

Health status results

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2/27/2021

1. Scenarios

In this section, we test how grouping stocks by their initial stock affect the profits, biomass and effort allocation. We are considering 3 species/fish have a healthy stock ($X_0 = 50$), and 2 species/fish are overfished ($X_0 = 15$) at time zero.

We considered 3 arrangement for the quota baskets:

- *Species with similar health status*: we have a QB of healthy stocks and a group of overfished stocks.
- *The healthy species predominates in a basket*: we have a QB were the healthy species predominates (2 healthy stocks and 1 overexploited stock), and the other basket has the remaining species (1 healthy stock and 1 overexploited stock).
- *The overfished species predominates in a basket*: we have a QB were the overfished species predominates (1 healthy stock and 2 overexploited stocks), and the other basket has the remaining species (2 healthy stocks).

We are going to compare these arrangements in terms of biomass, efforts, and total profits.

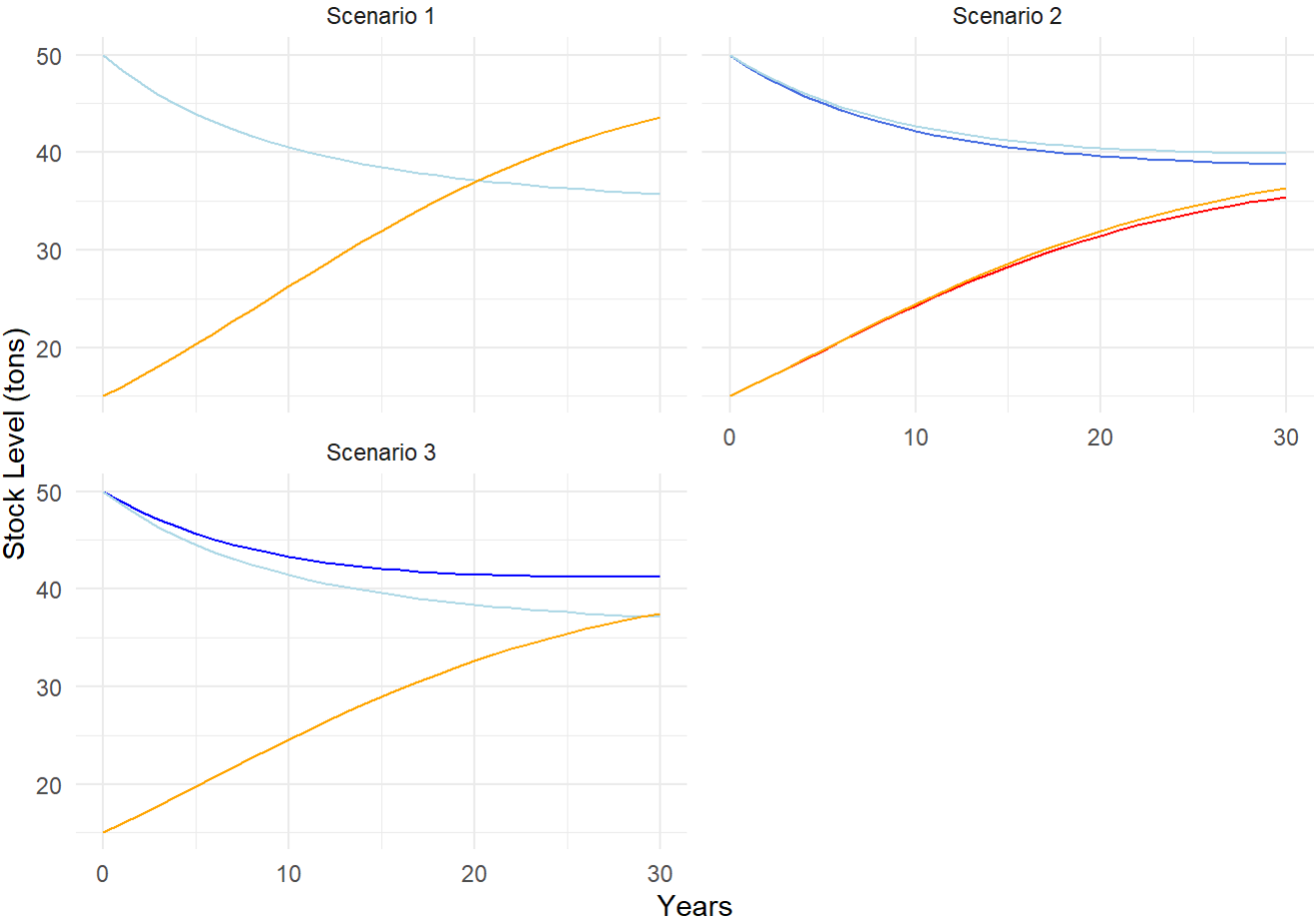
1.1 Parameters

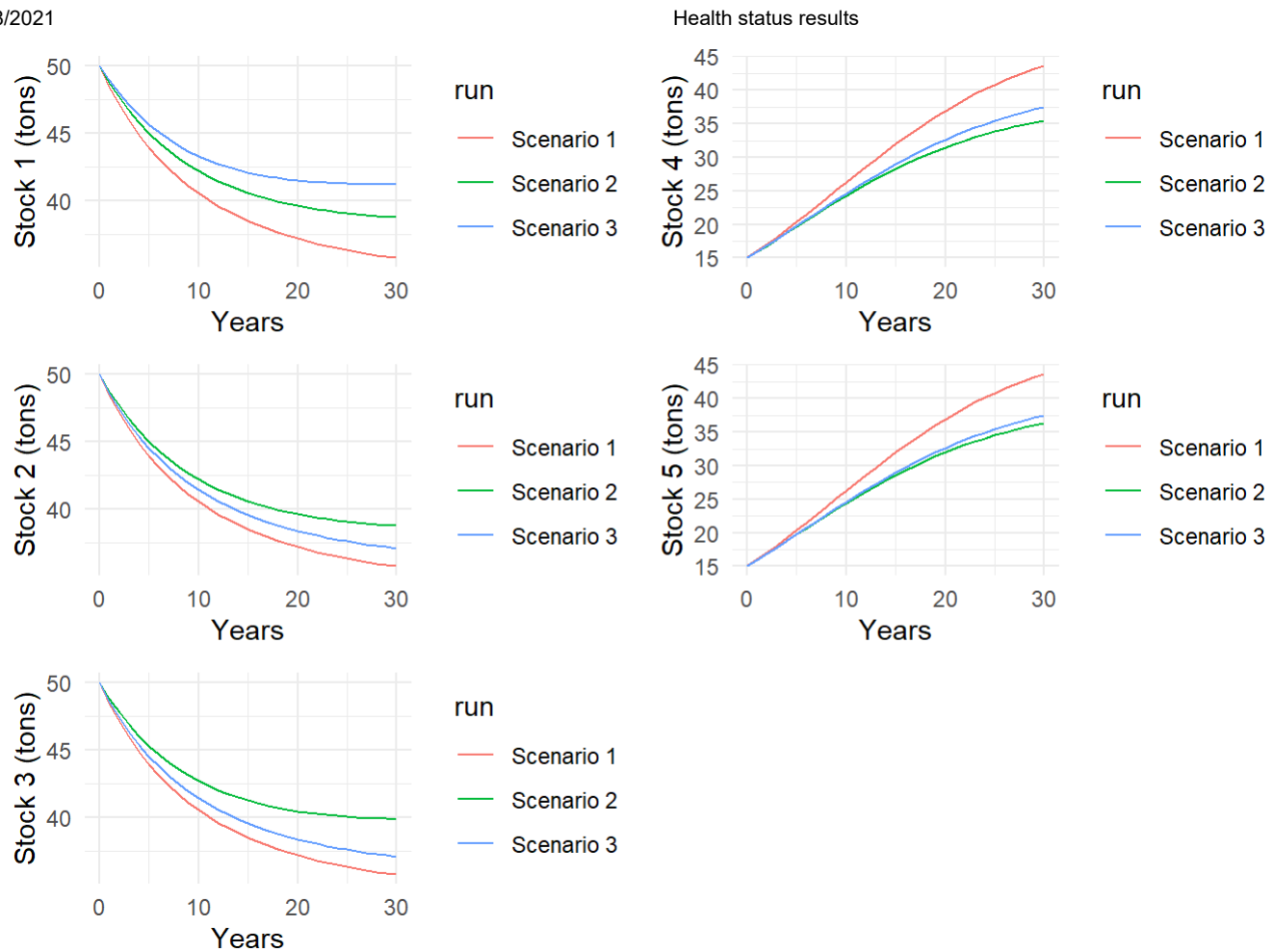
Species	r	K	Starting stock (X)			price
1	0.2	100			50	20
2	0.2	100			50	20
3	0.2	100			50	20
4	0.2	100			15	20
5	0.2	100			15	20

