

File = Run9.MCMC.dat

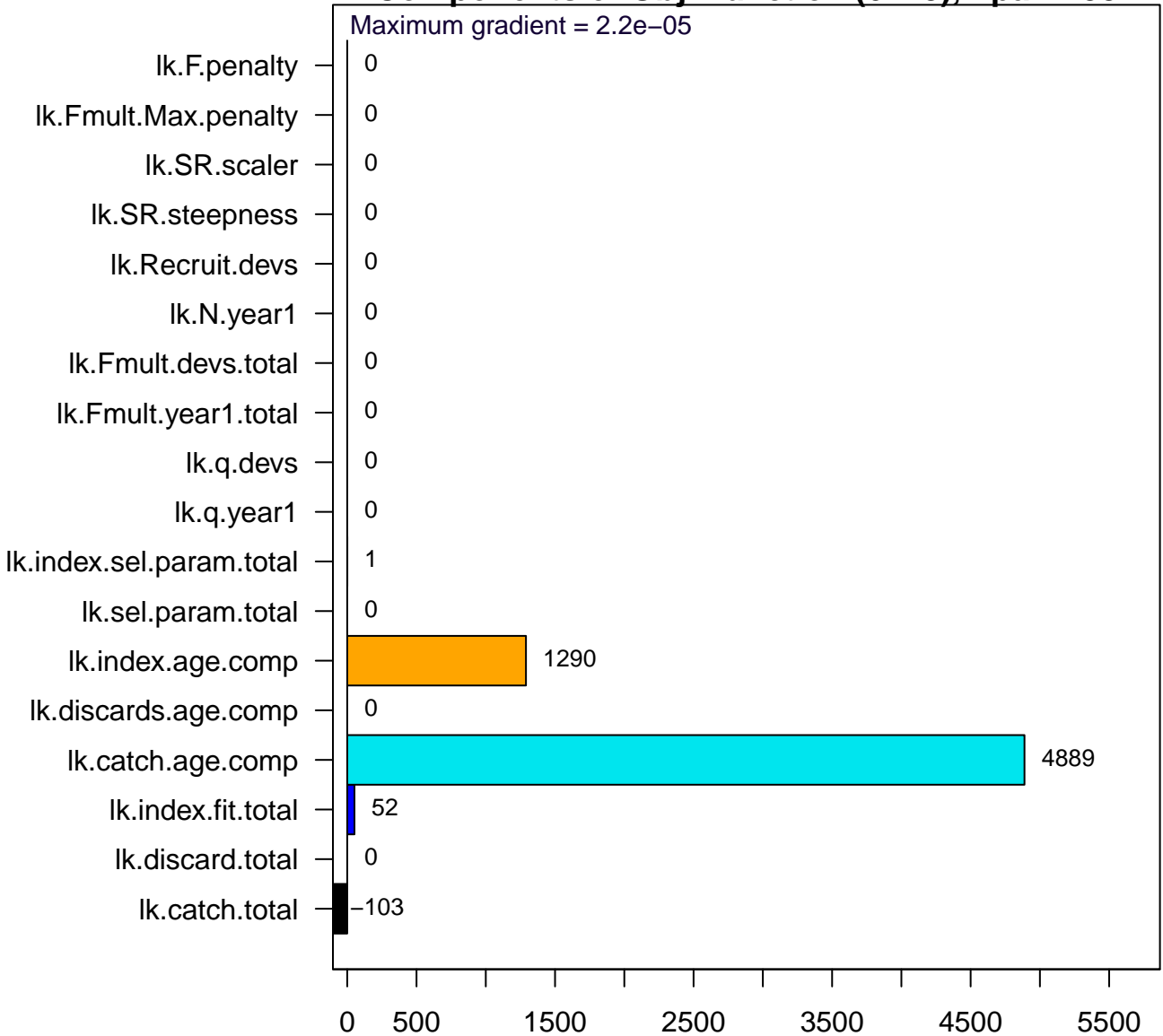
ASAP3 run on Thursday, 06 Jul 2023 at 15:59:17

sten.Curti\Desktop\Work\Mackerel\2023.Management.Track\Run9\mcmc.2000.

ASAPplots version = 0.2.18

npar = 138, maximum gradient = 2.20575e-005

Components of Obj. Function (6128), npar=138



Likelihood Contribution

Model: Run9.MCMC

Thursday, 06 Jul 2023 at 15:59:17

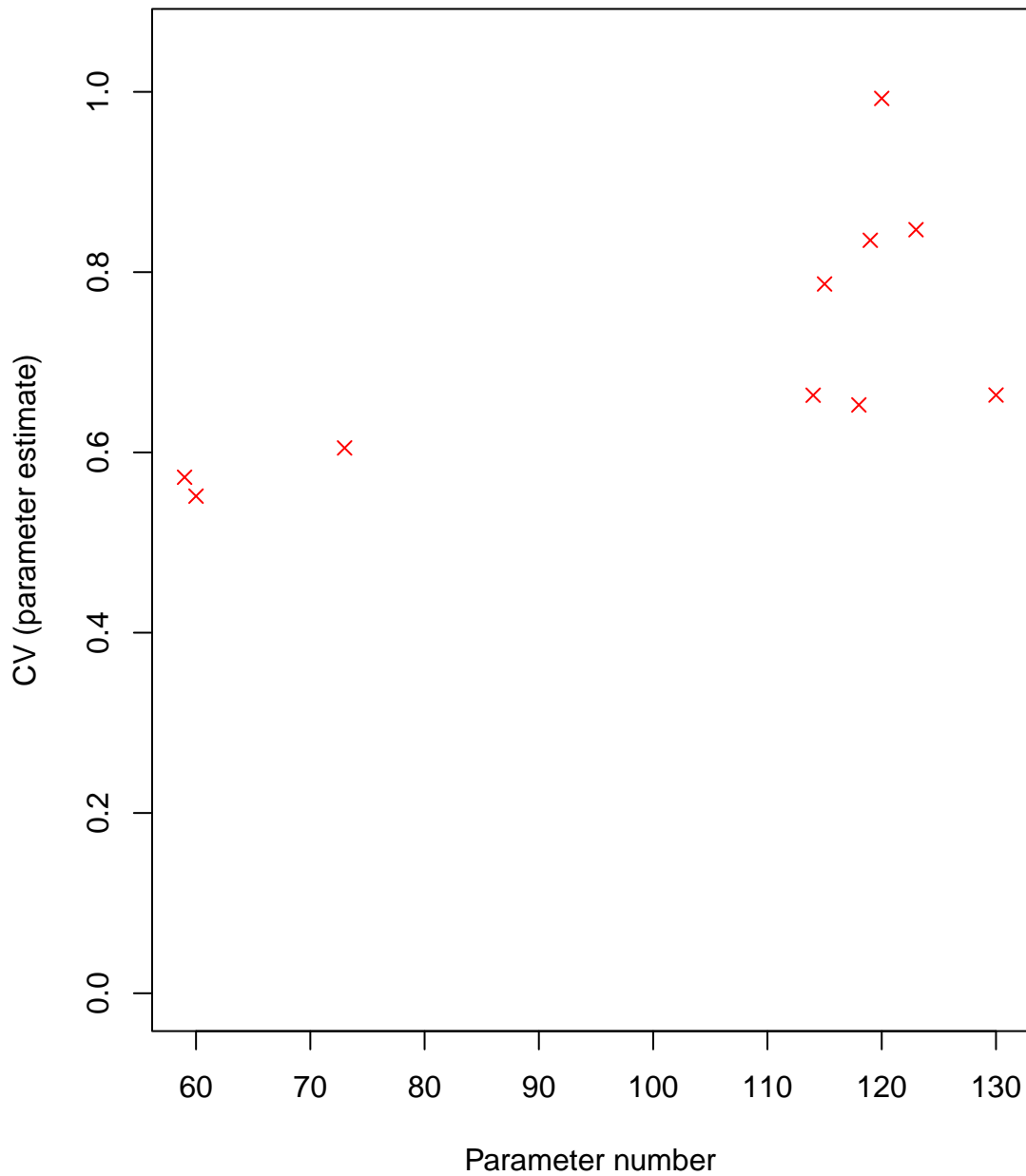
Number of high correlations

1.0
0.8
0.6
0.4
0.2
0.0

0 20 40 60 80 100 120 140

Parameter

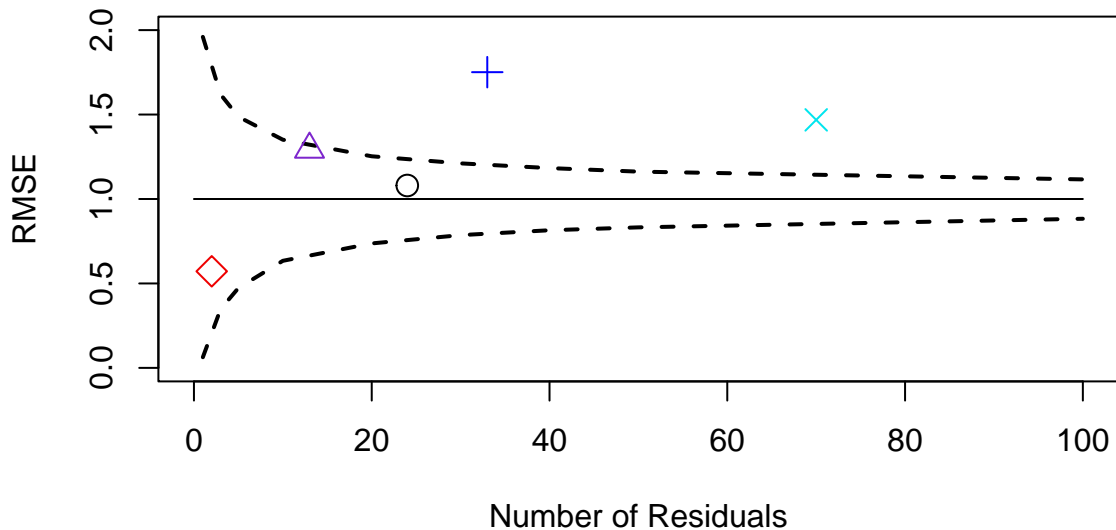




Root Mean Square Error computed from Standardized Residuals

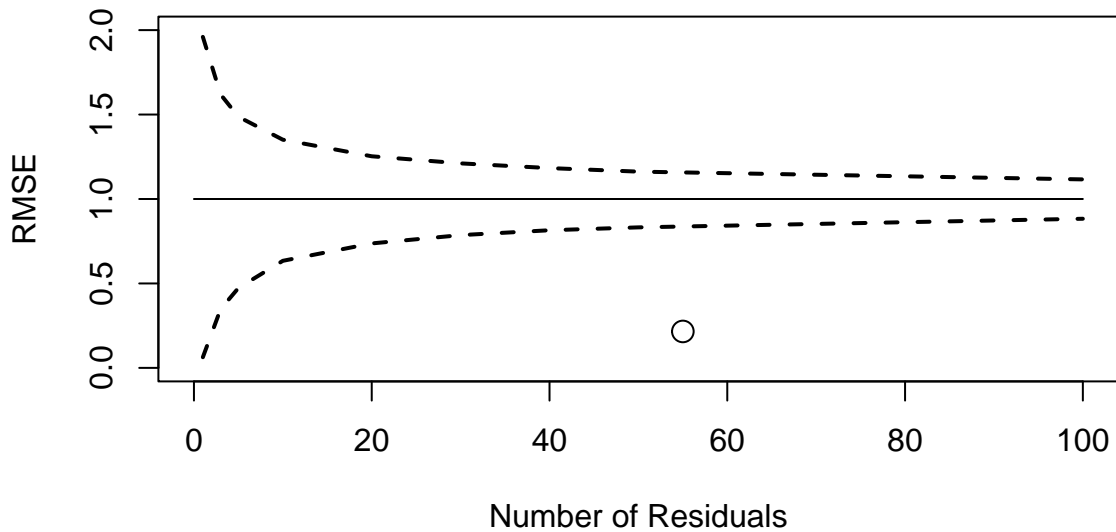
Component	# resids	RMSE
catch.tot	55	0.216
discard.tot	0	0
ind01	24	1.08
ind02	13	1.29
ind03	33	1.75
ind.total	70	1.47
N.year1	0	0
Fmult.year1	0	0
Fmult.devs.total	0	0
recruit.devs	0	0
fleet.sel.params	0	0
index.sel.params	2	0.572
q.year1	0	0
q.devs	0	0
SR.steepness	0	0
SR.scaler	0	0

Root Mean Square Error for Indices



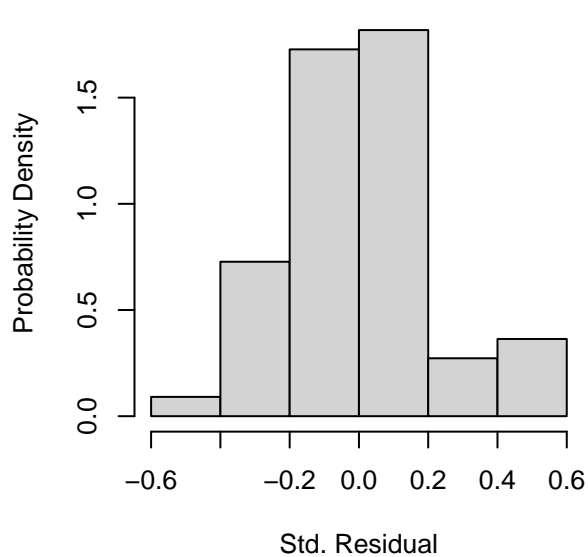
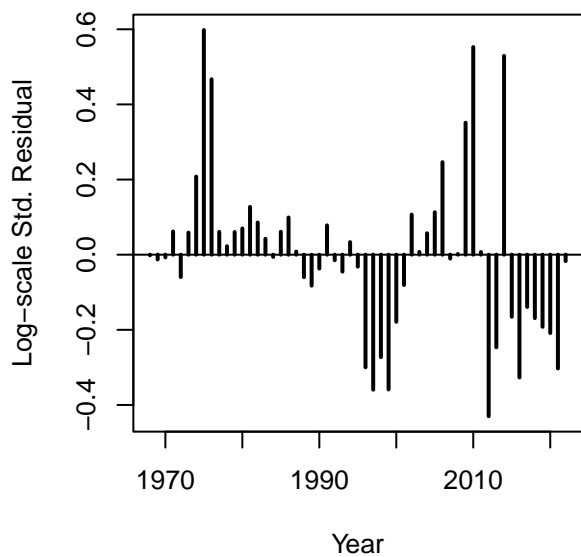
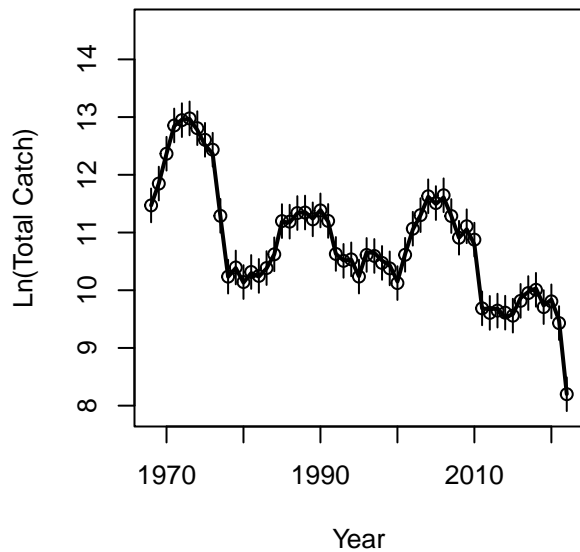
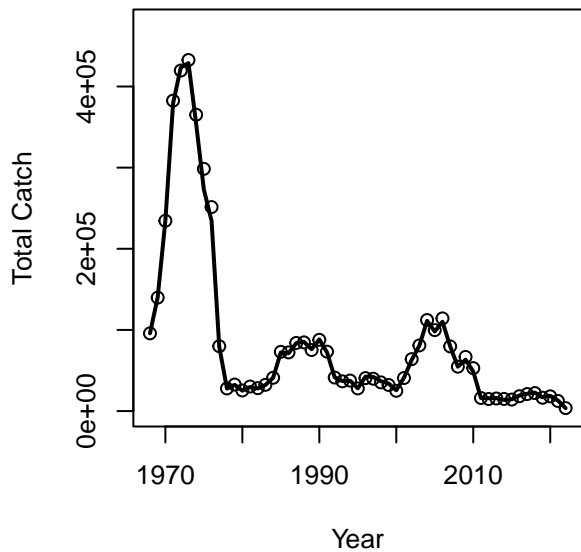
index.sel.params
ind.total
Spring Alb 3+
Spring Big 3+
Combined SSB

Root Mean Square Error for Catch



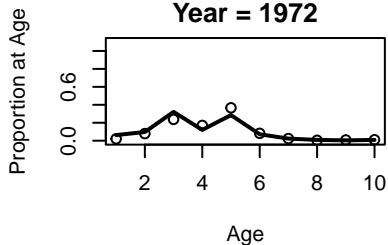
○ catch.tot

Fleet 1 Catch (Combined)

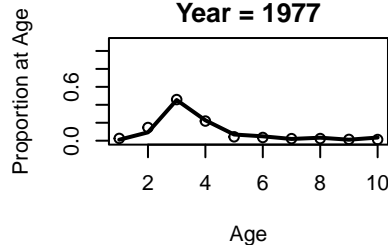


Catch

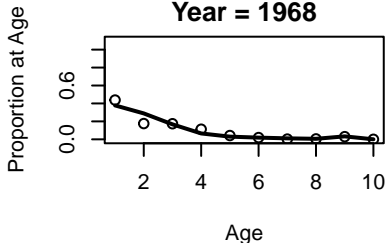
Year = 1972



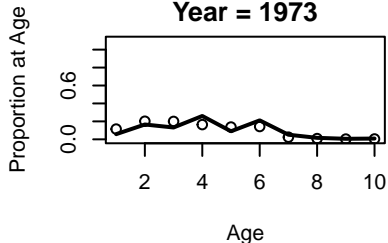
Year = 1977



Year = 1968



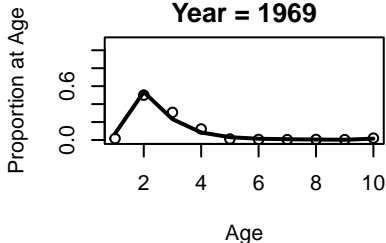
Year = 1973



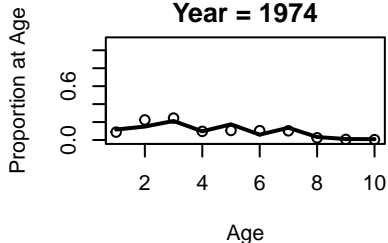
Year = 1978



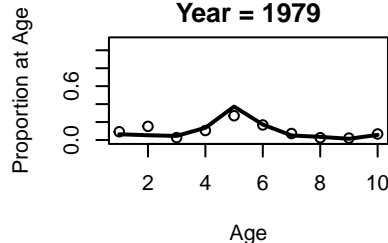
Year = 1969



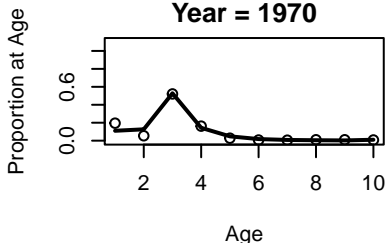
Year = 1974



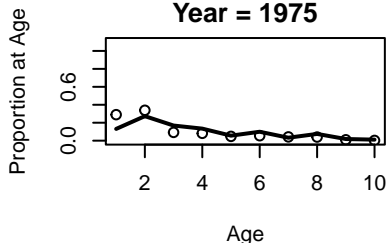
Year = 1979



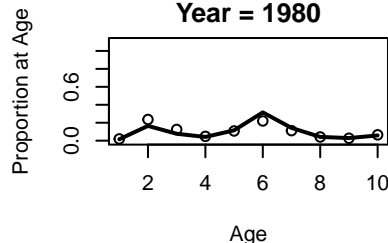
Year = 1970



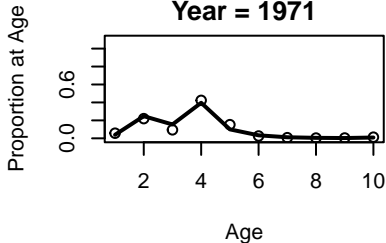
Year = 1975



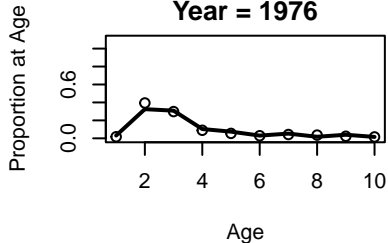
Year = 1980



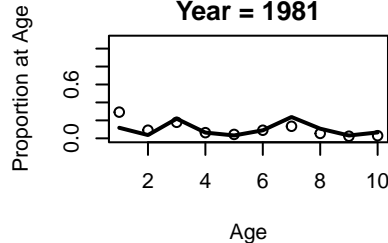
Year = 1971



Year = 1976



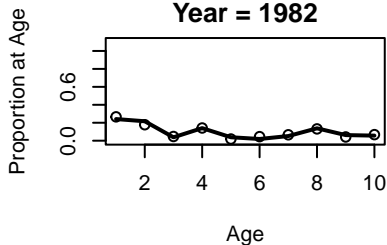
Year = 1981



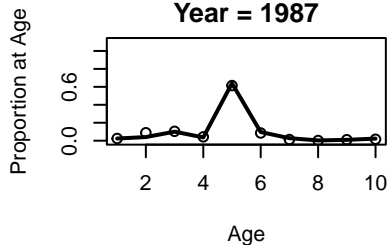
Fleet 1
Combined
↓

Catch

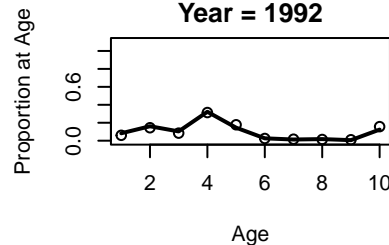
Year = 1982



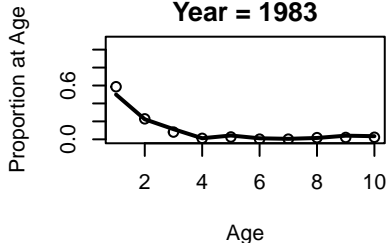
Year = 1987



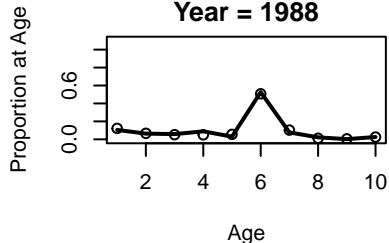
Year = 1992



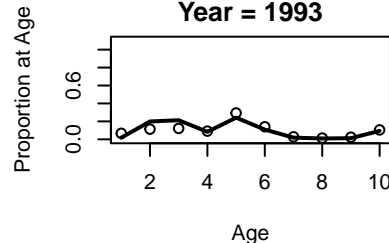
Year = 1983



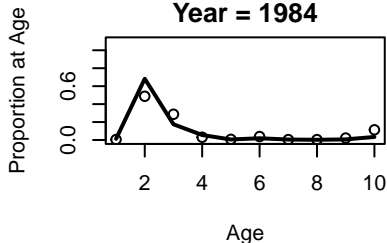
Year = 1988



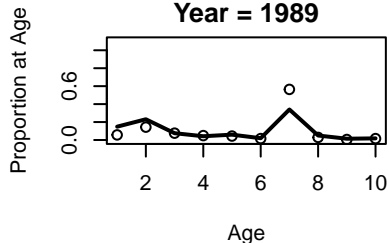
Year = 1993



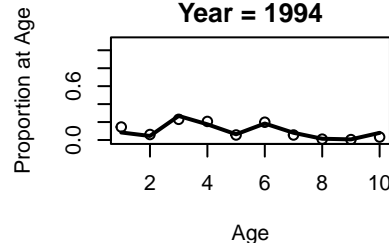
Year = 1984



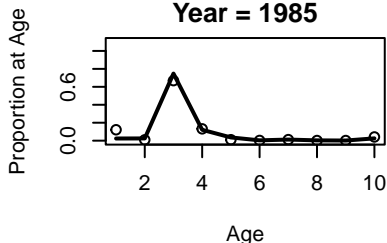
Year = 1989



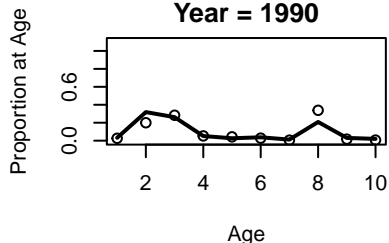
Year = 1994



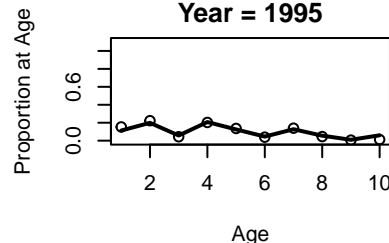
Year = 1985



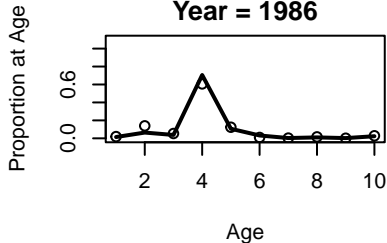
Year = 1990



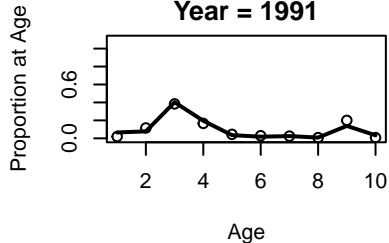
Year = 1995



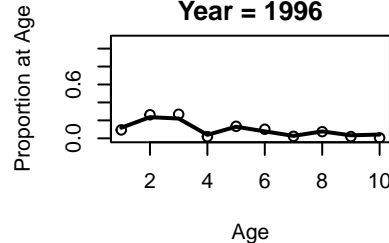
Year = 1986



Year = 1991

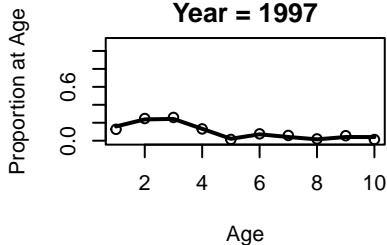


Year = 1996

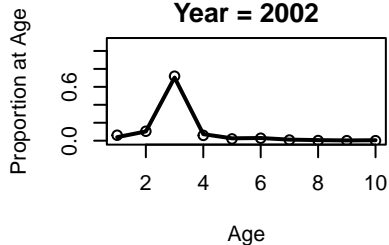


Catch

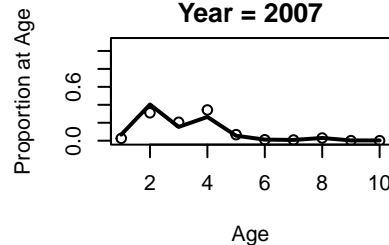
Year = 1997



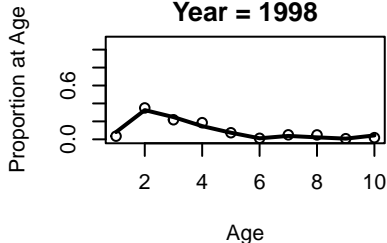
Year = 2002



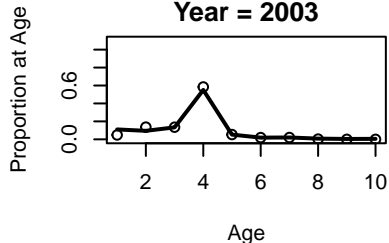
Year = 2007



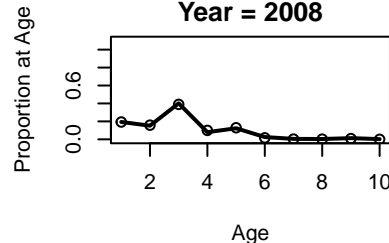
Year = 1998



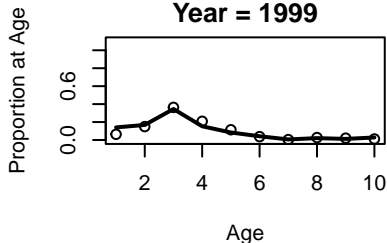
Year = 2003



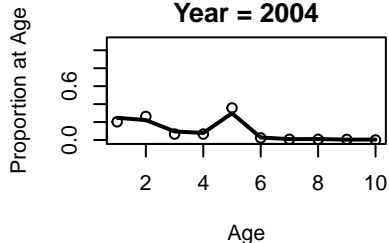
Year = 2008



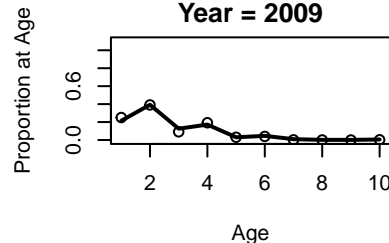
Year = 1999



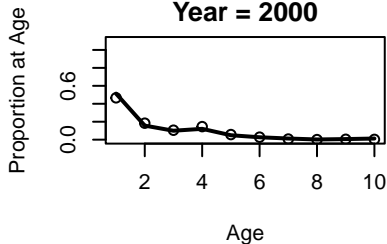
Year = 2004



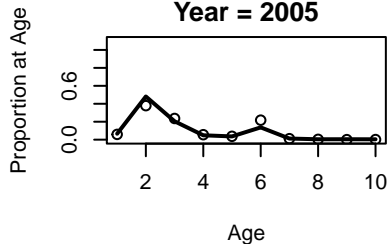
Year = 2009



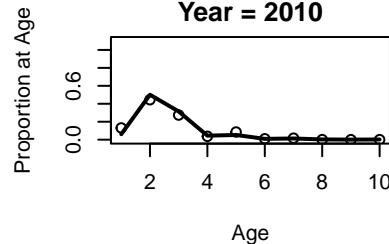
Year = 2000



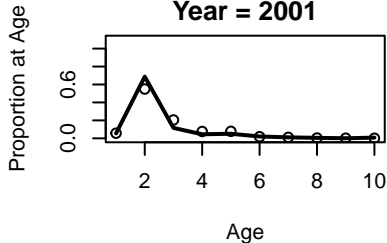
Year = 2005



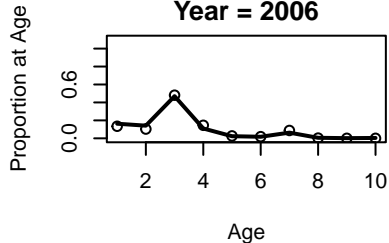
Year = 2010



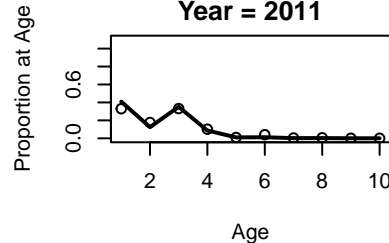
Year = 2001



Year = 2006

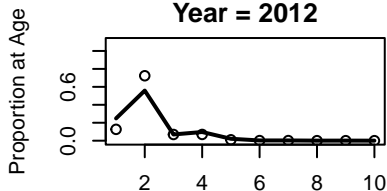


Year = 2011

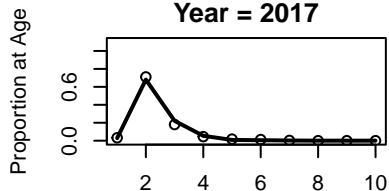


Catch

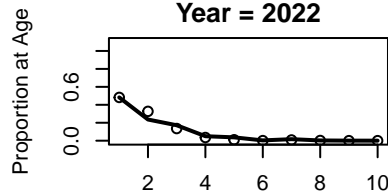
Year = 2012



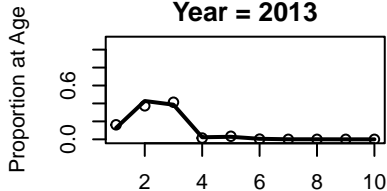
Year = 2017



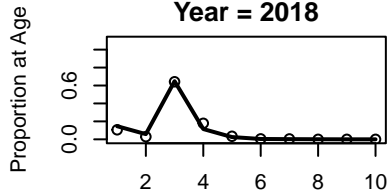
Year = 2022



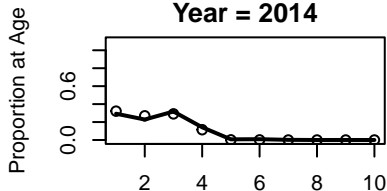
Year = 2013



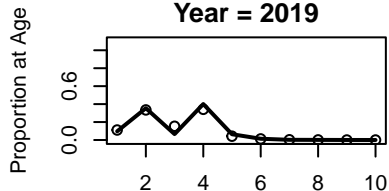
Year = 2018



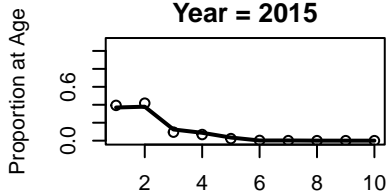
Year = 2014



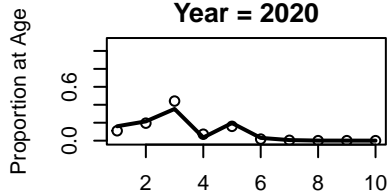
Year = 2019



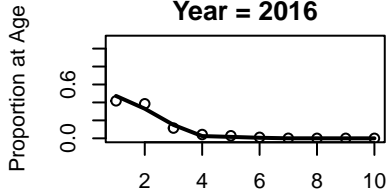
Year = 2015



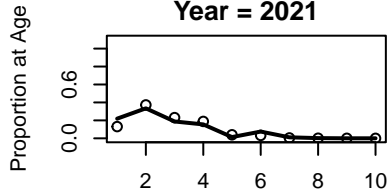
Year = 2020



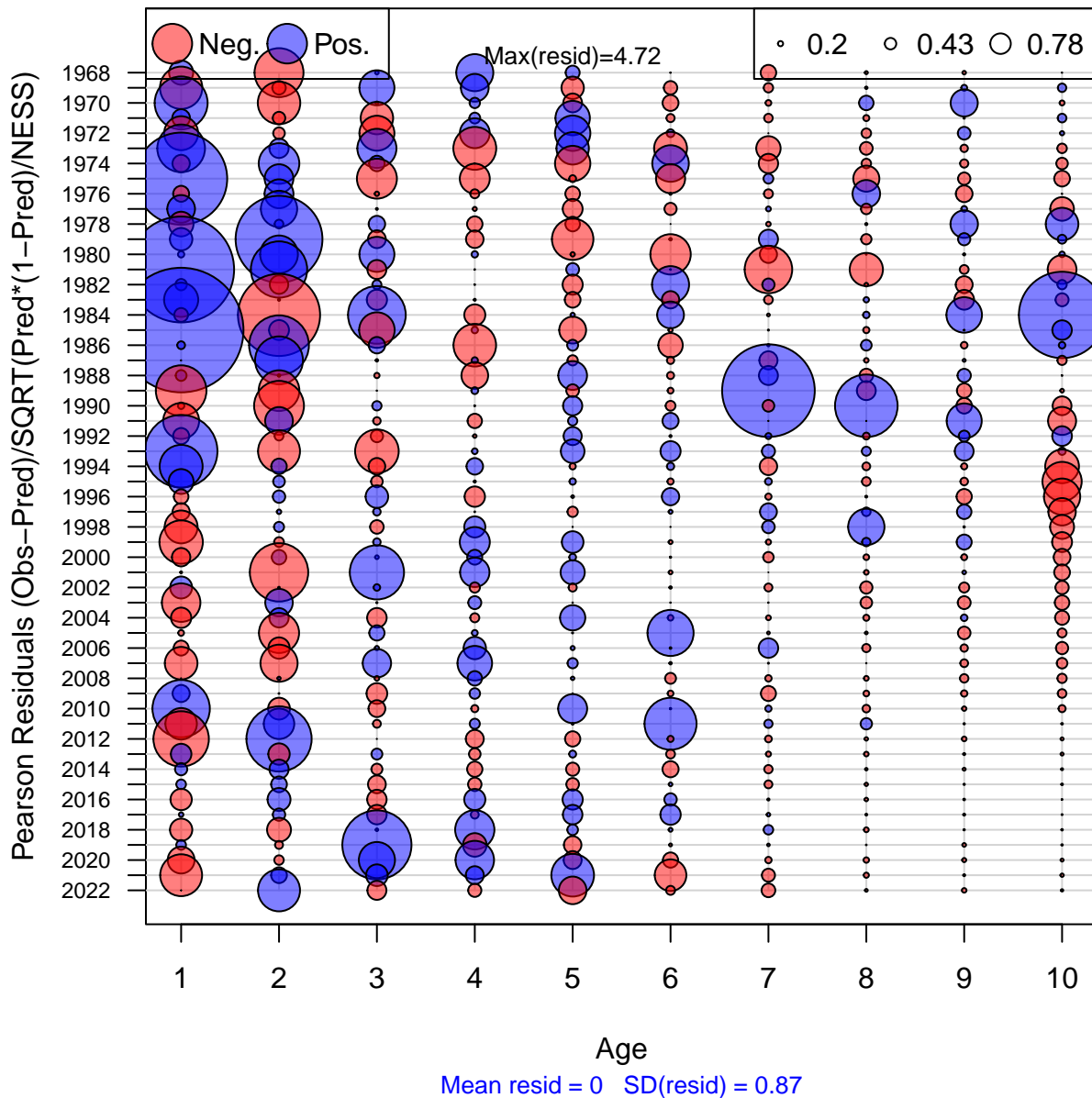
Year = 2016



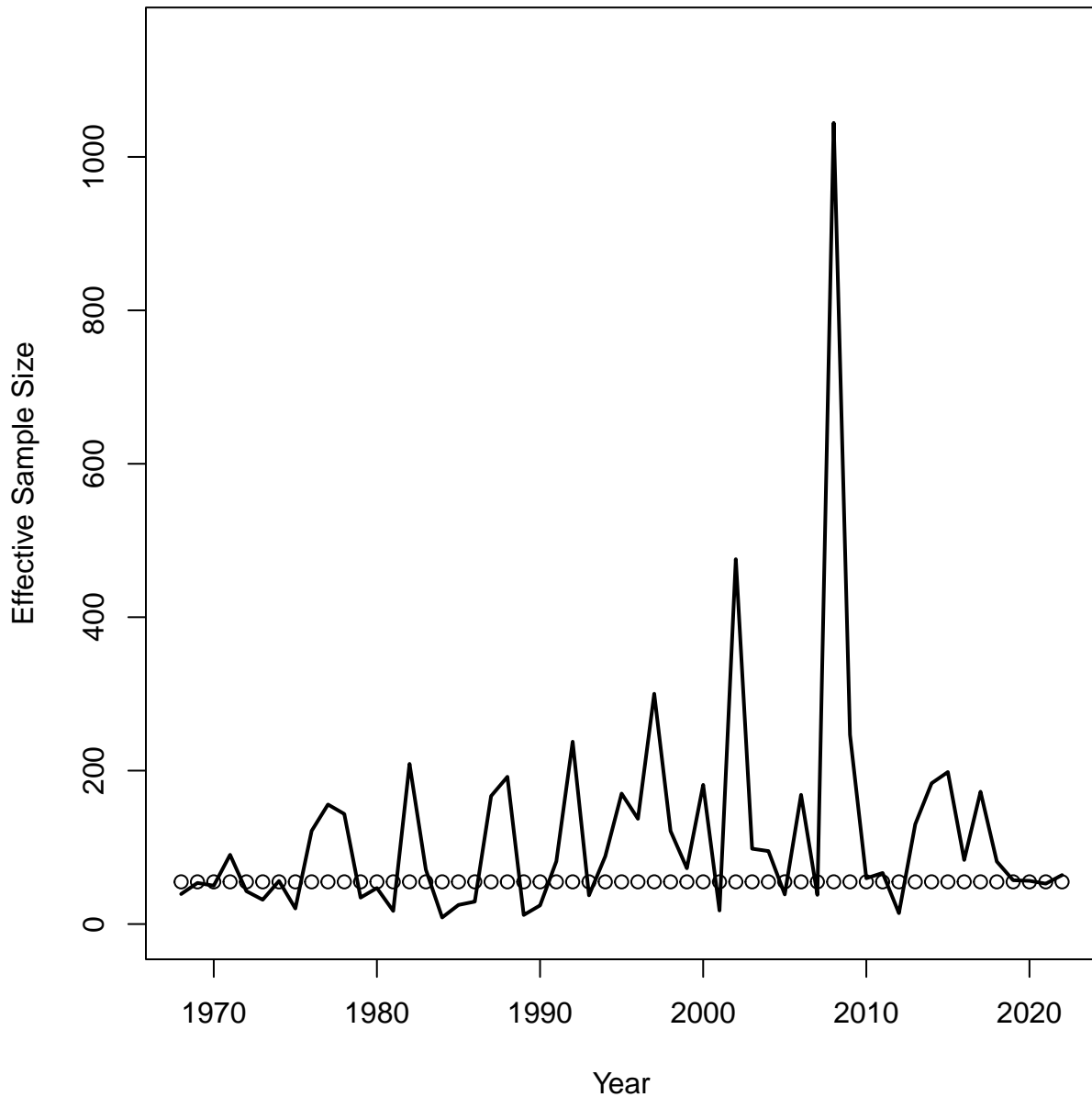
Year = 2021



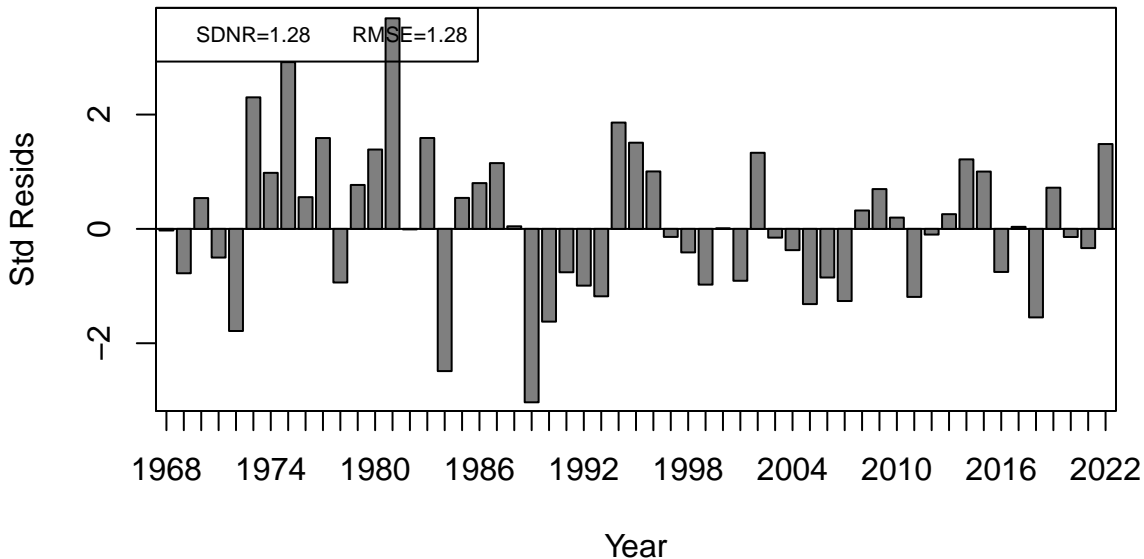
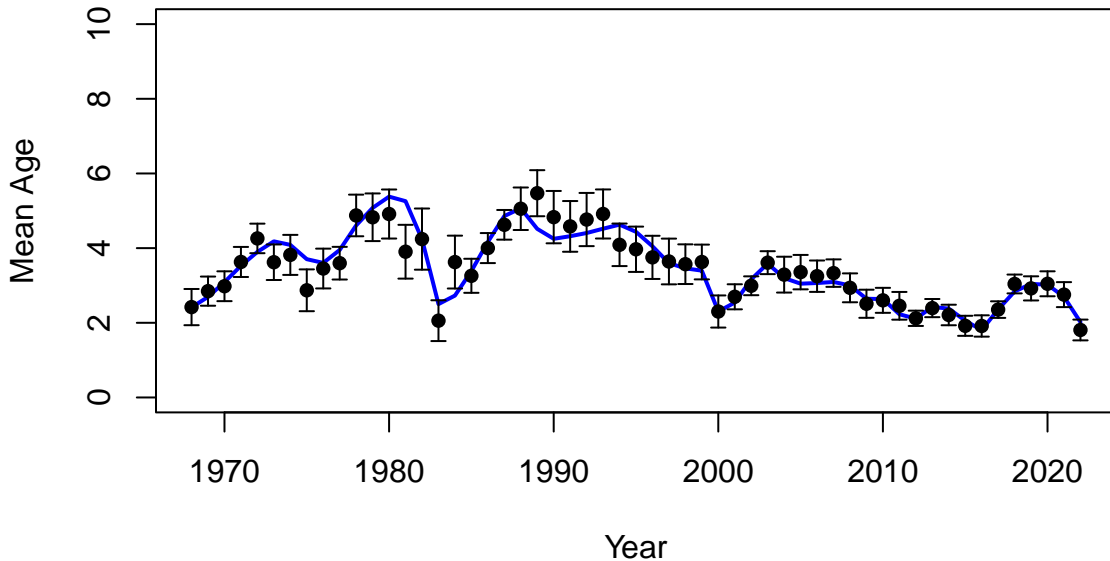
Age Comp Residuals for Catch by Fleet 1 (Combined)



