

File = y2000r4c1m3.3s111100000_000.dat

ASAP3 run on Monday, 04 Nov 2019 at 11:45:16

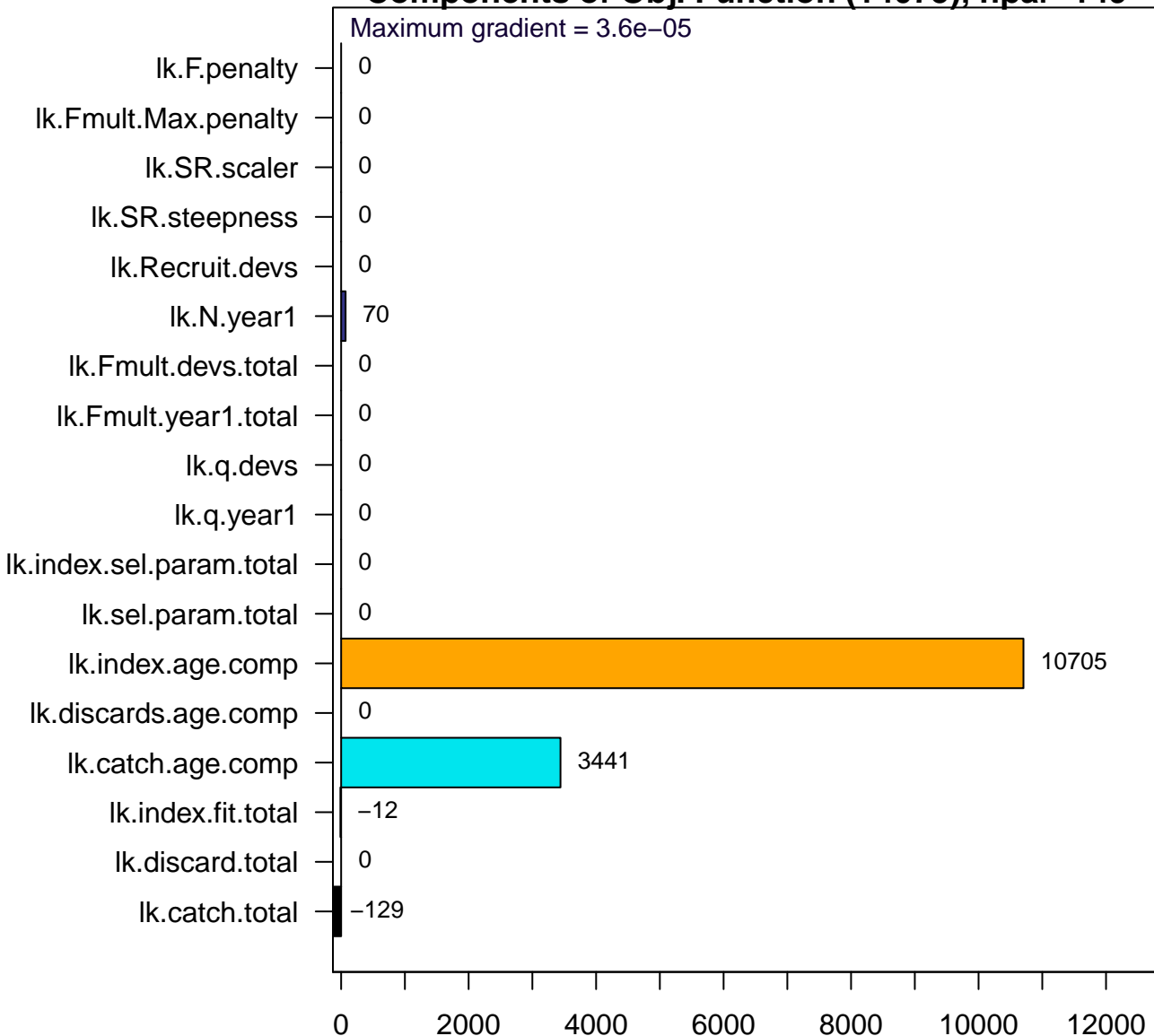
chris.legault\Documents\Working\ICES-WKFORBIAS 2019\WhiteHake\Rose\w

ASAPplots version = 0.2.14

npar = 149, maximum gradient = 3.59764×10^{-5}

Components of Obj. Function (14075), npar=149

Maximum gradient = 3.6e-05

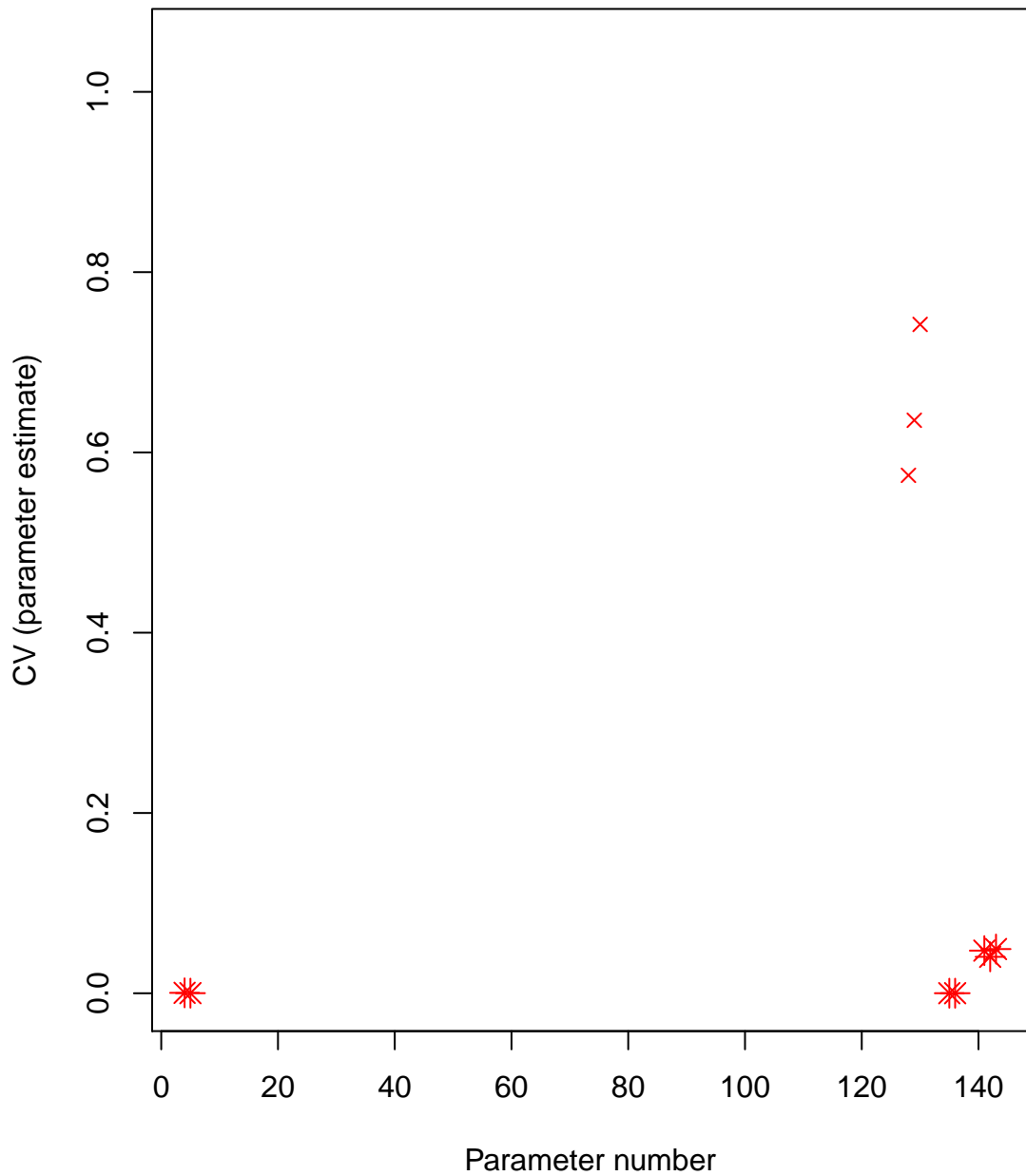


Likelihood Contribution

Model: y2000r4c1m3.3s111100000_000

Monday, 04 Nov 2019 at 11:45

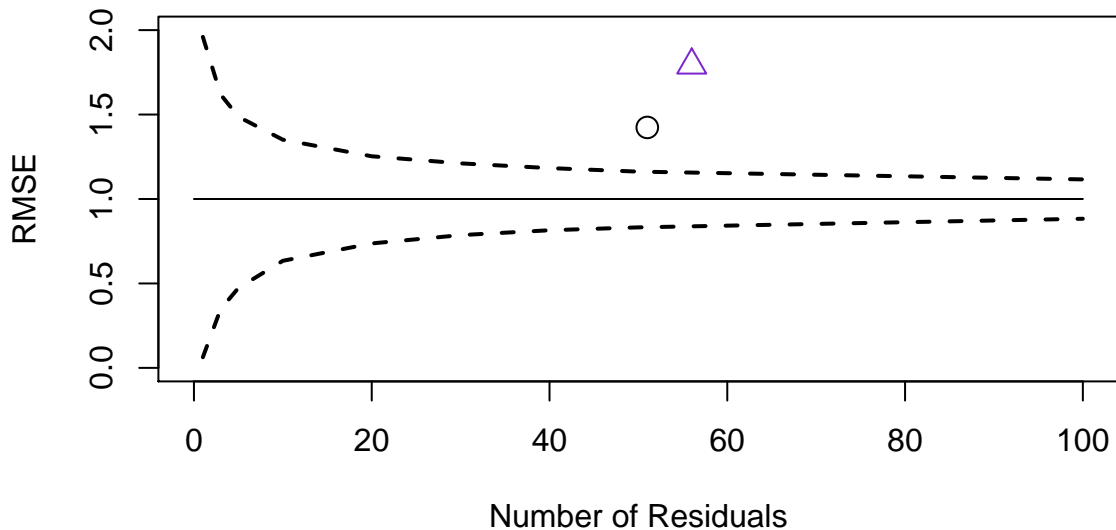




Root Mean Square Error computed from Standardized Residuals

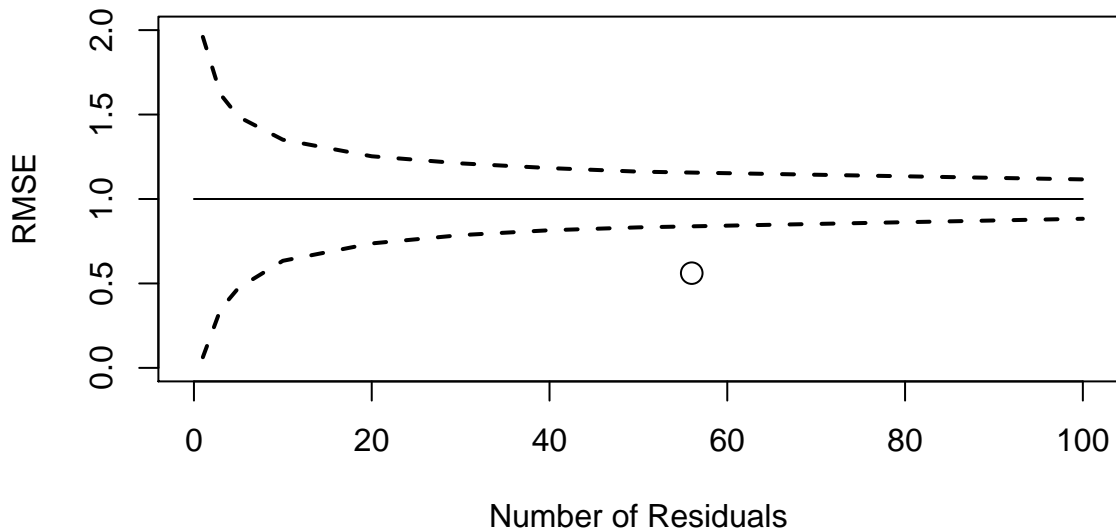
Component	# resids	RMSE
catch.tot	56	0.561
discard.tot	0	0
ind01	51	1.42
ind02	56	1.79
ind.total	107	1.63
N.year1	8	1.15
Fmult.year1	0	0
Fmult.devs.total	0	0
recruit.devs	0	0
fleet.sel.params	0	0
index.sel.params	0	0
q.year1	0	0
q.devs	0	0
SR.steepness	0	0
SR.scaler	0	0

Root Mean Square Error for Indices



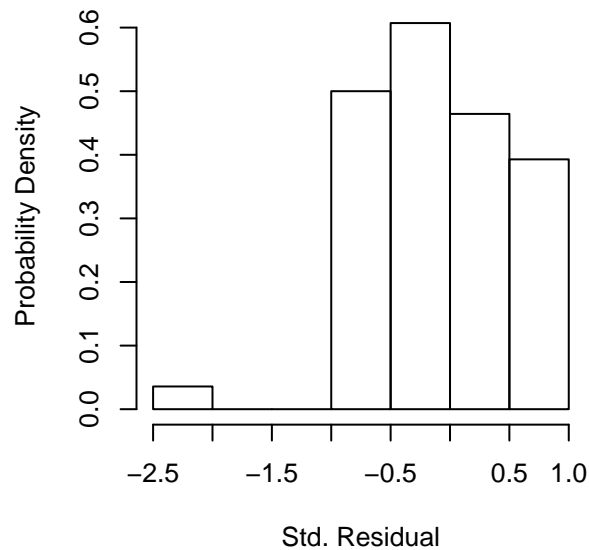
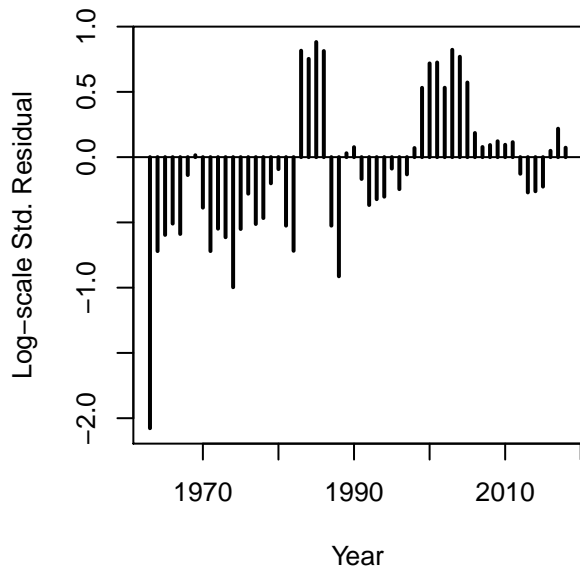
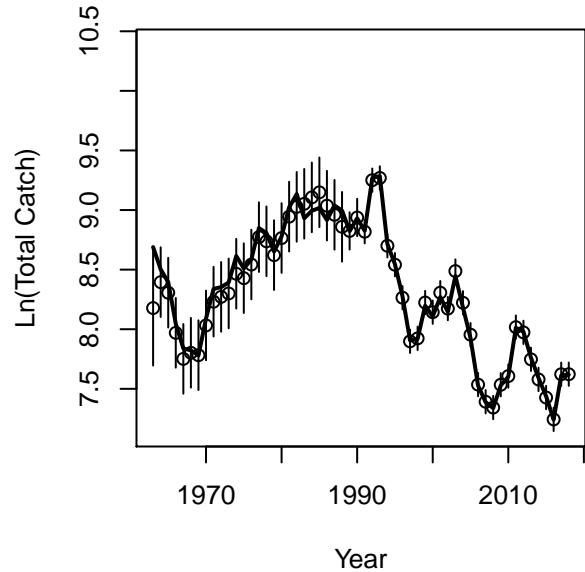
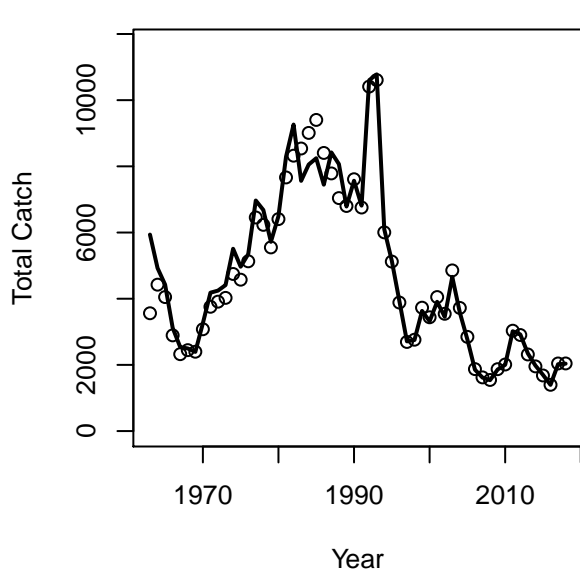
+ ind total
△ INDEX-2
○ INDEX-1

Root Mean Square Error for Catch



○ catch.tot

Fleet 1 Catch (FLEET-1)

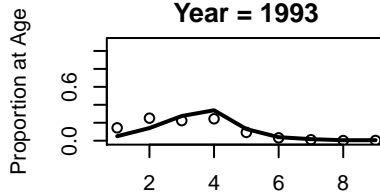


Catch

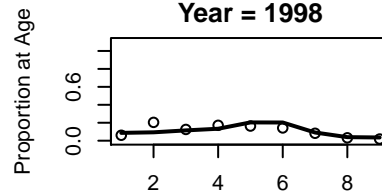
Fleet 1
FLEET-1



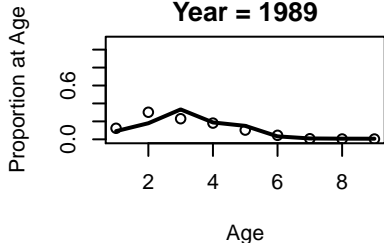
Year = 1993



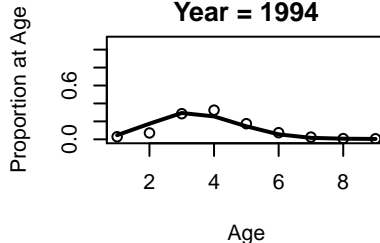
Year = 1998



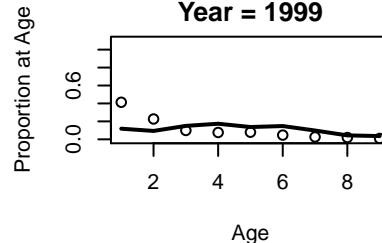
Year = 1989



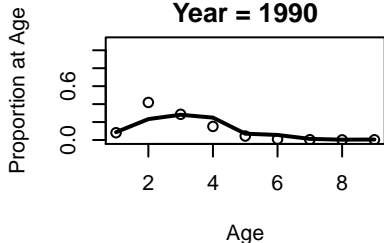
Year = 1994



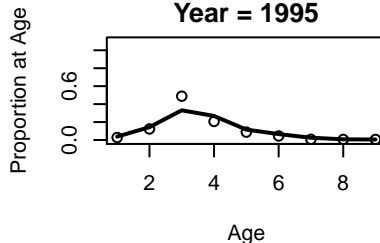
Year = 1999



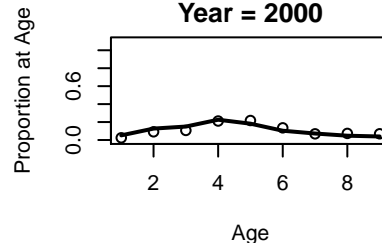
Year = 1990



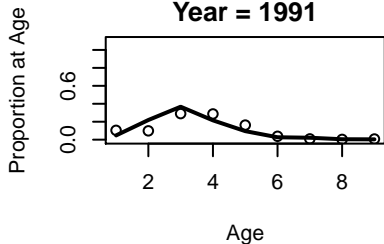
Year = 1995



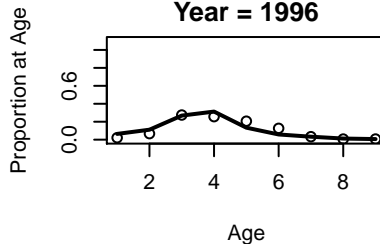
Year = 2000



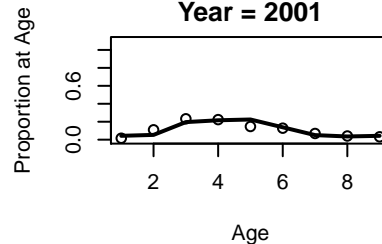
Year = 1991



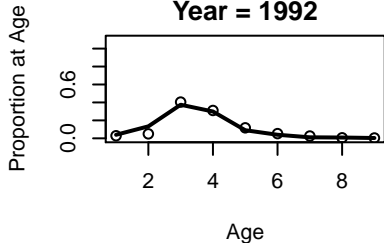
Year = 1996



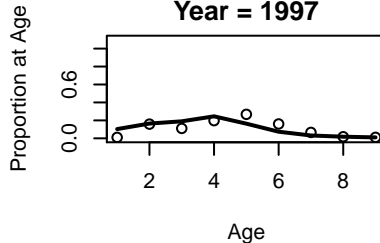
Year = 2001



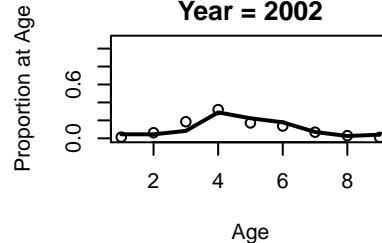
Year = 1992



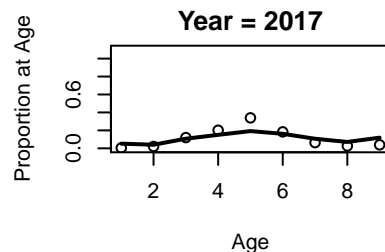
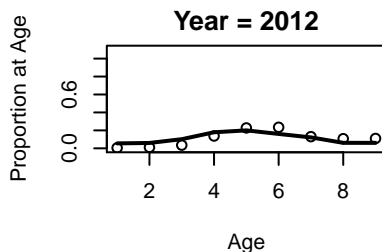
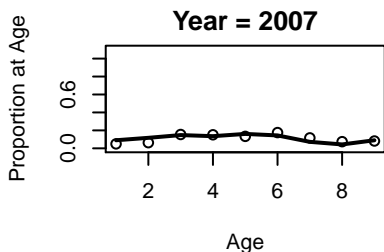
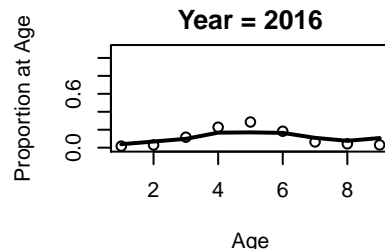
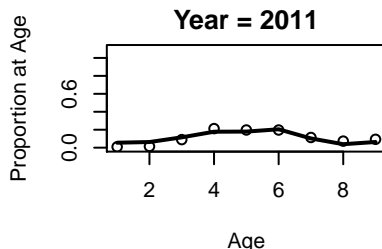
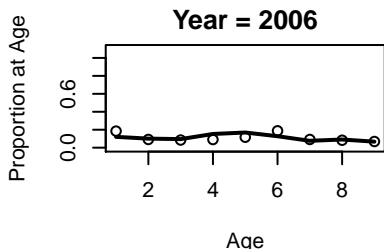
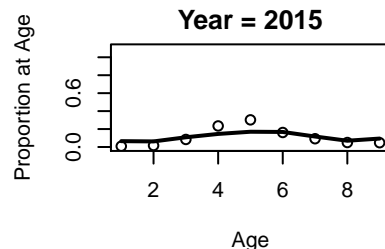
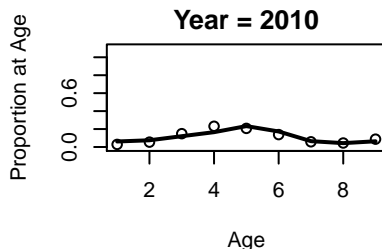
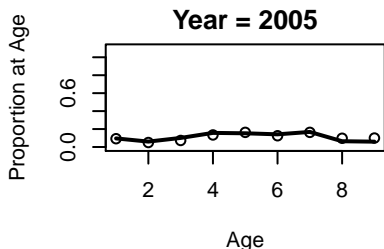
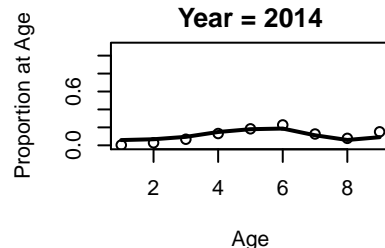
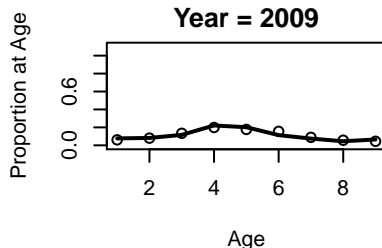
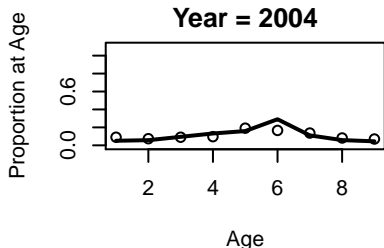
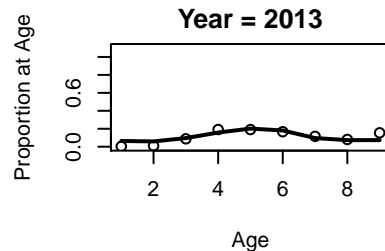
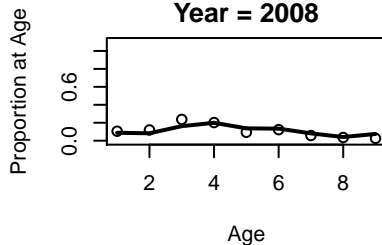
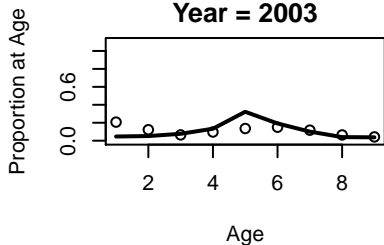
Year = 1997