Tech	q1	q2	q3	q4	q5	cost
1	0.04	0.01	0.01	0.01	0.01	1
2	0.01	0.04	0.01	0.01	0.01	1
3	0.01	0.01	0.04	0.01	0.01	1
4	0.01	0.01	0.01	0.04	0.01	1
5	0.01	0.01	0.01	0.01	0.04	1

2. Biomass

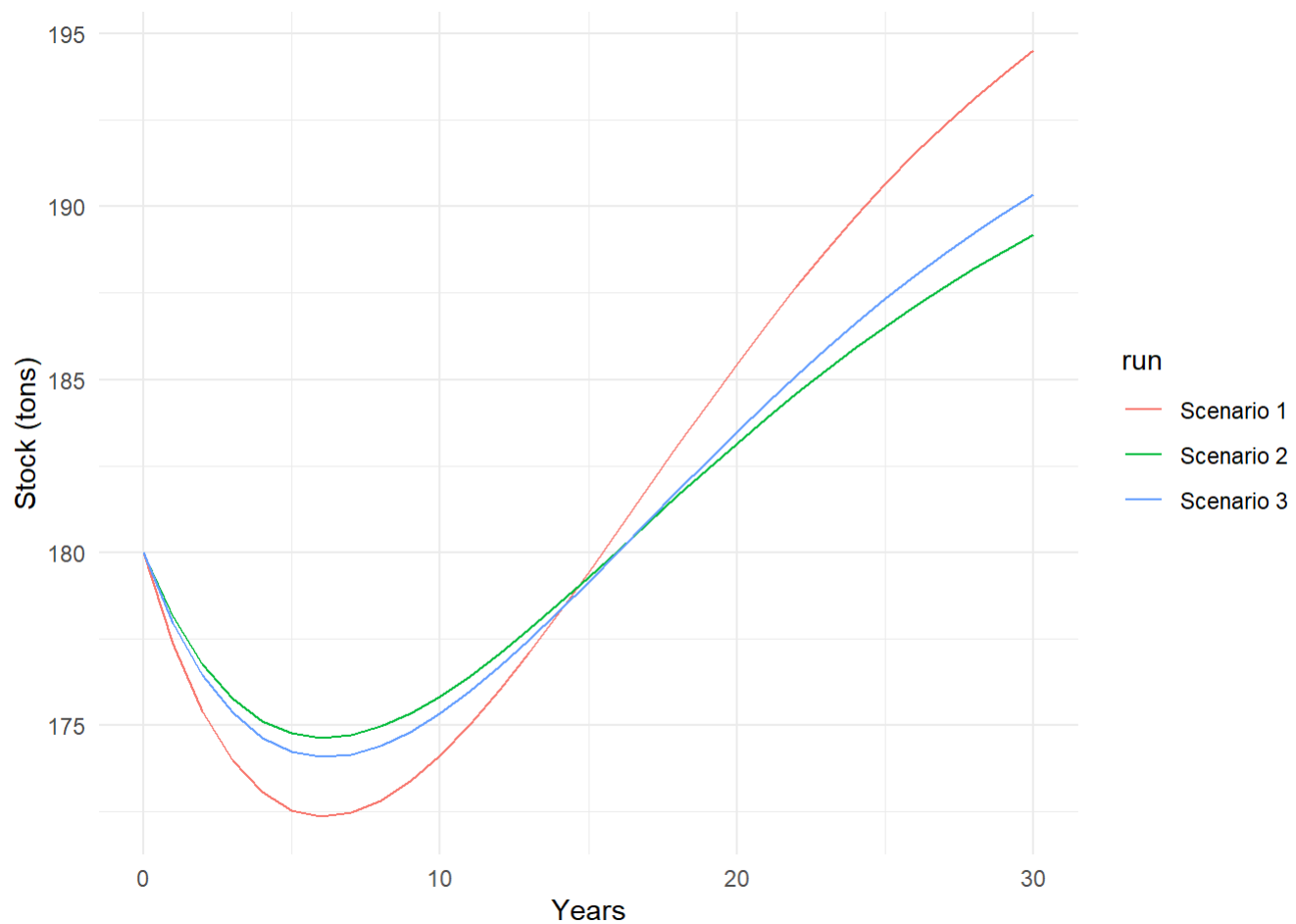
2.1 Biomass per species