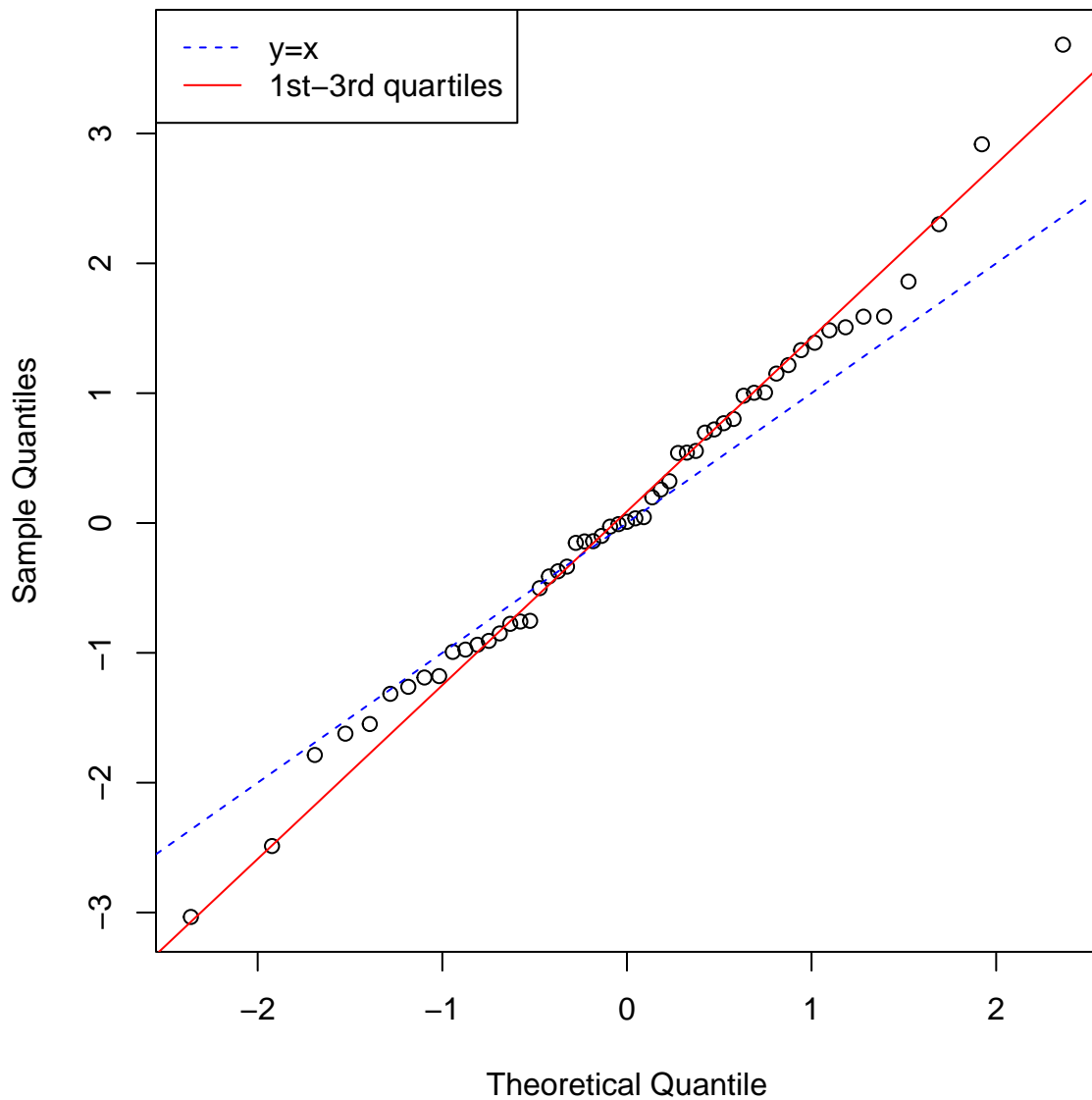
Catch Neff Fleet 1 (Combined)



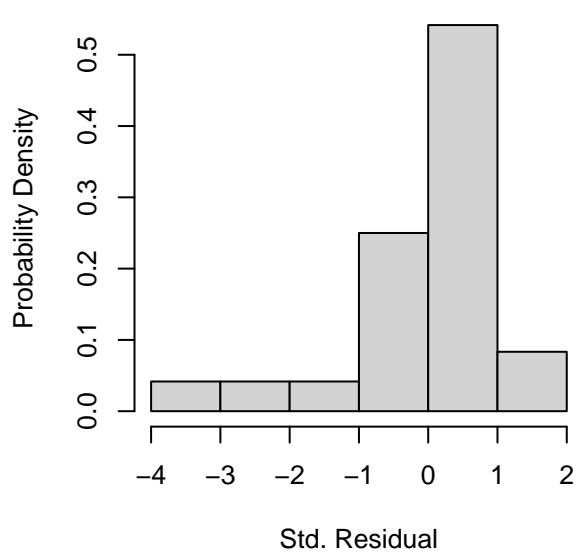
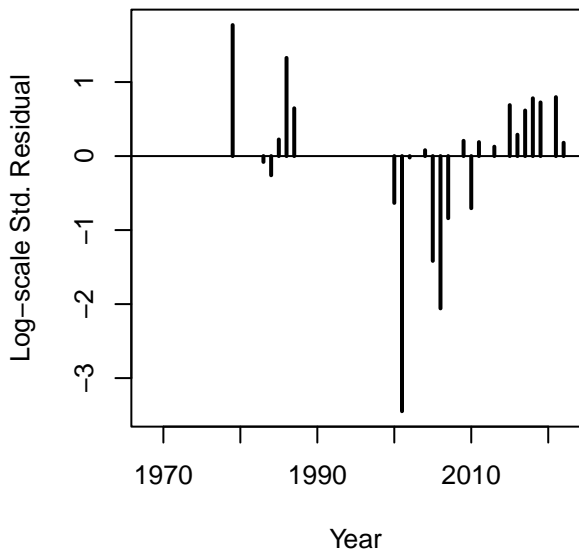
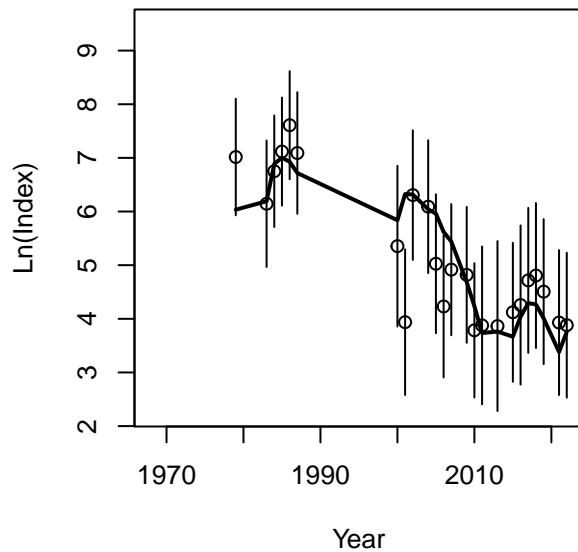
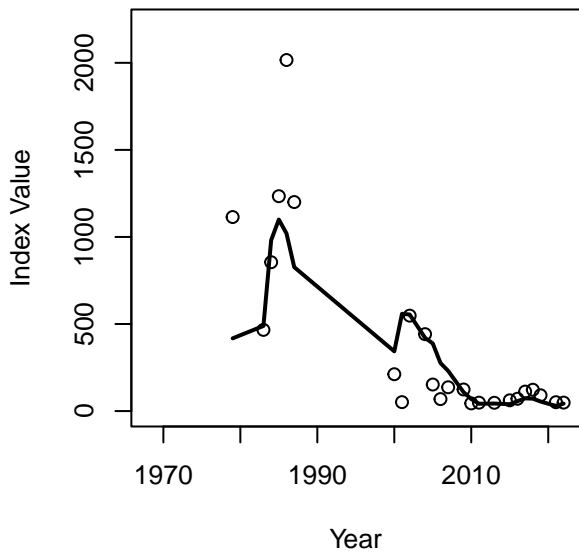
Catch Fleet 1 (Combined) ESS = 55



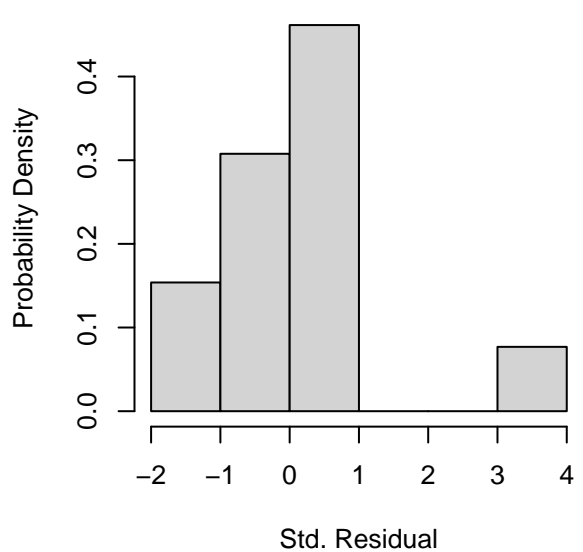
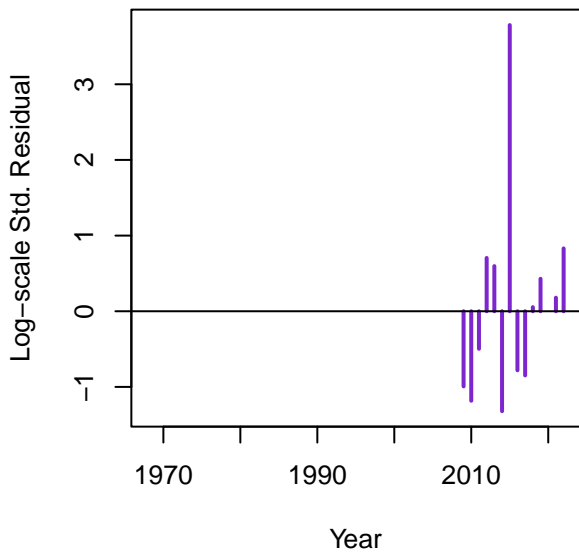
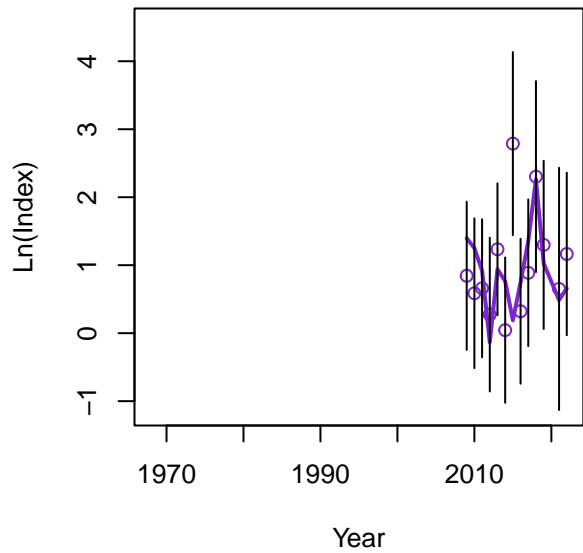
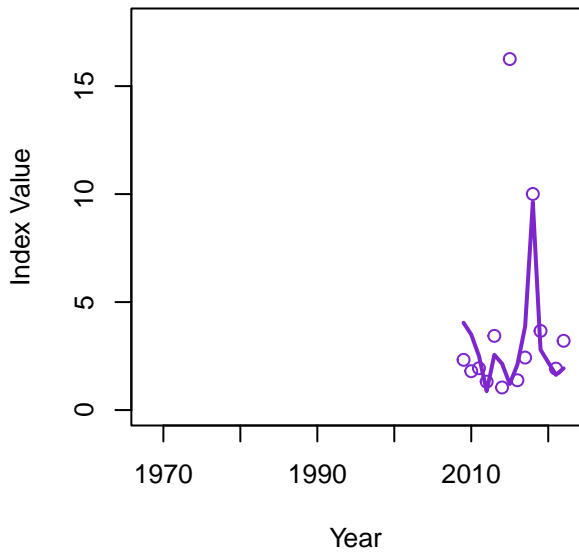
Catch Fleet 1 (Combined) ESS = 55



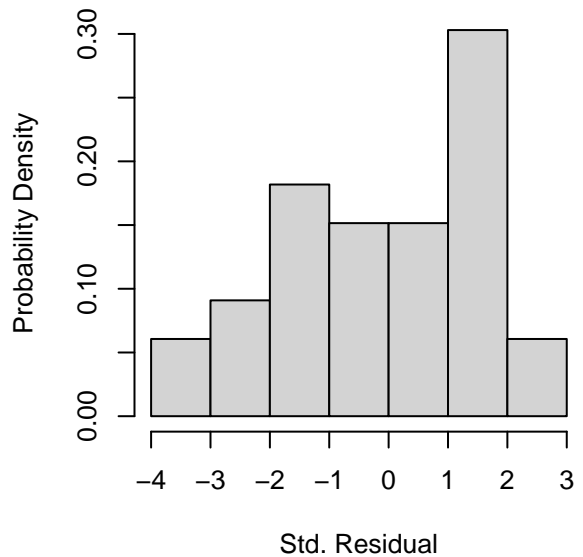
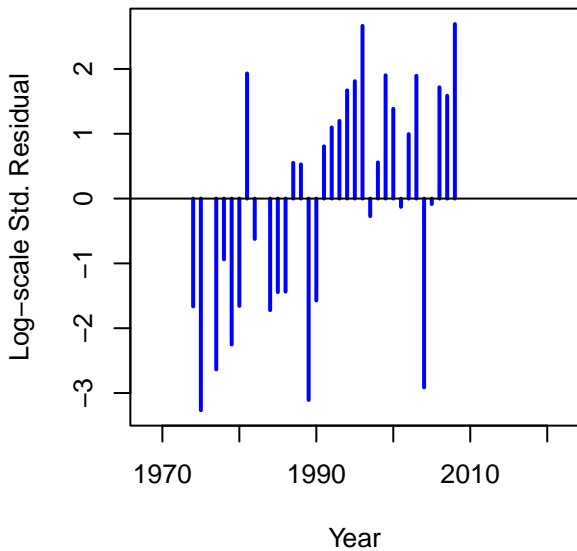
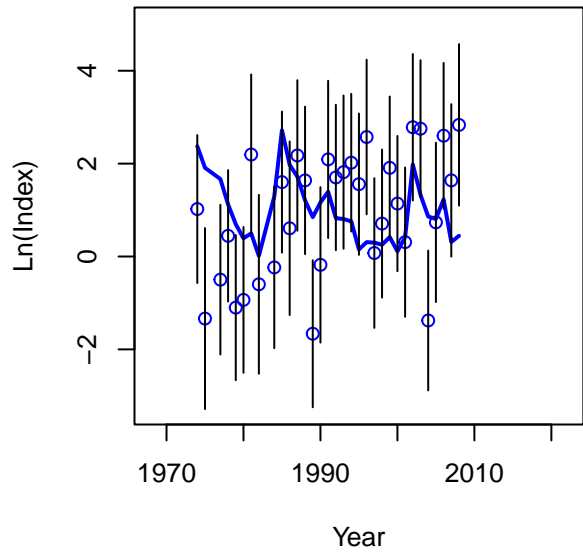
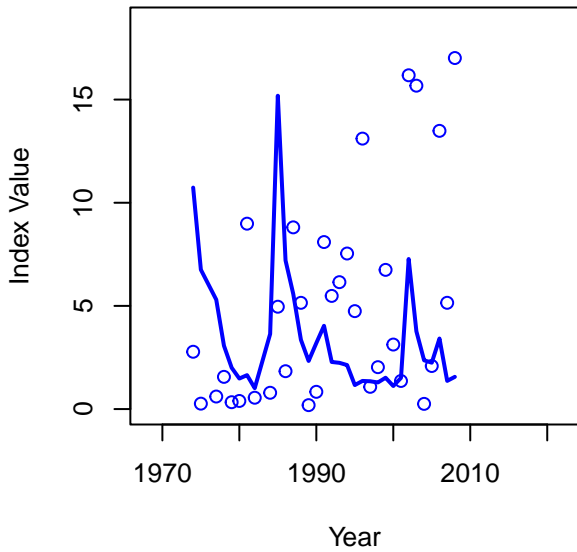
Index 1 (Combined SSB)



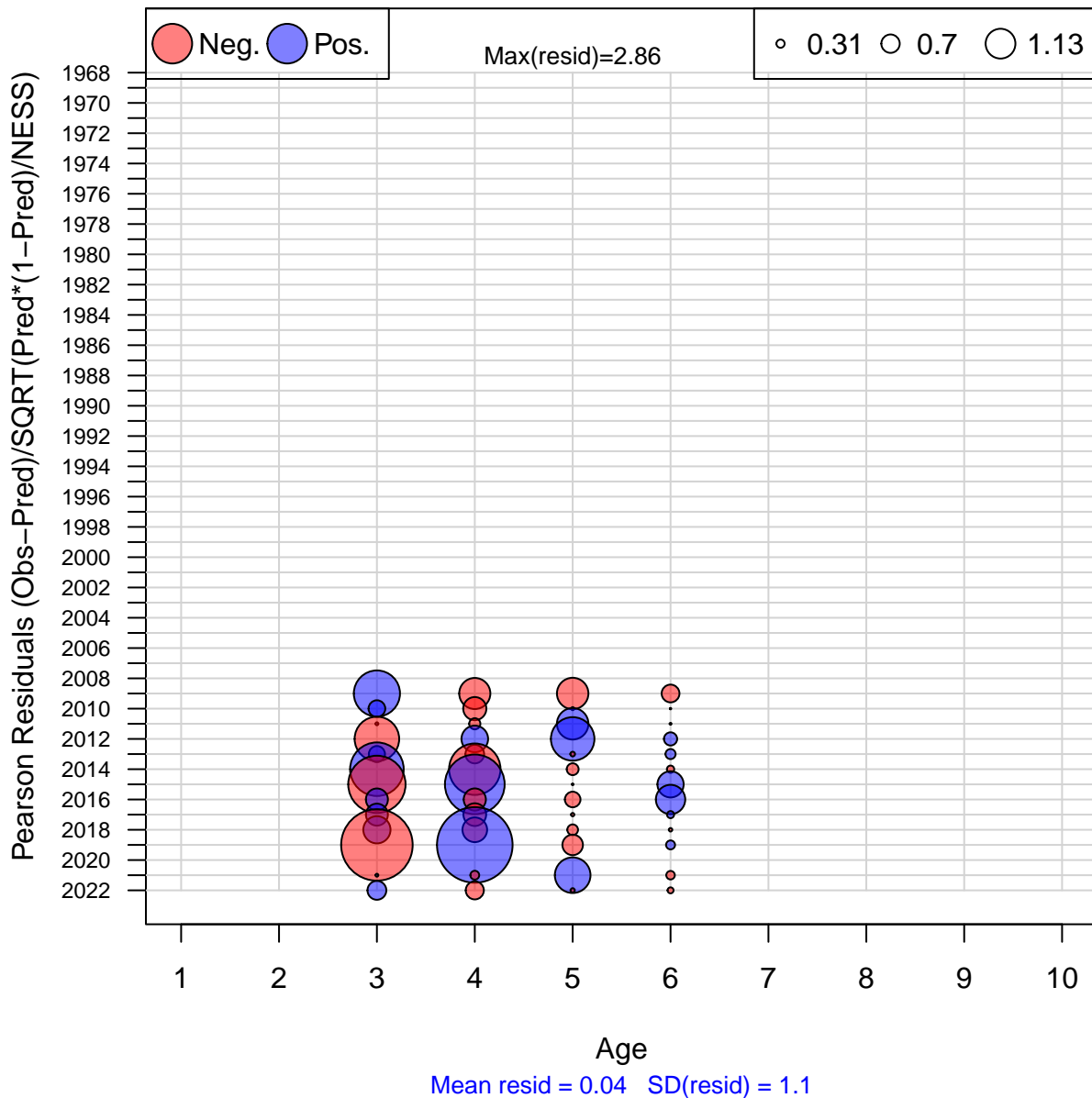
Index 2 (Spring Big 3+)



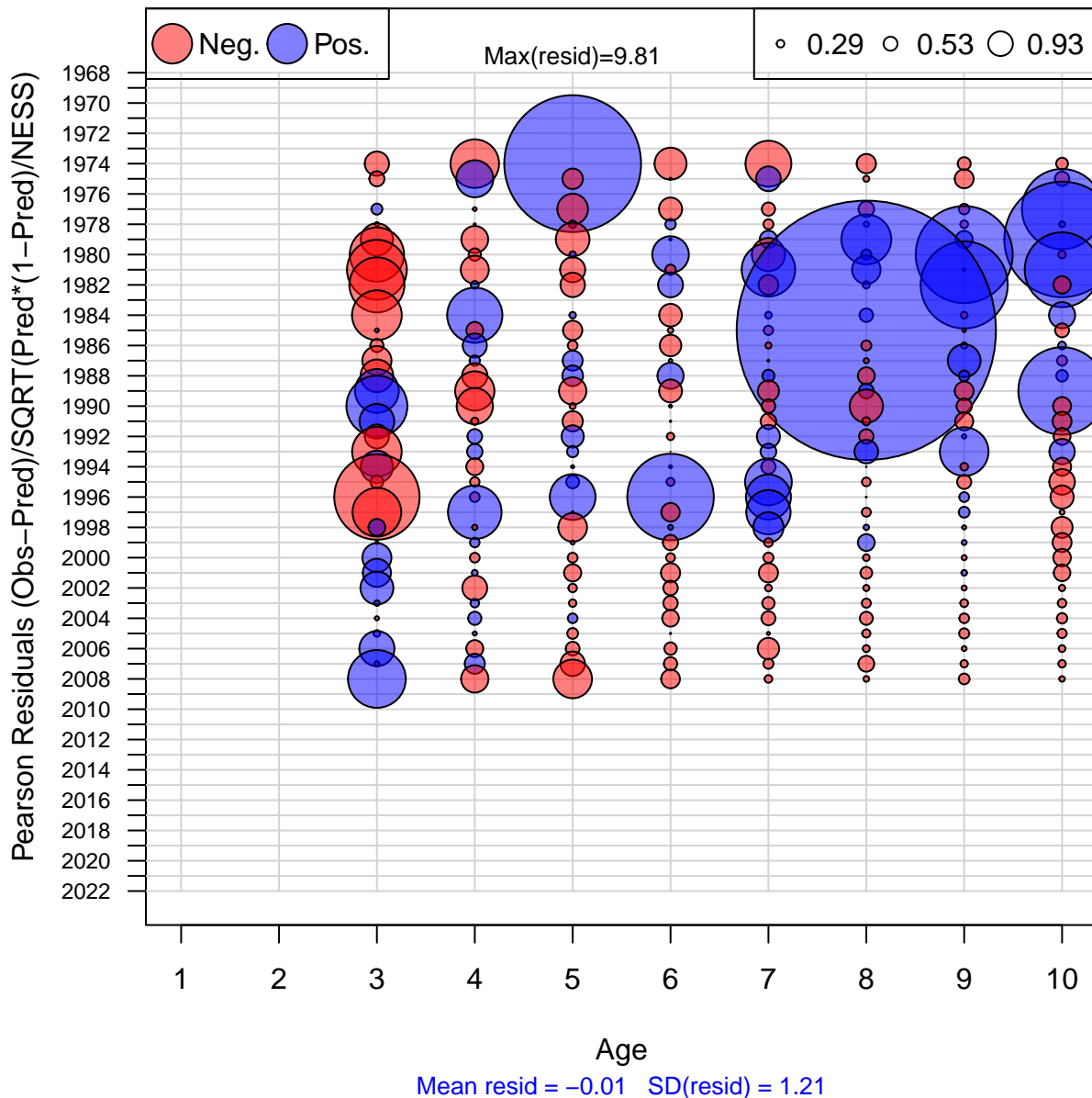
Index 3 (Spring Alb 3+)



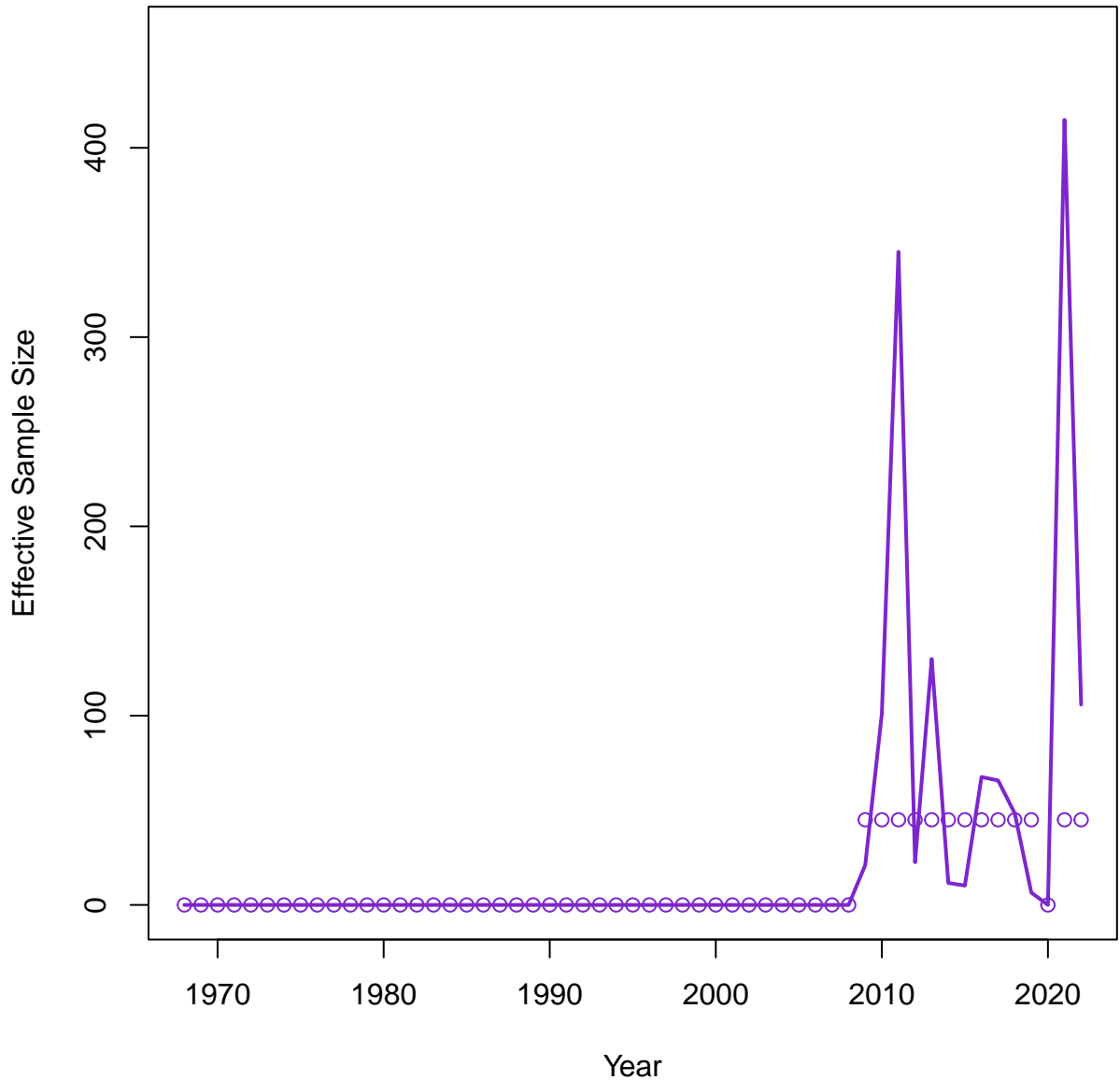
Age Comp Residuals for Index 2 (Spring Big 3+)



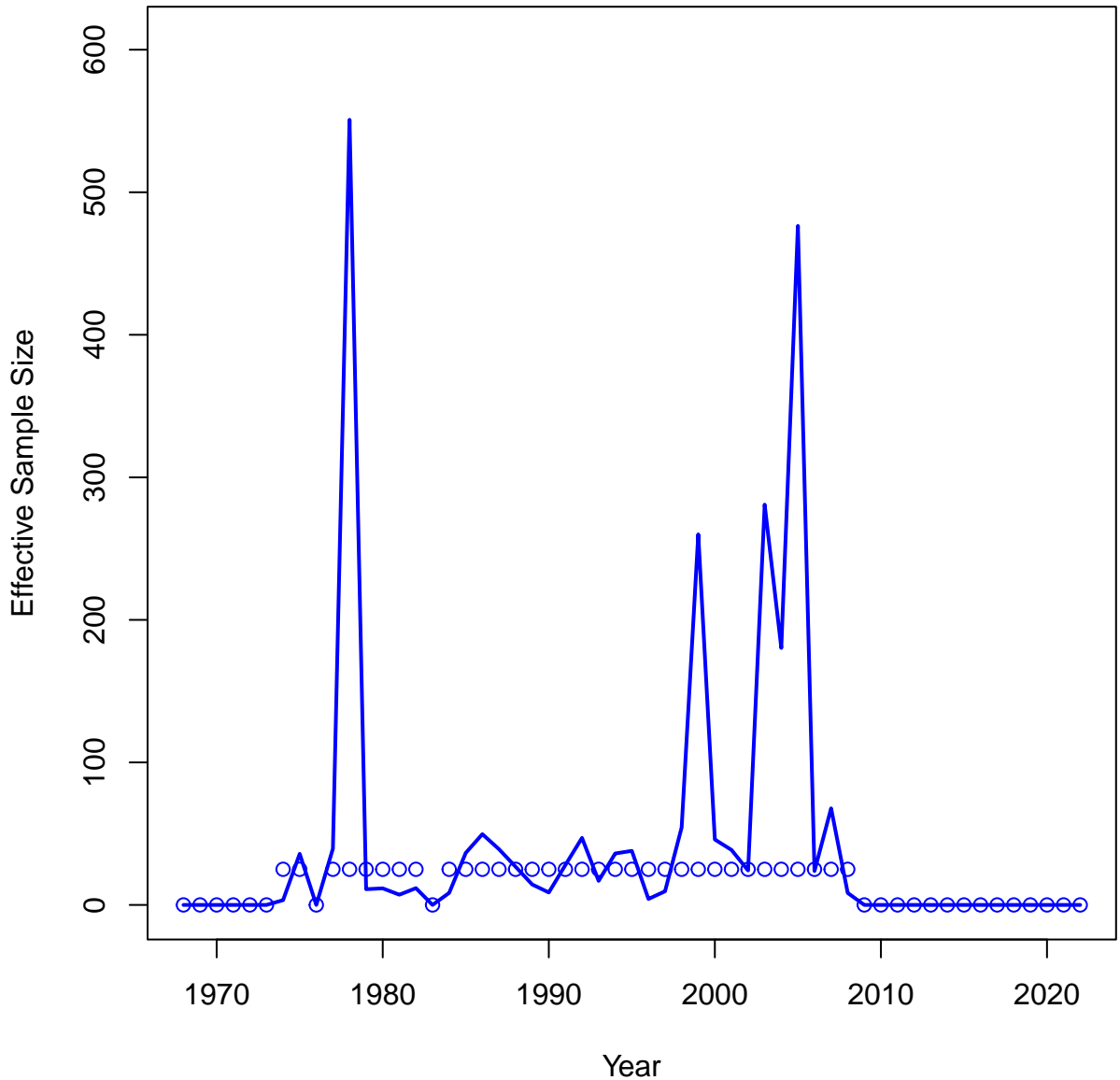
Age Comp Residuals for Index 3 (Spring Alb 3+)



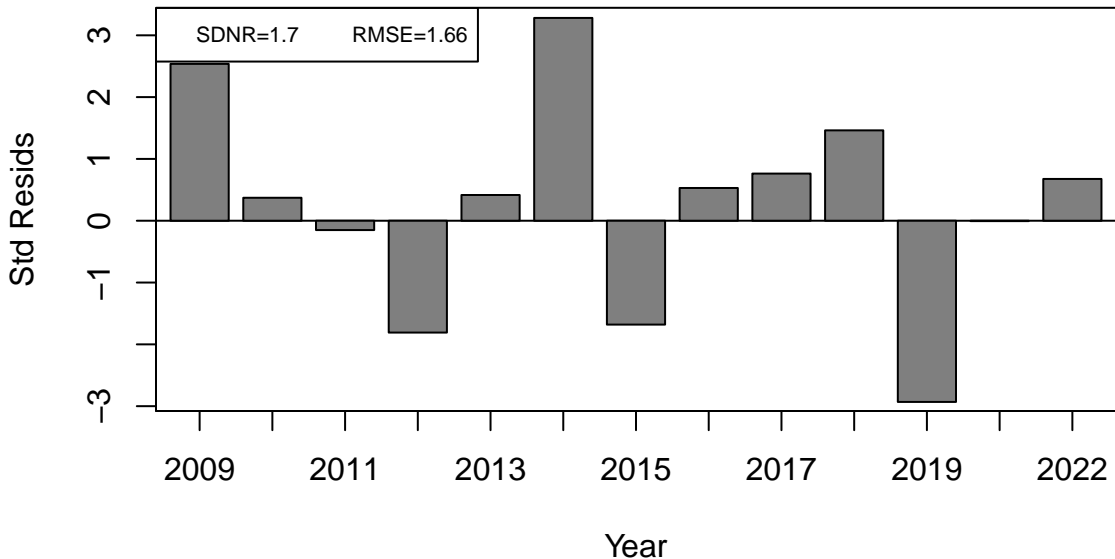
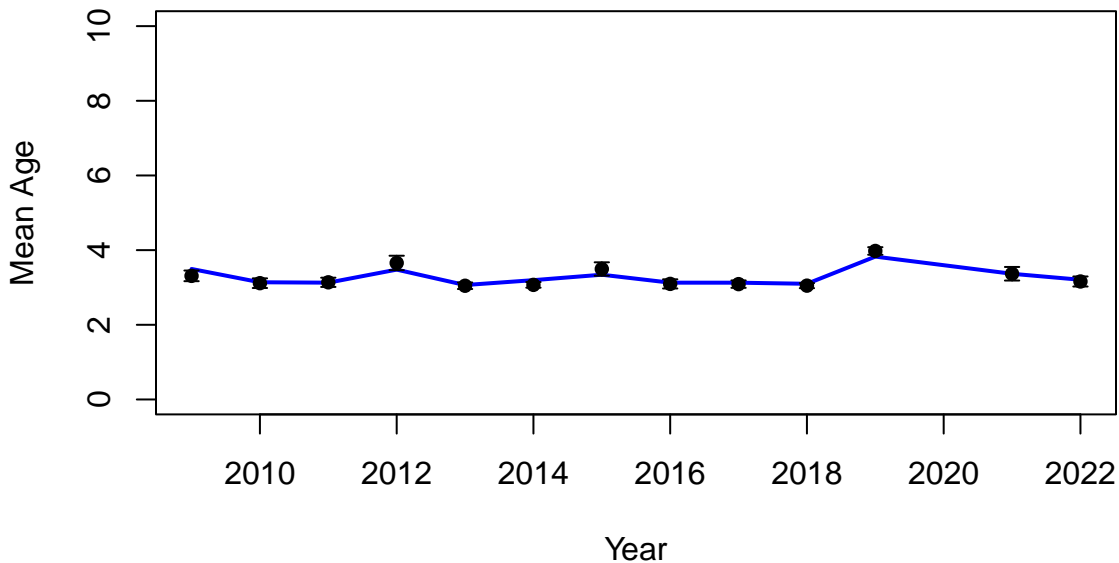
Index Neff 2 (Spring Big 3+)



