Density Dependence

MSE for Mackerel
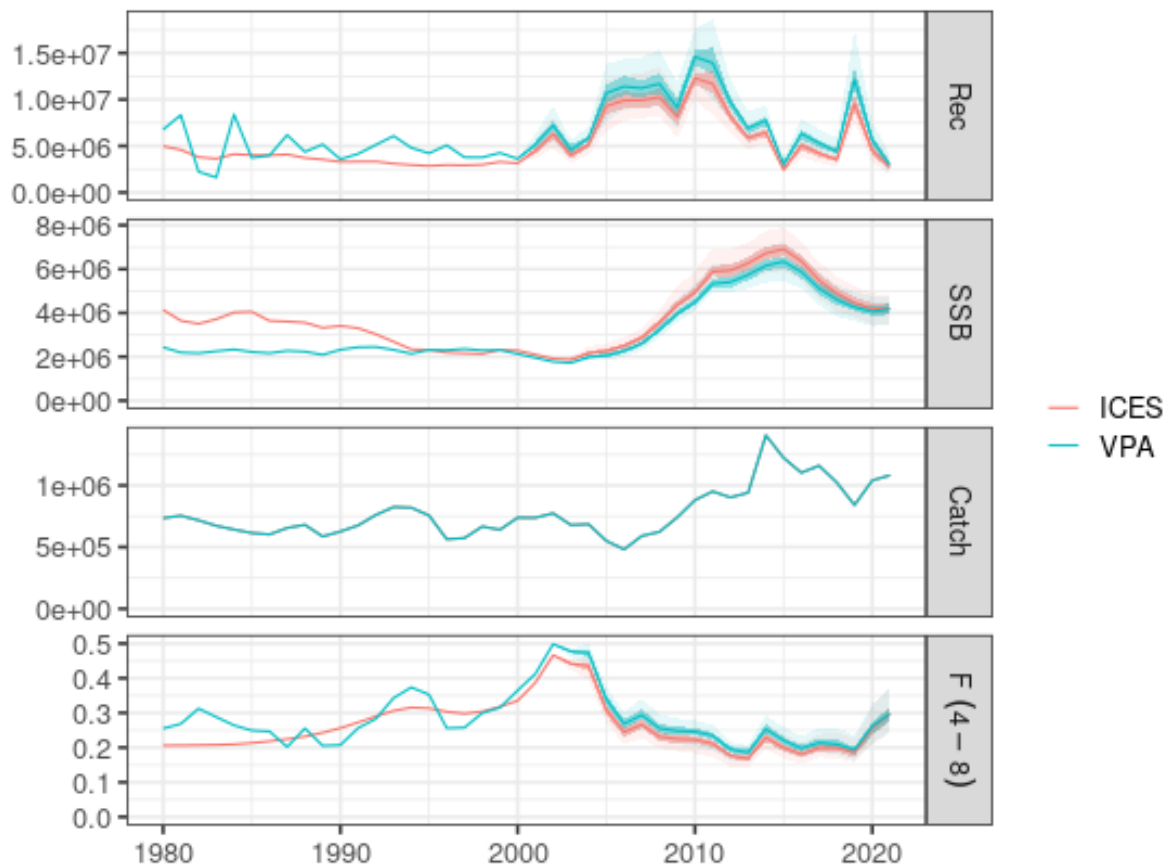
L Kell

20 February, 2023

Conditioning procedure

- Load ICES assessment
- Time varying M
- Conduct VPA

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Error