

North Atlantic Albacore MSE

Exploratory Analysis

L Kell

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Looking at a single OM for a range of MP options, or a single MP for a range of OM scenarios it is easier to understand how the MSE are performing. It is also helpful to look at a single iteration, since this helps to check if bounds and other feedback elements are working as expected. For example **Figure 1** shows results for a single OM and MP scenario with bounds of 20, 25 and 30%, it would be expected that as a bound becomes more restrictive i.e. reduces from 30 to 20%, variability in catches would be reduced and that for a stock currently below B_{MSY} that in the short term F would be higher and SSB lower than the case with a bound of 30%. **Figure 2** shows the same scenarios for a single iteration.

Figure 3 Shows the medians by $B_{threshold}$ (row) and F_{target} (lines, the red line is for an F_{target} of 0.8) for a TAC bound of 30%.

Figures 4 and 5 contrast the same OM for different values of steepness.

The plots, although quite simple need some explaining, e.g.

- you can not compare runs as the random numbers vary by scenario.
- Fig 1 is troubling, you would expect the 25% bound to be intermediate to the 20 and 30% bounds.
- Recruitment (and CV of OEM) could be a bigger determinant of outcome than the MP
- Steepness appears to have no effect

Agreed validation steps before any advice will be given

- Use the same random deviates across all scenarios, and check stability of higher and lower percentiles within and across OM/MP scenarios. i.e. run for 1000 iters for selected OM/MP combinations.
- To check SRR run with high F 's and the dynamics are working the way they should, i.e contrast in the Spawning stock size and what it gives on recruitment
- Conduct a crosstest, i.e. run OM without feedback generate catch and CPUE fit SA, every 3 years and compare the OM and stock assessment (SA)
- Use OEM in cross test
- For all OM/MP trials run simple $F=F_{target}$ projection, to check dynamics
- Run OM with feedback for an F target of F_{MSY} and compare to F projection
- Run a OM with feedback for an F target of F_{MSY} and an $B_{threshold}$ of B_{MSY} , compare to above.
- Run a OM with feedback for an F target of F_{MSY} and an $B_{threshold}$ of B_{MSY} plus TAC bounds of 20, 25 and 30%, compare to above.
- Run scenarios using a factorial design, i.e. main effects, 1st, 2nd, ... order interactions, see if you can predict the performance indicators
- Compare OM and MP reference points
- Check TAC output by MP and Catch taken from OM, iteration by iteration.
- OM conditioning, of historic and future, i.e. calculate the OM production functions and compare trajectories to these.
- Compare OM reference points and statistics such as K , r , ... to MP values
- Check SA, e.g. hitting bounds, convergence
- Compare TAC output from MP compared to Catch from OM

