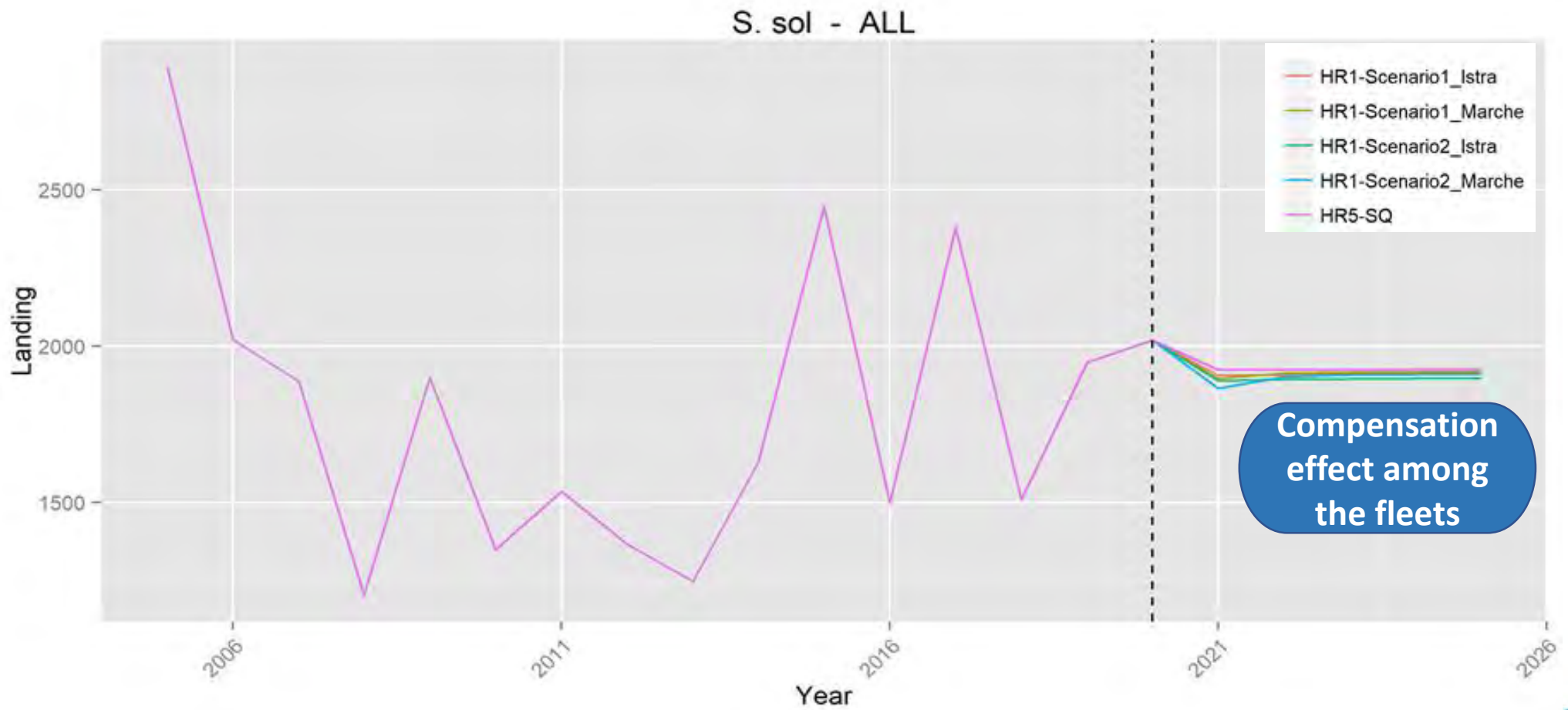


BIOECO scenarios - Marche

trend of mean length of sole in TBB landing

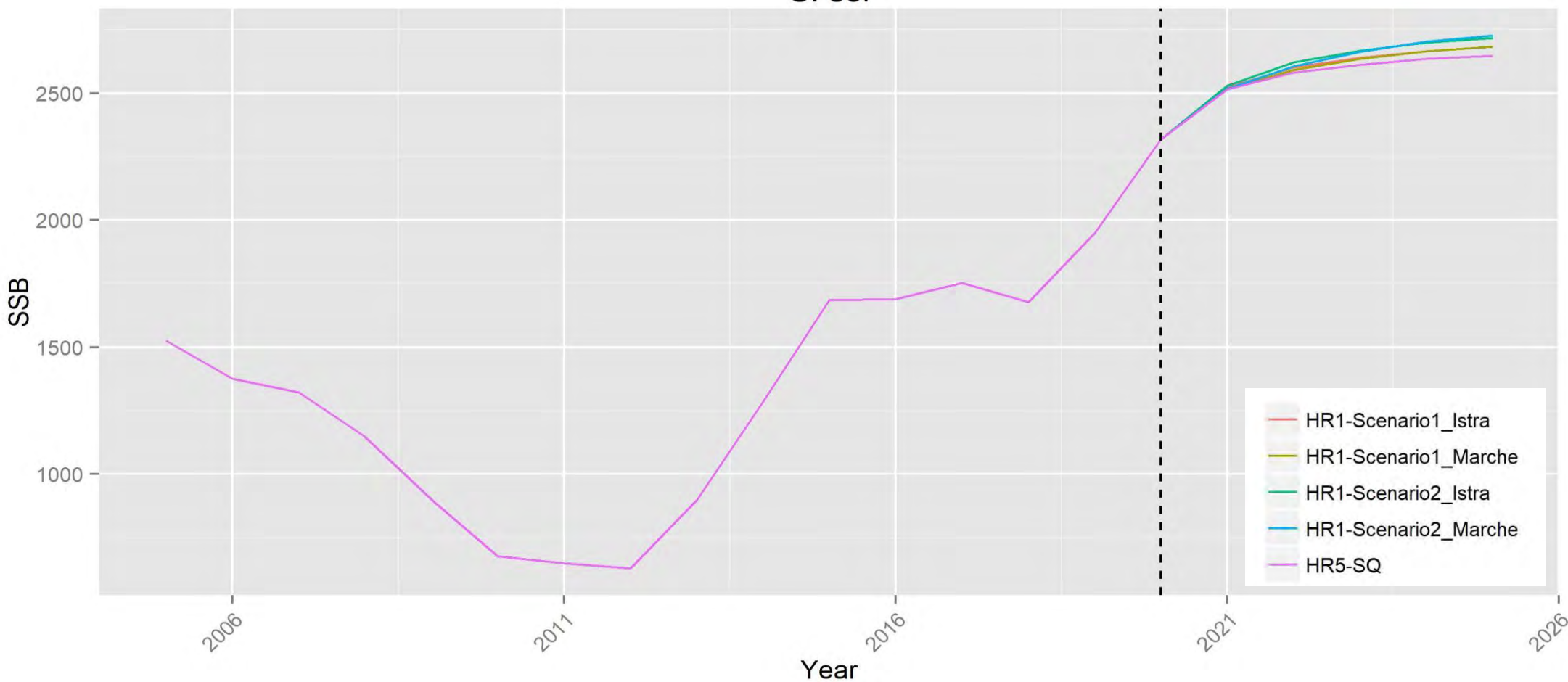


BIOECO All scenarios – trend of landings for all the fleets



BIOECO All scenarios – trend of SSB

S. sol



Some remarks and next steps

A benchmark assessment of common sole is ongoing during this week, new elements will be taken into account

New scenarios to be implemented with uncertainty:

- a. Extending to the other beam trawlers and trawlers the same measure as for Marche beam trawlers*
- b. Extending best practices of Istria small scale fleet*
- c. Introducing a fishing ban for small scale fisheries in winter time when common sole reproduces*
- d. A combination of measures*

Preliminary results of Pilot Actions case studies


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Thank you for your attention!