in get_dropbox() : object 'info' not found
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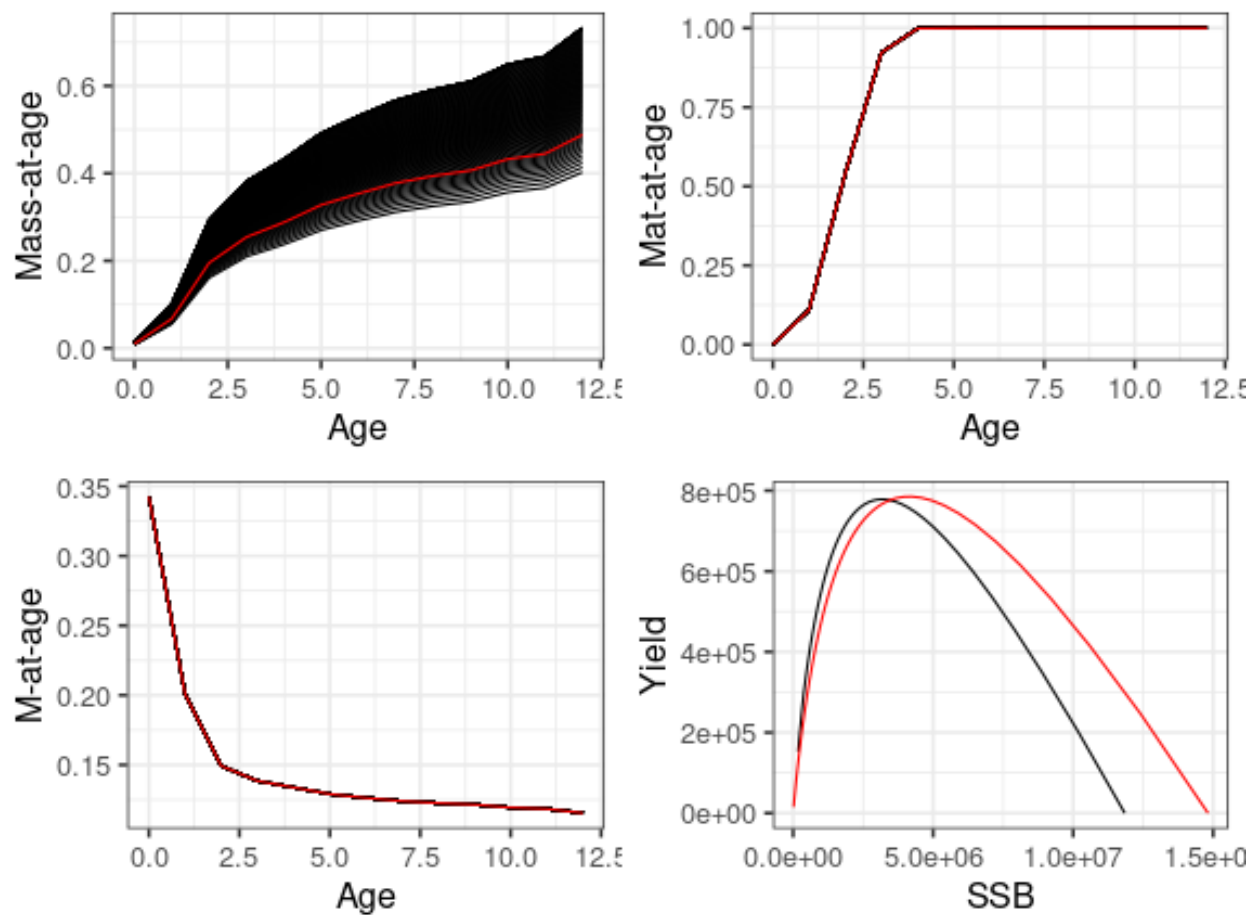
Figure 1 Equilibrium curves and biological parameters for assumptions about density dependence