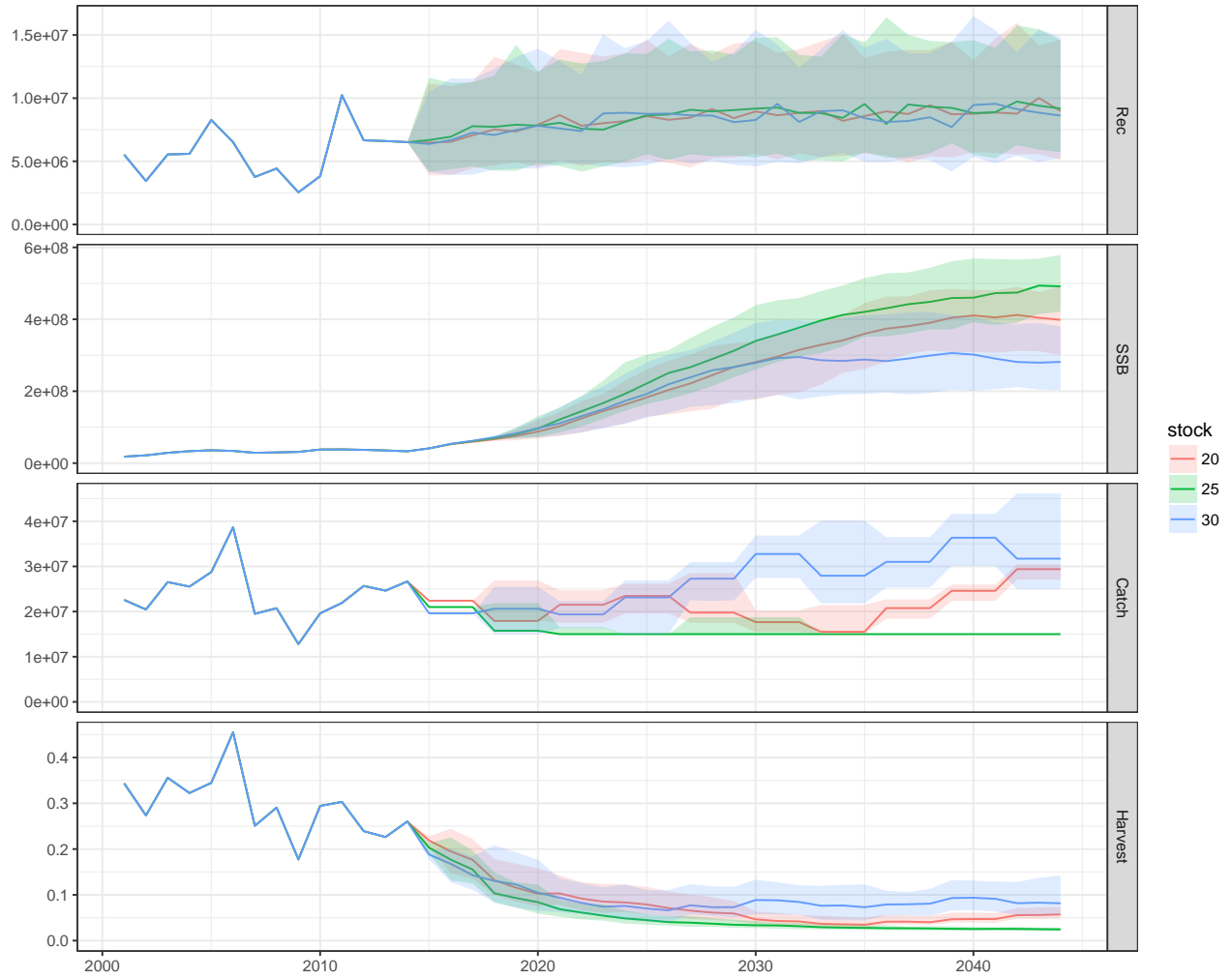


Figure 1. Operating Model runs for Multifan-CL scenario Alt1 with $M=0.2$ and $\text{steepness}=0.6$; HCR with $F_{\text{target}}=0.6$ and $B_{\text{threshold}}=0.6$.

