

Cancer pagurus

Malin Stock (VIa) assessment and overall status

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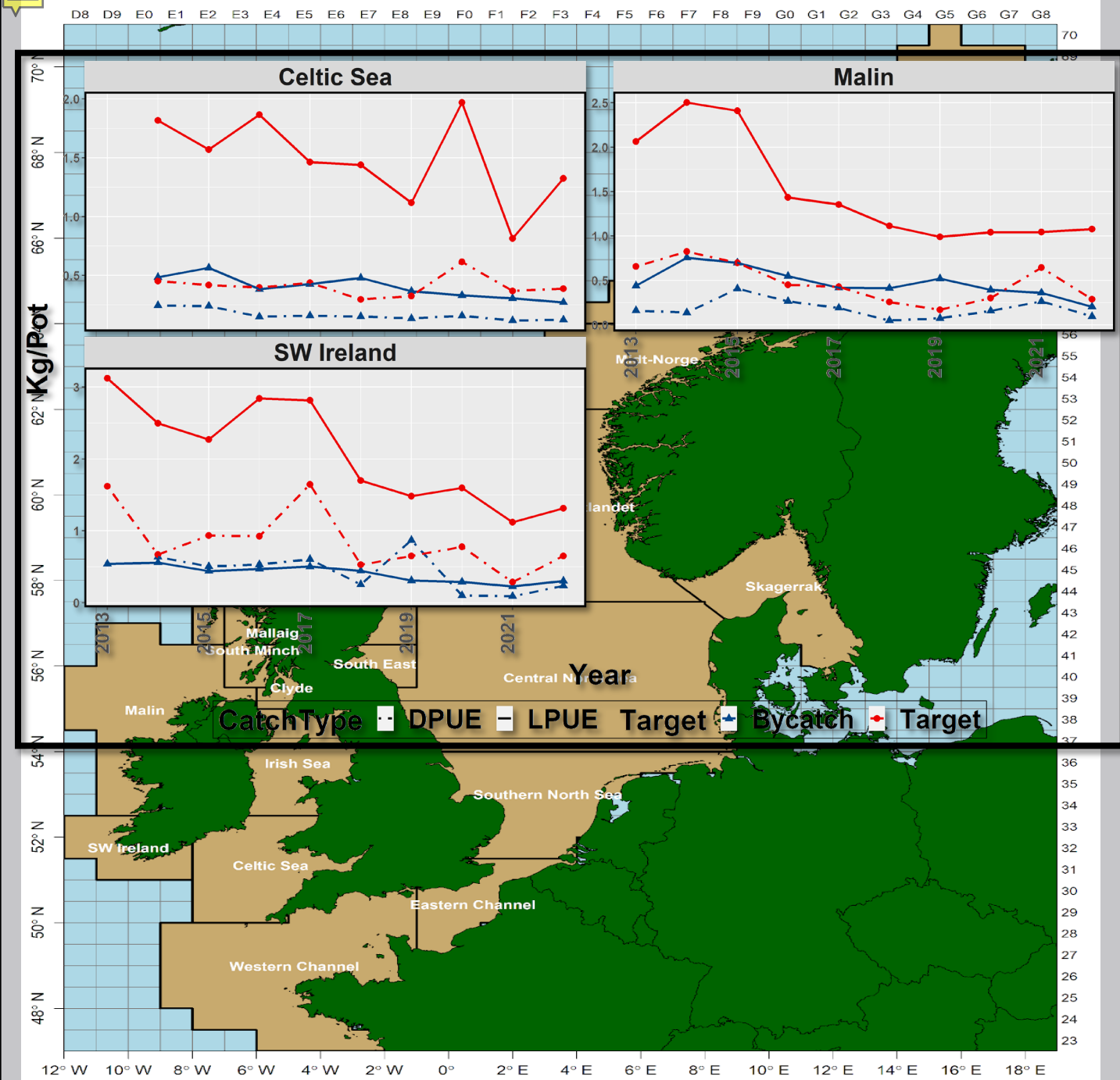


Overall status

Sentinel Vessel Fleet (SVP) showing a continuous decline since 2014 (both LPUE and DPUE). Not observed before in previous data collection programmes