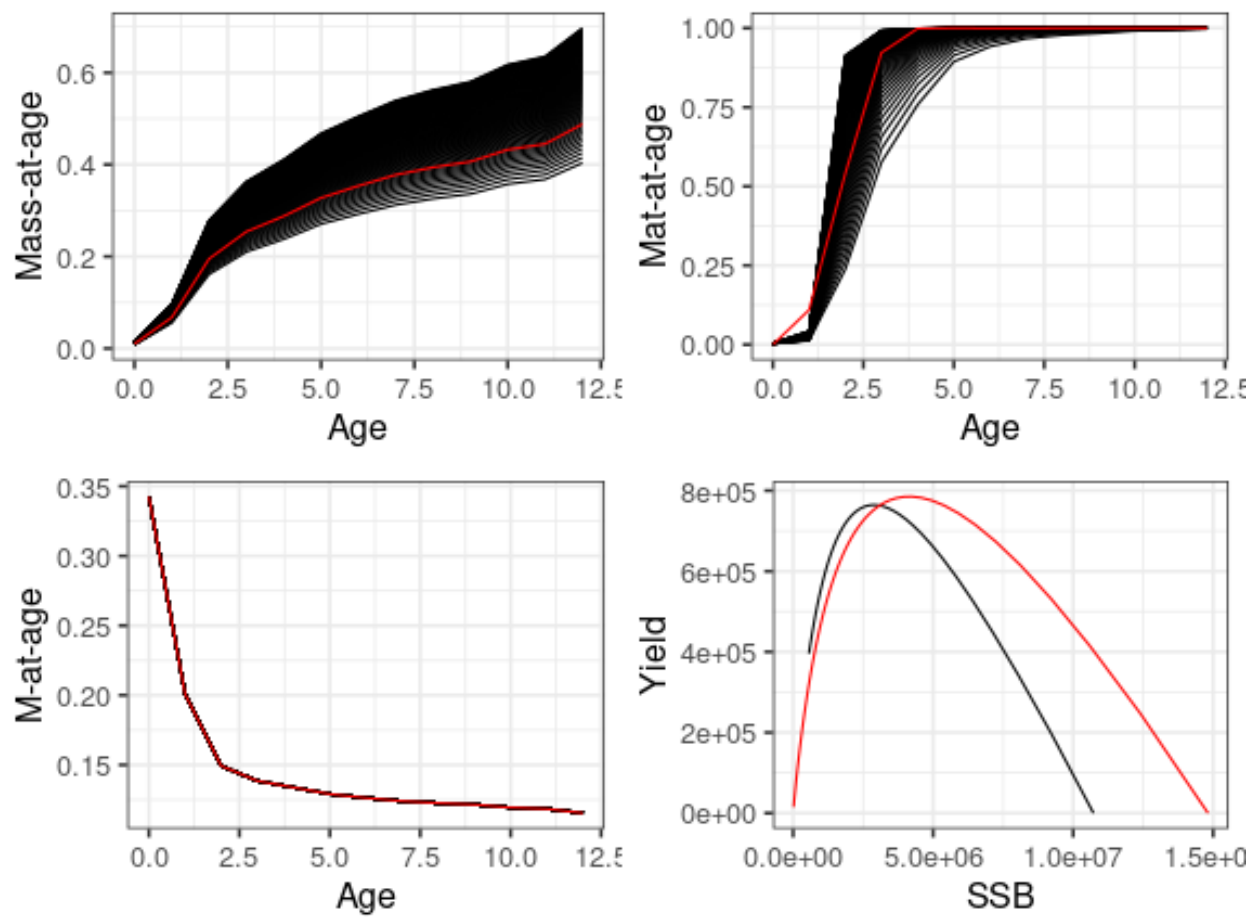
Figure 2 Equilibrium curves and biological parameters for assumptions about density dependence
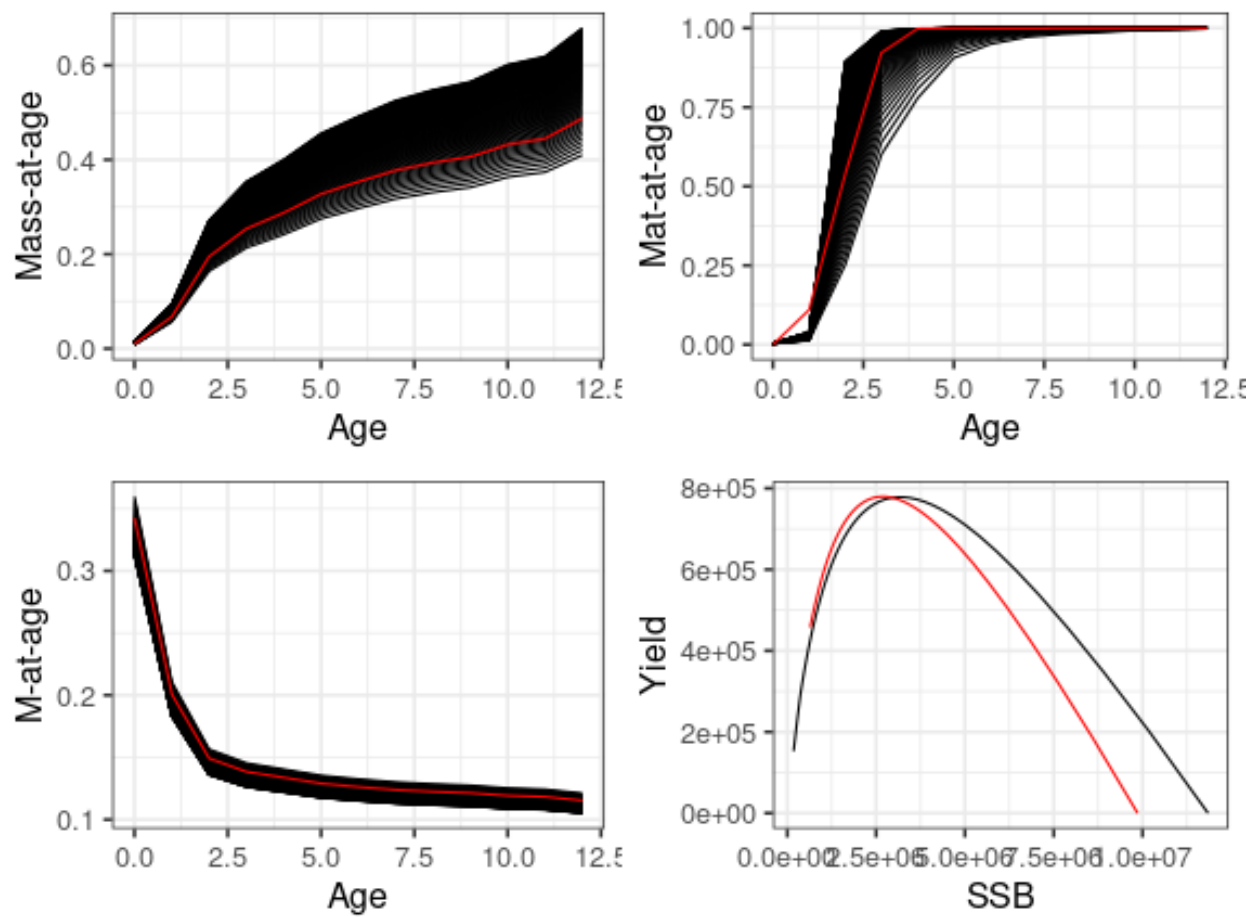