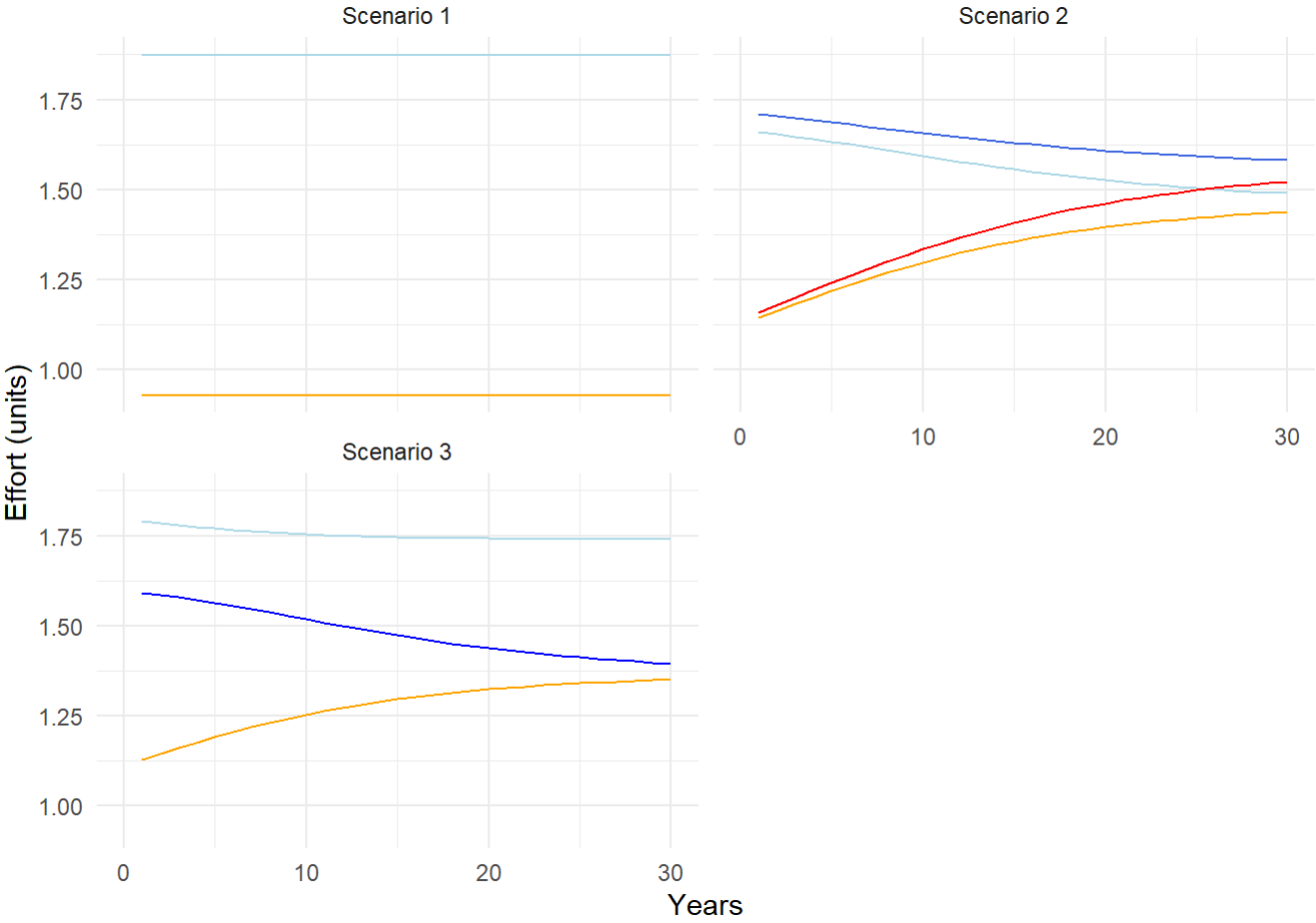
- Holding the rest of variables constant, the healthy stocks decline more in baskets dominated by healthy stocks.
- Holding the rest of variables constant, the overfished stocks recover more in the baskets dominated by them.