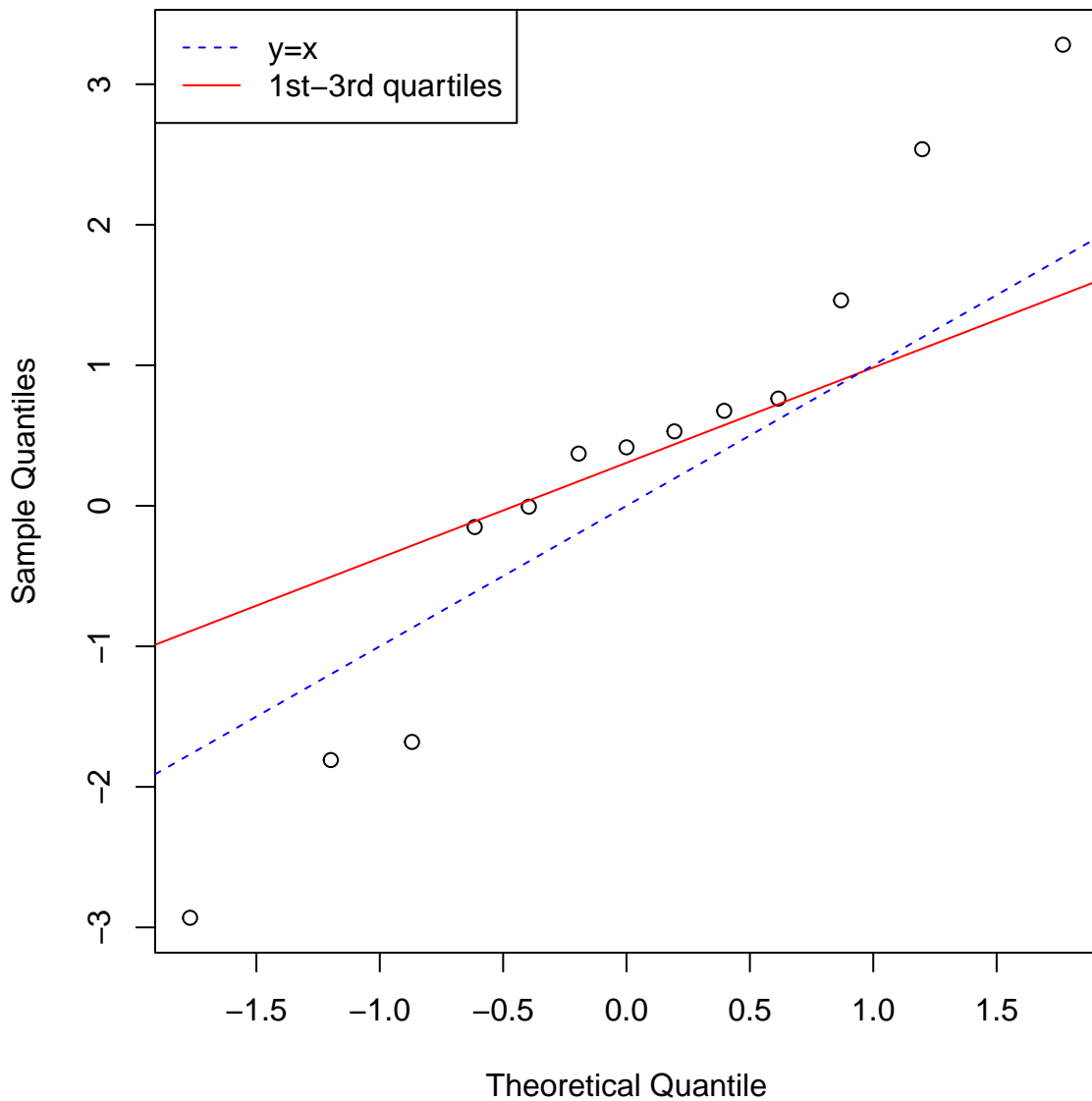
Index Neff 3 (Spring Alb 3+)



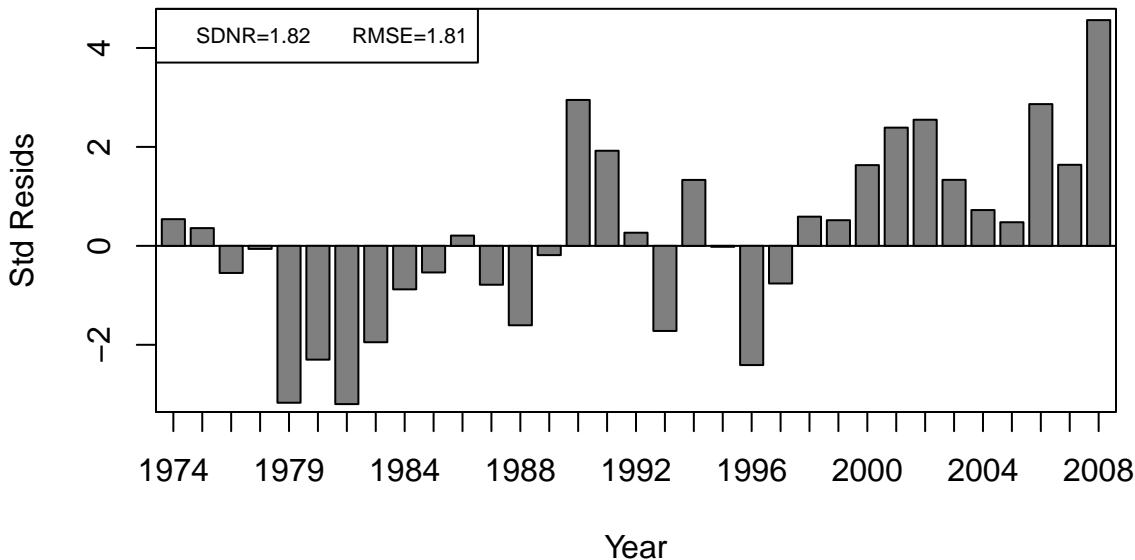
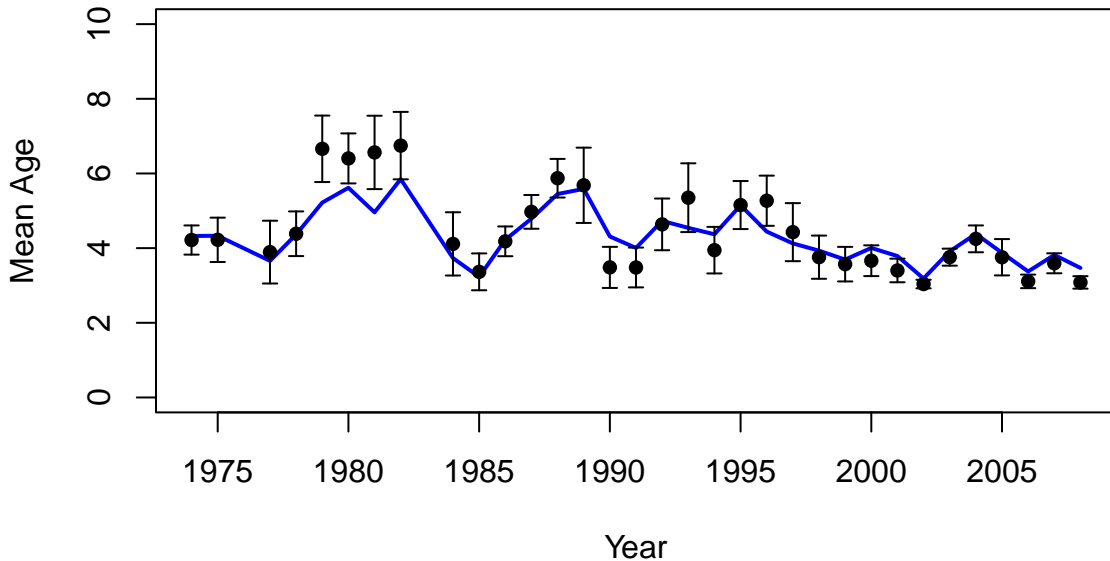
Index 2 (Spring Big 3+) ESS = 45



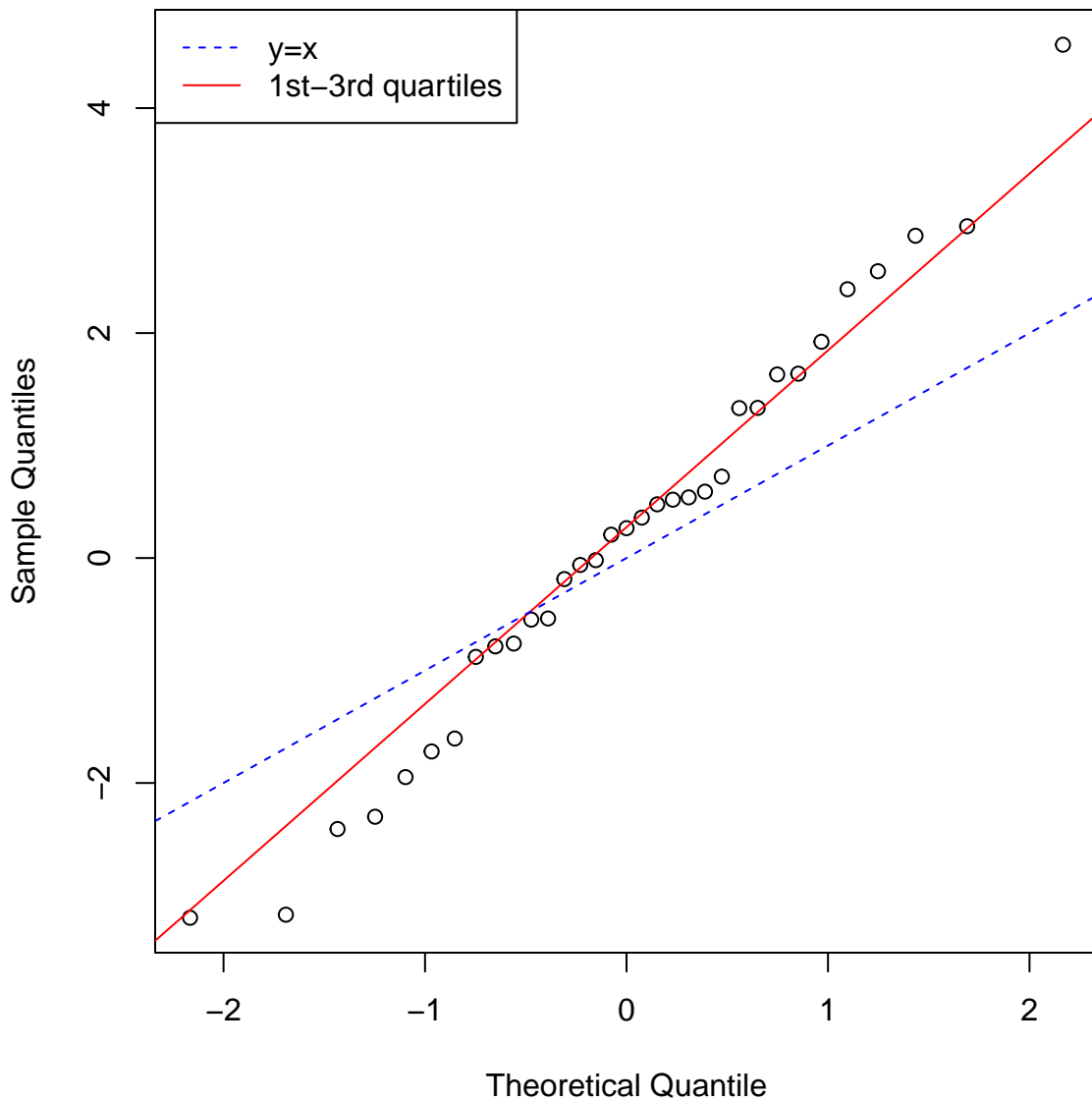
Index 2 (Spring Big 3+) ESS = 45



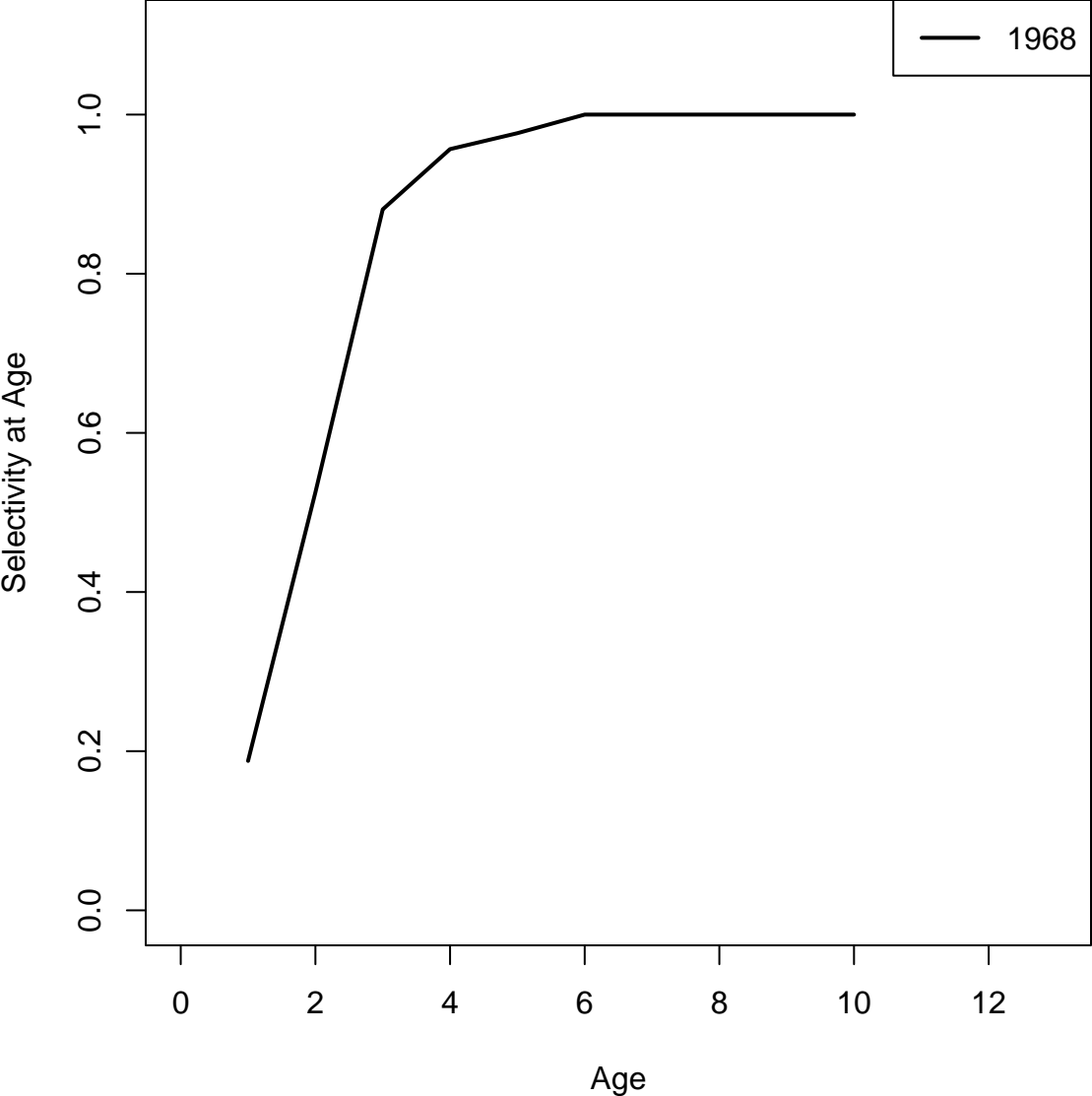
Index 3 (Spring Alb 3+) ESS = 25

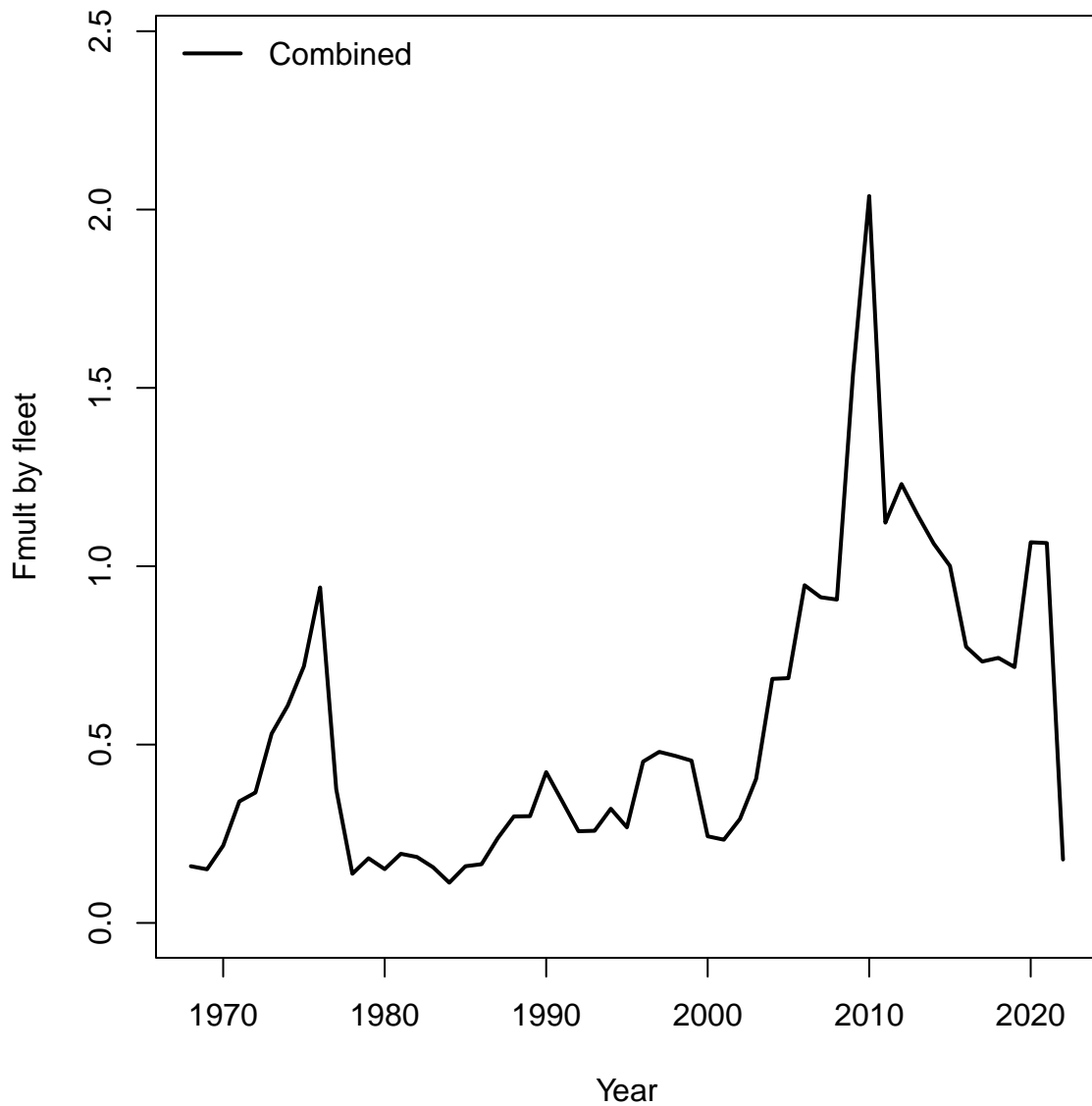


Index 3 (Spring Alb 3+) ESS = 25

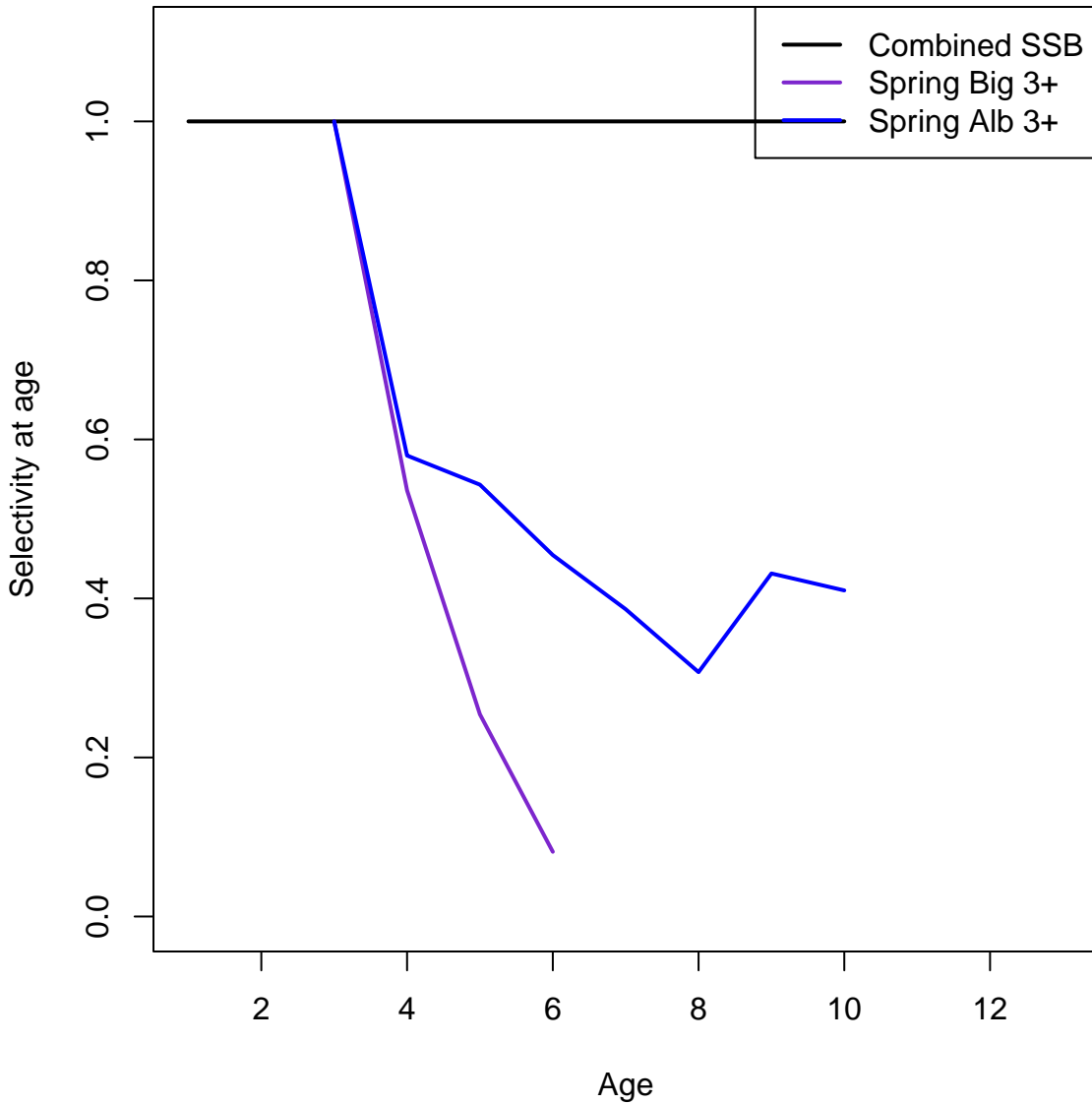


Fleet 1 (Combined)

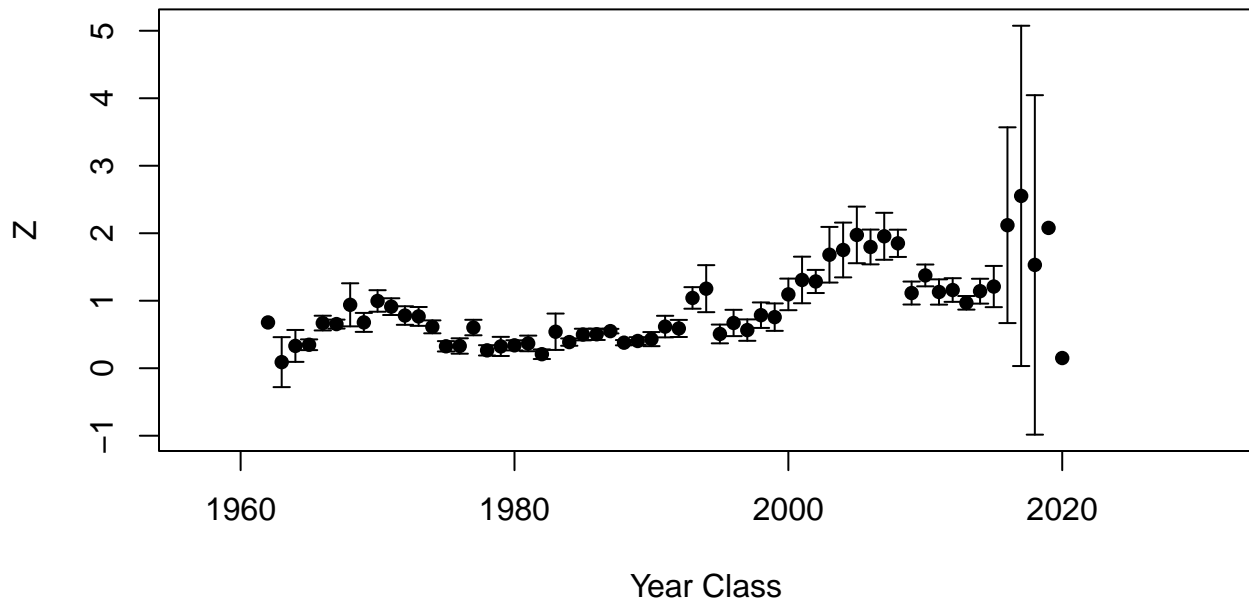
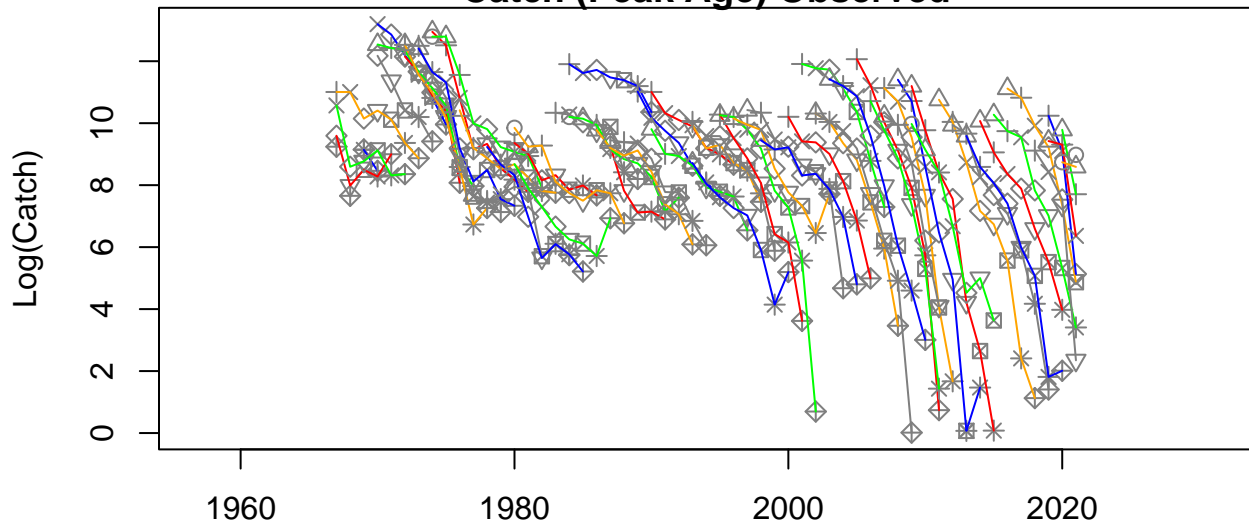




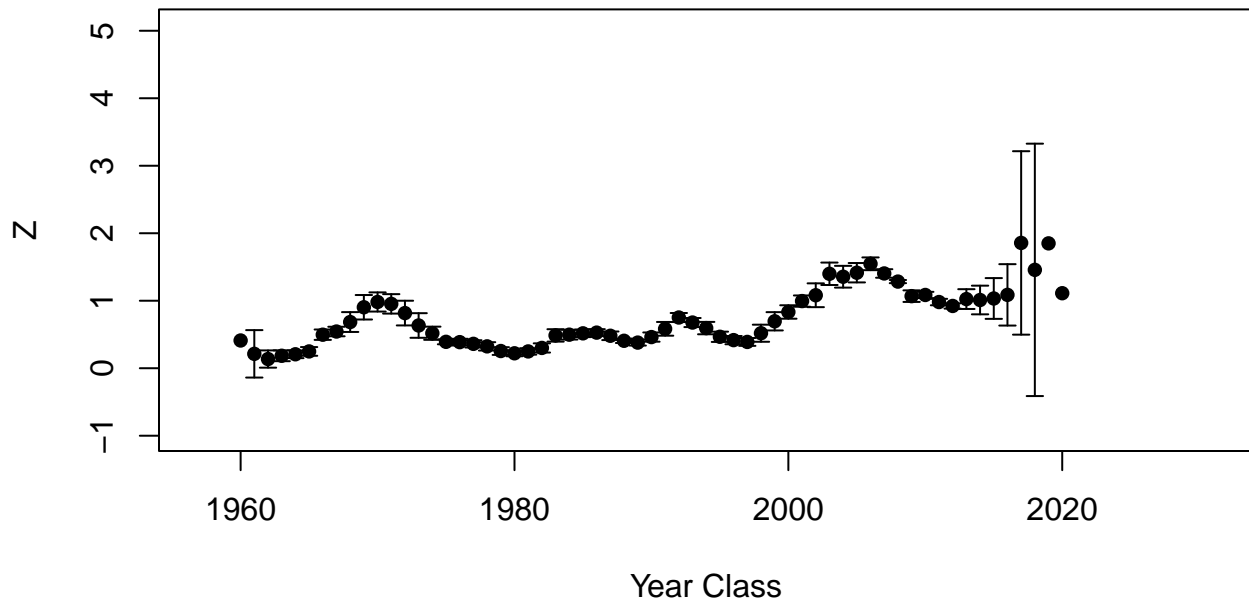
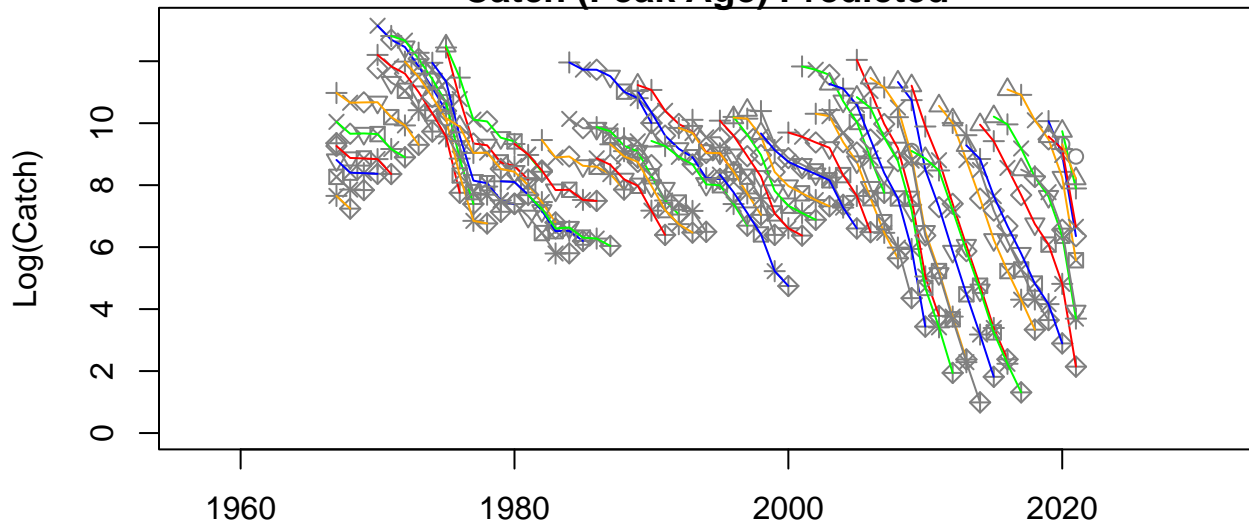
Indices



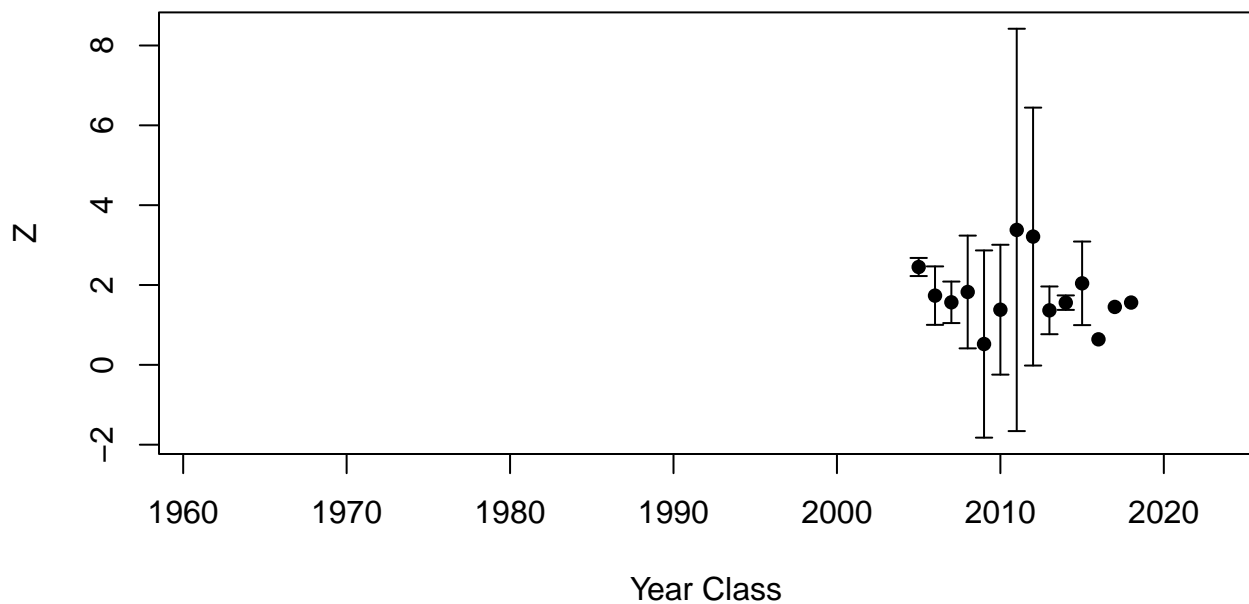
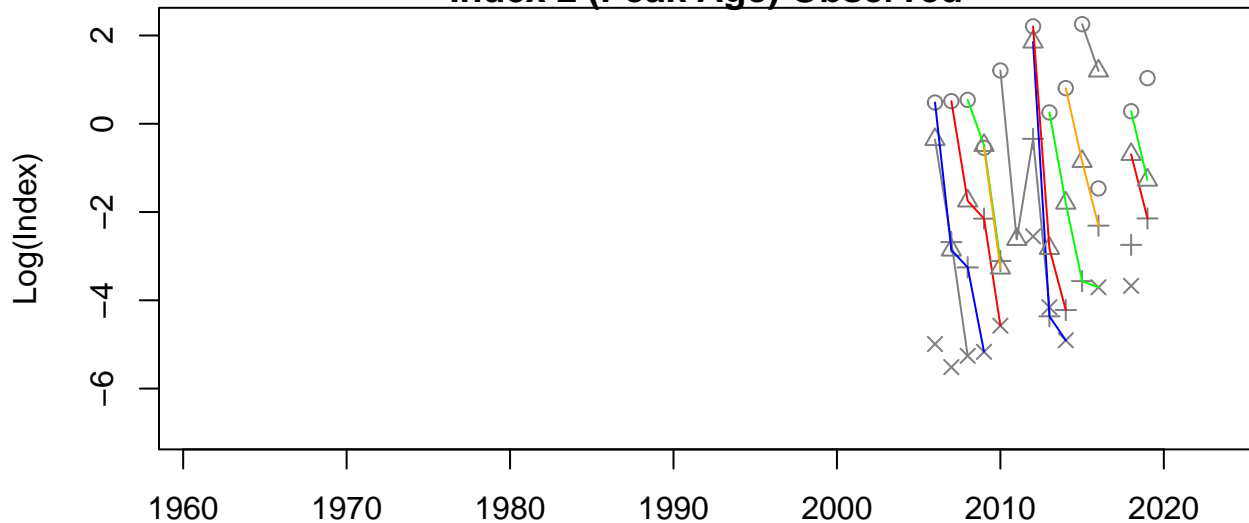
Catch (Peak Age) Observed



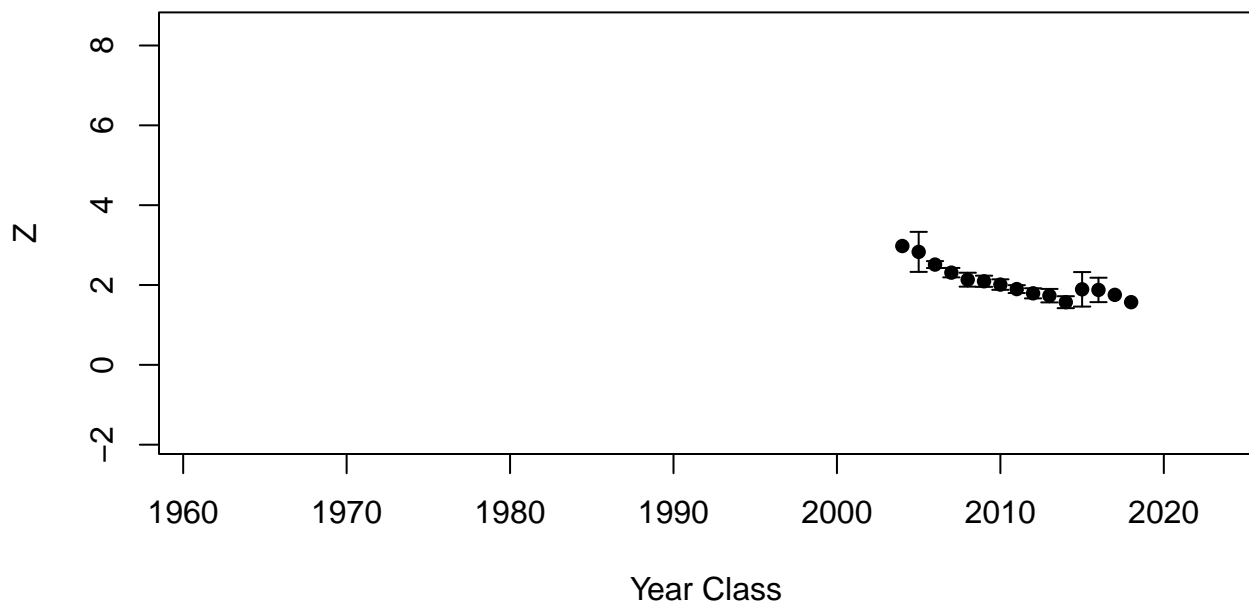
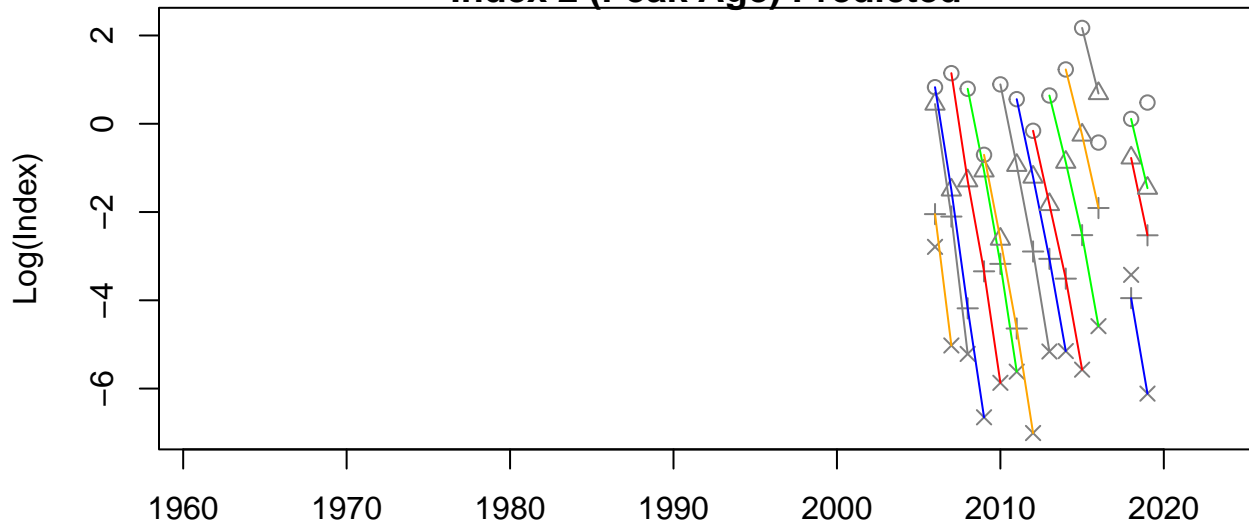
Catch (Peak Age) Predicted



