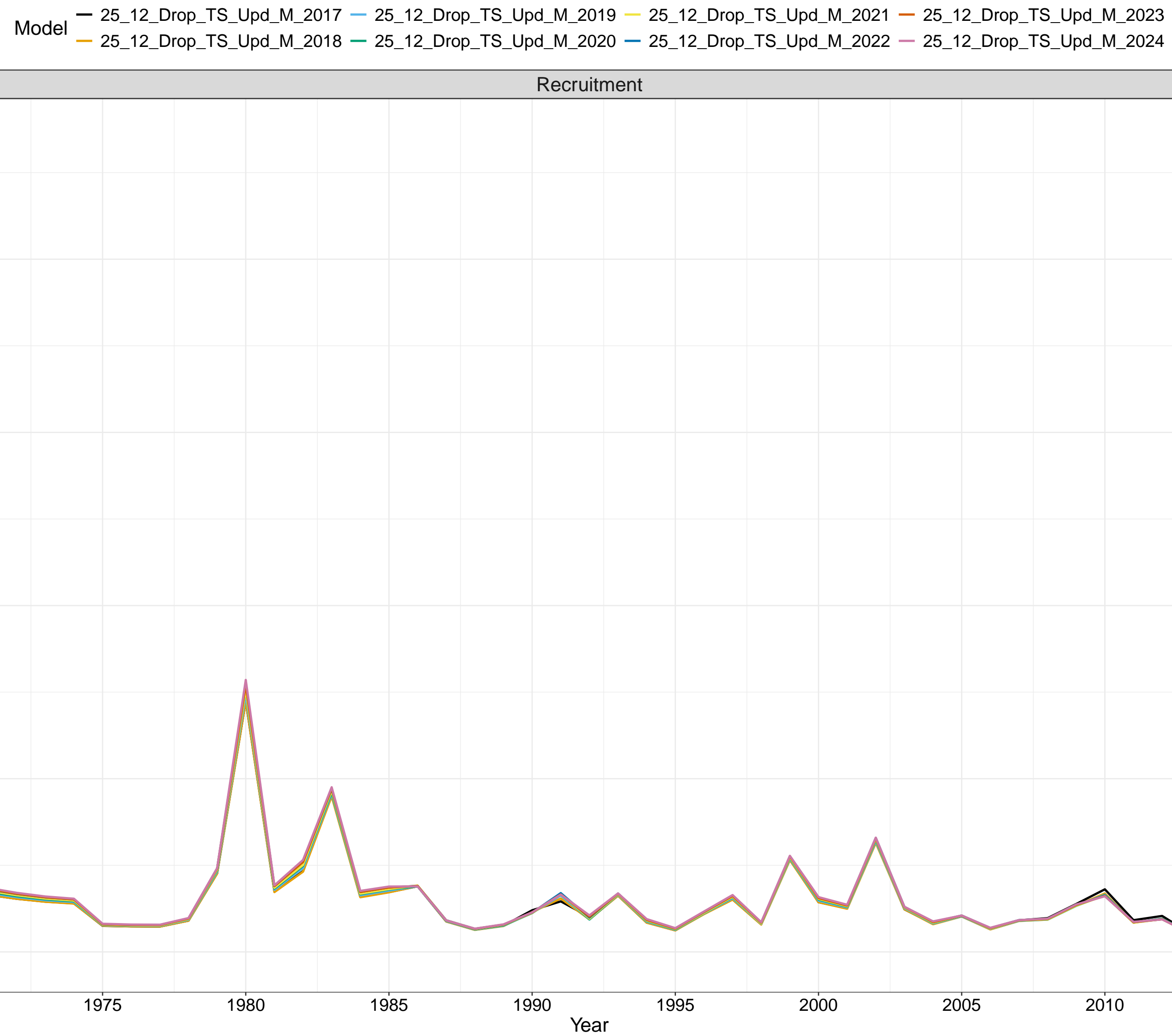


# Fishing Mortality

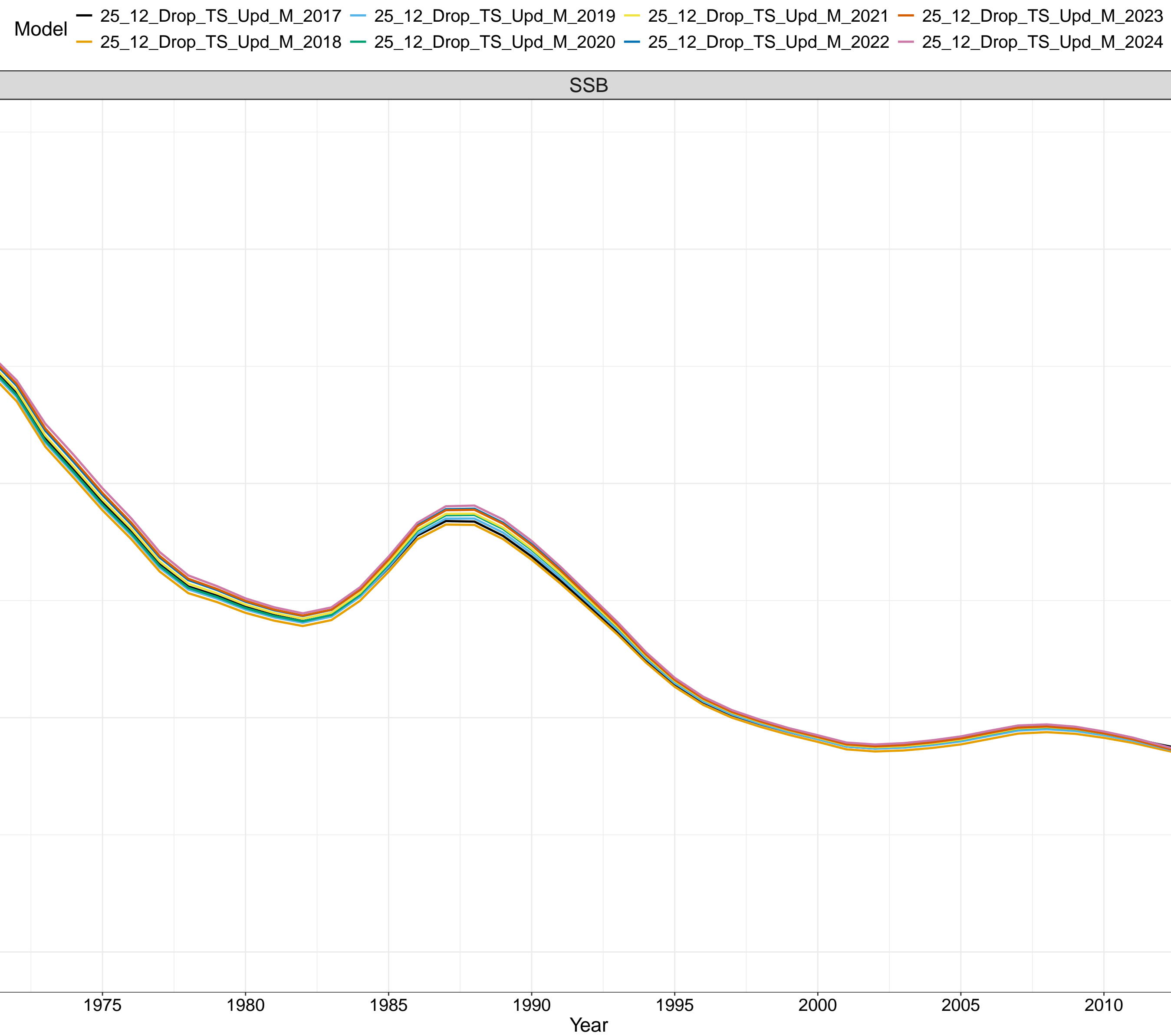
Model 25\_12\_Drop\_TS\_Upd\_M\_2017 25\_12\_Drop\_TS\_Upd\_M\_2019 25\_12\_Drop\_TS\_Upd\_M\_2021 25\_12\_Drop\_TS\_Upd\_M\_2023  
25\_12\_Drop\_TS\_Upd\_M\_2018 25\_12\_Drop\_TS\_Upd\_M\_2020 25\_12\_Drop\_TS\_Upd\_M\_2022 25\_12\_Drop\_TS\_Upd\_M\_2024



