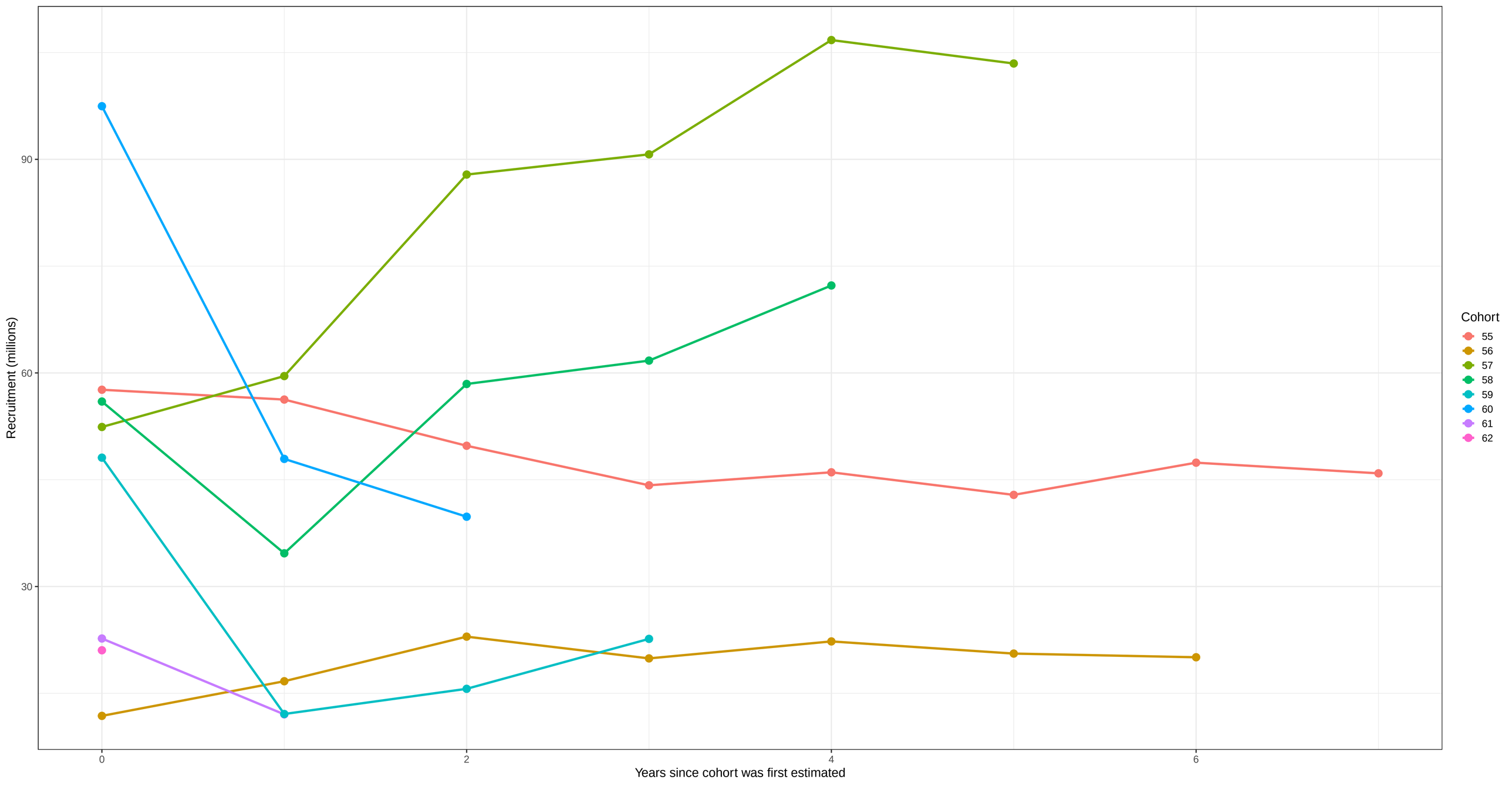
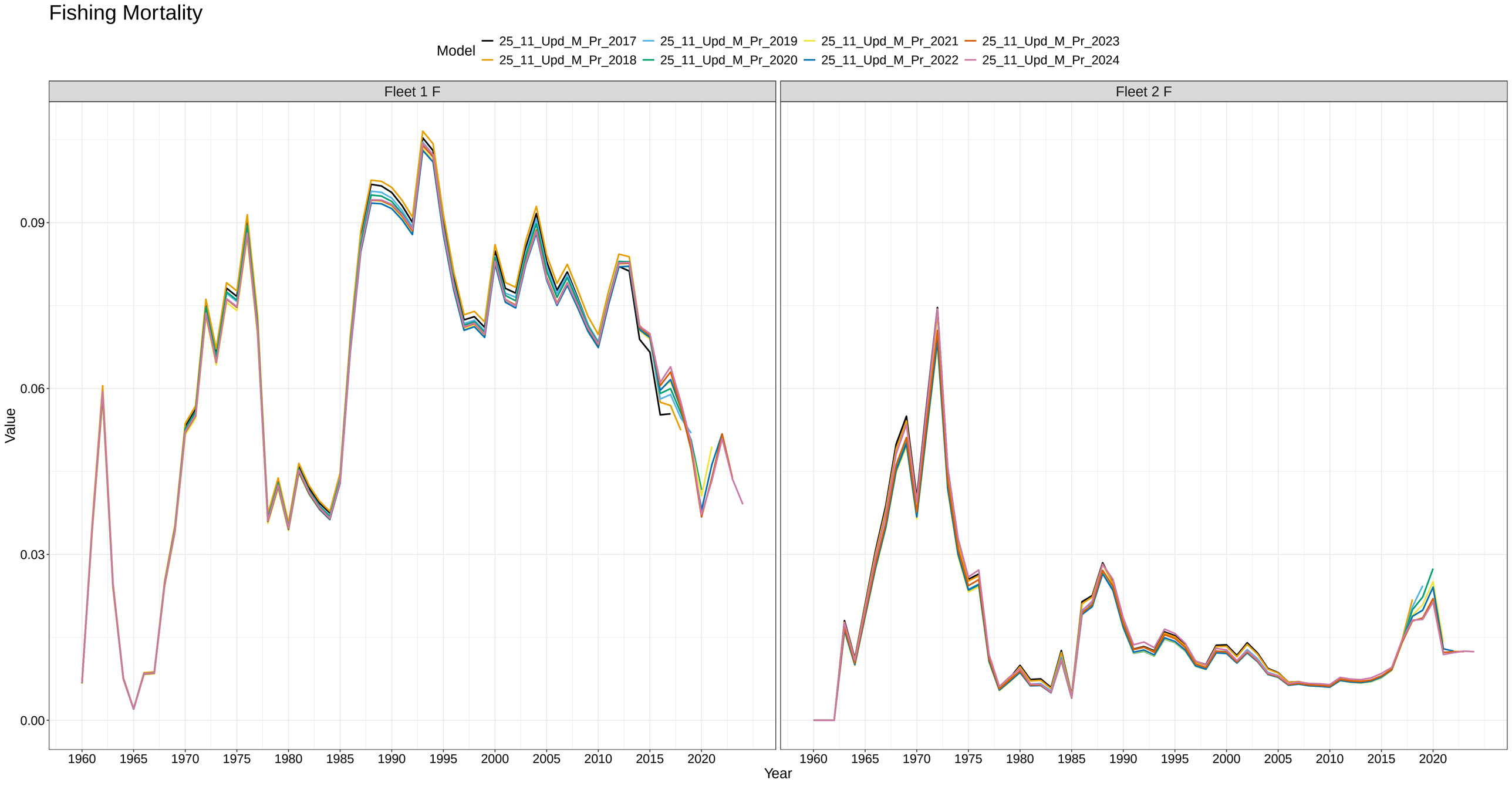
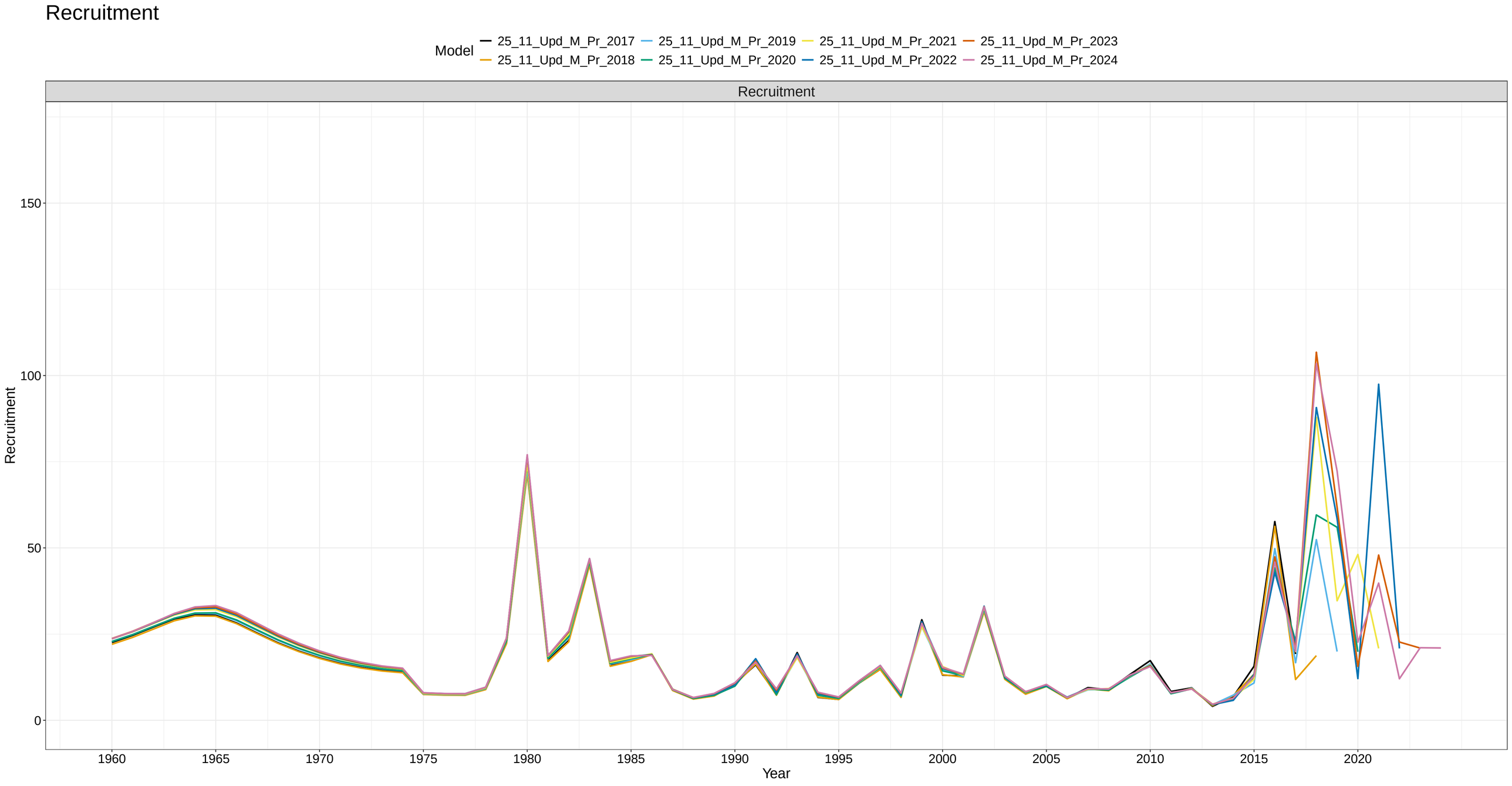
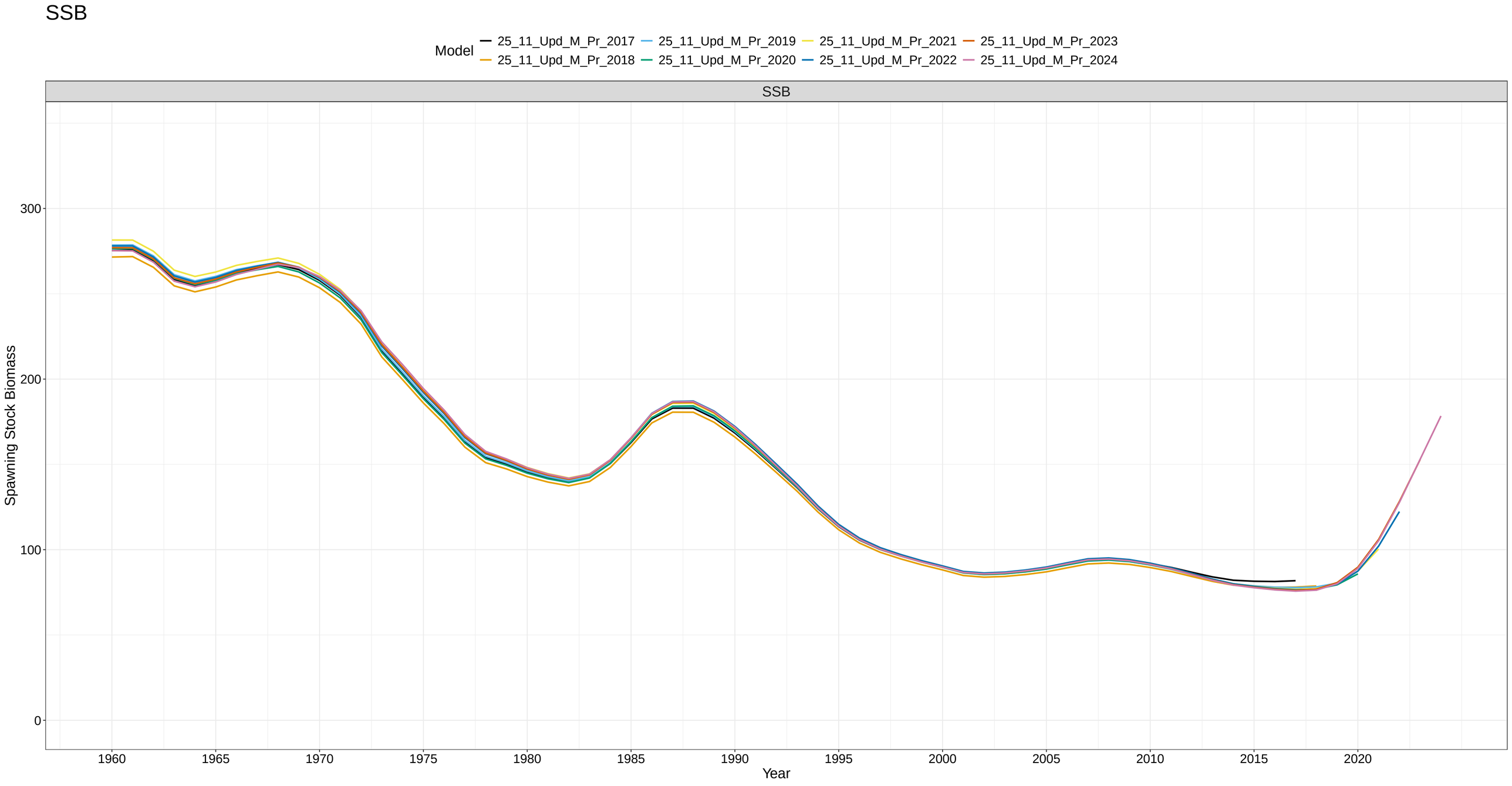