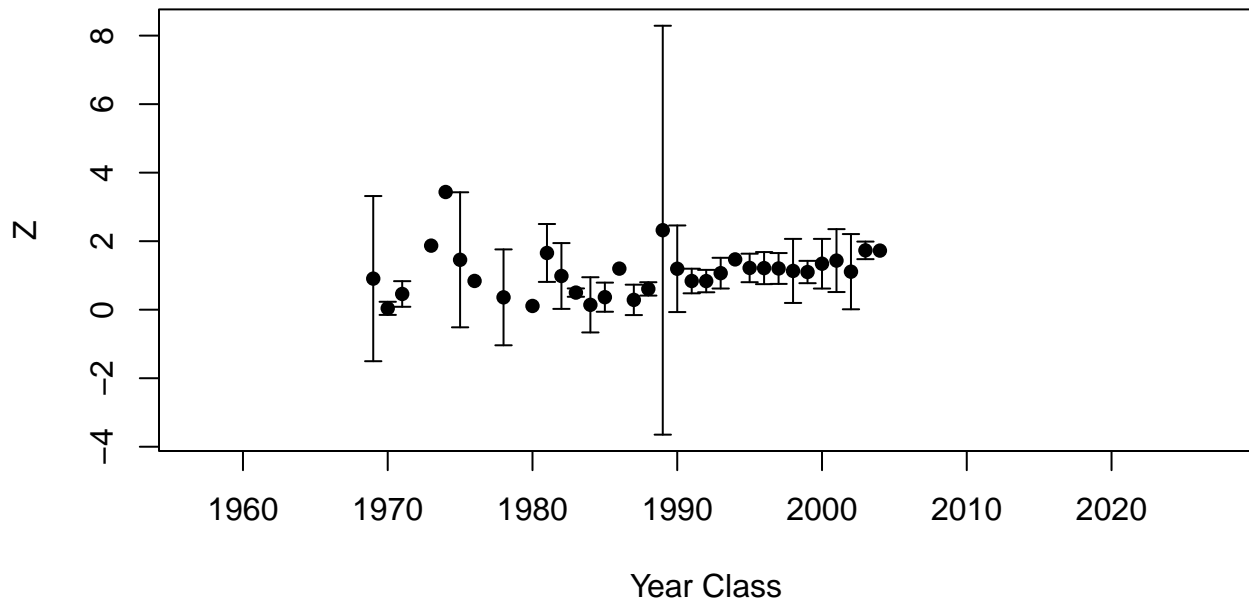
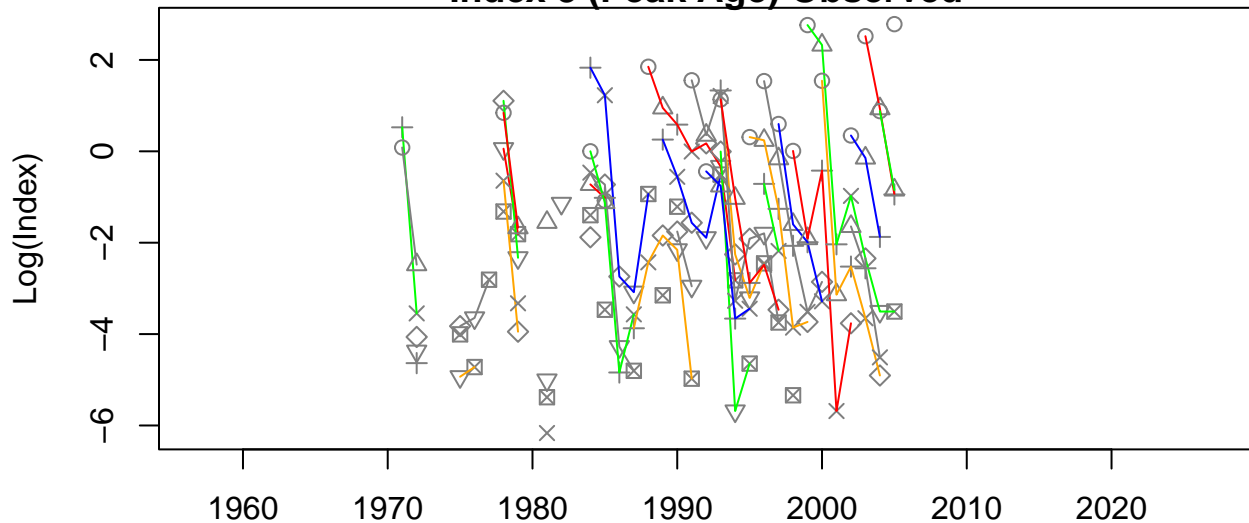
Index 2 (Peak Age) Observed



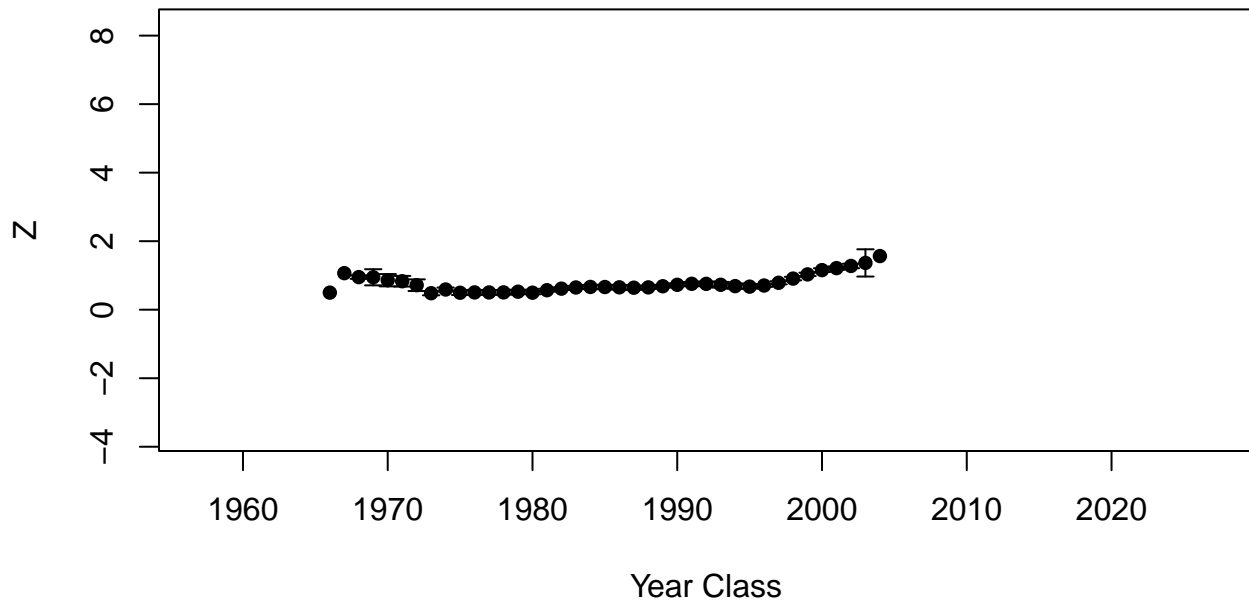
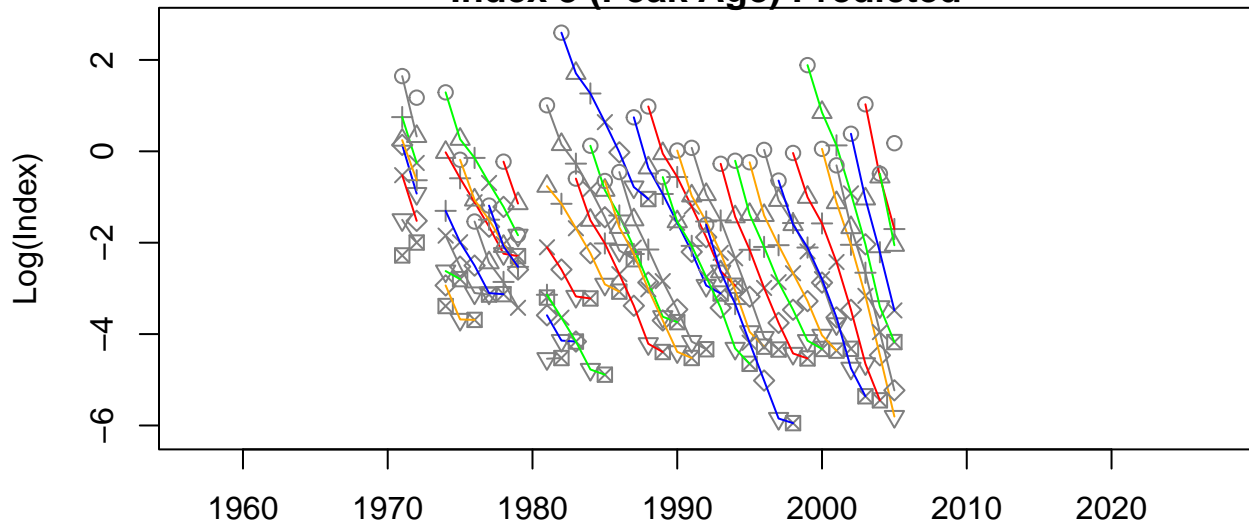
Index 2 (Peak Age) Predicted



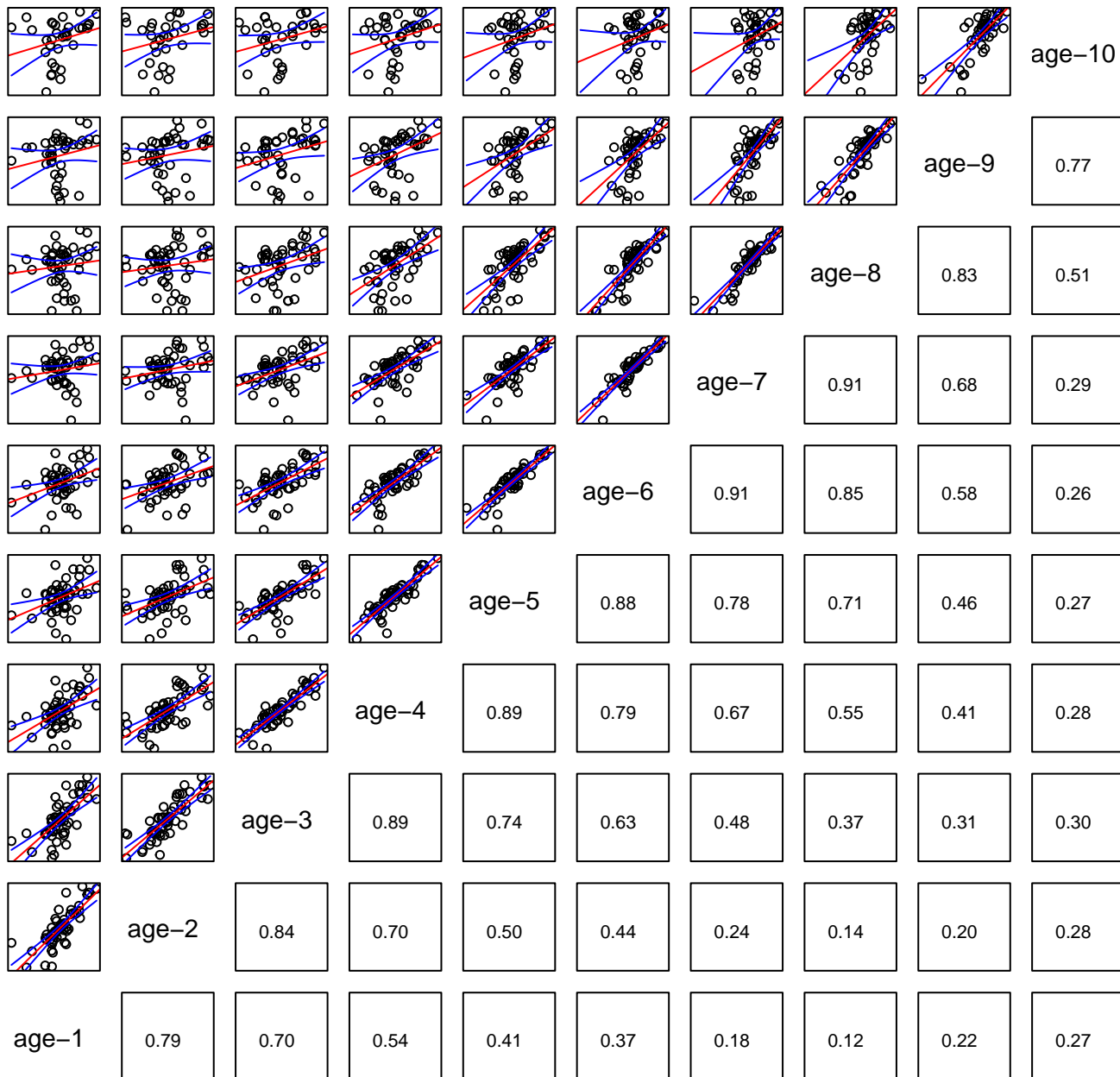
Index 3 (Peak Age) Observed



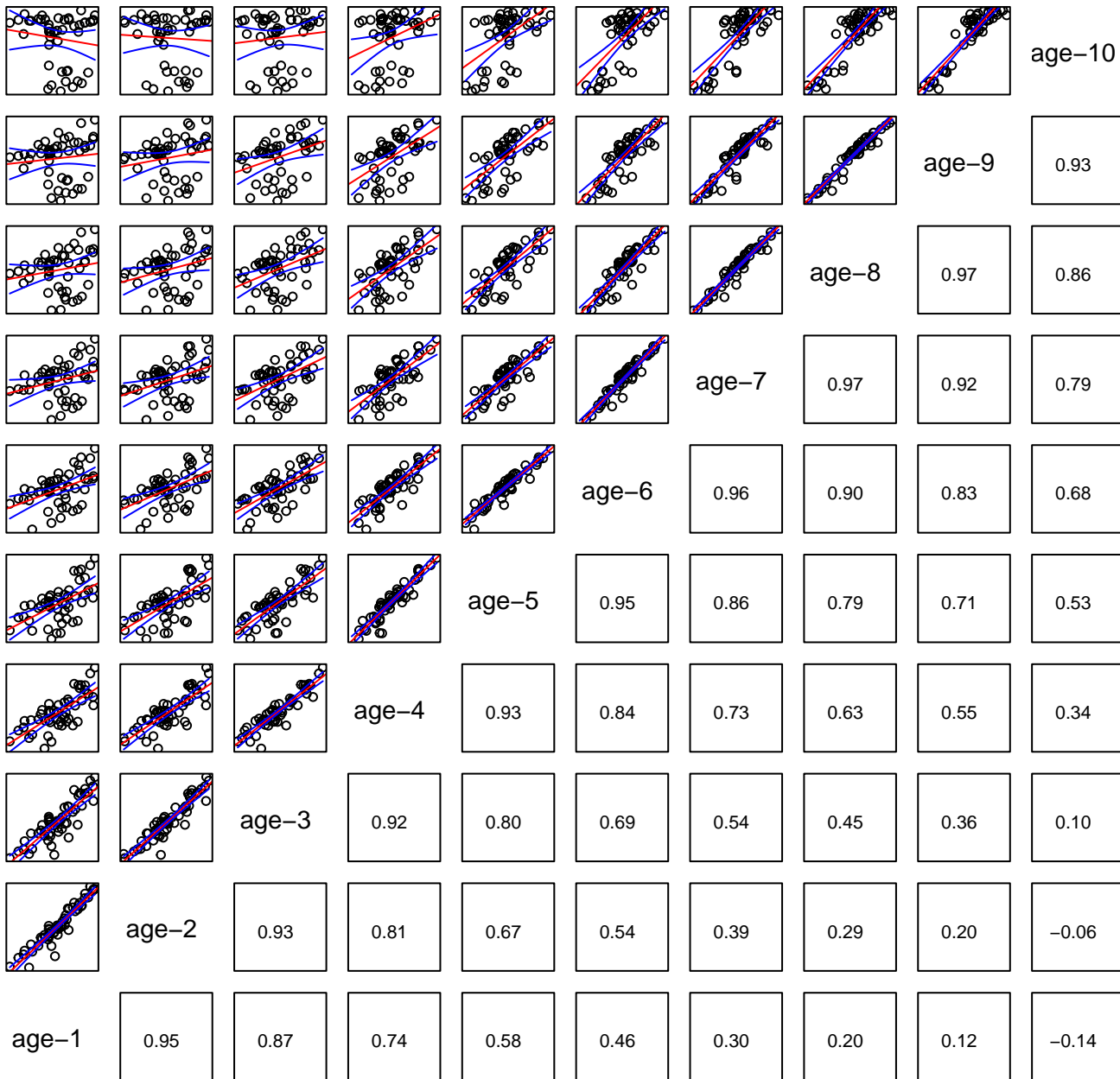
Index 3 (Peak Age) Predicted



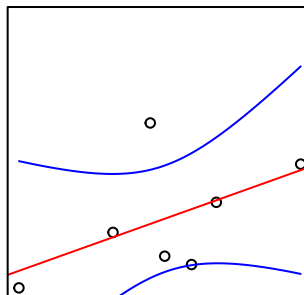
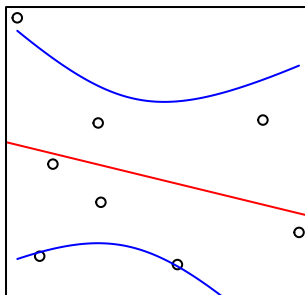
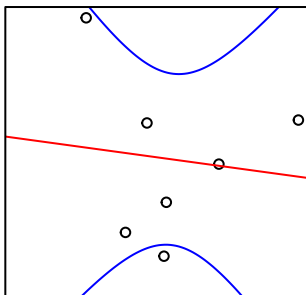
Catch Observed



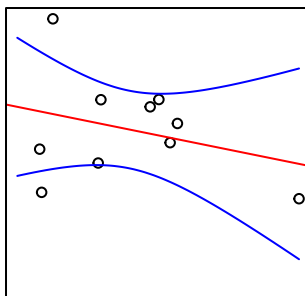
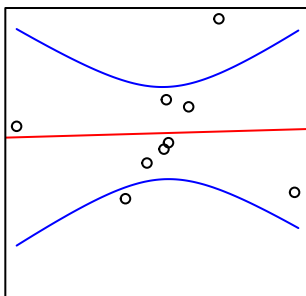
Catch Predicted



Index 2 (Spring Big 3+) Observed

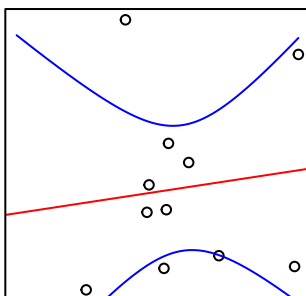


age-6



age-5

0.53



age-4

-0.31

-0.30

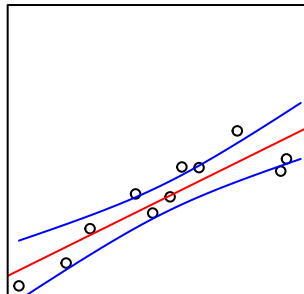
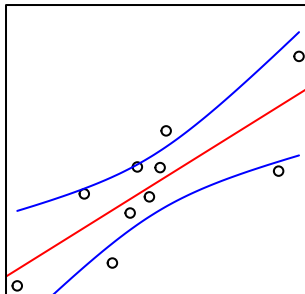
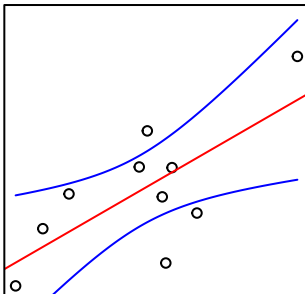
age-3

0.11

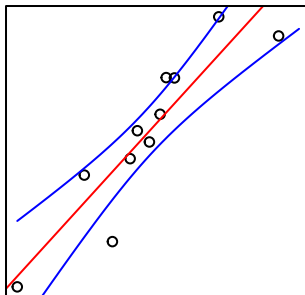
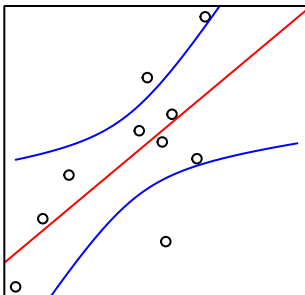
0.04

-0.12

Index 2 (Spring Big 3+) Predicted

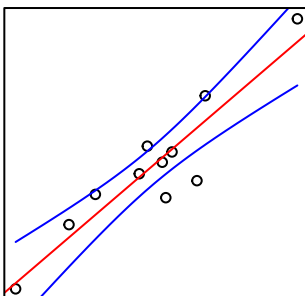


age-6



age-5

0.90



age-4

0.91

0.81

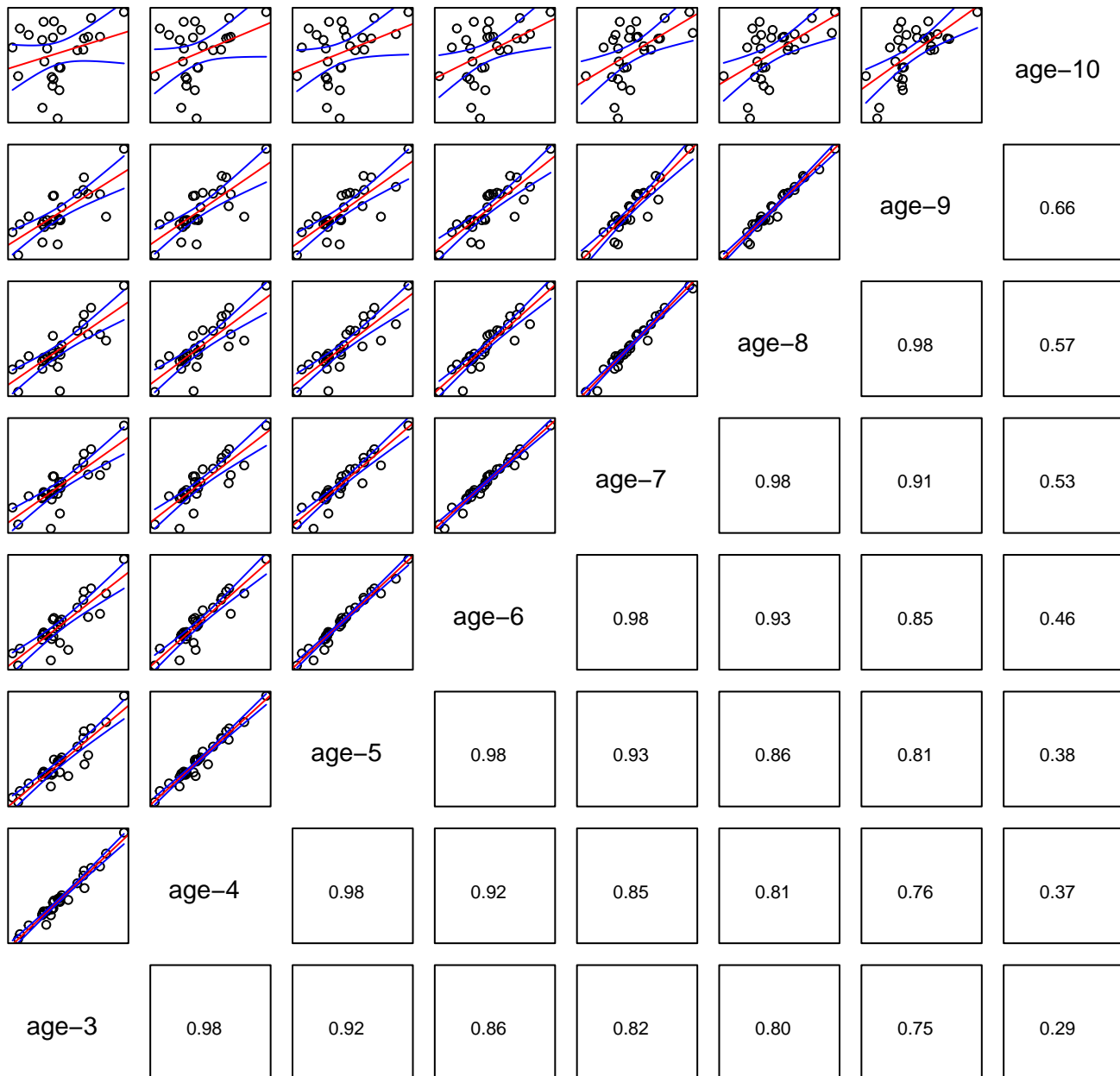
age-3

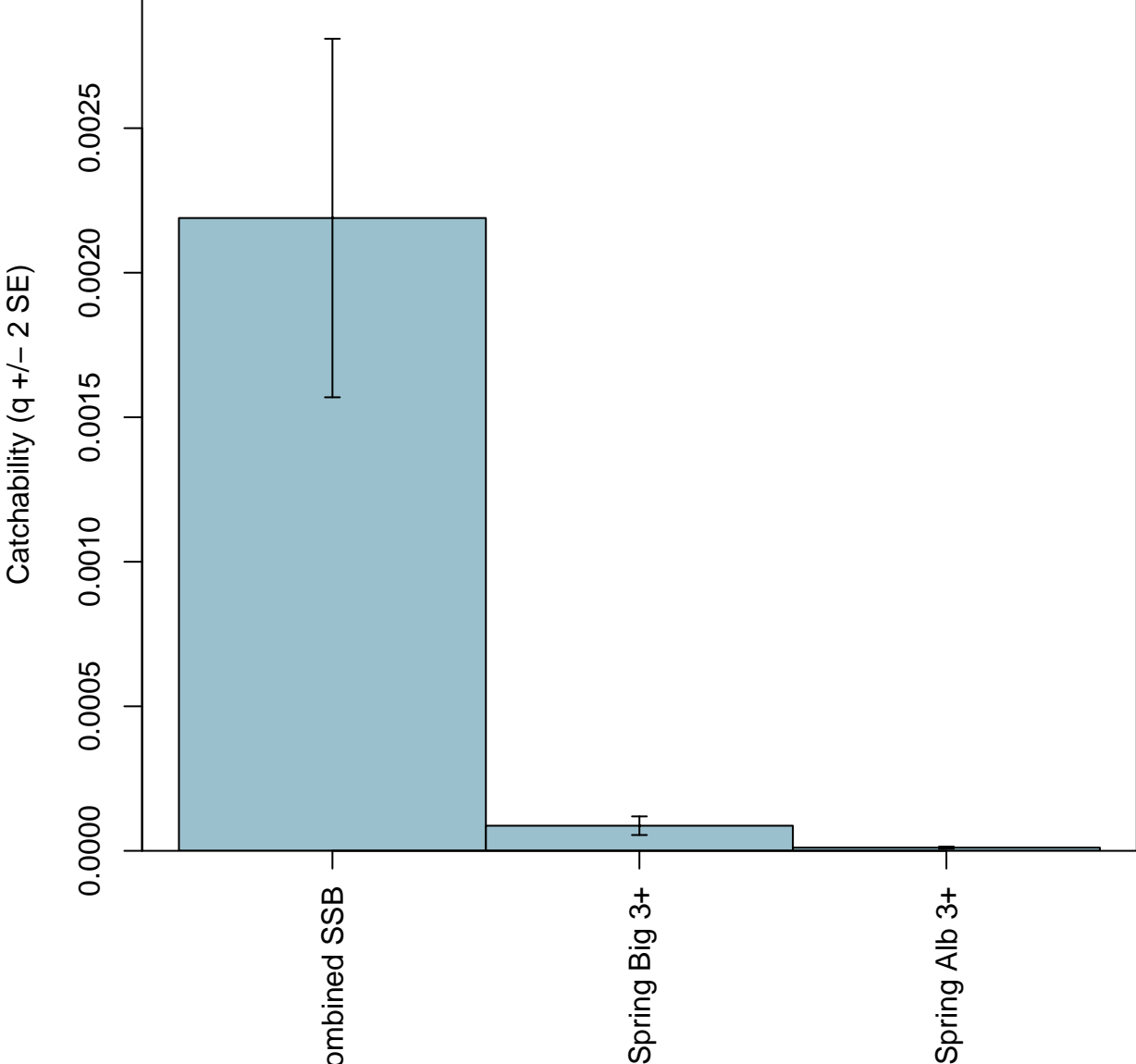
0.92

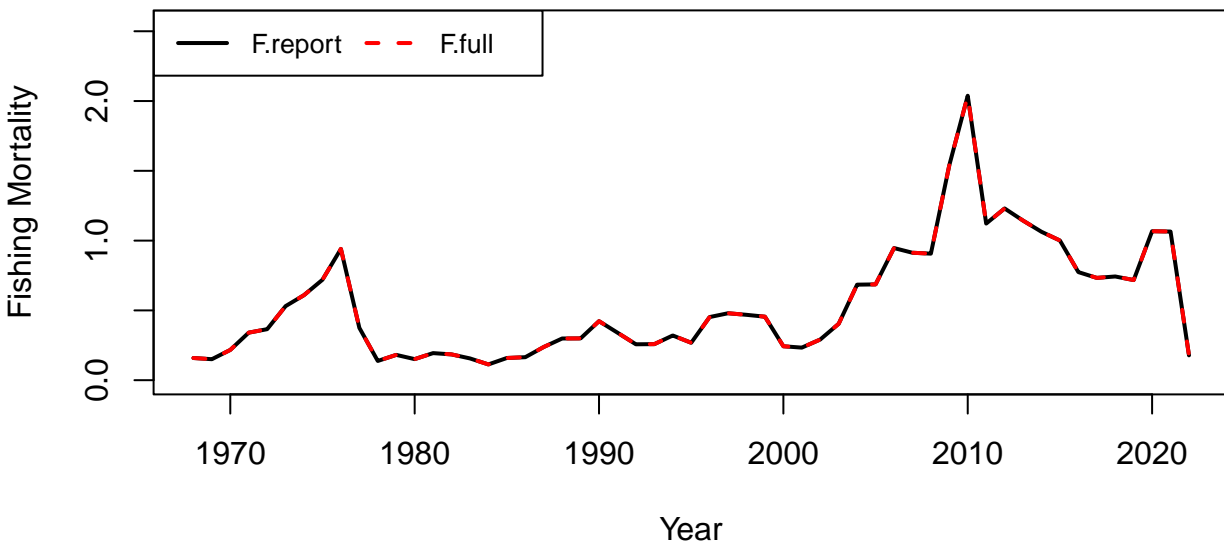
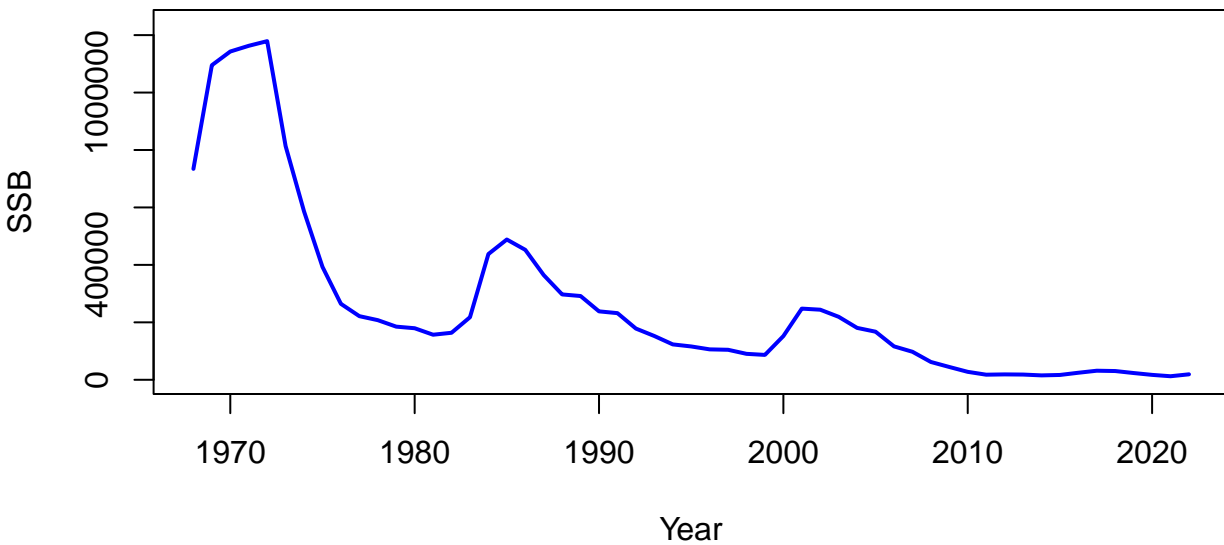
0.69