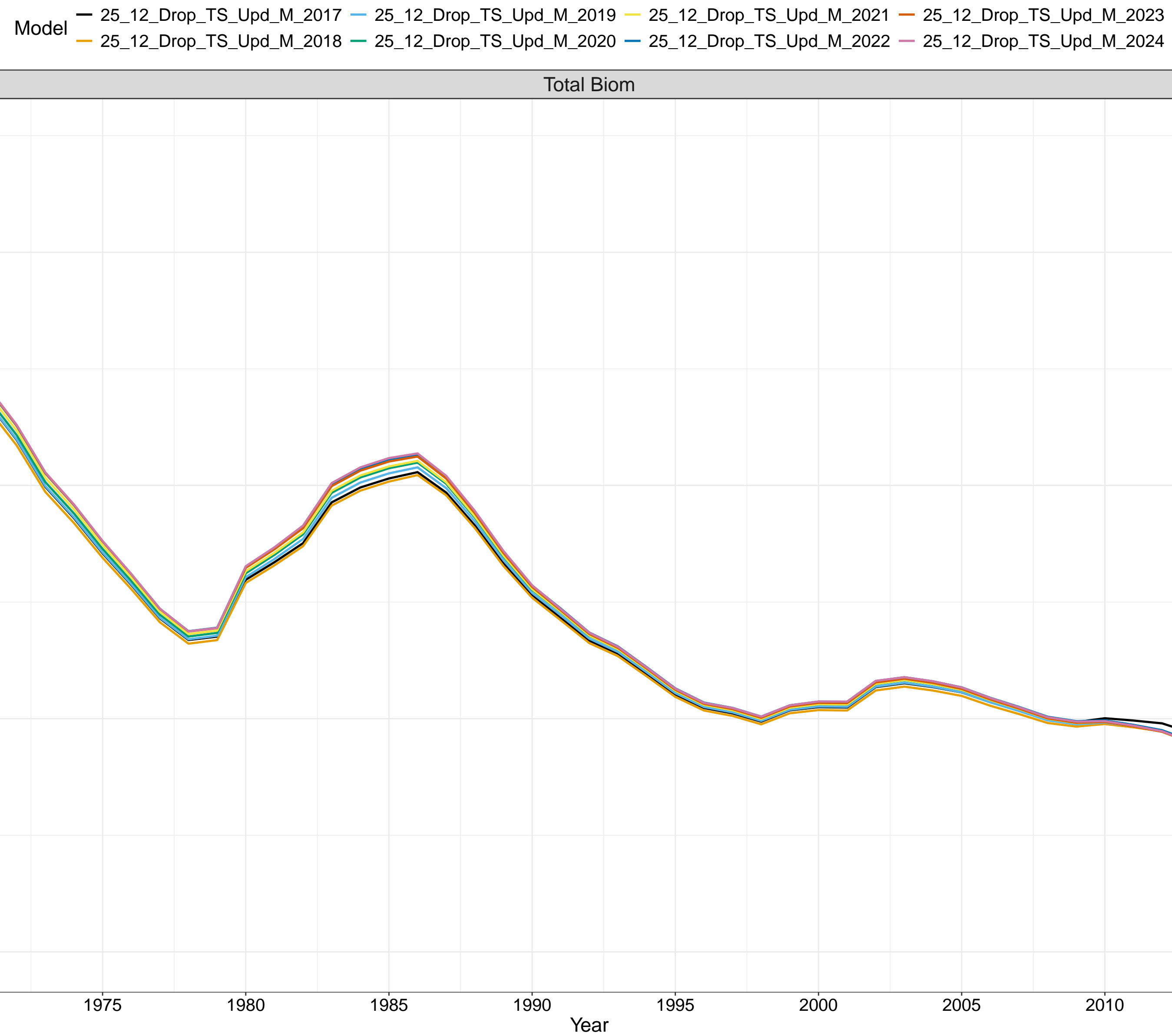
## Recruitment



## SSB



## Biomass



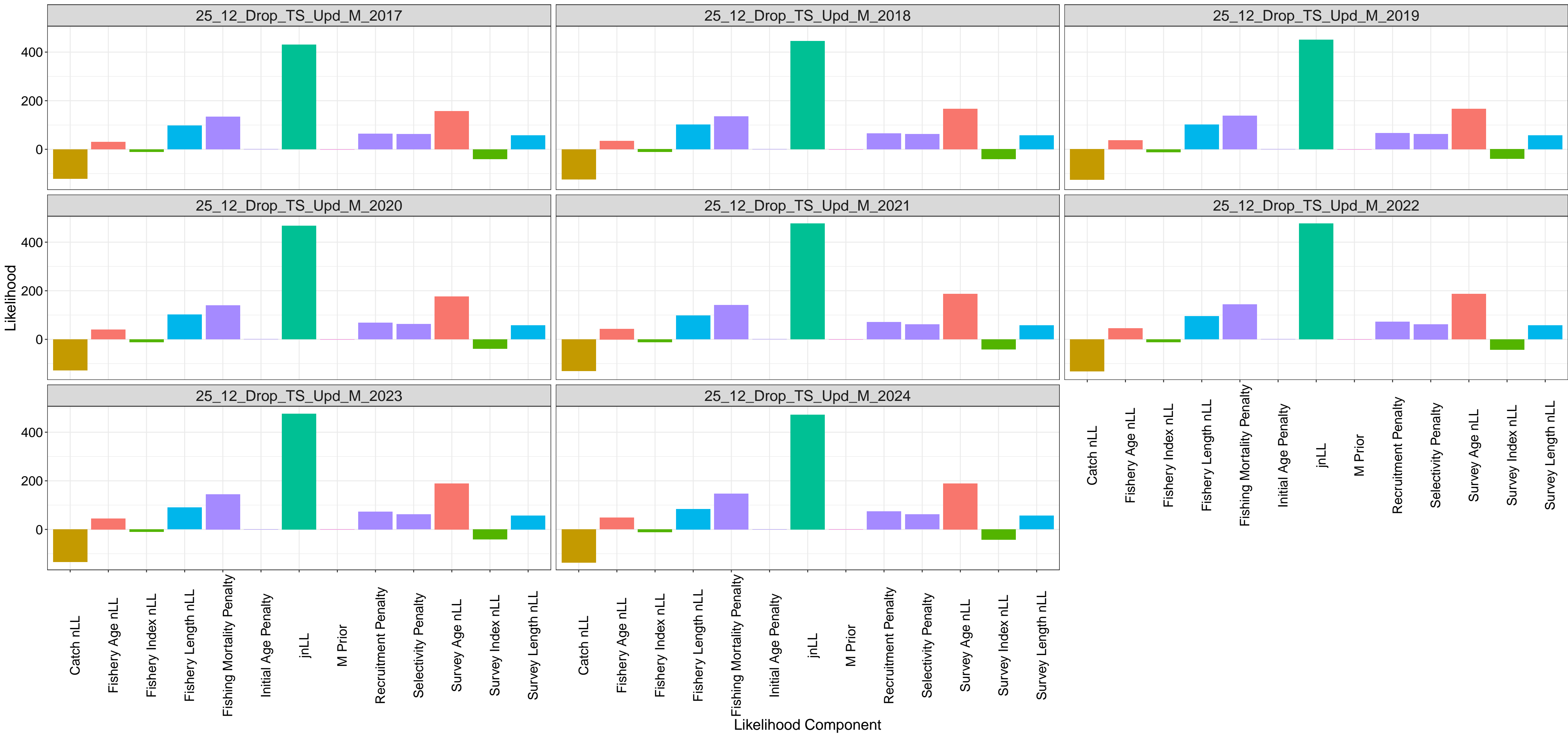
	Model	Region	Terminal_SSB	Terminal_F	Catch_Advice	B_Ref_Pt	F_Ref_Pt	B_over_B_Ref	F_over_F_Ref
1	25_12_Drop_TS_Upd_M_2024	1	194.09067	0.04842486	39.55329	126.6058	0.08308	1.53303	0.58289
2	25_12_Drop_TS_Upd_M_2023	1	165.86384	0.05359405	39.34904	126.0062	0.08124	1.31632	0.65966
3	25_12_Drop_TS_Upd_M_2022	1	131.38539	0.06317542	37.05519	121.1549	0.07981	1.08444	0.79158
4	25_12_Drop_TS_Upd_M_2021	1	107.87141	0.06150518	27.15267	119.3514	0.07933	0.90381	0.77534
5	25_12_Drop_TS_Upd_M_2020	1	93.60091	0.06559922	21.00304	116.3000	0.08132	0.80482	0.80667
6	25_12_Drop_TS_Upd_M_2019	1	85.14776	0.07390263	16.37874	106.2864	0.08019	0.80112	0.92155
7	25_12_Drop_TS_Upd_M_2018	1	82.60555	0.07256886	13.32857	107.1168	0.07956	0.77117	0.91211
8	25_12_Drop_TS_Upd_M_2017	1	86.48767	0.06802310	14.78216	103.0249	0.08202	0.83948	0.82932

	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_12_Drop_TS_Upd_M_2024	471.8339	−0.2370537	74.67764	61.83381	−136.2188	146.9955	−42.64644	−10.954655	0.2847093	189.5774	48.50805	56.40044	83.61323
2	25_12_Drop_TS_Upd_M_2023	475.8554	−0.3544518	73.63665	62.01749	−134.0617	145.0308	−41.69439	−10.787402	0.2755116	189.6251	45.43871	56.71314	90.01600
3	25_12_Drop_TS_Upd_M_2022	476.1479	−0.3691474	72.77150	62.14908	−131.9239	143.1337	−42.58062	−11.477793	0.2645023	187.3405	44.86995	56.88006	95.09015
4	25_12_Drop_TS_Upd_M_2021	476.1050	−0.5543299	70.34745	62.21956	−129.7675	141.3065	−40.94114	−11.365132	0.2510809	186.7517	43.19656	57.12242	97.53785
5	25_12_Drop_TS_Upd_M_2020	467.4028	−0.6592102	68.45472	62.33496	−127.6254	139.5403	−38.97161	−11.104741	0.2403626	175.7728	39.68757	57.30432	102.42881
6	25_12_Drop_TS_Upd_M_2019	451.4349	−0.7810796	66.17869	62.30441	−125.4707	137.5548	−39.43353	−11.599632	0.2402909	166.9837	36.71785	57.30286	101.43729
7	25_12_Drop_TS_Upd_M_2018	445.9860	−0.9401511	64.91897	62.20371	−123.3049	135.6149	−40.55962	−10.956438	0.2352407	166.0768	33.90628	57.39850	101.39272
8	25_12_Drop_TS_Upd_M_2017	430.3378	−0.9133087	63.57397	62.10184	−121.1782	133.7709	−40.17086	−9.851065	0.2538518	157.6857	30.52299	57.00804	97.53398