Recruitment (millions)
90
60
30
0
2
4
6
Years since cohort was first estimated
Cohort
55
56
57
58
59
60
61
62

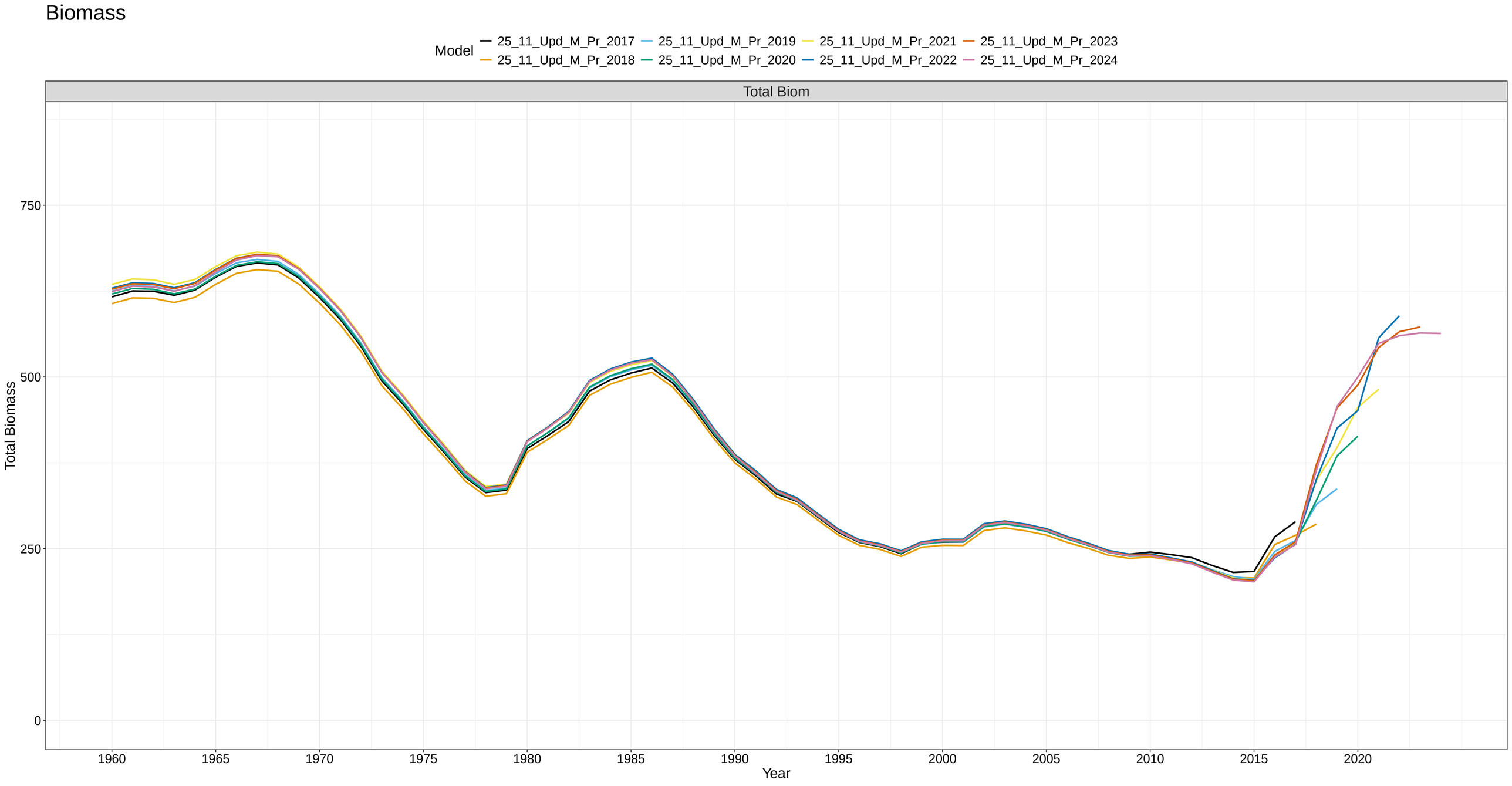

Fishing Mortality
Model
25_11_Upd_M_Pr_2017
25_11_Upd_M_Pr_2018
25_11_Upd_M_Pr_2019
25_11_Upd_M_Pr_2020
25_11_Upd_M_Pr_2021
25_11_Upd_M_Pr_2022
25_11_Upd_M_Pr_2023
25_11_Upd_M_Pr_2024
Fleet 1 F
Fleet 2 F
Value
0.00
0.03
0.06
0.09
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year