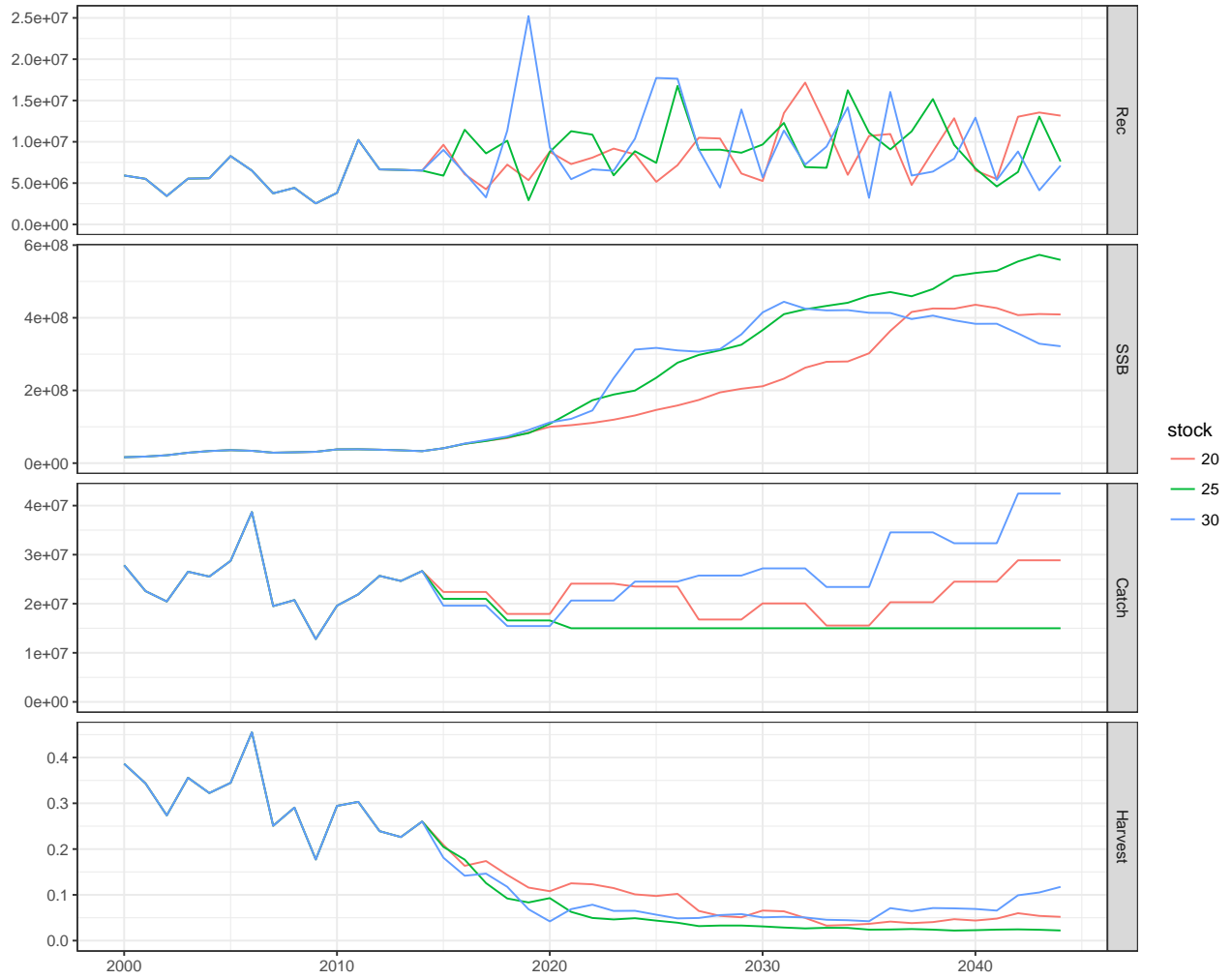


Figure 2. Single iteration for Operating Model runs for Multifan-CL scenario Alt1 with $M=0.2$ and steepness=0.6; HCR with $F_{target}=0.6$ and $B_{threshold}=0.6$.