# Negative Log-Likelihood

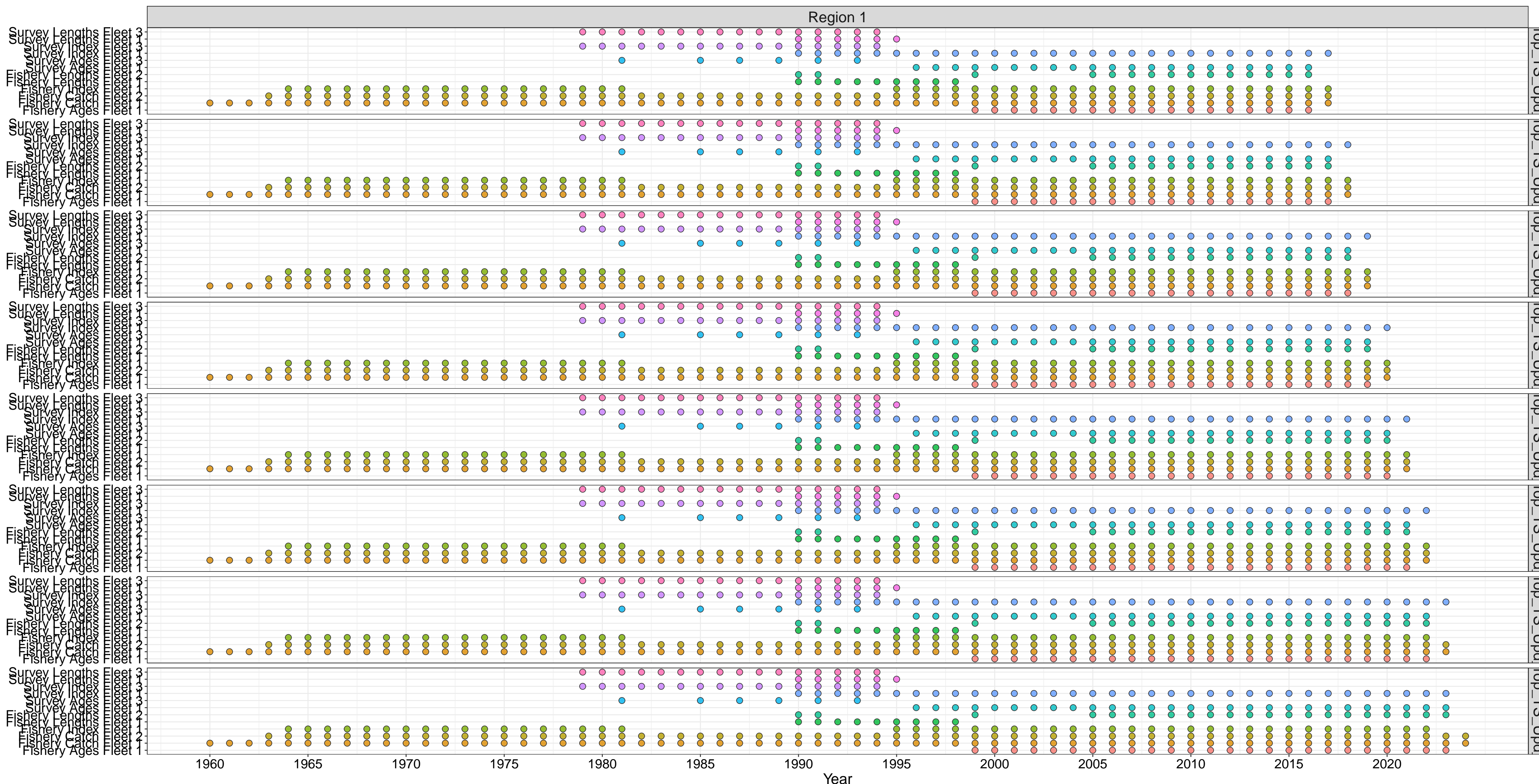
Type

Age	Index	Length	Prior
Catch	jnLL	Penalty	



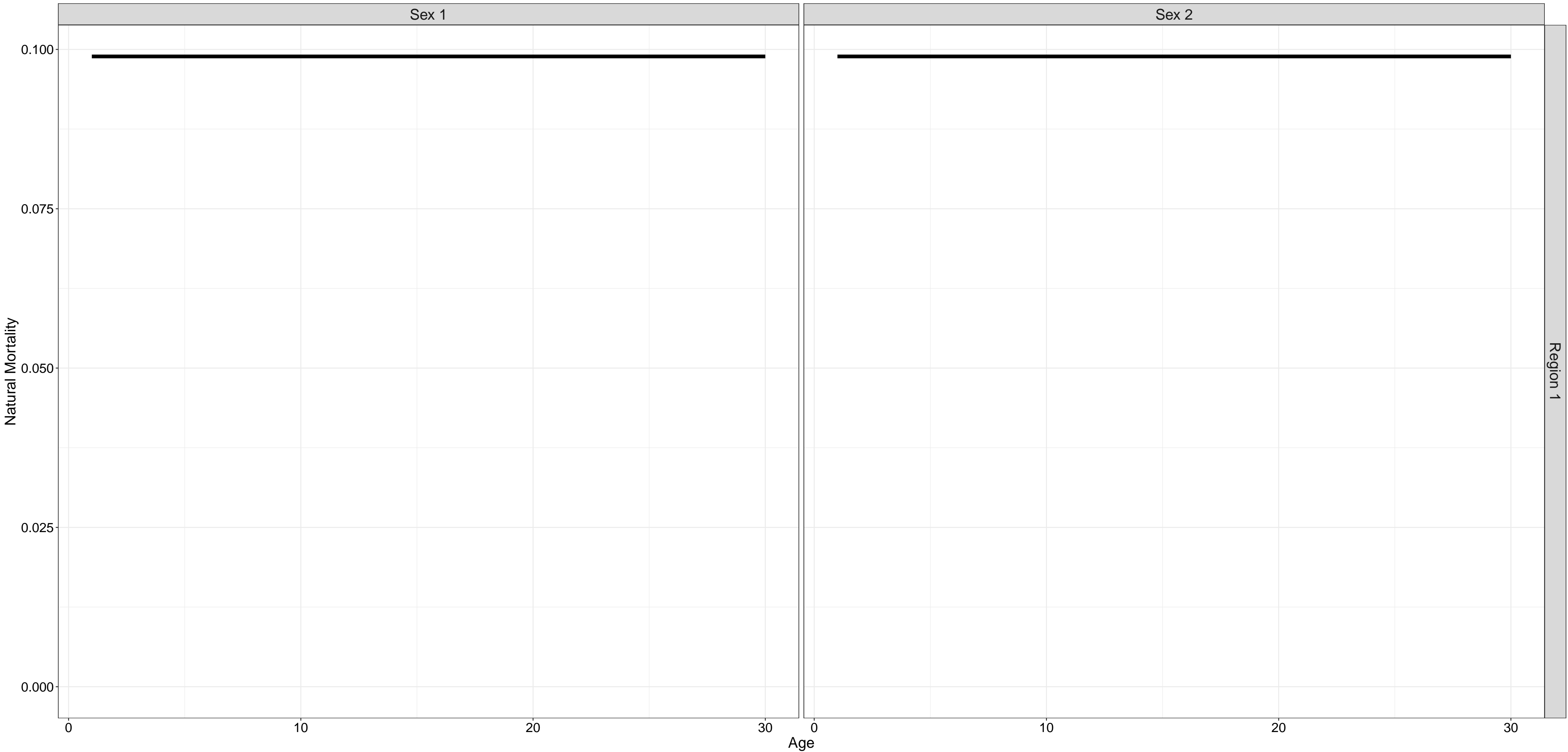


Data



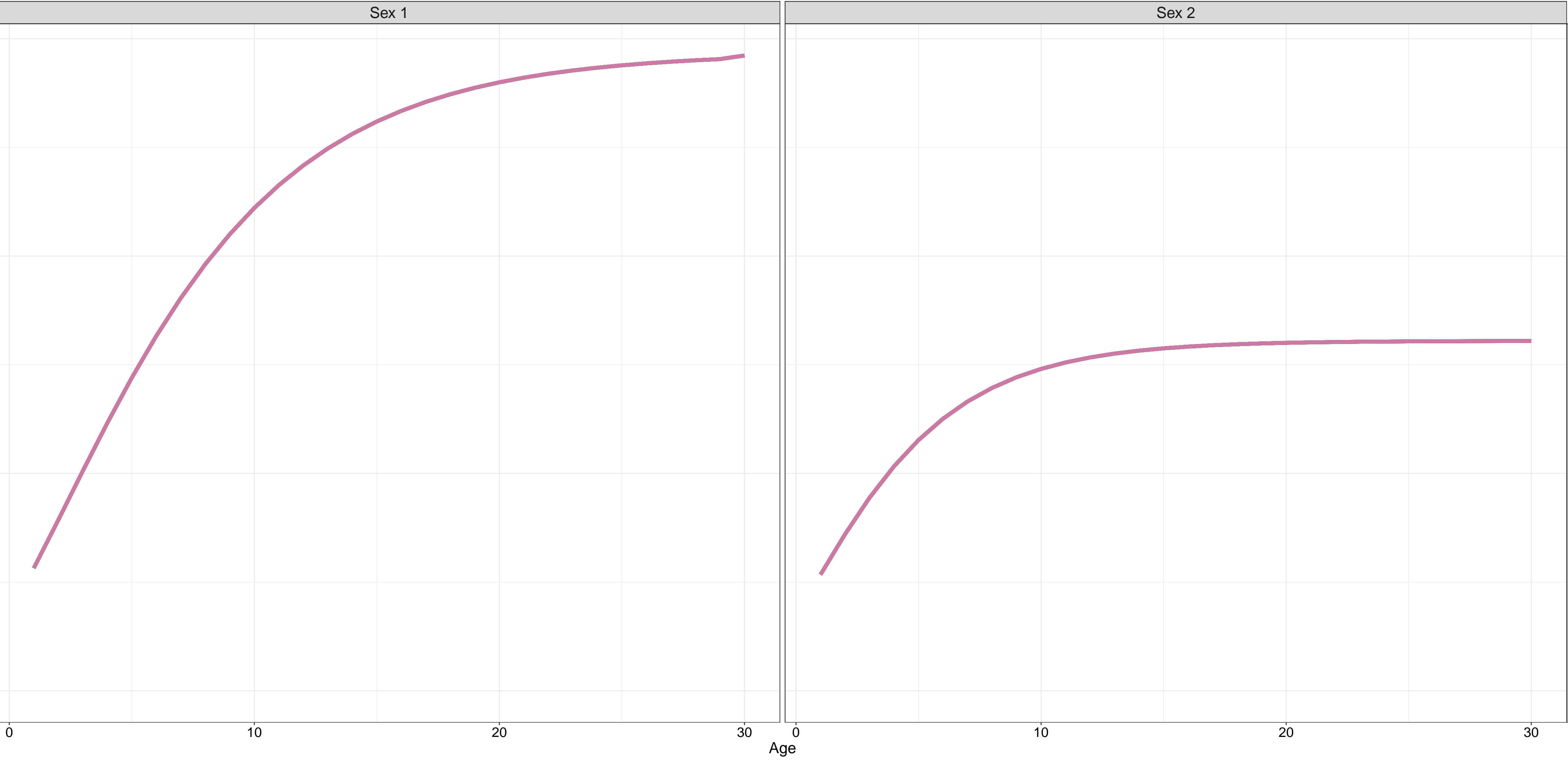
# Natural Mortality

Model 25\_12\_Drop\_TS\_Upd\_M\_2024



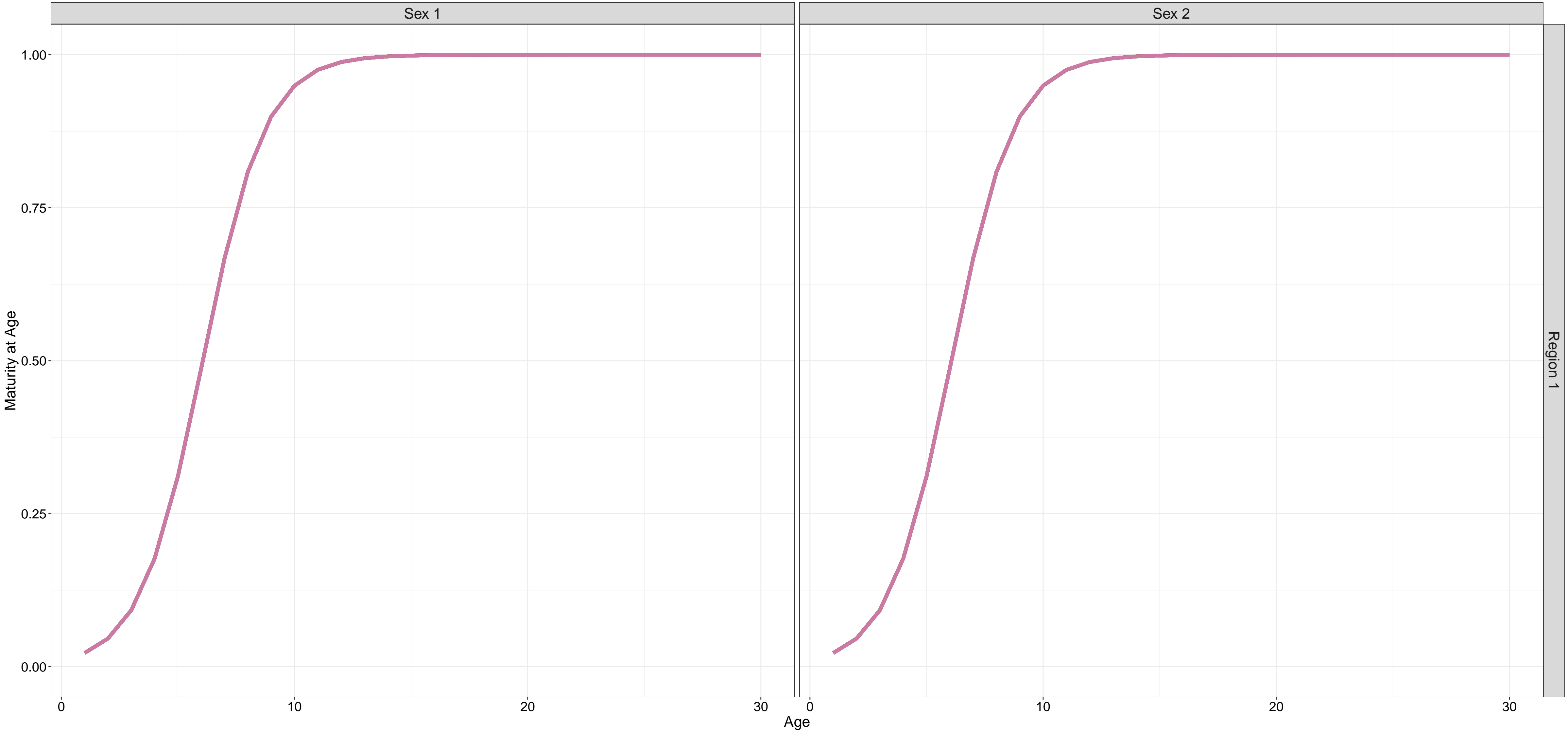
# Weight-at-Age

Model 25\_12\_Drop\_TS\_Upd\_M\_2017 25\_12\_Drop\_TS\_Upd\_M\_2019 25\_12\_Drop\_TS\_Upd\_M\_2021 25\_12\_Drop\_TS\_Upd\_M\_2023  
25\_12\_Drop\_TS\_Upd\_M\_2018 25\_12\_Drop\_TS\_Upd\_M\_2020 25\_12\_Drop\_TS\_Upd\_M\_2022 25\_12\_Drop\_TS\_Upd\_M\_2024



