North Atlantic Albacore MSE

Exploratory Analysis

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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 currentky 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 for 100 iters
- Run for 1 OM a simple F=FMSY projection
- Conduct a crosstest, i.e. run a single OM without feedback generate catch and CPUE fit SA, every 3 years and compare the OM and SA
- Run a single OM with feedback for an F target of FMSY
- Run a single OM with feedback for an F target of FMSY and an Btreshold of BMSY
- Identify and explain all differences
- Run a single OM with feedback for an F target of FMSY and an Btreshold of BMSY plus TAC bounds of 20, 25 and 30%
- Run a single OM with feedback for ll 45 MPs
- Run all OMs for a simple F=FMSY projection
- Run a single OM for 1000 iters with feedback for an F target of FMSY and an Btreshold of BMSY plus TAC bounds of 20, 25 and 30%, check stability of higher and lower percentiles
- Based on analysis above run the remaining Scenarios using a factorial design, i.e. main effects, 1st, 2nd, … order interactions

Additional Checks required

- OM conditioning, historic and future
- OM reference points,
- OEM
- SA, e.g. hitting bounds, convergence
- TAC output from MP compared to Catch from OM

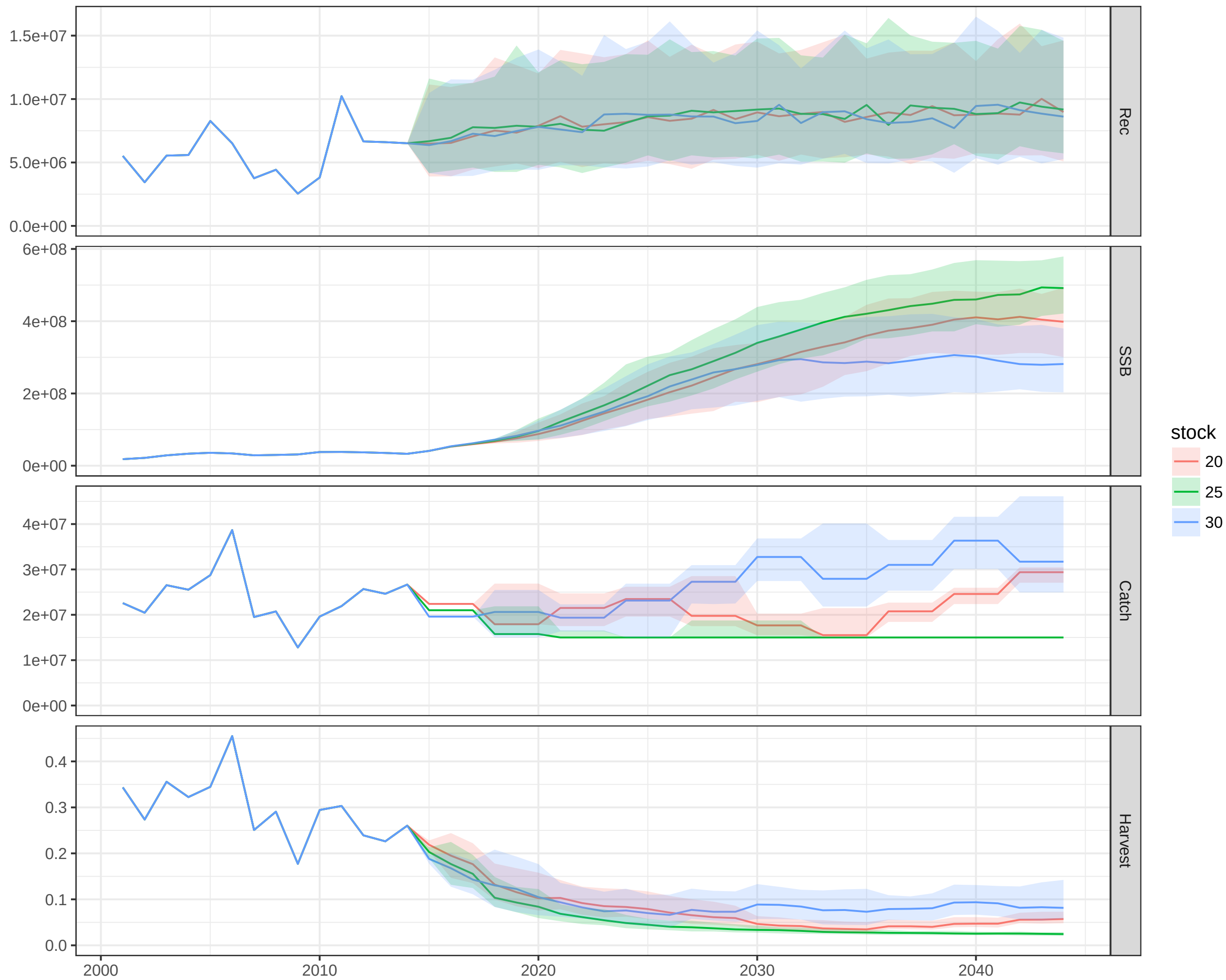

Figure 1. Operating Model runs for Multifan-CL scenario Alt1 with M=0.2 and steepness=0.6; HCR with Ftarget=0.6 and Bthreshold=0.6.

