Sensitivity Tests #1

From FINAL Peer Review Report

- Conduct sensitivity analyses including:
- 1) an exploration of alternative parameterizations for natural mortality (e.g. different age-independent constant values, or age-dependent M)
- 2) profiles of the initial fishing mortality (i.e. initial depletion)
- 3) an evaluation of which individual surveys should be included in the VAST index by comparing WHAM estimates (e.g., biomass time series) from the proposed run with individual fishery independent surveys. Surveys that do not appear to accurately reflect changes in stock size through this analysis should not be included in the VAST index.

Options for Sensitivity Item 1

1. Estimate age-independent M
2. Fix M at higher or lower values than was used in Run 34
3. Fix age-dependent M

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Run 35-36 (Option 1)

Run 34

- Age-invariant M fixed at 0.4

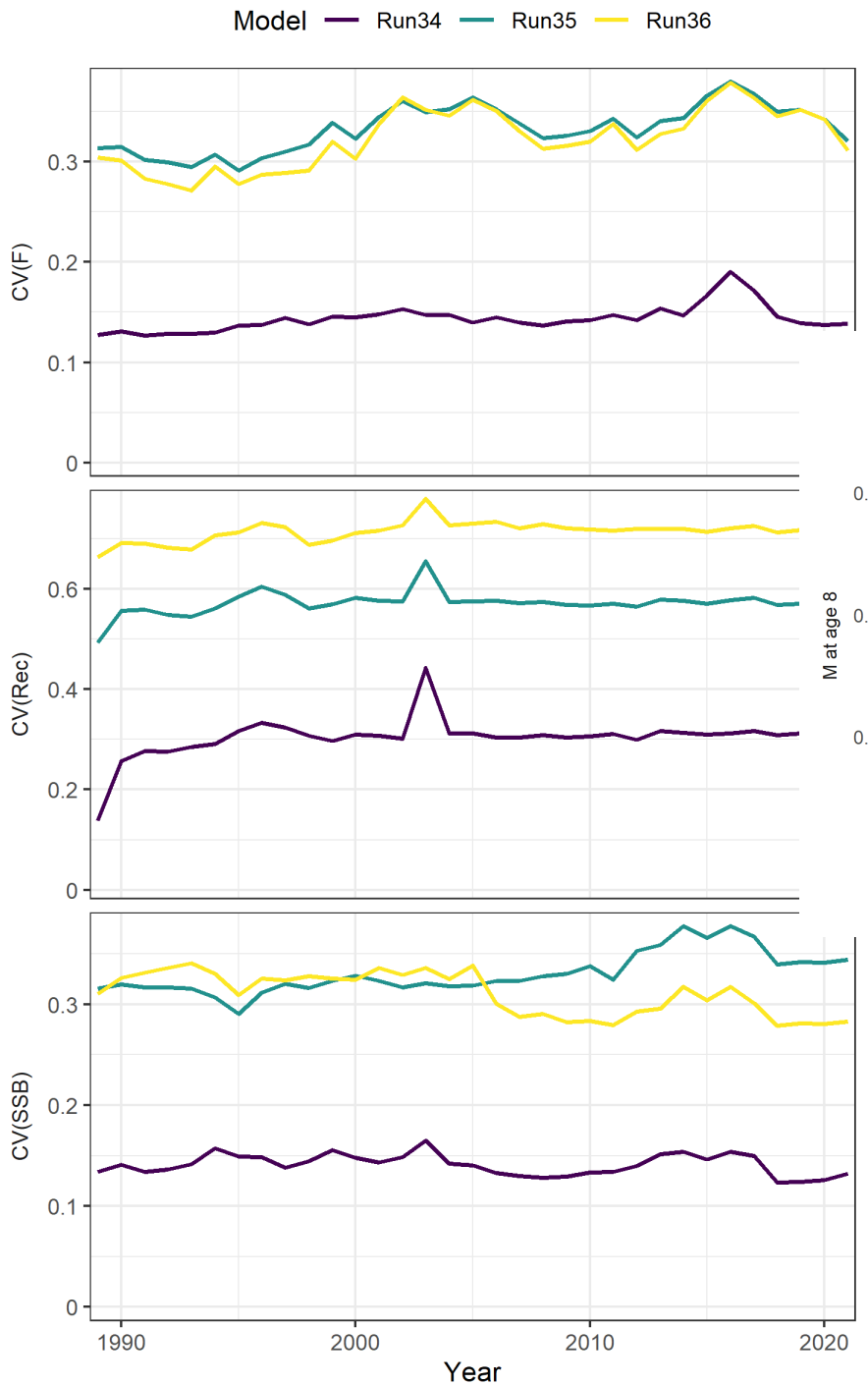
Run 35

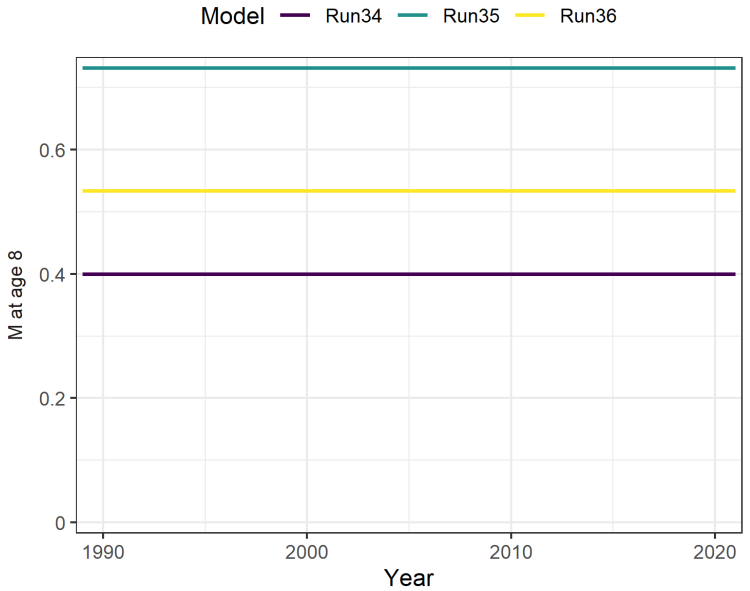
- One M estimated: 0.732

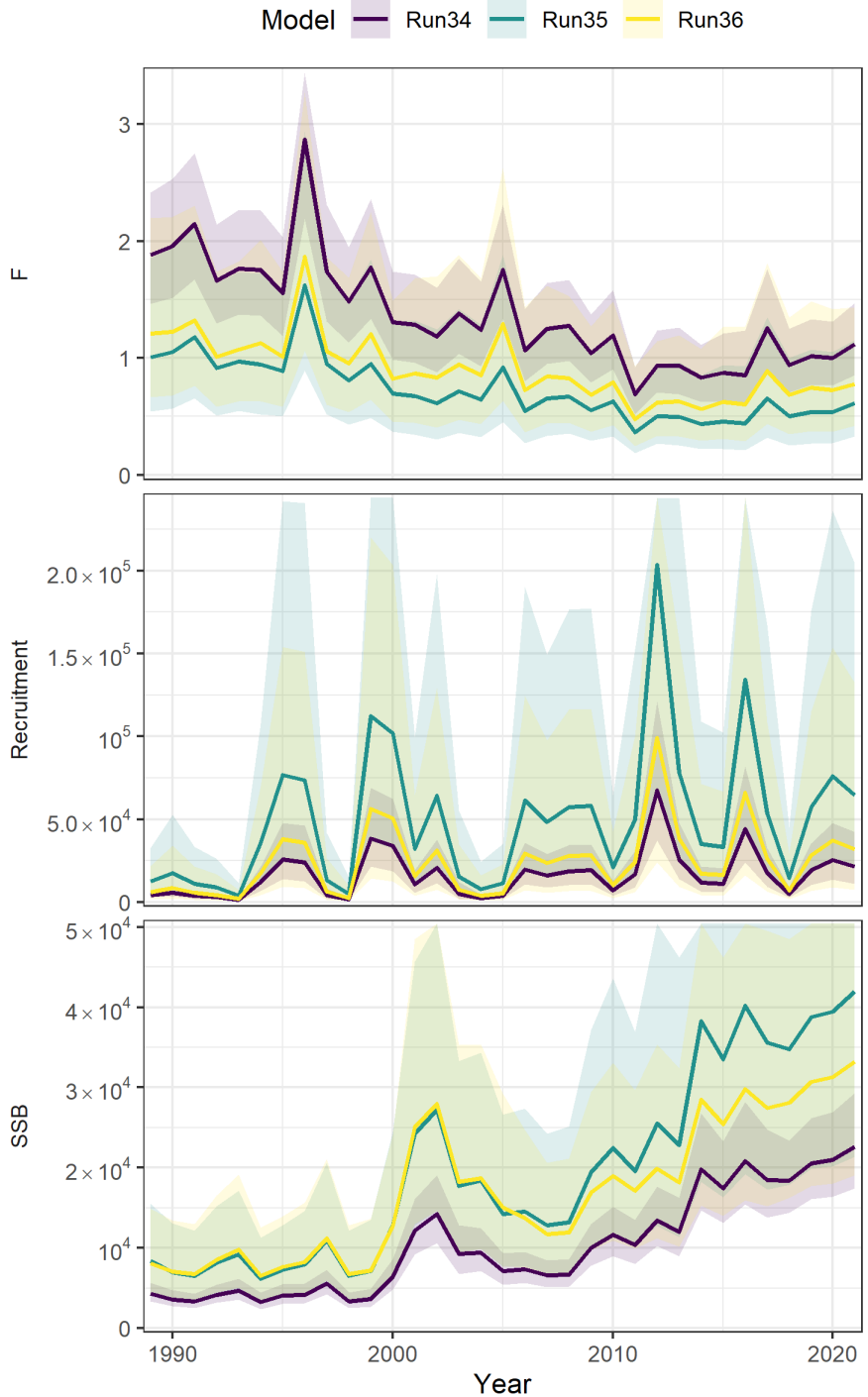
Run 36

- Two M estimated (stock)
  - North - 0.534
  - South - 0.778

	dAIC	AIC	rho_R	rho_SSB	rho_Fbar
Run35	0.0	-1566.0	0.3388	0.0149	-0.0242
Run36	0.8	-1565.2	1.0454	0.2980	-0.2165
Run34	7.8	-1558.2	0.1209	-0.0579	0.0598


Model
Run34
Run35
Run36
CV(F)
CV(Rec)
CV(SSB)
Year
1990
2000
2010
2020


Model
Run34
Run35
Run36
M at age 8
Year


Model
Run34
Run35
Run36
F
Recruitment
SSB
Year

Options for Sensitivity Item 1

1. Estimate age-independent M
2. Fix M at higher or lower values than was used in Run 34
3. Fix age-dependent M

Run 39-40 (Option 1)