Maturity

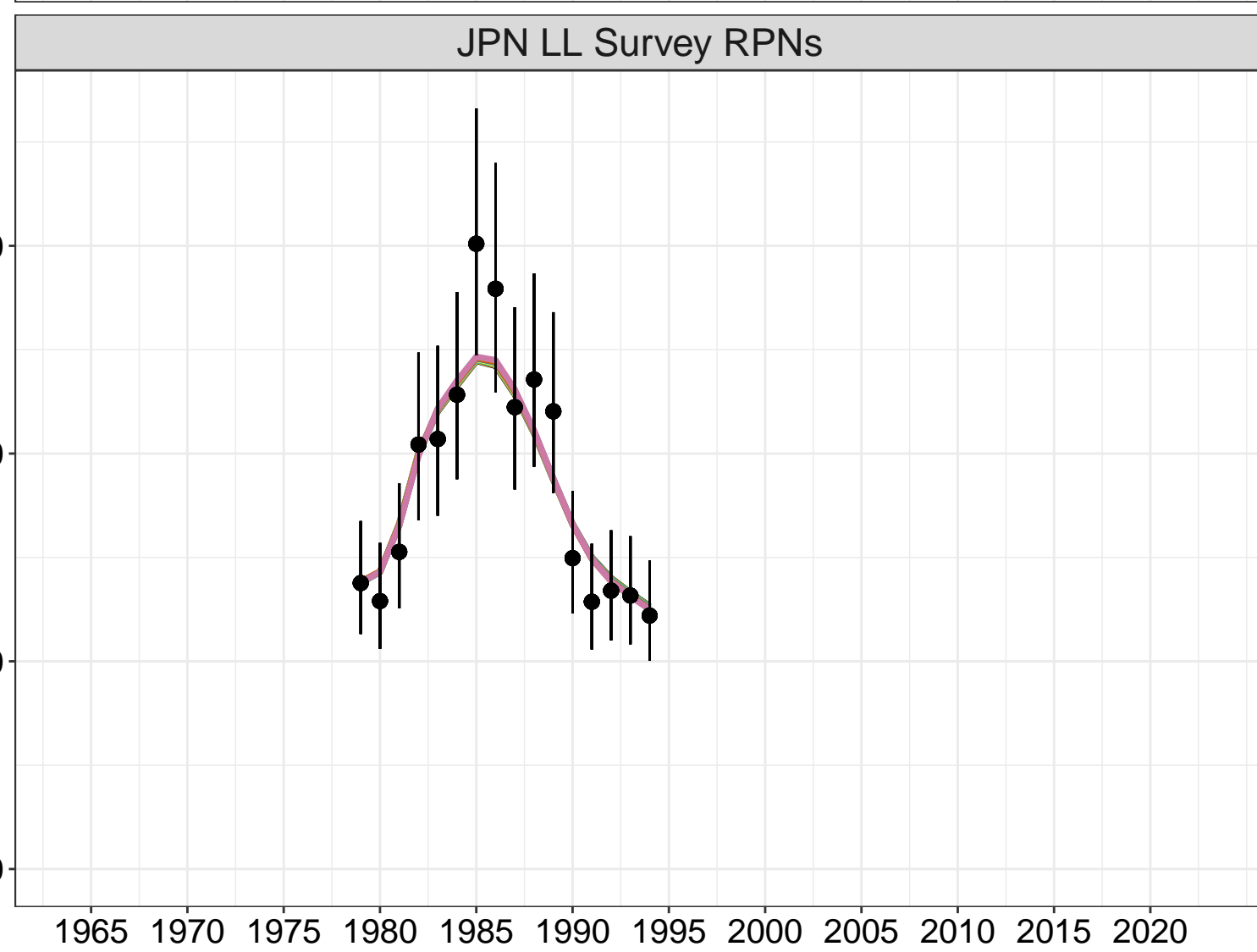
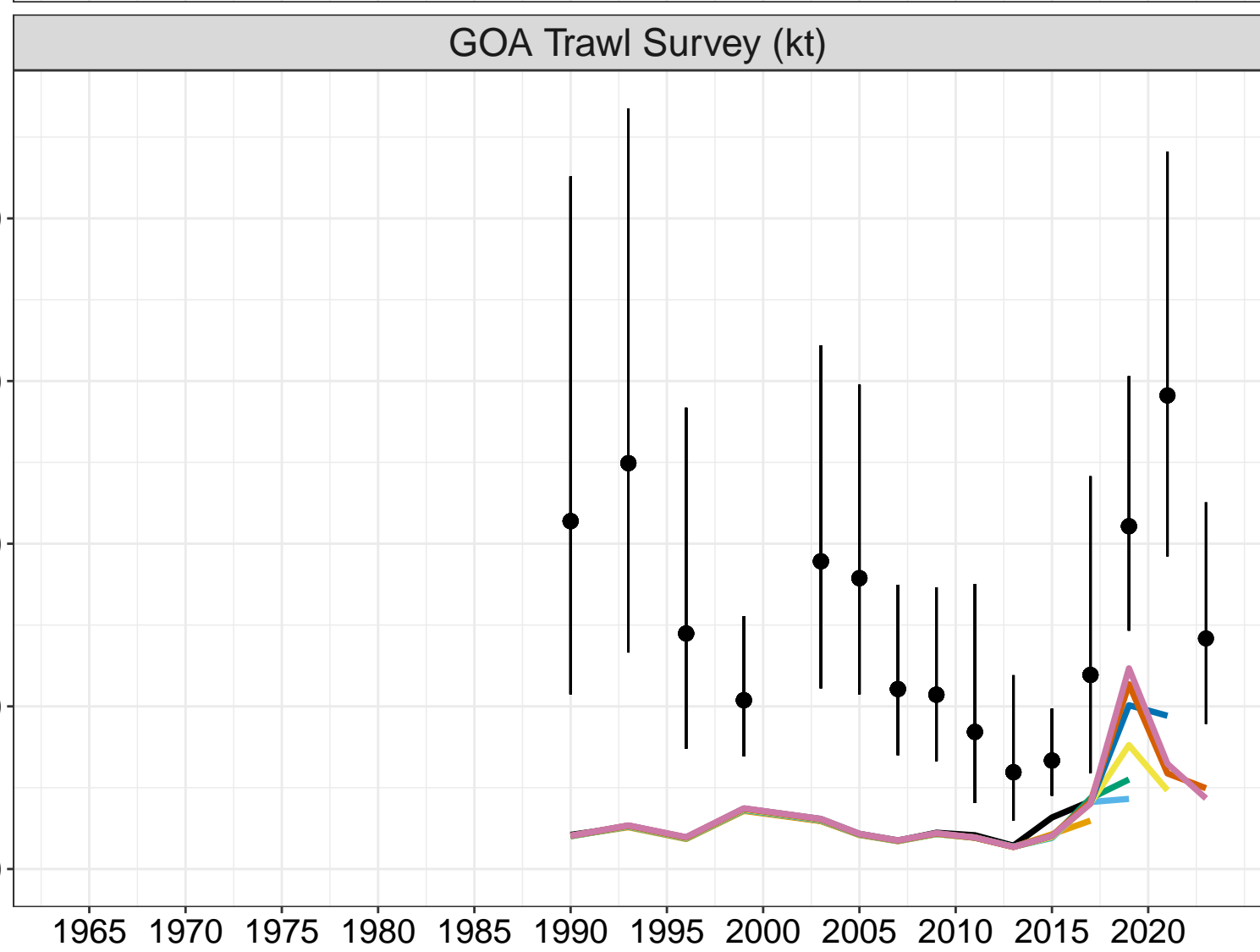
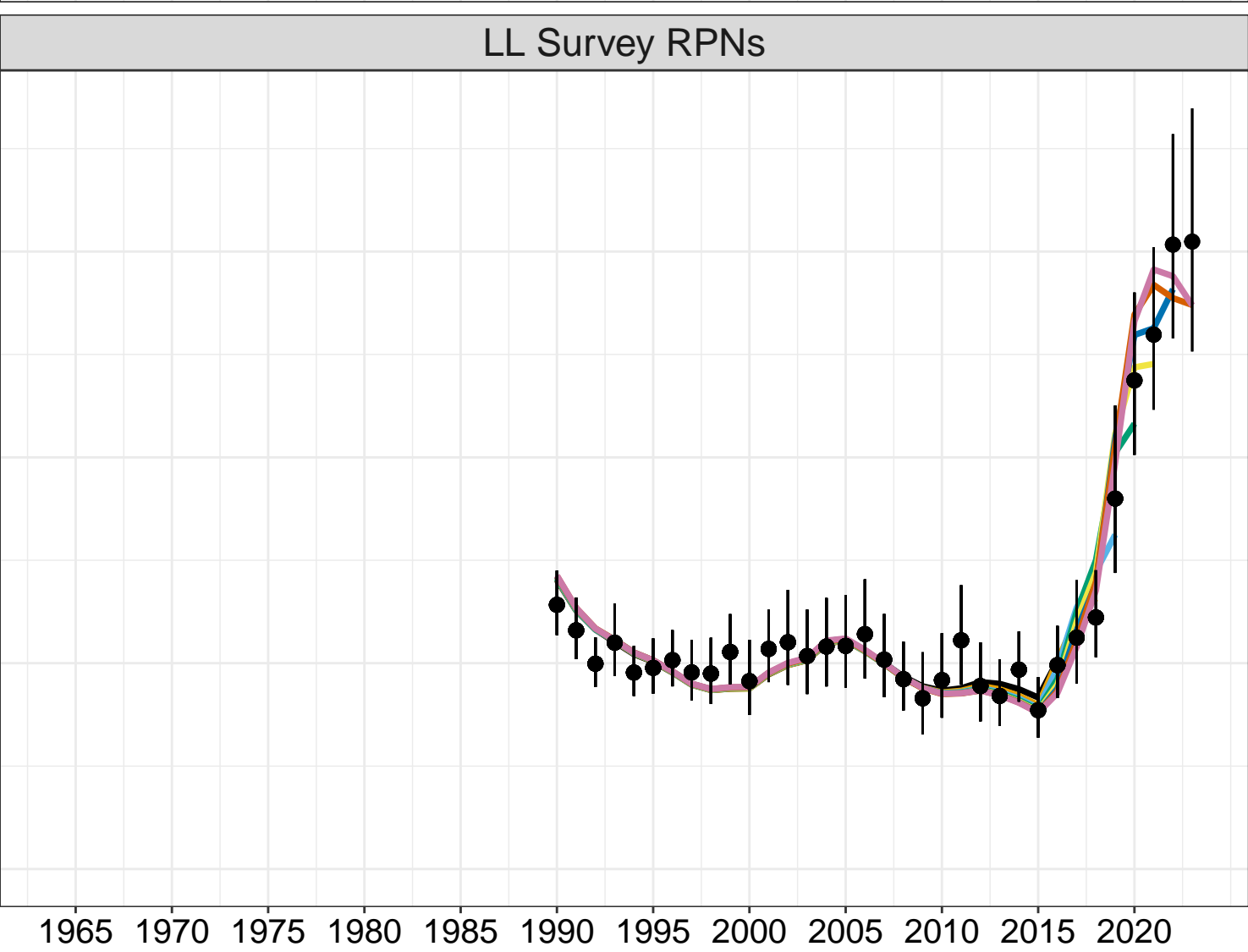
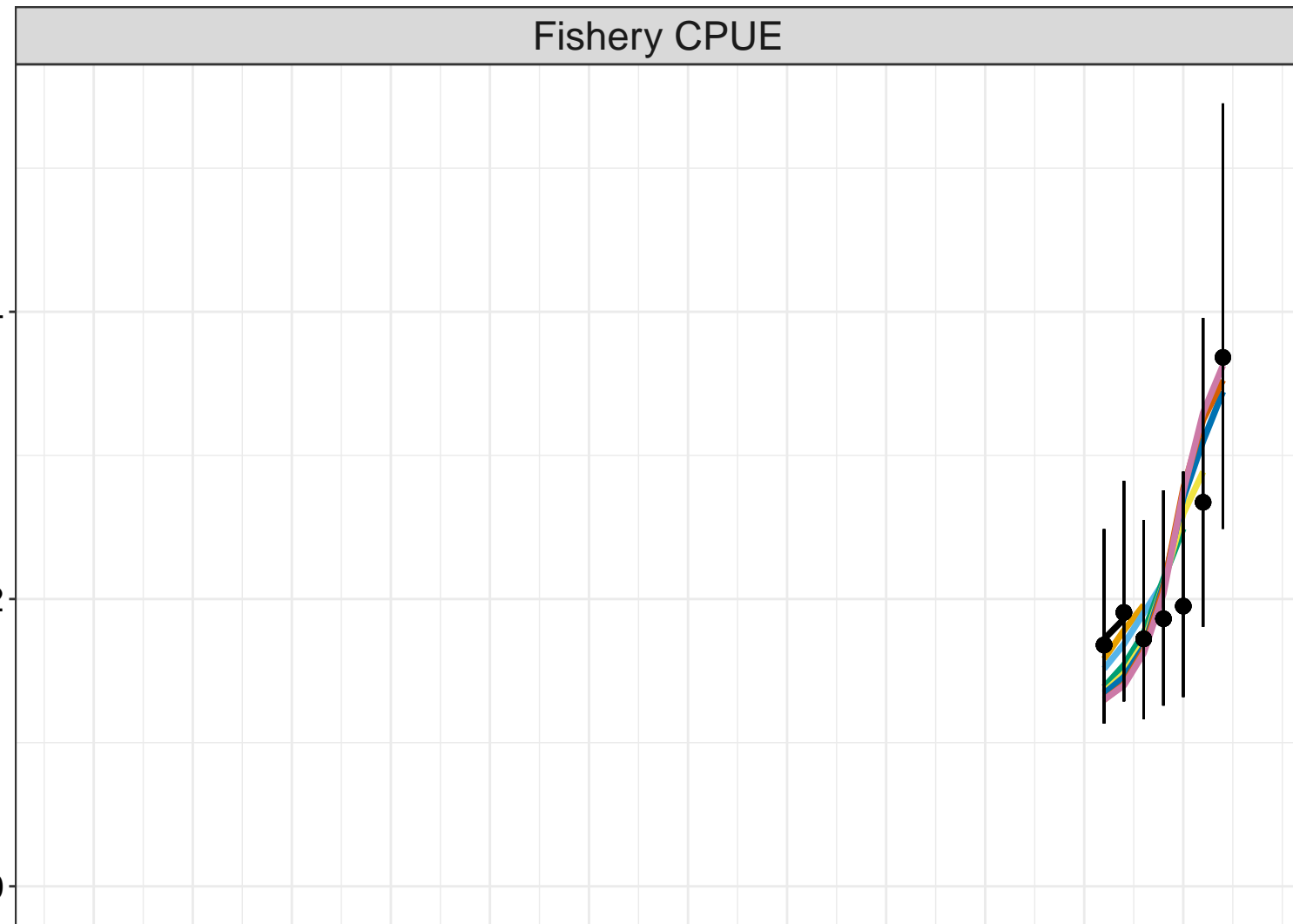
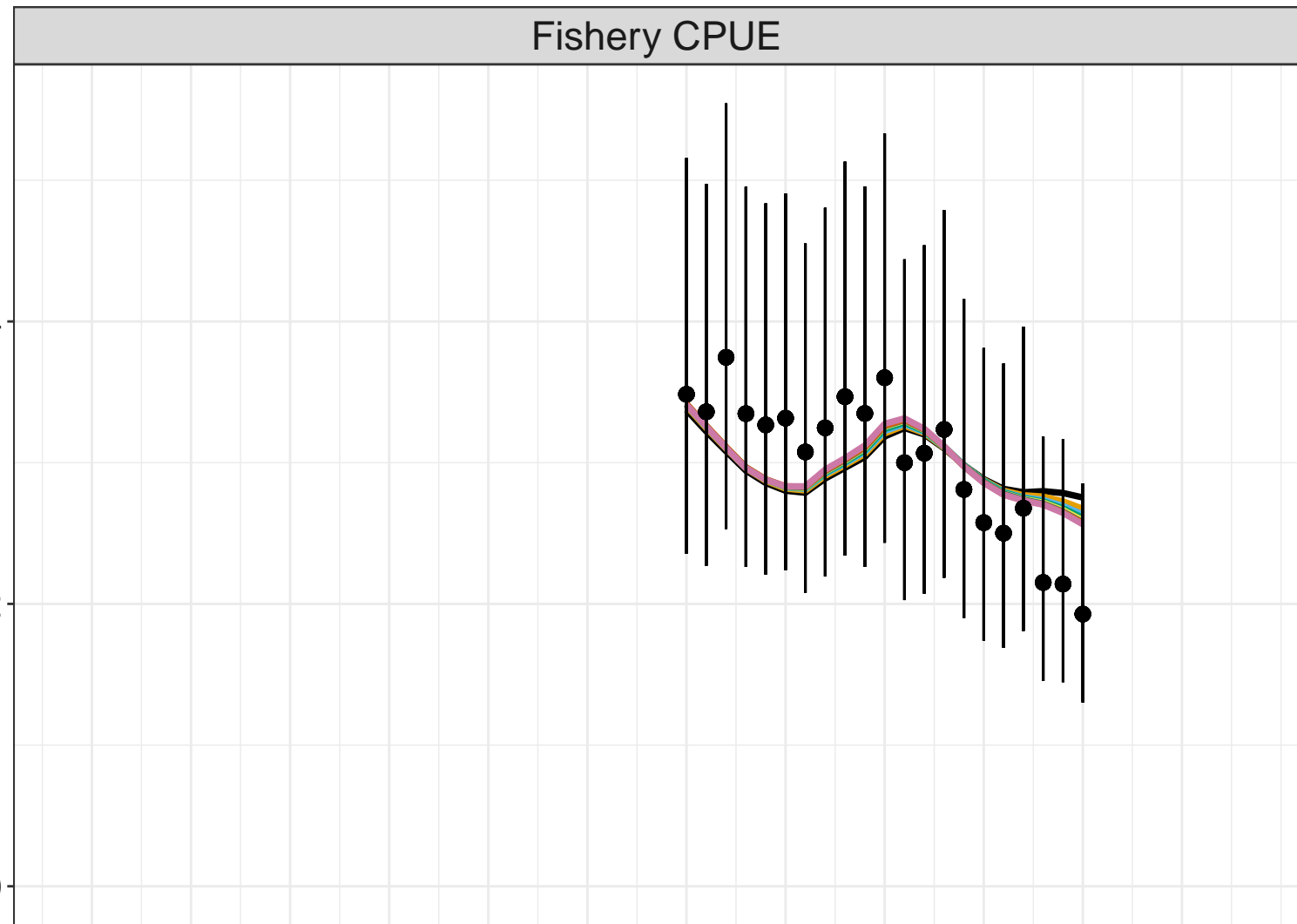
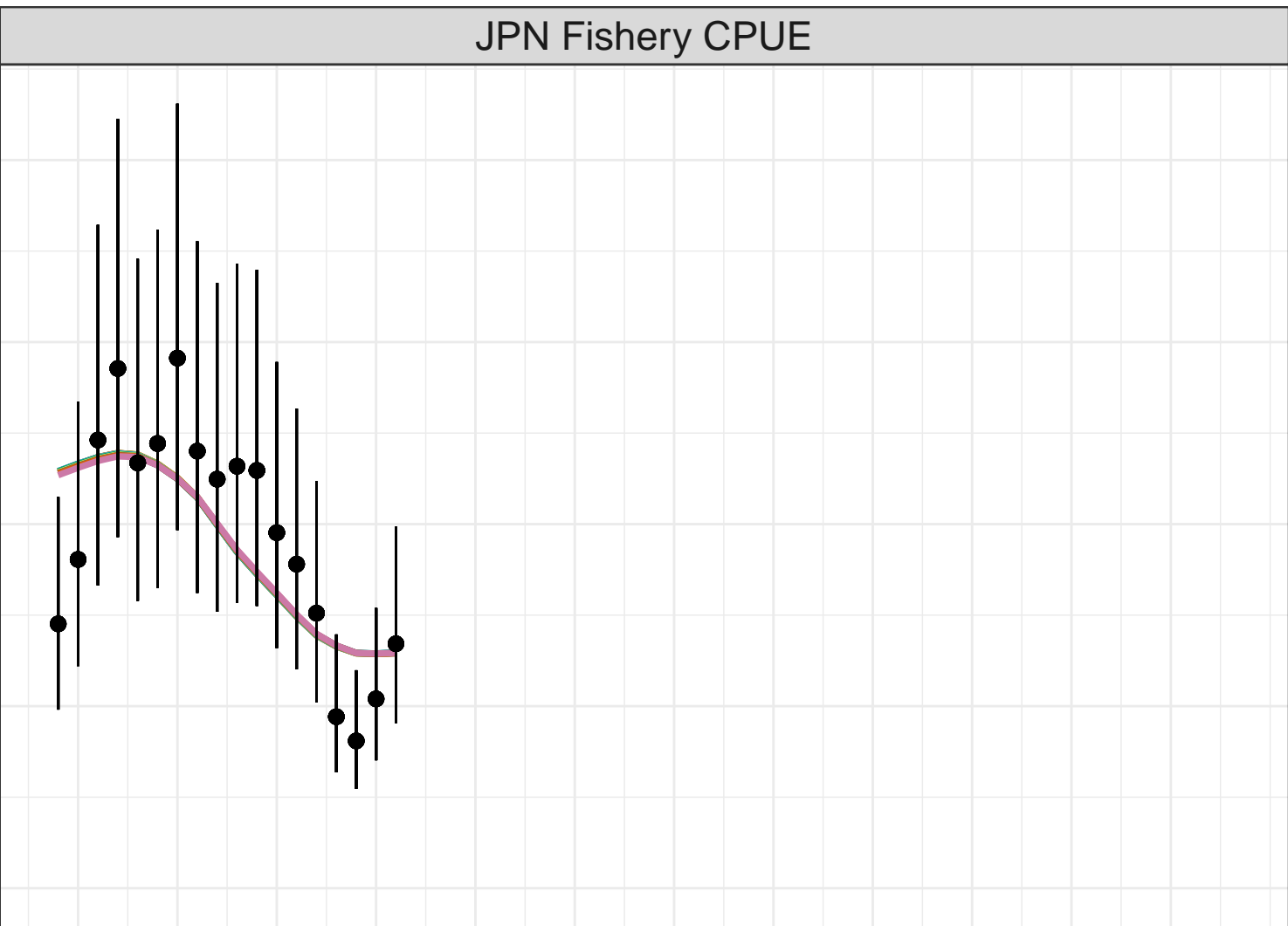
Model 25\_12\_Drop\_TS\_Upd\_M\_2017 25\_12\_Drop\_TS\_Upd\_M\_2019 25\_12\_Drop\_TS\_Upd\_M\_2021 25\_12\_Drop\_TS\_Upd\_M\_2023  
25\_12\_Drop\_TS\_Upd\_M\_2018 25\_12\_Drop\_TS\_Upd\_M\_2020 25\_12\_Drop\_TS\_Upd\_M\_2022 25\_12\_Drop\_TS\_Upd\_M\_2024