0.72

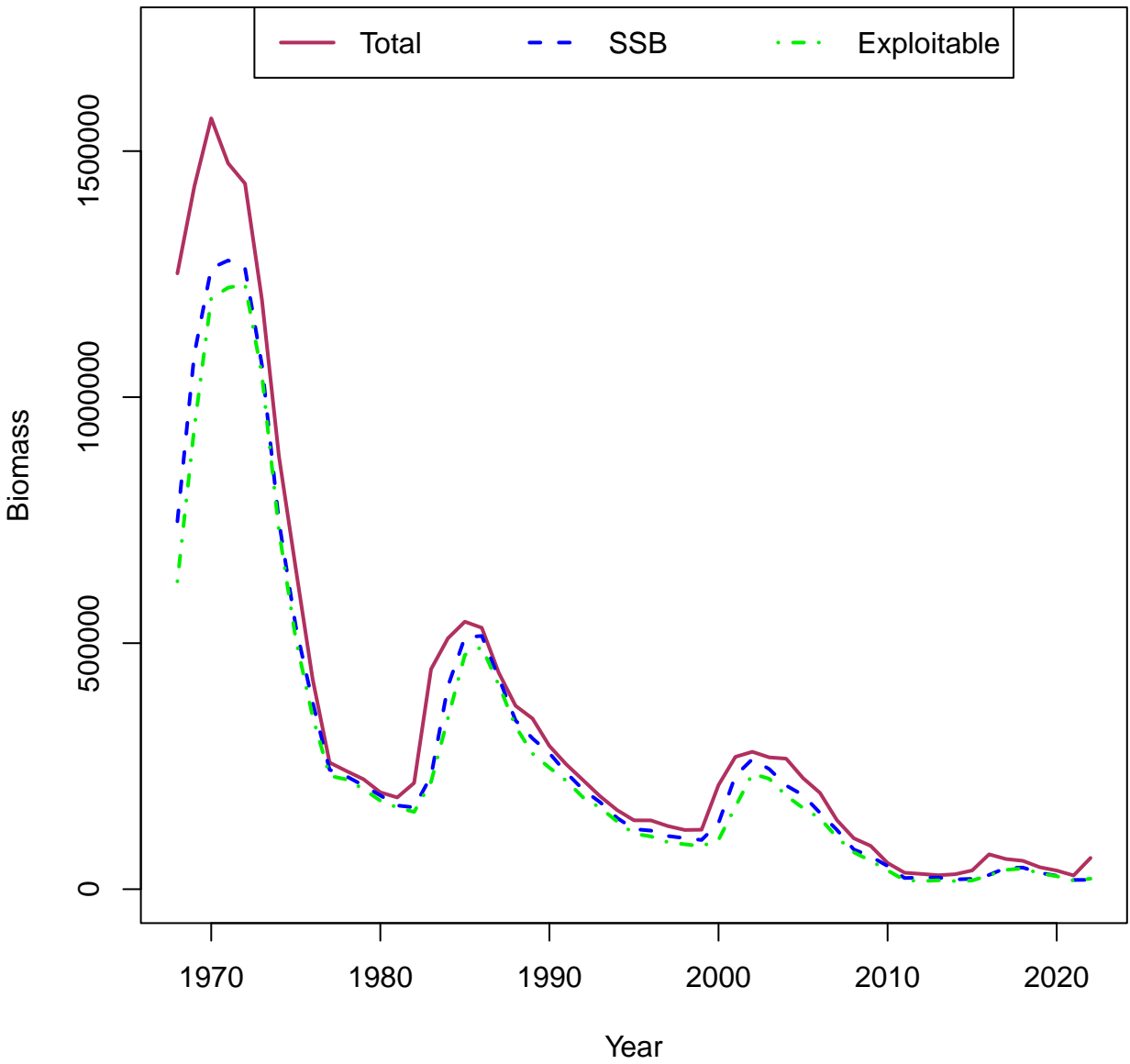
Index 3 (Spring Alb 3+) Predicted

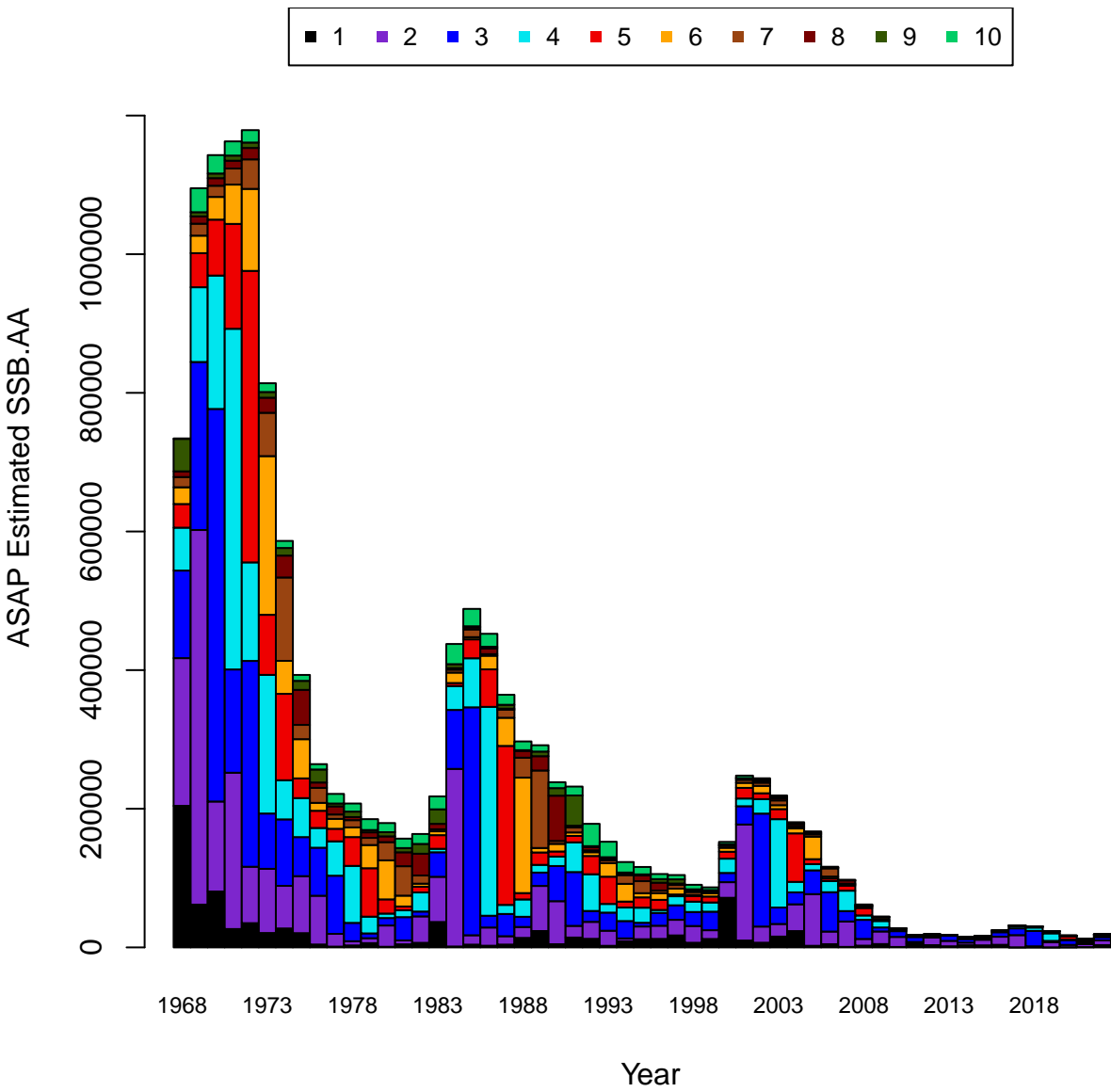


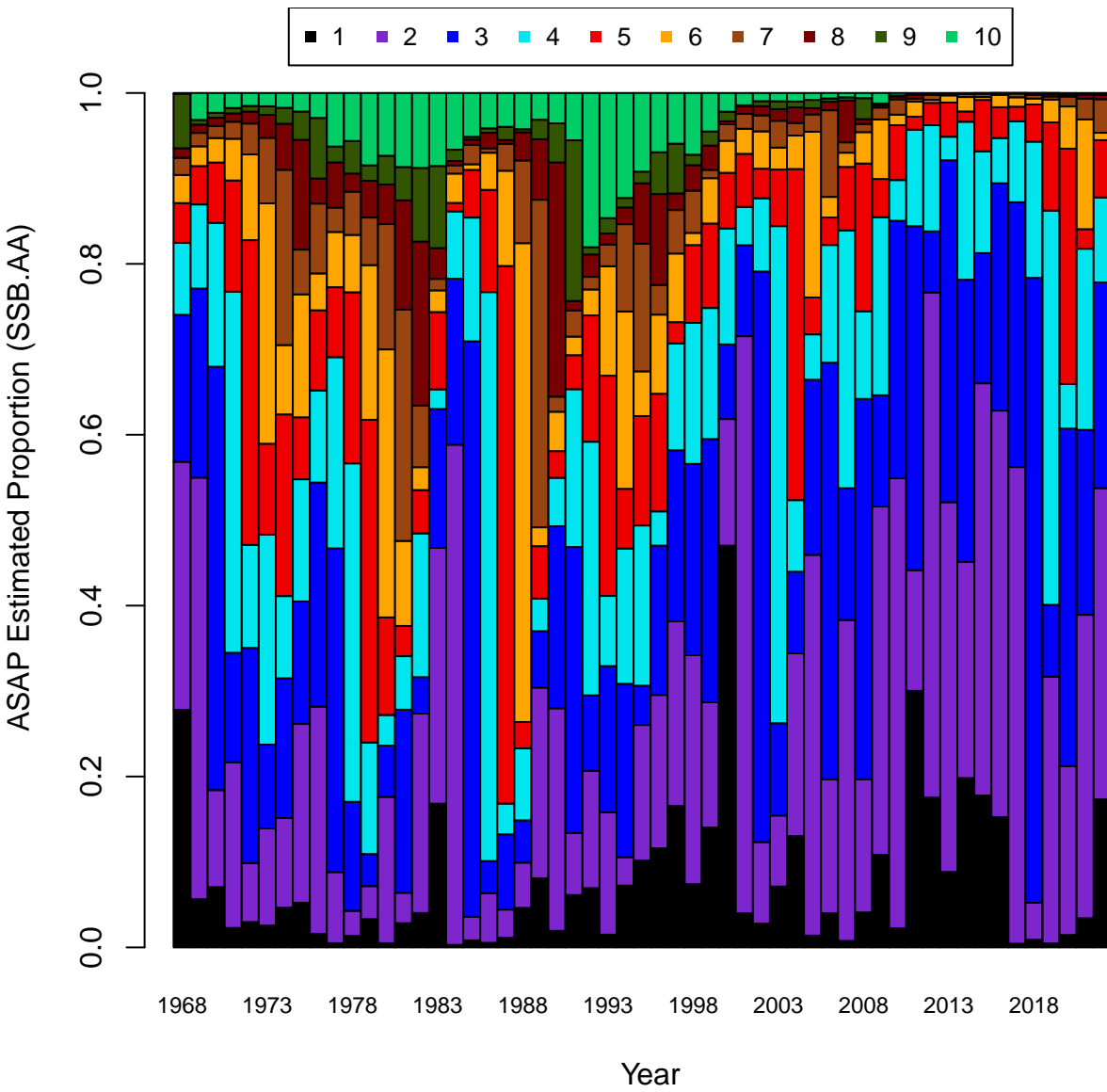


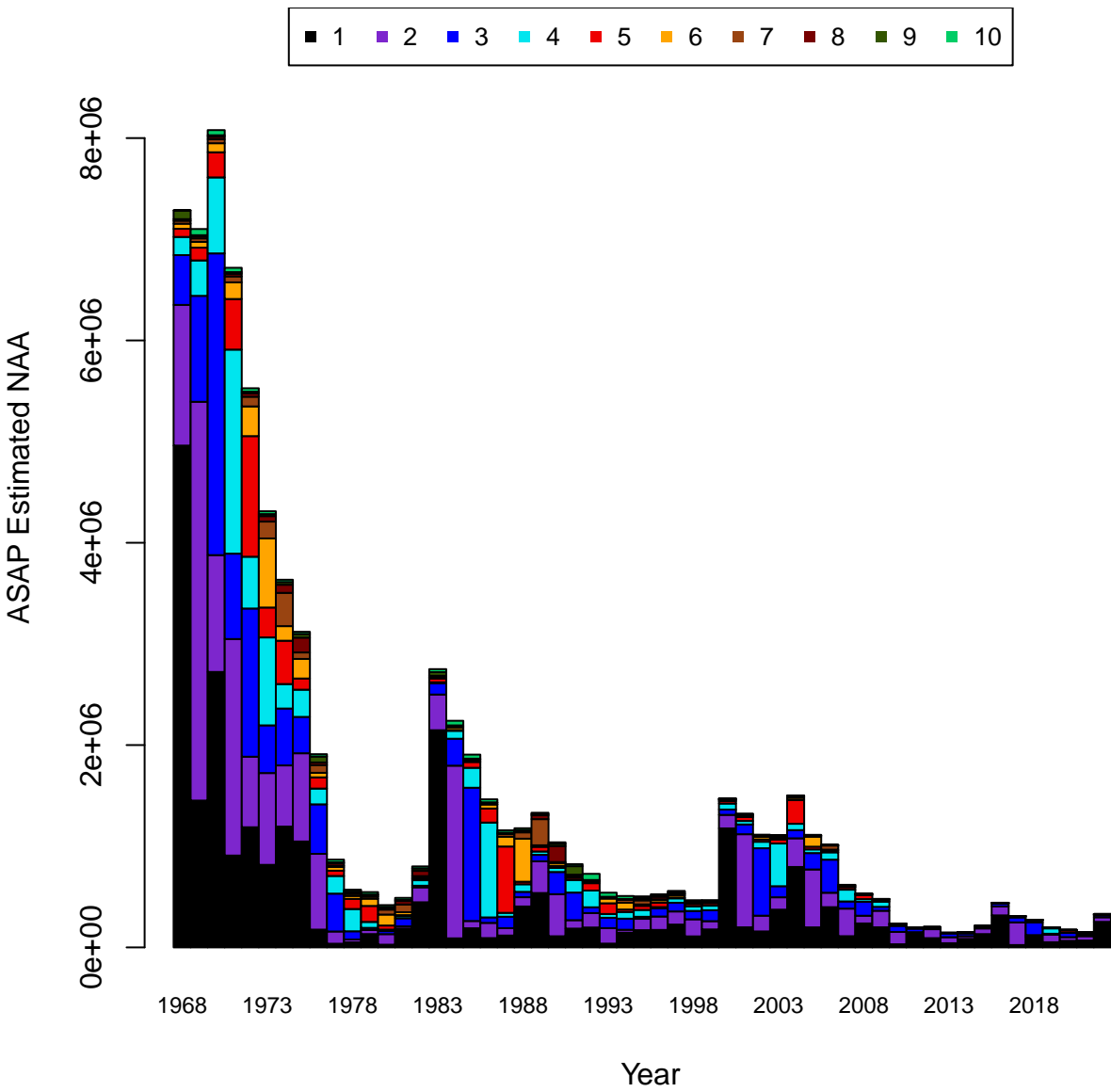


Comparison of January 1 Biomass

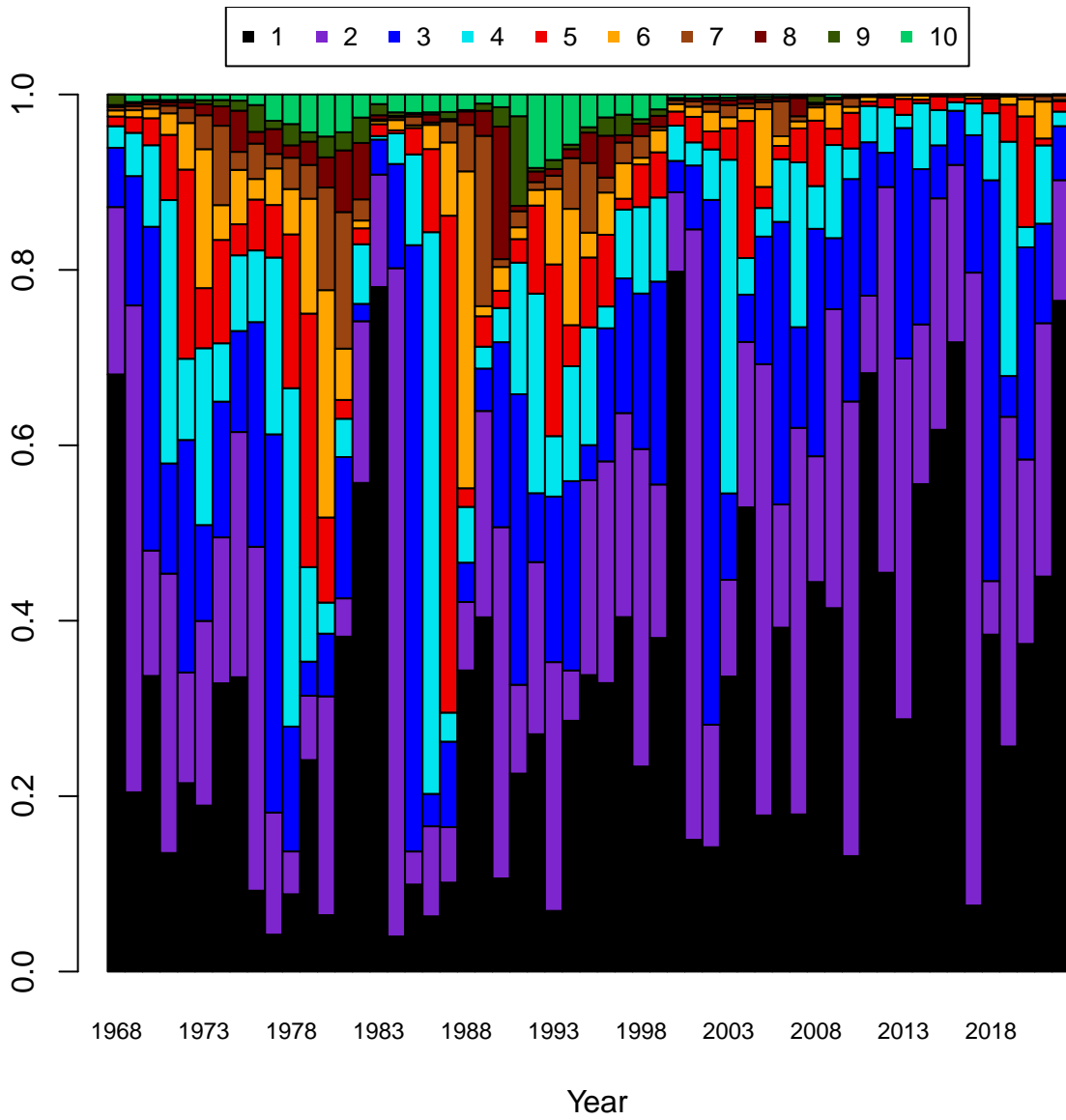


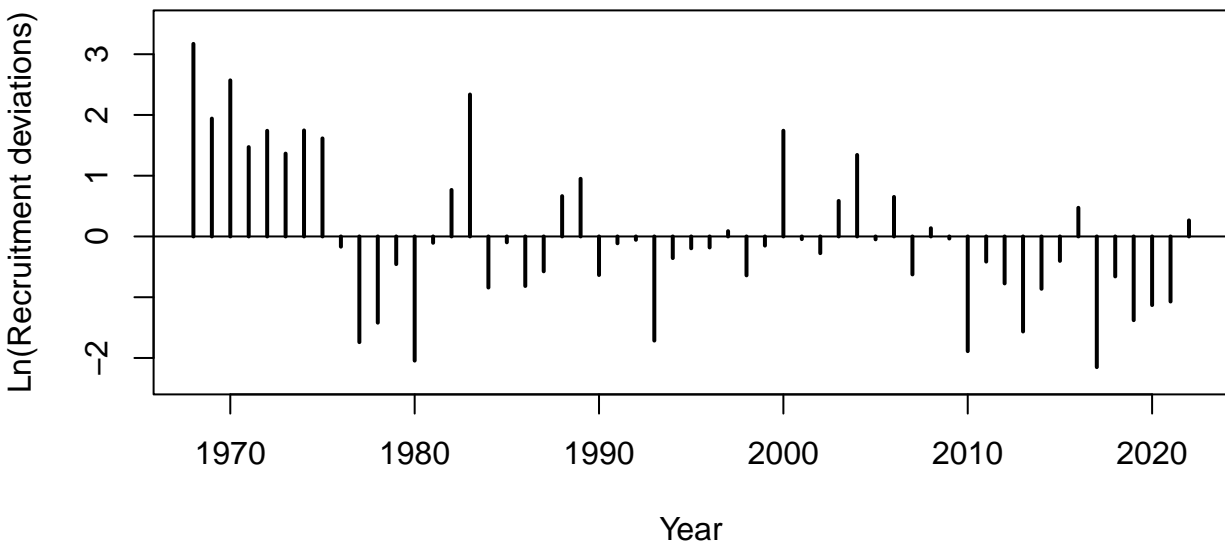
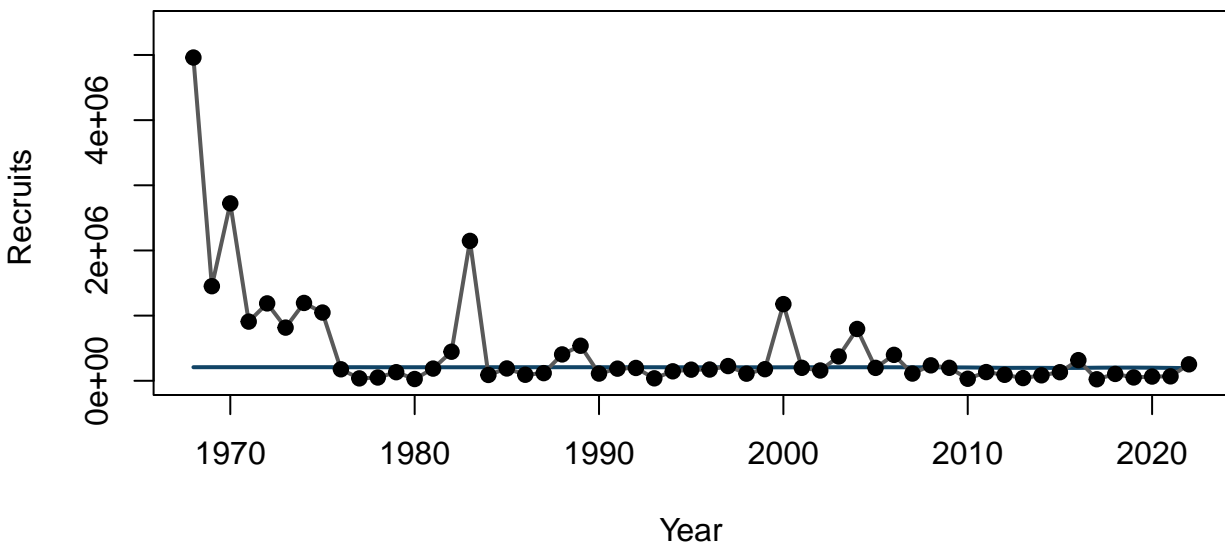


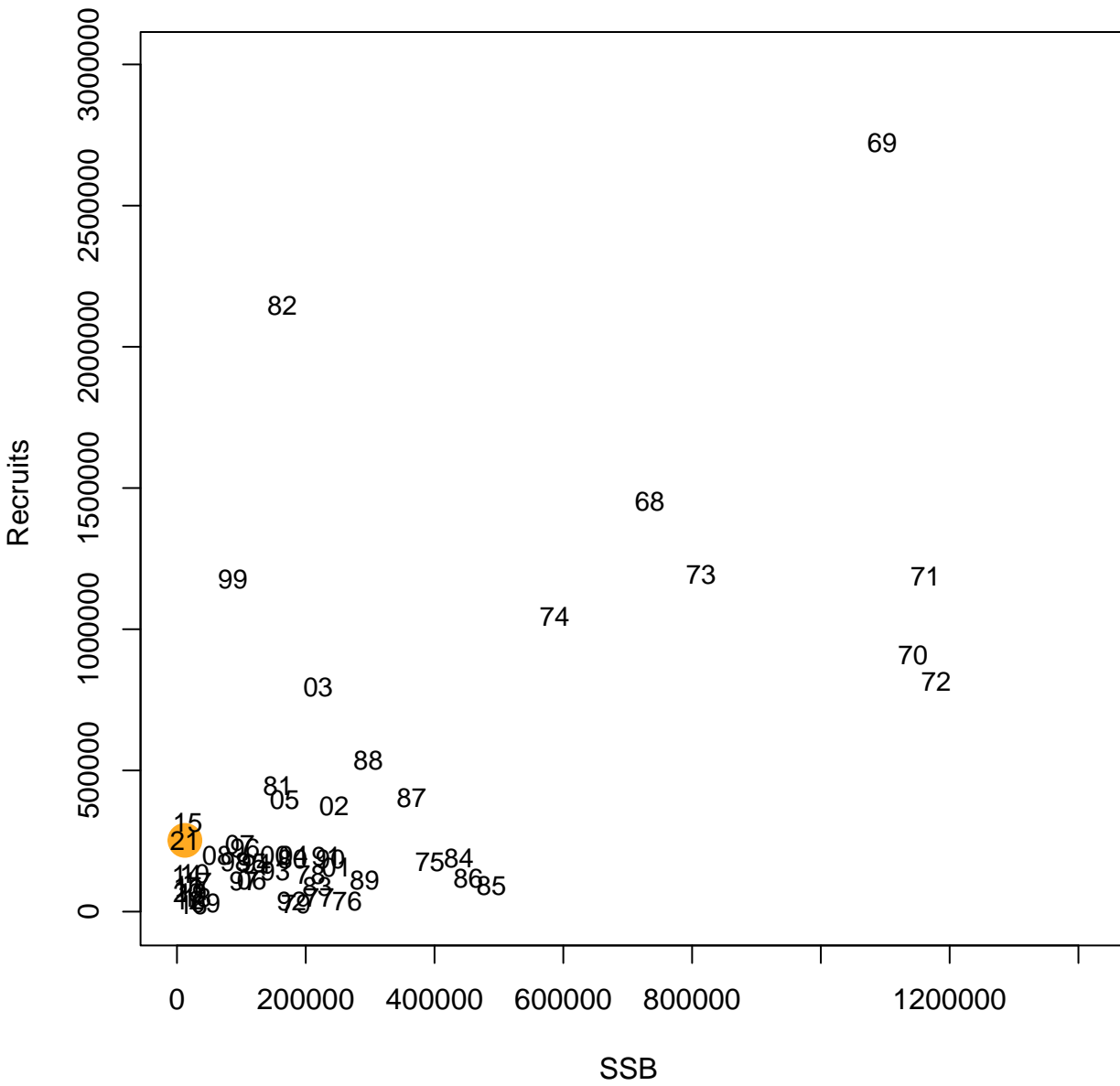


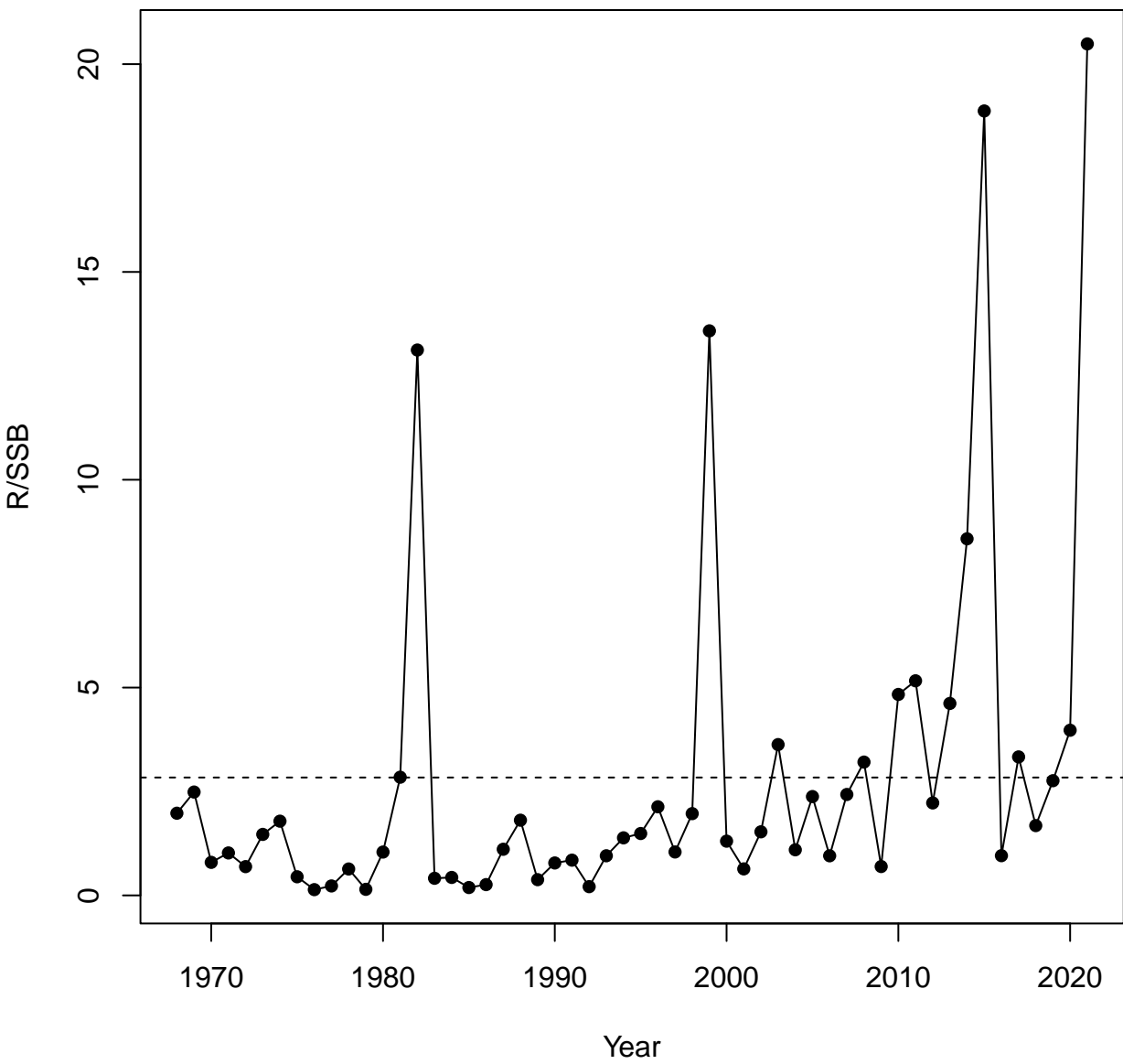


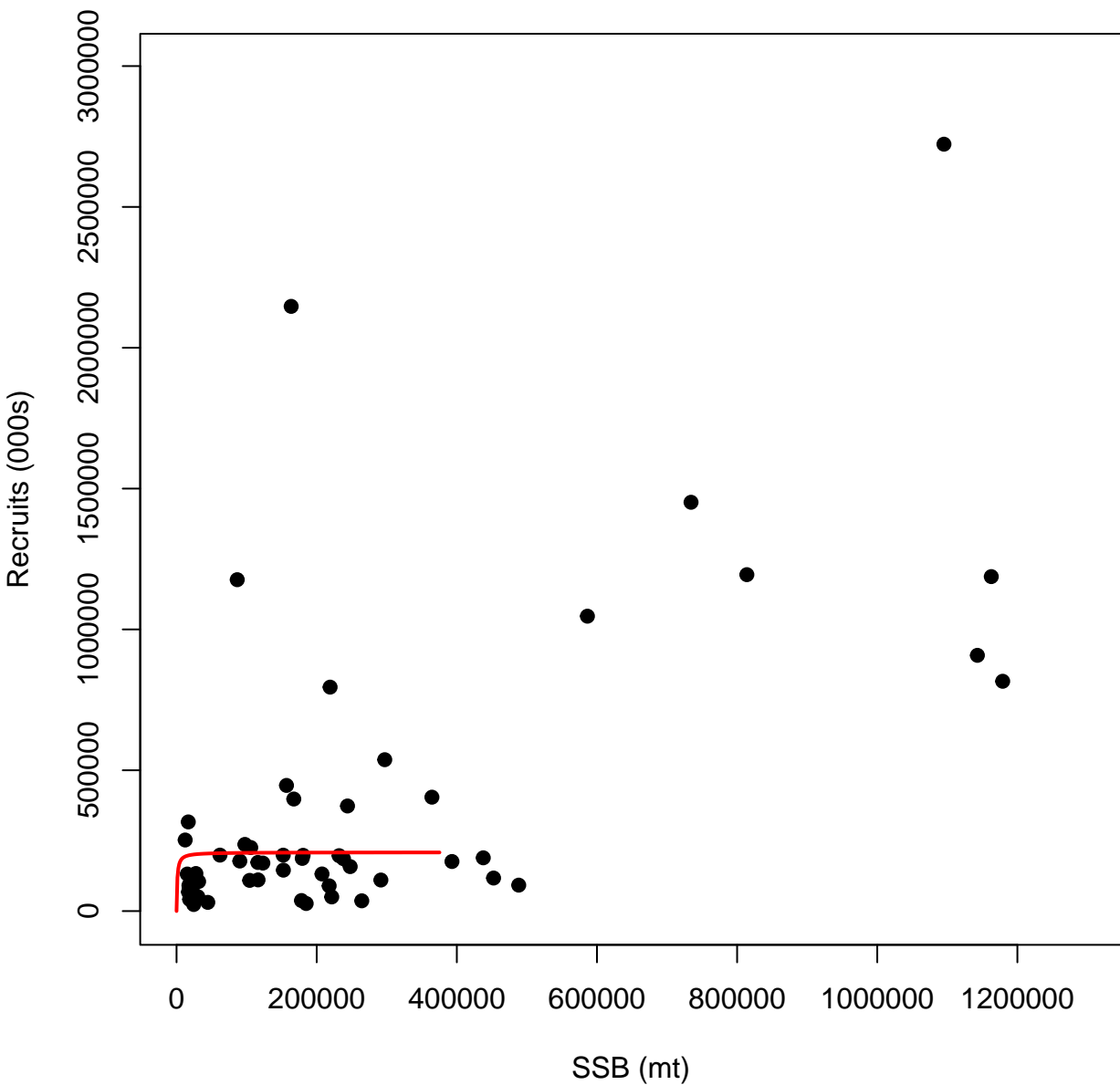
ASAP Estimated Proportion (NAA)

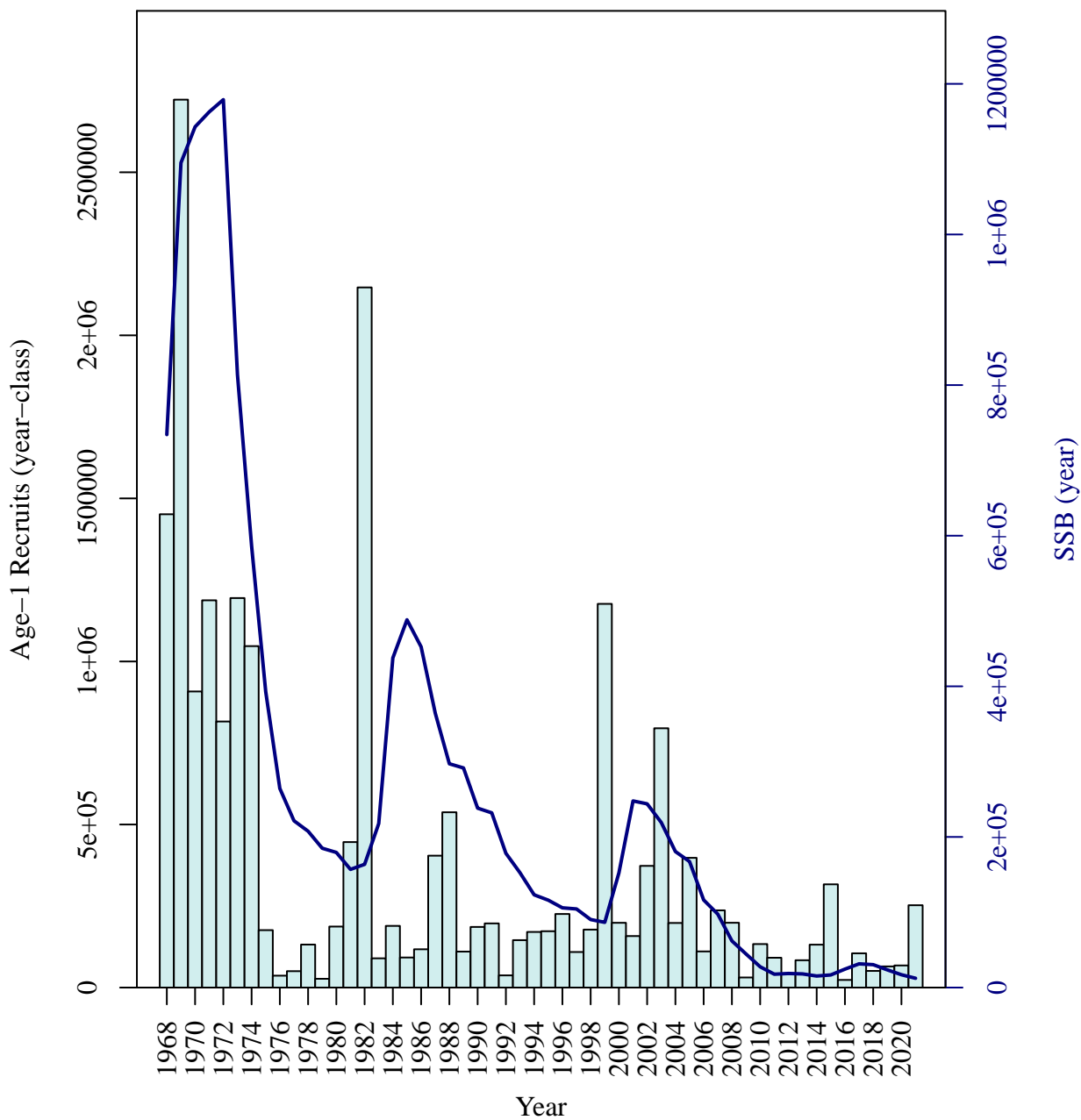


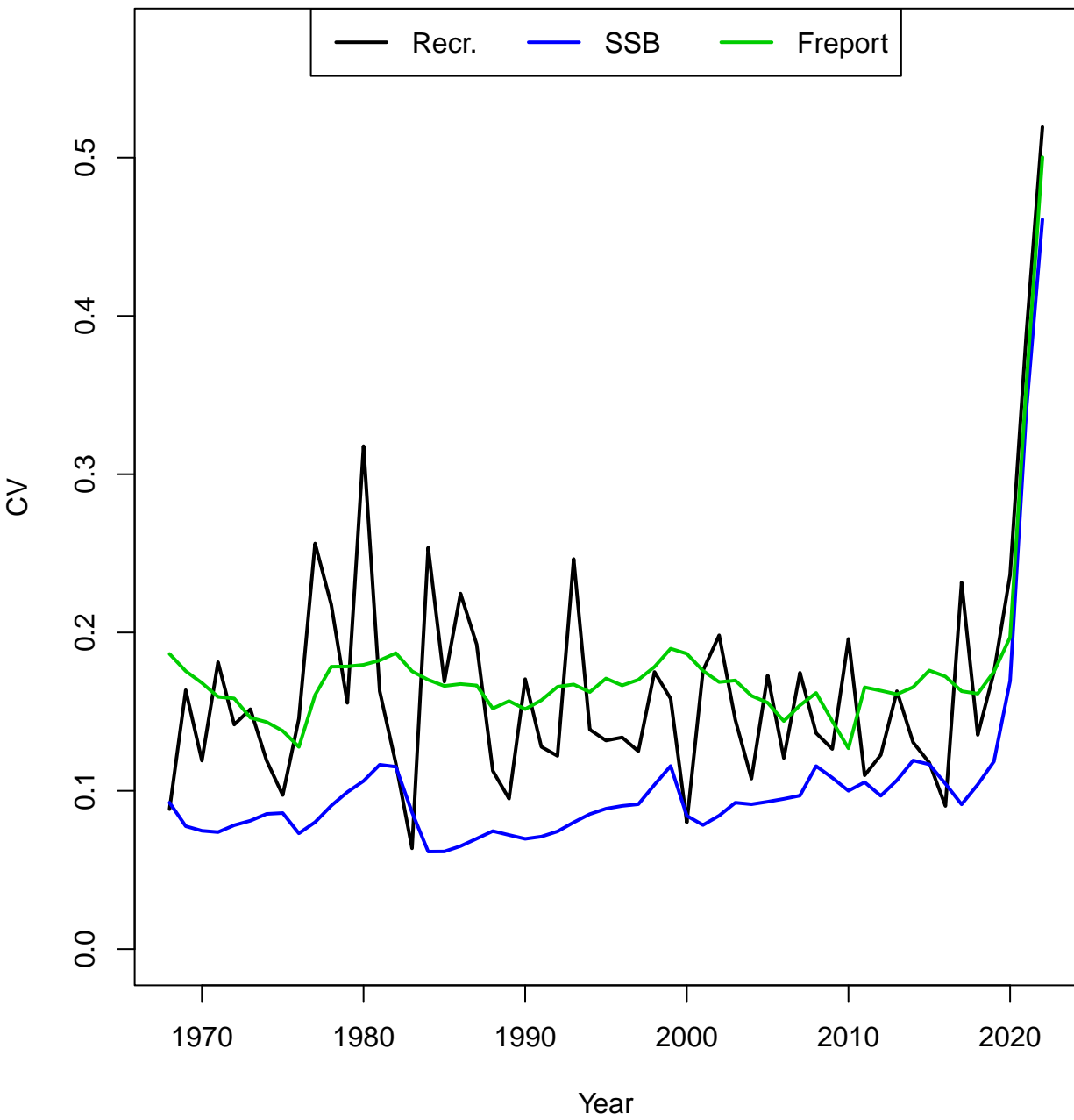




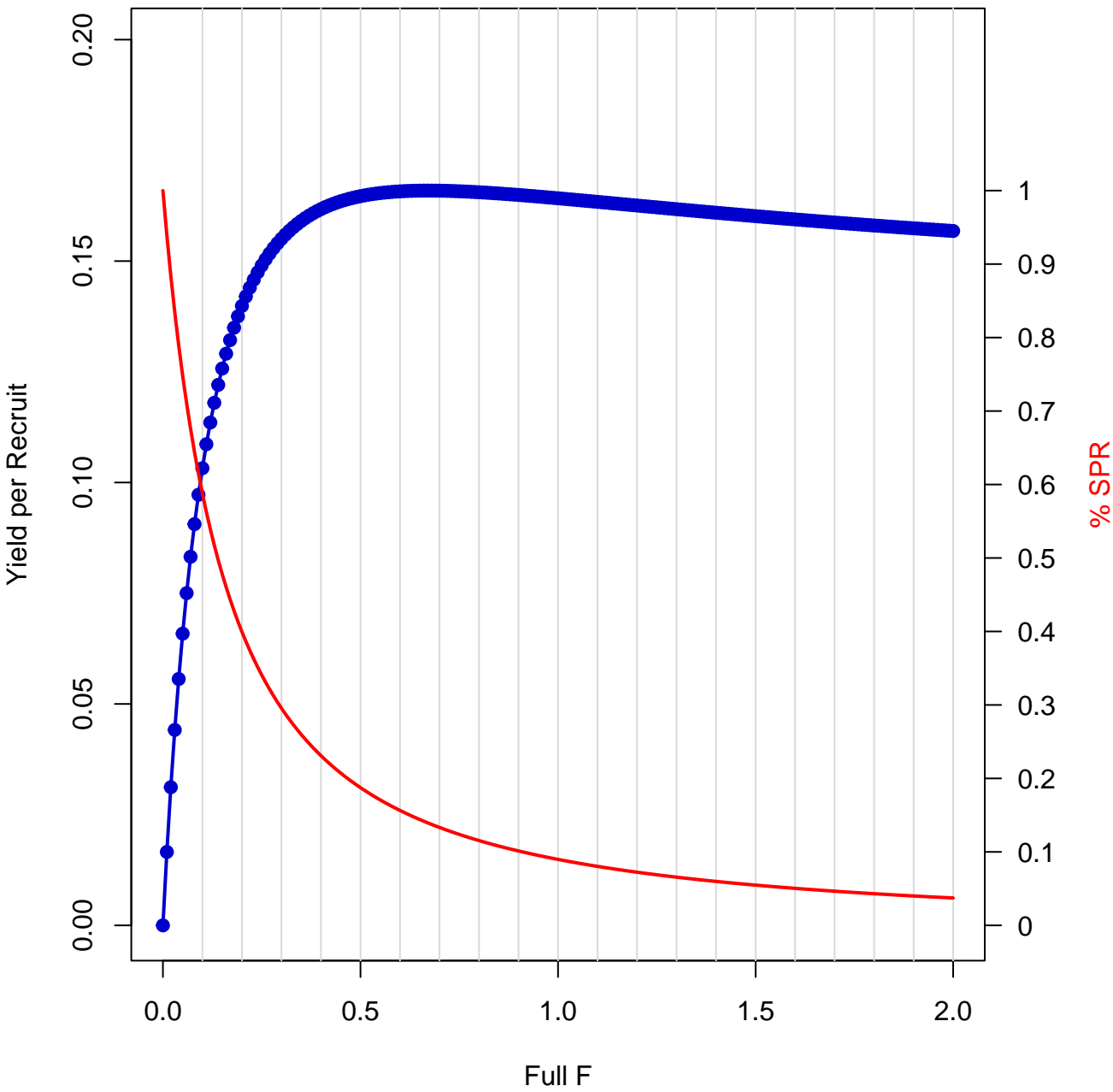








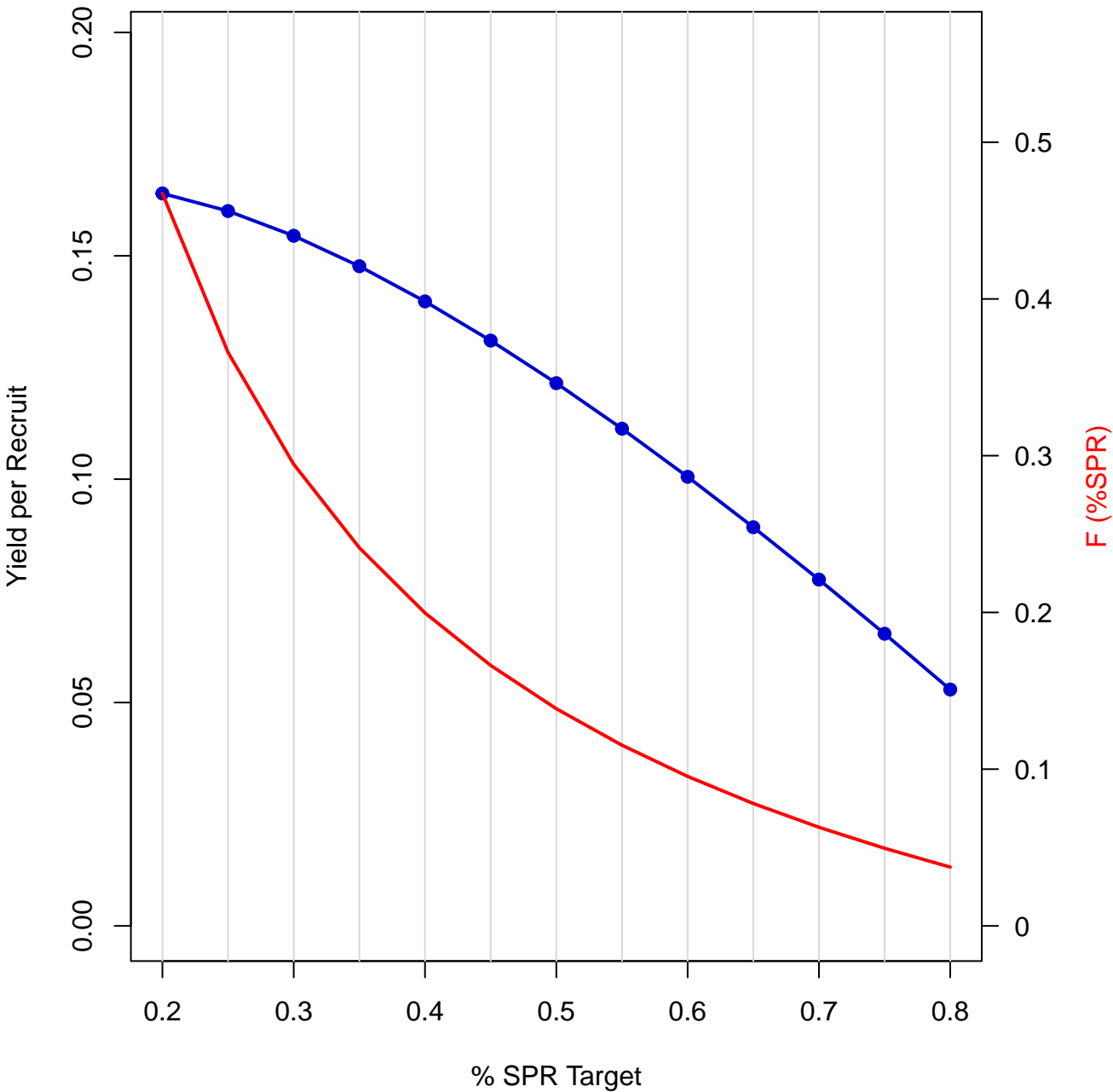
YPR-SPR Reference Points (Years Avg = 5)