# Recruitment



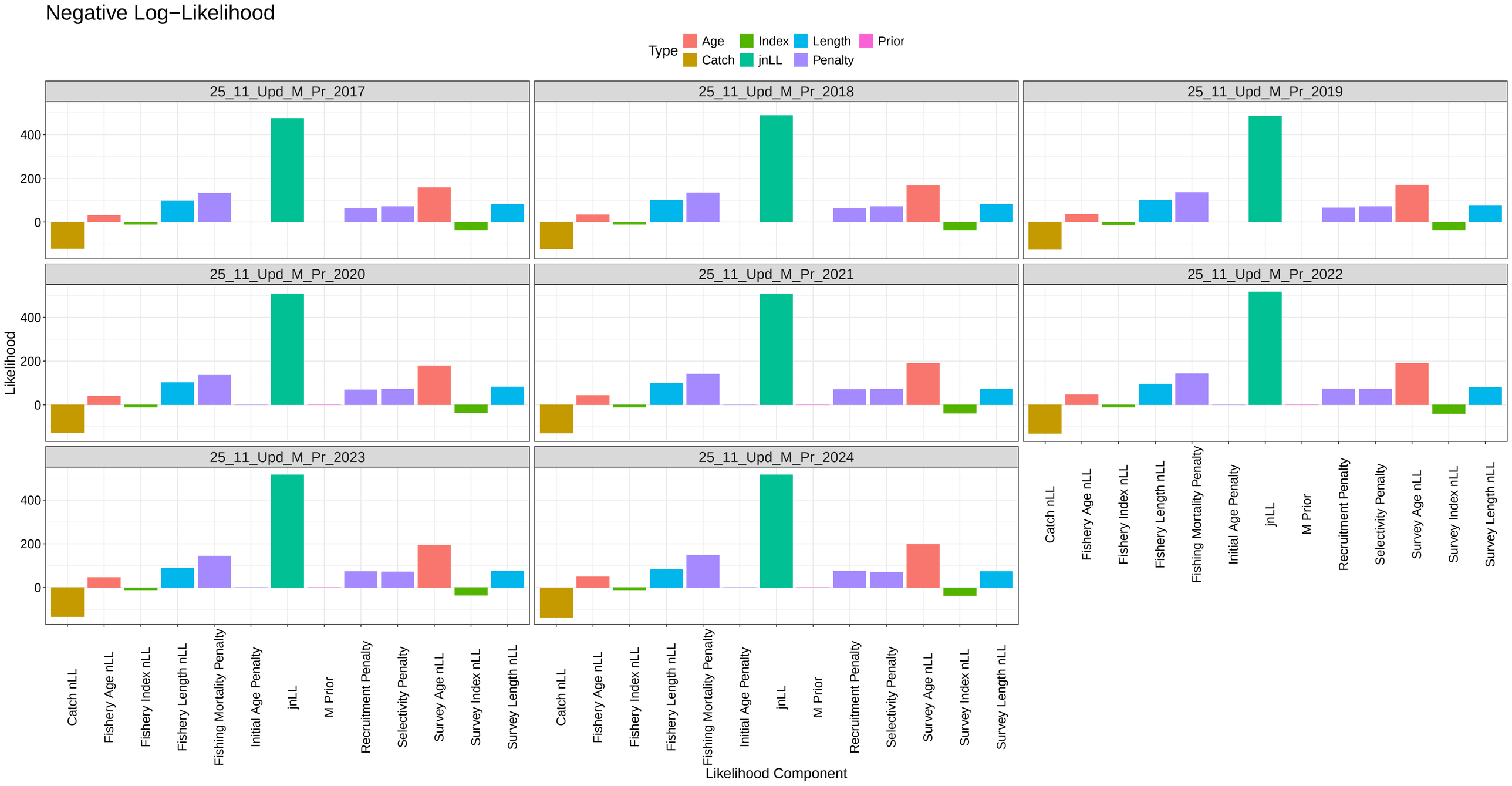

SSB
Model
25_11_Upd_M_Pr_2017
25_11_Upd_M_Pr_2018
25_11_Upd_M_Pr_2019
25_11_Upd_M_Pr_2020
25_11_Upd_M_Pr_2021
25_11_Upd_M_Pr_2022
25_11_Upd_M_Pr_2023
25_11_Upd_M_Pr_2024
SSB
Spawning Stock Biomass
0
100
200
300
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year

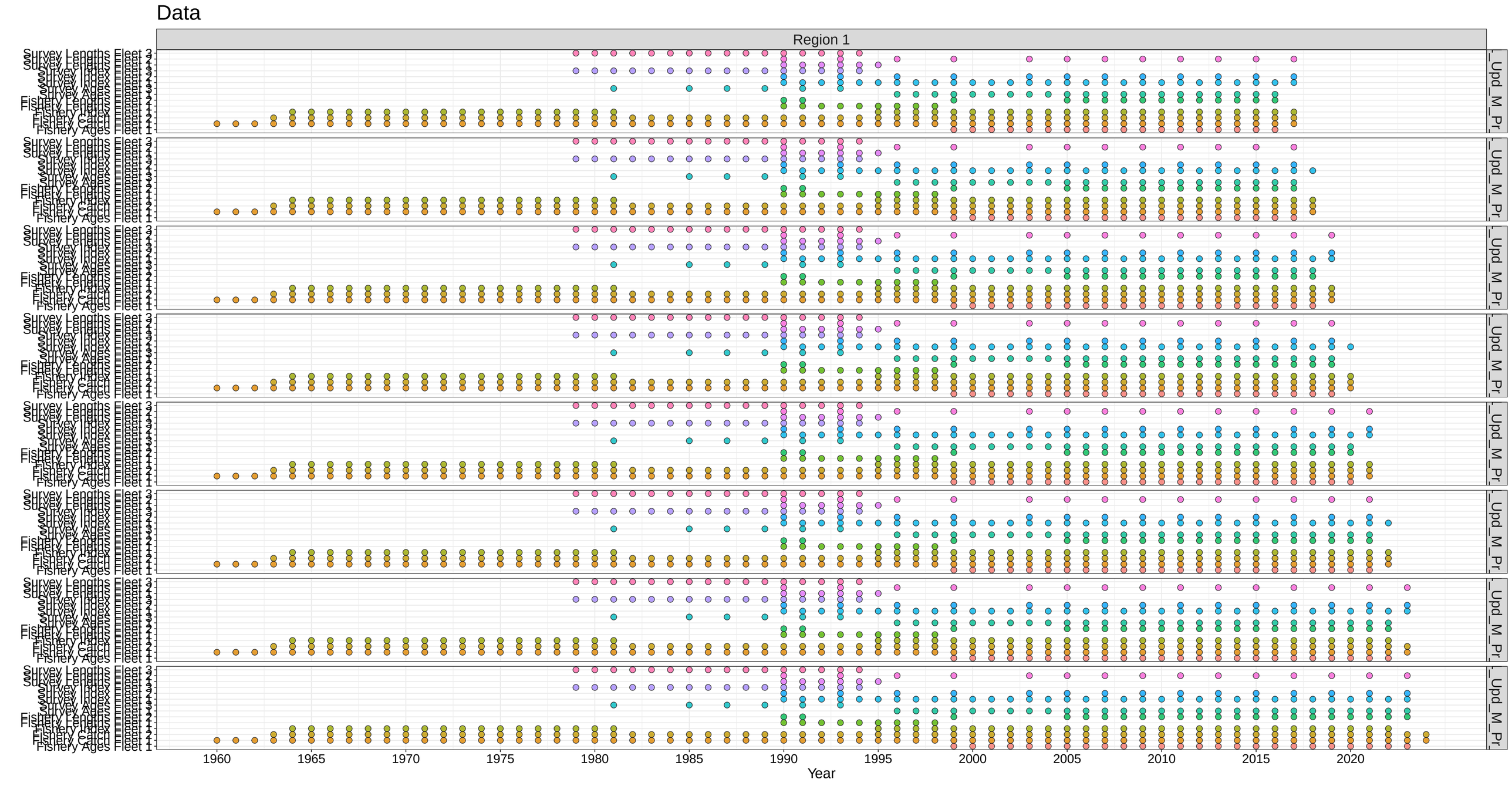
# Biomass


Model
25_11_Upd_M_Pr_2017
25_11_Upd_M_Pr_2018
25_11_Upd_M_Pr_2019
25_11_Upd_M_Pr_2020
25_11_Upd_M_Pr_2021
25_11_Upd_M_Pr_2022
25_11_Upd_M_Pr_2023
25_11_Upd_M_Pr_2024
Total Biom
Total Biomass
0
250
500
750
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year

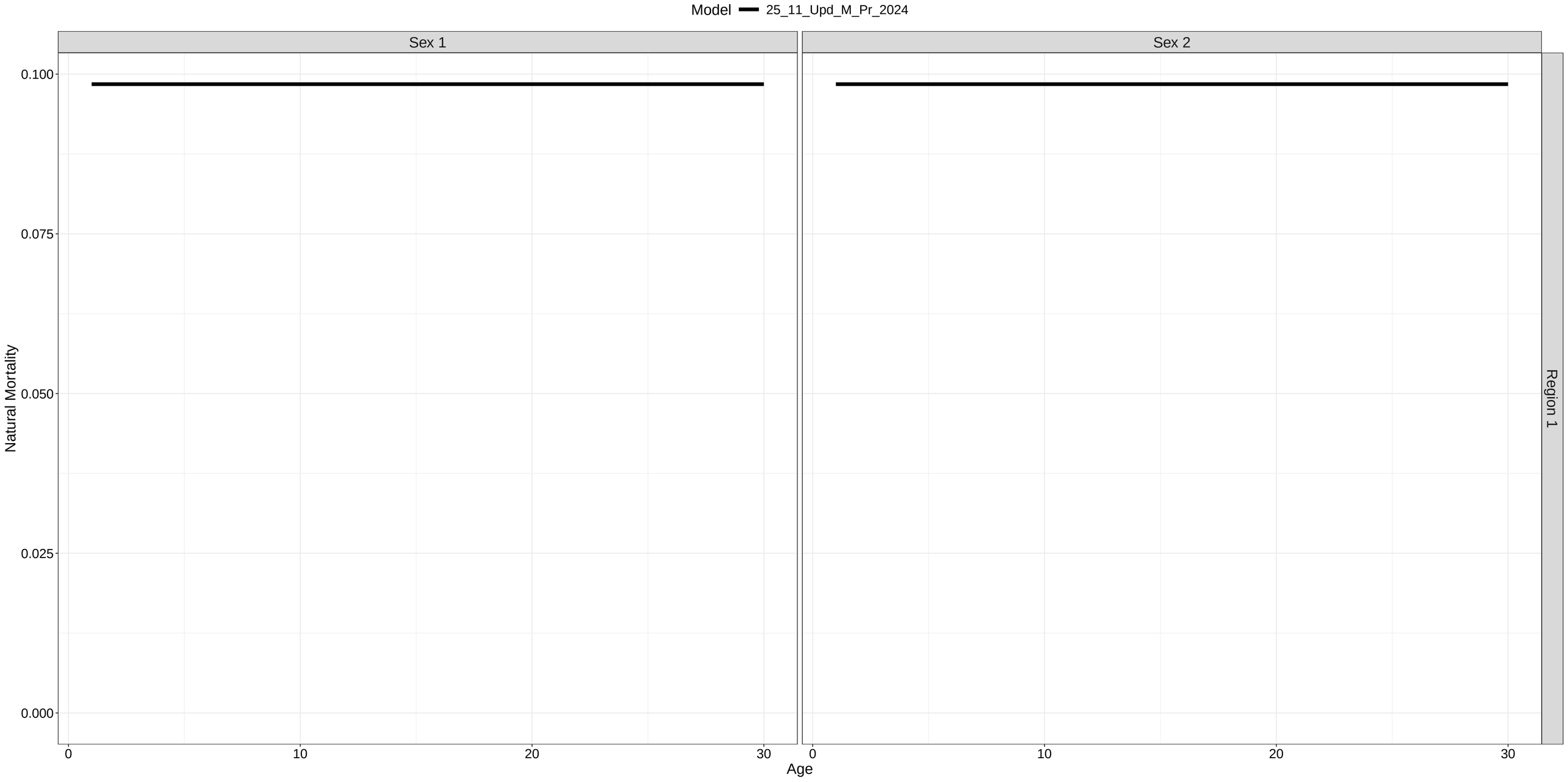
| | Model | Region | Terminal_SSB | Terminal_F | Catch_Advice | B_Ref_Pt | F_Ref_Pt | B_over_B_Ref | F_over_F_Ref |
|---|---|---|---|---|---|---|---|---|---|
| *1* | 25_11_Upd_M_Pr_2024 | 1 | 178.38031 | 0.05147170 | 37.28203 | 123.4346 | 0.08281 | 1.44514 | 0.62155 |
| *2* | 25_11_Upd_M_Pr_2023 | 1 | 152.89115 | 0.05623061 | 37.40633 | 124.6255 | 0.08119 | 1.22680 | 0.69261 |
| *3* | 25_11_Upd_M_Pr_2022 | 1 | 122.33014 | 0.06437061 | 37.41276 | 117.7591 | 0.07925 | 1.03882 | 0.81222 |
| *4* | 25_11_Upd_M_Pr_2021 | 1 | 100.45952 | 0.06364703 | 25.75131 | 115.5344 | 0.07895 | 0.86952 | 0.80614 |
| *5* | 25_11_Upd_M_Pr_2020 | 1 | 85.83376 | 0.06907942 | 19.74039 | 110.4760 | 0.08036 | 0.77694 | 0.85966 |
| *6* | 25_11_Upd_M_Pr_2019 | 1 | 80.38222 | 0.07629700 | 15.60073 | 103.8503 | 0.07985 | 0.77402 | 0.95549 |
| *7* | 25_11_Upd_M_Pr_2018 | 1 | 78.72051 | 0.07431230 | 12.60690 | 106.5028 | 0.07925 | 0.73914 | 0.93767 |
| *8* | 25_11_Upd_M_Pr_2017 | 1 | 81.82430 | 0.06981449 | 14.16927 | 100.3101 | 0.07955 | 0.81571 | 0.87758 |