Trends are consistent with recent questionnaire data from Donegal fisherman

Landings and LPUE decrease despite increase in effort



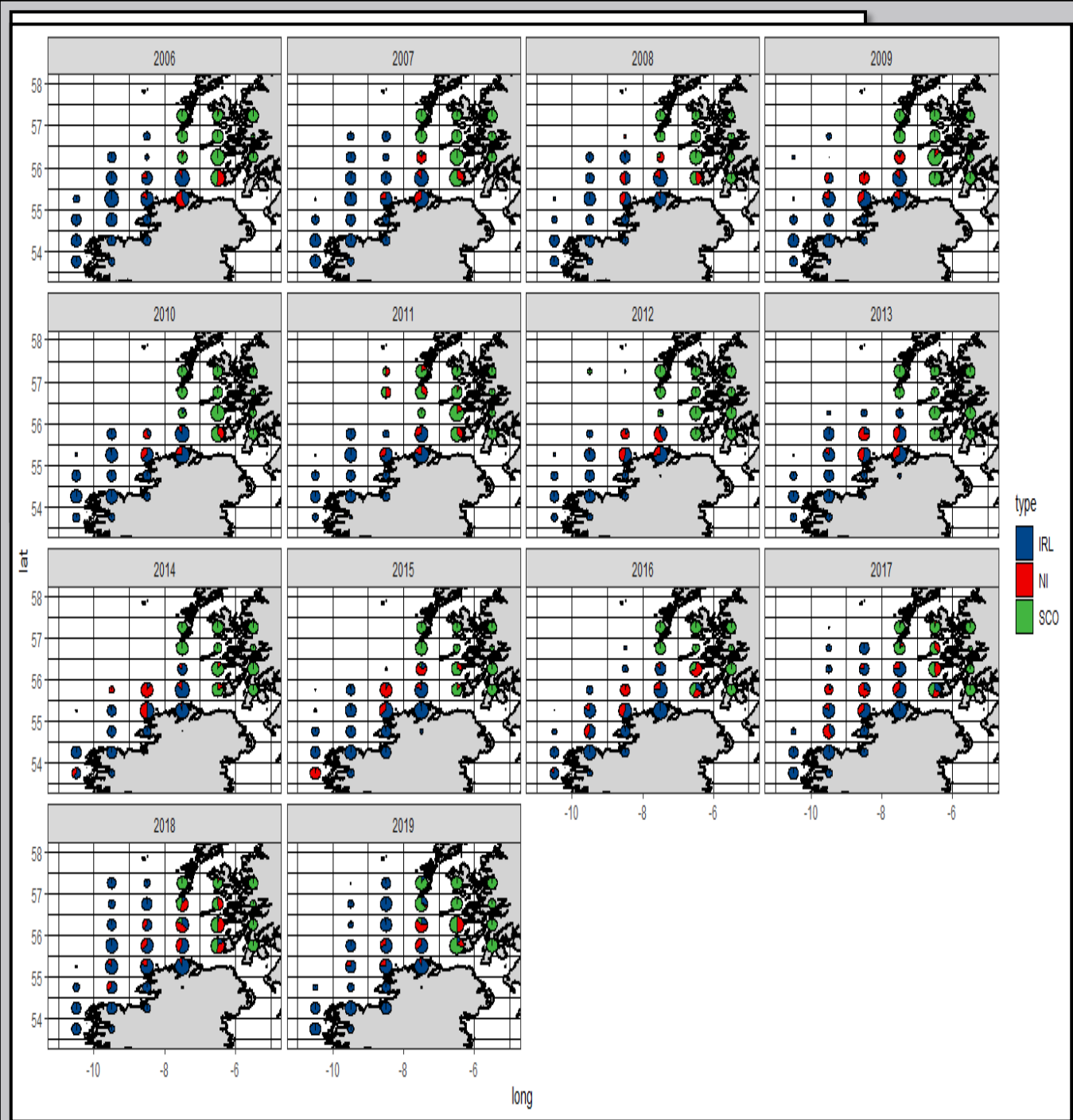
The Malin Stock

The fishery

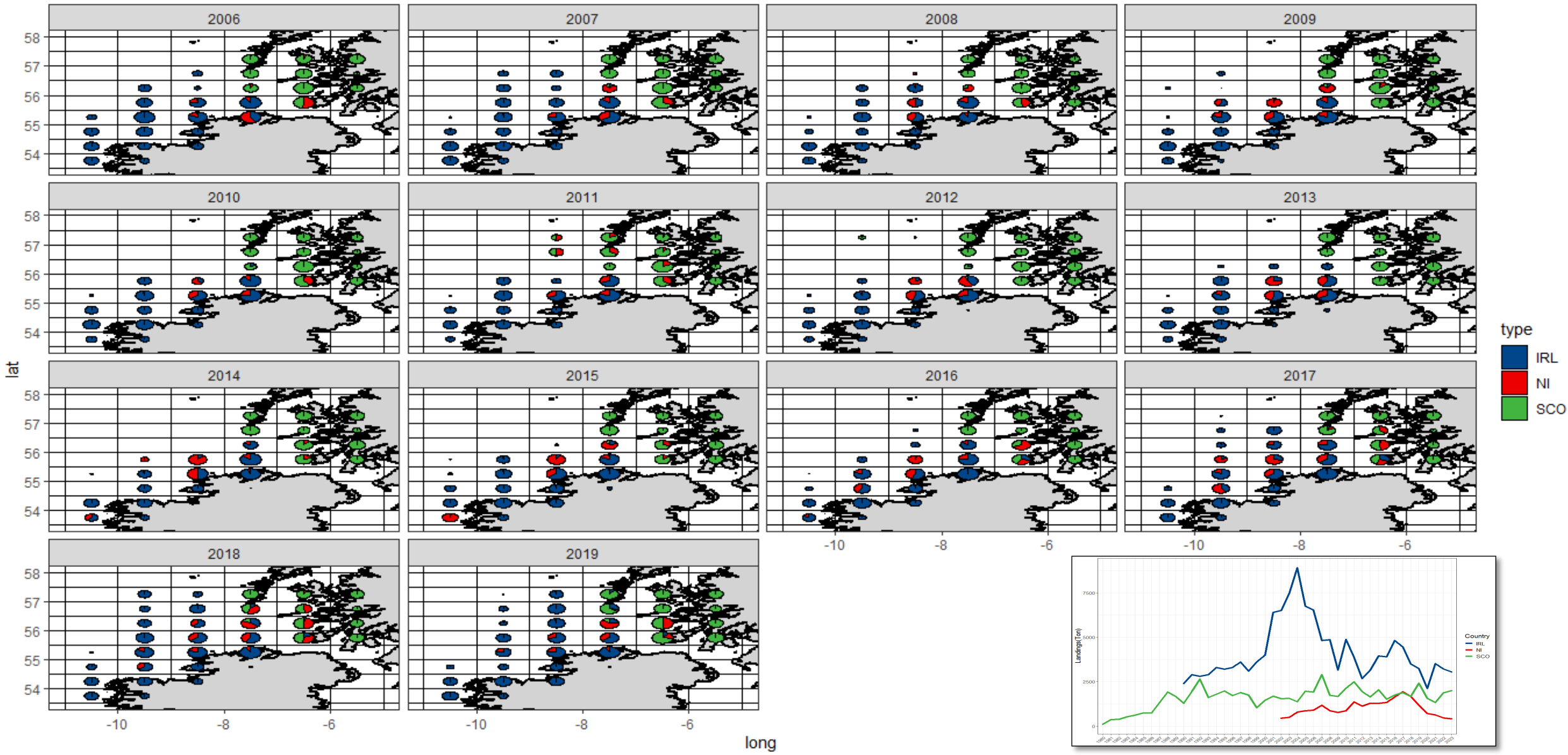
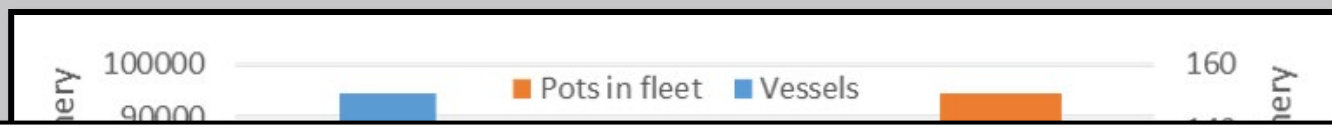
Fishery developed during the 1960's off Malin head in Donegal