Index Fits

Model 25\_12\_Drop\_TS\_Upd\_M\_2017 25\_12\_Drop\_TS\_Upd\_M\_2019 25\_12\_Drop\_TS\_Upd\_M\_2021 25\_12\_Drop\_TS\_Upd\_M\_2023  
25\_12\_Drop\_TS\_Upd\_M\_2018 25\_12\_Drop\_TS\_Upd\_M\_2020 25\_12\_Drop\_TS\_Upd\_M\_2022 25\_12\_Drop\_TS\_Upd\_M\_2024

Index



Year

Catch

- Model
- 25\_12\_Drop\_TS\_Upd\_M\_2017

25\_12\_Drop\_TS\_Upd\_M\_2019

25\_12\_Drop\_TS\_Upd\_M\_2021

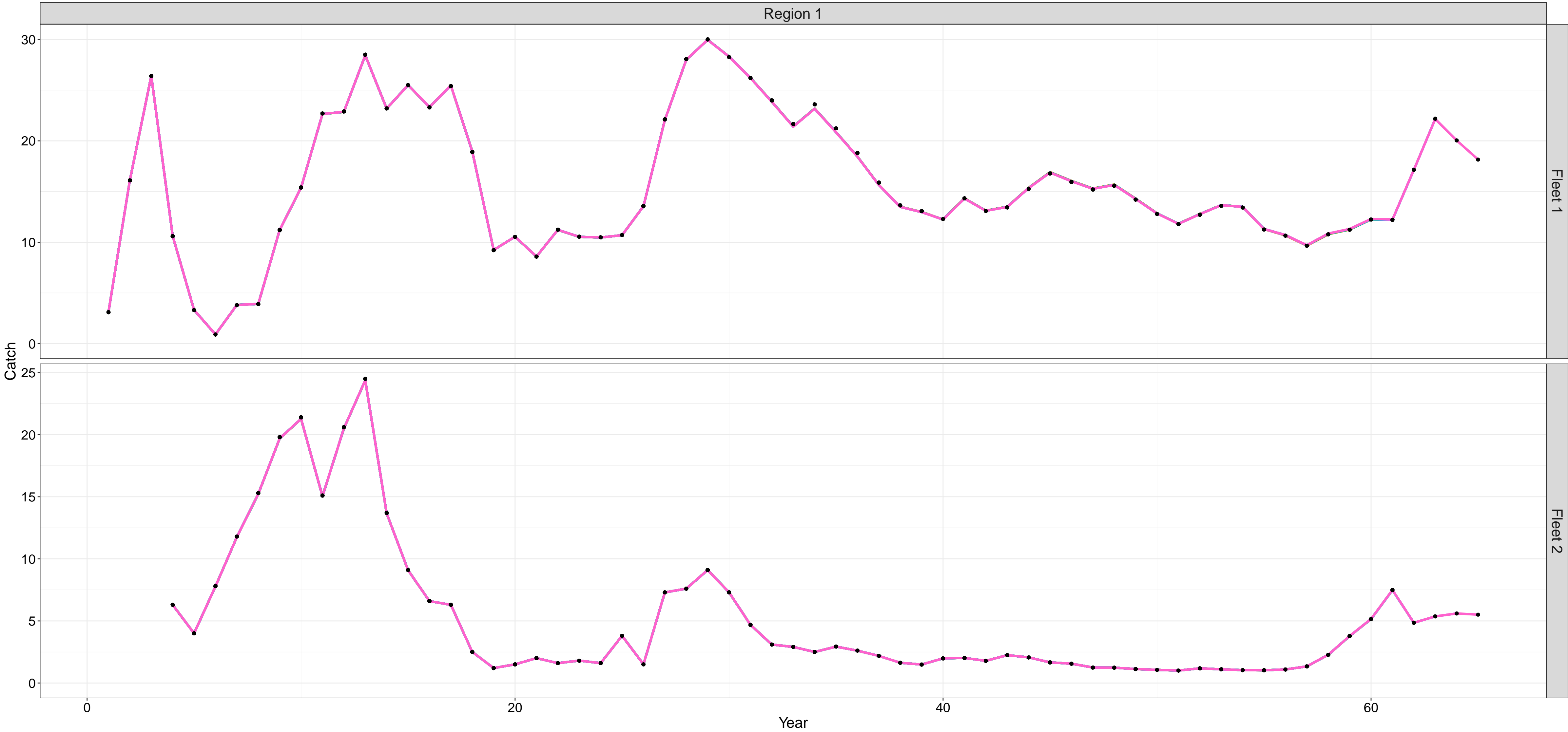
25\_12\_Drop\_TS\_Upd\_M\_2023

25\_12\_Drop\_TS\_Upd\_M\_2018

25\_12\_Drop\_TS\_Upd\_M\_2020

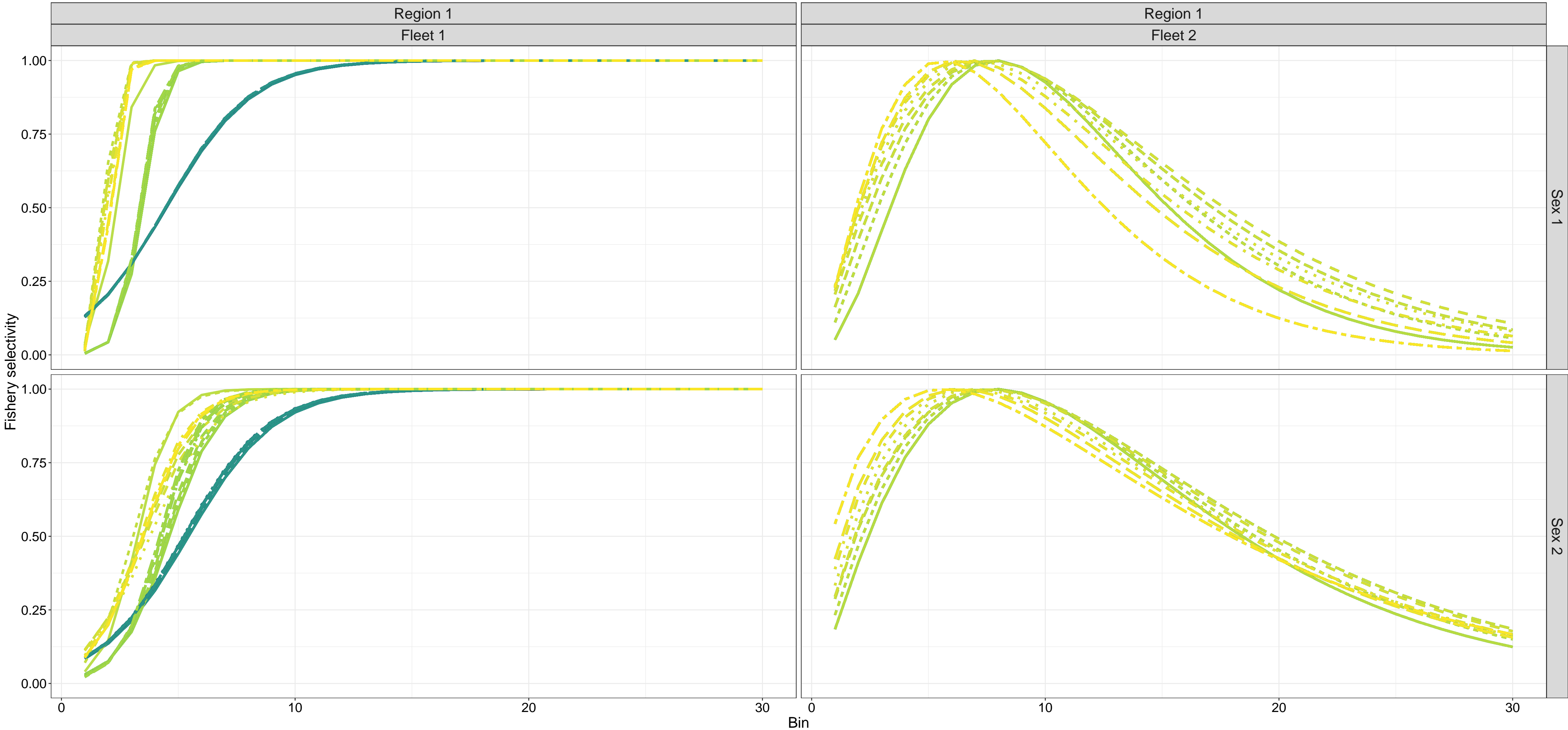
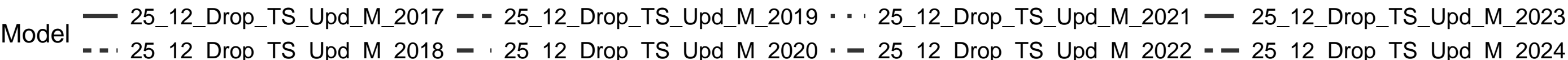
25\_12\_Drop\_TS\_Upd\_M\_2022