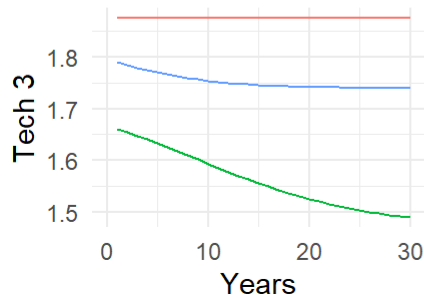
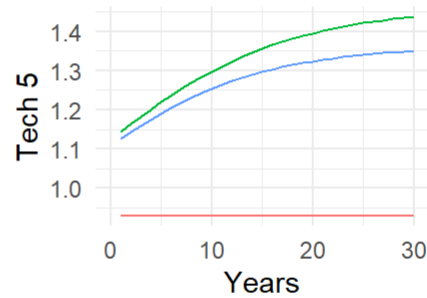
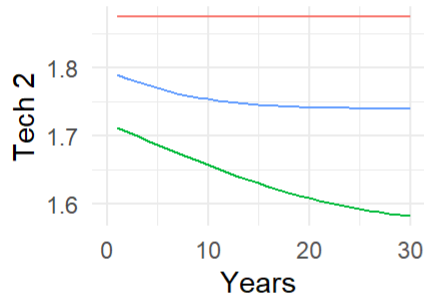
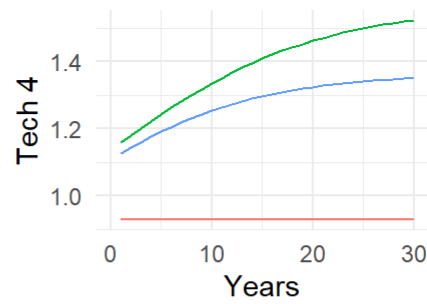
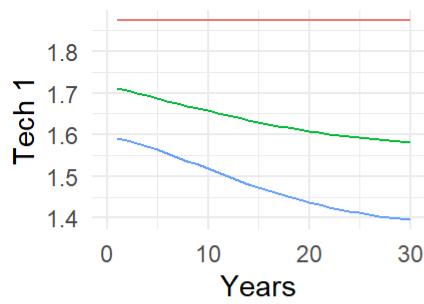
2.2 Total biomass in the ocean



Holding the other of parameters similar among species, the total stock declines during the first 5 years and recovers in the long term. Scenario 1 provides better stock results on the long term, but the trade off is putting additional pressure on the healthy stocks.