Run 34

- Age-invariant M fixed at 0.4

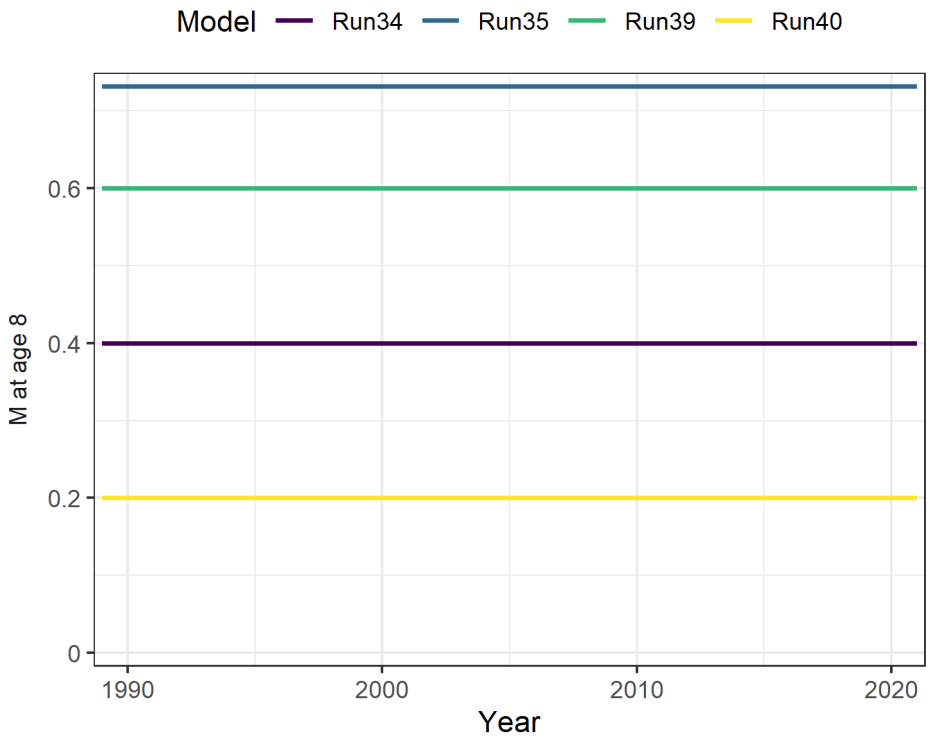
Run 39

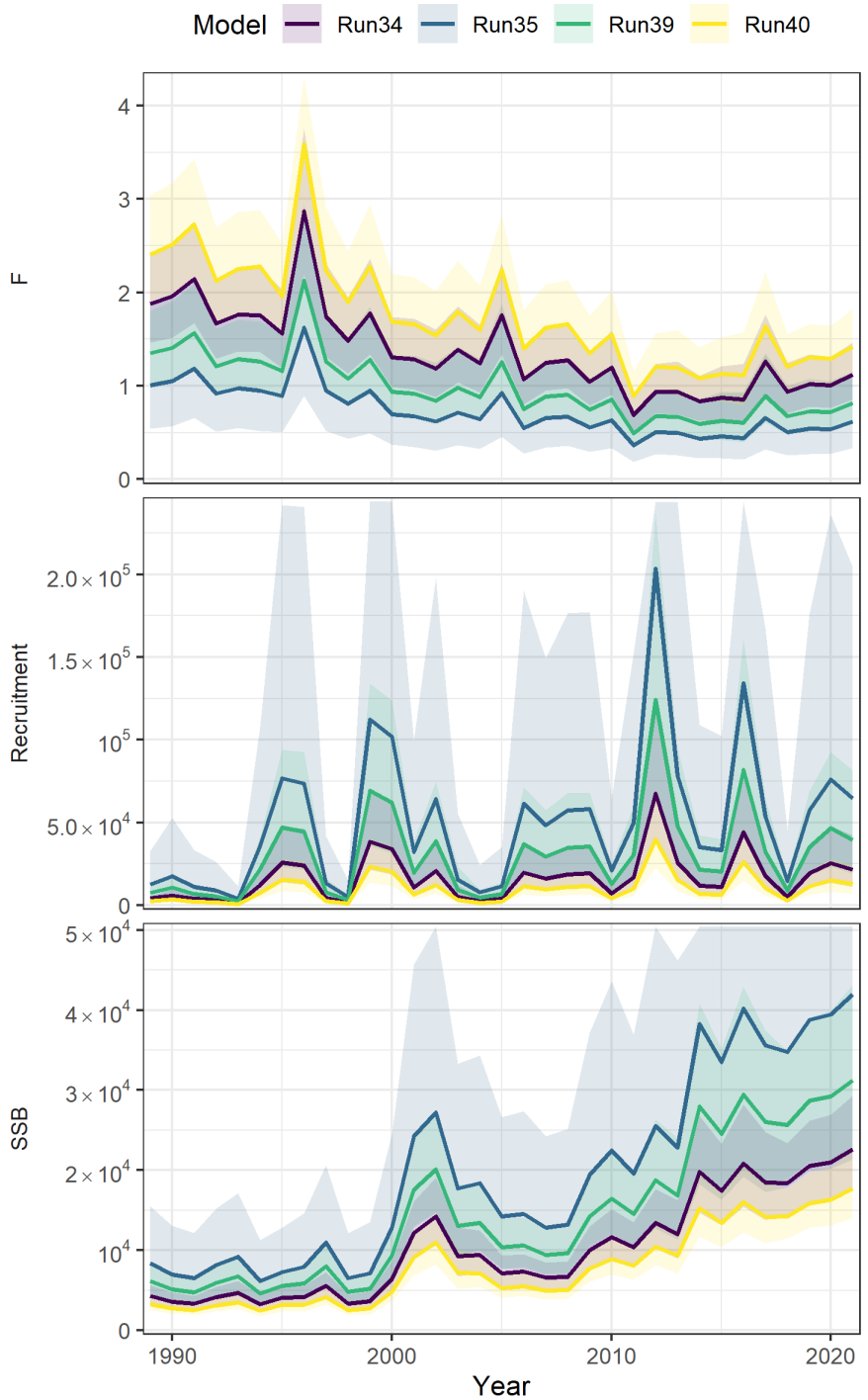
- Age-invariant M fixed at 0.6

Run 40

- Age-invariant M fixed at 0.2

	dAIC	AIC	rho_R	rho_SSB	rho_Fbar
Run39	0.0	-1566.3	0.1026	-0.0850	0.0869
Run35	0.3	-1566.0	0.3388	0.0149	-0.0242
Run34	8.1	-1558.2	0.1209	-0.0579	0.0598
Run40	20.8	-1545.5	0.1289	-0.0414	0.0451


Model
Run34
Run35
Run39
Run40
M at age 8
0
0.2
0.4
0.6
1990
2000
2010
2020
Year


Model
Run34
Run35
Run39
Run40
F
0
1
2
3
4
Recruitment
0
5.0 × 10^4
10^5
1.5 × 10^5
2.0 × 10^5
SSB
0
10^4
2 × 10^4
3 × 10^4
4 × 10^4
5 × 10^4
1990
2000
2010
2020
Year

Conclusions about Sensitivity Test

- M has a strong influence on recruitment and therefore SSB

Sensitivity Tests #2

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- Conduct sensitivity analyses including:
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- 3) an evaluation of which individual surveys should be included in the VAST index by comparing WHAM estimates (e.g., biomass time series) from the proposed run with individual fishery independent surveys. Surveys that do not appear to accurately reflect changes in stock size through this analysis should not be included in the VAST index.