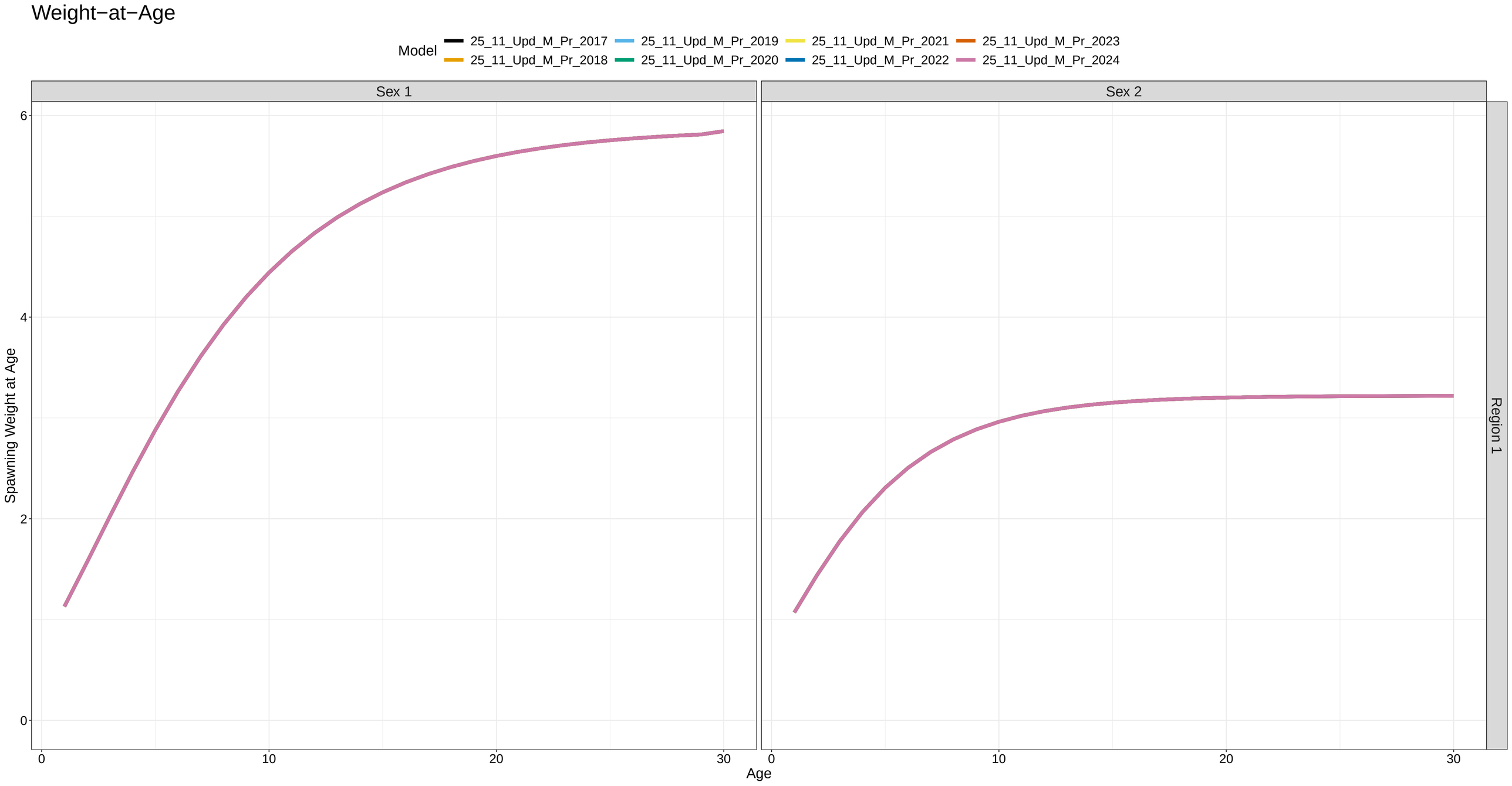
| | Model | jnLL | M Prior | Recruitment Penalty | Selectivity Penalty | Catch nLL | Fishing Mortality Penalty | Survey Index nLL | Fishery Index nLL | Initial Age Penalty | Survey Age nLL | Fishery Age nLL | Survey Length nLL | Fishery Length nLL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *1* | 25_11_Upd_M_Pr_2024 | 515.6982 | −0.3081874 | 75.25098 | 72.00785 | −136.1671 | 146.9464 | −36.65904 | −11.54096 | 0.2849454 | 198.4586 | 49.73668 | 74.45816 | 83.22979 |
| *2* | 25_11_Upd_M_Pr_2023 | 516.8483 | −0.3661791 | 74.19991 | 72.19508 | −134.0234 | 144.9890 | −36.38058 | −11.44484 | 0.2728068 | 195.0319 | 47.09627 | 75.39349 | 89.88487 |
| *3* | 25_11_Upd_M_Pr_2022 | 518.0296 | −0.4303273 | 74.17745 | 72.37372 | −131.8954 | 143.1361 | −40.74634 | −12.07976 | 0.2628862 | 190.5830 | 46.40220 | 79.94859 | 96.29744 |
| *4* | 25_11_Upd_M_Pr_2021 | 509.5797 | −0.5365912 | 71.02540 | 72.42858 | −129.7555 | 141.3975 | −39.16099 | −11.95105 | 0.2679207 | 190.7554 | 44.36833 | 72.17588 | 98.56481 |
| *5* | 25_11_Upd_M_Pr_2020 | 509.3289 | −0.7490160 | 69.75856 | 72.58238 | −127.5994 | 139.6022 | −37.78674 | −11.67880 | 0.2448044 | 179.0258 | 41.43688 | 82.19876 | 102.29339 |
| *6* | 25_11_Upd_M_Pr_2019 | 485.9310 | −0.7929169 | 67.02459 | 72.49815 | −125.4633 | 137.5969 | −36.91710 | −11.96250 | 0.2542637 | 169.6055 | 37.55934 | 75.43089 | 101.09714 |
| *7* | 25_11_Upd_M_Pr_2018 | 488.1827 | −1.0016014 | 65.74684 | 72.44956 | −123.2813 | 135.5600 | −36.57268 | −11.31811 | 0.2346261 | 167.8247 | 35.00930 | 81.83385 | 101.69755 |
| *8* | 25_11_Upd_M_Pr_2017 | 474.9450 | −0.9375503 | 65.00130 | 72.41509 | −121.1658 | 133.6661 | −36.08053 | −10.48848 | 0.2474168 | 158.6795 | 31.92547 | 84.02353 | 97.65892 |


Negative Log−Likelihood
Type
Age
Index
Length
Prior
Catch
jnLL
Penalty
25_11_Upd_M_Pr_2017
25_11_Upd_M_Pr_2018
25_11_Upd_M_Pr_2019
25_11_Upd_M_Pr_2020
25_11_Upd_M_Pr_2021
25_11_Upd_M_Pr_2022
25_11_Upd_M_Pr_2023
25_11_Upd_M_Pr_2024
Likelihood
0
200
400
Catch nLL
Fishery Age nLL
Fishery Index nLL
Fishery Length nLL
Fishing Mortality Penalty
Initial Age Penalty
jnLL
M Prior
Recruitment Penalty
Selectivity Penalty
Survey Age nLL
Survey Index nLL
Survey Length nLL
Likelihood Component