Offshore fishery developed in the 1990's
NW crab stock fished by IRL, SCO and NI vessels

Reduction in the number of boats over time,
but increased number of pots in fleet since
1990's (modernization of the fleet over time;
Offshore VS Inshore activity)



The Malin Stock



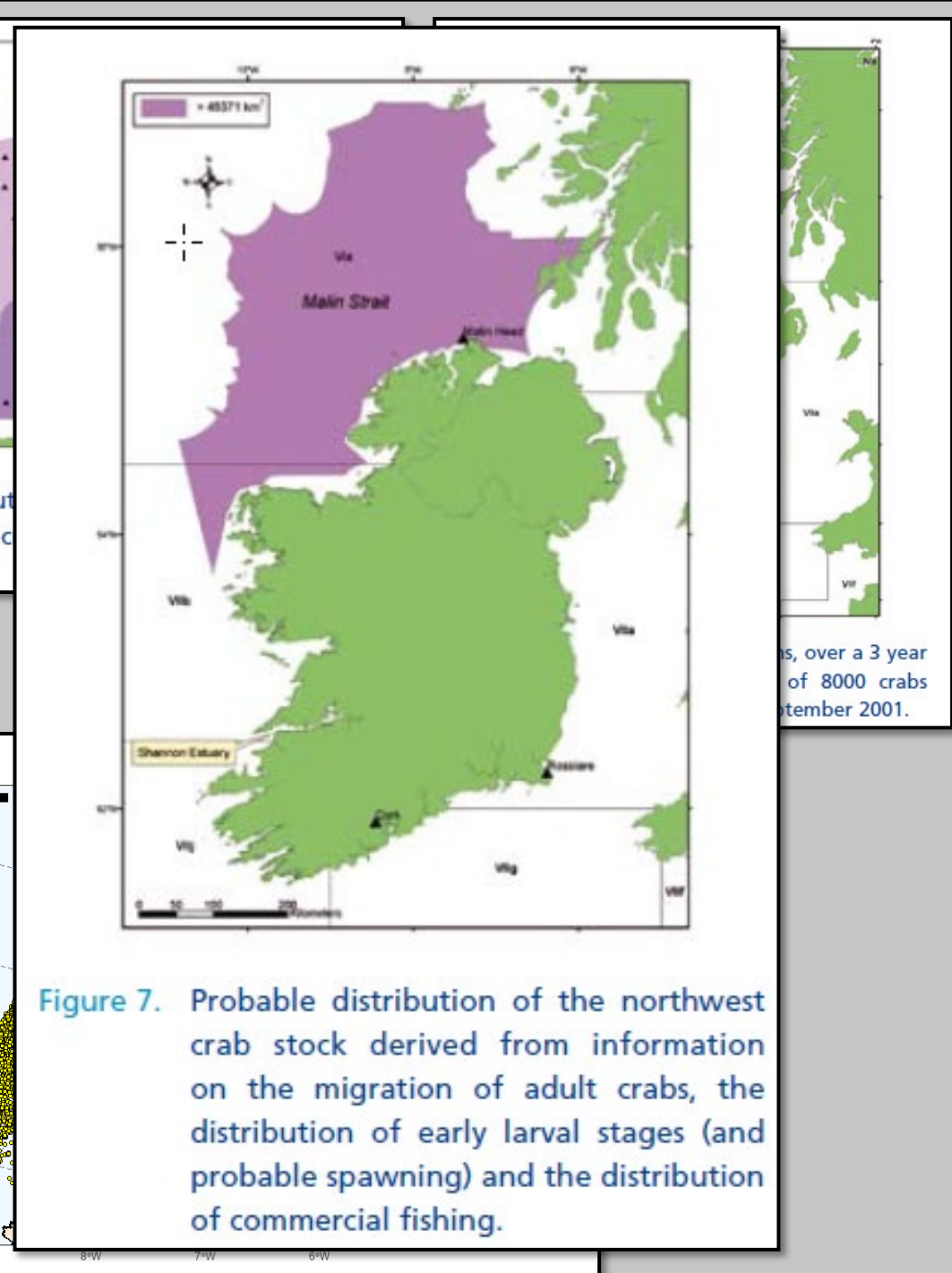
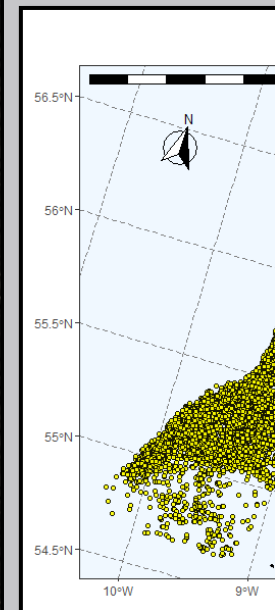
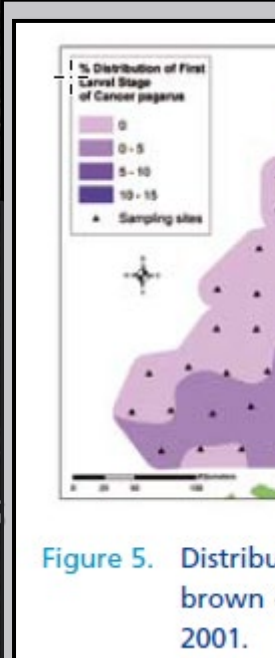
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Stock structure

Larval distribution (2001), tag returns studies (2004) and distribution of commercial LPUE delimited the stock area as a single functional unit.



...s, over a 3 year
...of 8000 crabs
...tember 2001.