Year = 2002



Year = 2008



Year = 2018

Proportion at Age

0.0 0.6

2

4

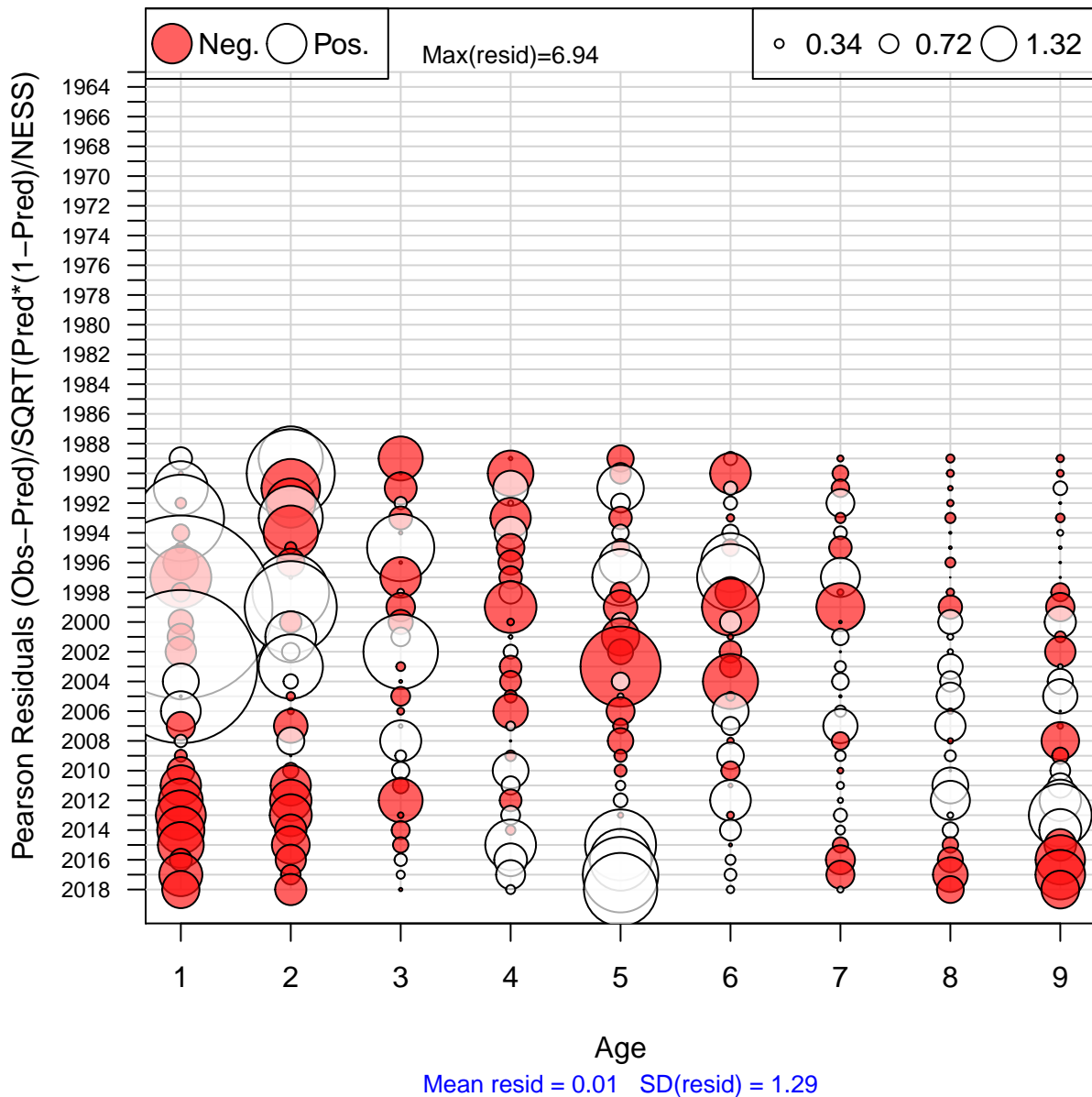
6

8

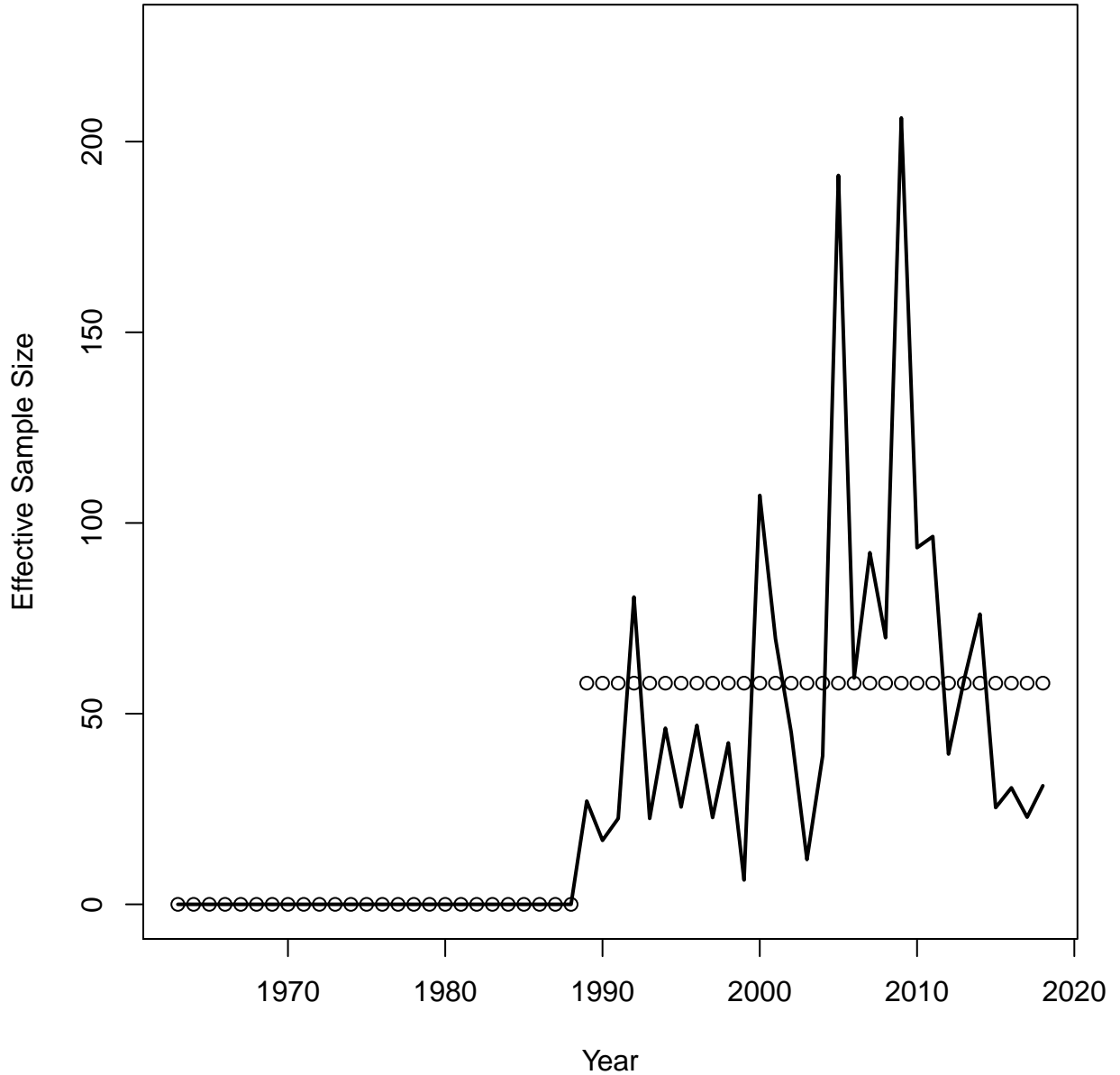
Age

Catch

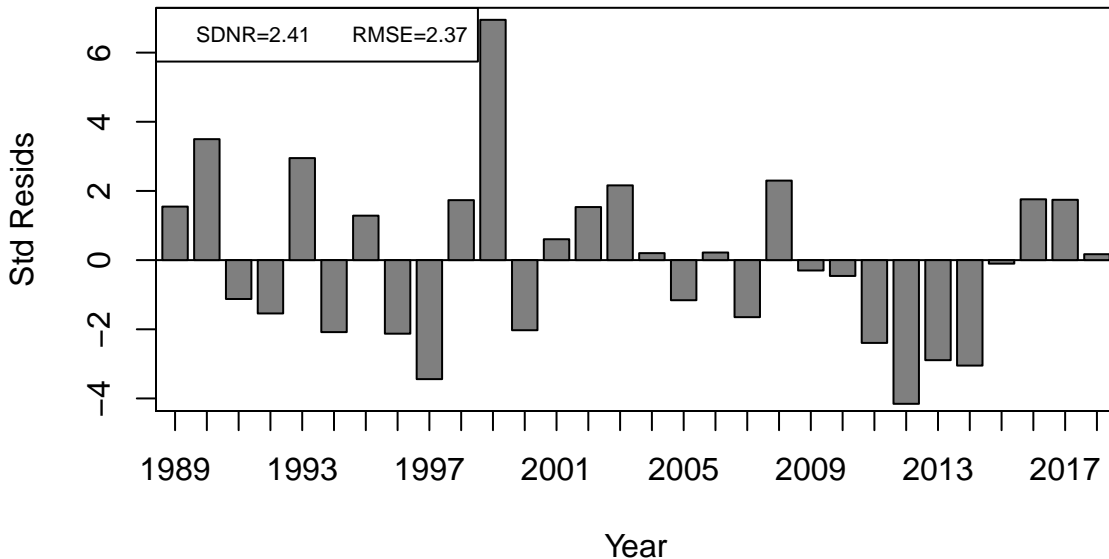
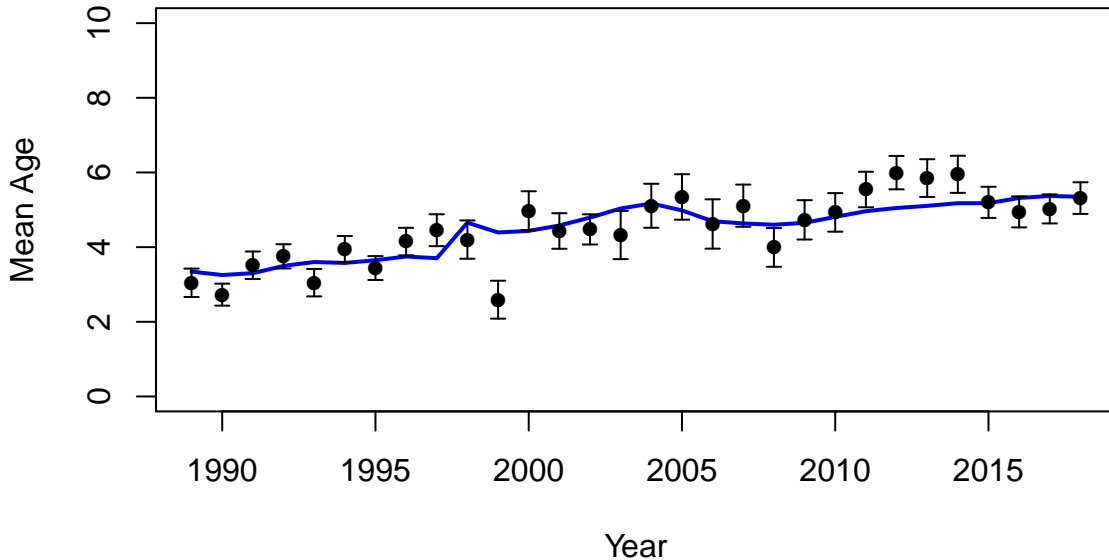
Age Comp Residuals for Catch by Fleet 1 (FLEET-1)



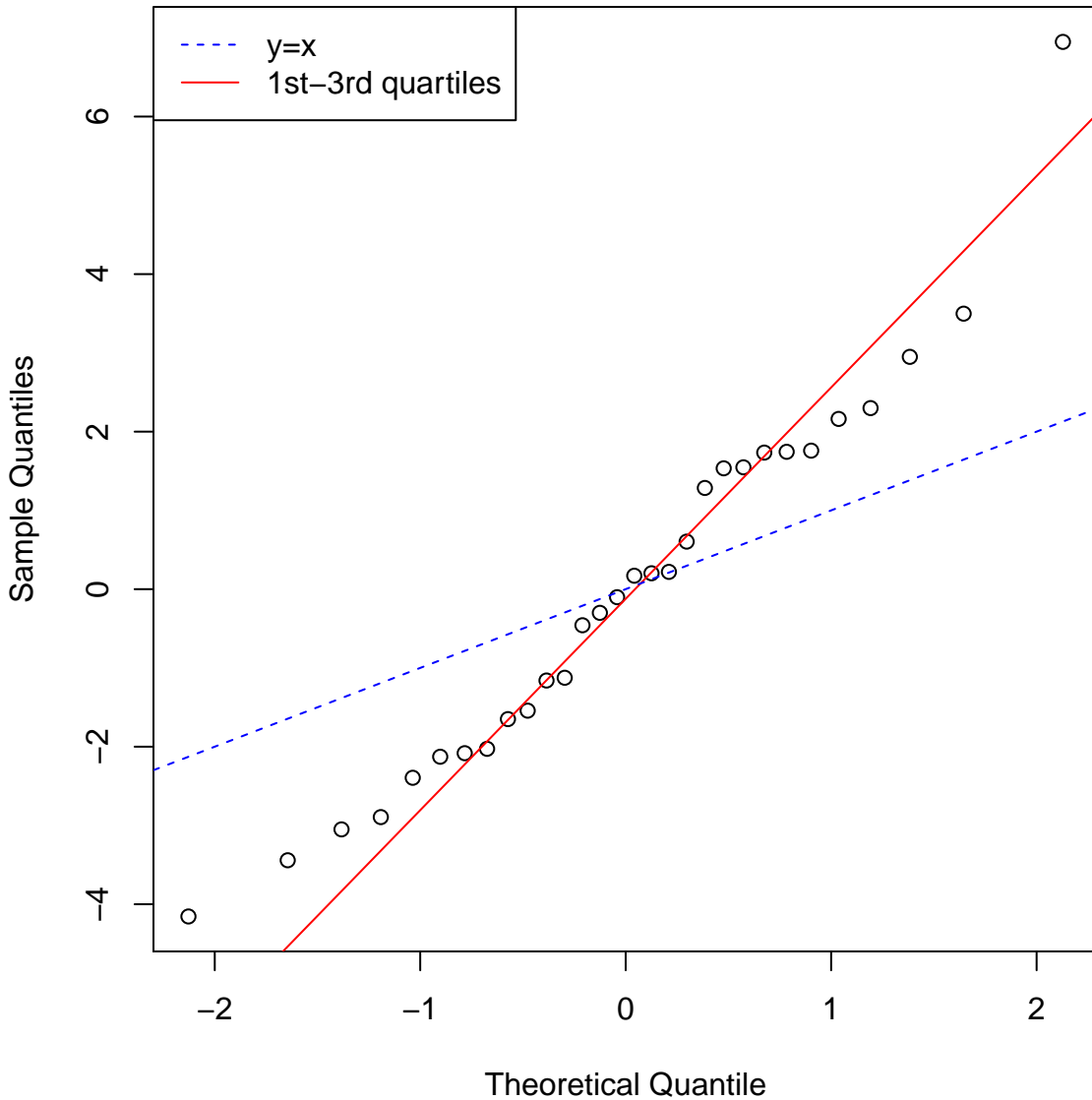
Catch Neff Fleet 1 (FLEET-1)



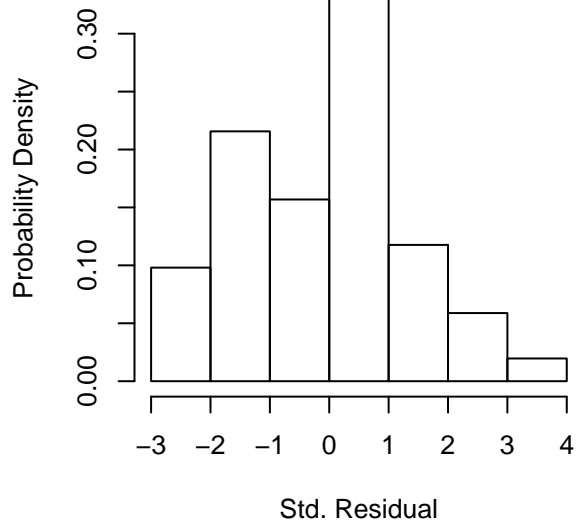
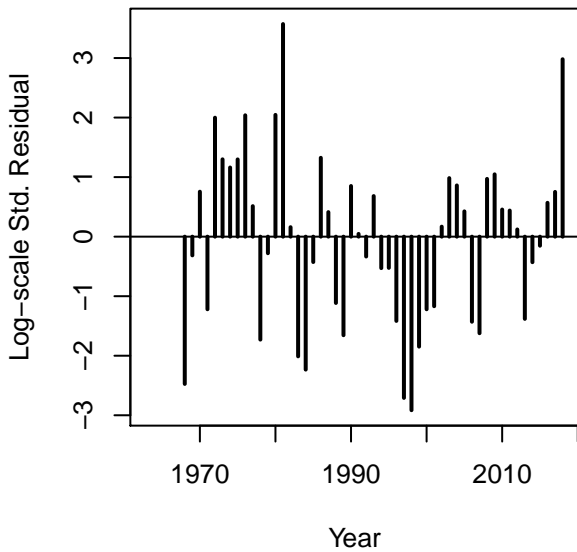
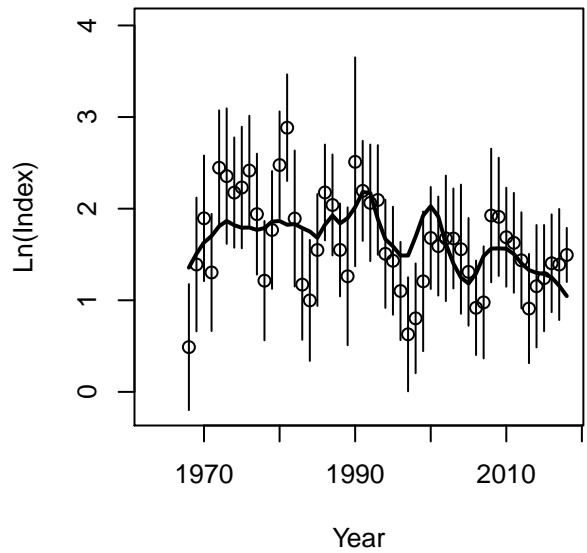
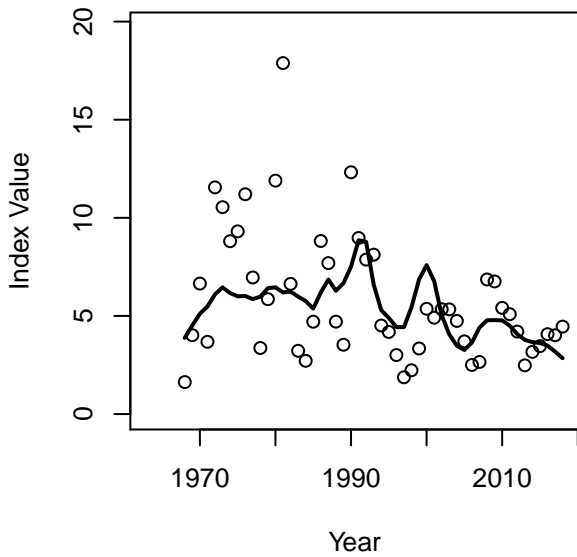
Catch Fleet 1 (FLEET-1) ESS = 58



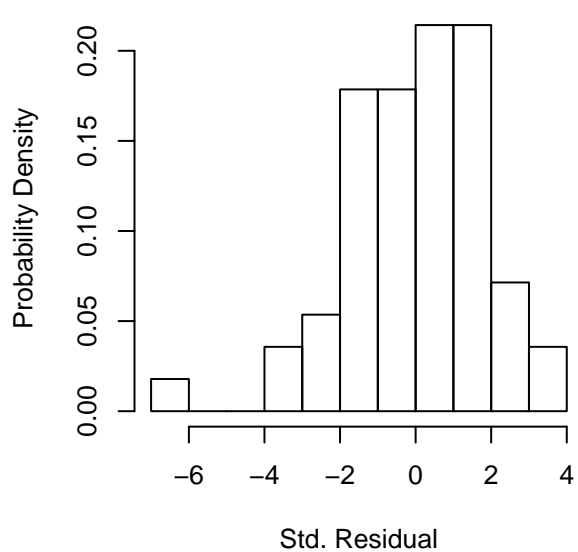
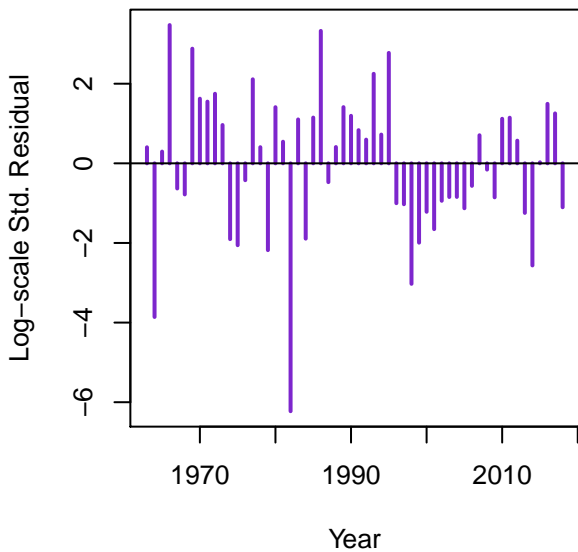
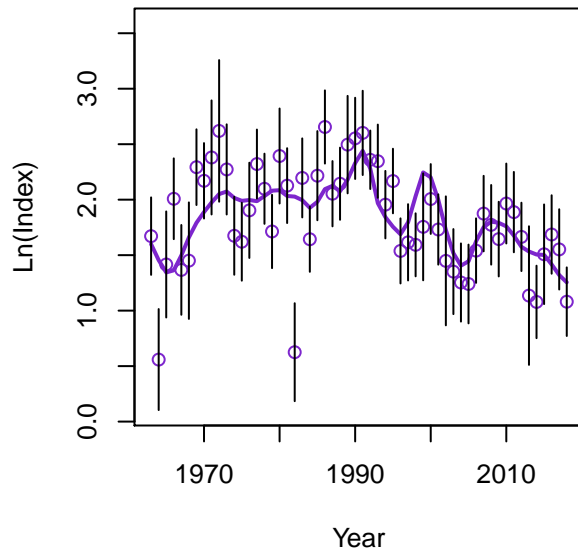
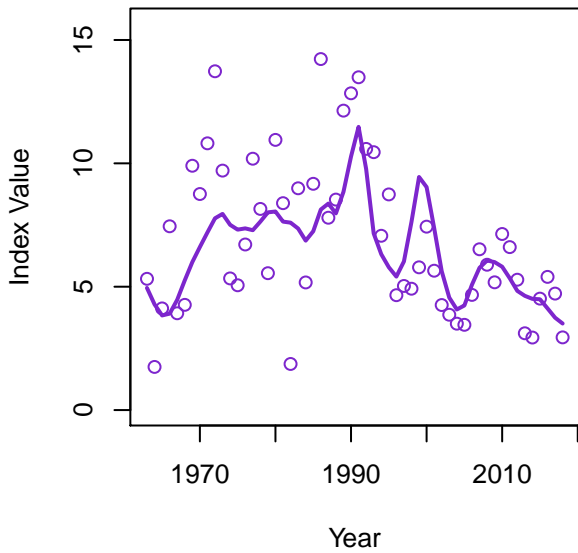
Catch Fleet 1 (FLEET-1) ESS = 58



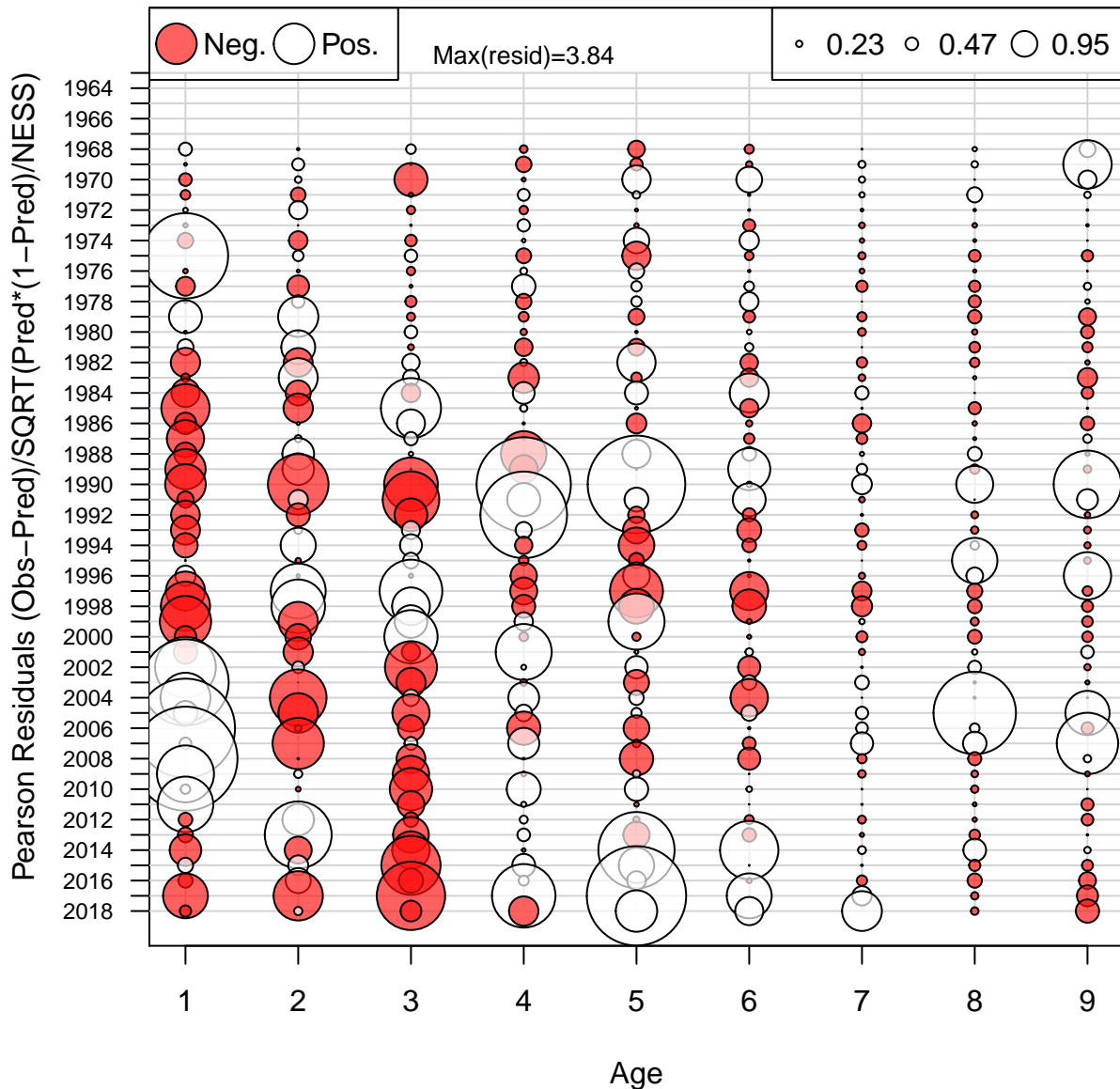
Index 1 (INDEX-1)



Index 2 (INDEX-2)