YPR–SPR Reference Points (Years Avg = 5)

F	YPR	SPR	F	YPR	SPR	F	YPR	SPR
0	0	1	0.35	0.159	0.2598	0.7	0.1659	0.1333
0.01	0.0166	0.939	0.36	0.1597	0.2536	0.71	0.1659	0.1313
0.02	0.0312	0.8841	0.37	0.1603	0.2476	0.72	0.1659	0.1294
0.03	0.0441	0.8344	0.38	0.1608	0.2418	0.73	0.1658	0.1275
0.04	0.0556	0.7892	0.39	0.1613	0.2363	0.74	0.1658	0.1256
0.05	0.0659	0.7481	0.4	0.1617	0.231	0.75	0.1658	0.1238
0.06	0.075	0.7104	0.41	0.1621	0.2258	0.76	0.1657	0.1221
0.07	0.0832	0.6759	0.42	0.1625	0.2209	0.77	0.1657	0.1203
0.08	0.0906	0.6441	0.43	0.1629	0.2162	0.78	0.1656	0.1187
0.09	0.0972	0.6148	0.44	0.1632	0.2116	0.79	0.1656	0.117
0.1	0.1032	0.5877	0.45	0.1635	0.2072	0.8	0.1655	0.1154
0.11	0.1086	0.5626	0.46	0.1638	0.203	0.81	0.1655	0.1139
0.12	0.1135	0.5392	0.47	0.164	0.1989	0.82	0.1654	0.1123
0.13	0.118	0.5175	0.48	0.1643	0.195	0.83	0.1654	0.1108
0.14	0.122	0.4972	0.49	0.1645	0.1912	0.84	0.1653	0.1094
0.15	0.1257	0.4782	0.5	0.1647	0.1875	0.85	0.1653	0.108
0.16	0.1291	0.4605	0.51	0.1648	0.1839	0.86	0.1652	0.1066
0.17	0.1322	0.4438	0.52	0.165	0.1804	0.87	0.1651	0.1052
0.18	0.135	0.4282	0.53	0.1651	0.1771	0.88	0.1651	0.1039
0.19	0.1375	0.4134	0.54	0.1652	0.1739	0.89	0.165	0.1025
0.2	0.1399	0.3996	0.55	0.1654	0.1707	0.9	0.1649	0.1013
0.21	0.142	0.3865	0.56	0.1655	0.1677	0.91	0.1649	0.1
0.22	0.144	0.3741	0.57	0.1655	0.1648	0.92	0.1648	0.0988
0.23	0.1458	0.3624	0.58	0.1656	0.1619	0.93	0.1647	0.0976
0.24	0.1475	0.3513	0.59	0.1657	0.1591	0.94	0.1646	0.0964
0.25	0.149	0.3408	0.6	0.1657	0.1564	0.95	0.1646	0.0952
0.26	0.1504	0.3308	0.61	0.1658	0.1538	0.96	0.1645	0.0941
0.27	0.1517	0.3214	0.62	0.1658	0.1513	0.97	0.1644	0.093
0.28	0.1529	0.3123	0.63	0.1659	0.1488	0.98	0.1643	0.0919
0.29	0.154	0.3038	0.64	0.1659	0.1464	0.99	0.1643	0.0908
0.3	0.155	0.2956	0.65	0.1659	0.1441	1	0.1642	0.0898
0.31	0.156	0.2878	0.66	0.1659	0.1418	1.01	0.1641	0.0888
0.32	0.1568	0.2803	0.67	0.1659	0.1396	1.02	0.164	0.0877
0.33	0.1576	0.2732	0.68	0.1659	0.1374	1.03	0.1639	0.0868
0.34	0.1584	0.2663	0.69	0.1659	0.1353	1.04	0.1639	0.0858

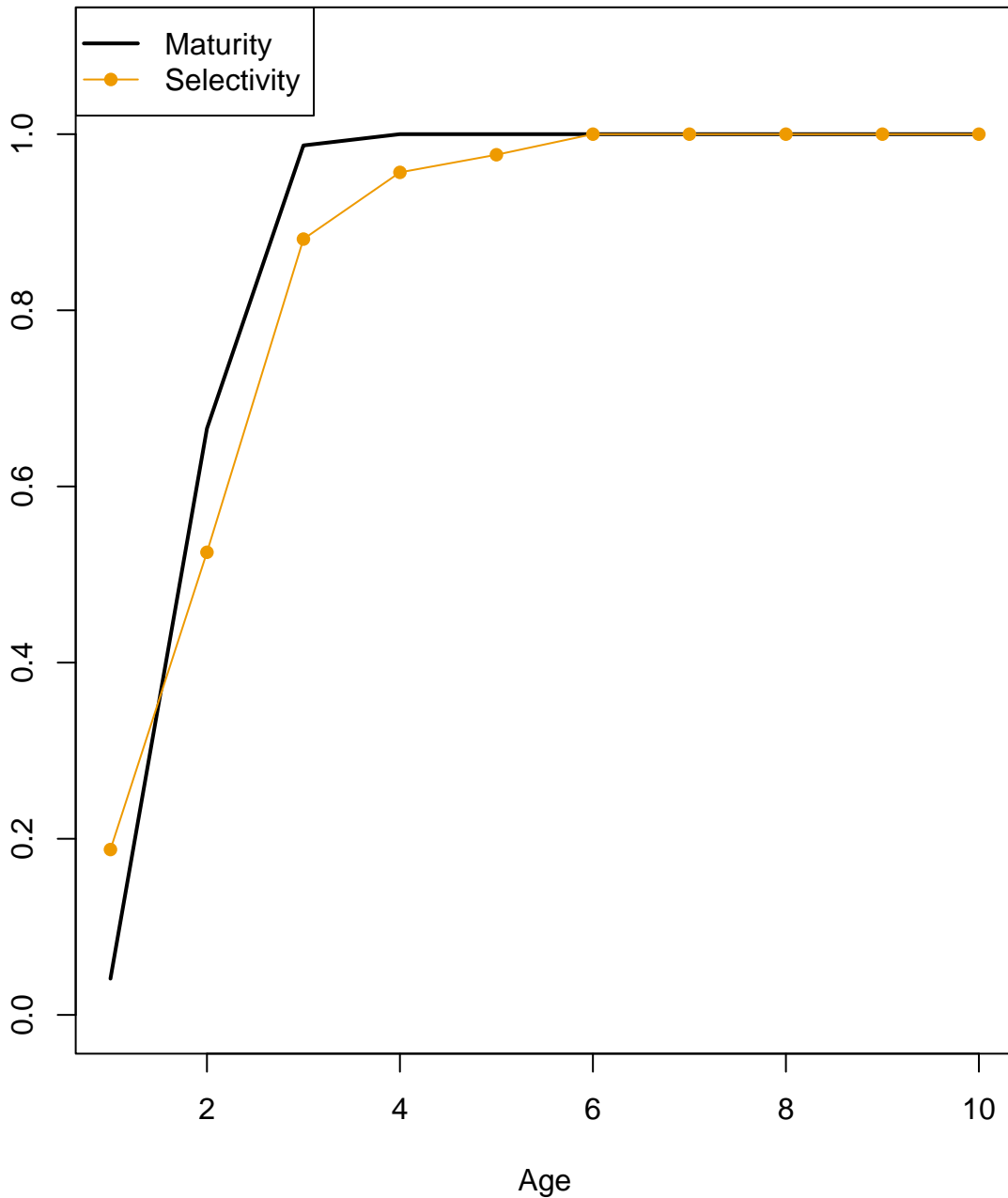
SPR Target Reference Points (Years Avg = 5)



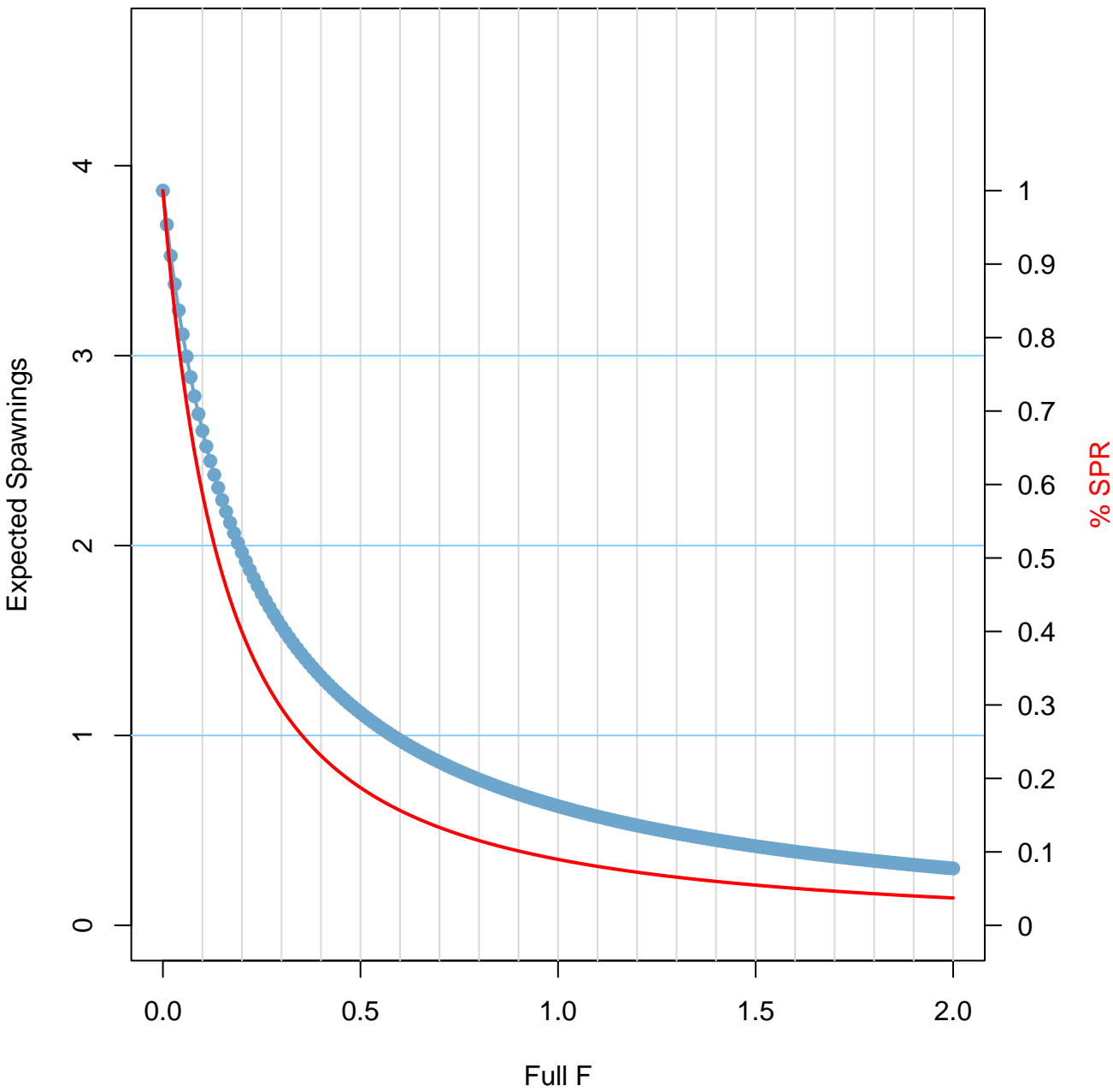
SPR Target Reference Points (Years Avg = 5)

% SPR	F(%SPR)	YPR
0.2	0.4673	0.164
0.25	0.3659	0.16
0.3	0.2945	0.1545
0.35	0.2412	0.1477
0.4	0.1997	0.1398
0.45	0.1662	0.131
0.5	0.1386	0.1215
0.55	0.1153	0.1113
0.6	0.0954	0.1005
0.65	0.0781	0.0893
0.7	0.0629	0.0775
0.75	0.0495	0.0654
0.8	0.0375	0.0529

Selectivity or Maturity at age



Expected Spawns and SPR Reference Points (Years Avg = 5)

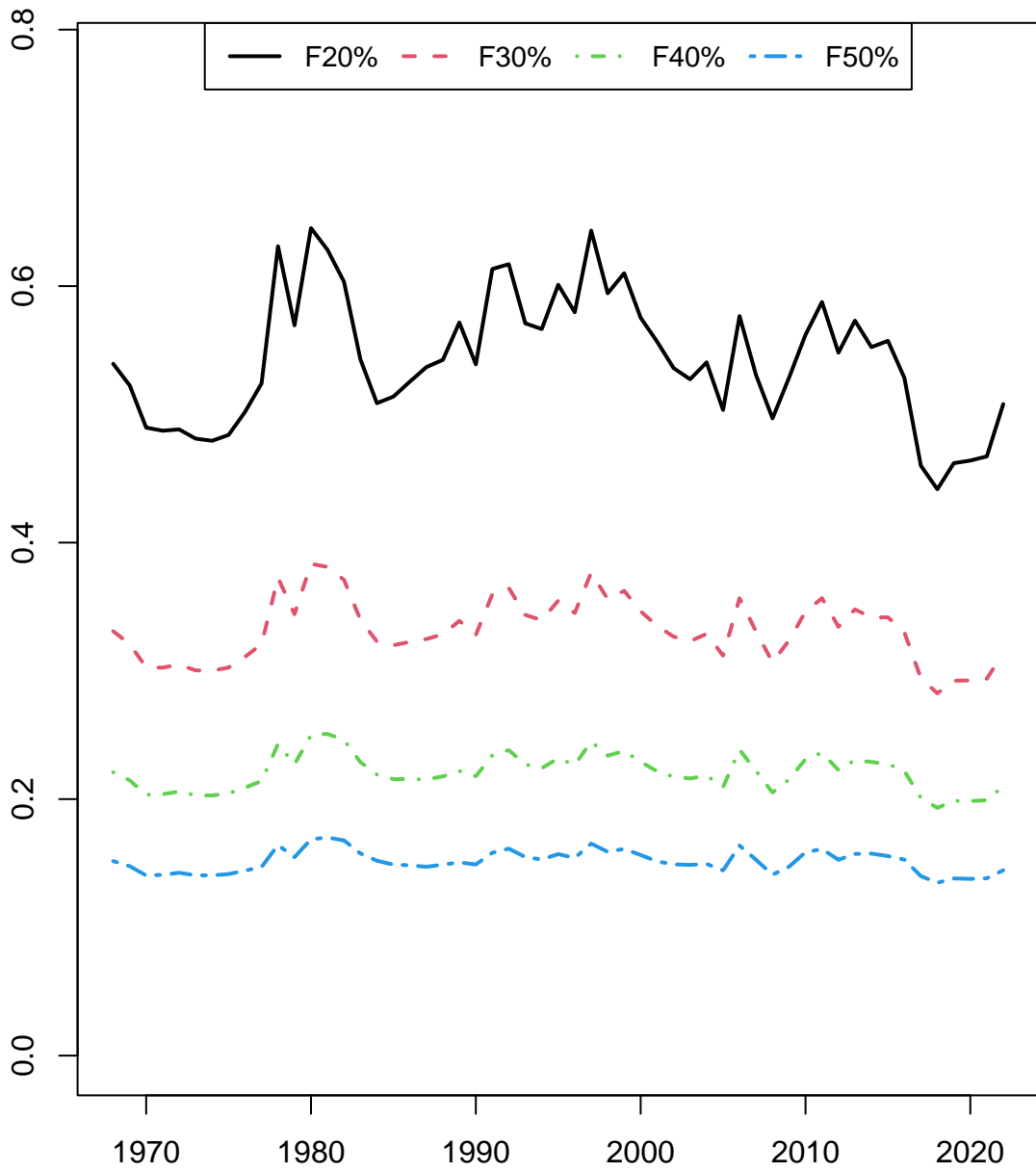


Expected Spawnings & SPR Reference Points (Years Avg = 5)

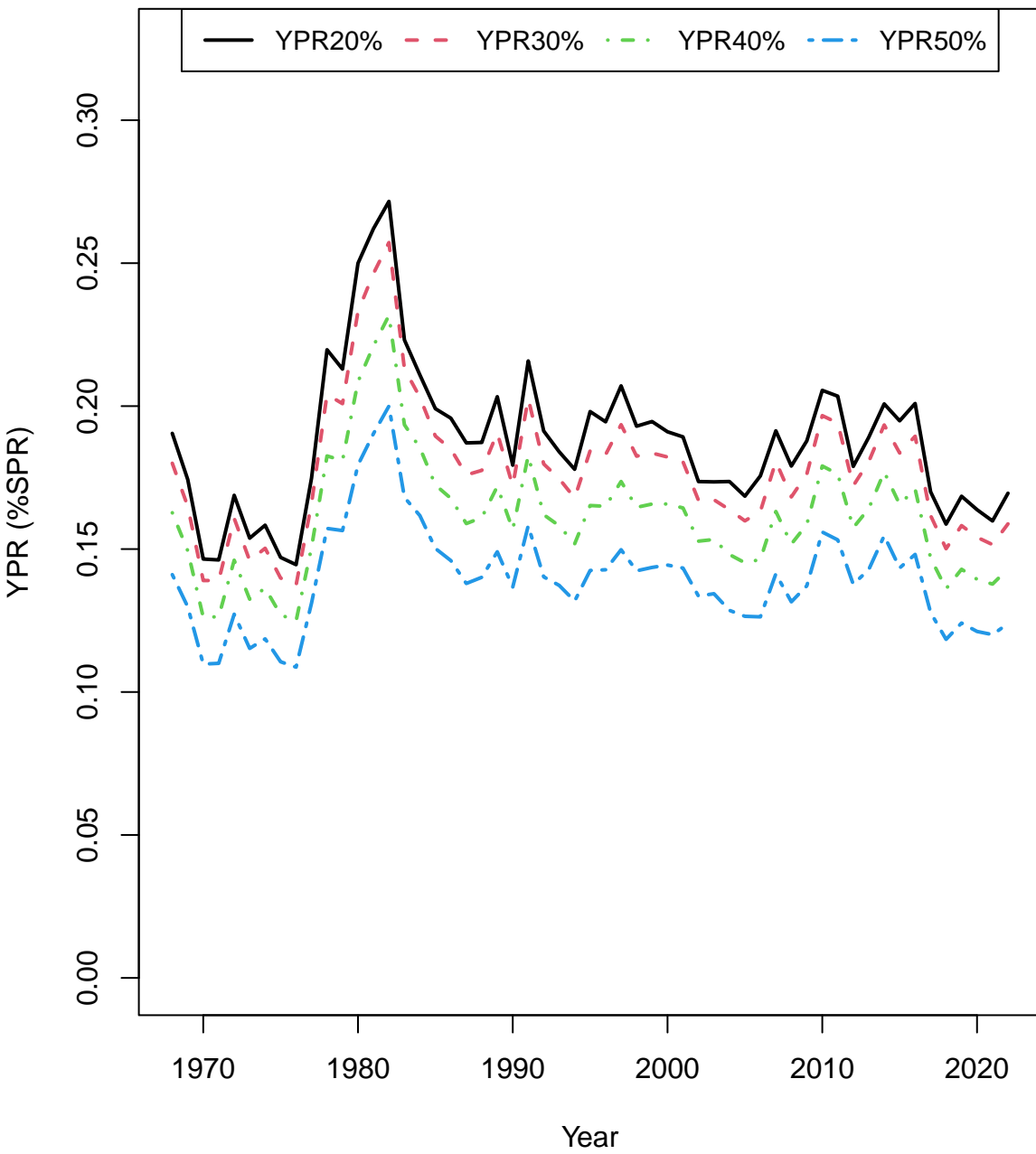
F	E[Sp]	SPR	F	E[Sp]	SPR	F	E[Sp]	SPR
0	3.8688	1	0.35	1.4303	0.2598	0.7	0.8602	0.1333
0.01	3.689	0.939	0.36	1.4046	0.2536	0.71	0.8501	0.1313
0.02	3.5253	0.8841	0.37	1.3797	0.2476	0.72	0.8402	0.1294
0.03	3.3757	0.8344	0.38	1.3557	0.2418	0.73	0.8305	0.1275
0.04	3.2384	0.7892	0.39	1.3325	0.2363	0.74	0.8211	0.1256
0.05	3.1119	0.7481	0.4	1.31	0.231	0.75	0.8118	0.1238
0.06	2.9951	0.7104	0.41	1.2882	0.2258	0.76	0.8027	0.1221
0.07	2.8867	0.6759	0.42	1.2671	0.2209	0.77	0.7937	0.1203
0.08	2.7859	0.6441	0.43	1.2467	0.2162	0.78	0.785	0.1187
0.09	2.692	0.6148	0.44	1.2268	0.2116	0.79	0.7764	0.117
0.1	2.6042	0.5877	0.45	1.2076	0.2072	0.8	0.768	0.1154
0.11	2.522	0.5626	0.46	1.1889	0.203	0.81	0.7597	0.1139
0.12	2.4448	0.5392	0.47	1.1707	0.1989	0.82	0.7516	0.1123
0.13	2.3722	0.5175	0.48	1.153	0.195	0.83	0.7436	0.1108
0.14	2.3038	0.4972	0.49	1.1359	0.1912	0.84	0.7358	0.1094
0.15	2.2392	0.4782	0.5	1.1192	0.1875	0.85	0.7281	0.108
0.16	2.1781	0.4605	0.51	1.1029	0.1839	0.86	0.7206	0.1066
0.17	2.1202	0.4438	0.52	1.0871	0.1804	0.87	0.7132	0.1052
0.18	2.0653	0.4282	0.53	1.0717	0.1771	0.88	0.7059	0.1039
0.19	2.0131	0.4134	0.54	1.0567	0.1739	0.89	0.6988	0.1025
0.2	1.9635	0.3996	0.55	1.0421	0.1707	0.9	0.6918	0.1013
0.21	1.9162	0.3865	0.56	1.0278	0.1677	0.91	0.6849	0.1
0.22	1.8711	0.3741	0.57	1.0139	0.1648	0.92	0.6781	0.0988
0.23	1.8281	0.3624	0.58	1.0004	0.1619	0.93	0.6714	0.0976
0.24	1.7869	0.3513	0.59	0.9871	0.1591	0.94	0.6649	0.0964
0.25	1.7476	0.3408	0.6	0.9742	0.1564	0.95	0.6584	0.0952
0.26	1.7098	0.3308	0.61	0.9616	0.1538	0.96	0.6521	0.0941
0.27	1.6737	0.3214	0.62	0.9493	0.1513	0.97	0.6459	0.093
0.28	1.639	0.3123	0.63	0.9373	0.1488	0.98	0.6397	0.0919
0.29	1.6056	0.3038	0.64	0.9255	0.1464	0.99	0.6337	0.0908
0.3	1.5736	0.2956	0.65	0.914	0.1441	1	0.6278	0.0898
0.31	1.5428	0.2878	0.66	0.9028	0.1418	1.01	0.6219	0.0888
0.32	1.5131	0.2803	0.67	0.8918	0.1396	1.02	0.6162	0.0877
0.33	1.4845	0.2732	0.68	0.881	0.1374	1.03	0.6105	0.0868
0.34	1.4569	0.2663	0.69	0.8705	0.1353	1.04	0.6049	0.0858

Annual F(%SPR) Reference Points

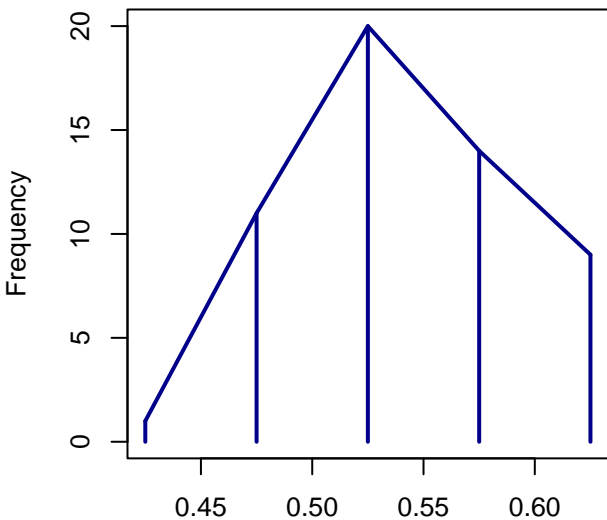
Full F (%SPR)



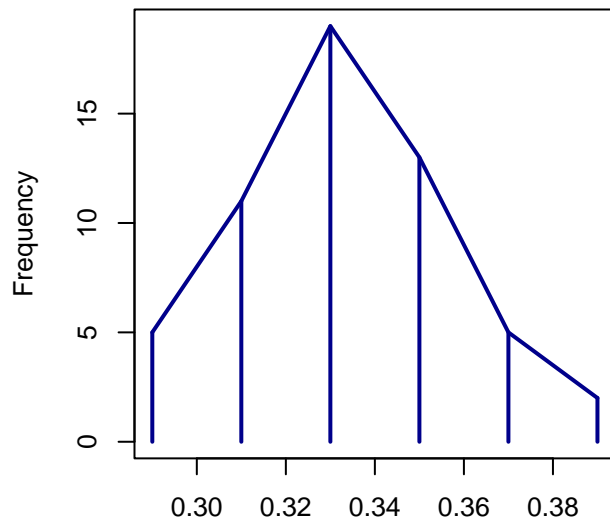
Annual YPR(%SPR) Reference Points



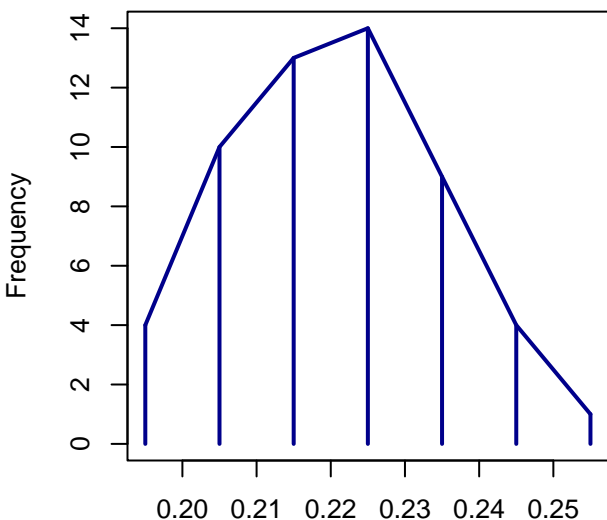
Annual F (%SPR) Reference Points



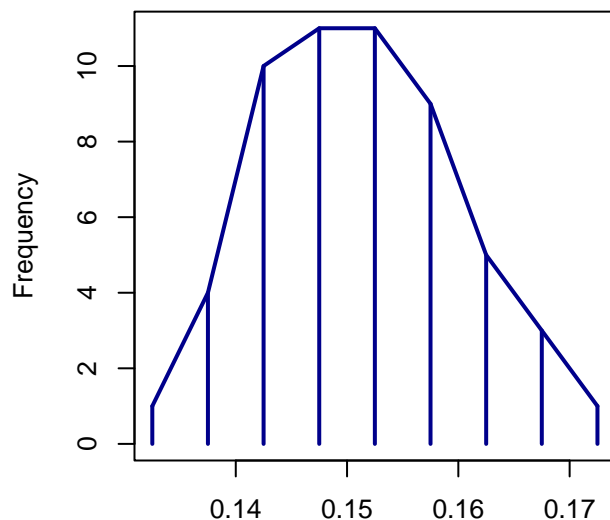
Full F20%



Full F30%

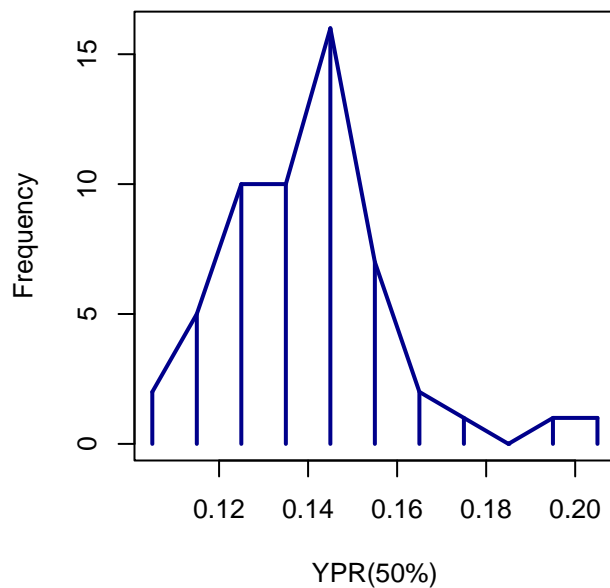
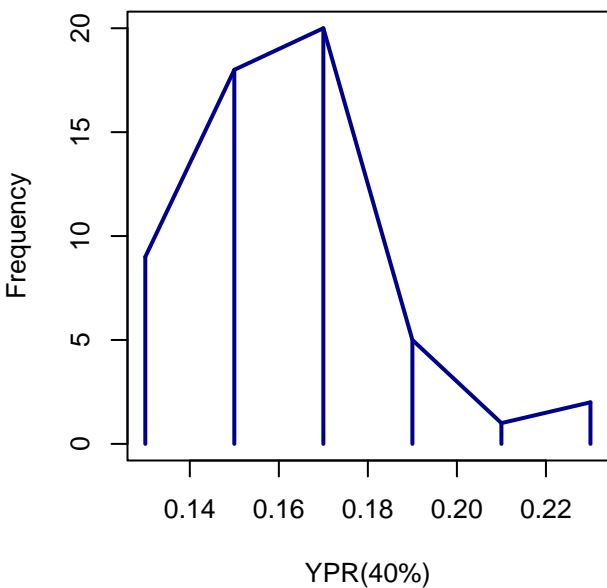
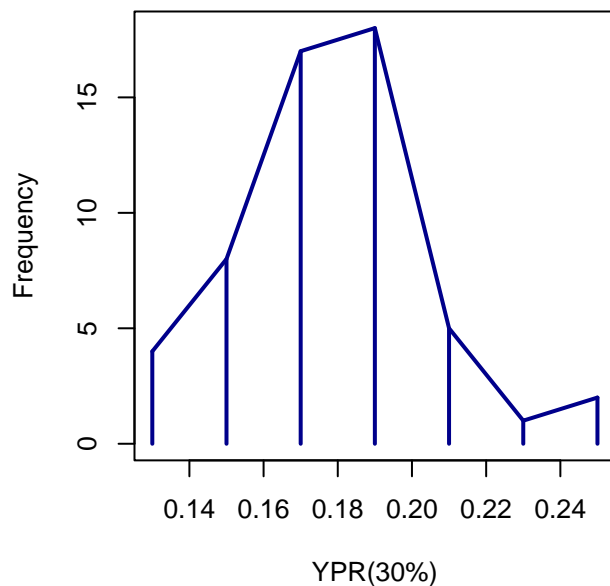
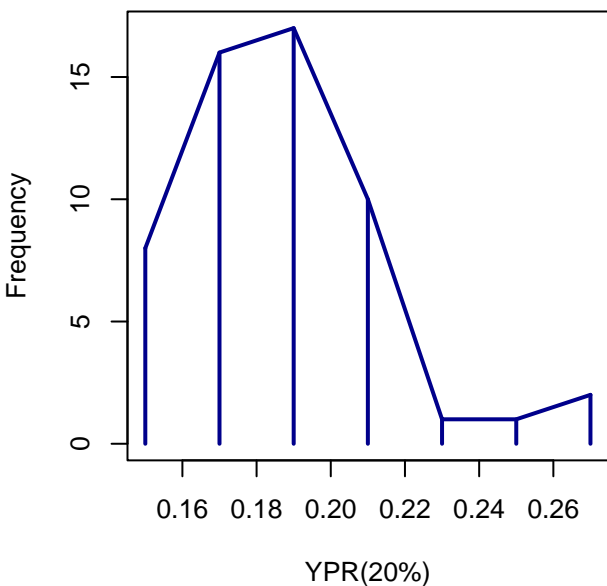


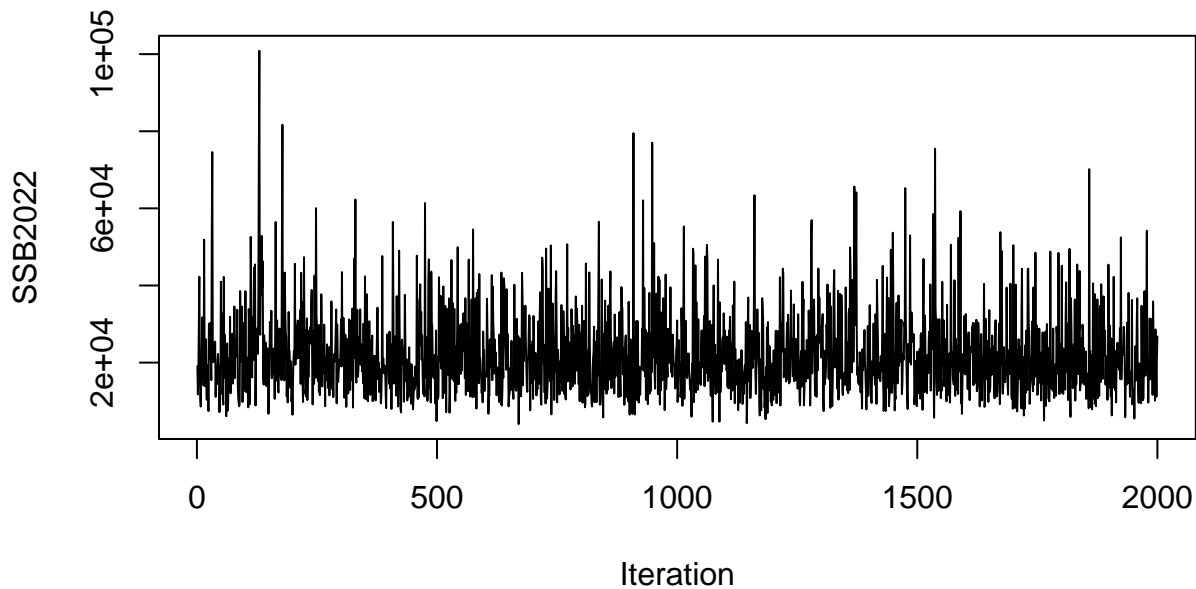
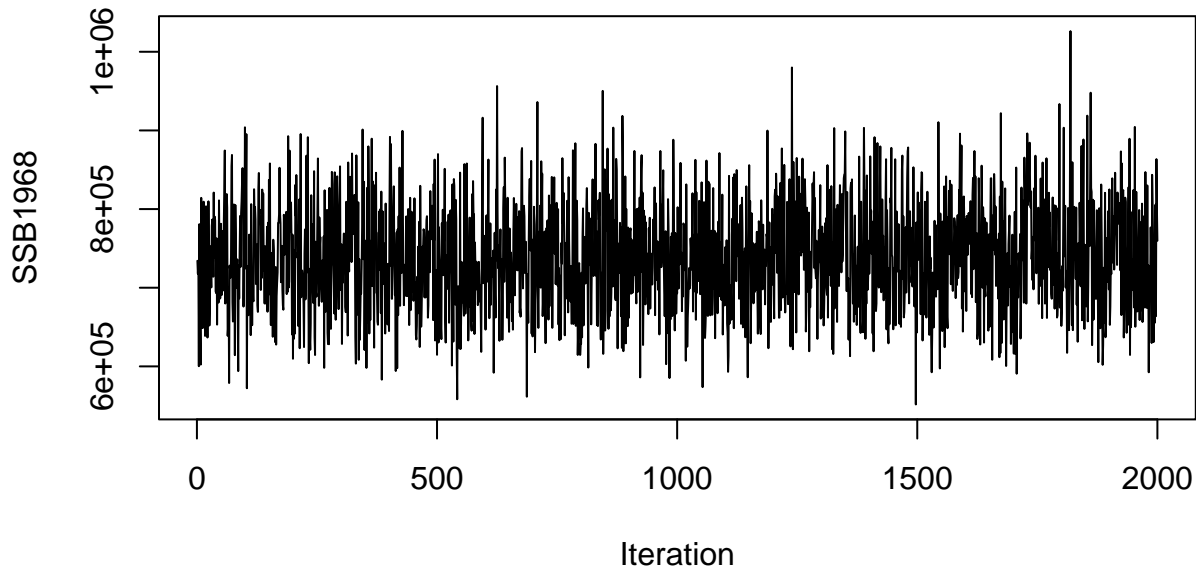
Full F40%

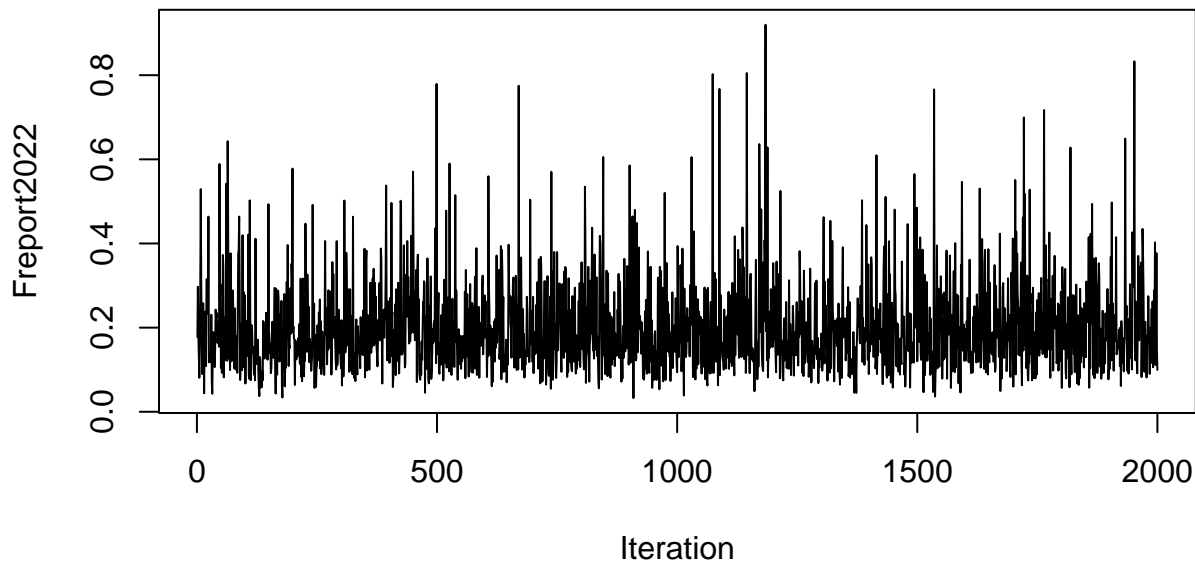
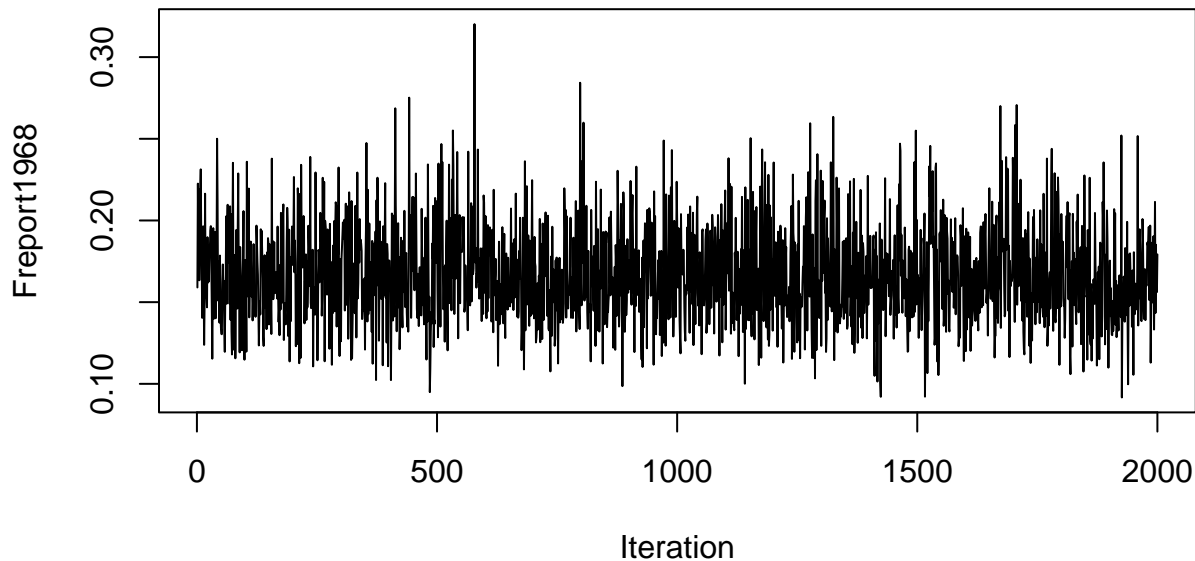