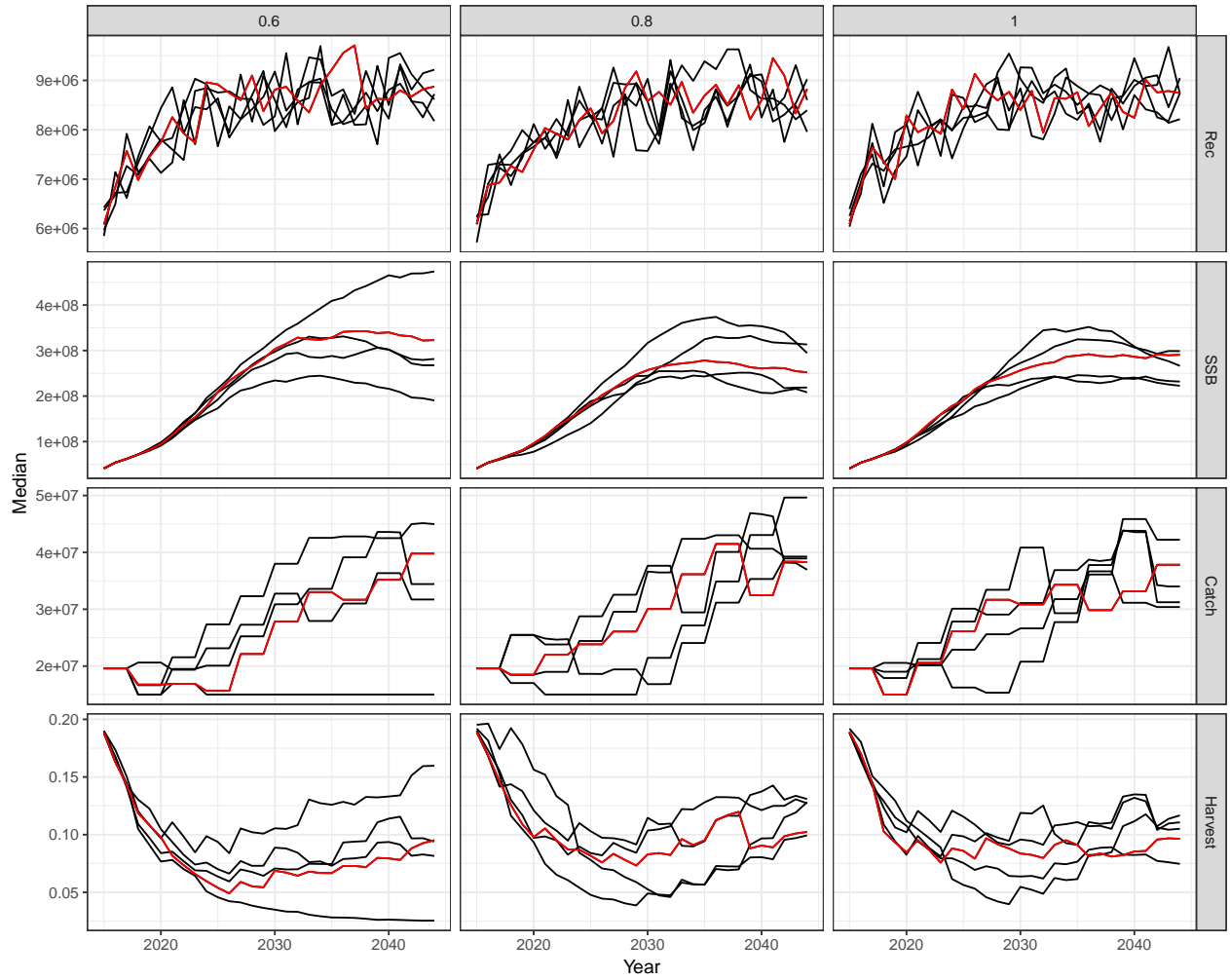


Figure 3. Median for Operating Model runs for Multifan-CL scenario Alt1 with $M=0.2$ and steepness=0.6; bound=30%.