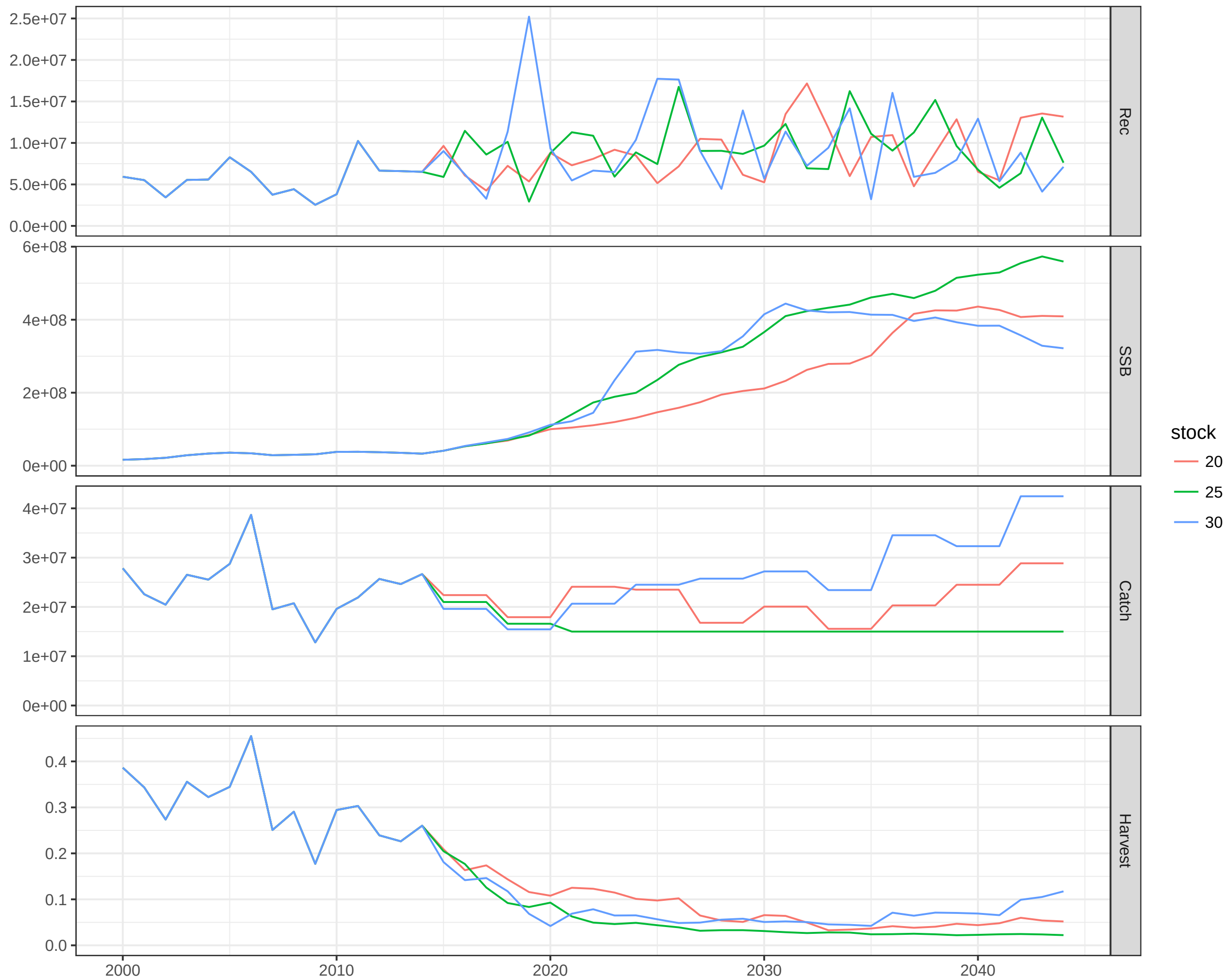

Figure 2. Single iteration for Operating Model runs for Multifan-CL scenario Alt1 with M=0.2 and steepness=0.6; HCR with Ftarget=0.6 and Bthreshold=0.6.