Figure 3 Equilibrium curves and biological parameters for assumptions about density dependence
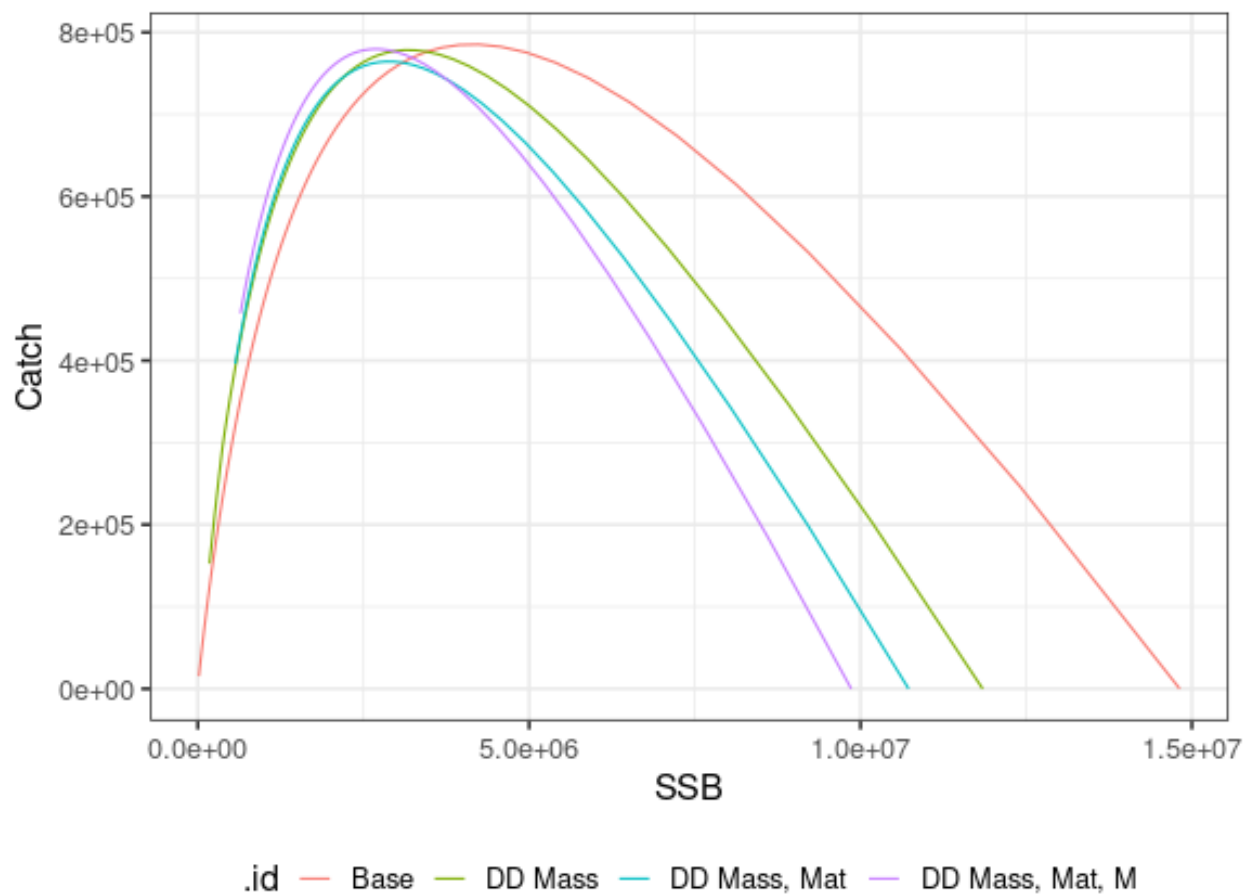
Figure 4 Equilibrium curves for assumptions about density dependence

Table 1 Reference points