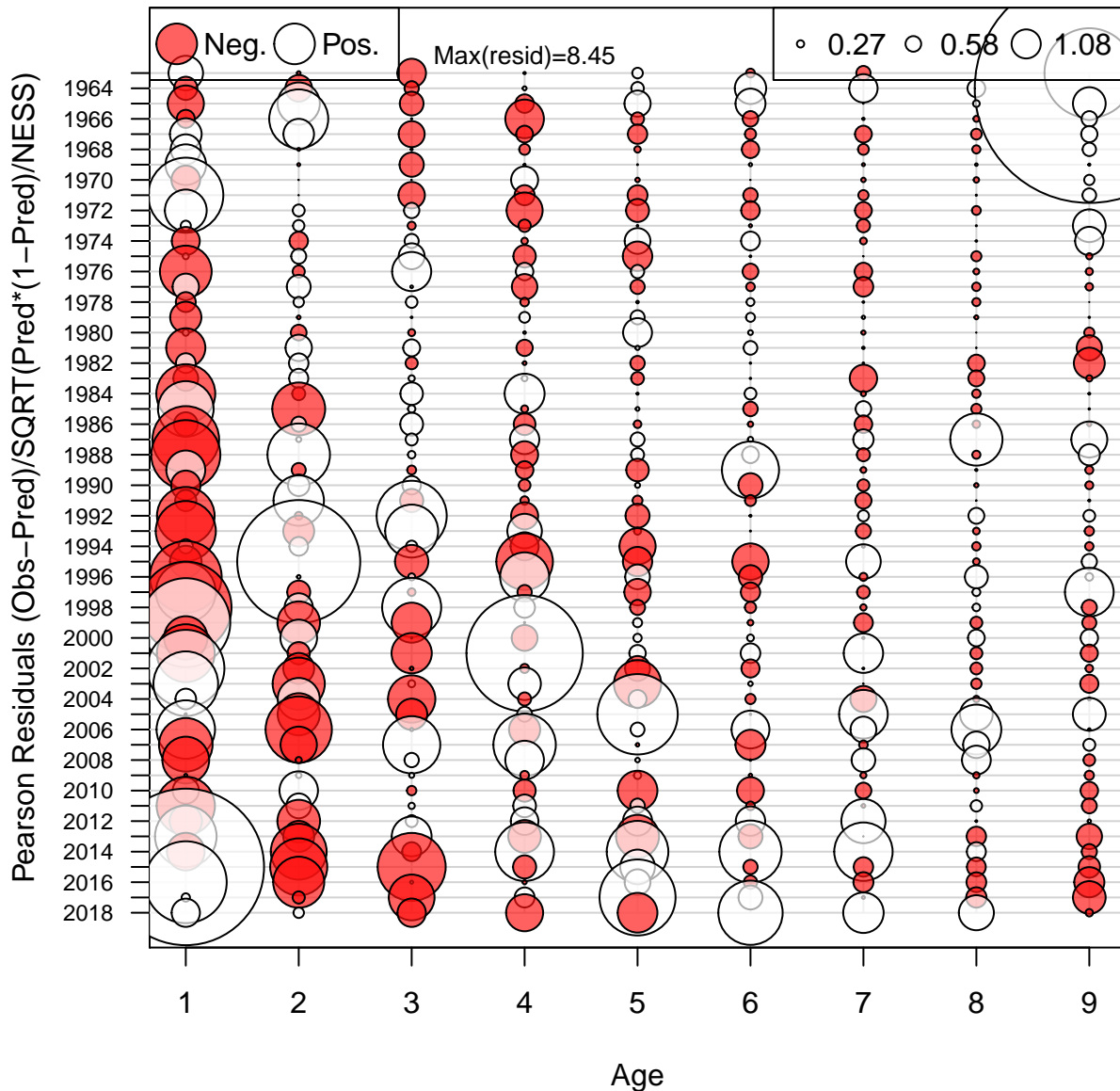


Age Comp Residuals for Index 1 (INDEX-1)



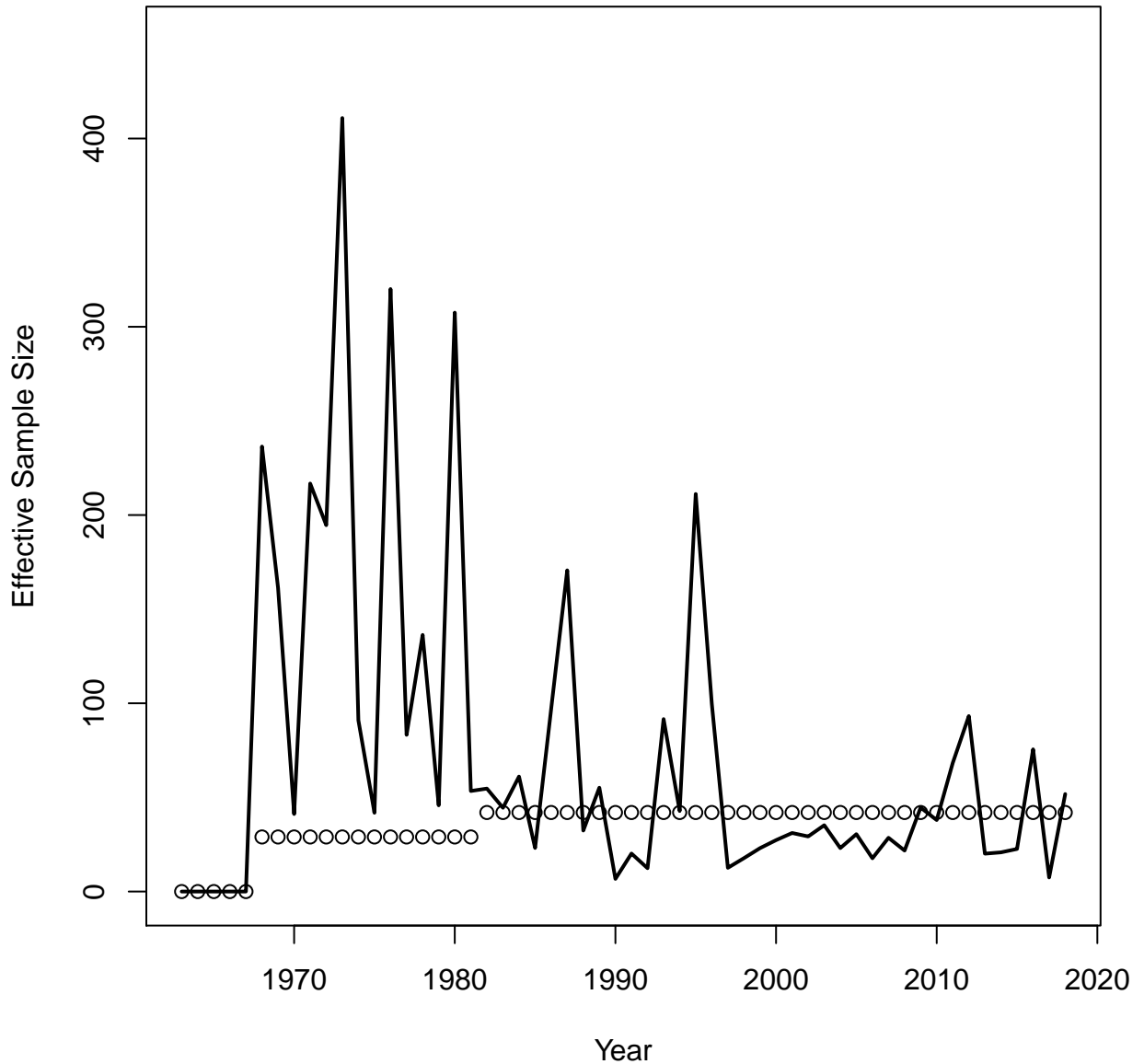
Mean resid = 0.02 SD(resid) = 0.98

Age Comp Residuals for Index 2 (INDEX-2)

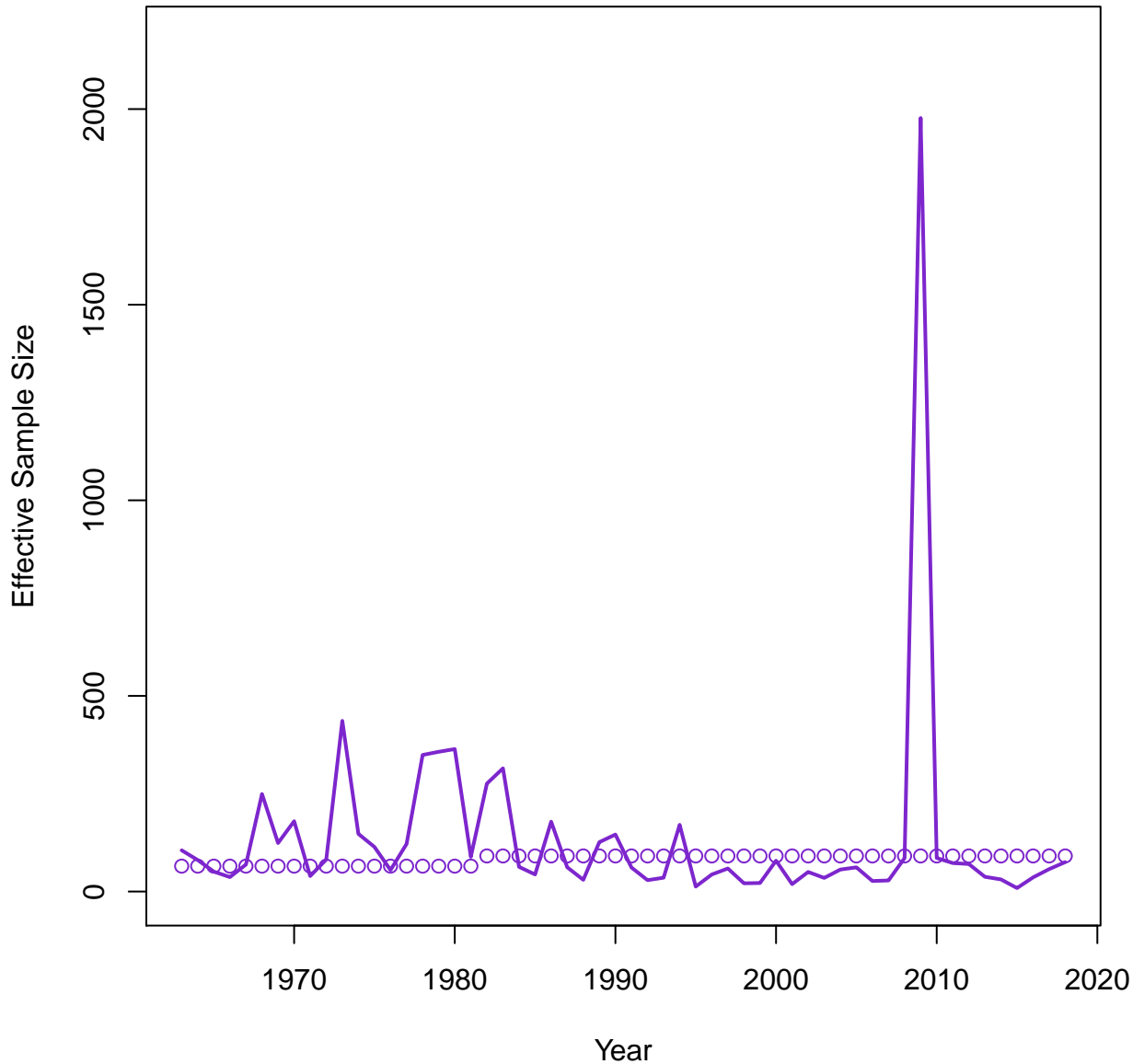


Mean resid = 0.02 SD(resid) = 1.14

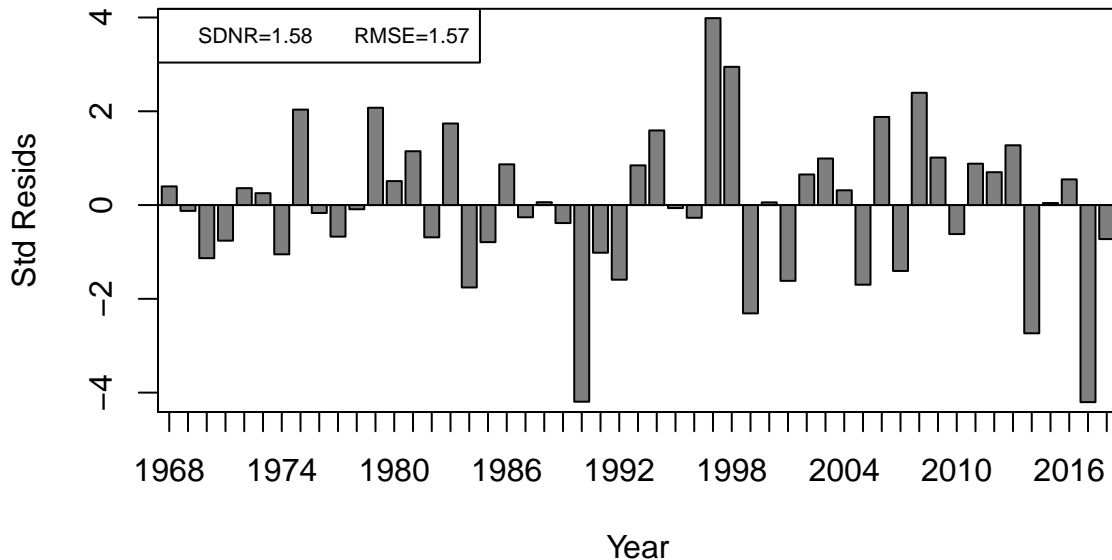
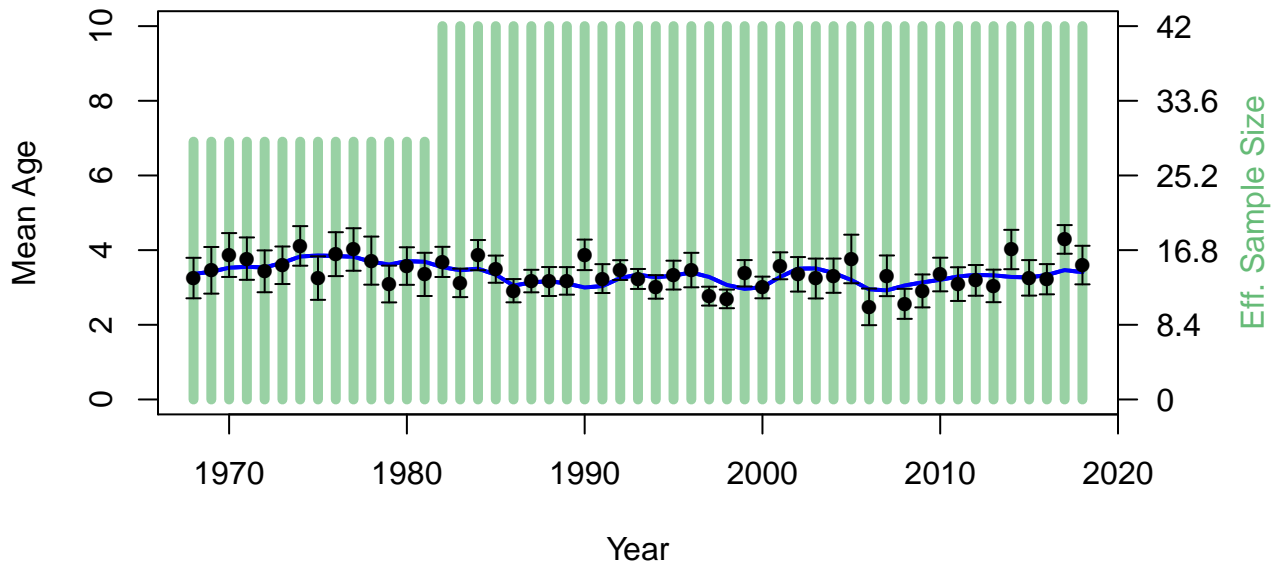
Index Neff 1 (INDEX-1)



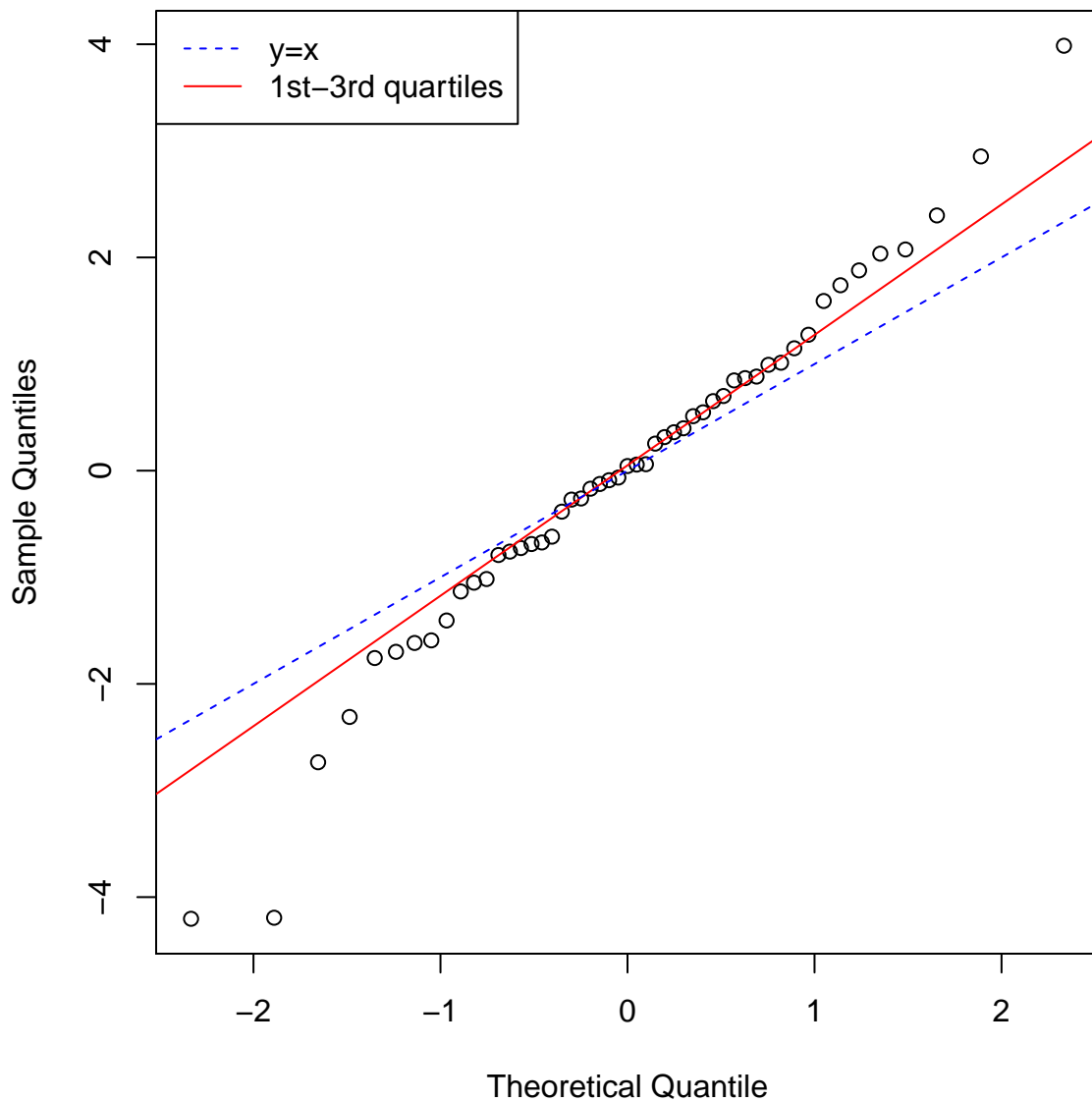
Index Neff 2 (INDEX-2)



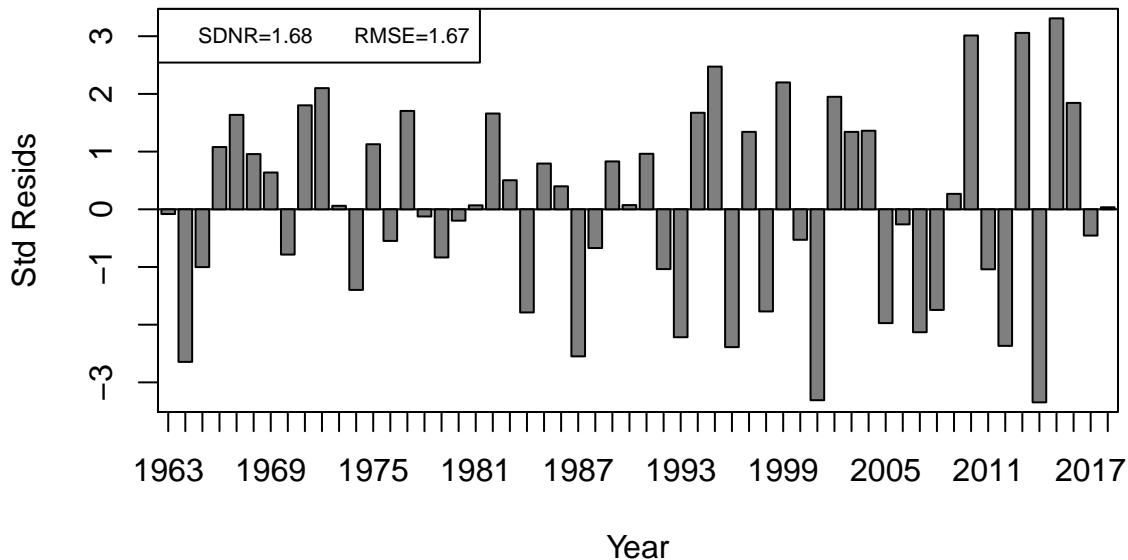
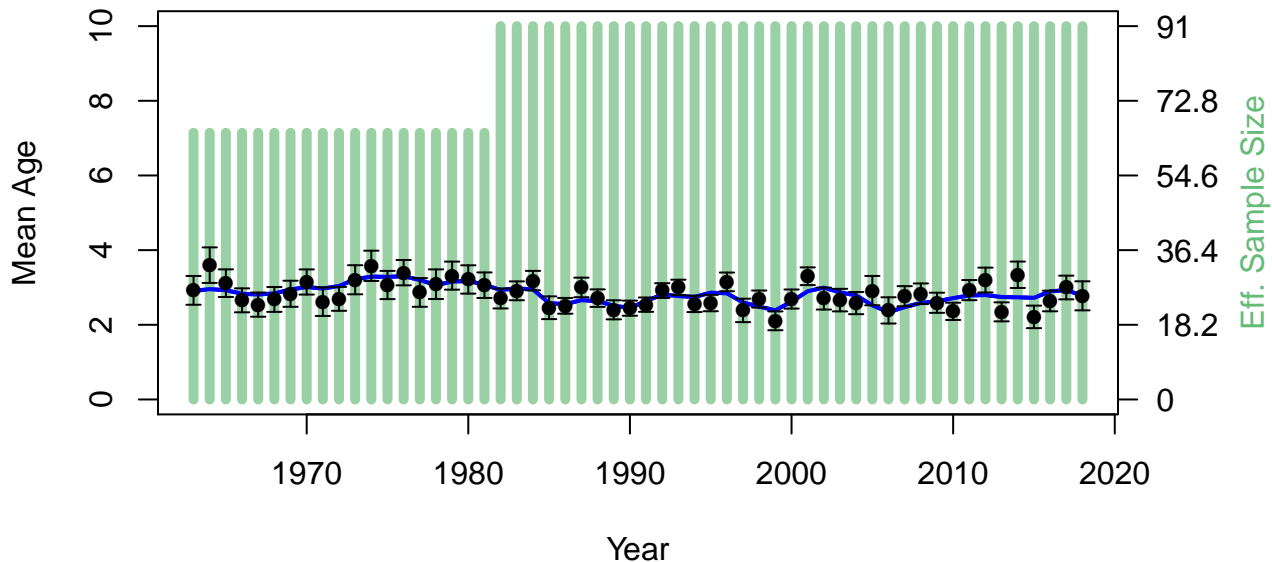
Index 1 (INDEX-1)



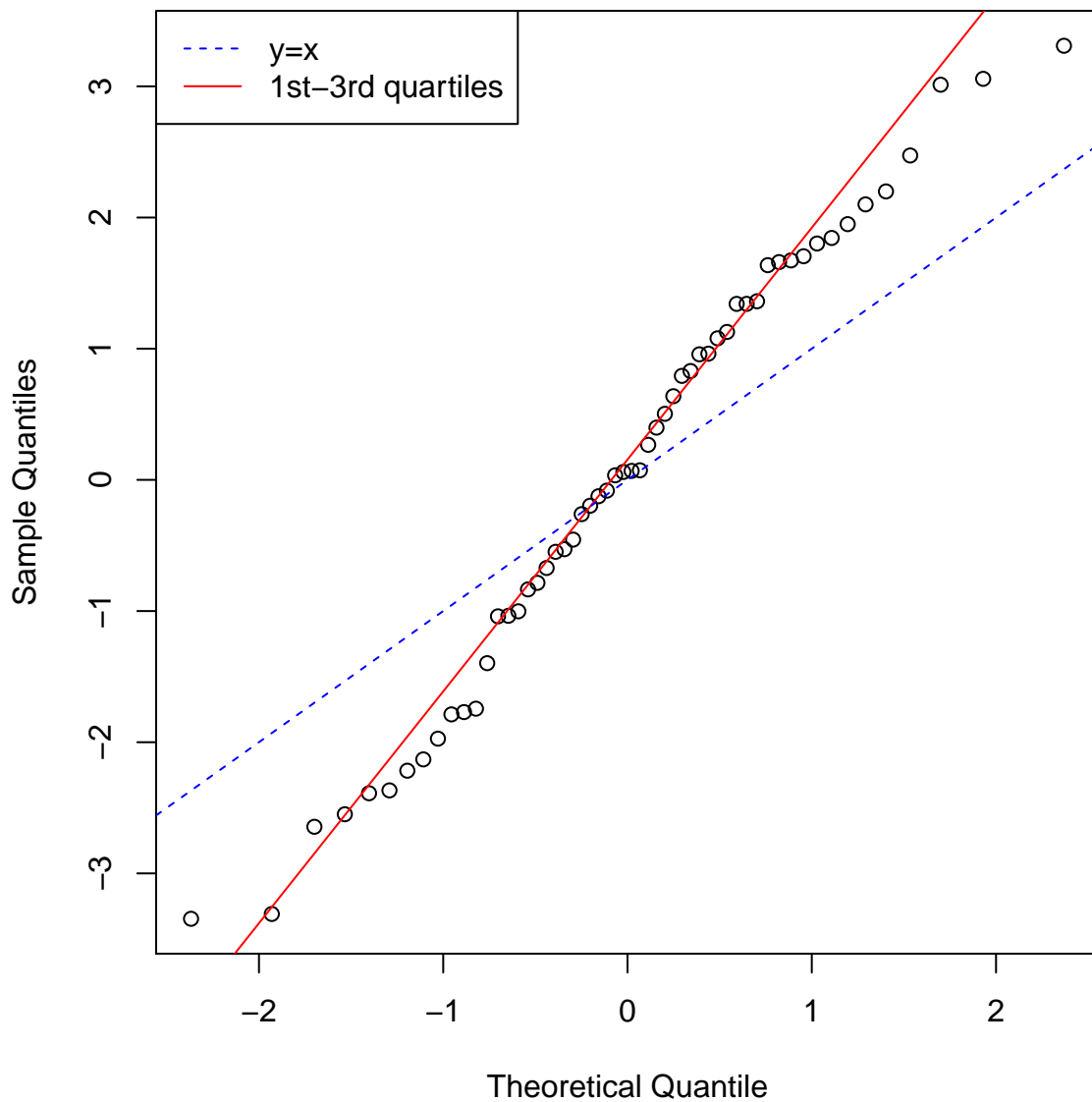
Index 1 (INDEX-1)