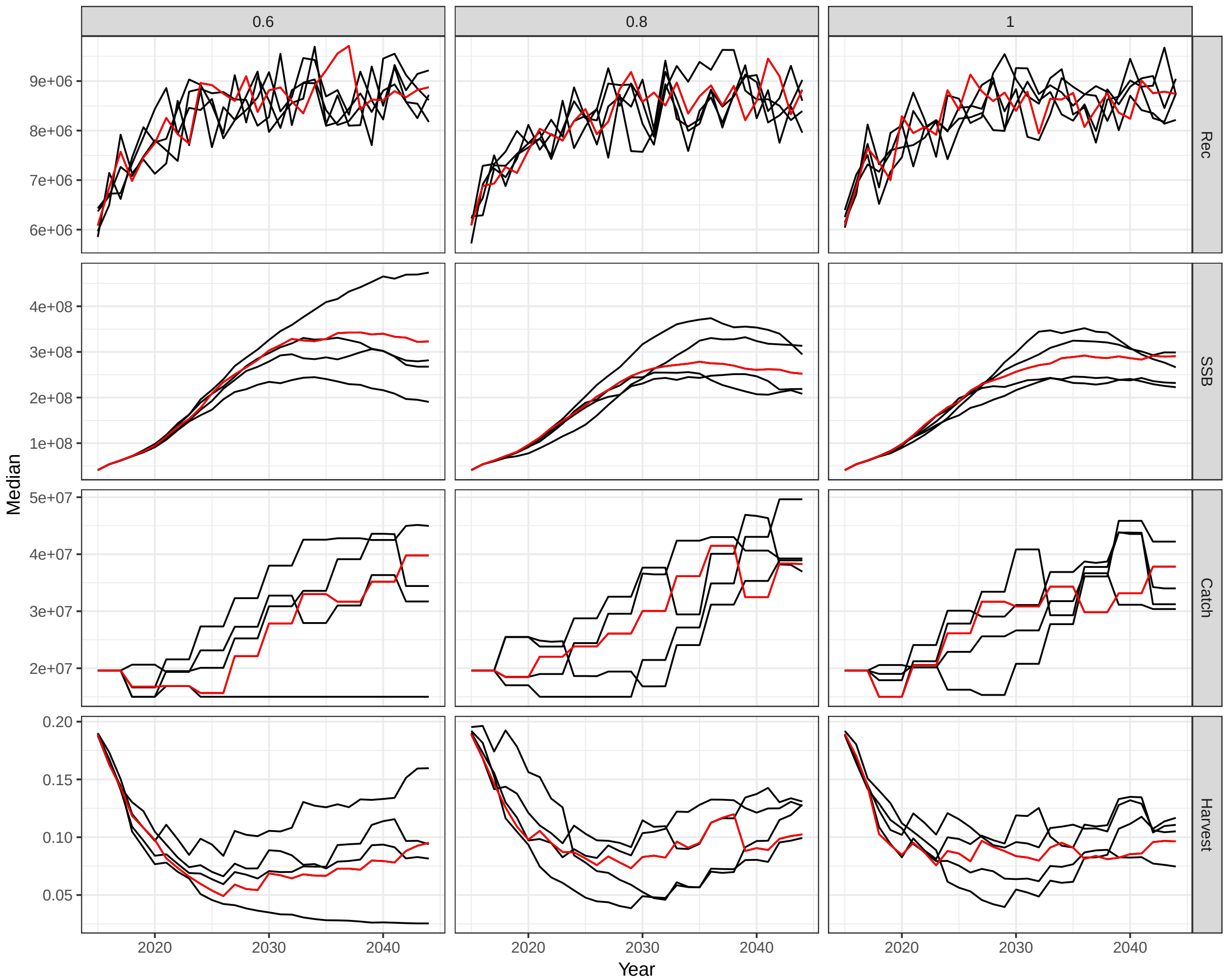

Figure 3. Median for Operating Model runs for Multifan-CL scenario Alt1 with M=0.2 and steepness=0.6; bound=30%.