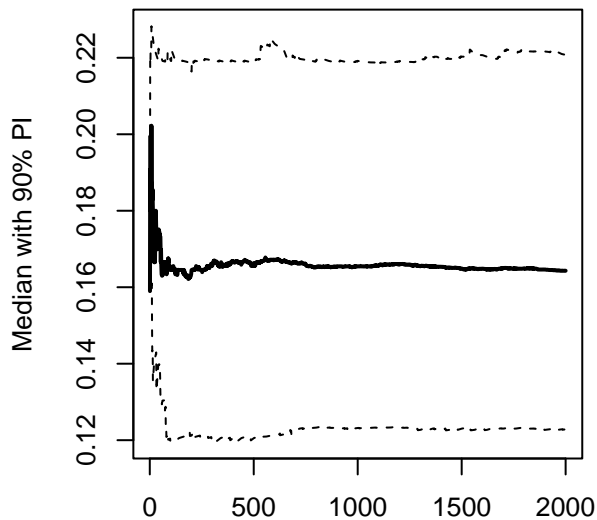
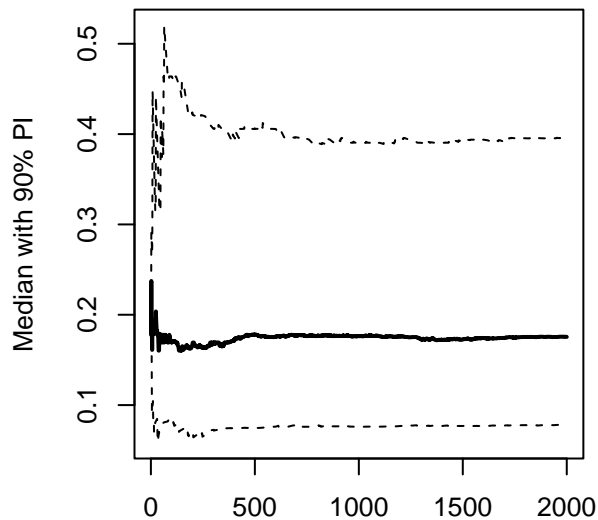
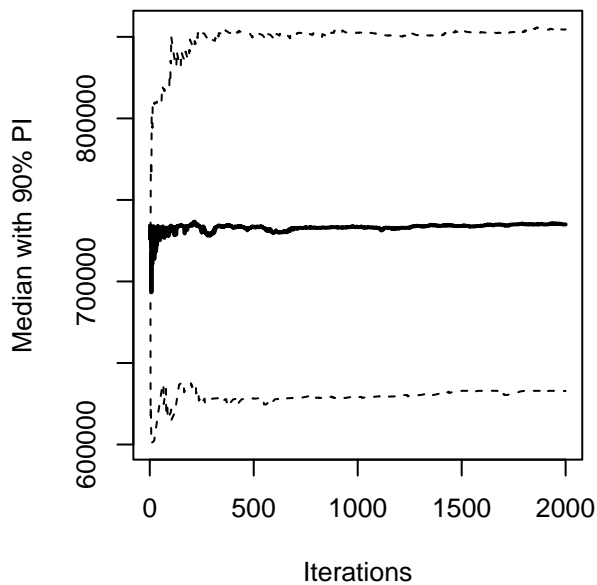
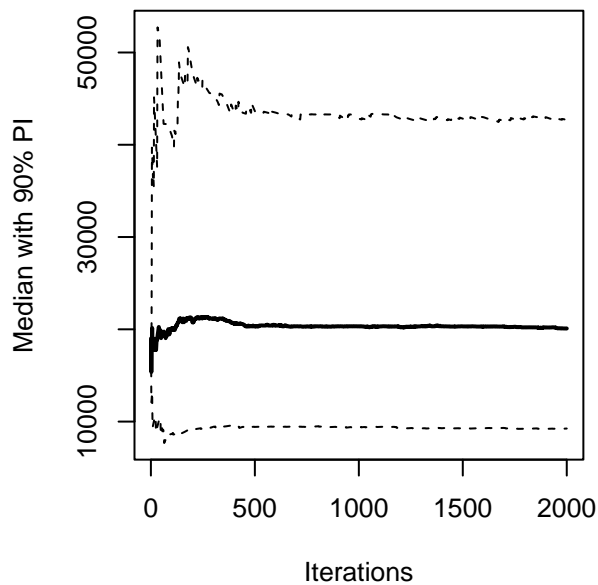
Full F50%

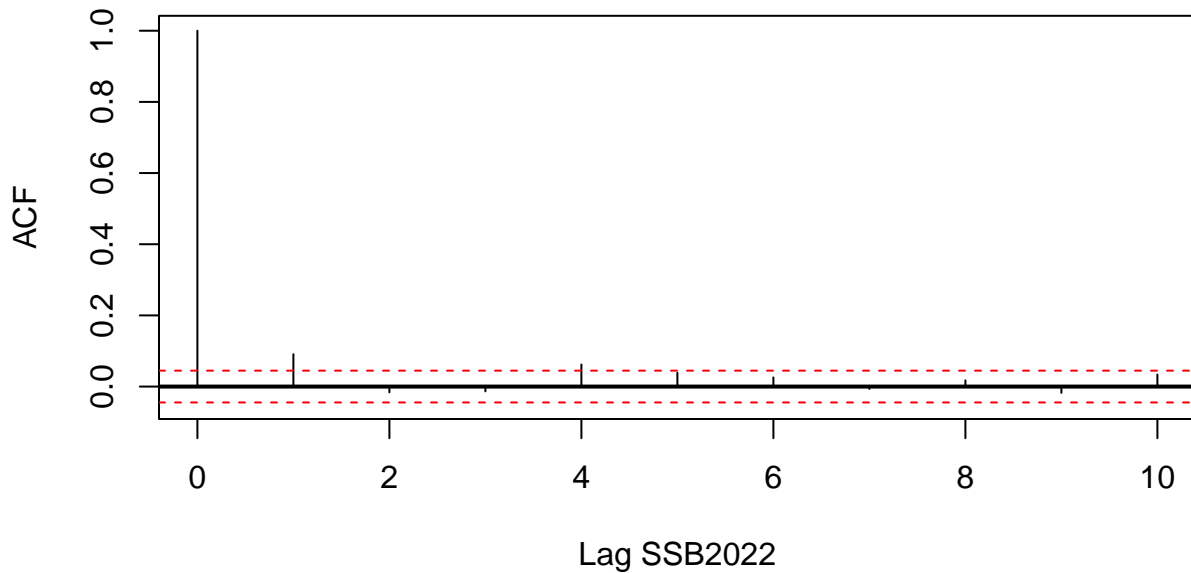
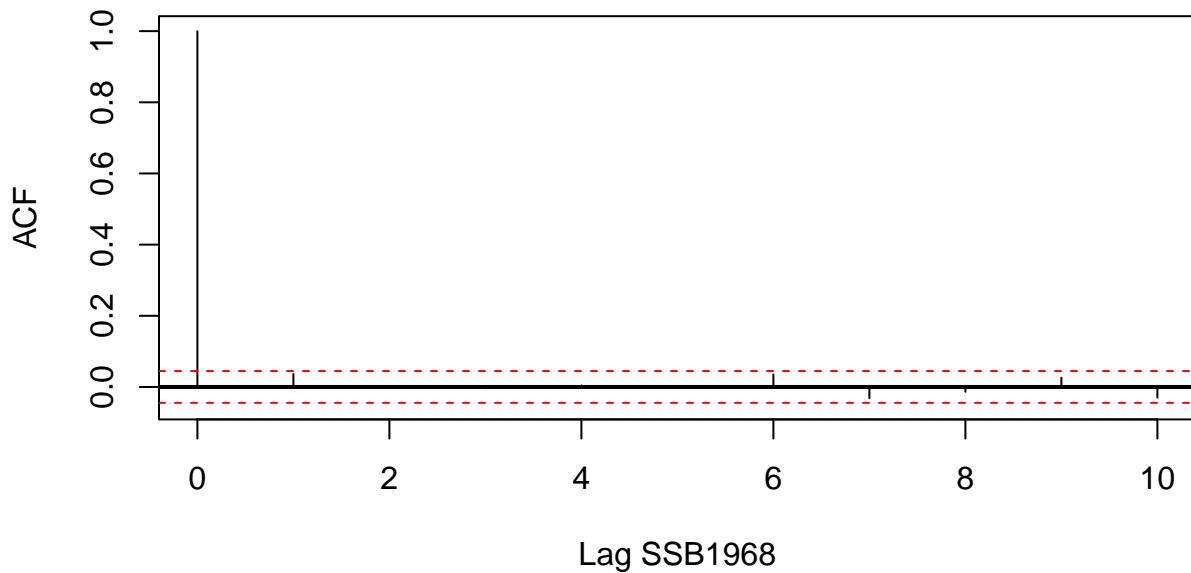
Annual YPR (%SPR) Reference Points

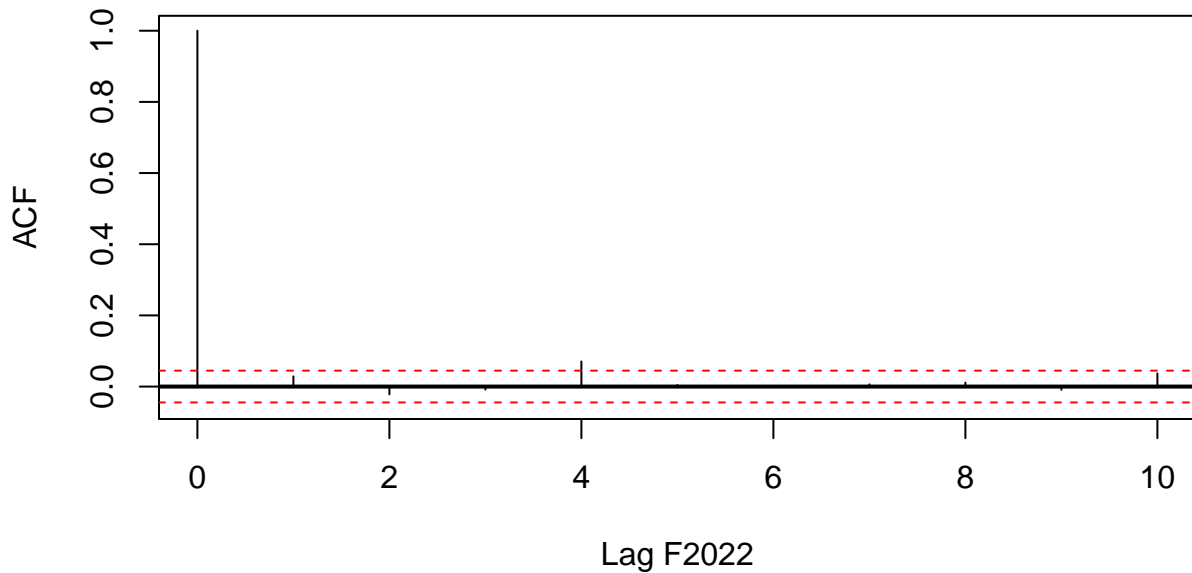
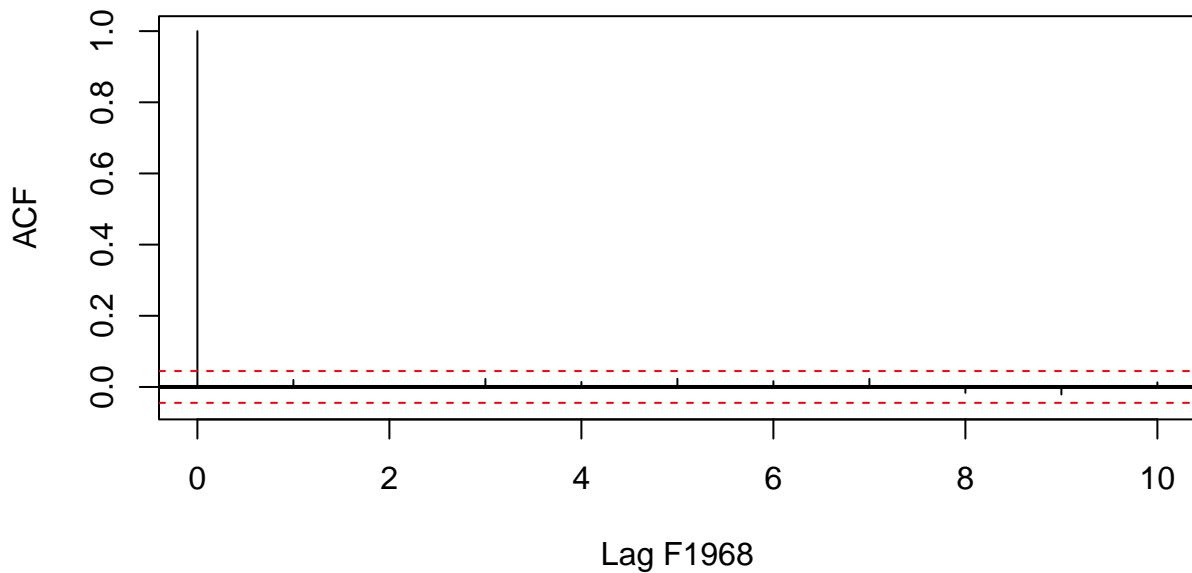


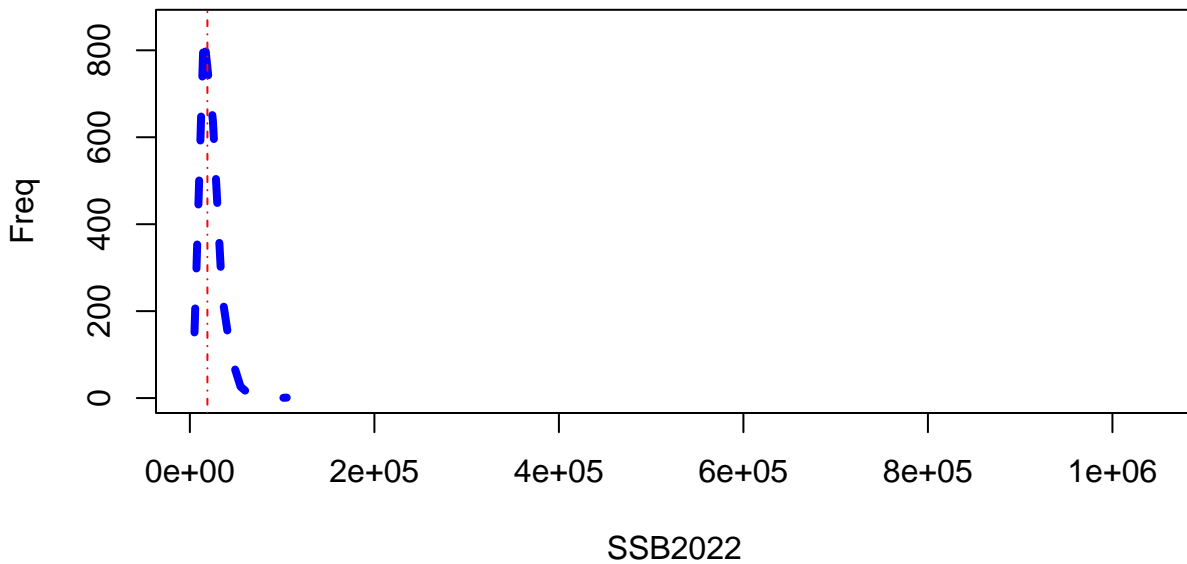
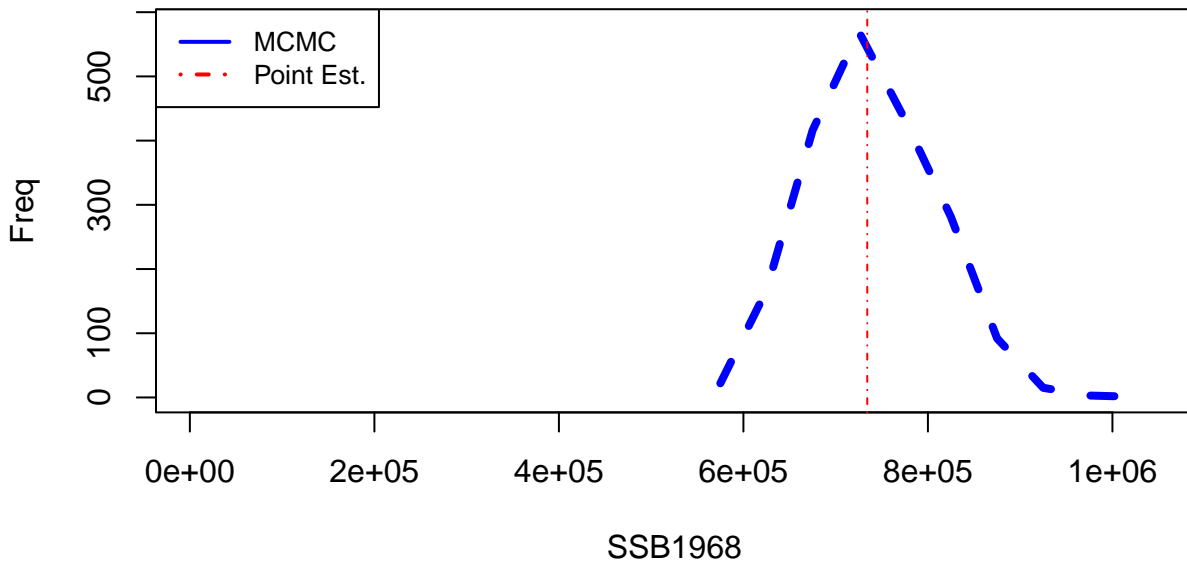


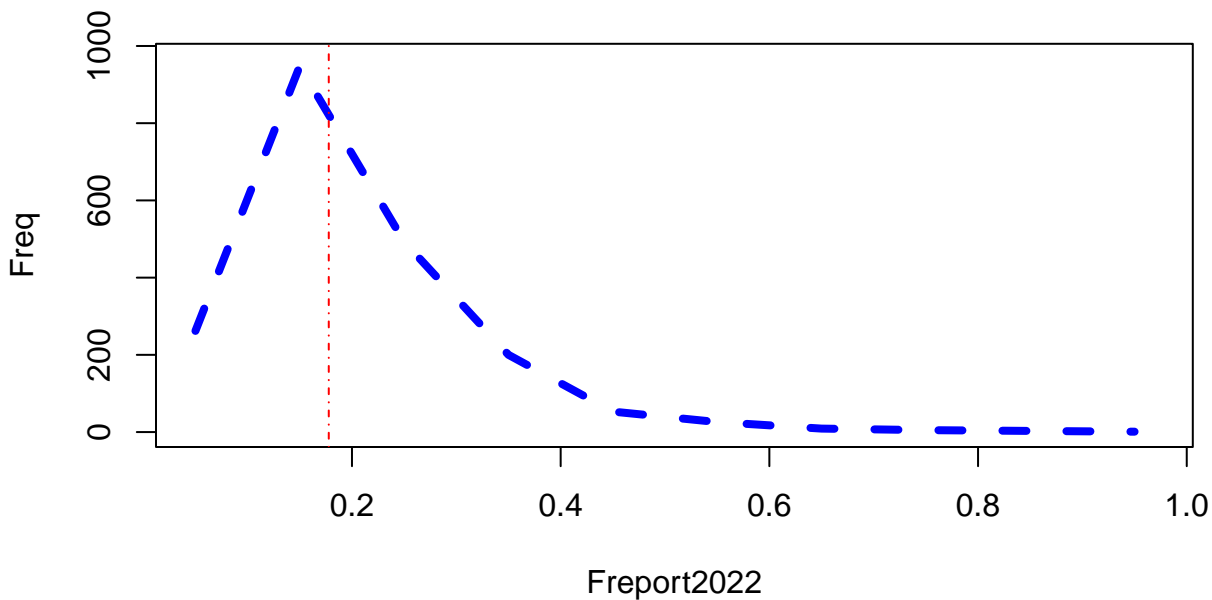
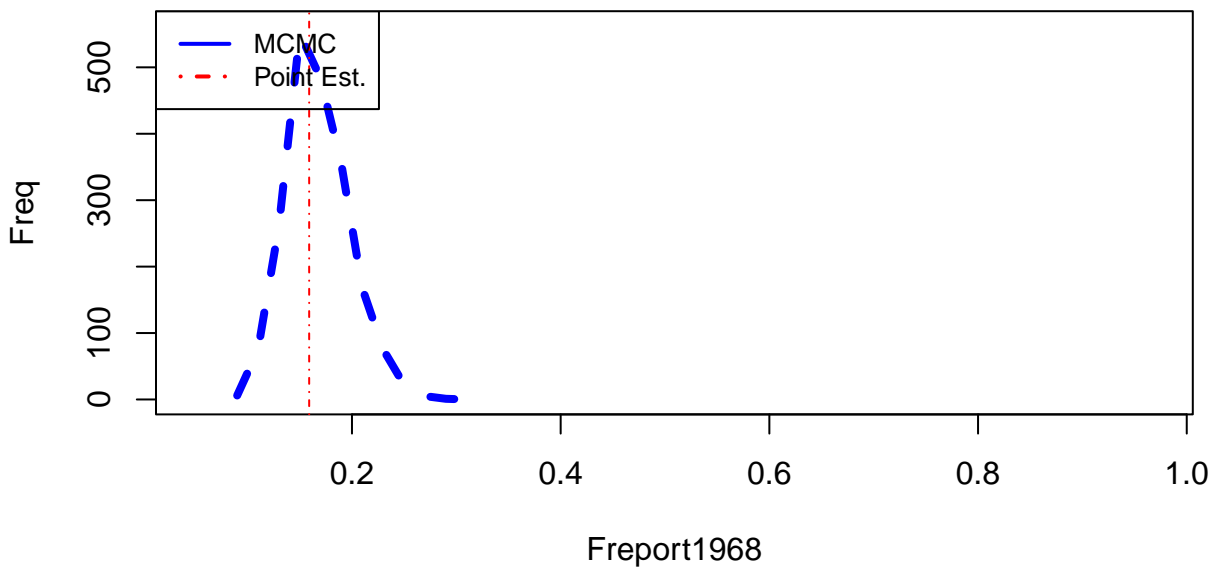


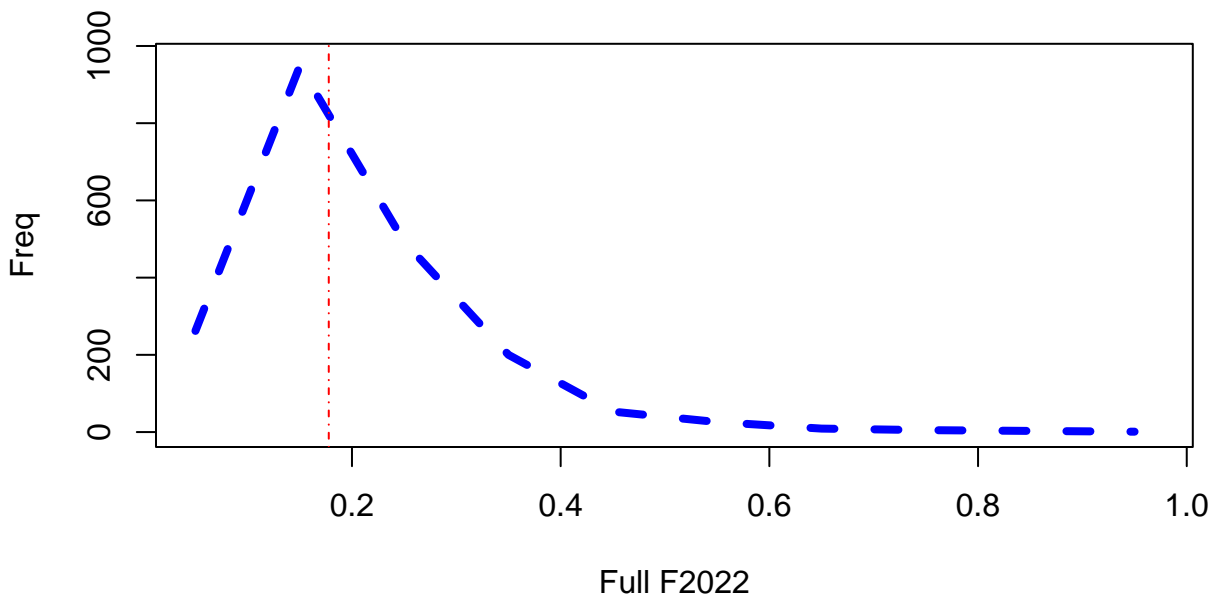
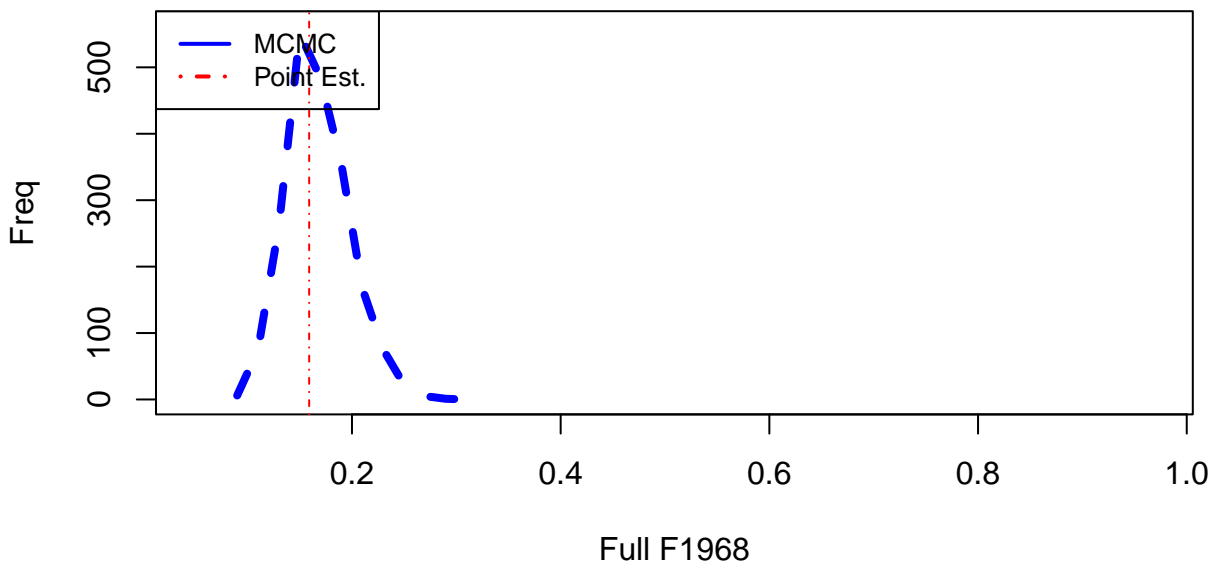
F1968**F2022****SSB1968****SSB2022**

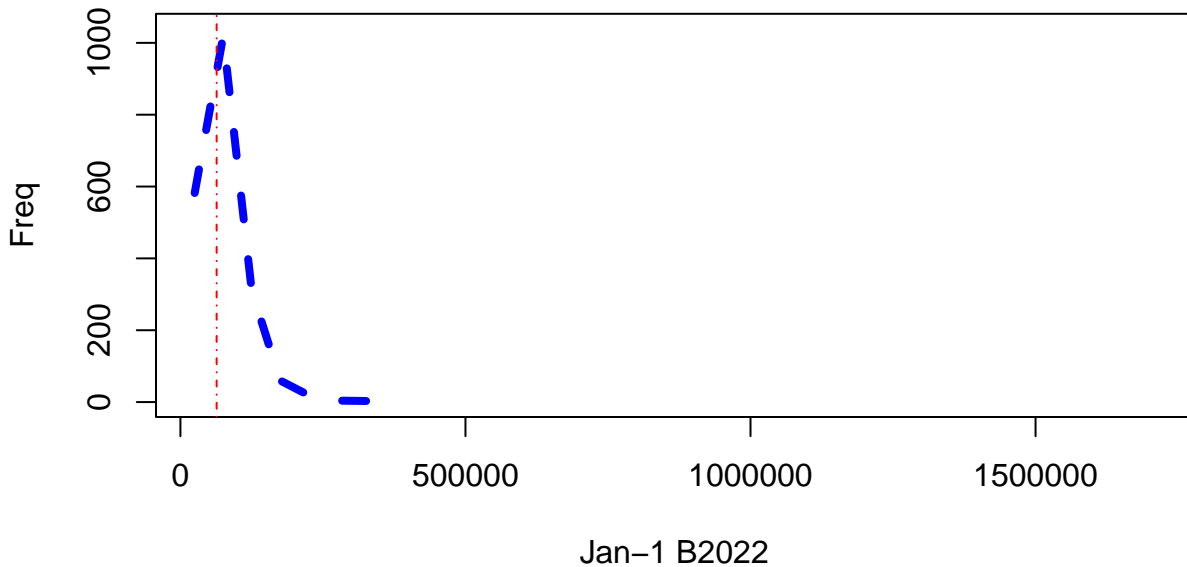
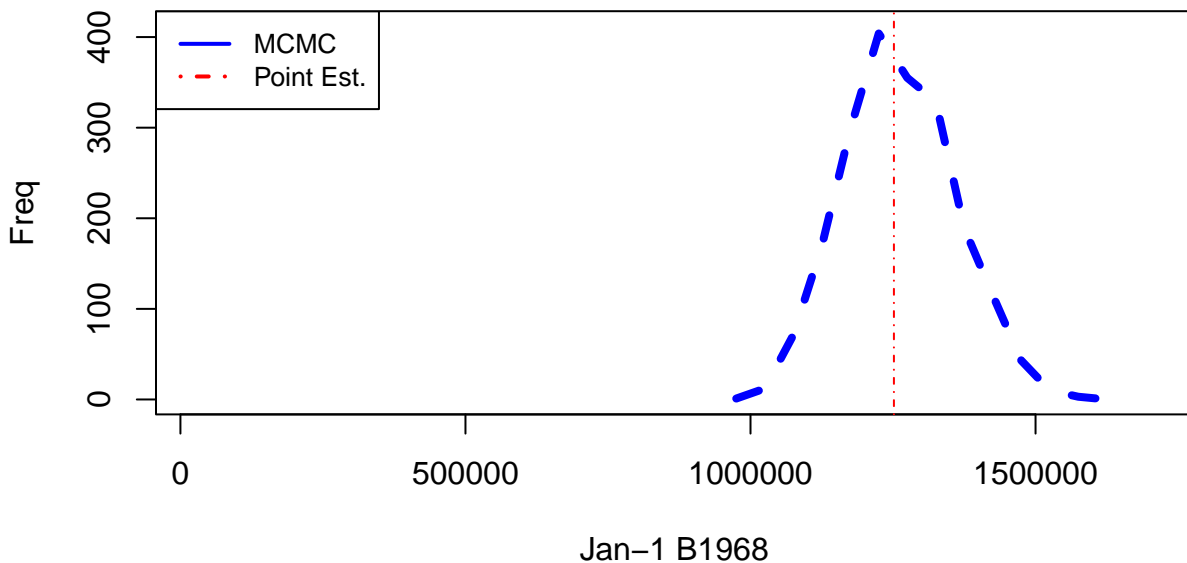