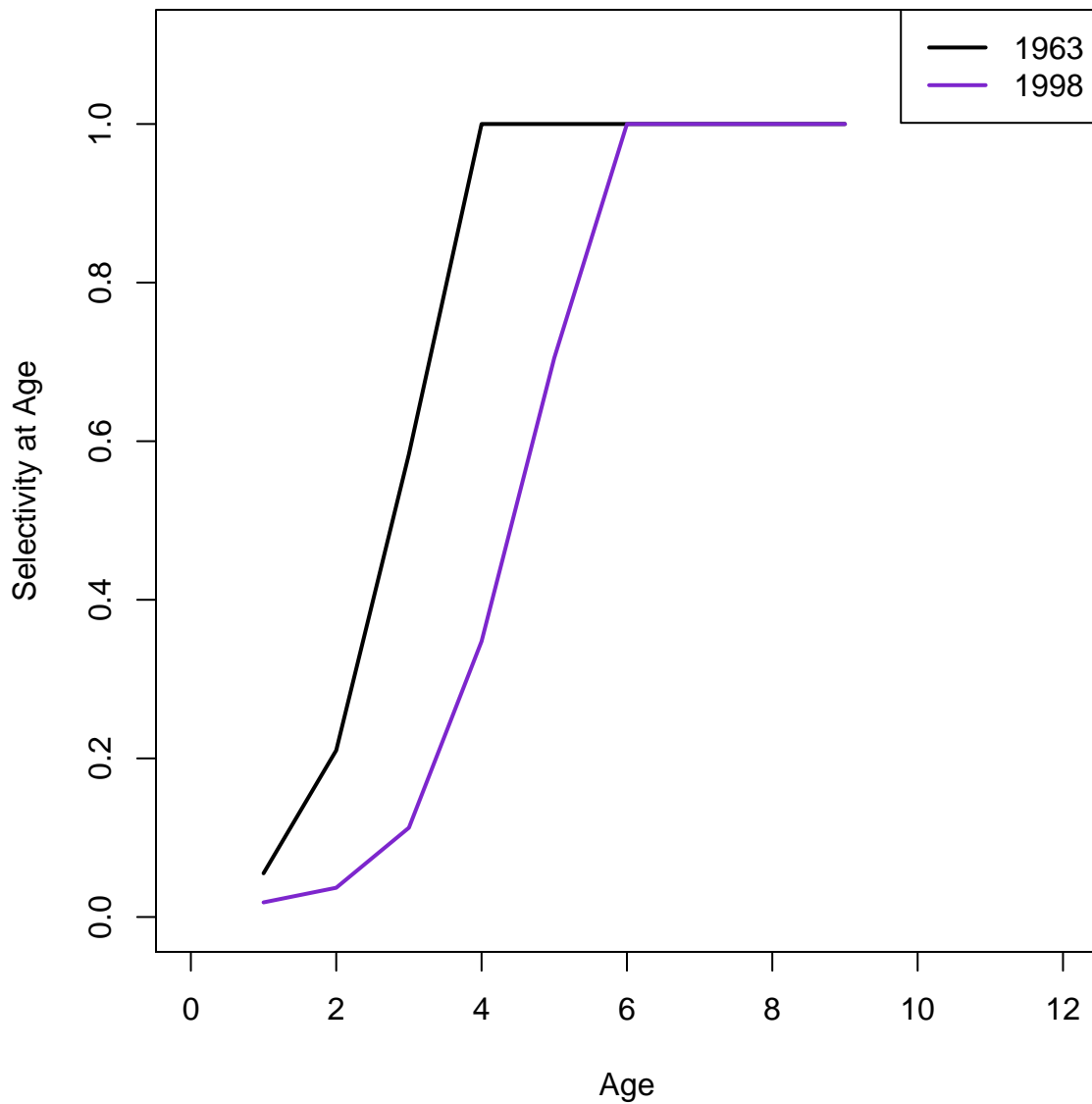
Index 2 (INDEX-2)

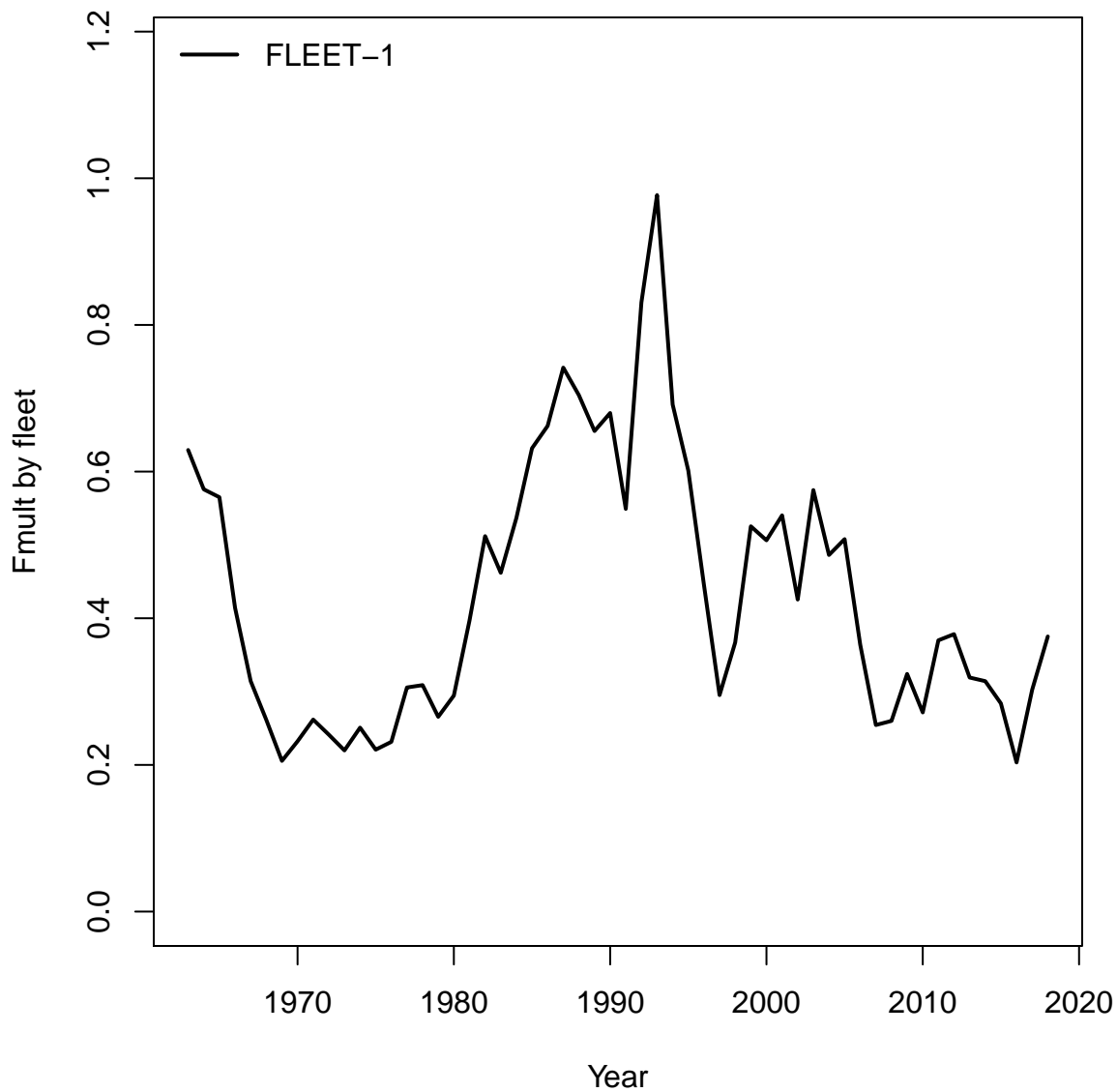


Index 2 (INDEX-2)

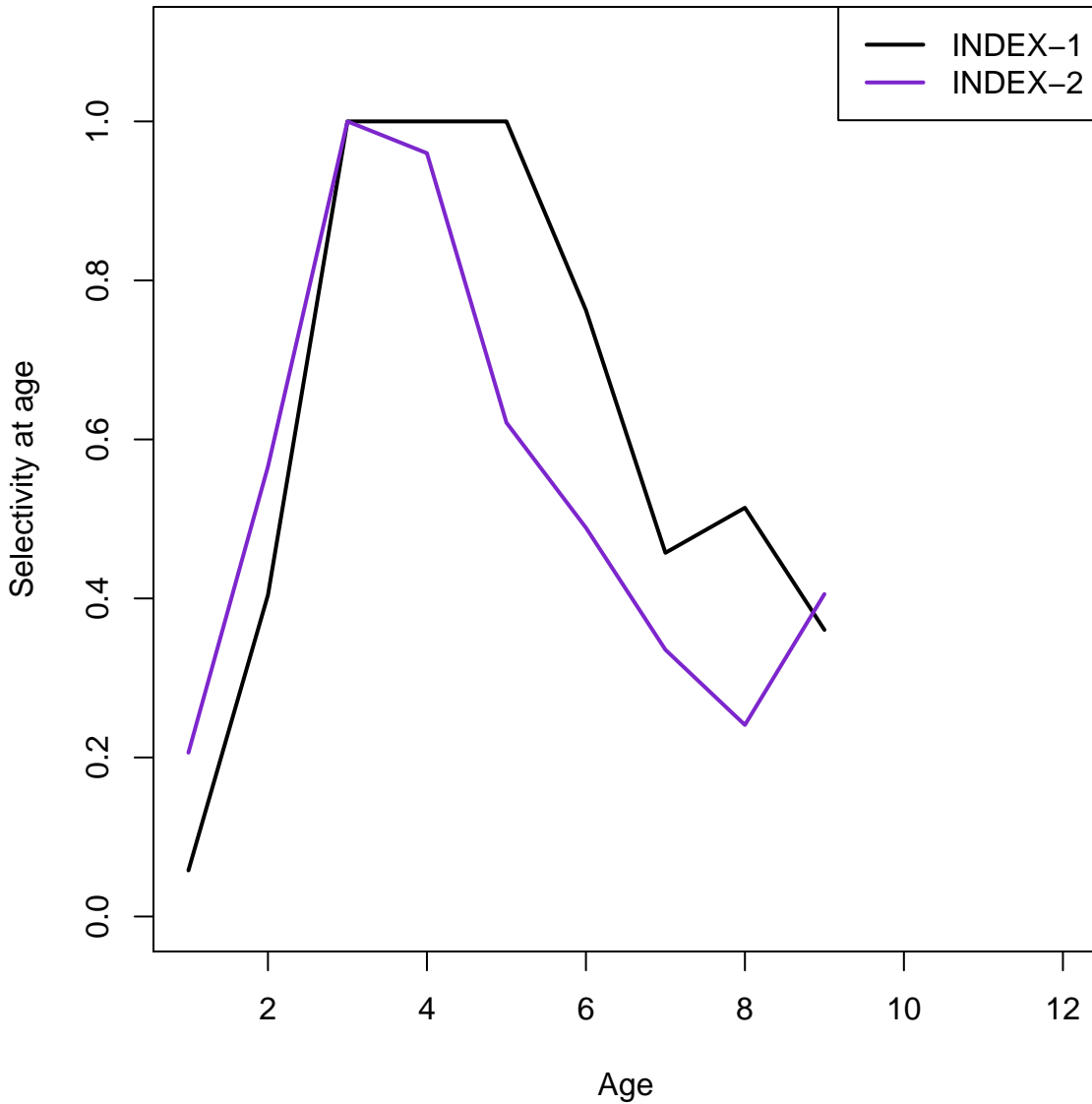


Fleet 1 (FLEET-1)

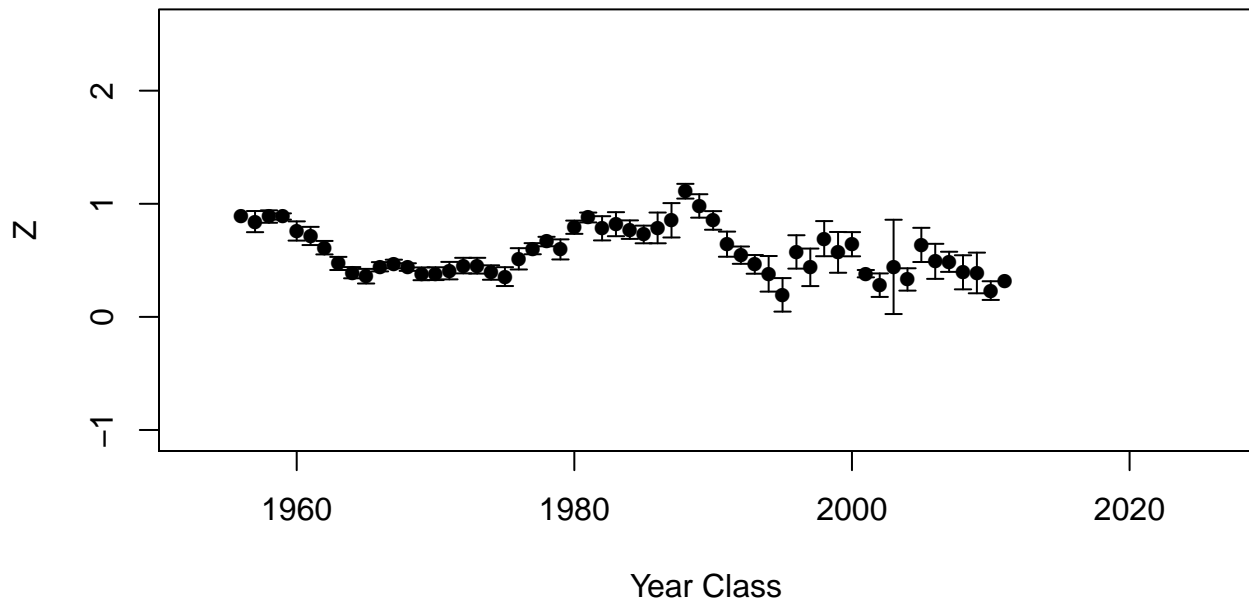
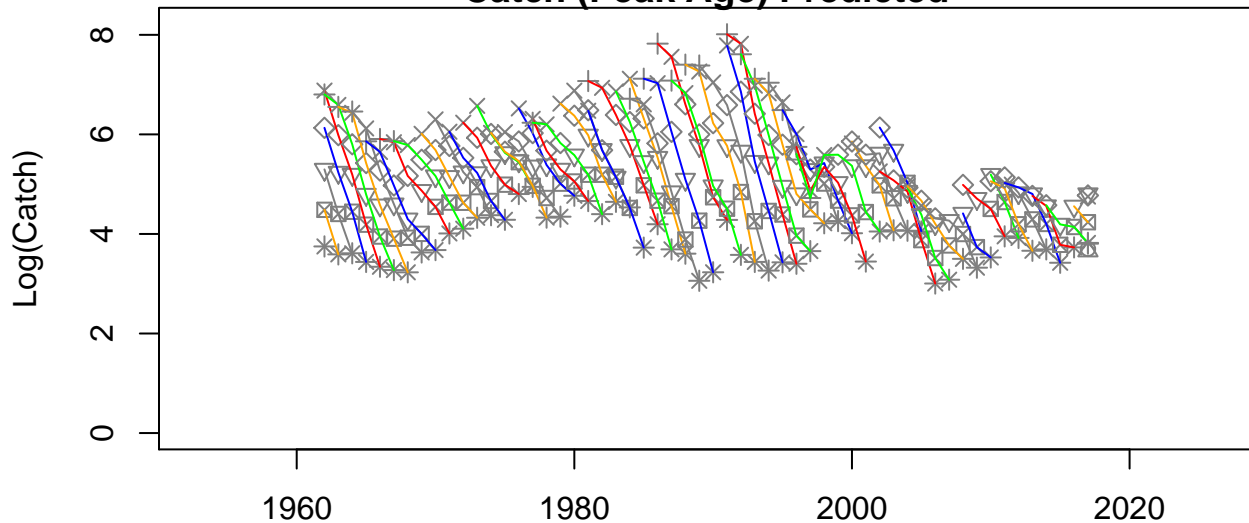




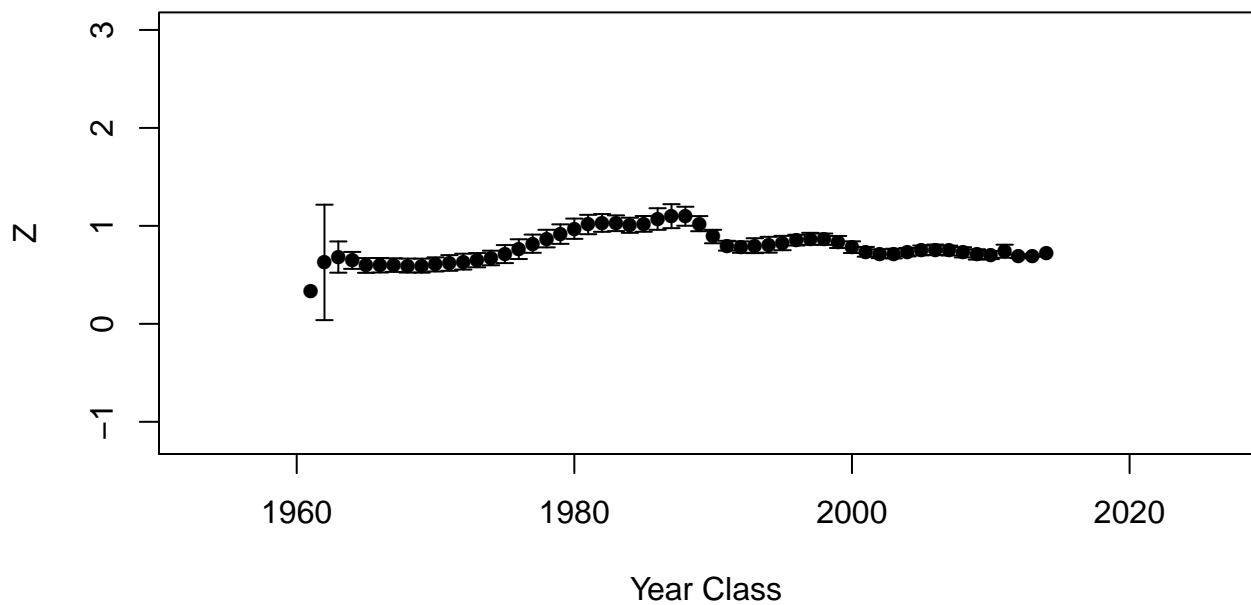
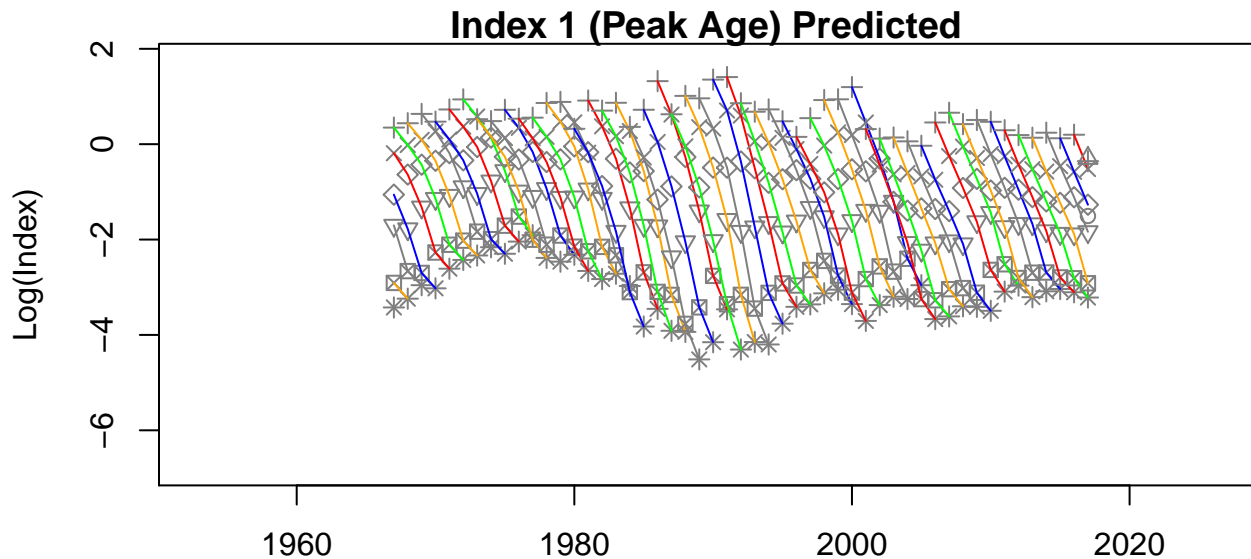
Indices

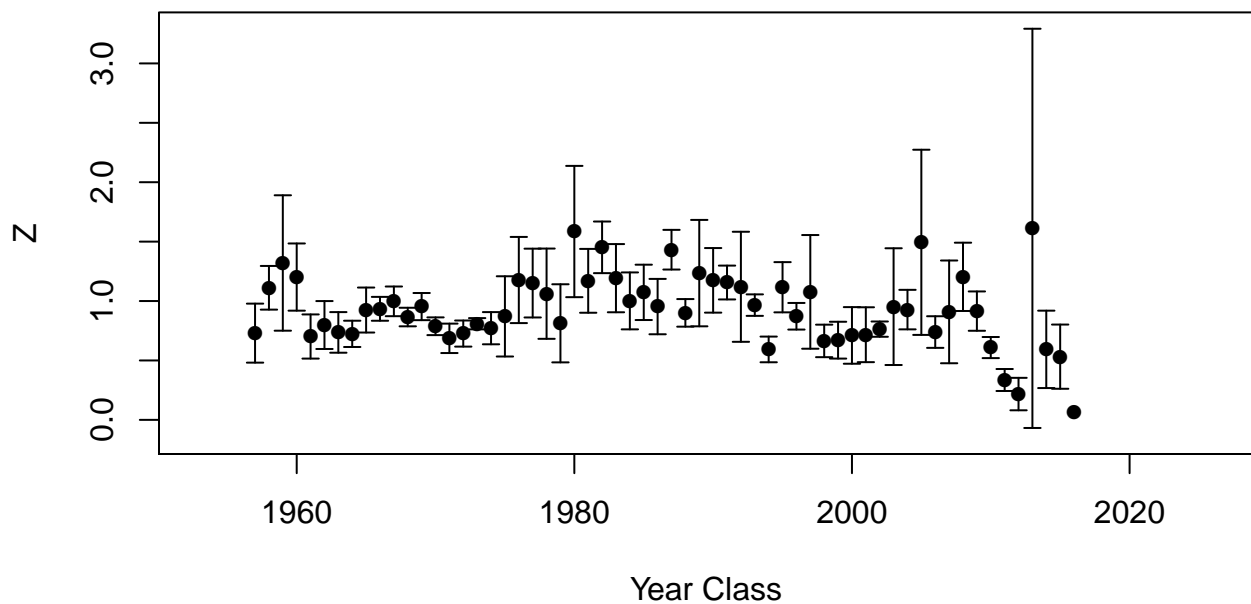
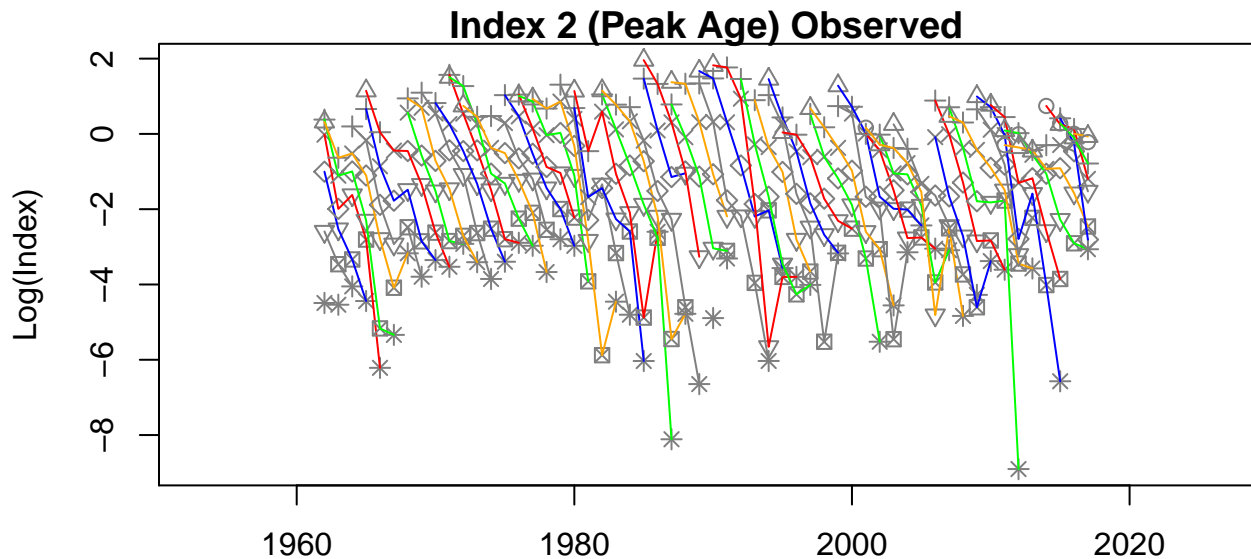