25\_12\_Drop\_TS\_Upd\_M\_2024

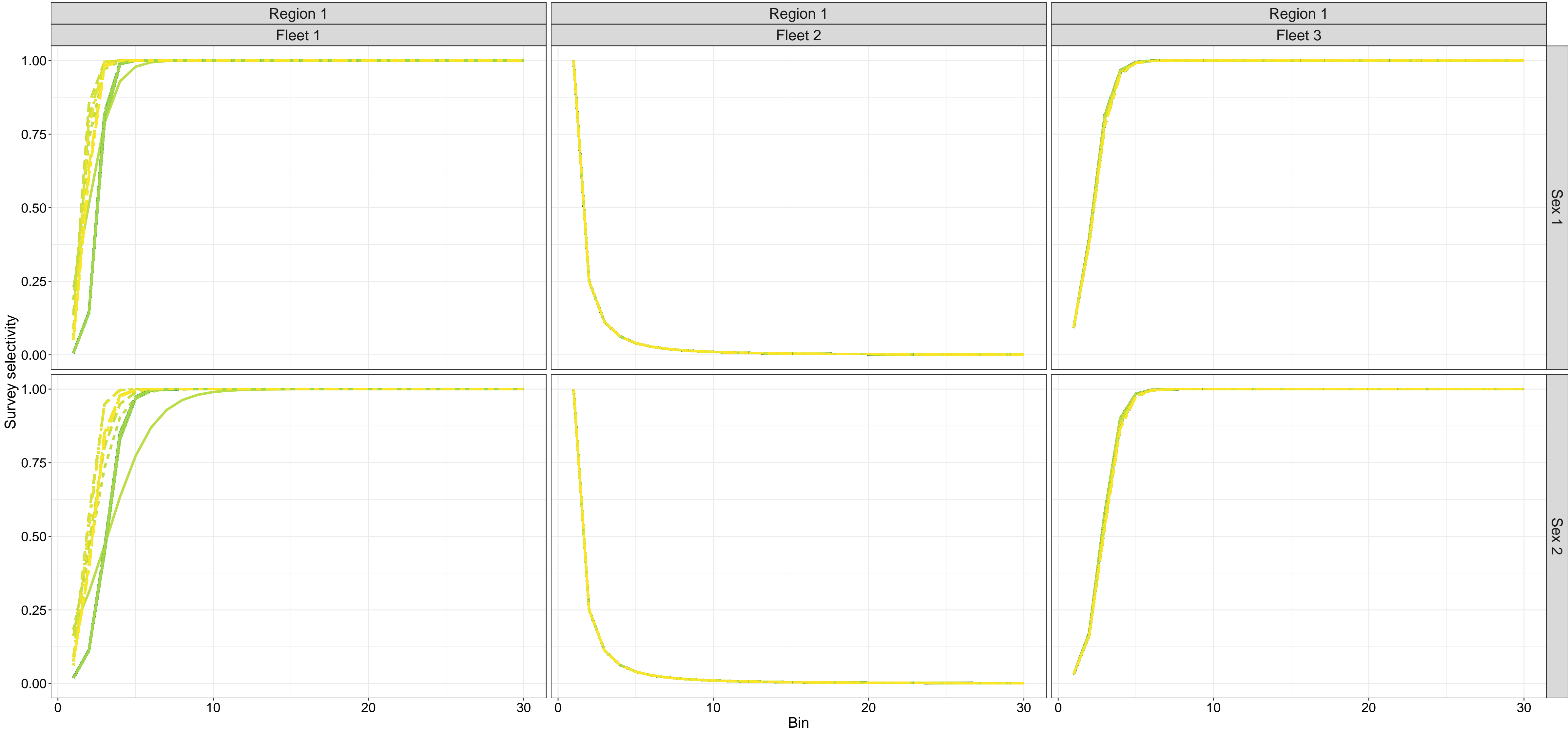
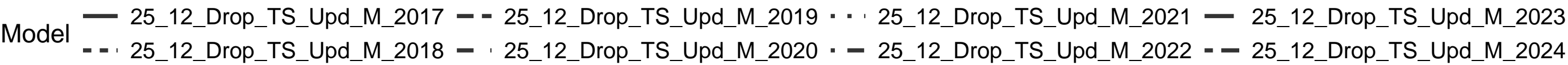




Fishery Selectivity



Survey Selectivity

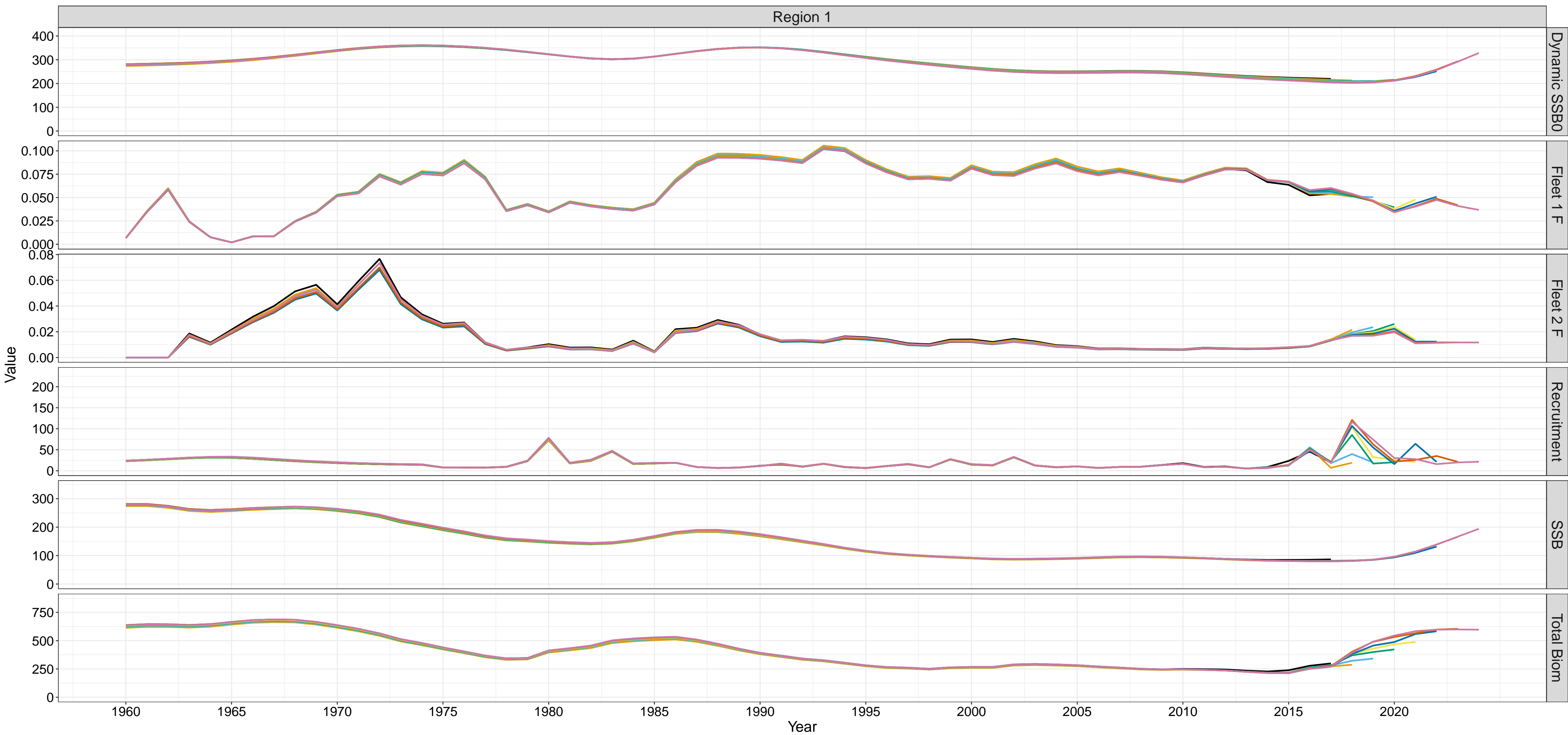




# Time Series Plots

Model

- 25\_12\_Drop\_TS\_Upd\_M\_2017
- 25\_12\_Drop\_TS\_Upd\_M\_2018
- 25\_12\_Drop\_TS\_Upd\_M\_2019
- 25\_12\_Drop\_TS\_Upd\_M\_2020
- 25\_12\_Drop\_TS\_Upd\_M\_2021
- 25\_12\_Drop\_TS\_Upd\_M\_2022
- 25\_12\_Drop\_TS\_Upd\_M\_2023
- 25\_12\_Drop\_TS\_Upd\_M\_2024