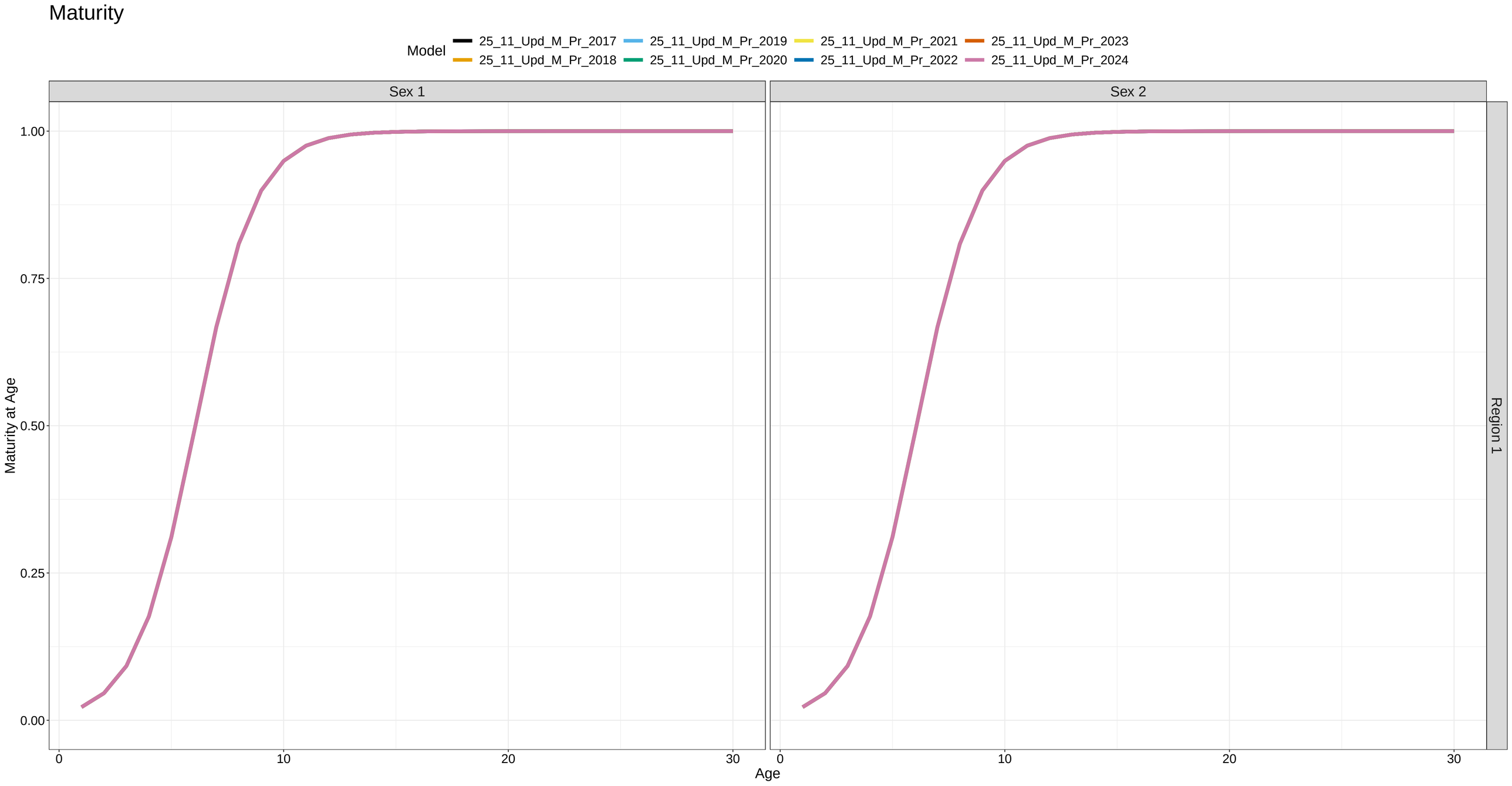

Data
Region 1
Survey Lengths Fleet 3
Survey Lengths Fleet 2
Survey Lengths Fleet 1
Survey Index Fleet 3
Survey Index Fleet 2
Survey Index Fleet 1
Survey Ages Fleet 3
Survey Ages Fleet 2
Survey Ages Fleet 1
Fishery Lengths Fleet 2
Fishery Lengths Fleet 1
Fishery Index Fleet 2
Fishery Index Fleet 1
Fishery Catch Fleet 2
Fishery Catch Fleet 1
Fishery Ages Fleet 1
_Upd_M_Pr
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year

# Natural Mortality

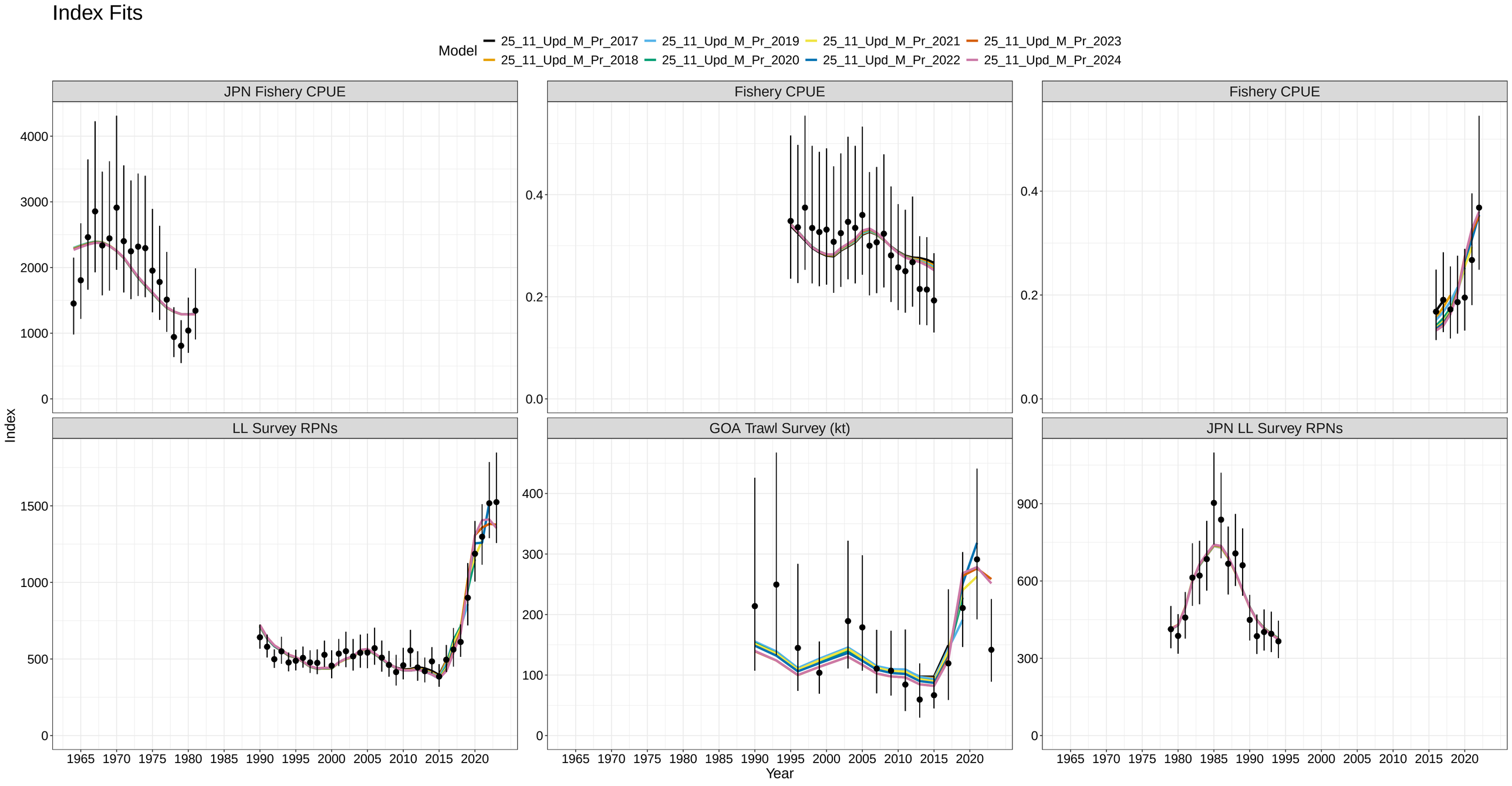



Weight−at−Age
Model
25_11_Upd_M_Pr_2017
25_11_Upd_M_Pr_2018
25_11_Upd_M_Pr_2019
25_11_Upd_M_Pr_2020
25_11_Upd_M_Pr_2021
25_11_Upd_M_Pr_2022
25_11_Upd_M_Pr_2023
25_11_Upd_M_Pr_2024
Sex 1
Sex 2
Region 1
Spawning Weight at Age
Age
0
2
4
6
0
10
20
30

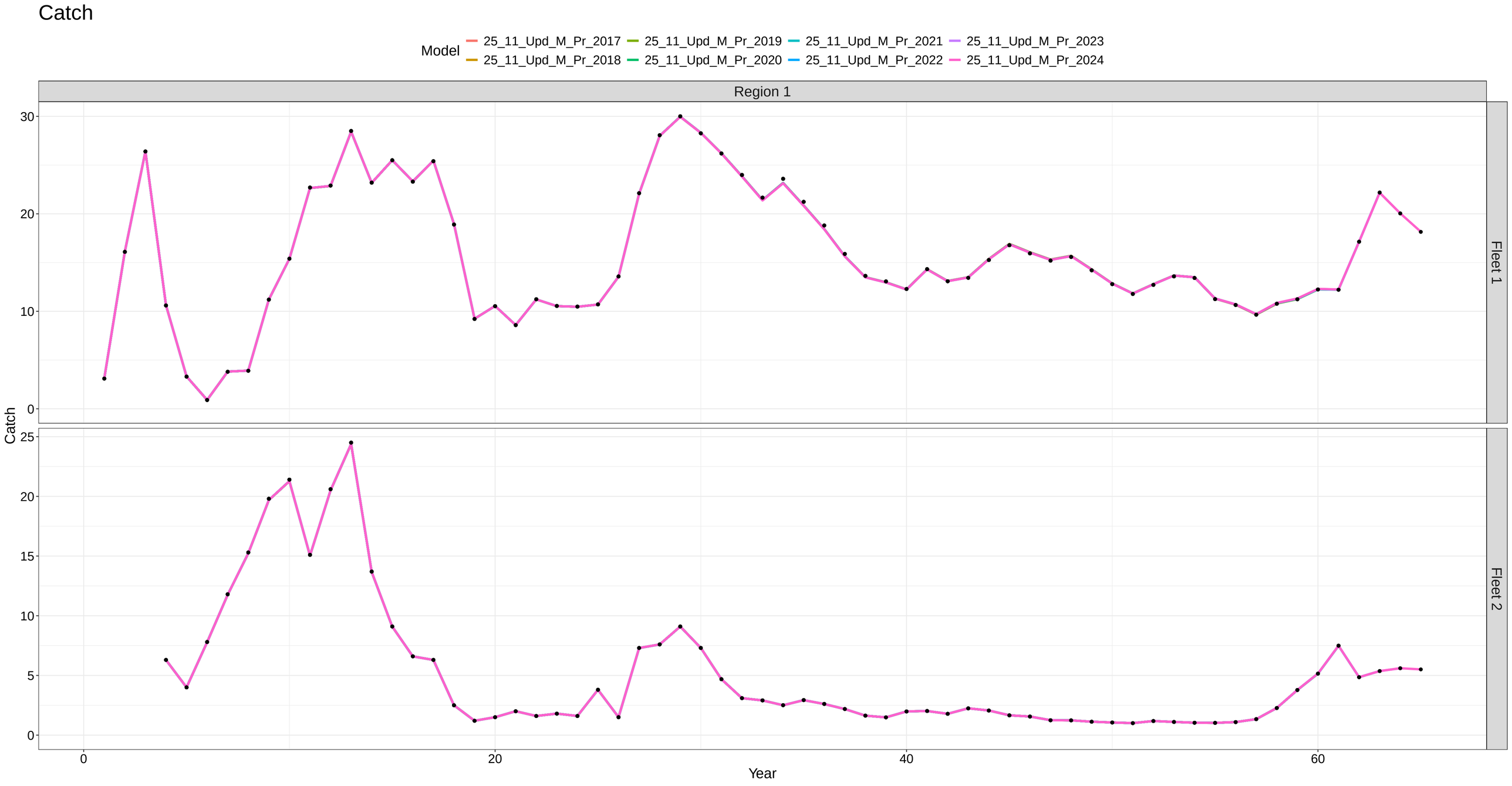
# Maturity


Model
25_11_Upd_M_Pr_2017
25_11_Upd_M_Pr_2018
25_11_Upd_M_Pr_2019
25_11_Upd_M_Pr_2020
25_11_Upd_M_Pr_2021
25_11_Upd_M_Pr_2022
25_11_Upd_M_Pr_2023
25_11_Upd_M_Pr_2024
Sex 1
Sex 2
Region 1
Maturity at Age
1.00
0.75
0.50
0.25
0.00
0
10
20
30
Age