Catch (Peak Age) Predicted

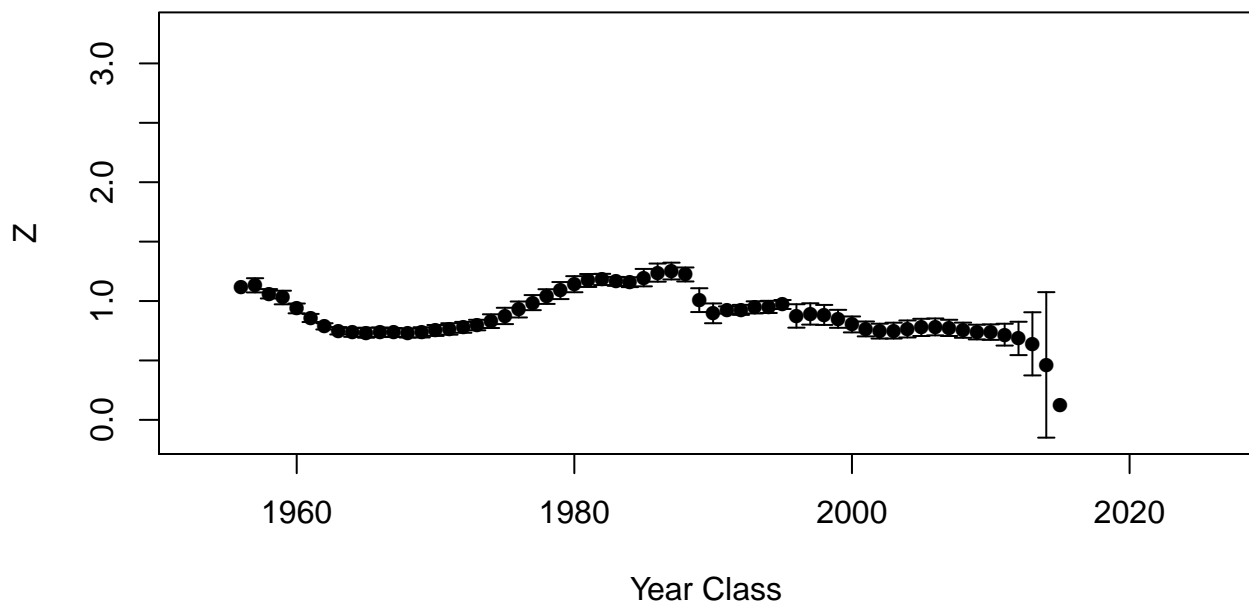
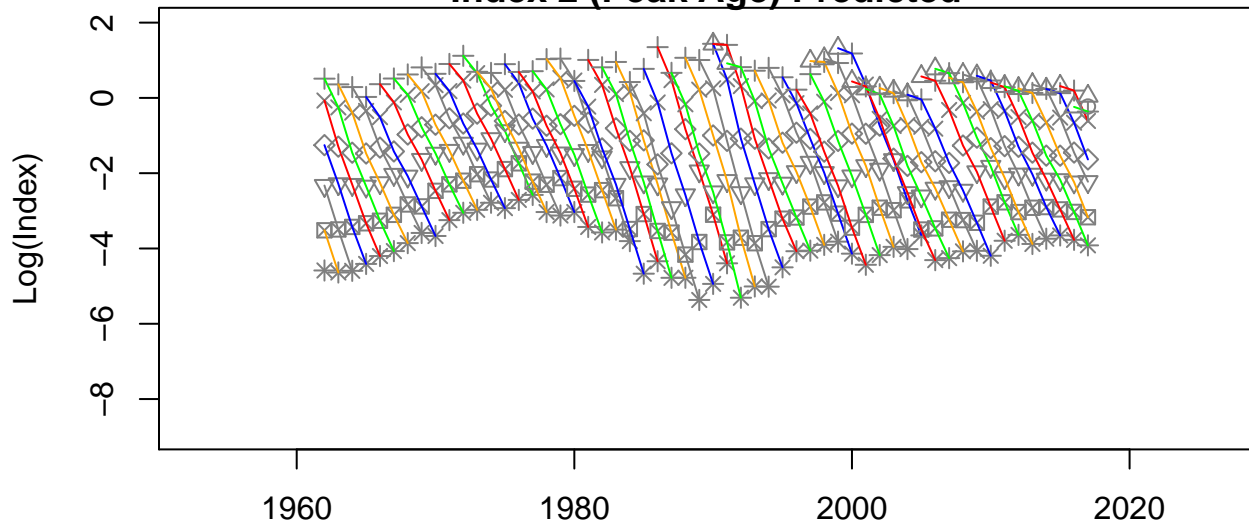