Options for Sensitivity Item 2

1. Look at the estimated initial F and the confidence interval. Pick the lower and upper values of the CI and fix them at those values in estimation model

Run 39

Run 34

- Initial F estimated at
  - N Com – 0.317
  - N Rec – 0.527
  - S Com – 0.315
  - S Rec – 0.721

Run 41

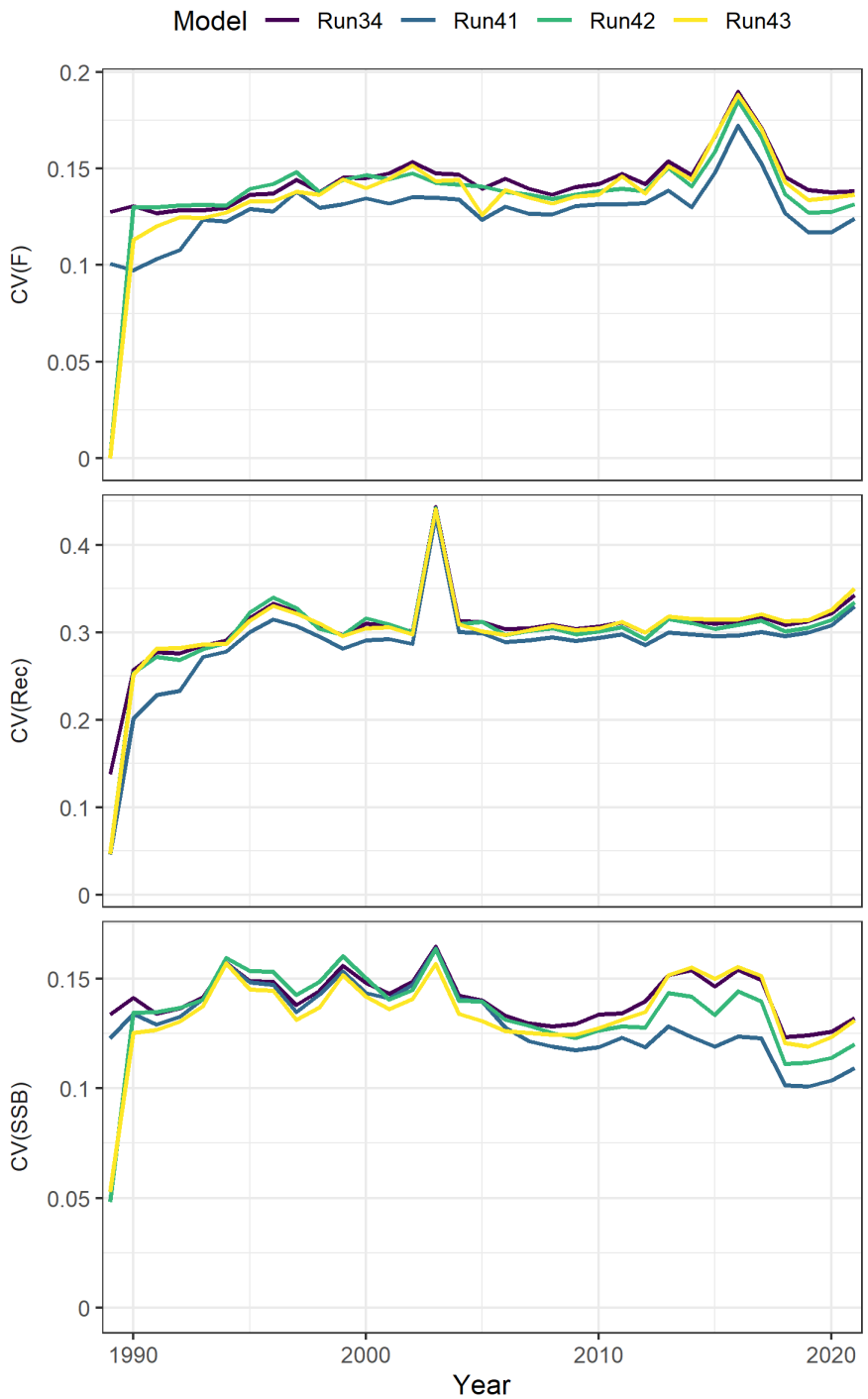
- F fixed at estimated values

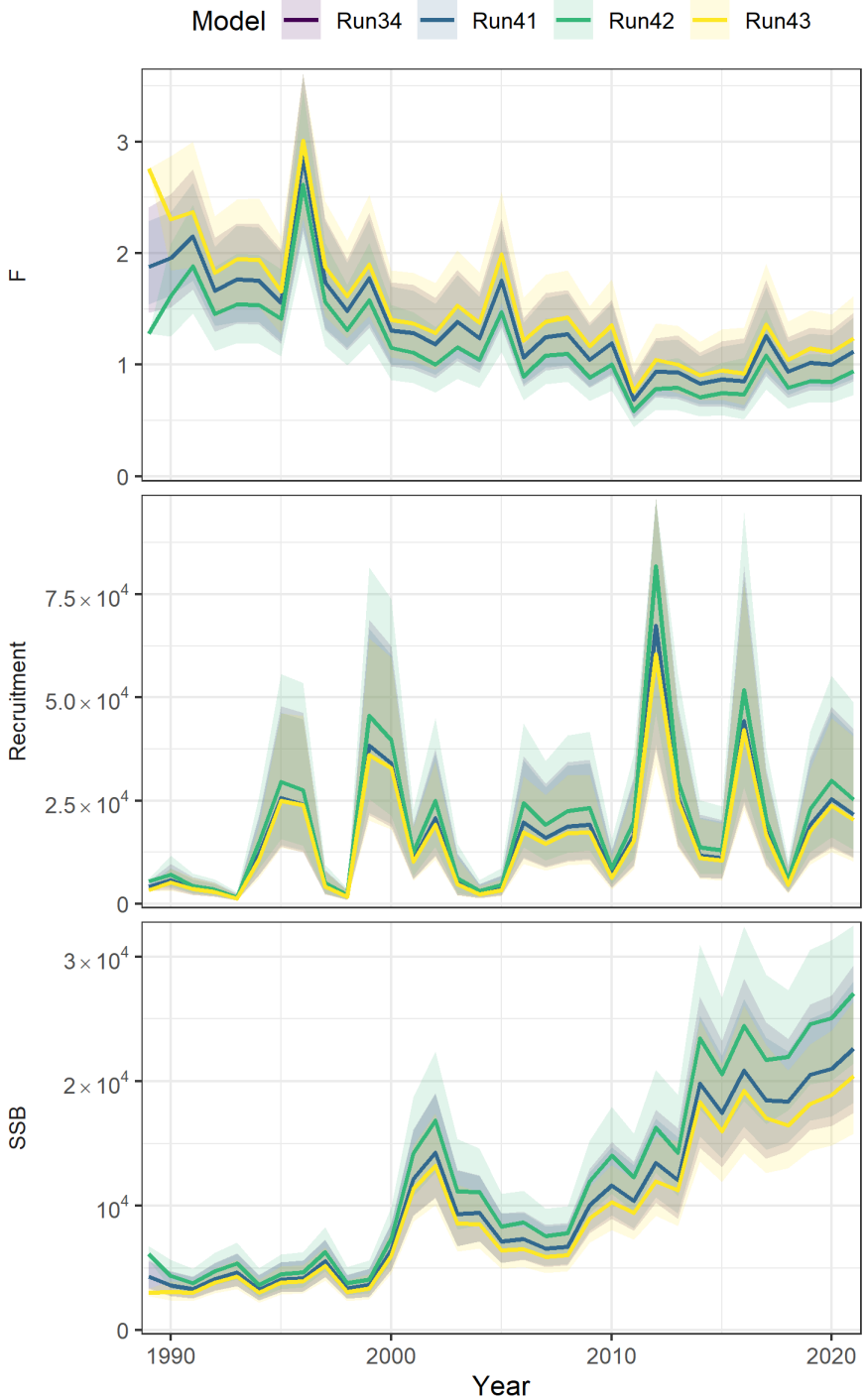
Run 42

- F fixed at 95% CI Lower

Run 43

- F fixed at 95% CI Upper





Run41 – Fixed at est
Run42 – Fixed at lowe
Run43 – Fixed at uppe