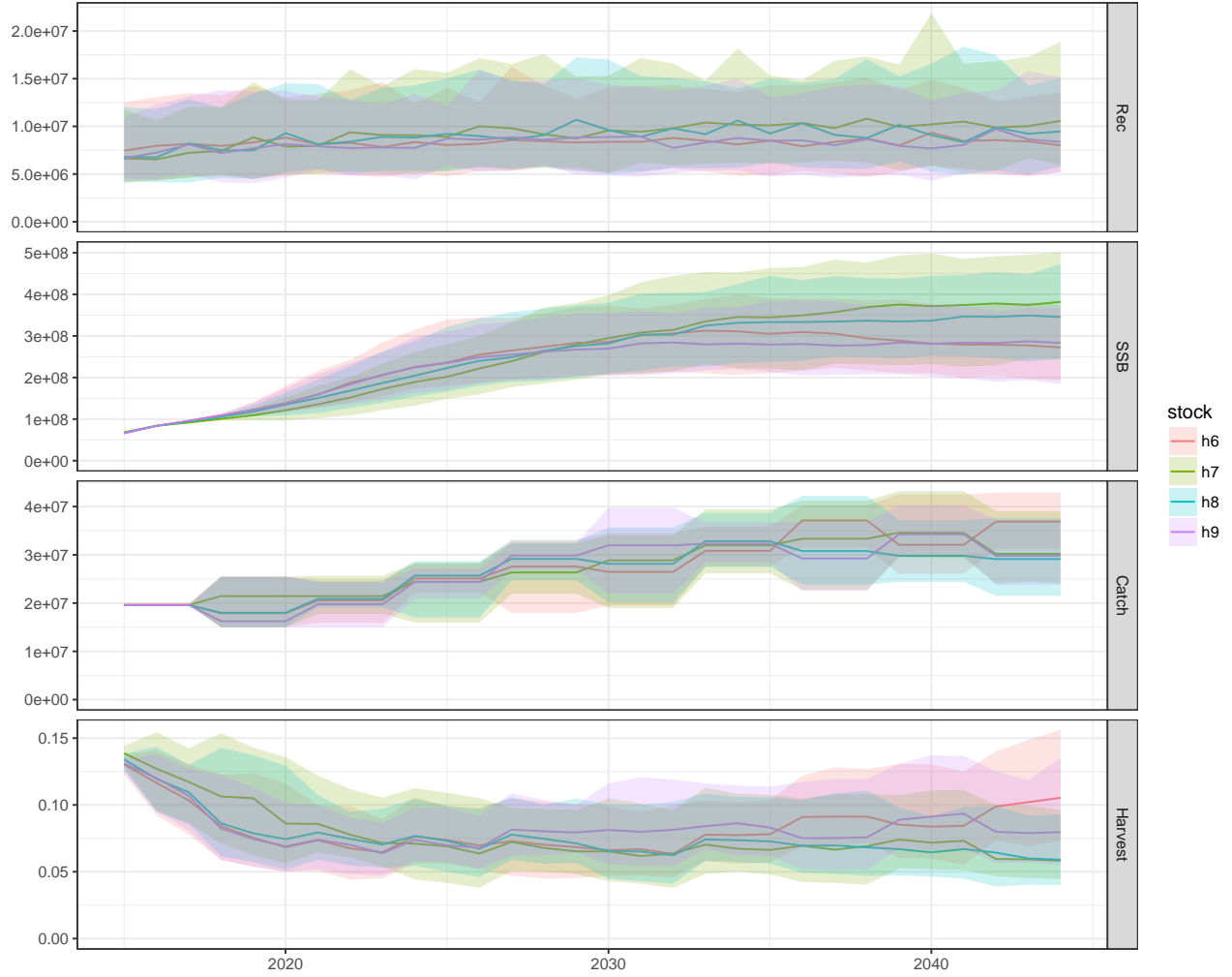


Figure 4. Operating Model runs for Multifan-CL scenario Alt1 with $M=0.2$; bound=30% and Btrhresh-old=0.6 and FTarget=0.6.