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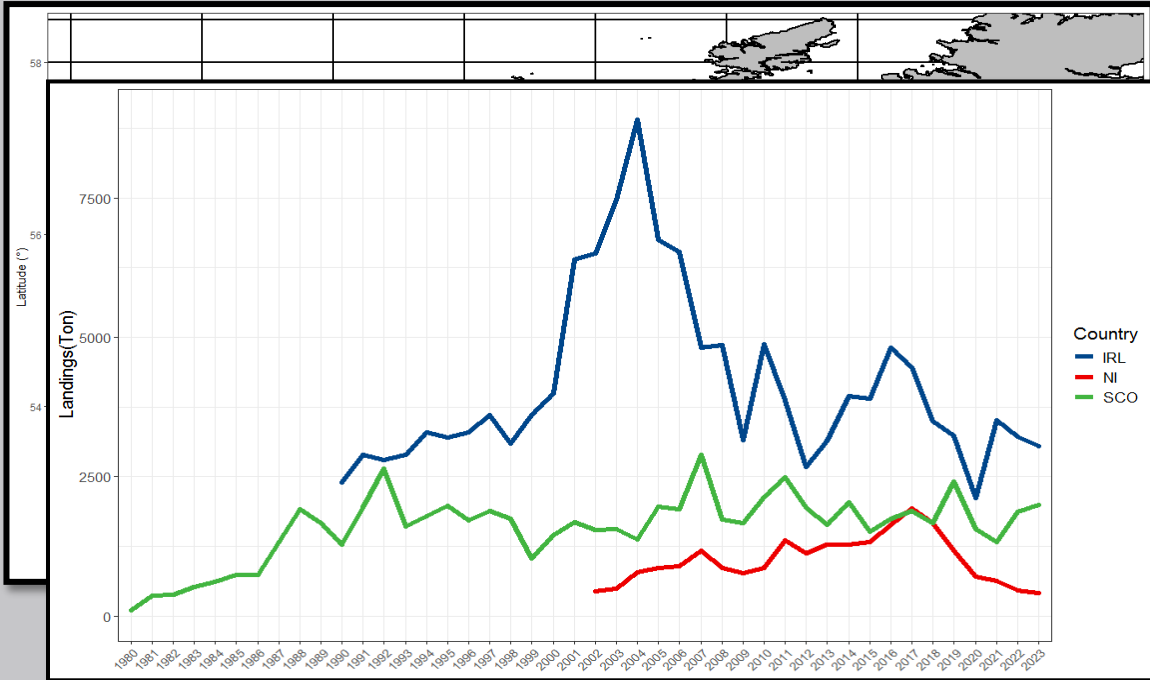
Management measures

MLS 130mm -> 140mm (2019)
KwDays at sea for vessels > 15m (Area VI)
KwDays at sea for vessels > 10m in BSA's (Mayo/Waterford)



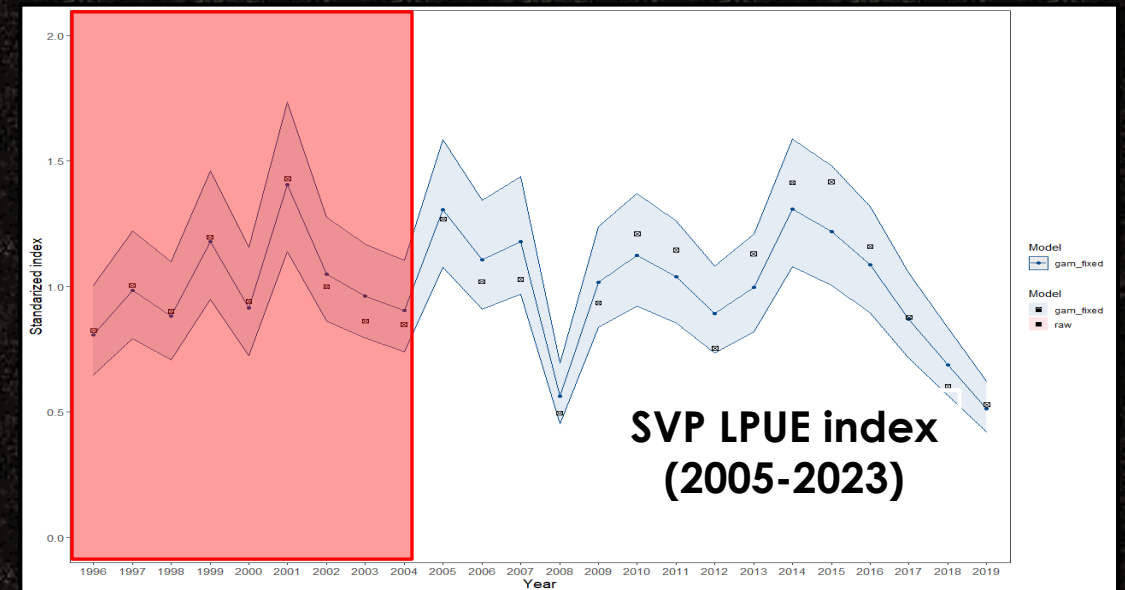
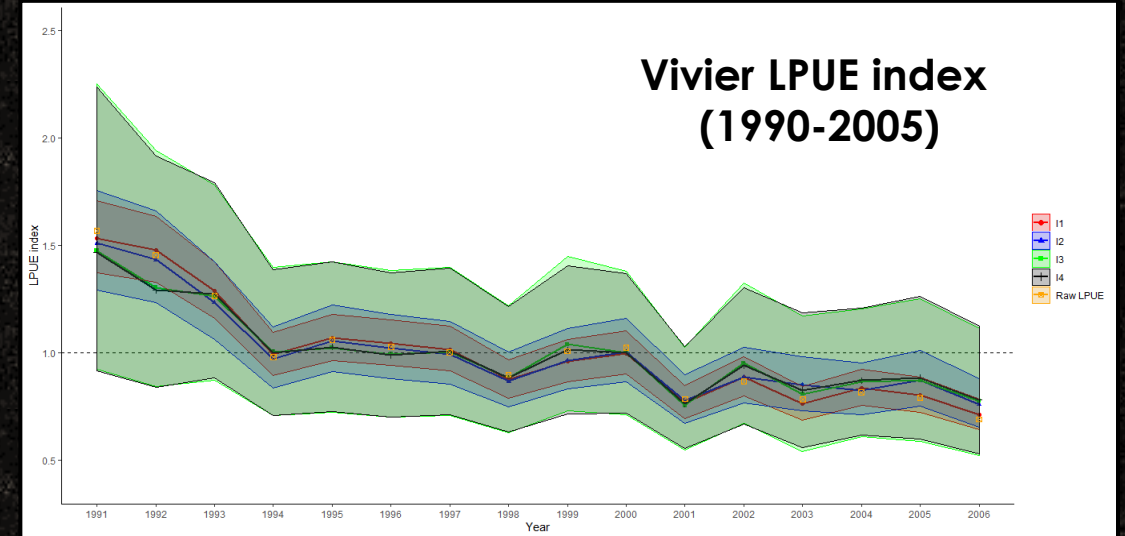
SPiCT- Data Sources Required