3. Effort

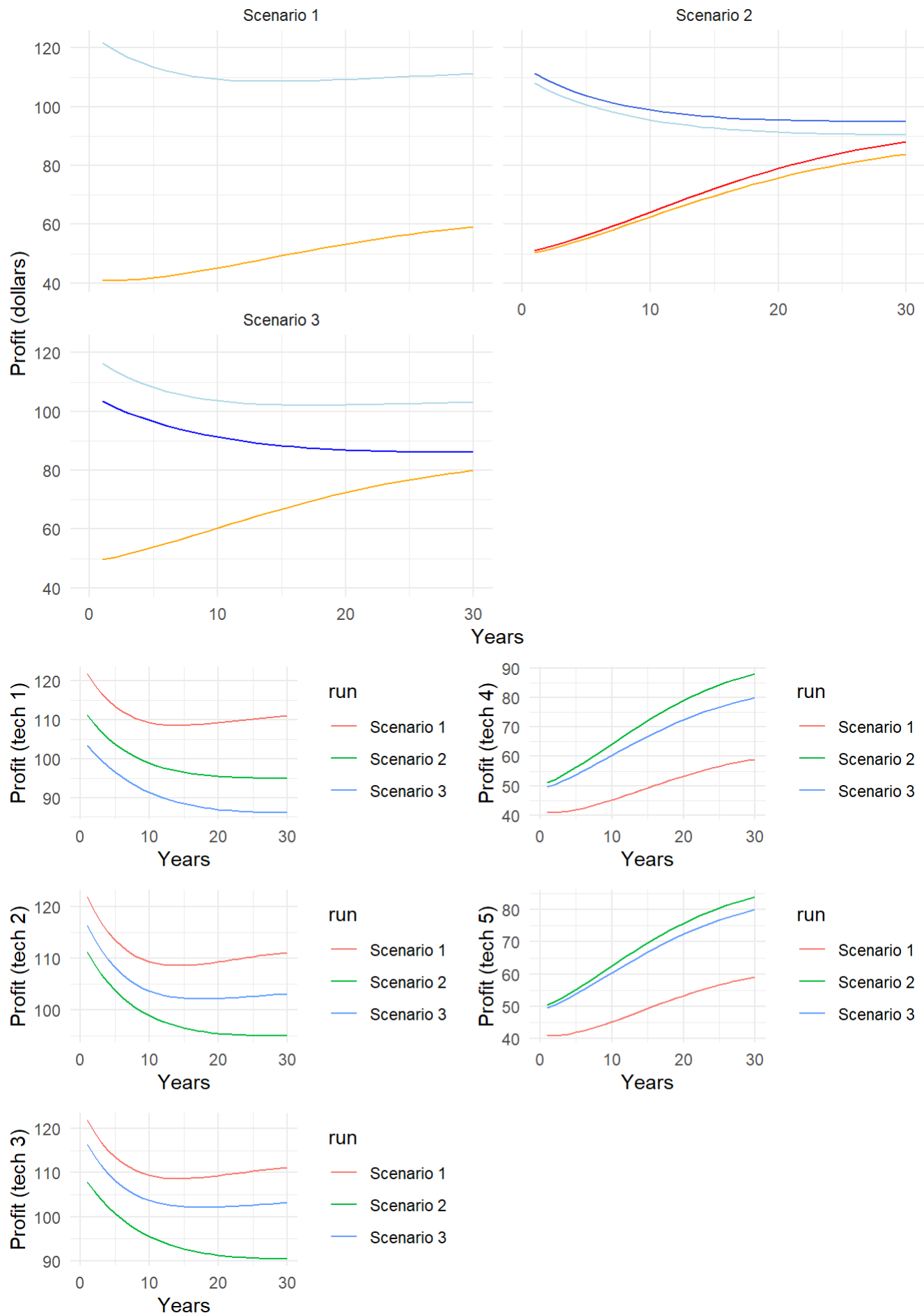




- Holding the other variables constant, we observe that baskets of similar elements display uniform effort units across all the period of analysis.
- In the other scenarios, the effort favorable in harvesting overfished species increase while these species recover they stock.