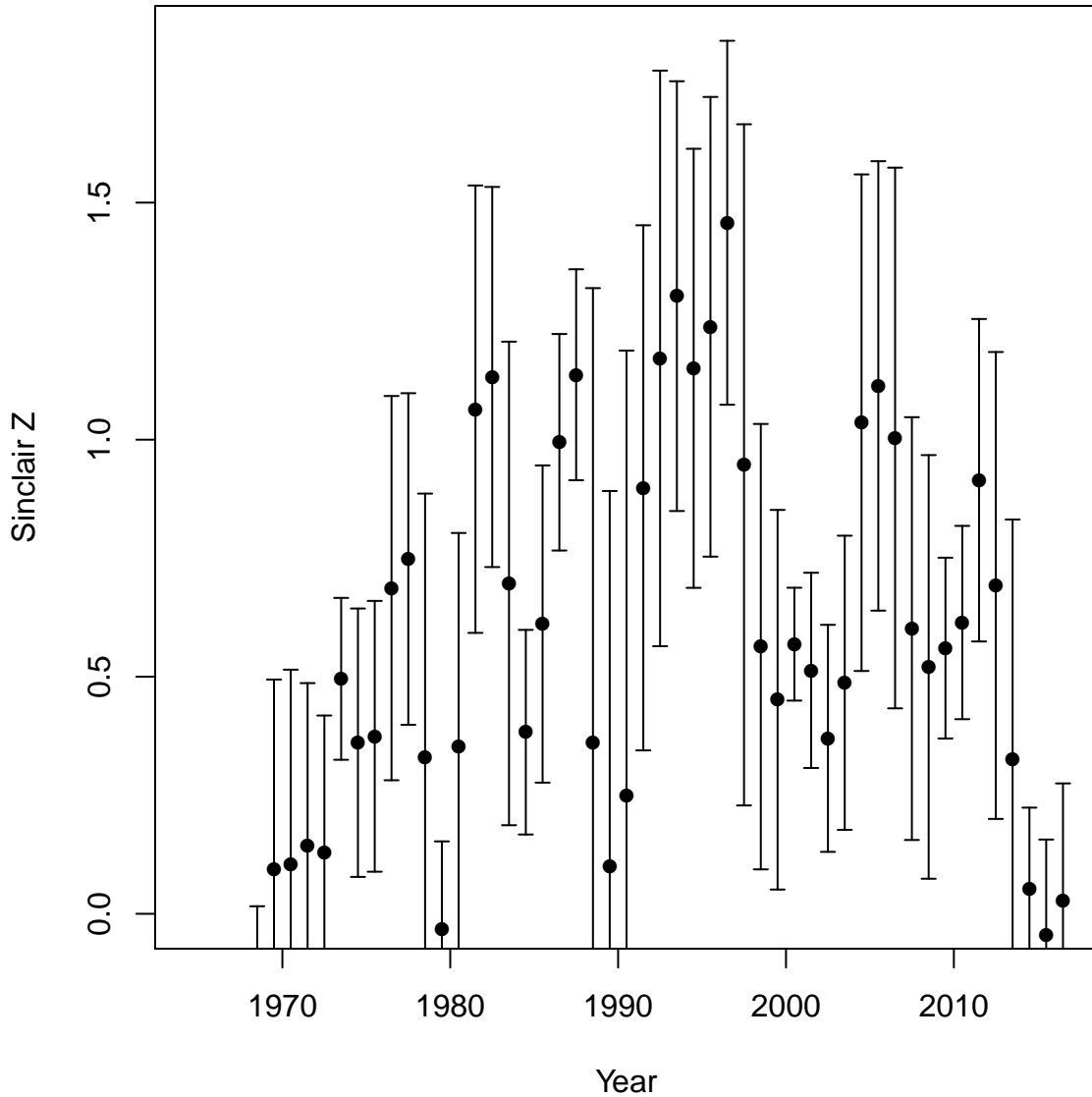




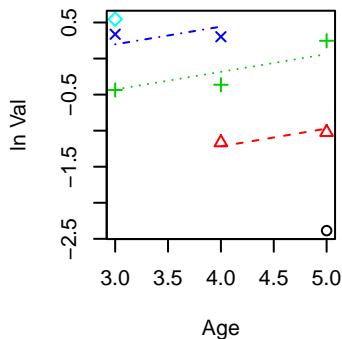
Index 2 (Peak Age) Predicted



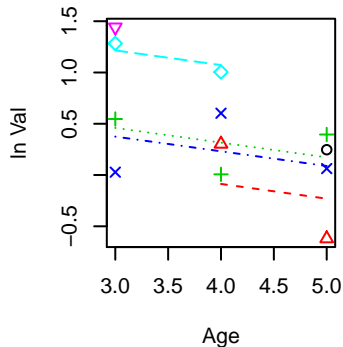
INDEX-1



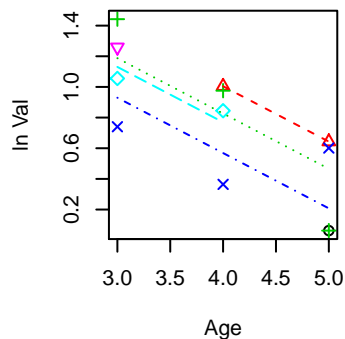
Years 1968 to 1970
Z = -0.246



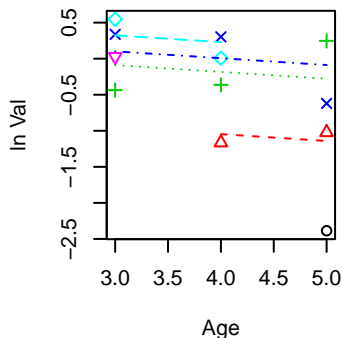
Years 1970 to 1973
Z = 0.143



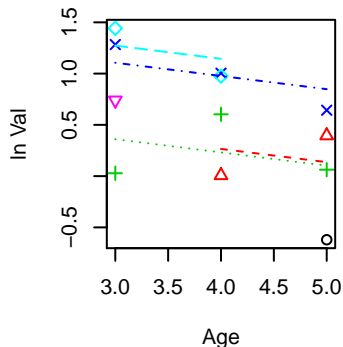
Years 1973 to 1976
Z = 0.361



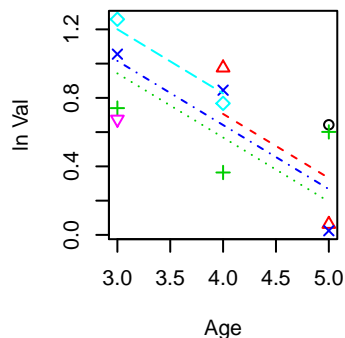
Years 1968 to 1971
Z = 0.095



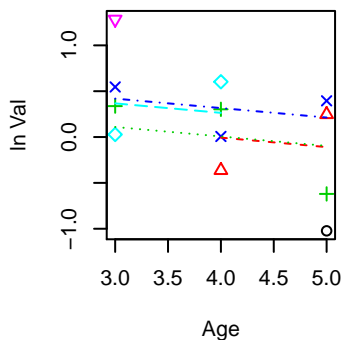
Years 1971 to 1974
Z = 0.129



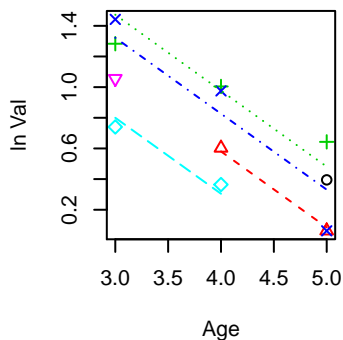
Years 1974 to 1977
Z = 0.374



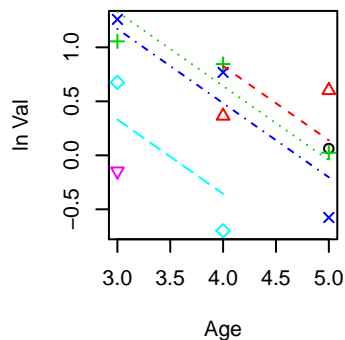
Years 1969 to 1972
Z = 0.103



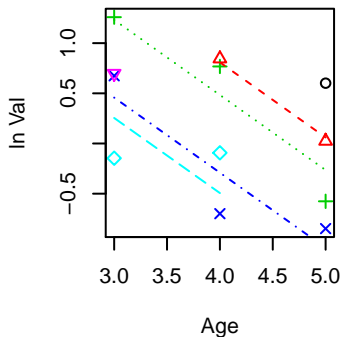
Years 1972 to 1975
Z = 0.496



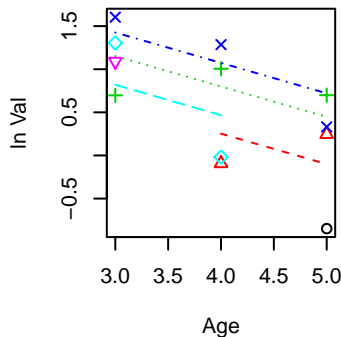
Years 1975 to 1978
Z = 0.687



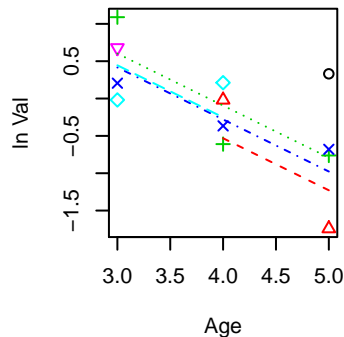
Years 1976 to 1979
Z = 0.748



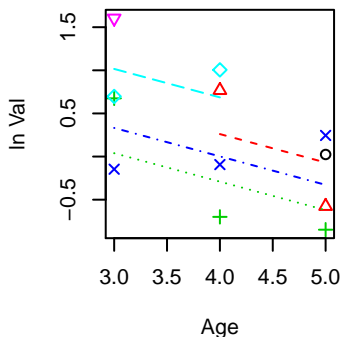
Years 1979 to 1982
Z = 0.353



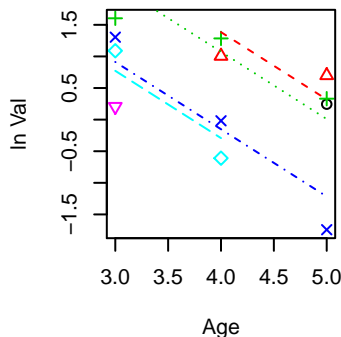
Years 1982 to 1985
Z = 0.697



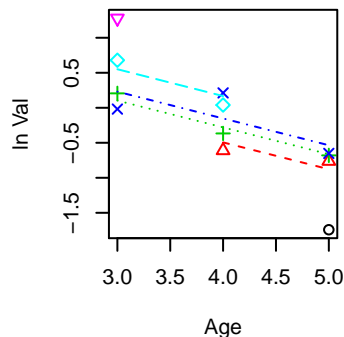
Years 1977 to 1980
Z = 0.33



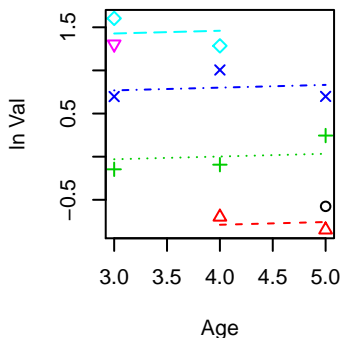
Years 1980 to 1983
Z = 1.064



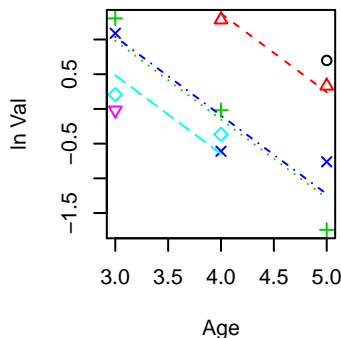
Years 1983 to 1986
Z = 0.383



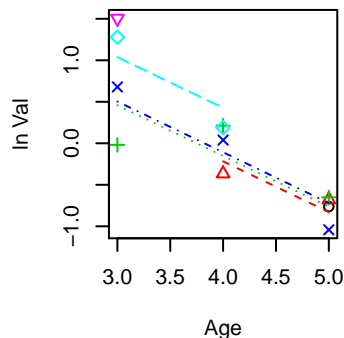
Years 1978 to 1981
Z = -0.032



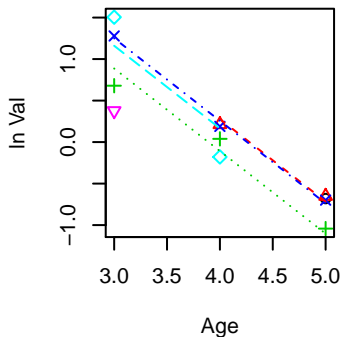
Years 1981 to 1984
Z = 1.132



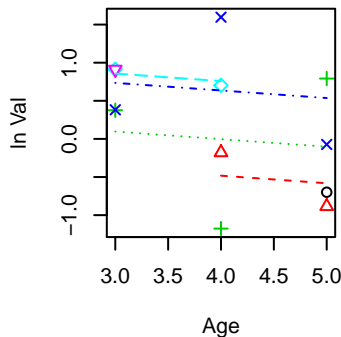
Years 1984 to 1987
Z = 0.611



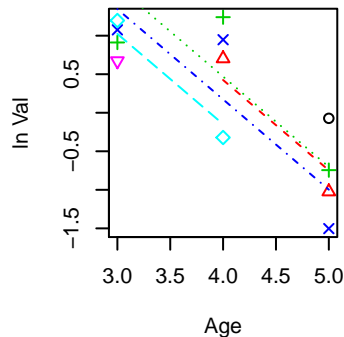
Years 1985 to 1988
Z = 0.995



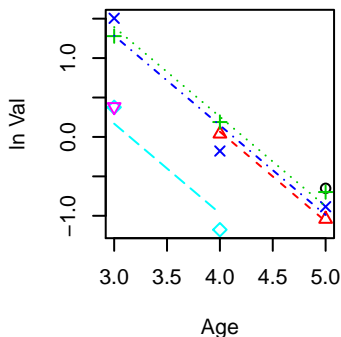
Years 1988 to 1991
Z = 0.099



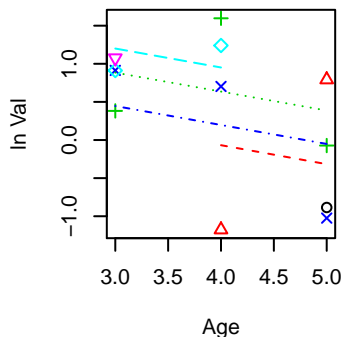
Years 1991 to 1994
Z = 1.171



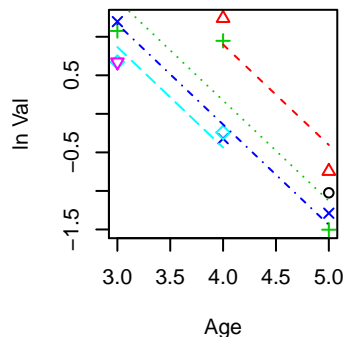
Years 1986 to 1989
Z = 1.137



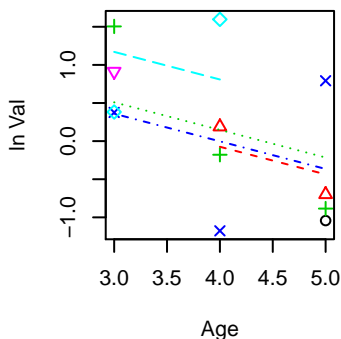
Years 1989 to 1992
Z = 0.249



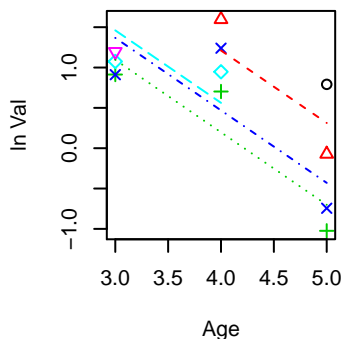
Years 1992 to 1995
Z = 1.303



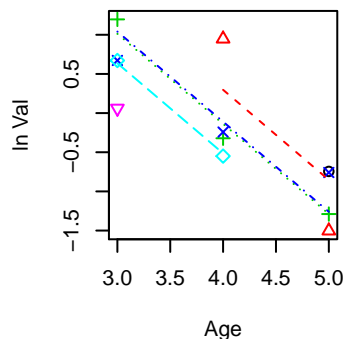
Years 1987 to 1990
Z = 0.362



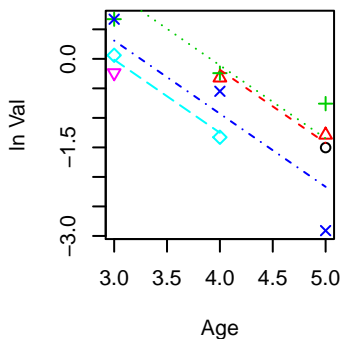
Years 1990 to 1993
Z = 0.898



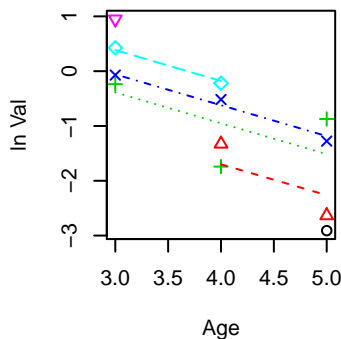
Years 1993 to 1996
Z = 1.151



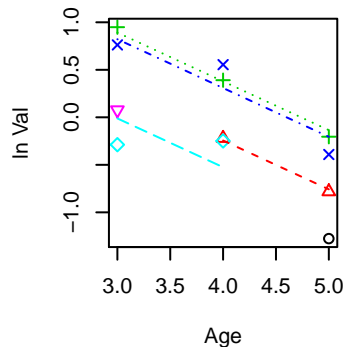
Years 1994 to 1997
Z = 1.238



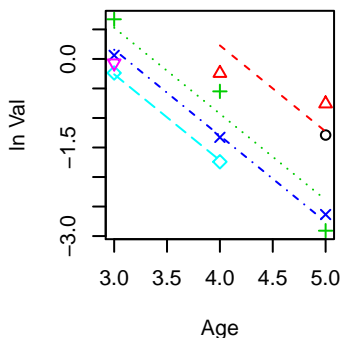
Years 1997 to 2000
Z = 0.563



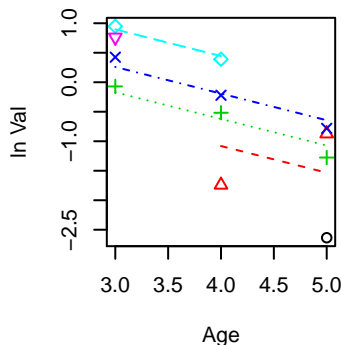
Years 2000 to 2003
Z = 0.513



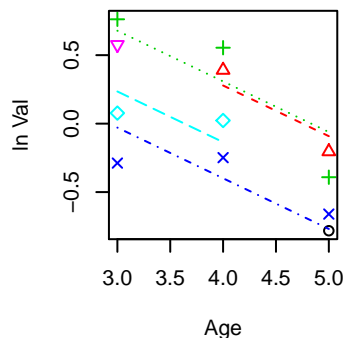
Years 1995 to 1998
Z = 1.457



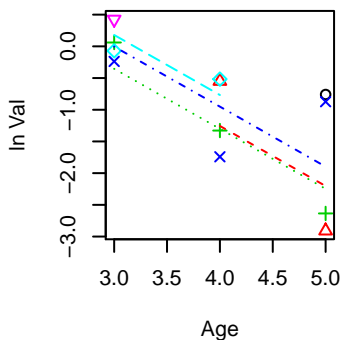
Years 1998 to 2001
Z = 0.451



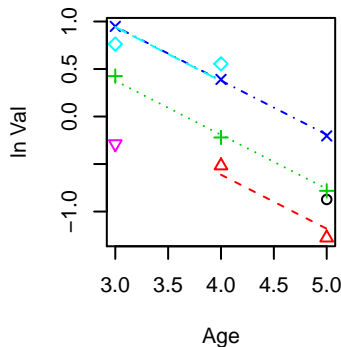
Years 2001 to 2004
Z = 0.37



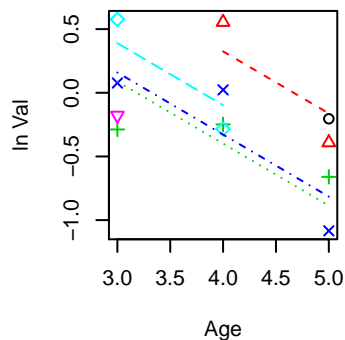
Years 1996 to 1999
Z = 0.947



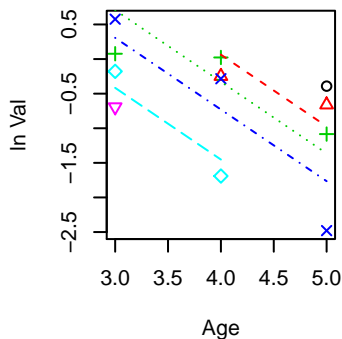
Years 1999 to 2002
Z = 0.569



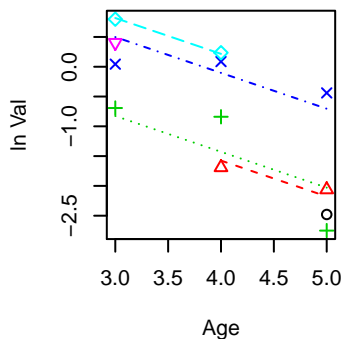
Years 2002 to 2005
Z = 0.487



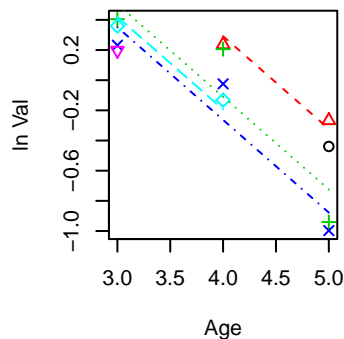
Years 2003 to 2006
Z = 1.036



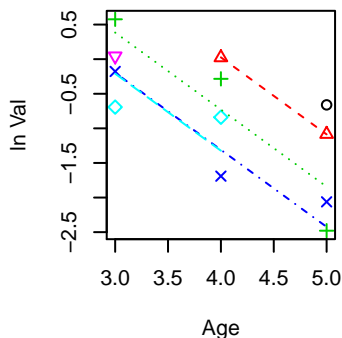
Years 2006 to 2009
Z = 0.602



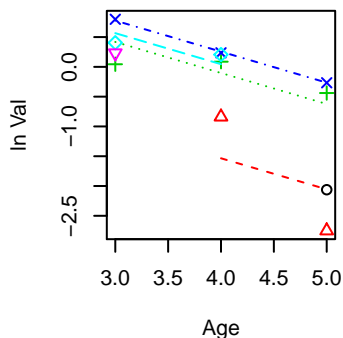
Years 2009 to 2012
Z = 0.614



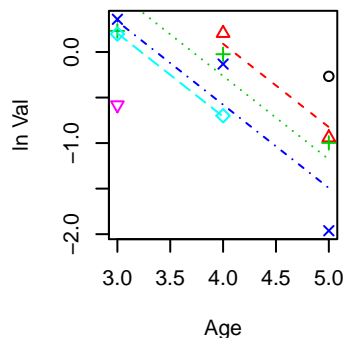
Years 2004 to 2007
Z = 1.113



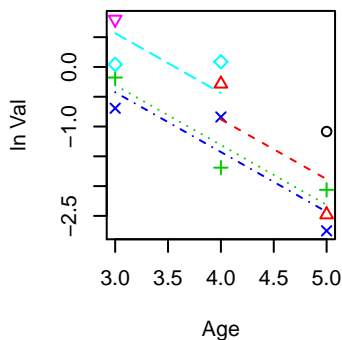
Years 2007 to 2010
Z = 0.521



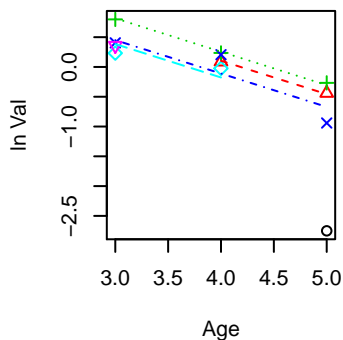
Years 2010 to 2013
Z = 0.914



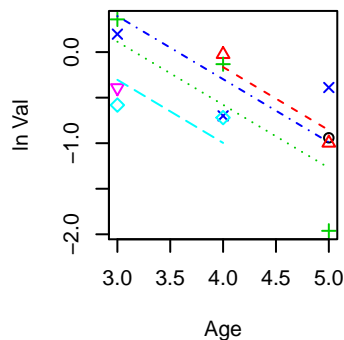
Years 2005 to 2008
Z = 1.004



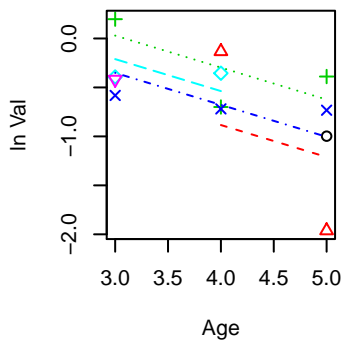
Years 2008 to 2011
Z = 0.56



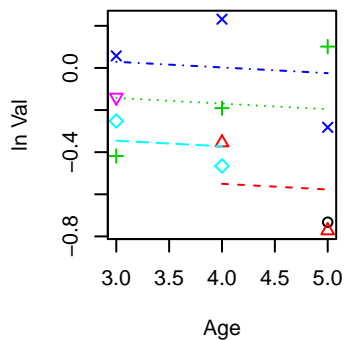
Years 2011 to 2014
Z = 0.693



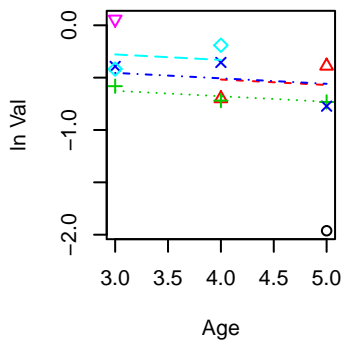
Years 2012 to 2015
Z = 0.327



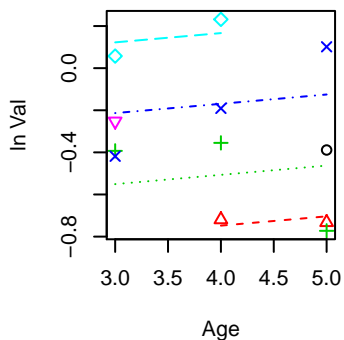
Years 2015 to 2018
Z = 0.027



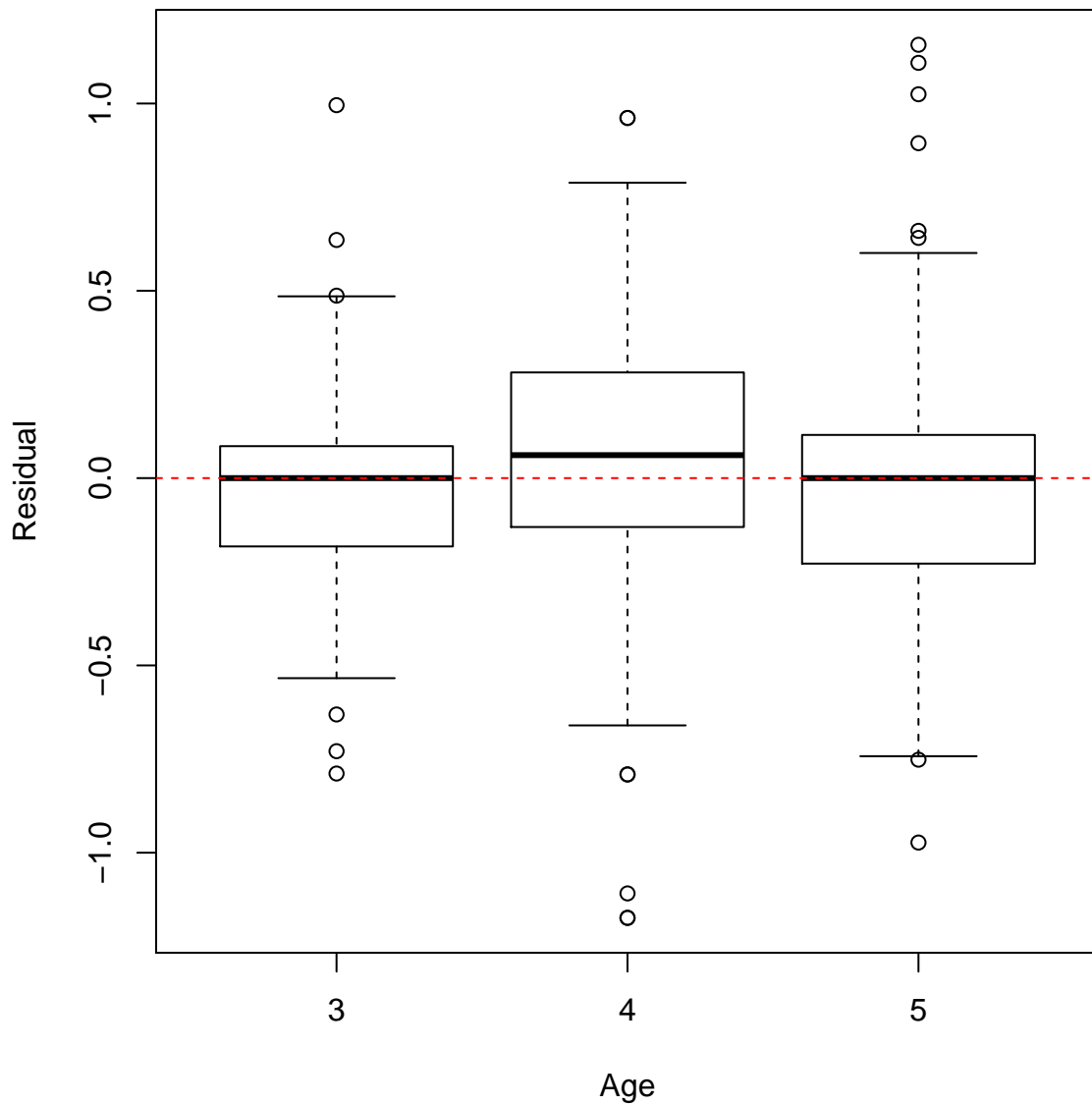
Years 2013 to 2016
Z = 0.052



Years 2014 to 2017
Z = -0.044

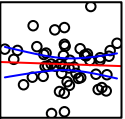
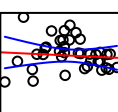
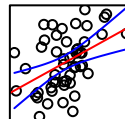
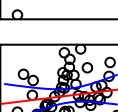
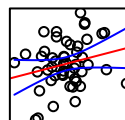
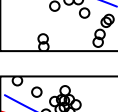
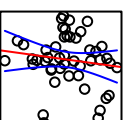
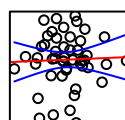
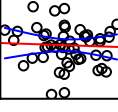
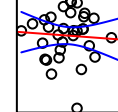
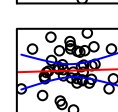
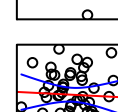

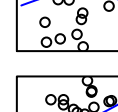

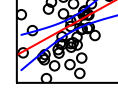
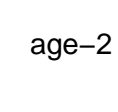
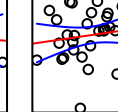


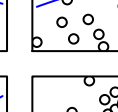
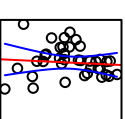
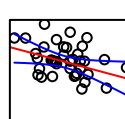
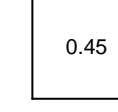
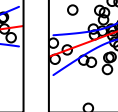
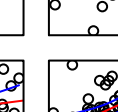
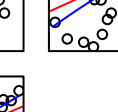
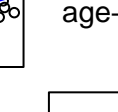
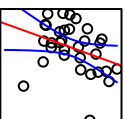
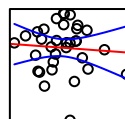
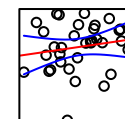
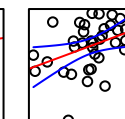
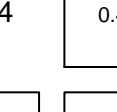
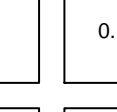
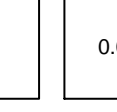
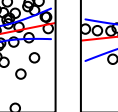
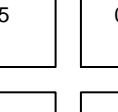
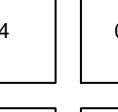
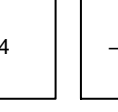
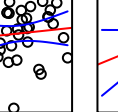
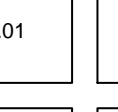
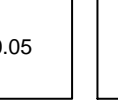
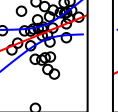
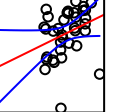


INDEX-1



Catch Observed



	age-1	age-2	age-3	age-4	age-5	age-6	age-7	age-8	age-9
									
	-0.04								
	-0.28	0.45							
	-0.33	0.24	0.54						
	-0.14	0.04	0.14	0.45					
	0.13	-0.05	0.01	0.14	0.57				
	0.20	0.03	0.06	0.00	0.23	0.48			
	-0.07	-0.32	-0.08	0.22	0.01	0.11	age-7	age-8	age-9
	-0.34	-0.07	0.16	0.37	0.25	0.12	0.31	0.31	

-0.34

-0.07

0.20

0.13

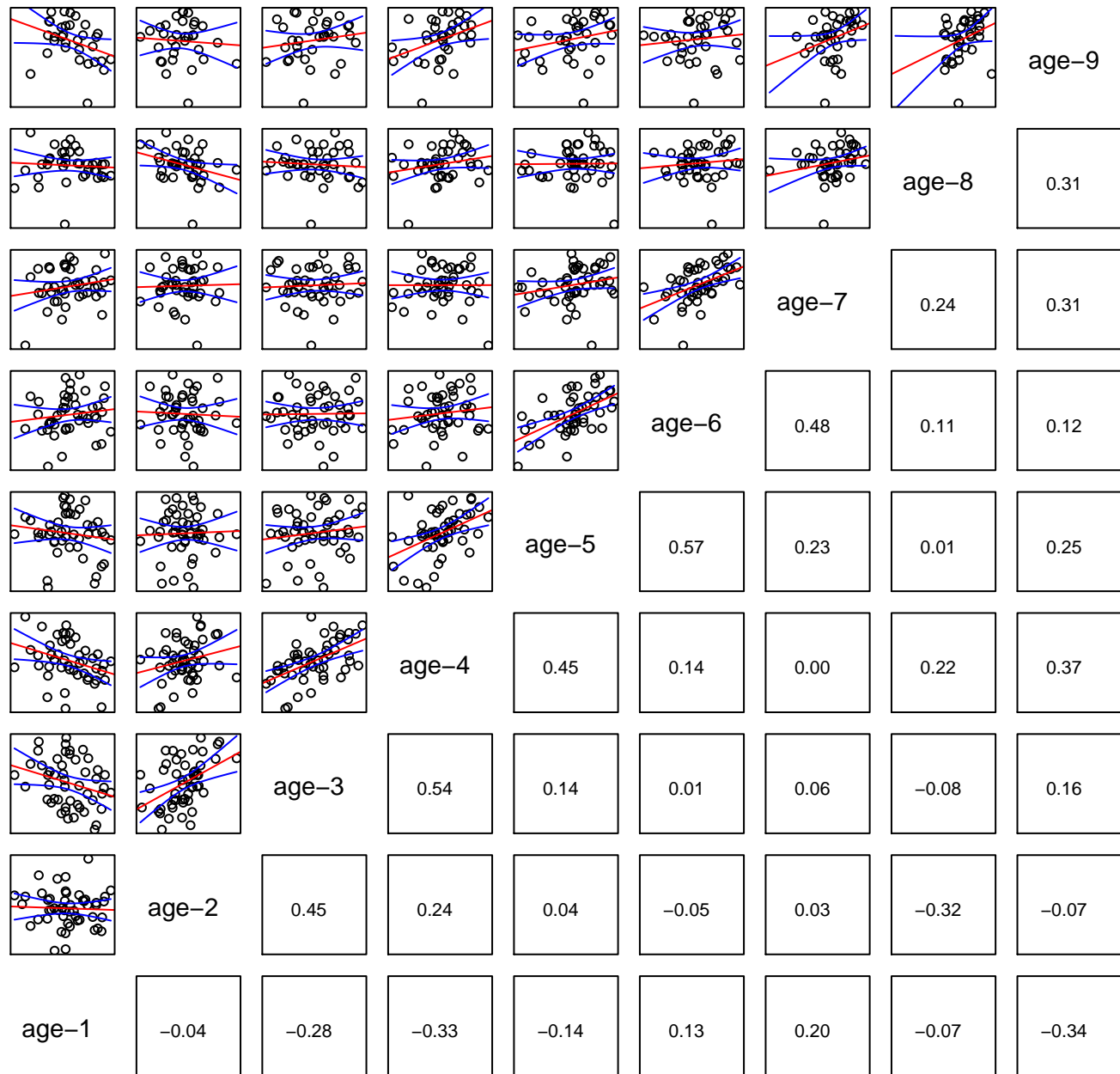
-0.14

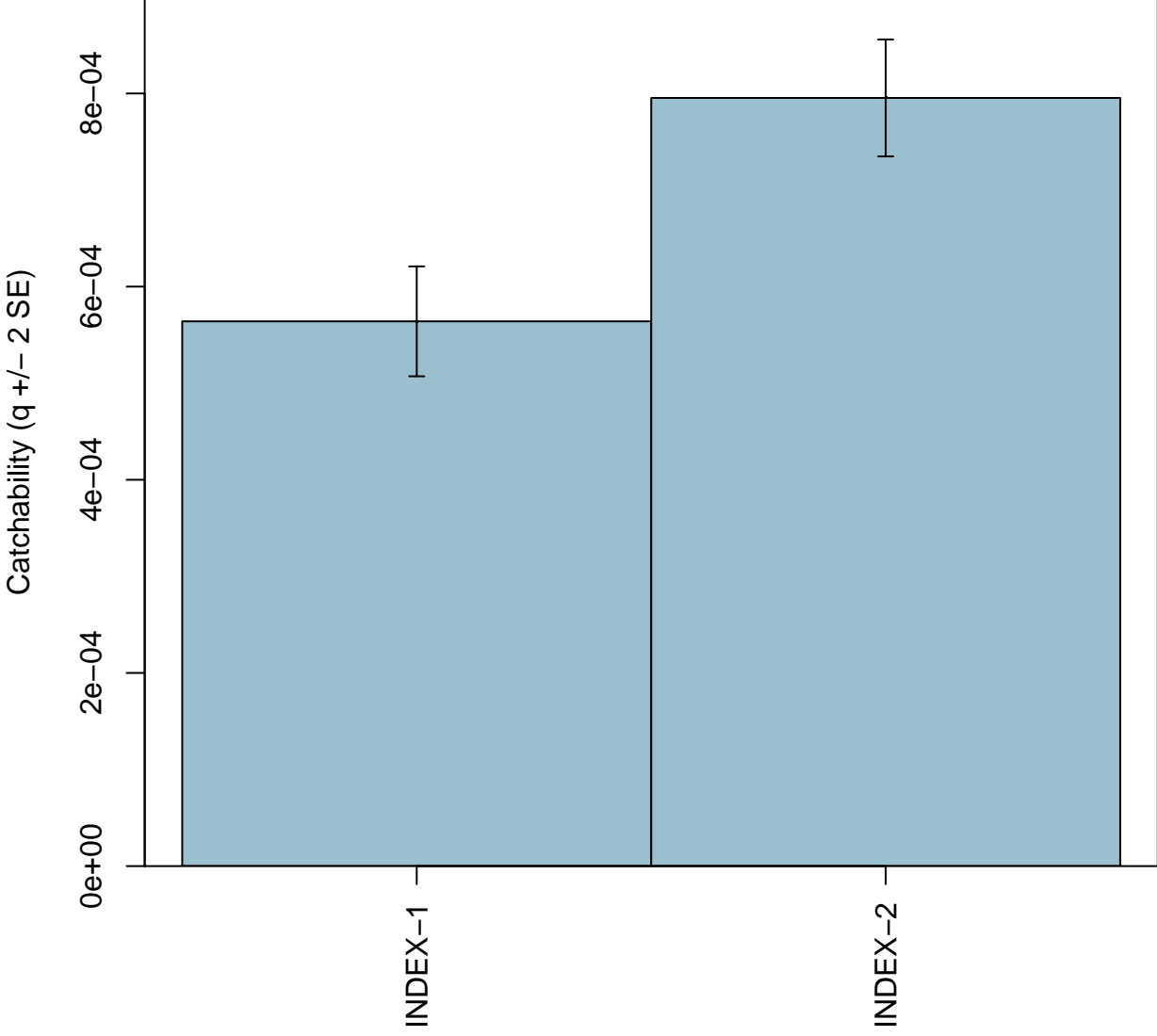
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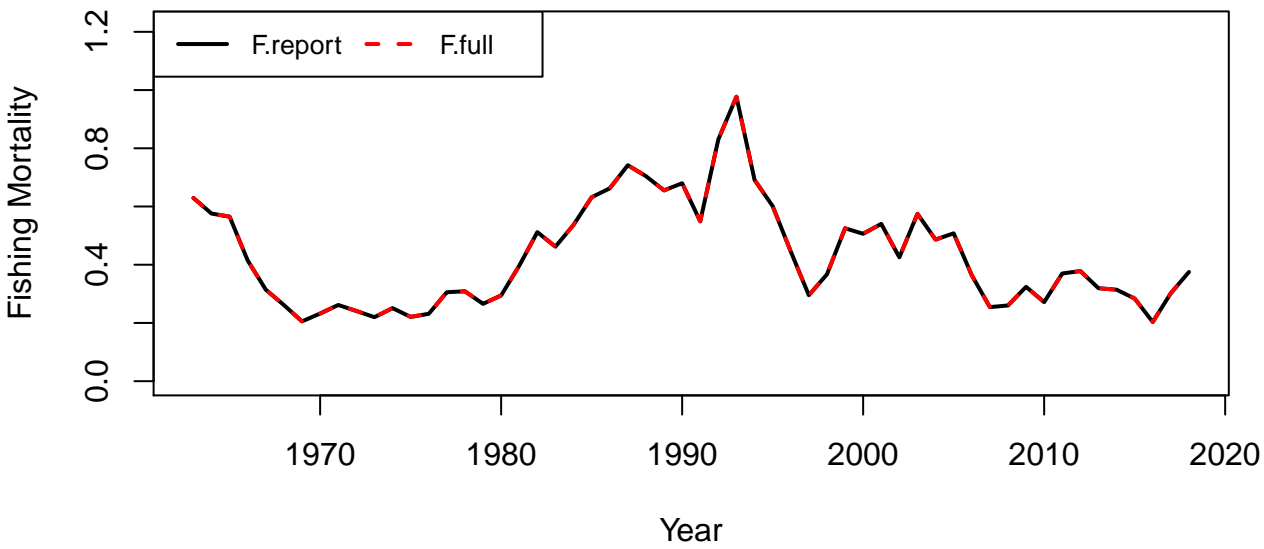
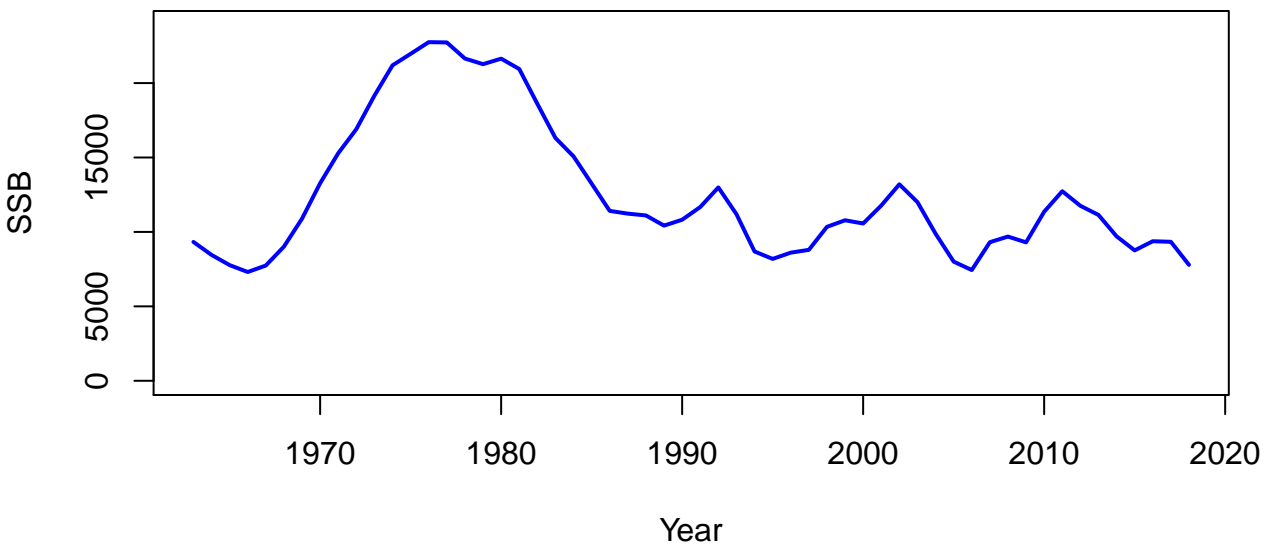
-0.28

-0.04

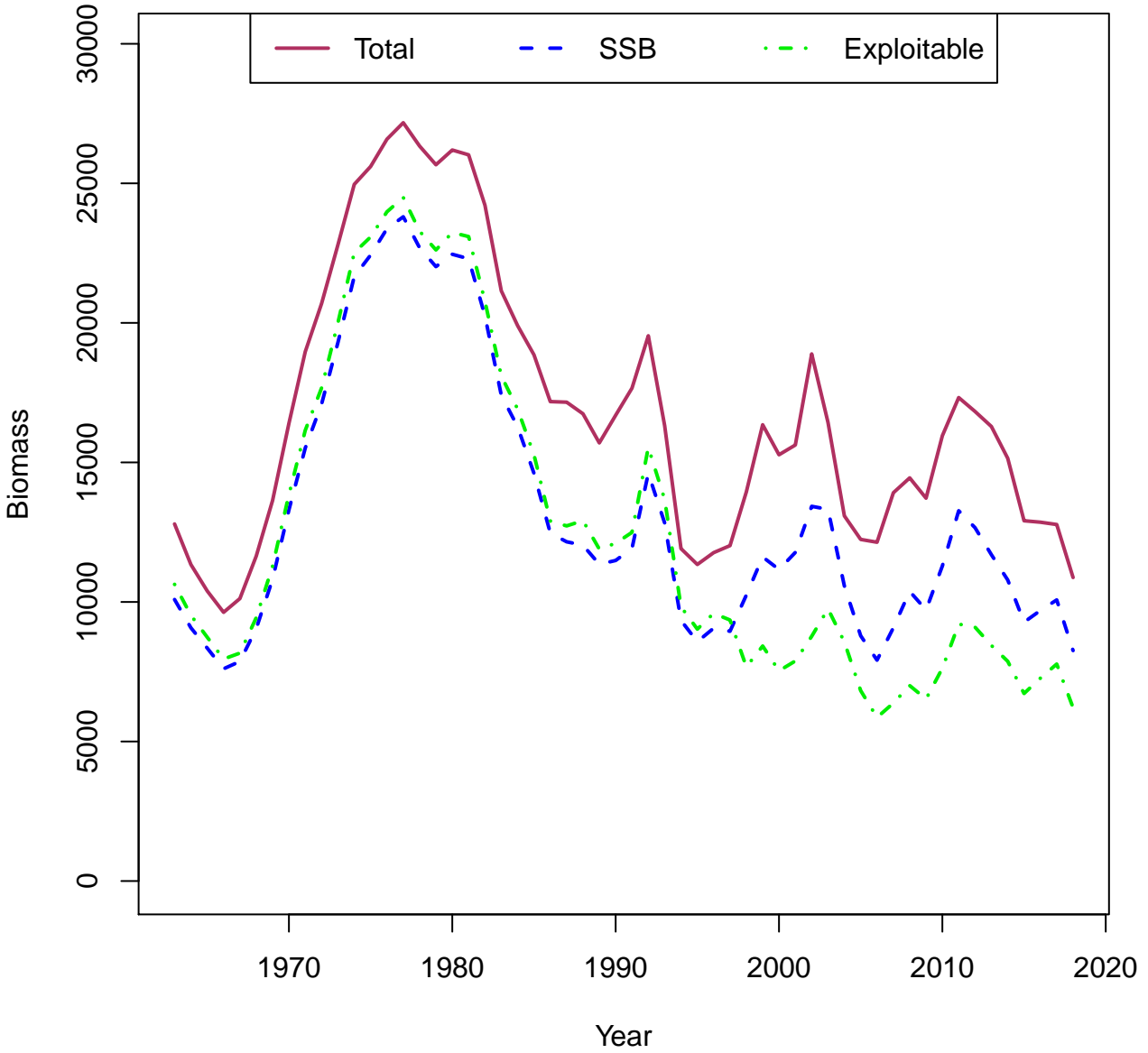
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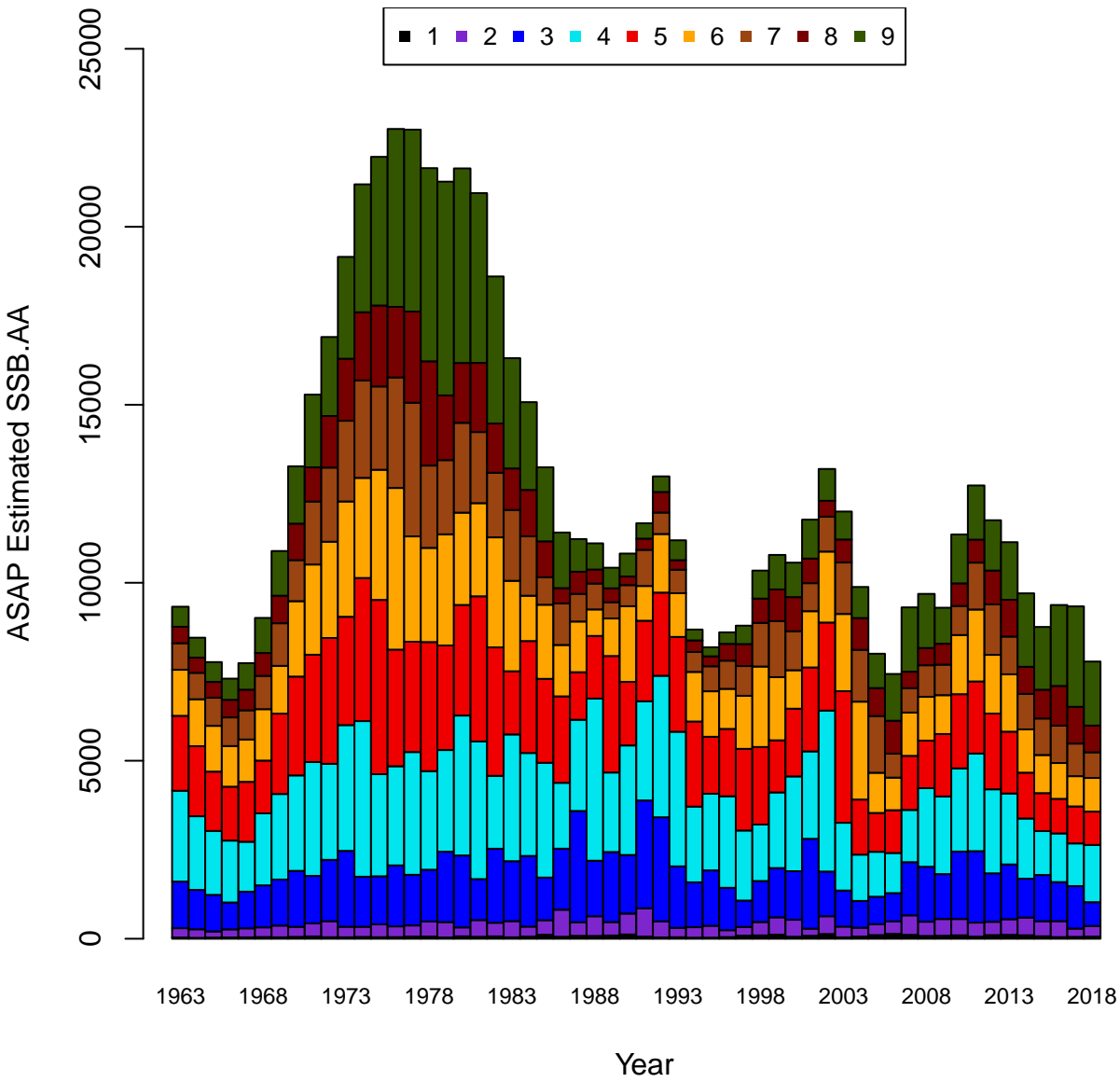