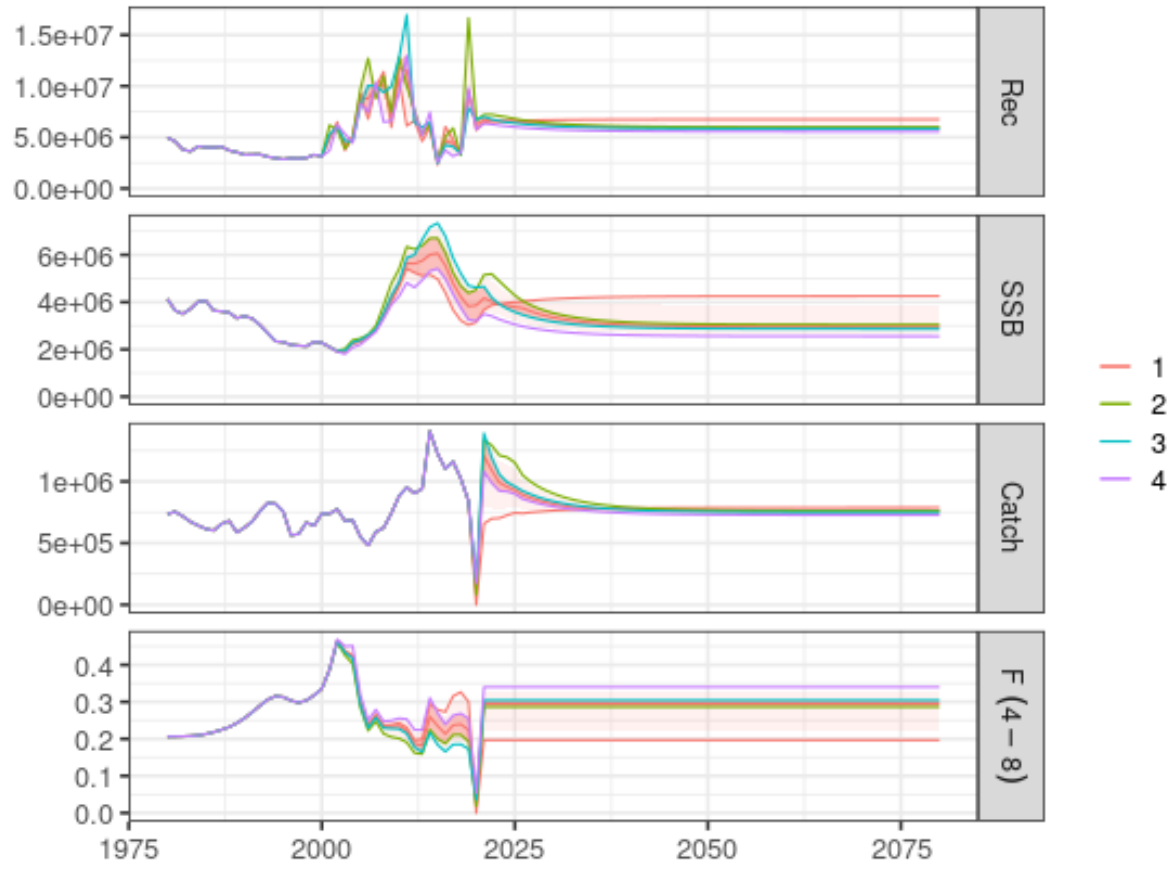|	.id	Bmsy	SSBmsy	MSY	Fmsy	Virgin	B0
1	Base	5366271	4238504	785174.8	0.1968635	14816099	16409787
2	DD Mass	4119410	3115355	778345.8	0.2863469	11842982	13116680