4. Profit

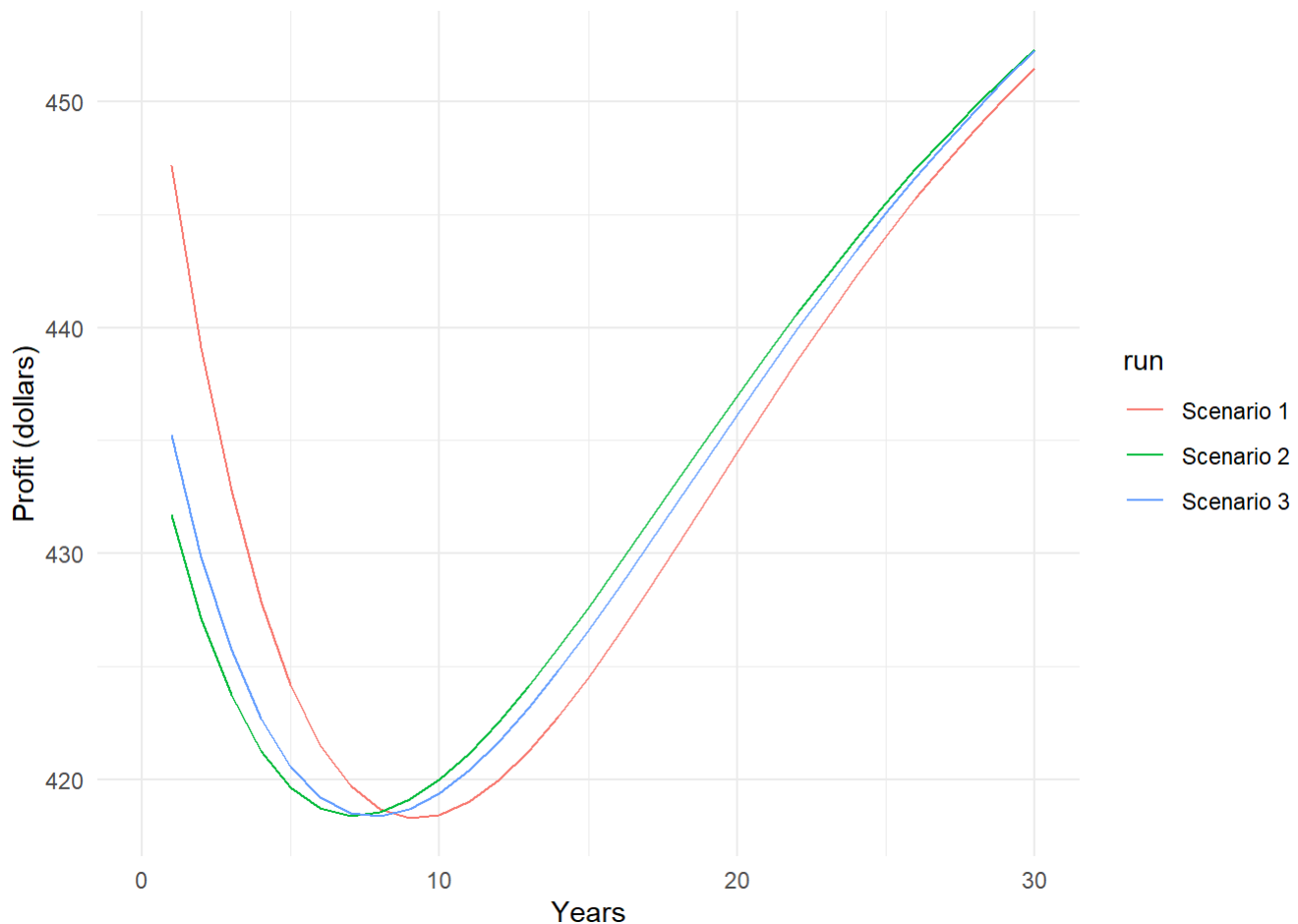
4.1 Profit per technology



- Grouping healthy species (scenario 1) provide greater profits in their favorable technologies in all scenarios.

- Grouping overfished species (scenario 1) provide less profits in their favorable technologies in all scenarios.
- Grouping overfished species with healthy species, favor the increase of profits in technologies favorable for overfished species.

4.2 Total profit per scenario



- Scenario 1 provides greater total profits in the short term.

5. Summary

Stocks

- Holding the rest of variables constant, the healthy stocks decline more in baskets dominated by healthy stocks.
- Holding the rest of variables constant, the overfished stocks recover more in the baskets dominated by them.

Effort

- Holding the other variables constant, we observe that baskets of similar elements display uniform effort units across all the period of analysis.
- In the other scenarios, the effort favorable in harvesting overfished species increase while these species recover they stock.

Profit

- Grouping healthy species (scenario 1) provide greater profits in their favorable technologies in all scenarios.
- Grouping overfished species (scenario 1) provide less profits in their favorable technologies in all scenarios.

- Grouping overfished species with healthy species, favor the increase of profits in technologies favorable for overfished species.
- Scenario 1 provides greater total profits in the short term.