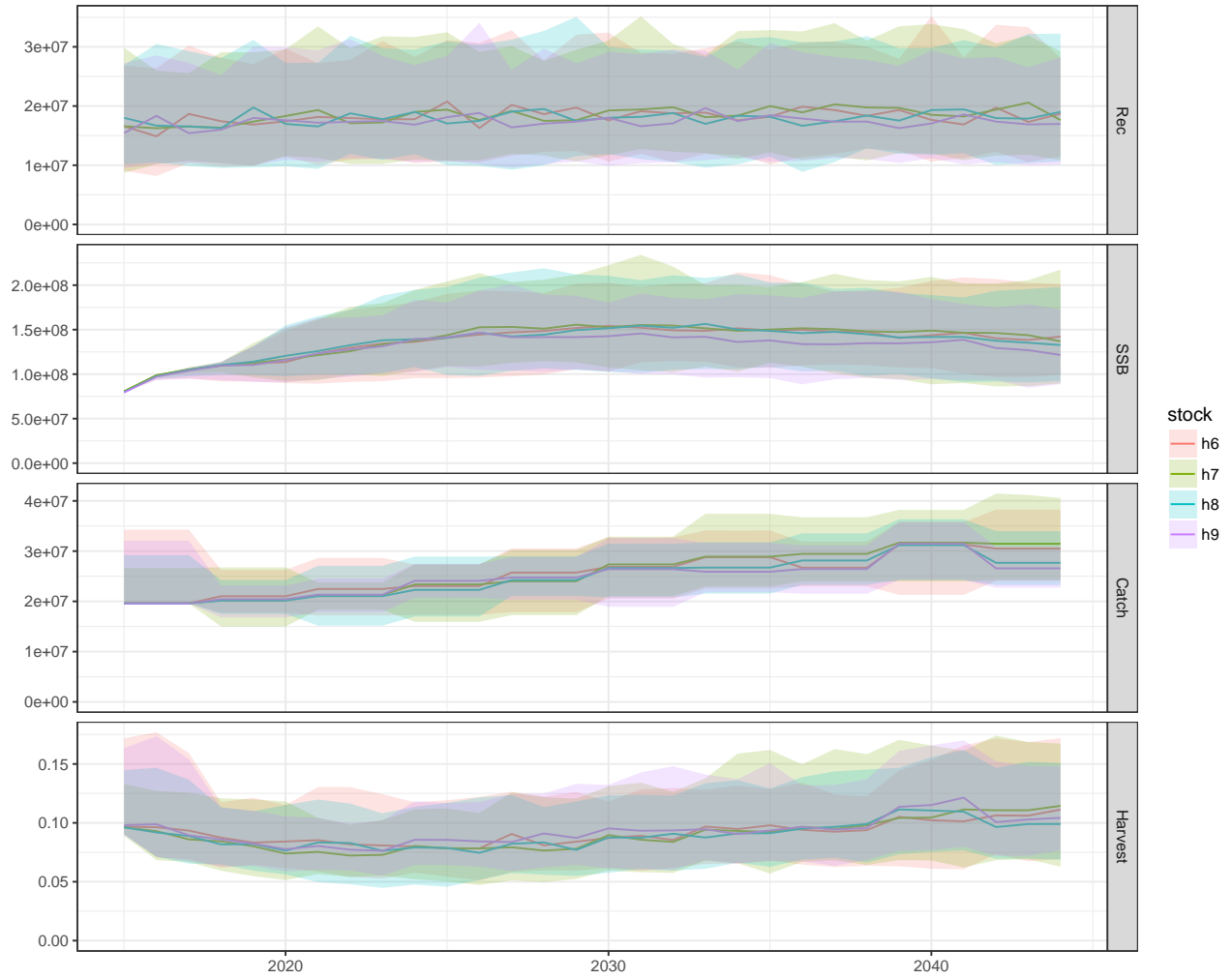


Figure 5. Operating Model runs for Multifan-CL scenario Alt1 with $M=0.4$; bound=30% and Btrhresh-old=0.6 and FTarget=0.6.