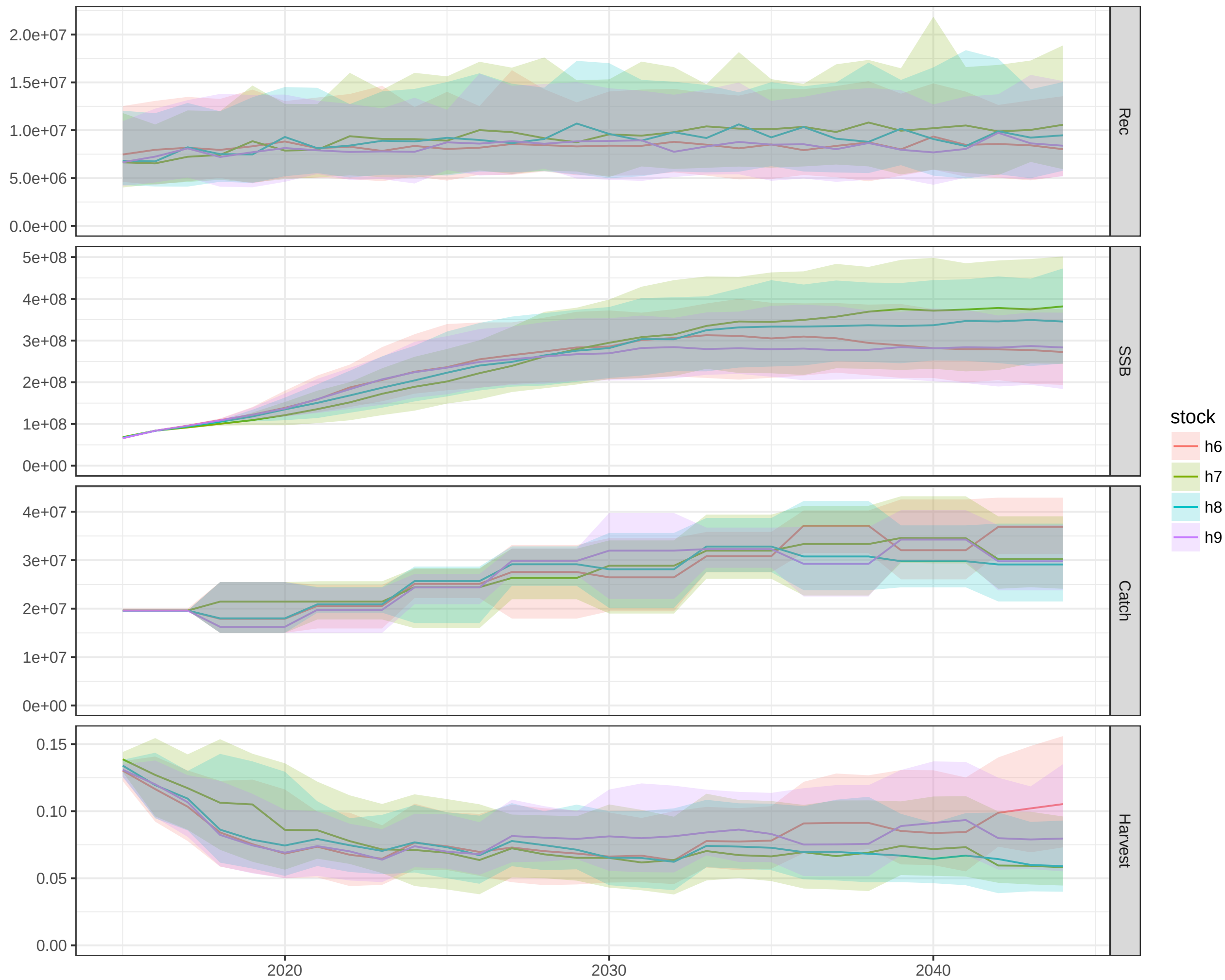

Figure 4. Operating Model runs for Multifan-CL scenario Alt1 with M=0.2; bound=30% and Btrhreshold=0.6 and FTarget=0.6.