3	DD Mass, Mat	3892055	2837075	764364.1	0.3042436	10725673	12937476
4	DD Mass, Mat, M	3690630	2671774	779652.6	0.3400369	9859977	11930310

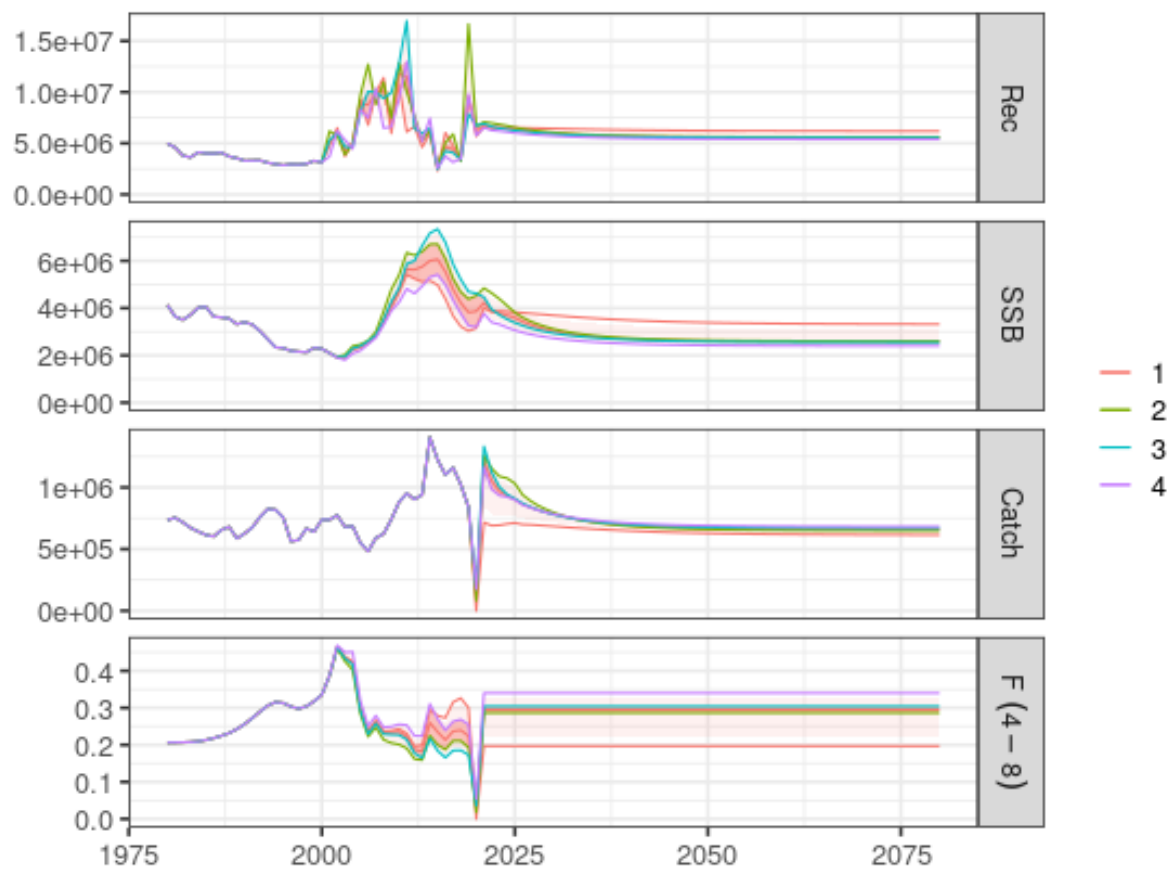**Figure 5** Projections for Operating Models, at F_{MSY} assuming no density dependence