Landings data



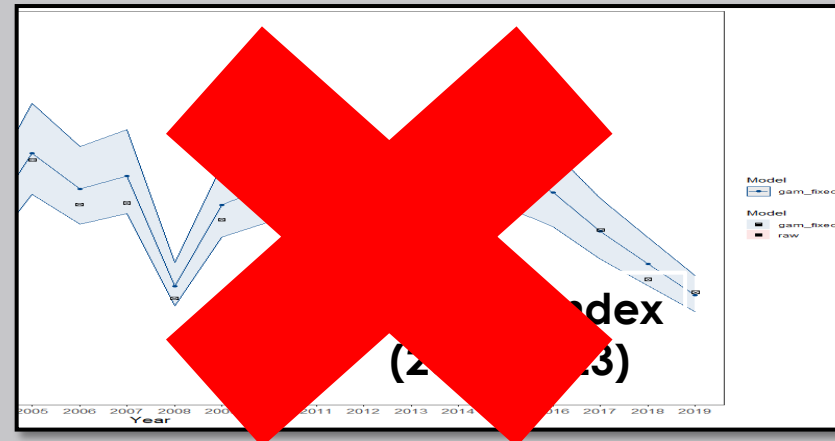
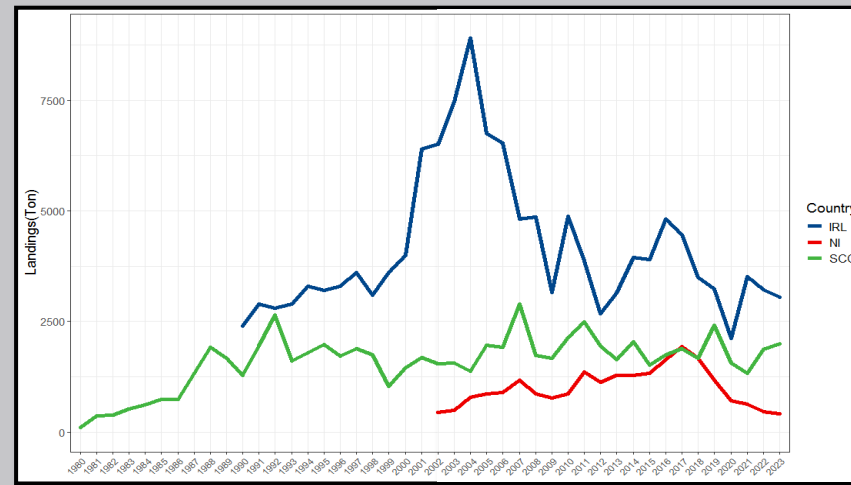
IRL Vessel < & > 10m (1990-2019)
 Vessels >10m ---- ICES Rec
 Vessels <10m ---- Div. VIa/VIIIb
 NI landings and Scottish landings obtained

Indices of Abundance



SPiCT- Scenarios

Tested several model inputs and configurations (e.g.: removing one index of abundance, varying the time series of landings or changing prior information of parameters) --- To test the robustness of the model to increased uncertainties, missing data, initial input values...