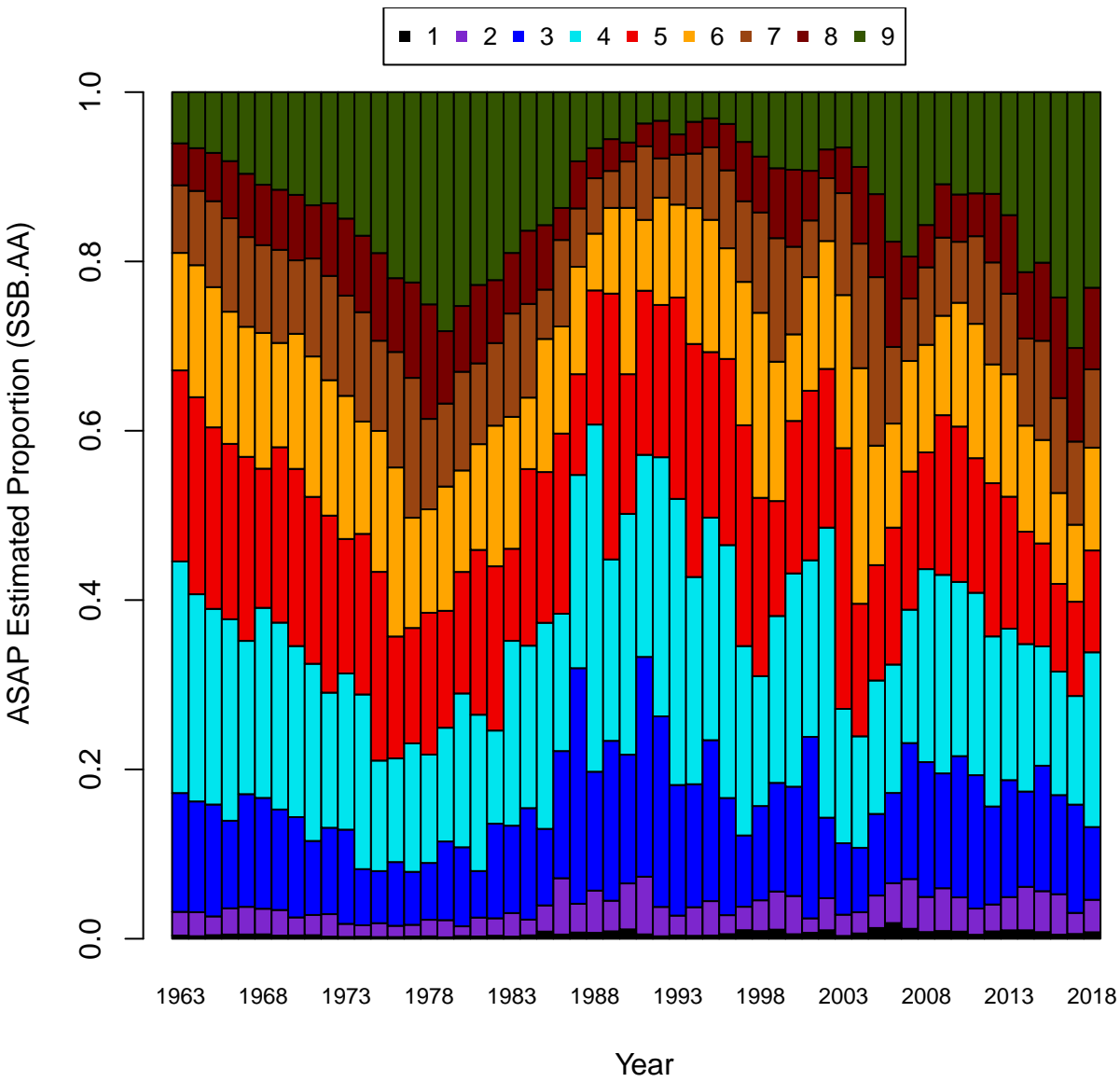


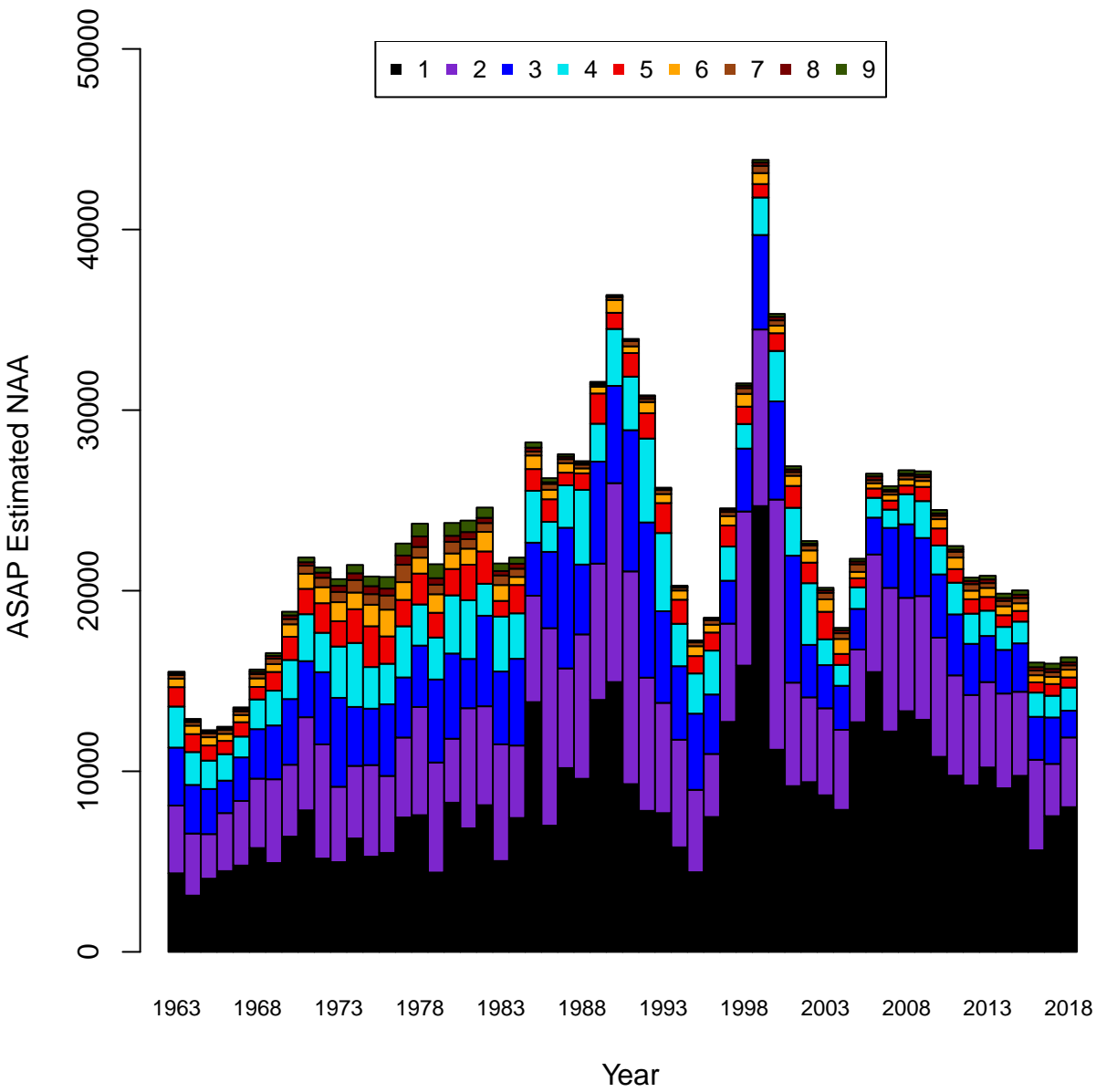


Comparison of January 1 Biomass

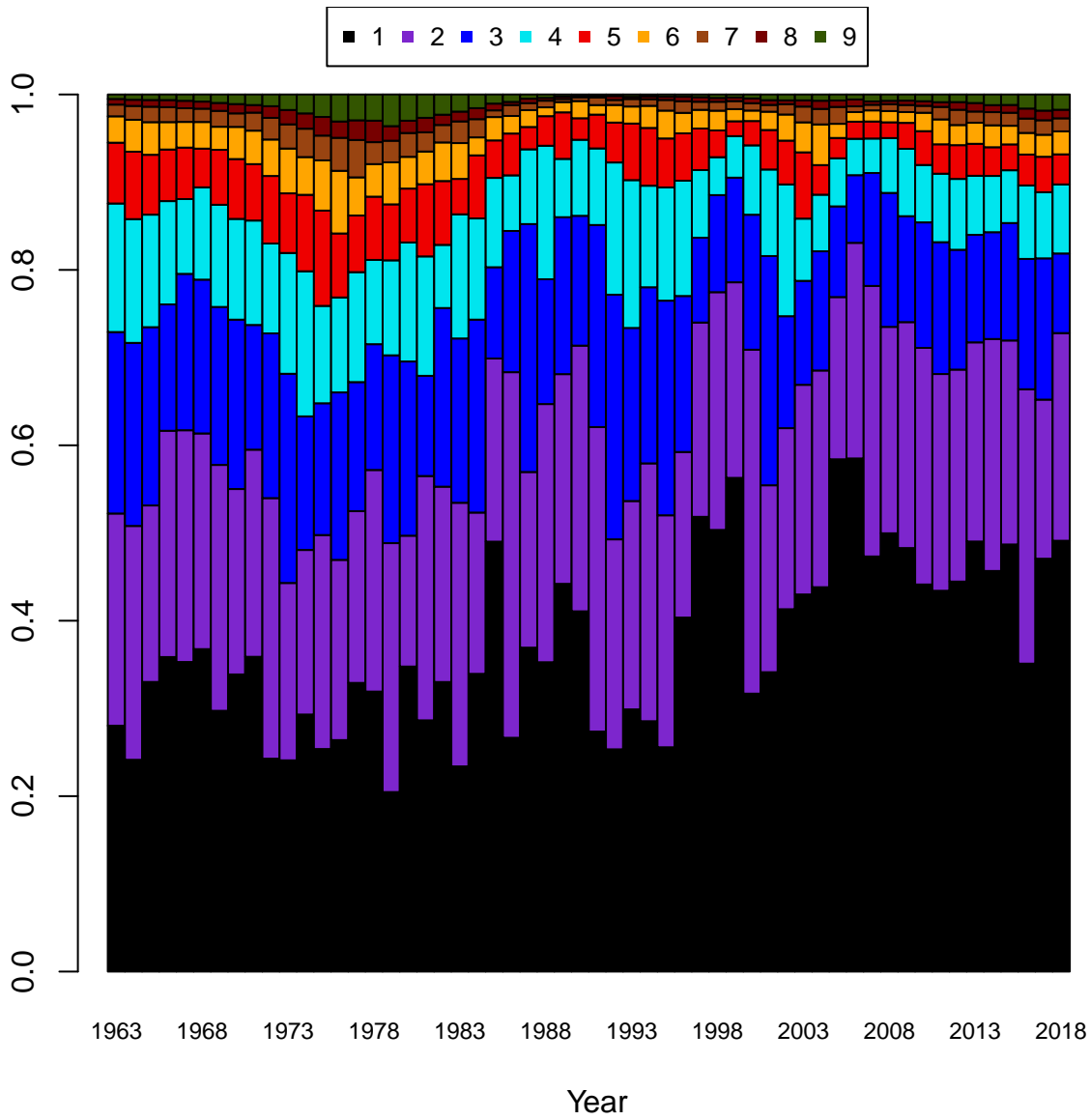


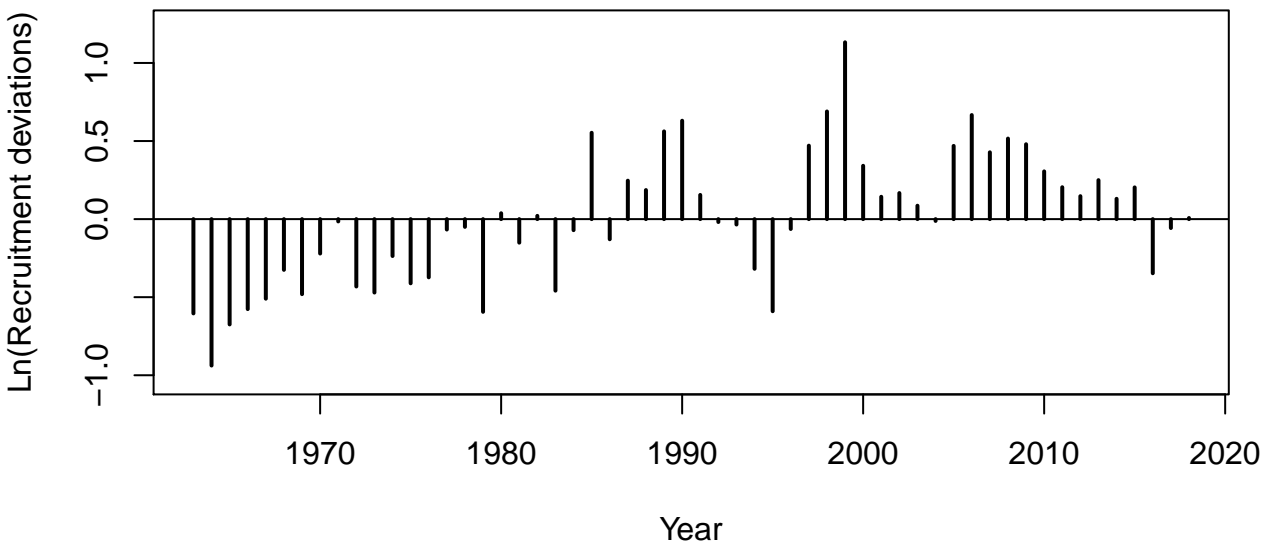
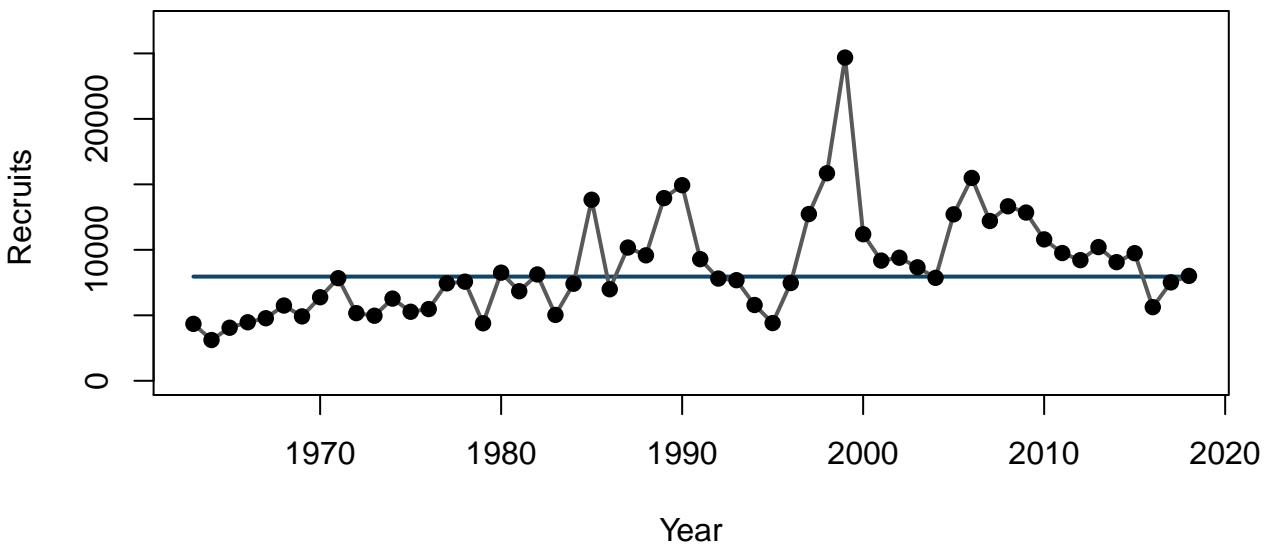


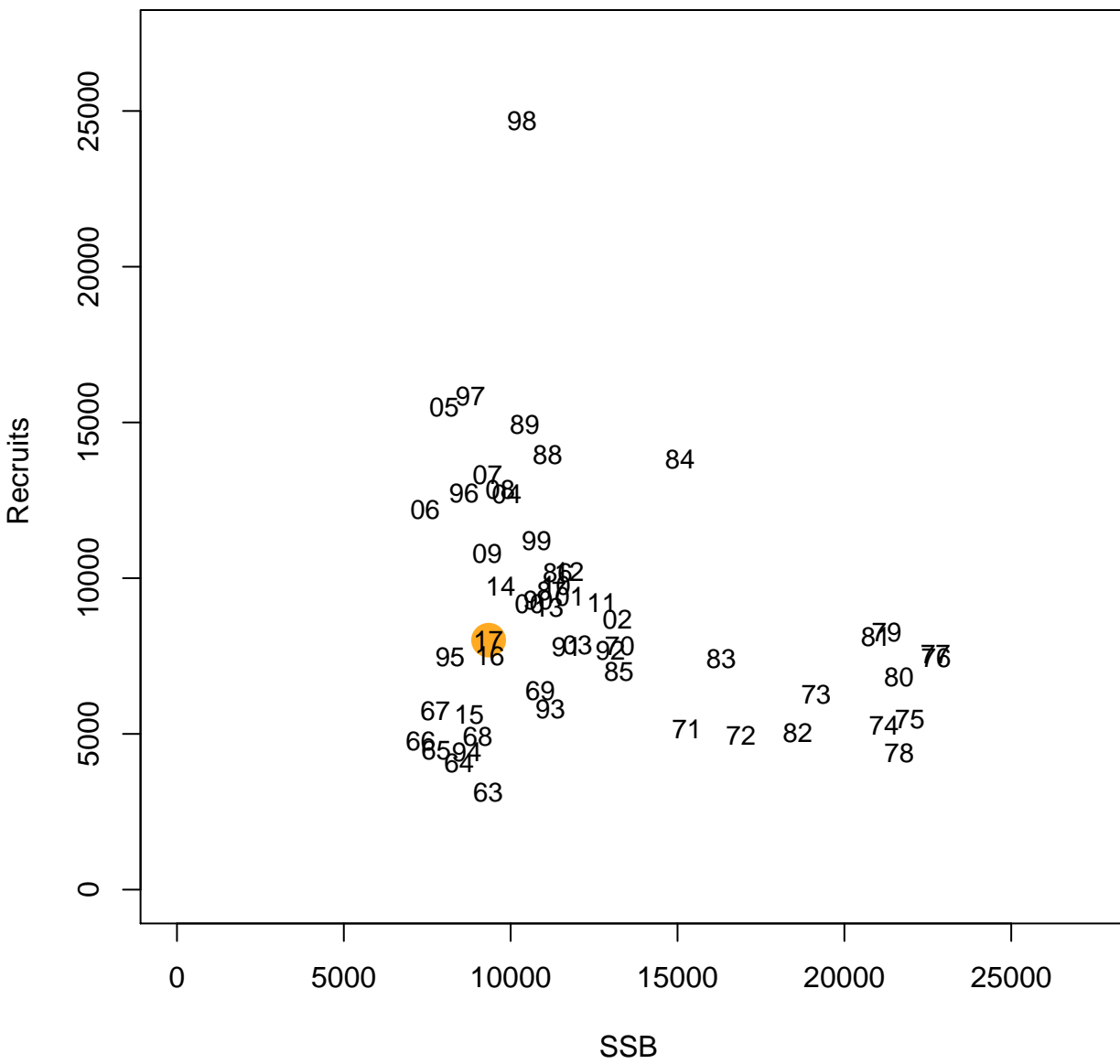


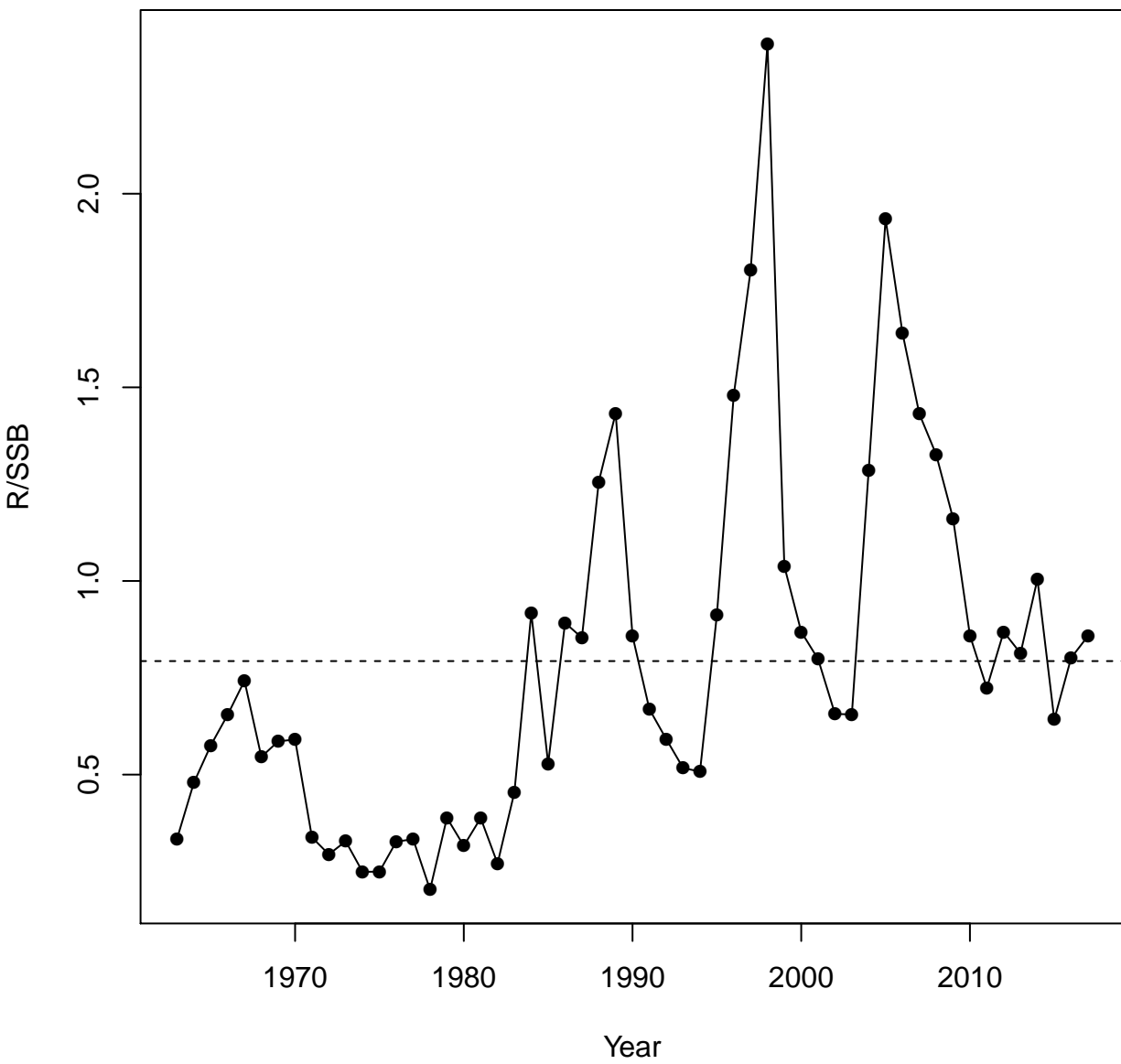


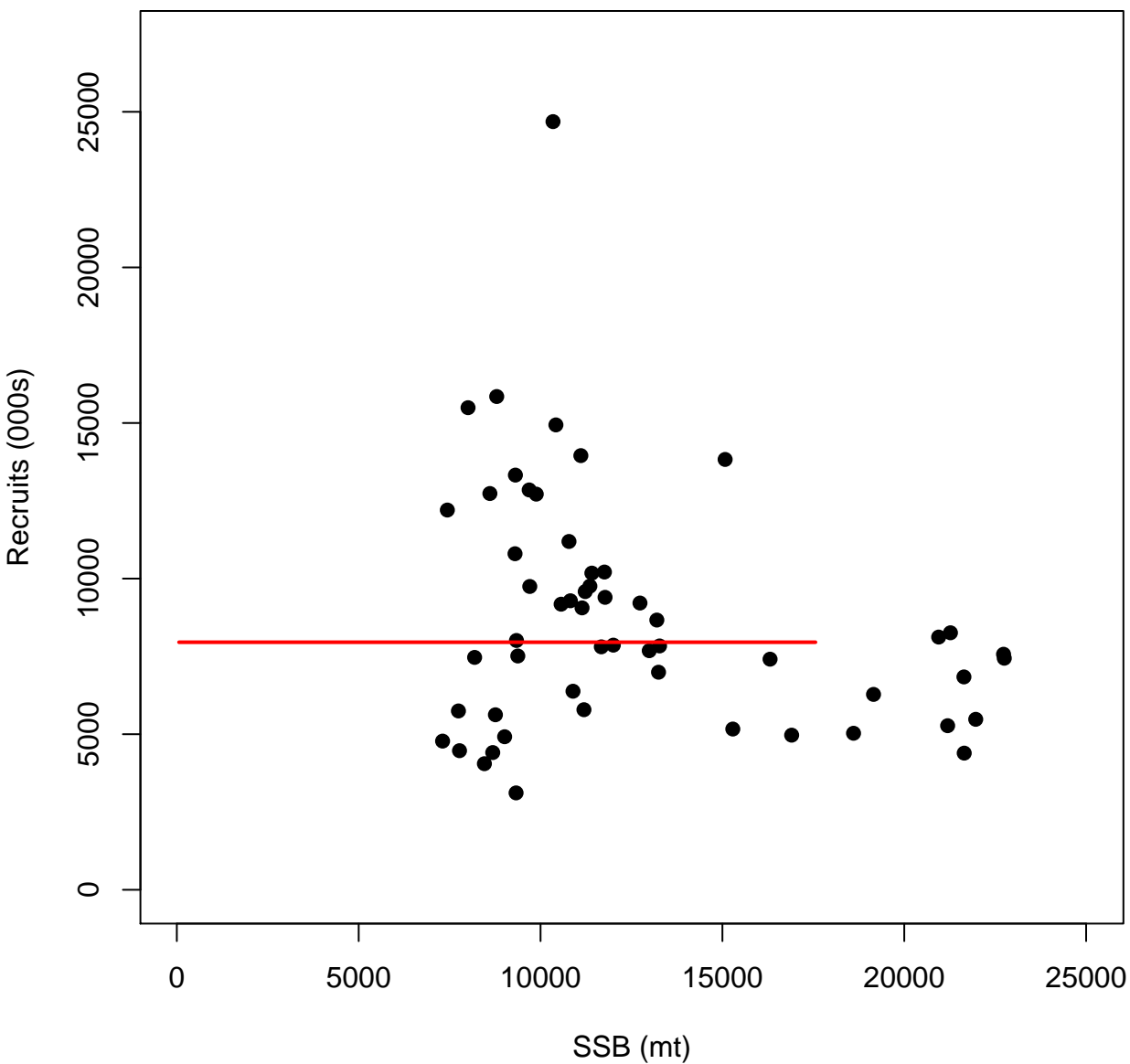
ASAP Estimated Proportion (NAA)