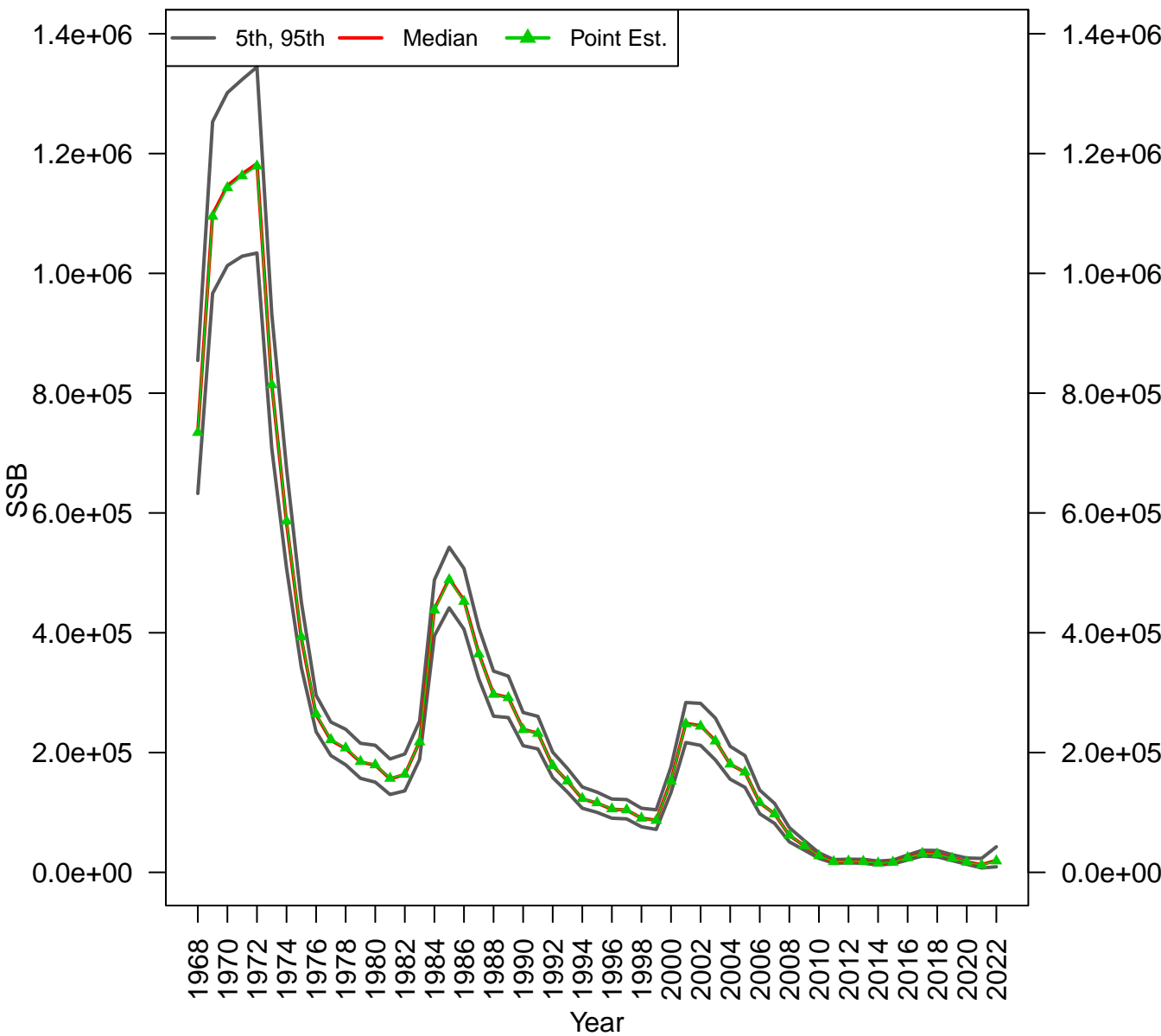


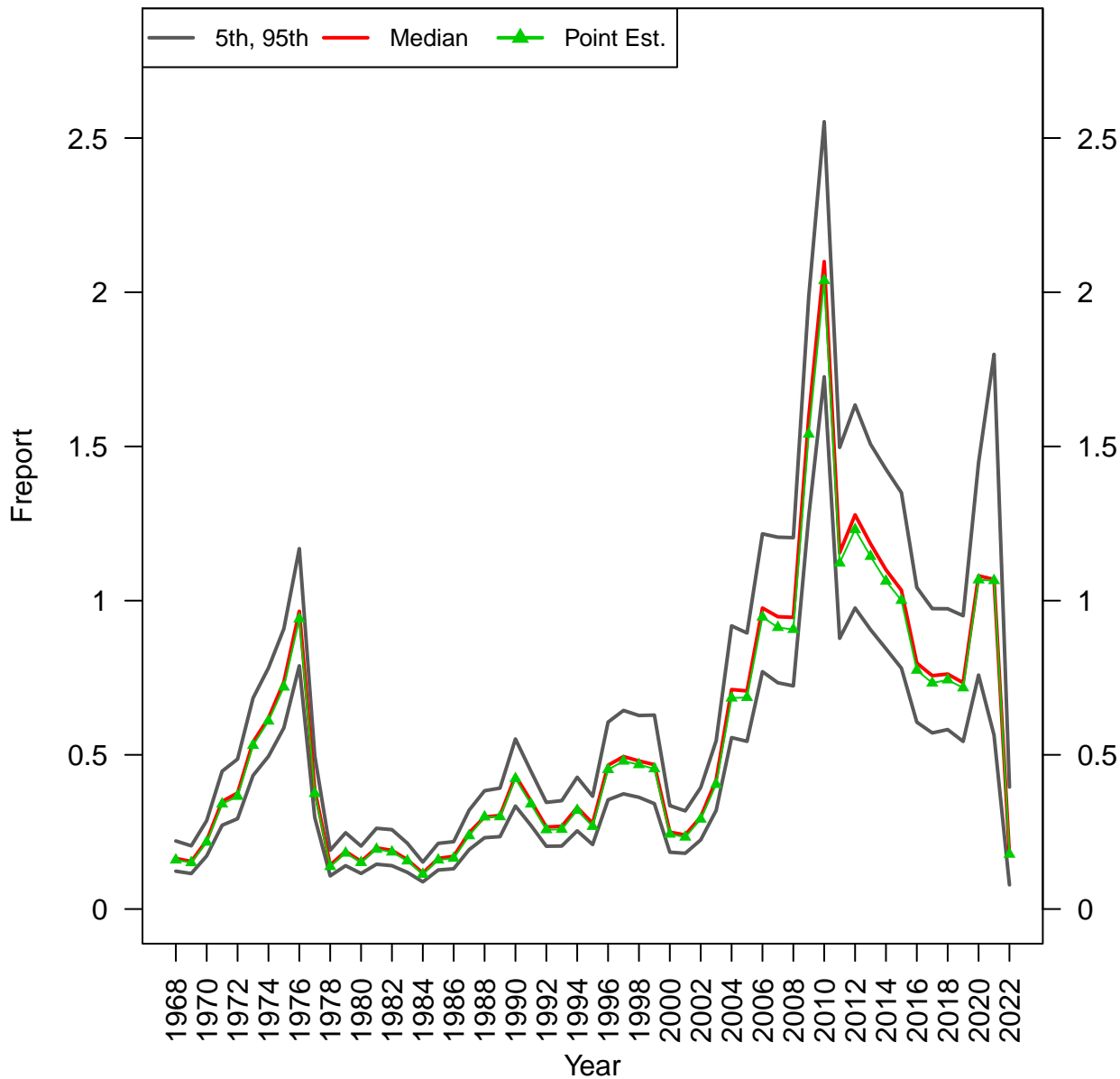


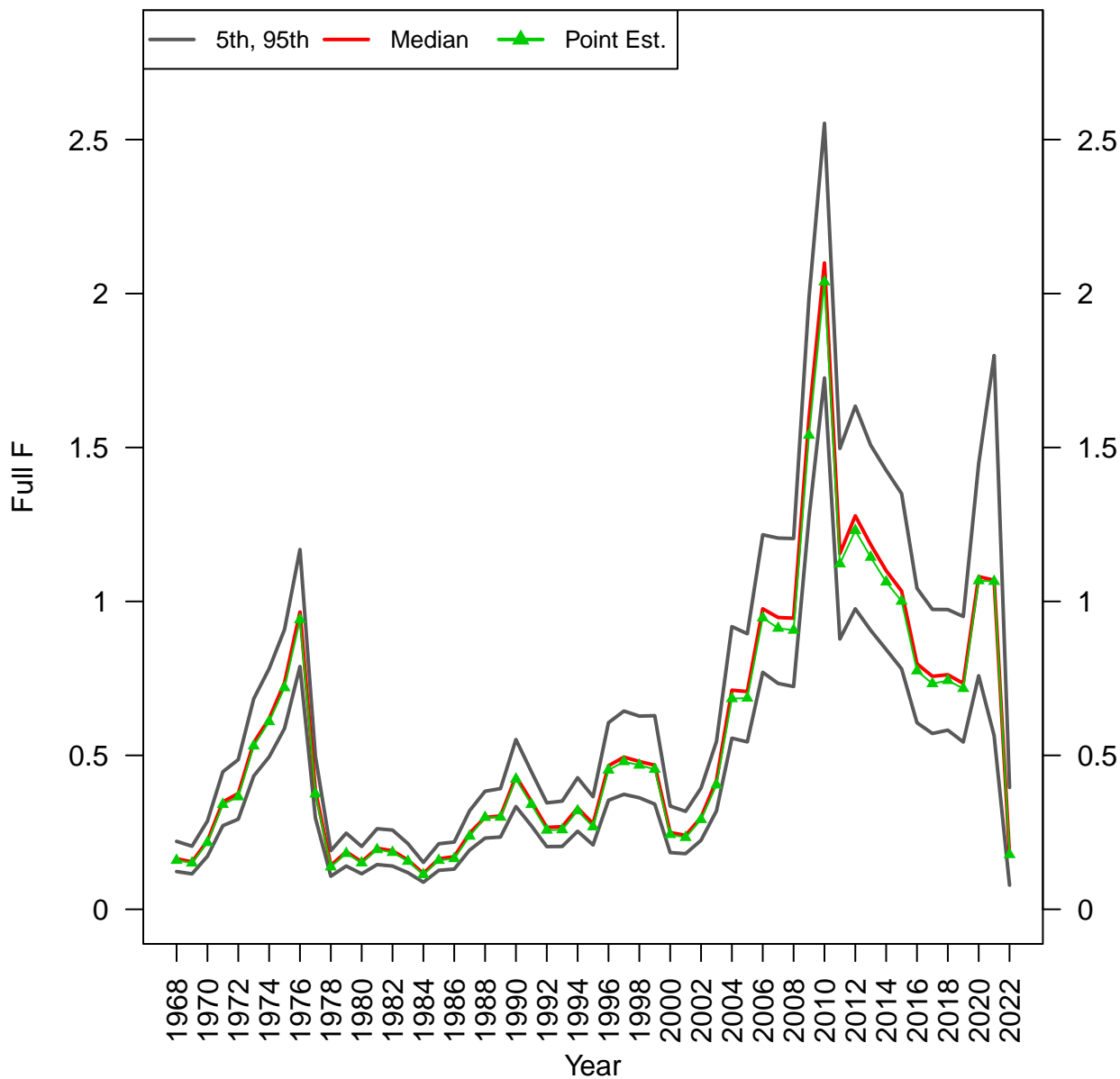


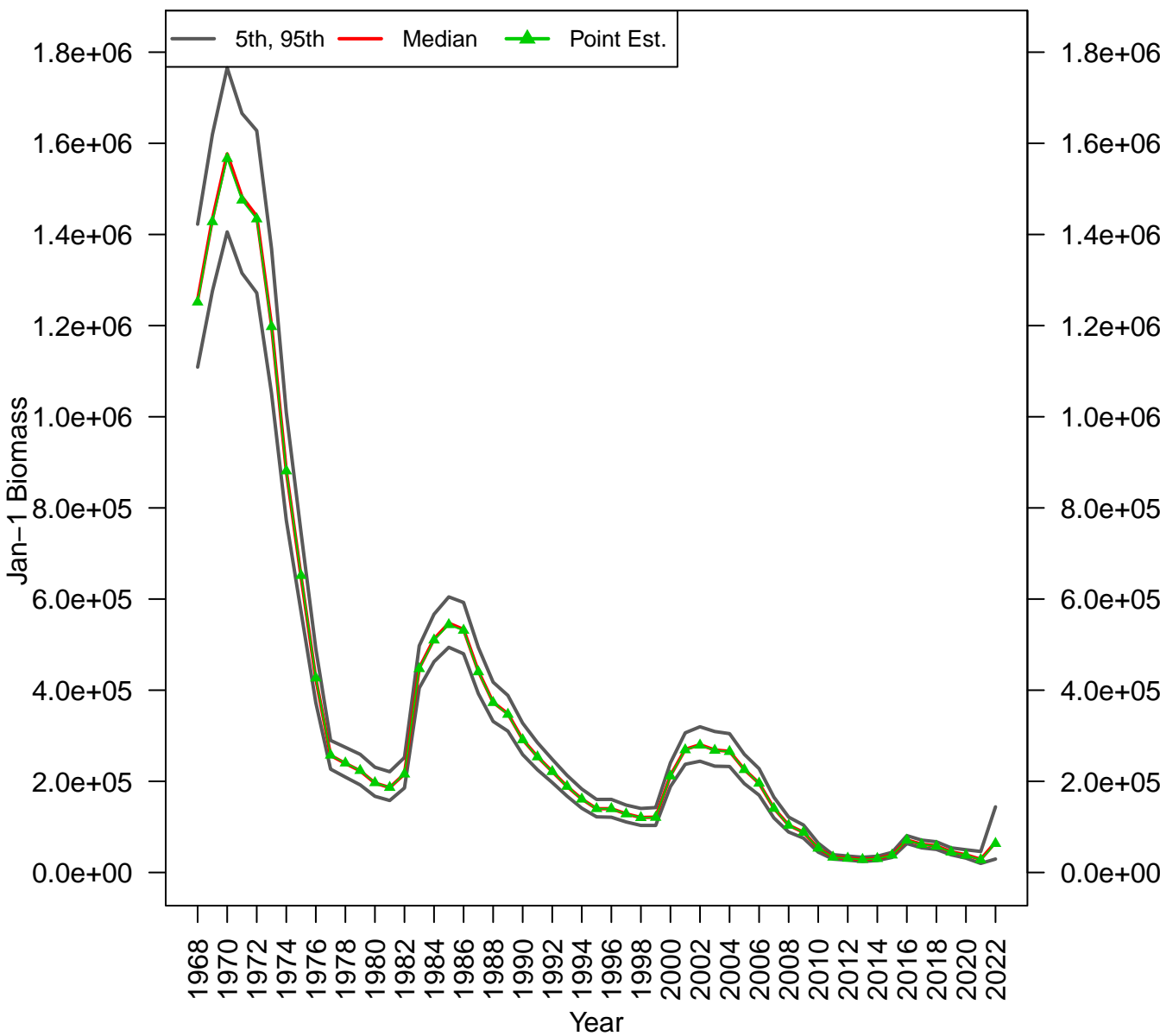


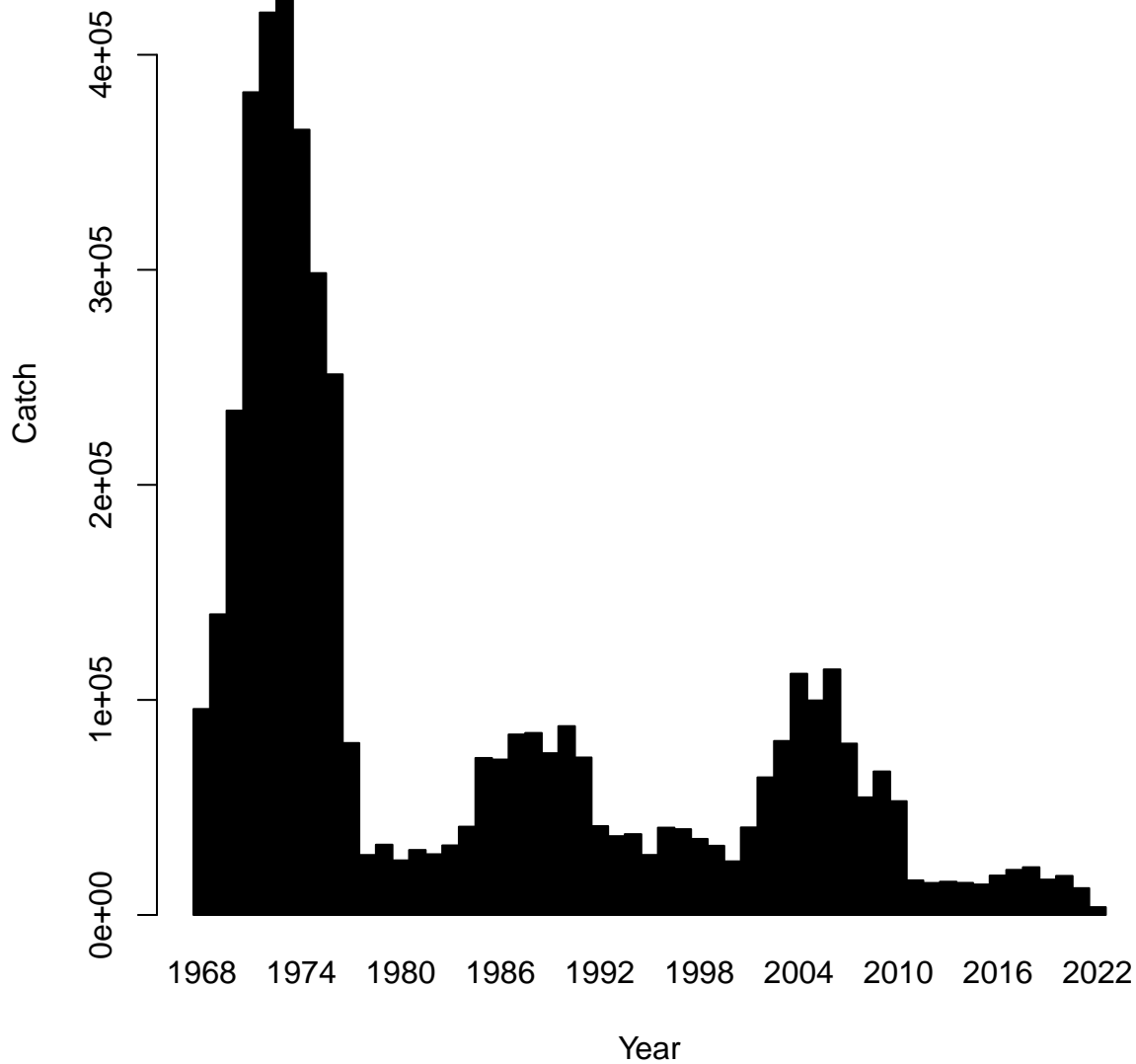




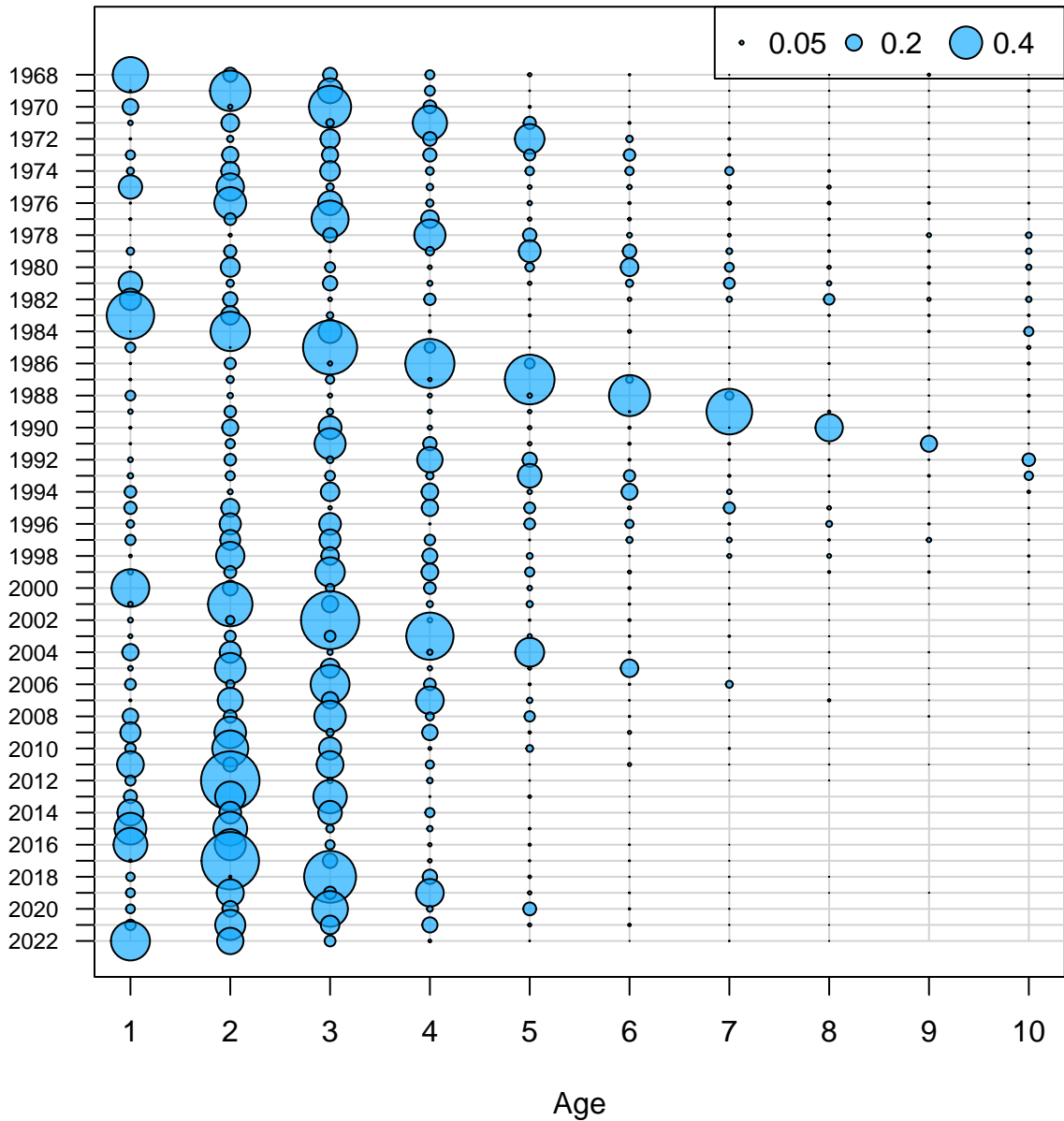


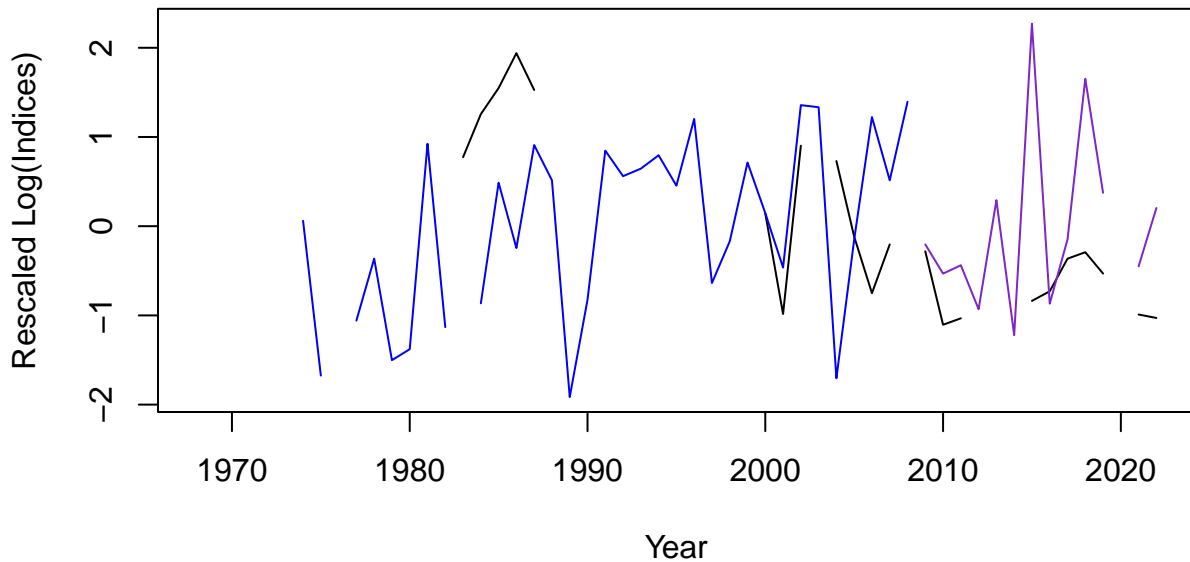
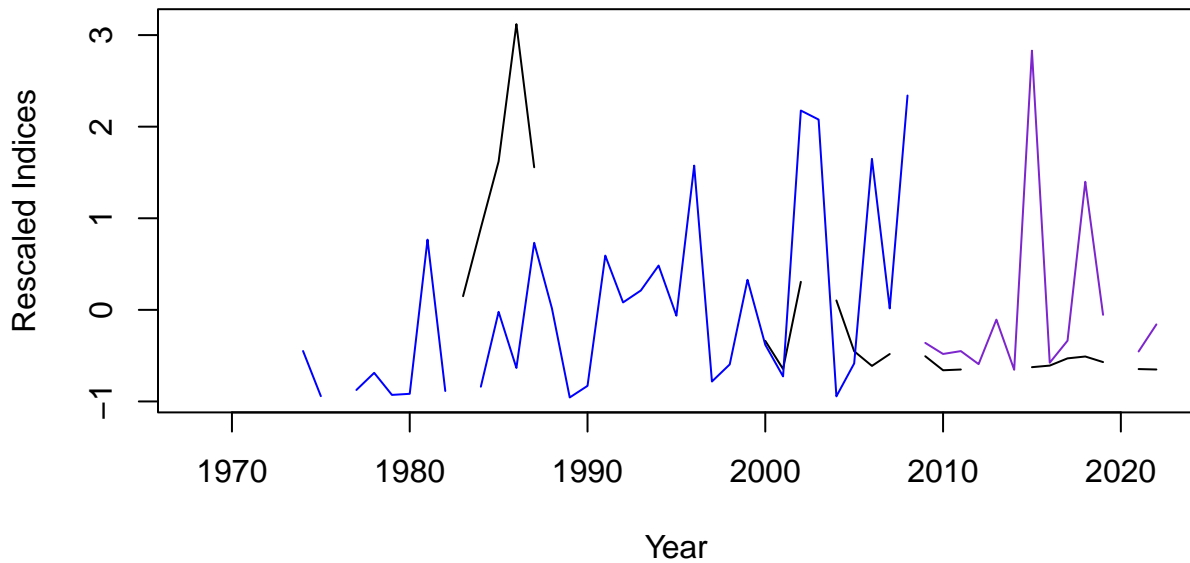




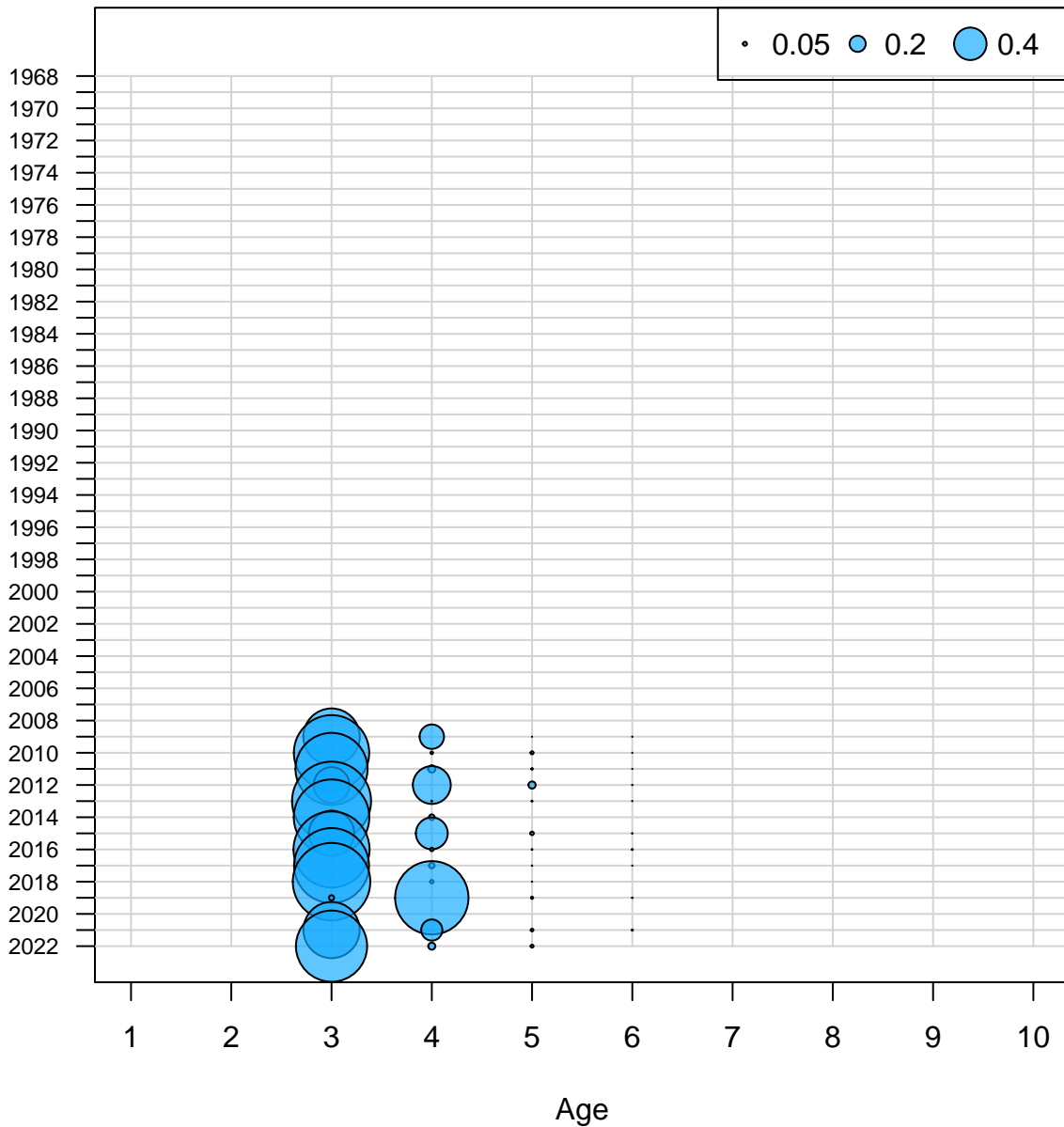


Age Comps for Catch by Fleet 1 (Combined)

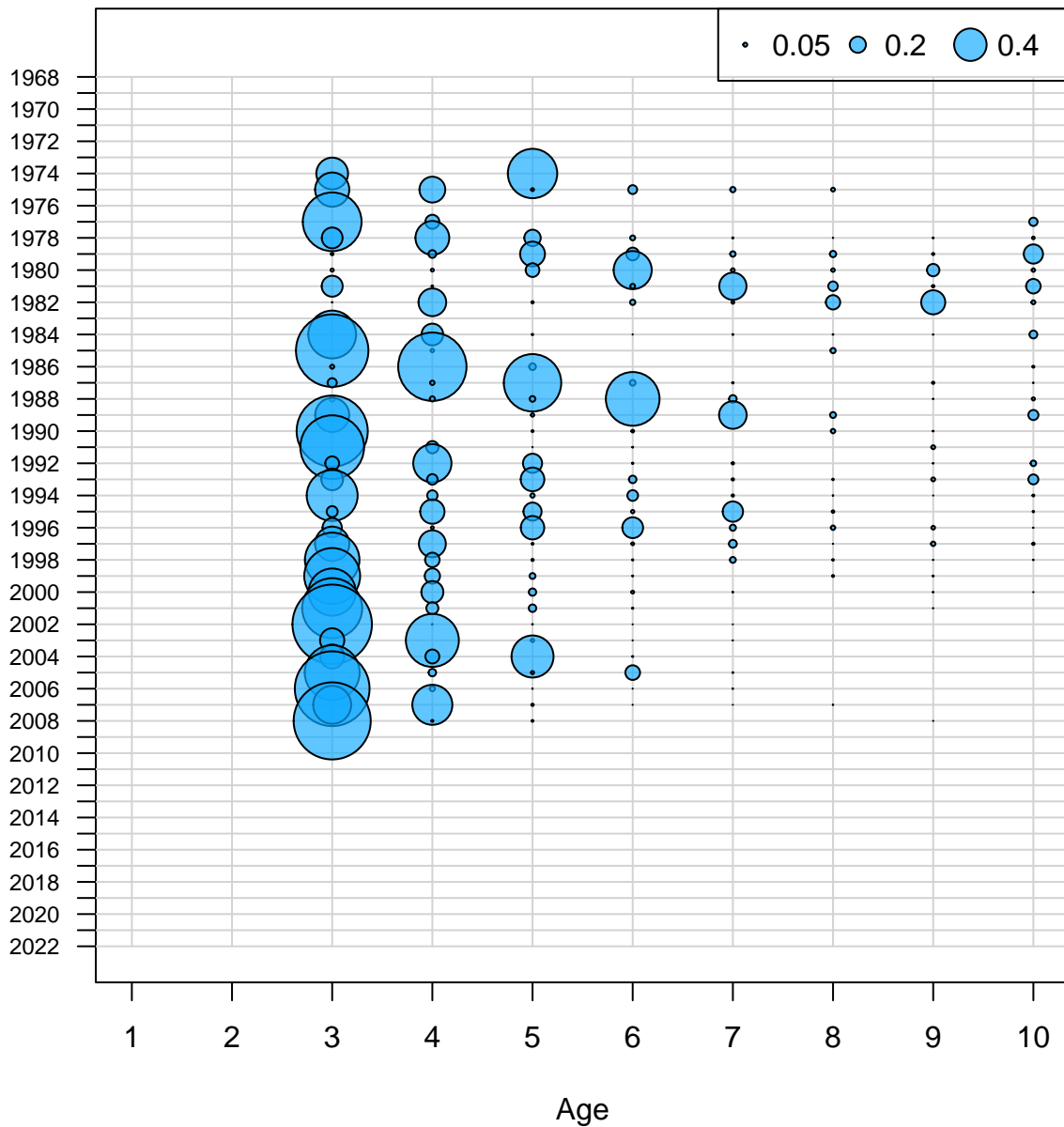




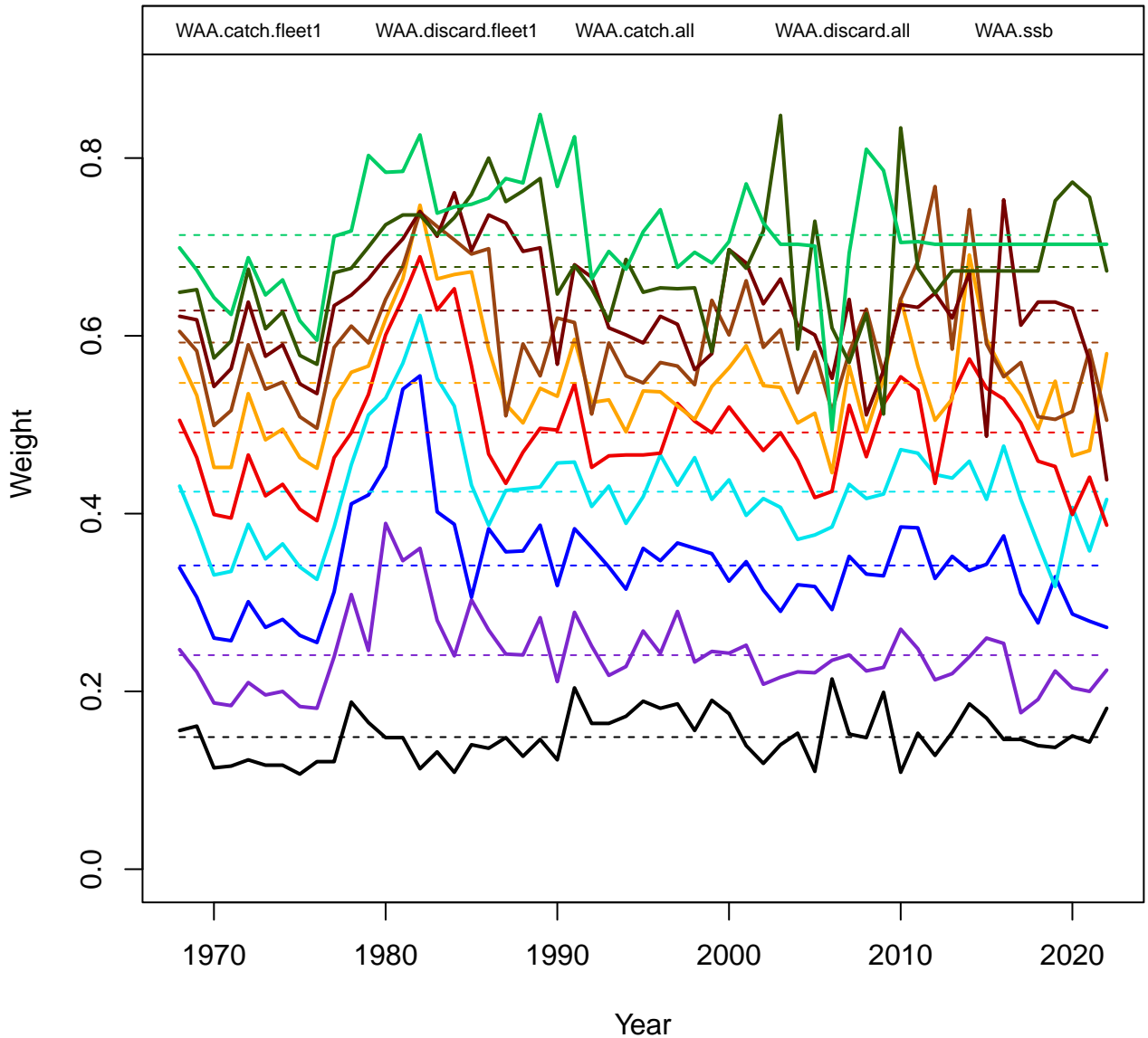
Age Comps for Index 2 (Spring Big 3+)



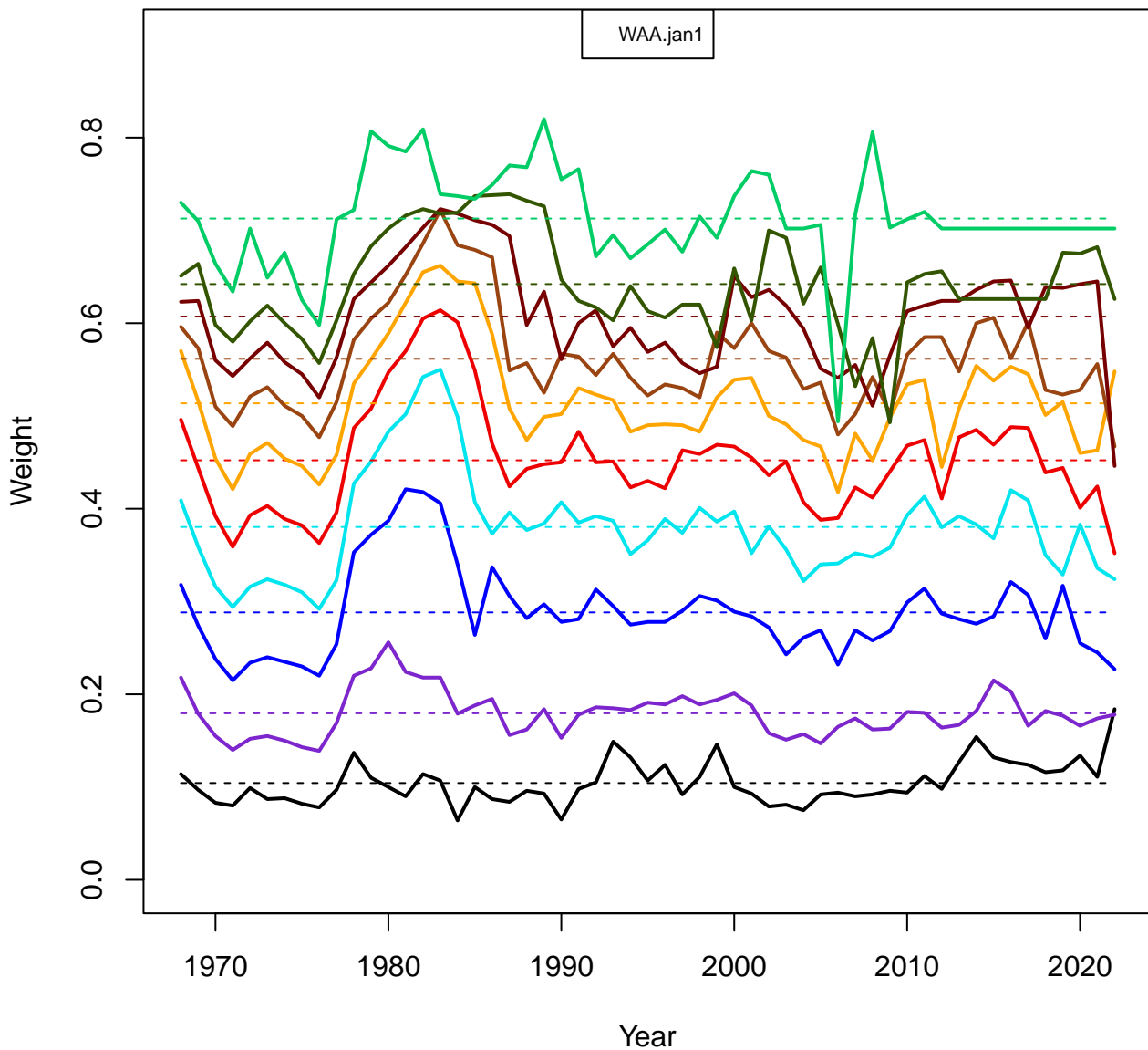
Age Comps for Index 3 (Spring Alb 3+)



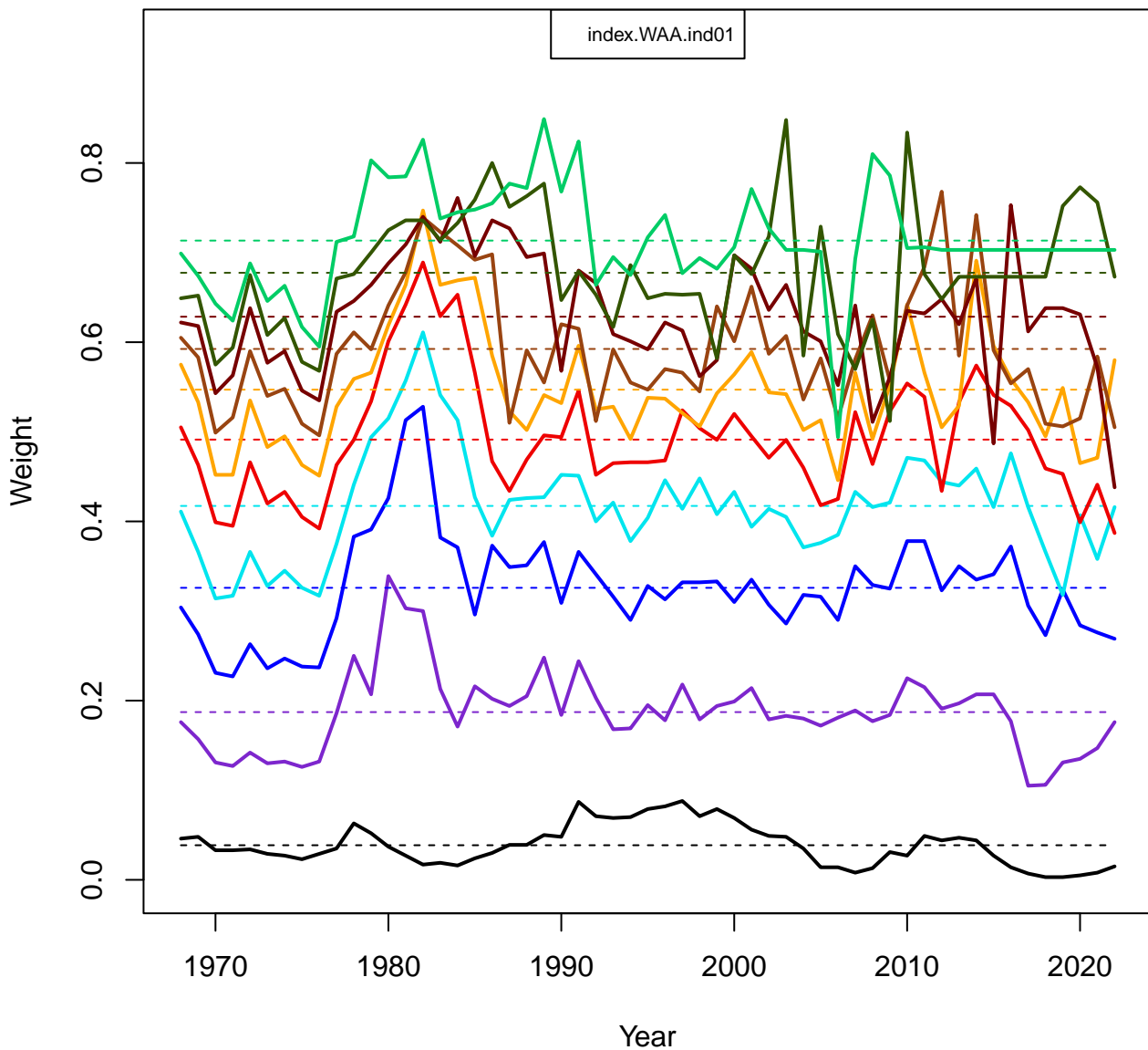
WAA matrix 1



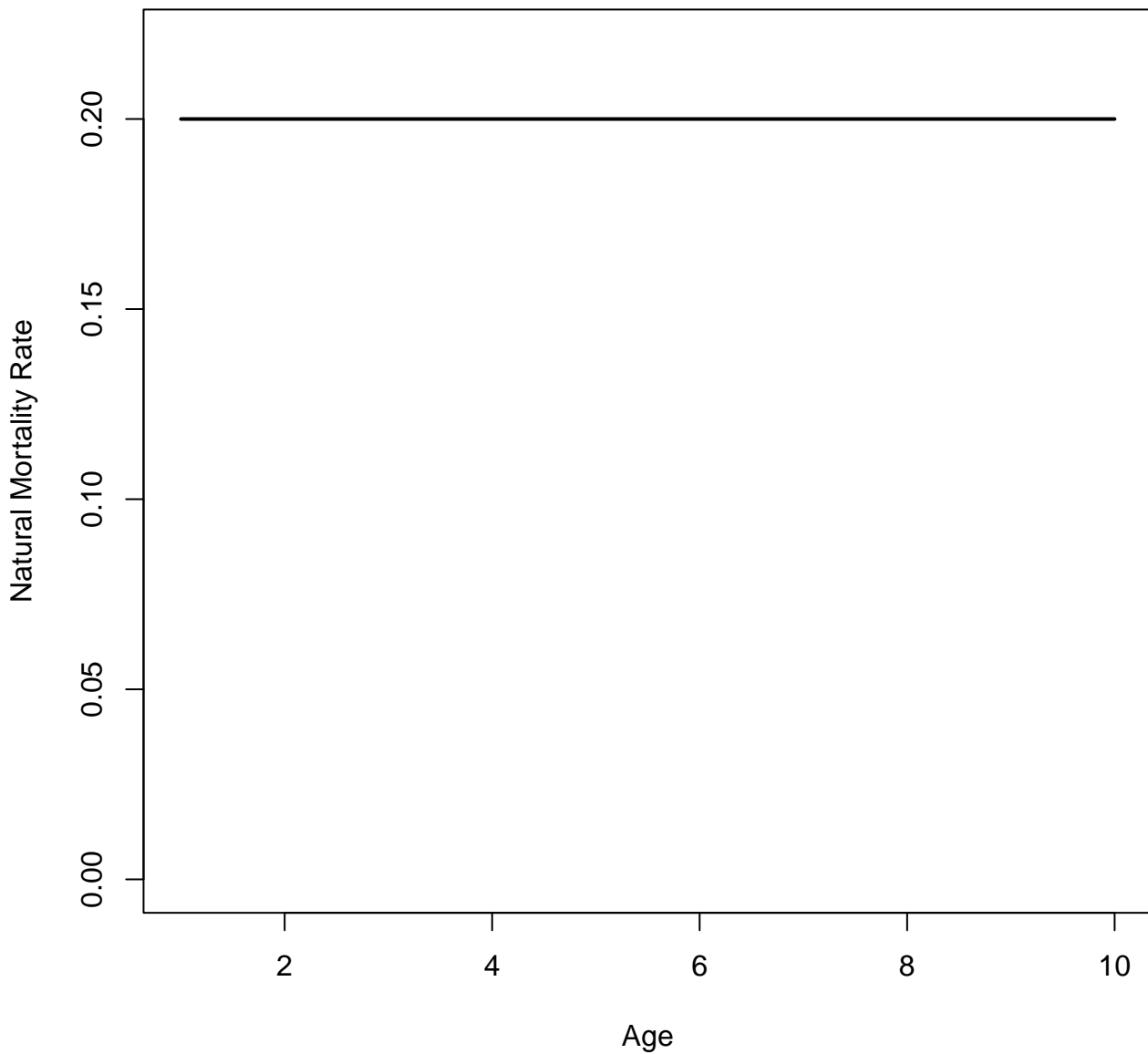
WAA matrix 2



WAA matrix 3



M



Maturity