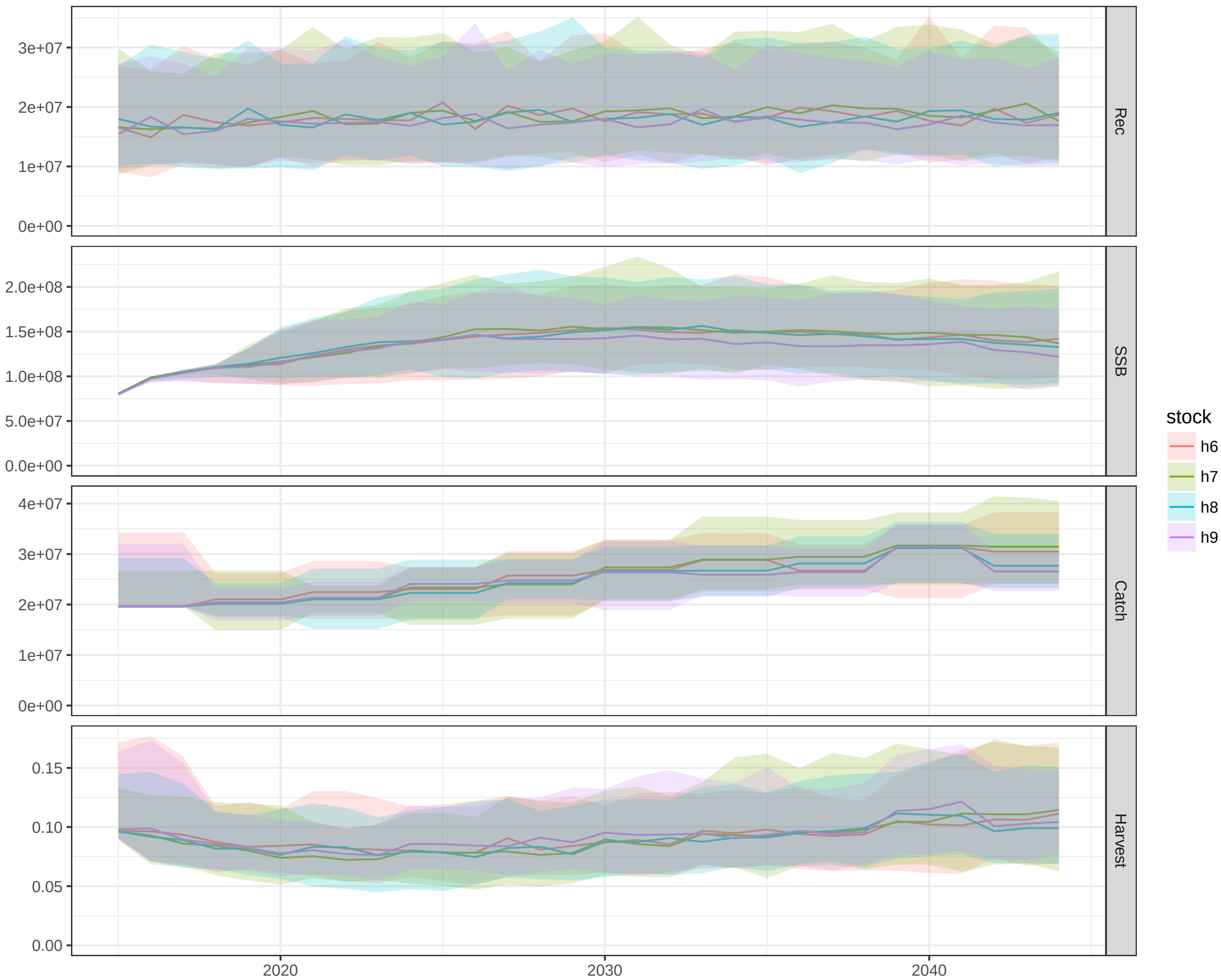

Figure 5. Operating Model runs for Multifan-CL scenario Alt1 with M=0.4; bound=30% and Btrhreshold=0.6 and FTarget=0.6.