# Time Series Plots

Model



25\_12\_Drop\_TS\_Upd\_M\_2017



25\_12\_Drop\_TS\_Upd\_M\_2019



25\_12\_Drop\_TS\_Upd\_M\_2021



25\_12\_Drop\_TS\_Upd\_M\_2023



25\_12\_Drop\_TS\_Upd\_M\_2018



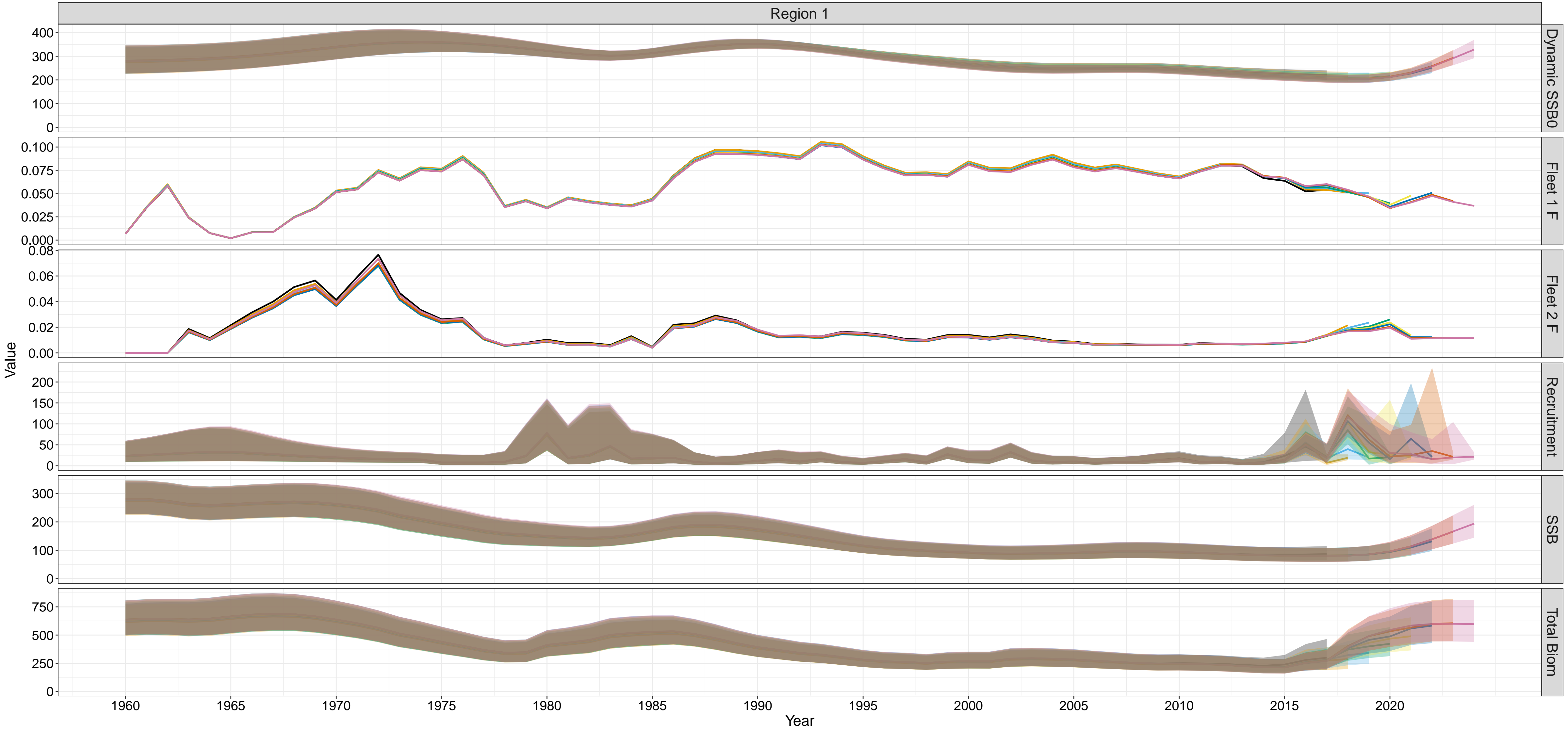
25\_12\_Drop\_TS\_Upd\_M\_2020



25\_12\_Drop\_TS\_Upd\_M\_2022



25\_12\_Drop\_TS\_Upd\_M\_2024

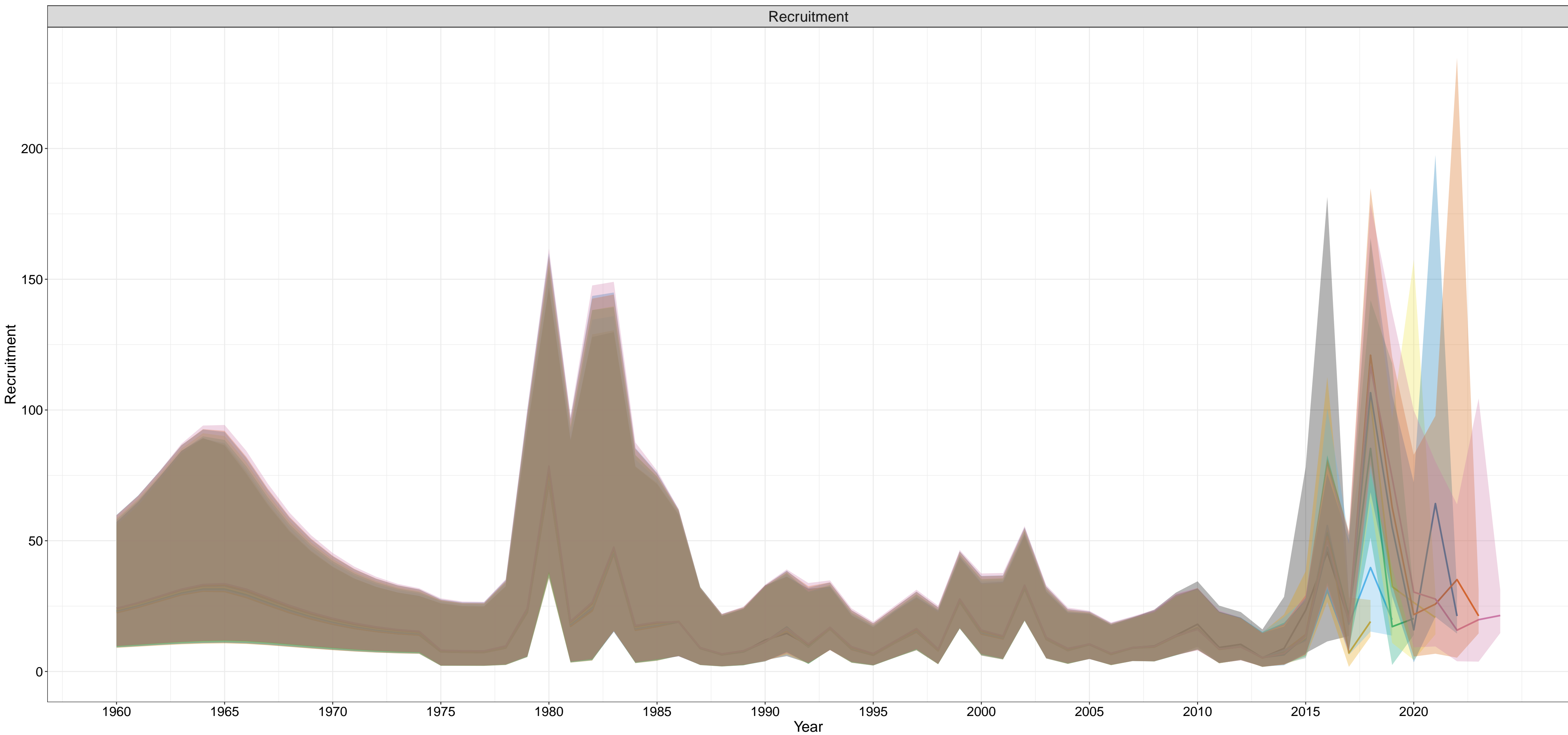
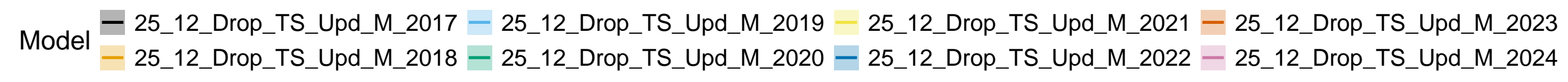


# Fishing Mortality

Model 25\_12\_Drop\_TS\_Upd\_M\_2017 25\_12\_Drop\_TS\_Upd\_M\_2019 25\_12\_Drop\_TS\_Upd\_M\_2021 25\_12\_Drop\_TS\_Upd\_M\_2023  
25\_12\_Drop\_TS\_Upd\_M\_2018 25\_12\_Drop\_TS\_Upd\_M\_2020 25\_12\_Drop\_TS\_Upd\_M\_2022 25\_12\_Drop\_TS\_Upd\_M\_2024



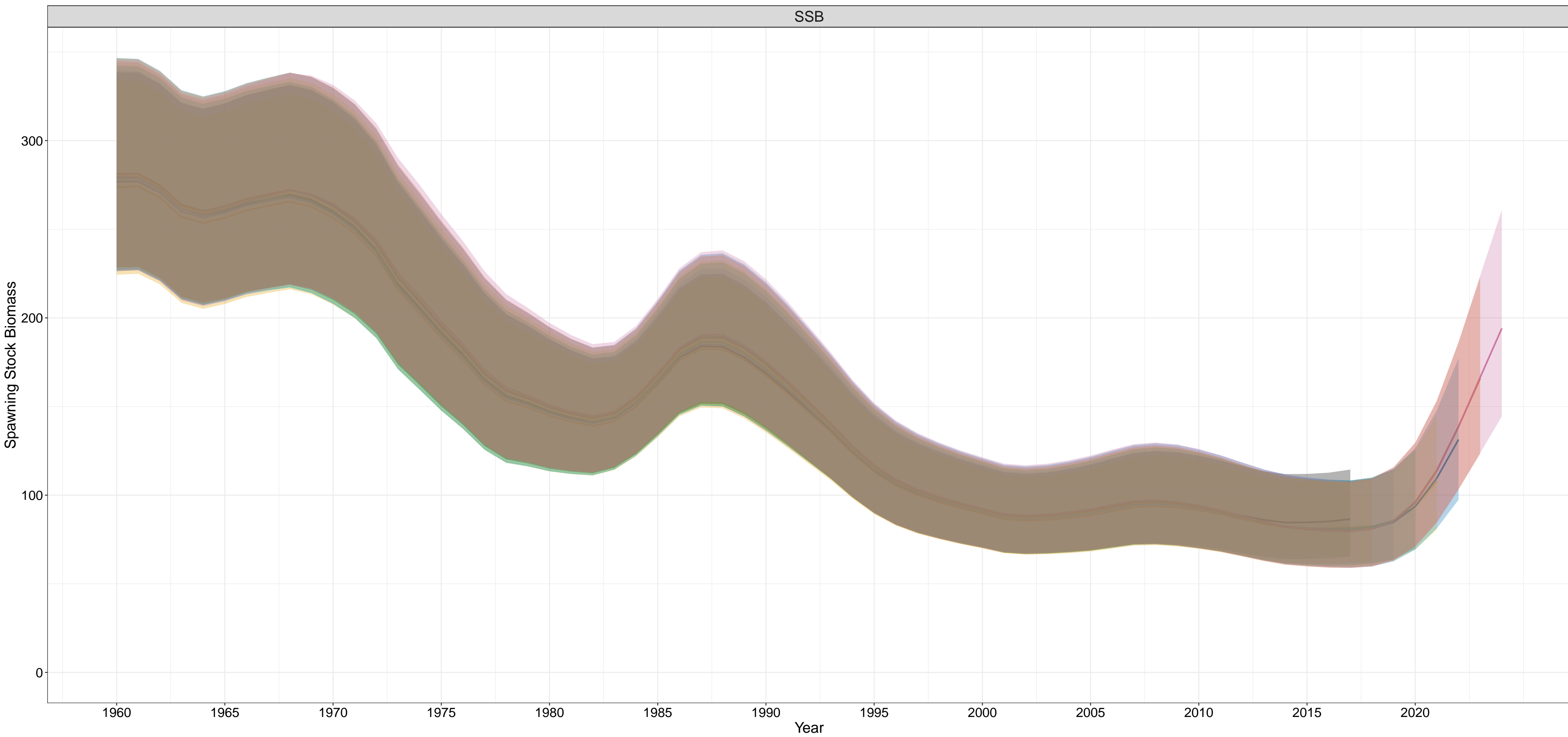
## Recruitment



# SSB

Model

25_12_Drop_TS_Upd_M_2017	25_12_Drop_TS_Upd_M_2019	25_12_Drop_TS_Upd_M_2021	25_12_Drop_TS_Upd_M_2023
25_12_Drop_TS_Upd_M_2018	25_12_Drop_TS_Upd_M_2020	25_12_Drop_TS_Upd_M_2022	25_12_Drop_TS_Upd_M_2024





# Biomass

Model 25\_12\_Drop\_TS\_Upd\_M\_2017 25\_12\_Drop\_TS\_Upd\_M\_2019 25\_12\_Drop\_TS\_Upd\_M\_2021 25\_12\_Drop\_TS\_Upd\_M\_2023  
25\_12\_Drop\_TS\_Upd\_M\_2018 25\_12\_Drop\_TS\_Upd\_M\_2020 25\_12\_Drop\_TS\_Upd\_M\_2022 25\_12\_Drop\_TS\_Upd\_M\_2024