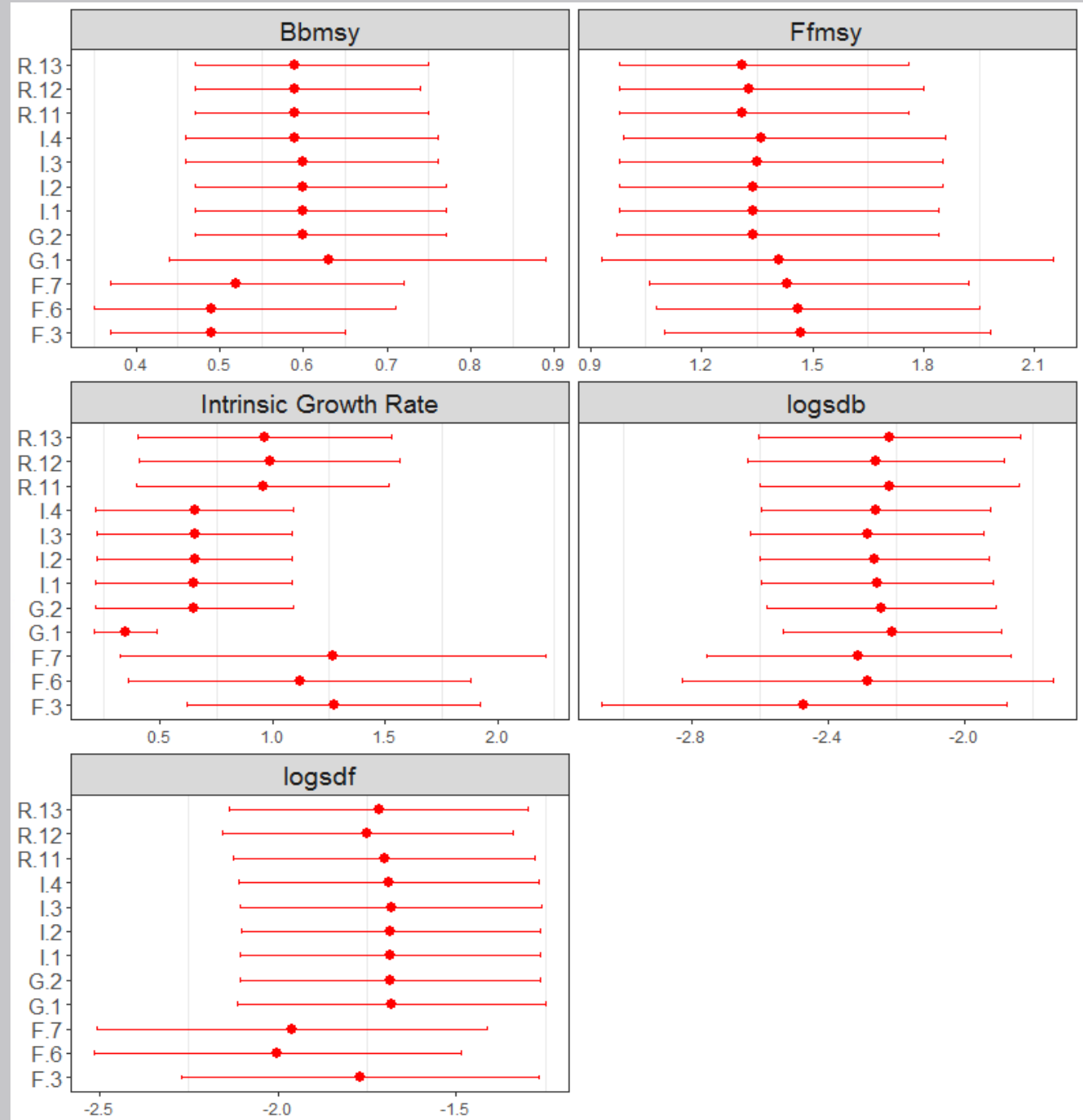


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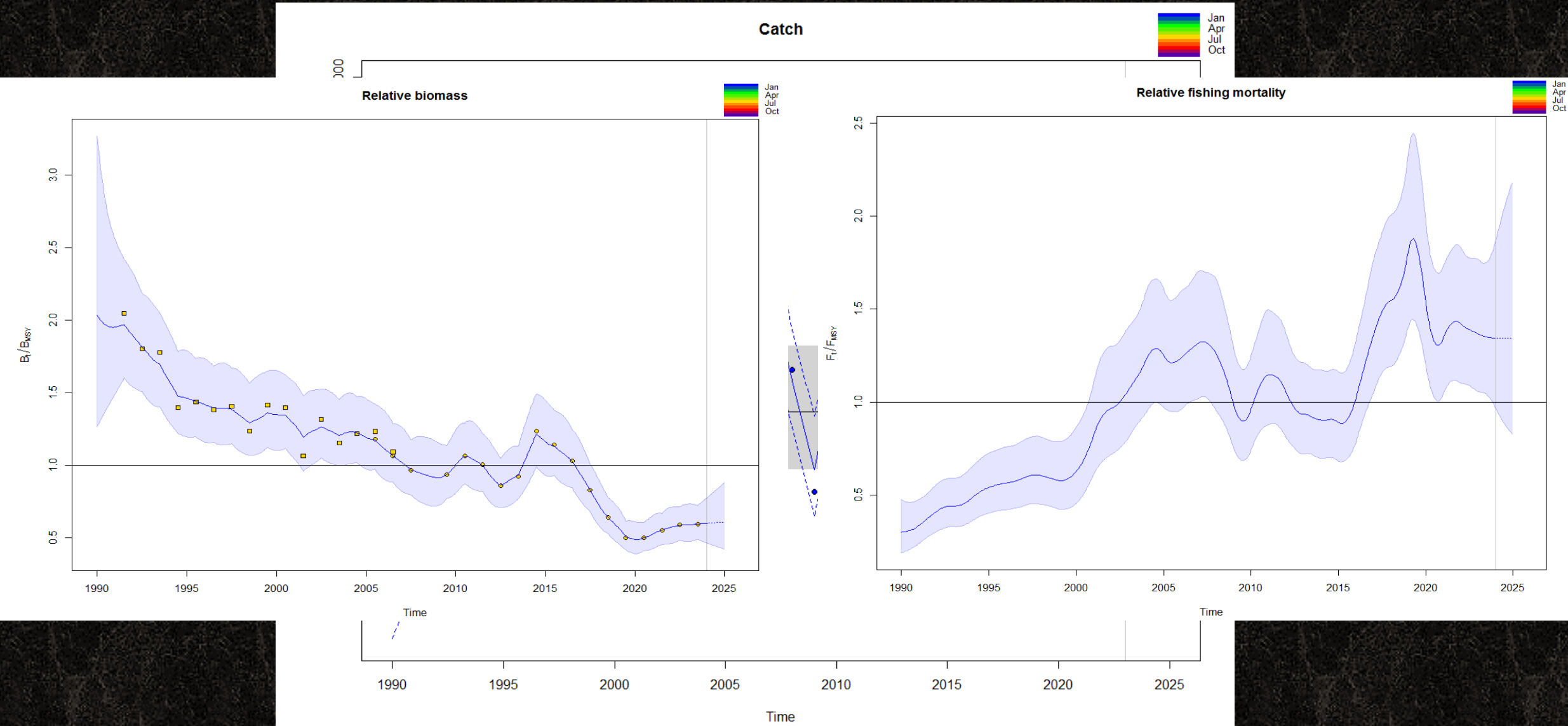
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Consistent trends and outputs across different scenarios