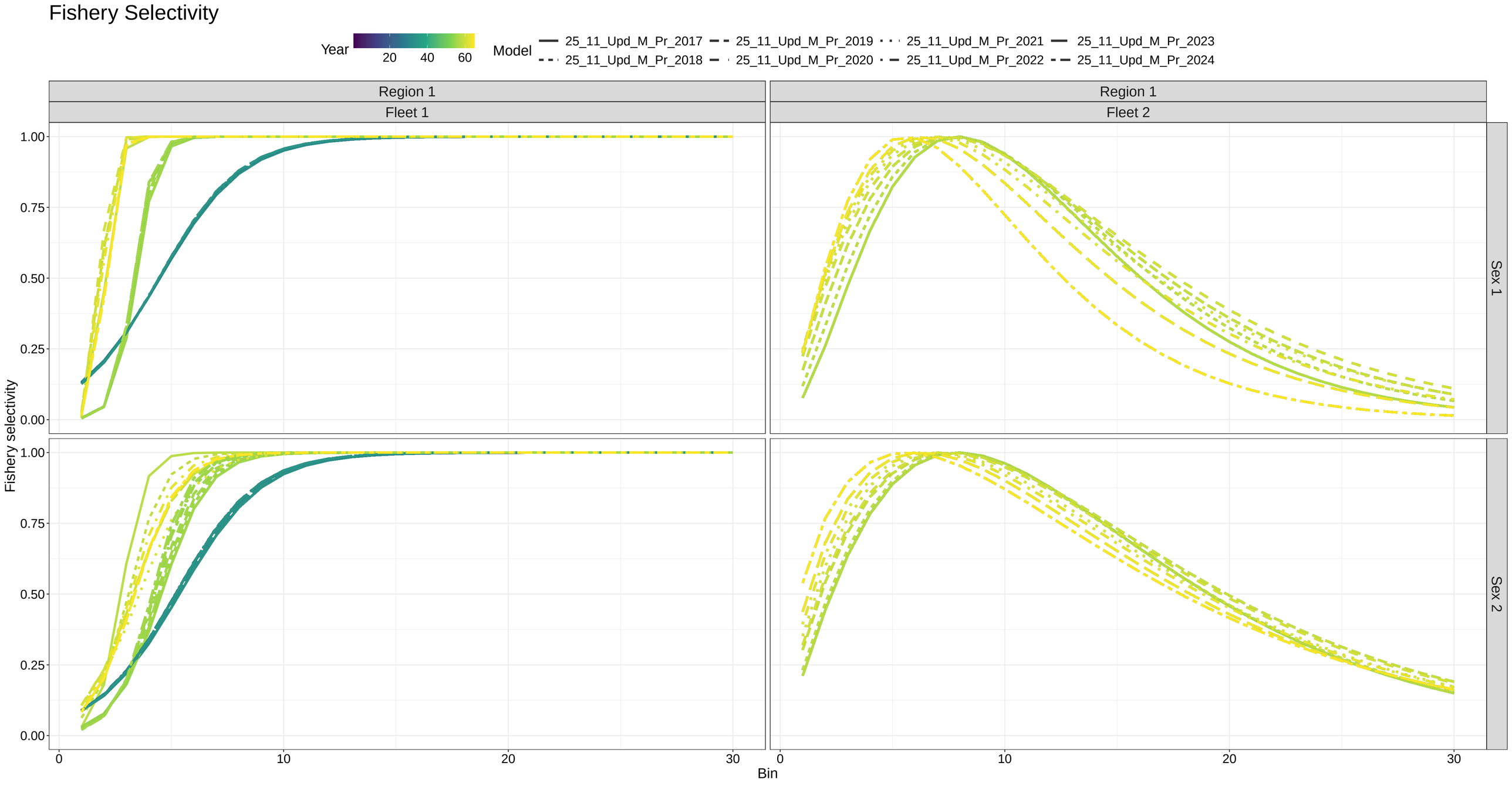
# Index Fits


Model
25_11_Upd_M_Pr_2017
25_11_Upd_M_Pr_2018
25_11_Upd_M_Pr_2019
25_11_Upd_M_Pr_2020
25_11_Upd_M_Pr_2021
25_11_Upd_M_Pr_2022
25_11_Upd_M_Pr_2023
25_11_Upd_M_Pr_2024
JPN Fishery CPUE
Fishery CPUE
Fishery CPUE
LL Survey RPNs
GOA Trawl Survey (kt)
JPN LL Survey RPNs
Index
Year

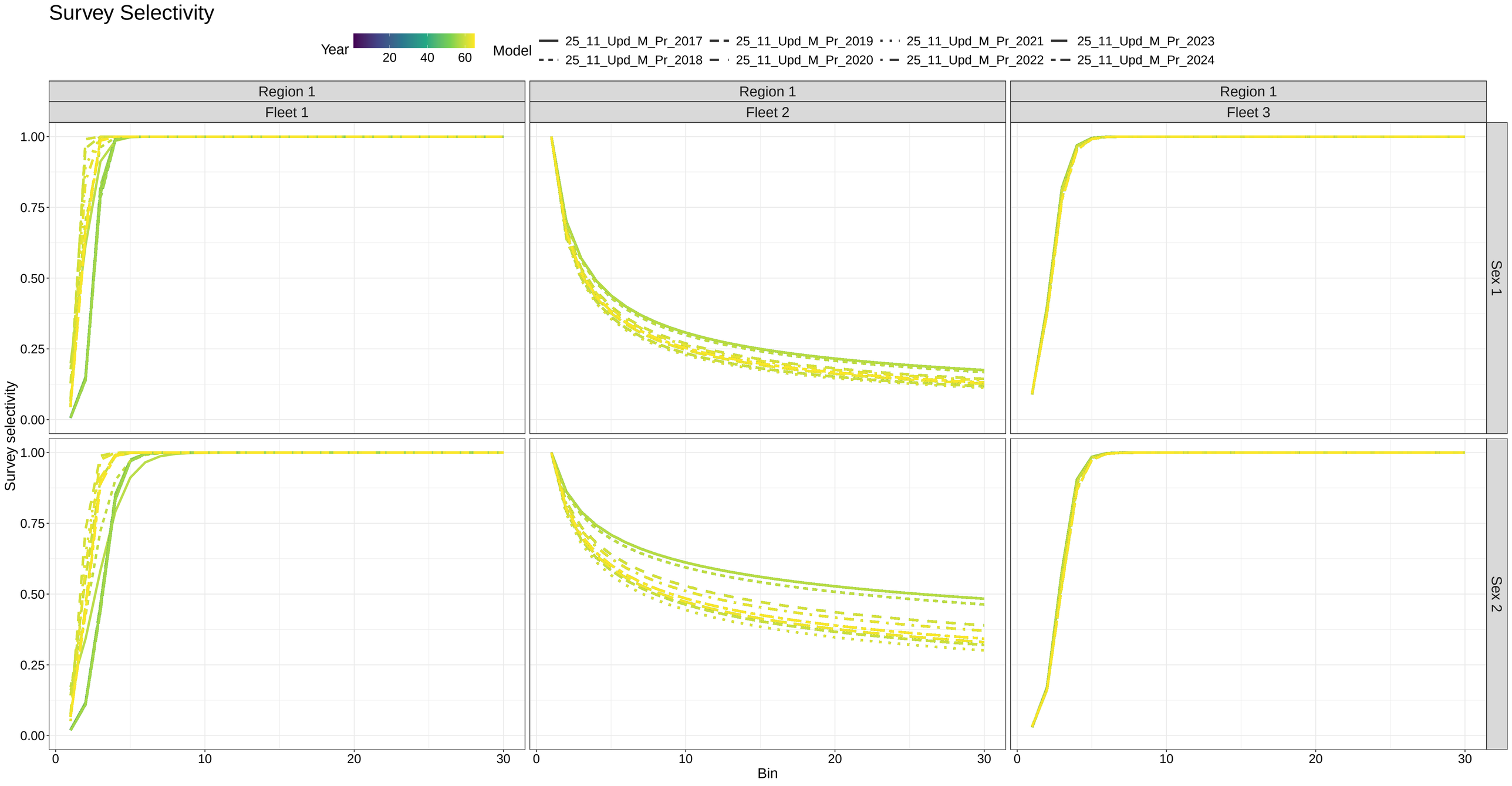
# Catch


Model
25_11_Upd_M_Pr_2017
25_11_Upd_M_Pr_2018
25_11_Upd_M_Pr_2019
25_11_Upd_M_Pr_2020
25_11_Upd_M_Pr_2021
25_11_Upd_M_Pr_2022
25_11_Upd_M_Pr_2023
25_11_Upd_M_Pr_2024
Region 1
Fleet 1
Fleet 2
Catch
Year
0
10
20
30
5
15
25
40
60