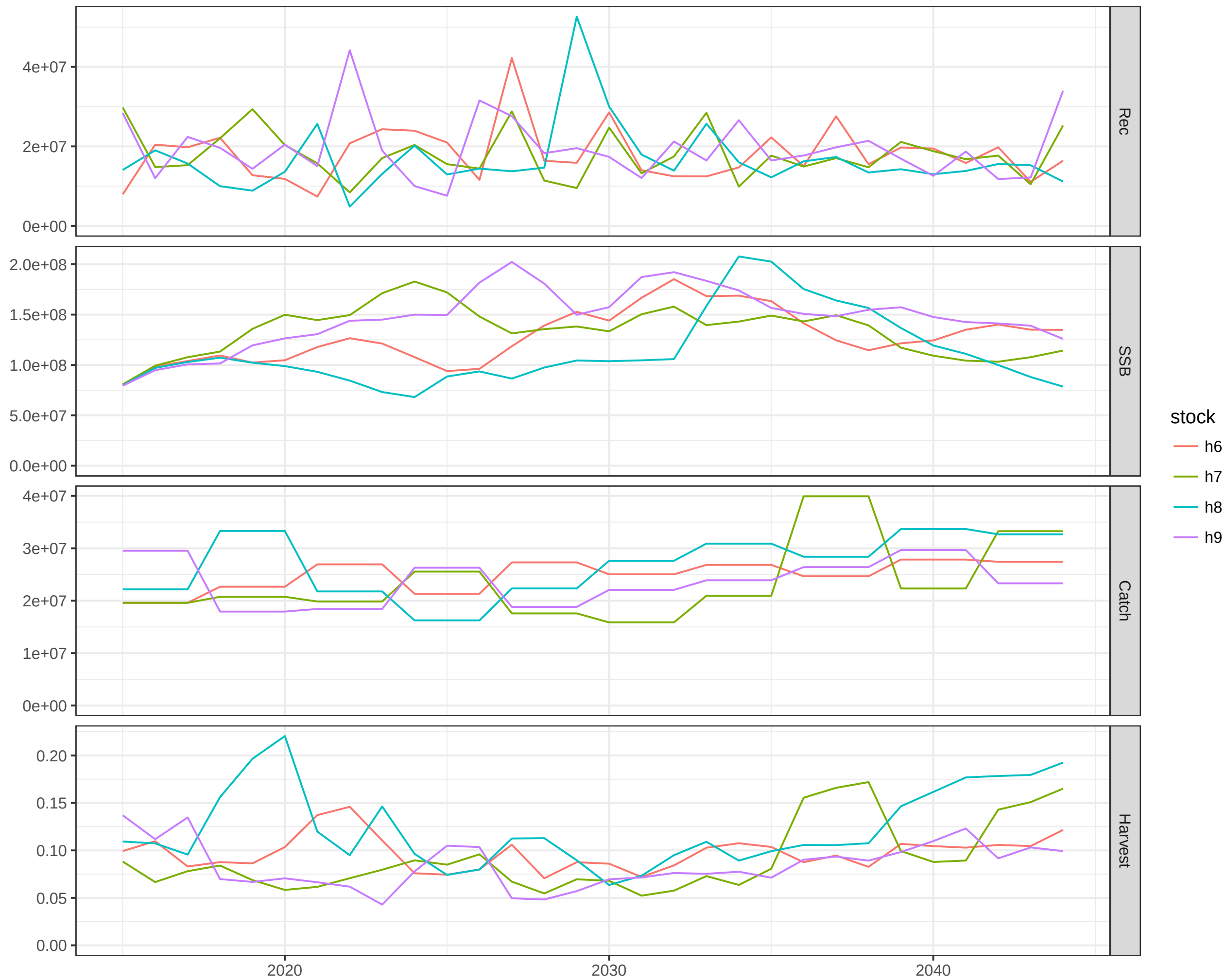

Figure 6. Operating Model runs, single iter, for Multifan-CL scenario Alt1 with M=0.2; bound=30% and Btrhreshold=0.6 and FTarget=0.6.

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