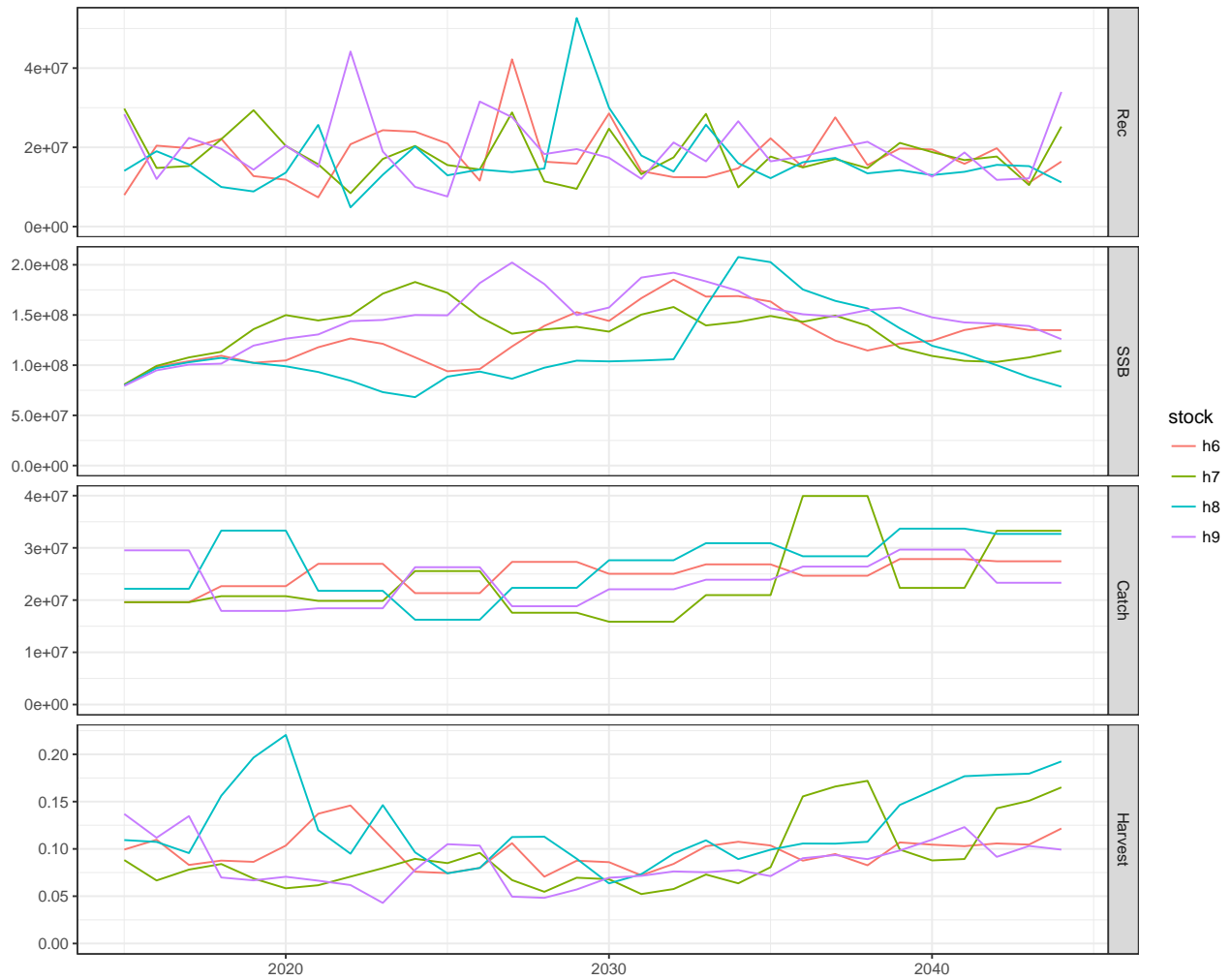


Figure 6. Operating Model runs, single iter, for Multifan-CL scenario Alt1 with $M=0.2$; $\text{bound}=30\%$ and $\text{Bthrshold}=0.6$ and $\text{FTarget}=0.6$.

MFCL Runs

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[1] "Alt6_M02_h6_q0" "Alt6_M02_h6_q1" "Alt6_M02_h7_q0" "Alt6_M02_h7_q1"
[5] "Alt6_M02_h8_q0" "Alt6_M02_h8_q1" "Alt6_M02_h9_q0" "Alt6_M02_h9_q1"
[9] "Alt6_M03_h6_q0" "Alt6_M03_h6_q1" "Alt6_M03_h7_q0" "Alt6_M03_h7_q1"
[13] "Alt6_M03_h8_q0" "Alt6_M03_h8_q1" "Alt6_M03_h9_q0" "Alt6_M03_h9_q1"
[17] "Alt6_M04_h6_q0" "Alt6_M04_h6_q1" "Alt6_M04_h7_q0" "Alt6_M04_h7_q1"
[21] "Alt6_M04_h8_q0" "Alt6_M04_h8_q1" "Alt6_M04_h9_q0" "Alt6_M04_h9_q1"
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Agreed Validation Steps

Use the same random deviates across all scenarios for 100 iters