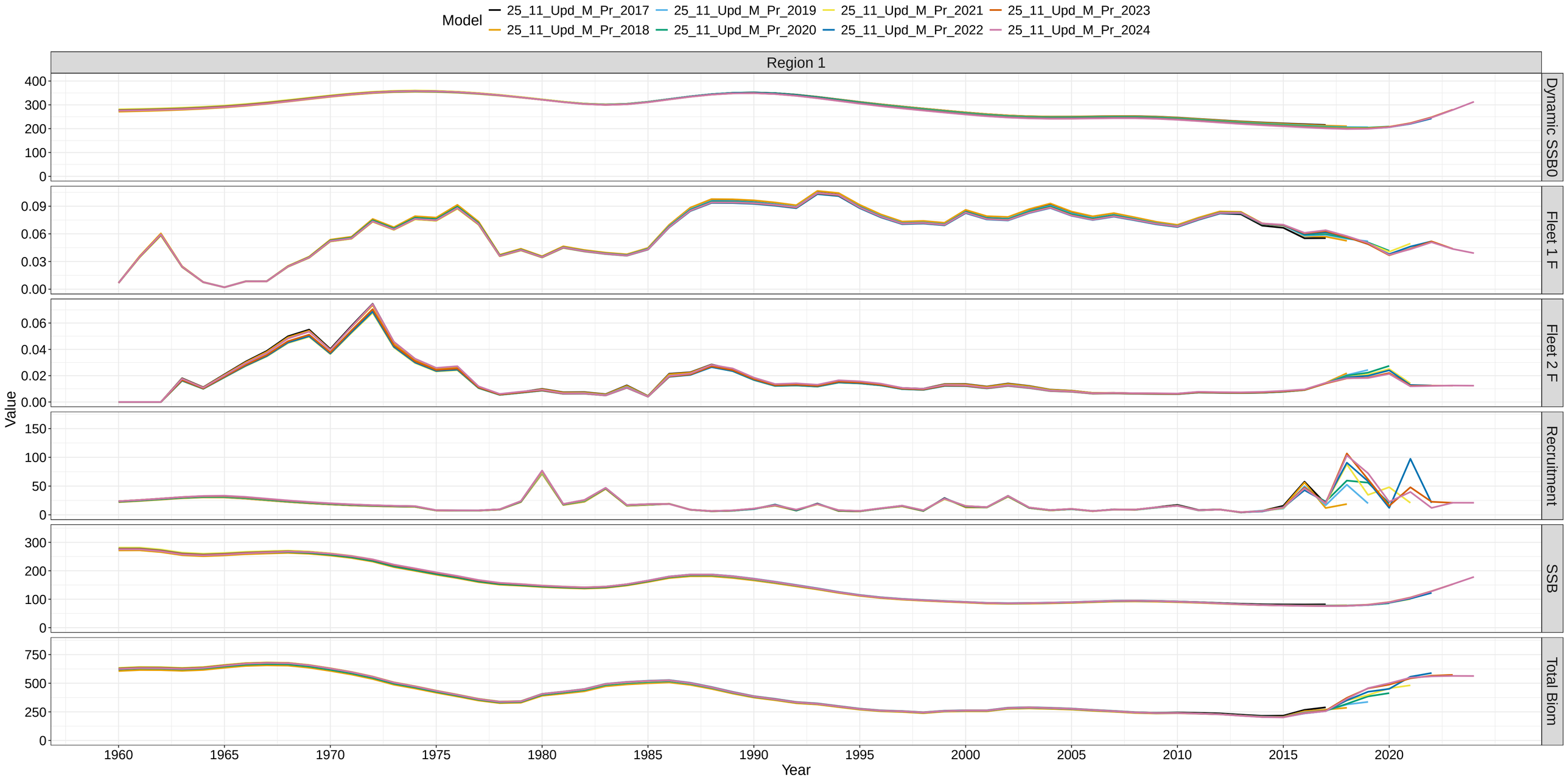
# Fishery Selectivity



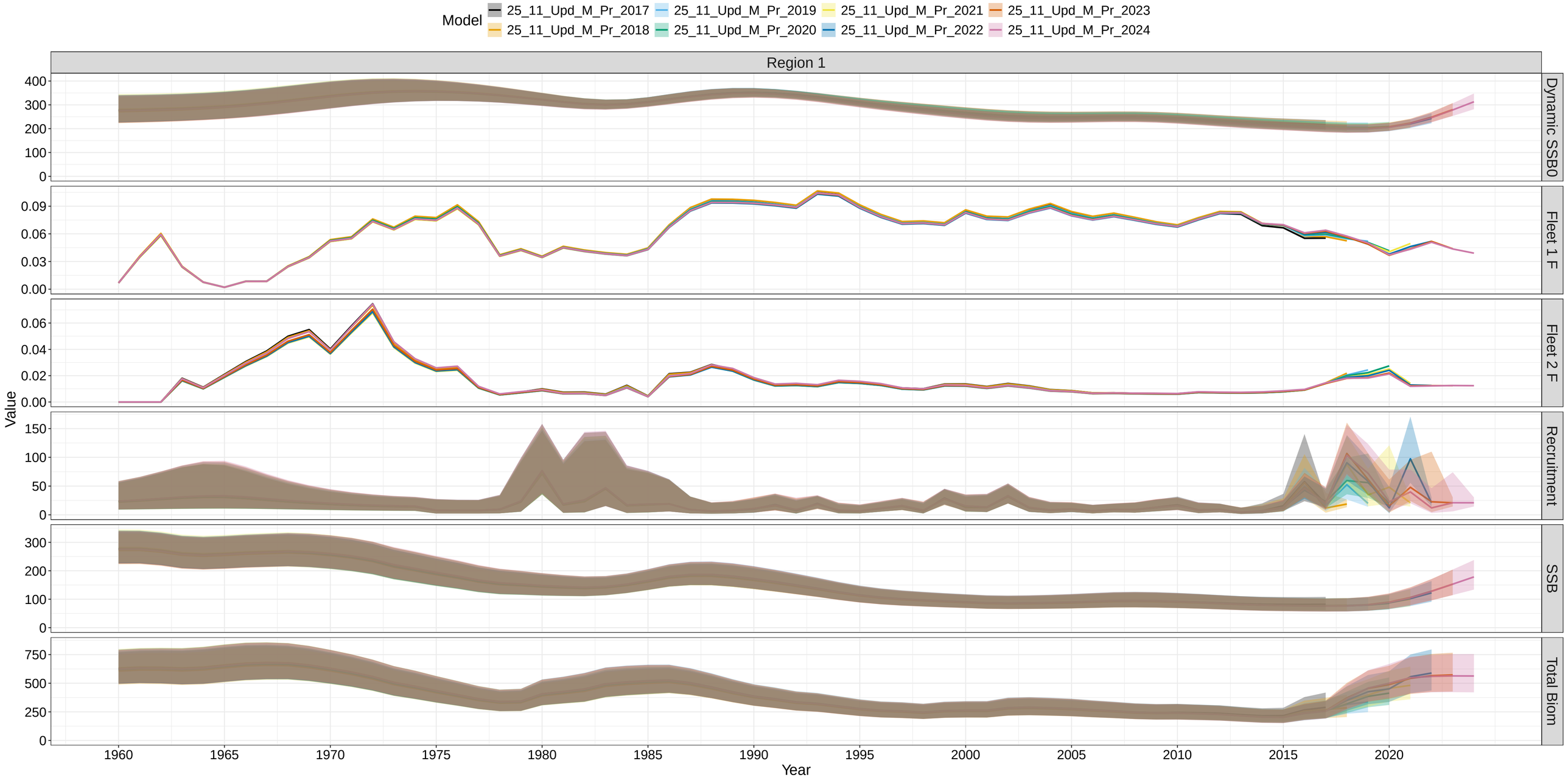
# Survey Selectivity

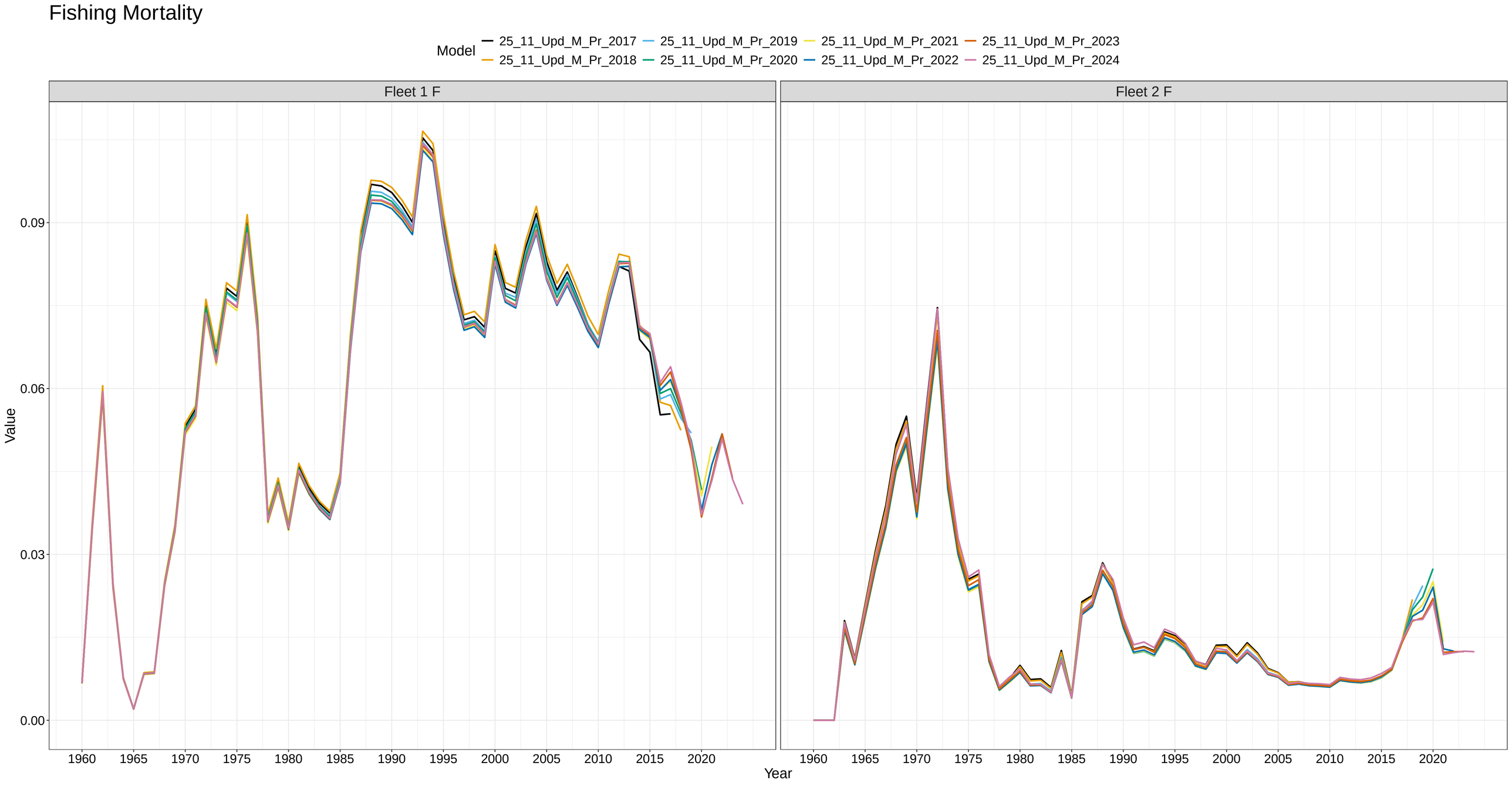


# Time Series Plots

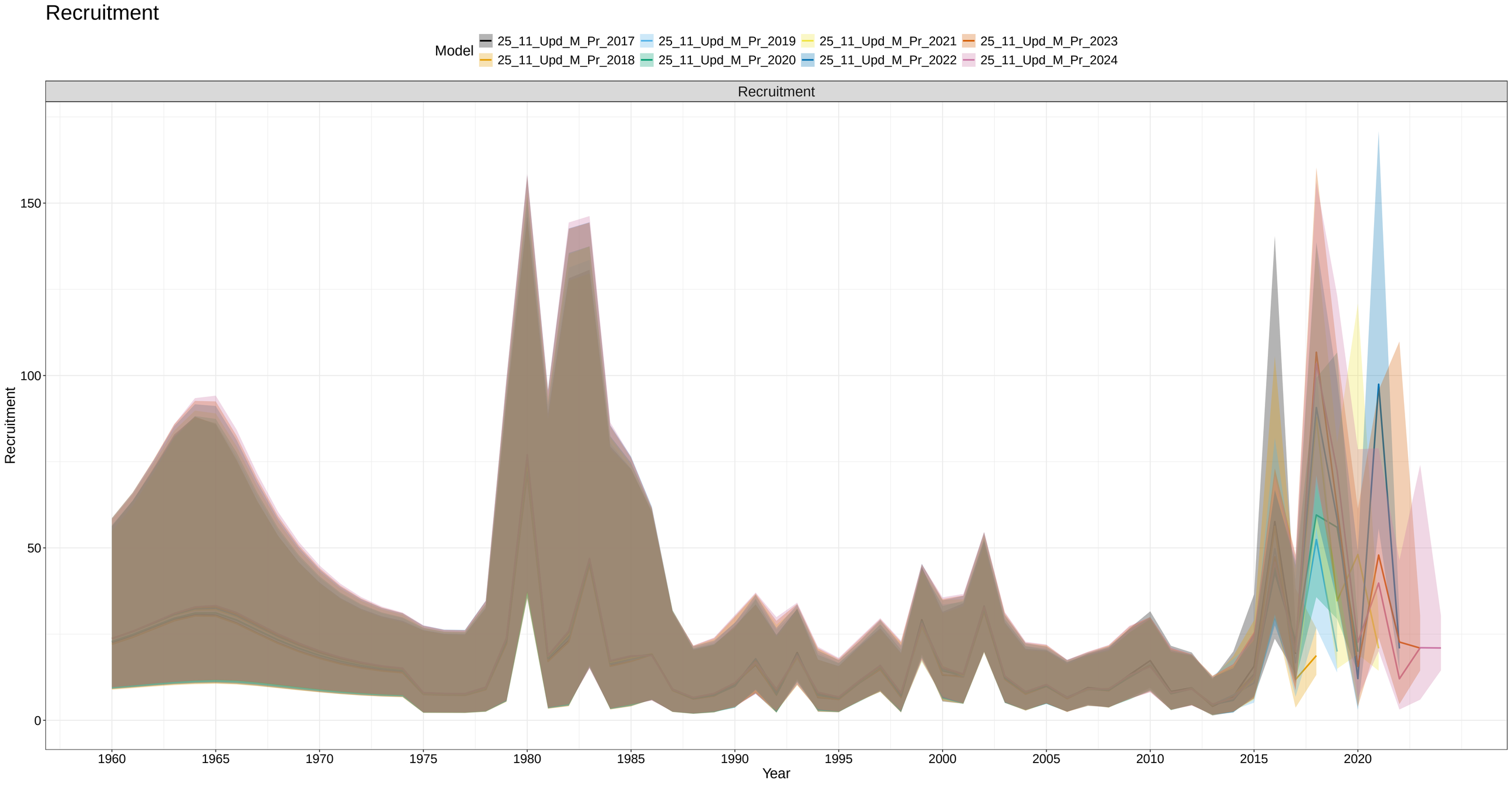


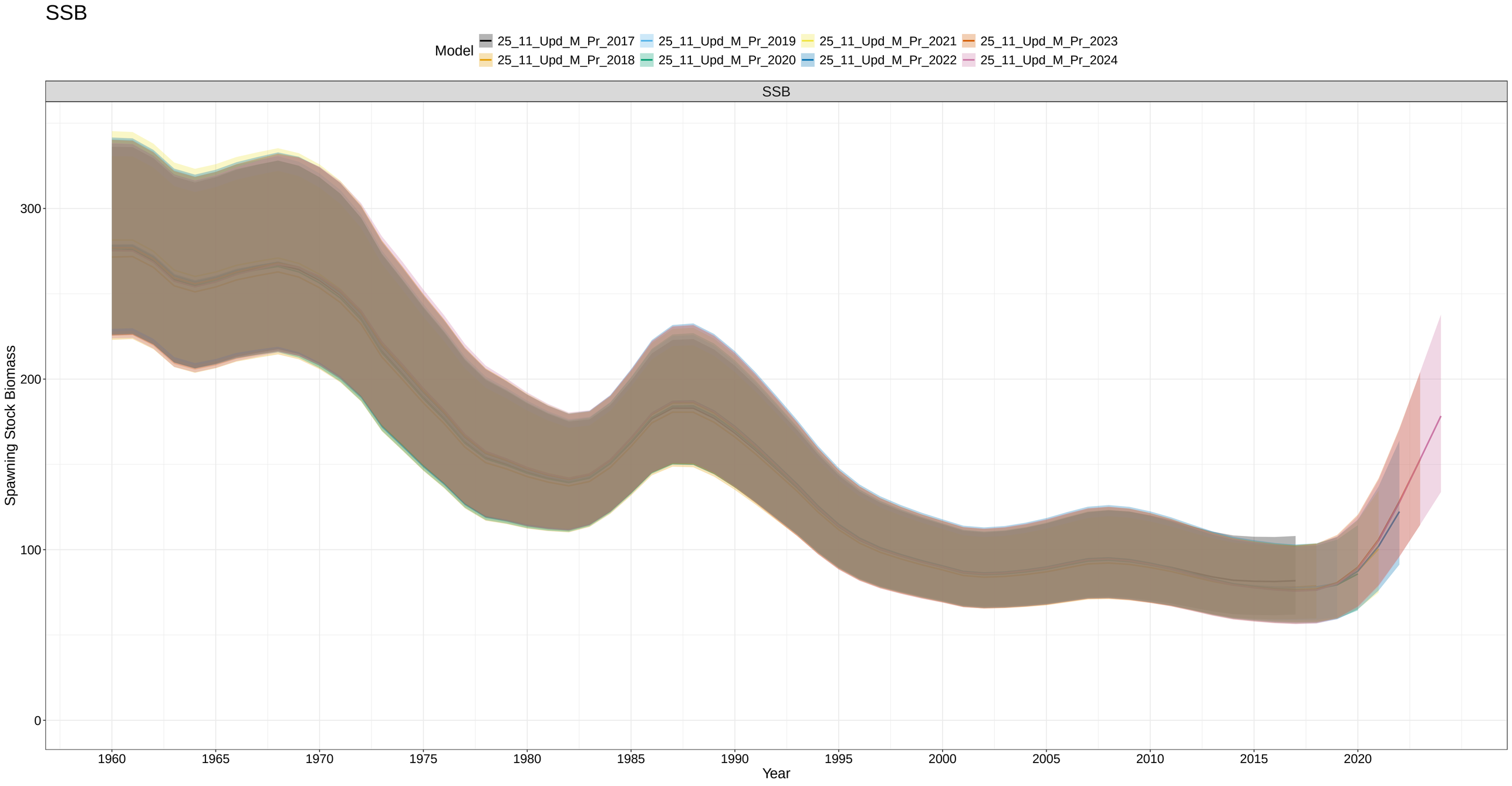
# Time Series Plots



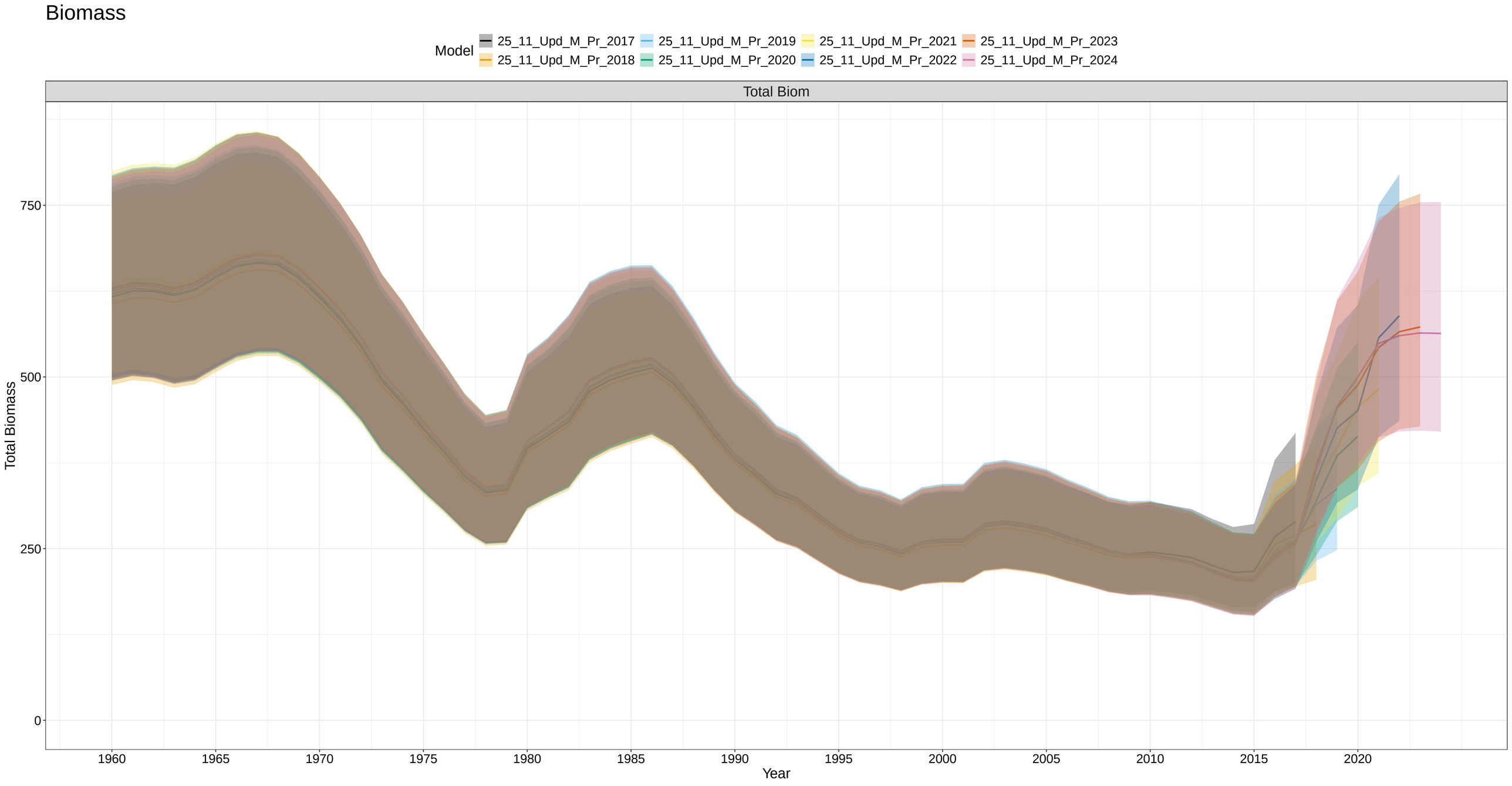

Fishing Mortality
Model
25_11_Upd_M_Pr_2017
25_11_Upd_M_Pr_2018
25_11_Upd_M_Pr_2019
25_11_Upd_M_Pr_2020
25_11_Upd_M_Pr_2021
25_11_Upd_M_Pr_2022
25_11_Upd_M_Pr_2023
25_11_Upd_M_Pr_2024
Fleet 1 F
Fleet 2 F
Value
0.00
0.03
0.06
0.09
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year

# Recruitment




SSB
Model
25_11_Upd_M_Pr_2017
25_11_Upd_M_Pr_2018
25_11_Upd_M_Pr_2019
25_11_Upd_M_Pr_2020
25_11_Upd_M_Pr_2021
25_11_Upd_M_Pr_2022
25_11_Upd_M_Pr_2023
25_11_Upd_M_Pr_2024
SSB
Spawning Stock Biomass
0
100
200
300
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year

# Biomass


Model
25_11_Upd_M_Pr_2017
25_11_Upd_M_Pr_2018
25_11_Upd_M_Pr_2019
25_11_Upd_M_Pr_2020
25_11_Upd_M_Pr_2021
25_11_Upd_M_Pr_2022
25_11_Upd_M_Pr_2023
25_11_Upd_M_Pr_2024
Total Biom
Total Biomass
0
250
500
750
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year