Figure 6 Projections for Operating Models, at F_{MSY} assuming density dependence in mass-at-age only
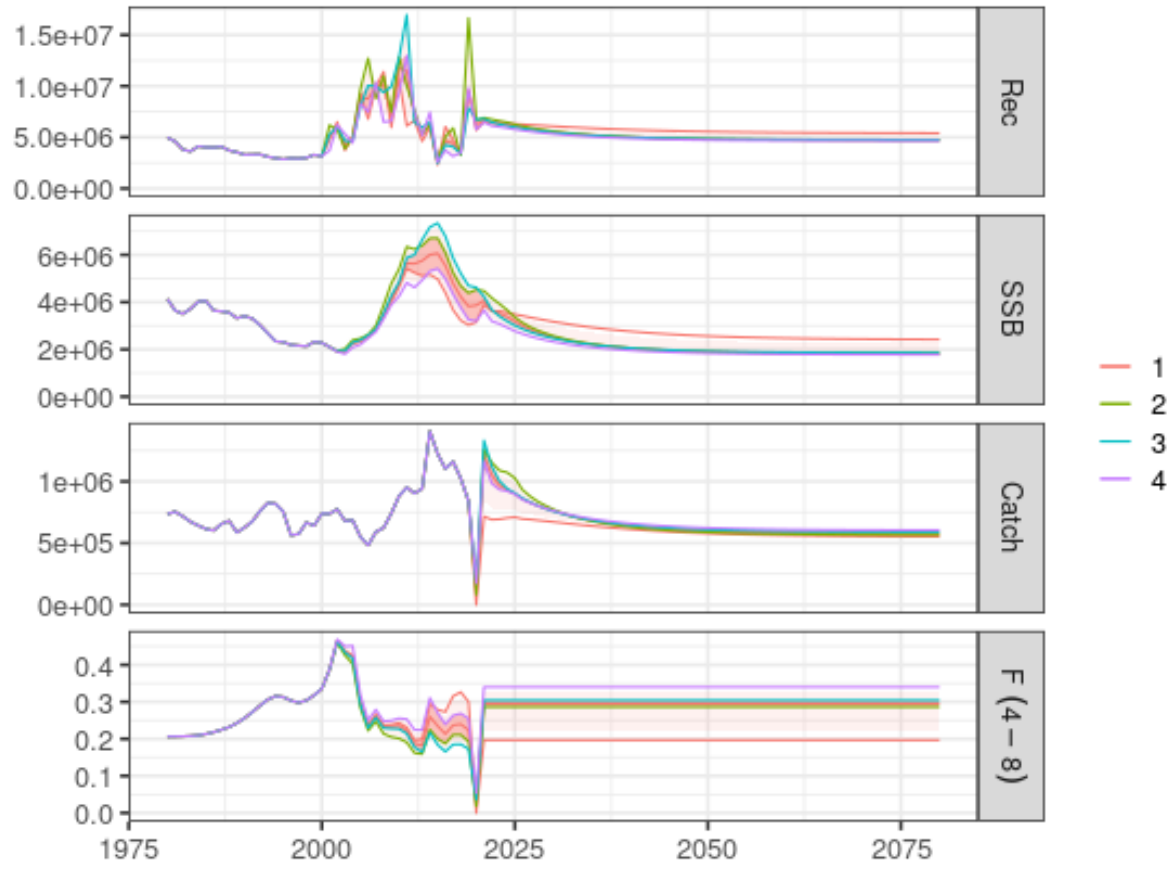
Figure 7 Projections for Operating Models, at F_{MSY} assuming