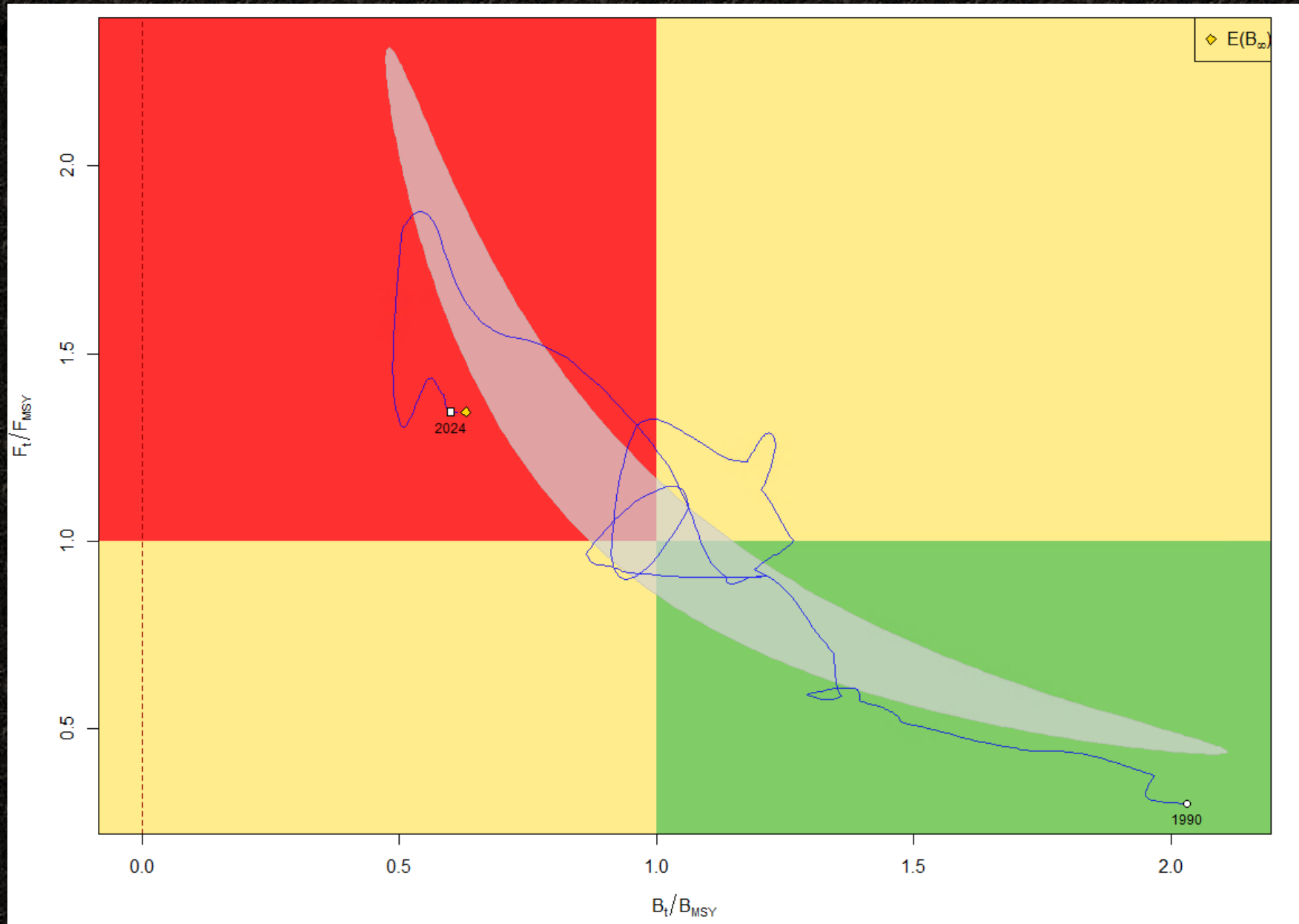
Model validation bullet points generally achieved across scenarios



SPiCT- Outputs



SPiCT- Outputs



SPiCT – Management Forecast

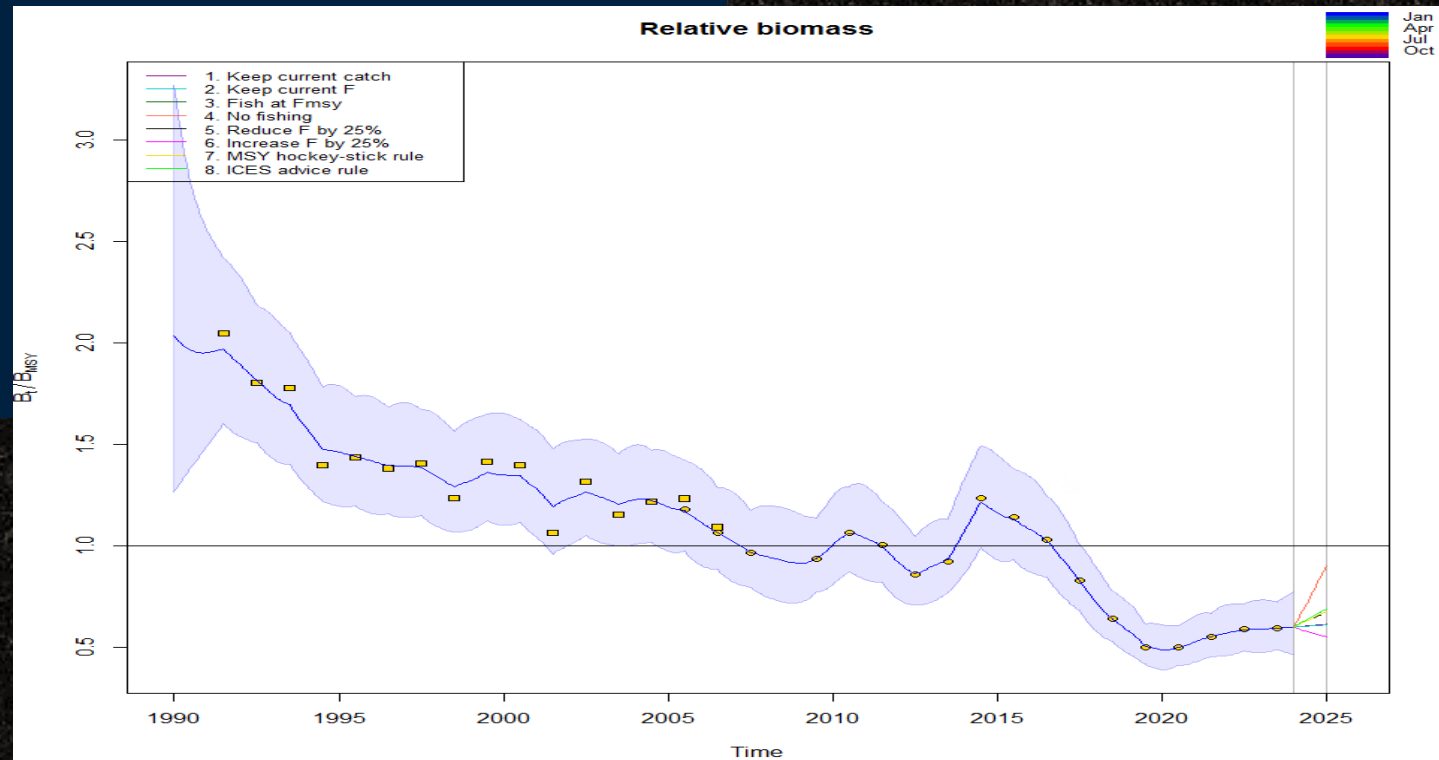
SPiCT timeline:

Observations: 1990.00 – 2024.00
 Management: 2024.00 – 2025.00

Management evaluation: 2025.00

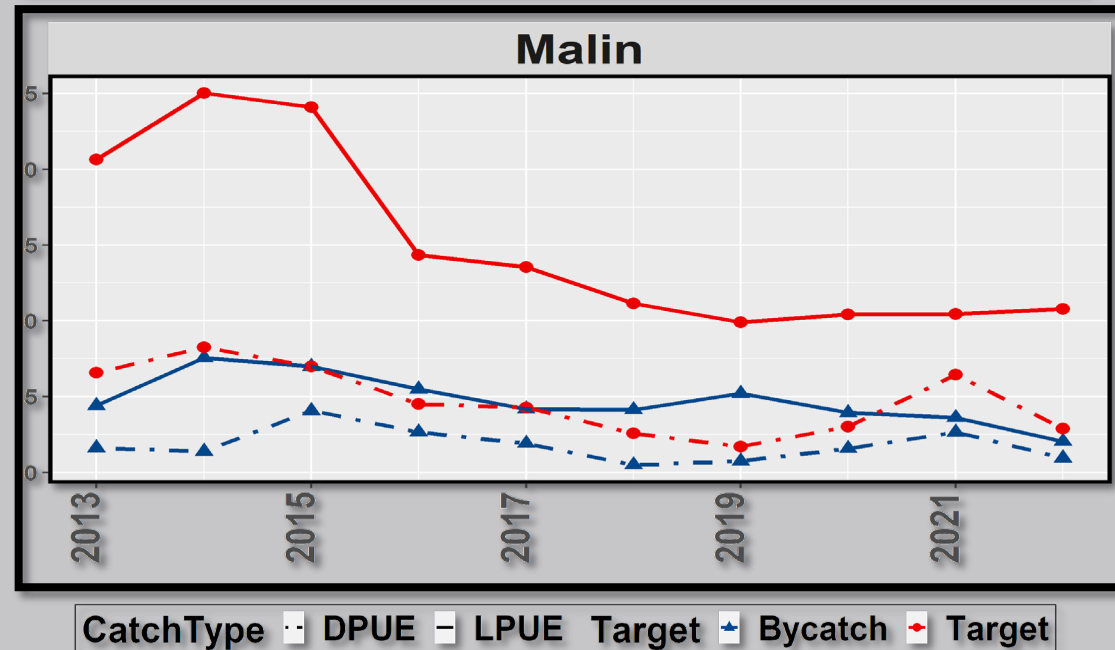
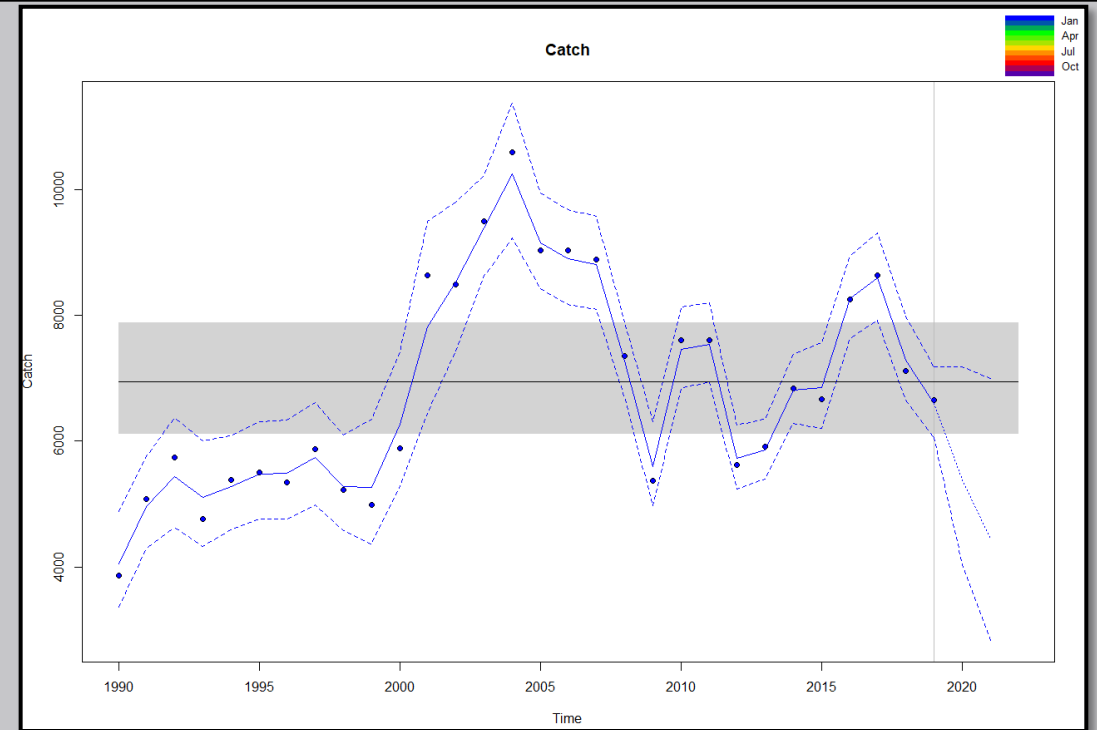
Predicted catch for management period and states at management evaluation time:

	C	B/B _{msy}	F/F _{msy}
1. Keep current catch	5480.0	0.61	1.33
2. Keep current F	5544.9	0.61	1.34
3. Fish at F _{msy}	4335.6	0.67	1.00
4. No fishing	6.8	0.90	0.00
5. Reduce F by 25%	4366.4	0.67	1.01
6. Increase F by 25%	6605.9	0.55	1.68
7. MSY hockey-stick rule	4335.6	0.67	1.00
8. ICES advice rule	4077.5	0.69	0.93



Conclusions

- Consistent SPiCT outputs across several scenarios
- Acceptable model diagnosis (benchmarked)
- Overfished stock since ~2017. No previous sign of stock decrease in response to fishing mortality in the time series. The decrease in landings and LPUE despite the increase of effort likely indicates growth overfishing.
- Decrease in the DPUE observed in the SVP index → Indicative of potential recruitment problem.



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Caveats and future work

- Extra sources of mortality (e.g. crab used as bait in whelk fishery)
- Uncertainties in the Life-history parameters of crab (affecting scale of the production curve)
- Update the offshore time series of LPUE using Logbooks-VMS data