density dependence in mass and maturity-at-age only
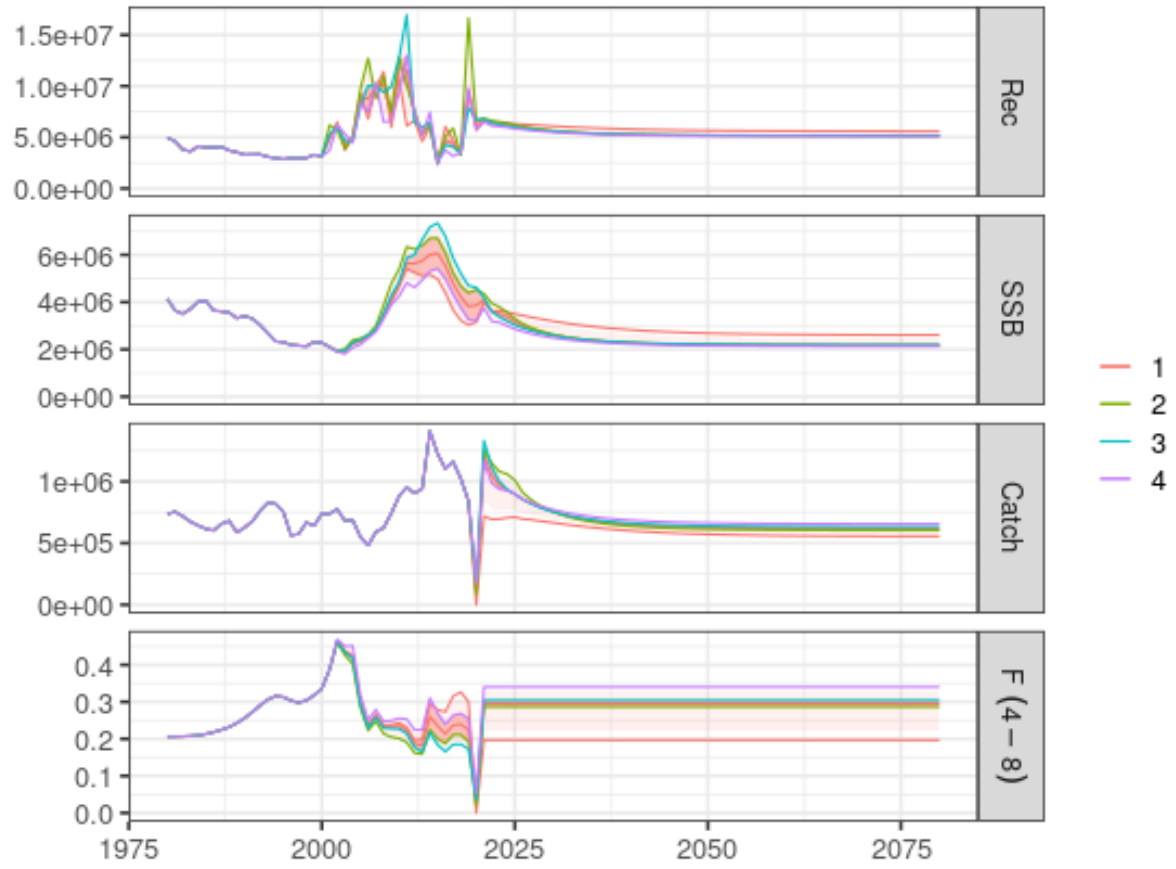
Figure 8 Projections for Operating Models, at F_{MSY} assuming density dependence in mass, maturity and natural mortality-at-age