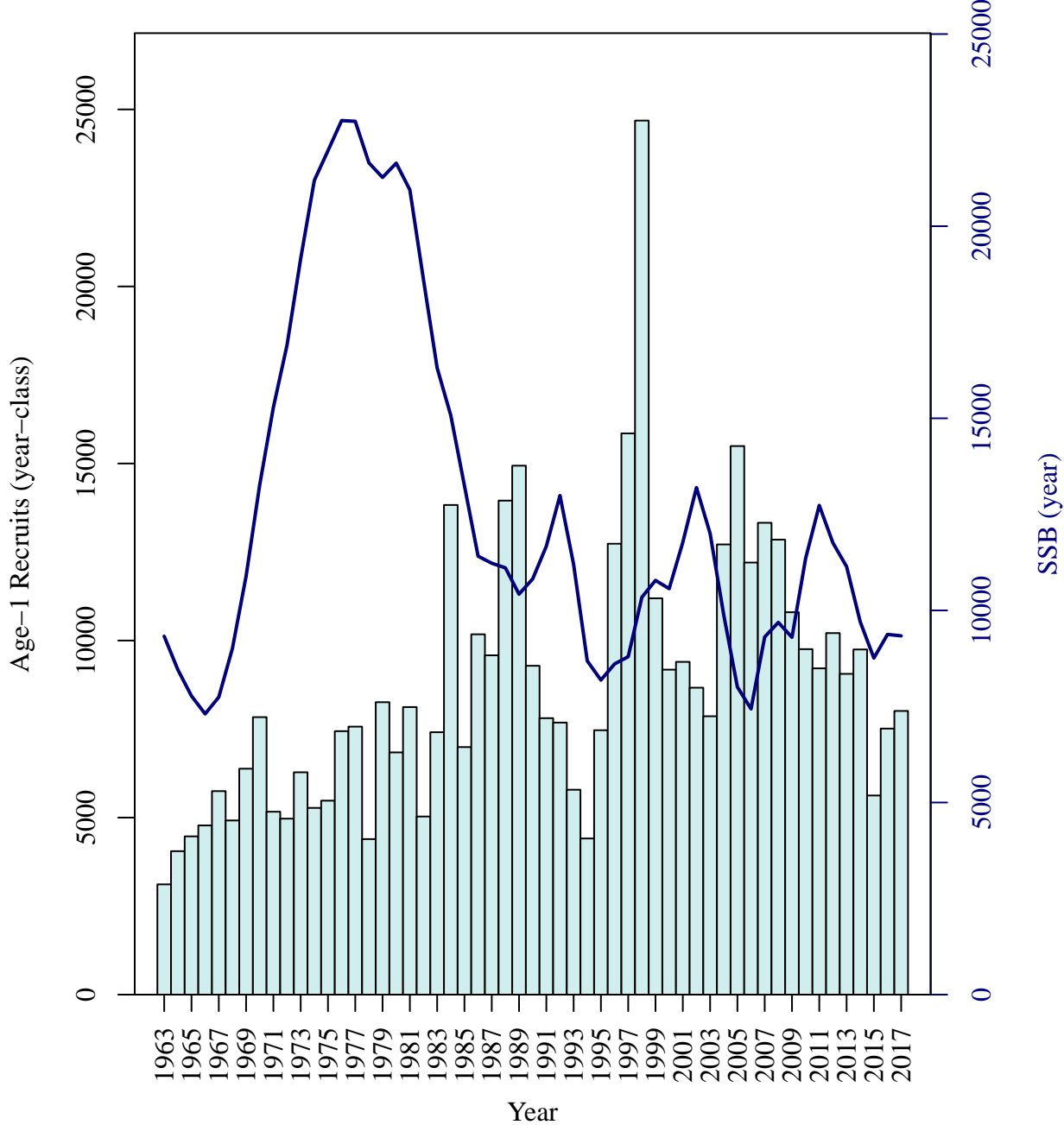


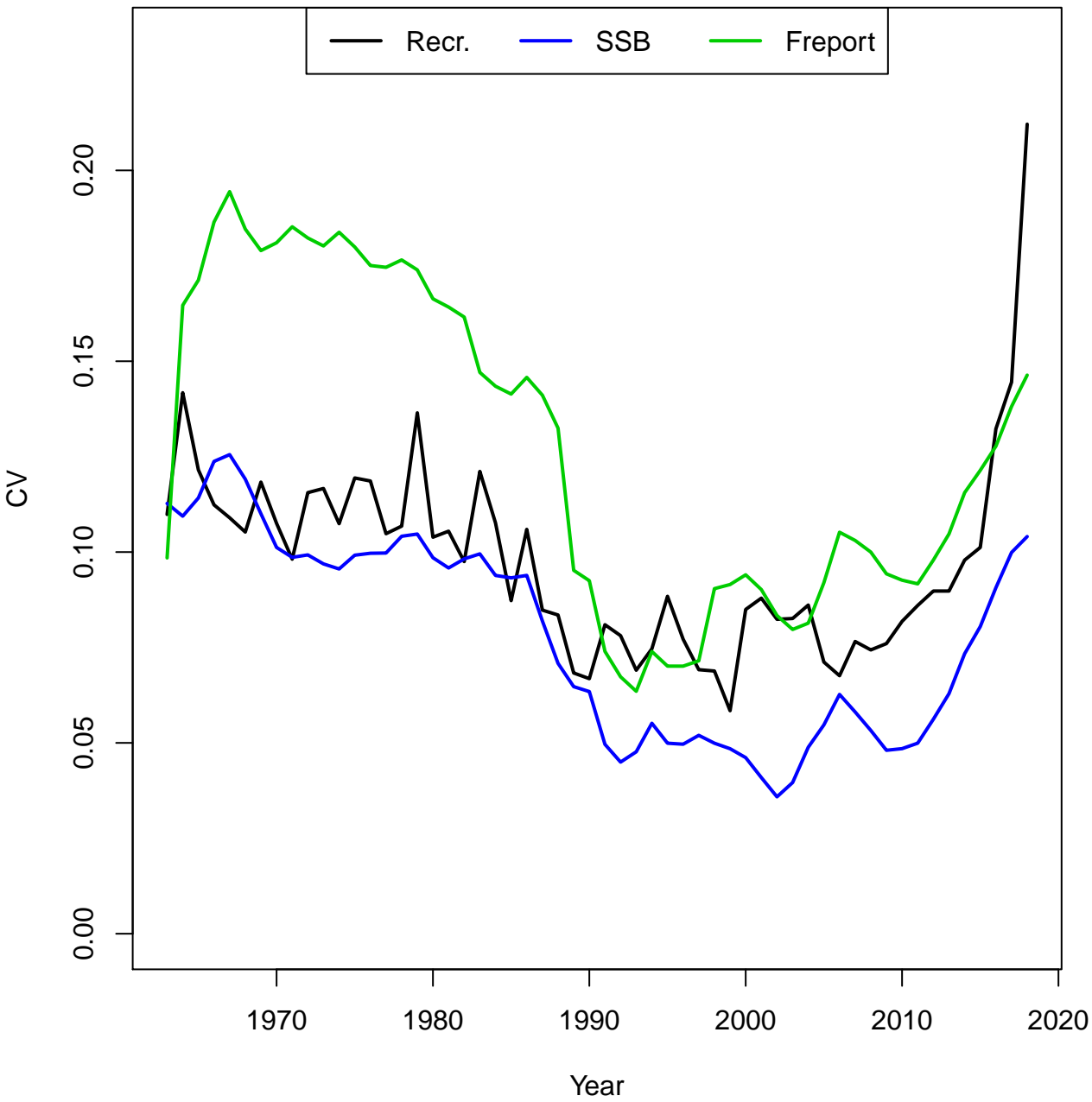




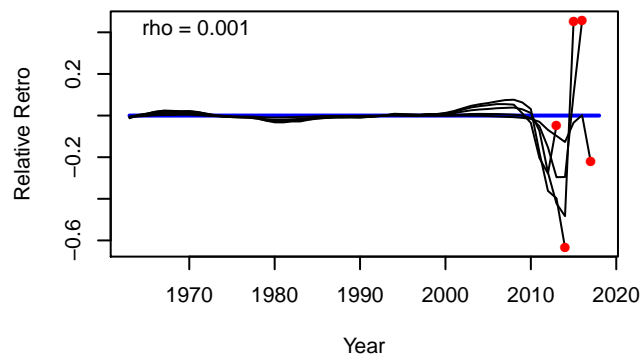
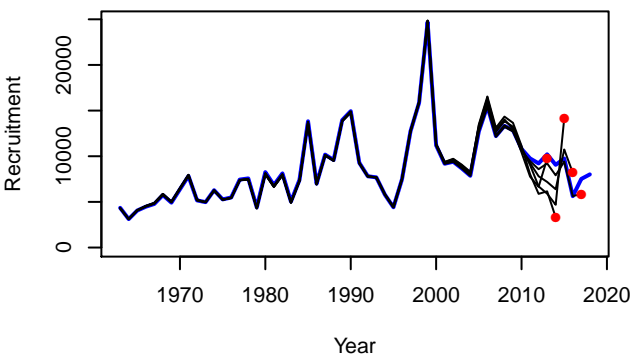
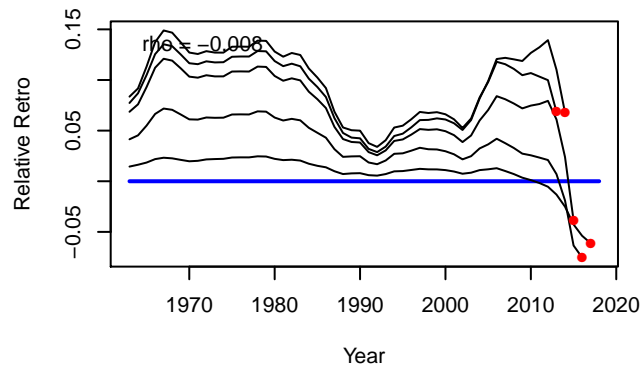
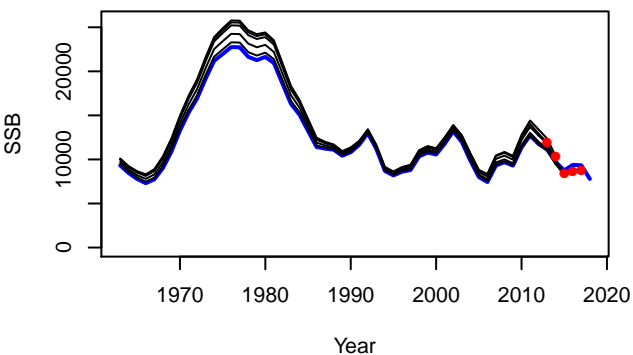
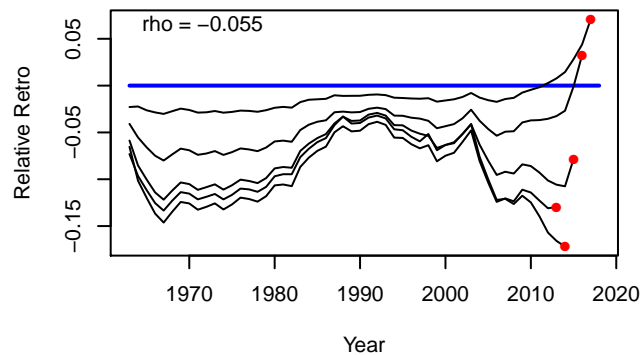
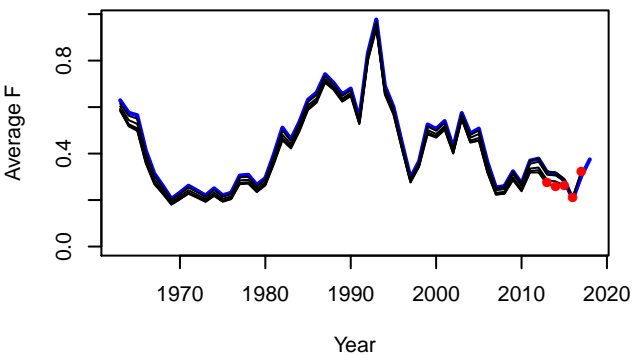






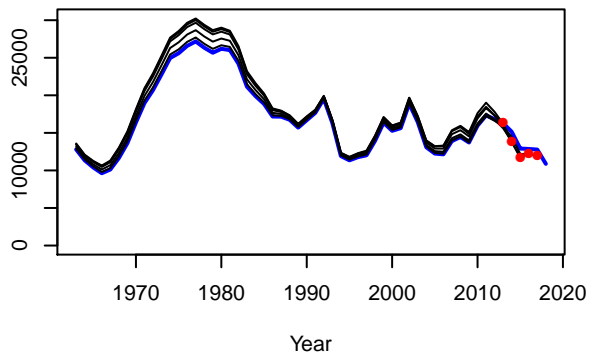


F, SSB, R

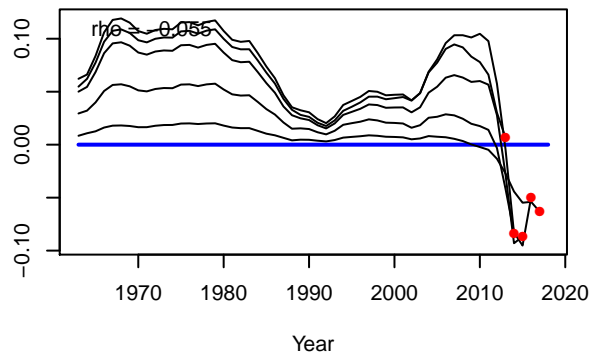


Jan-1 B, Exploitable B, Total Stock N

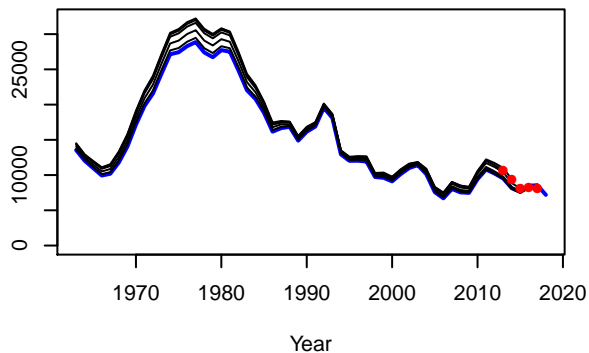
Jan-1 B



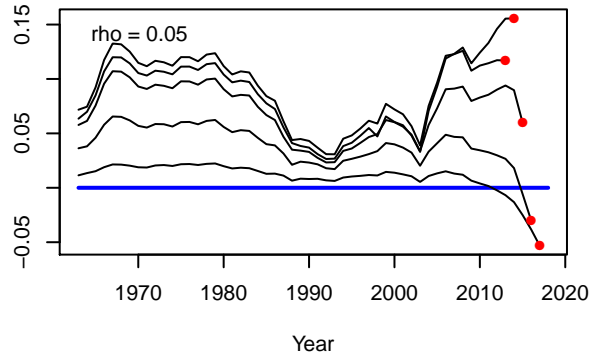
Relative Retro



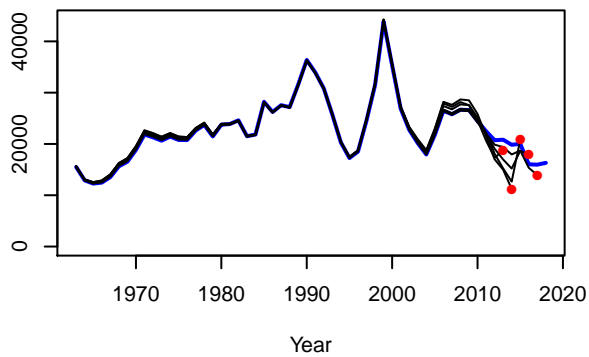
Exploitable B



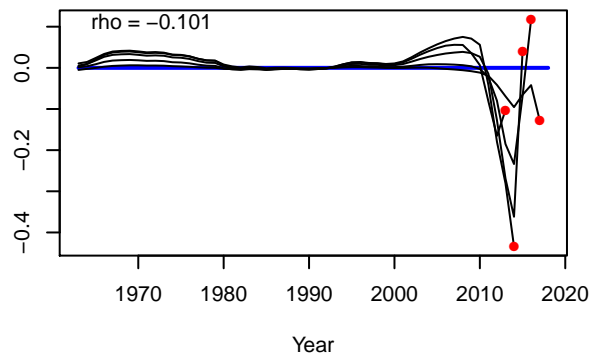
Relative Retro



Total Stock N

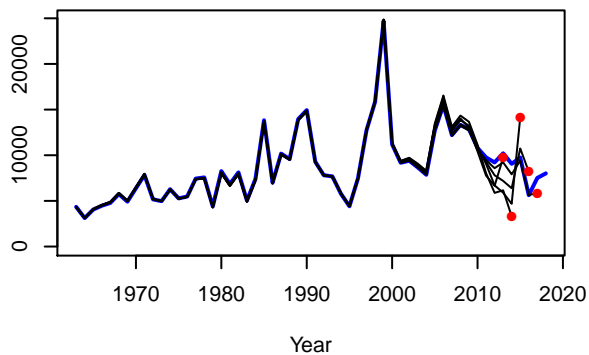


Relative Retro

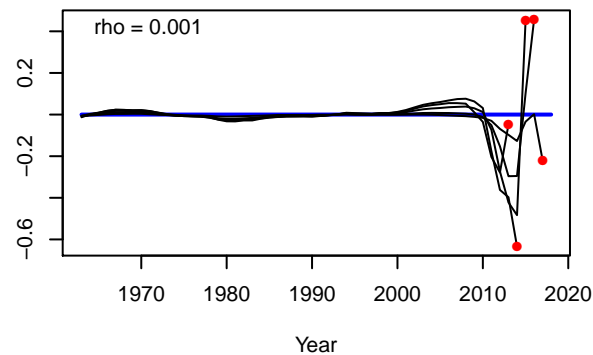


Stock Numbers at Age

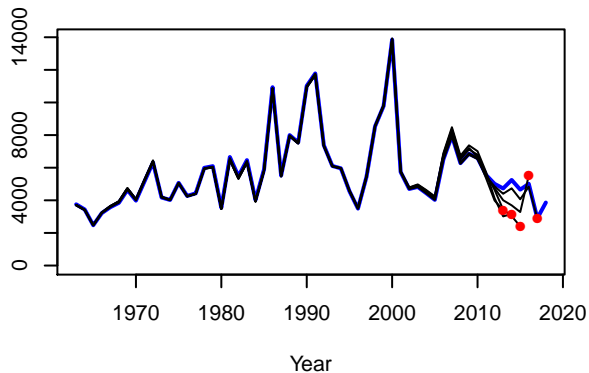
N at Age 1



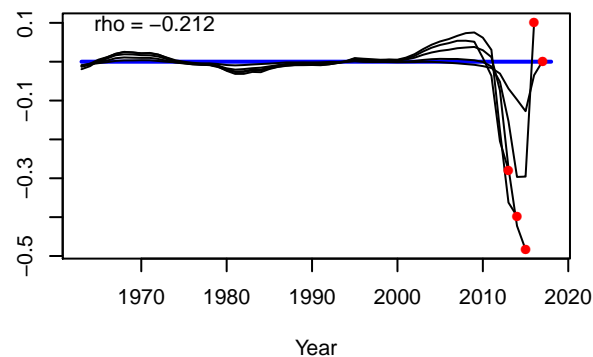
Relative Retro



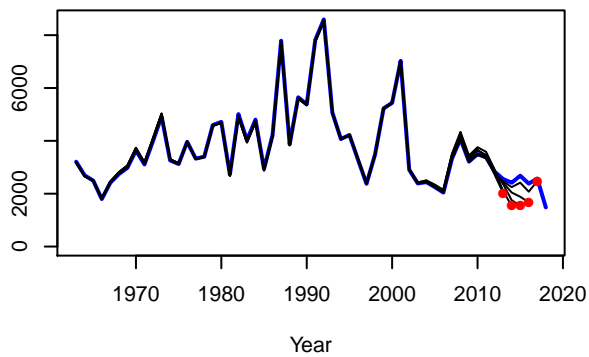
N at Age 2



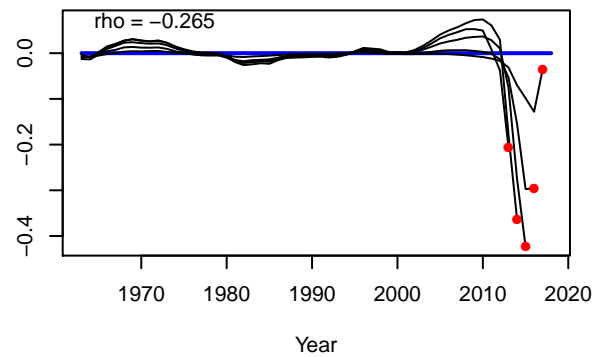
Relative Retro



N at Age 3

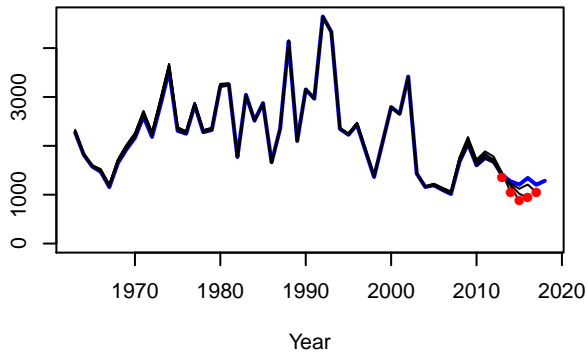


Relative Retro

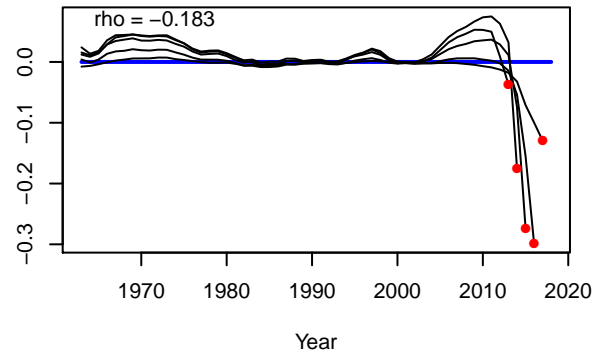


Stock Numbers at Age

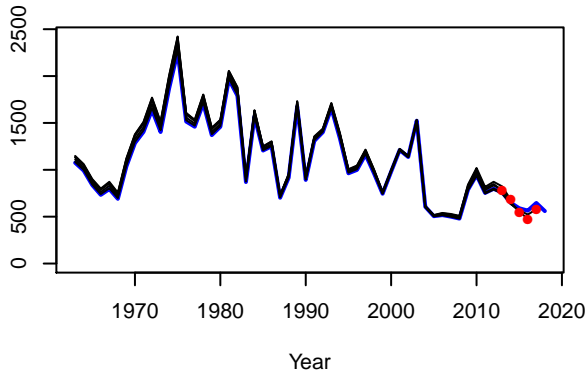
N at Age 4



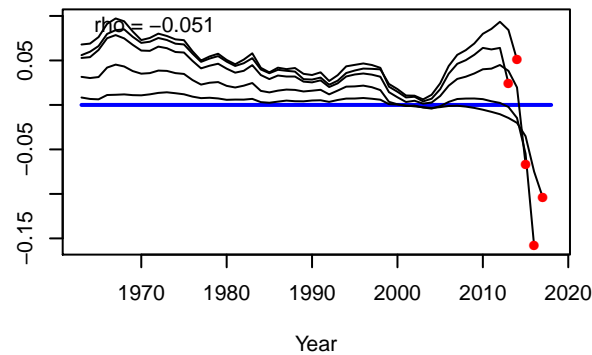
Relative Retro



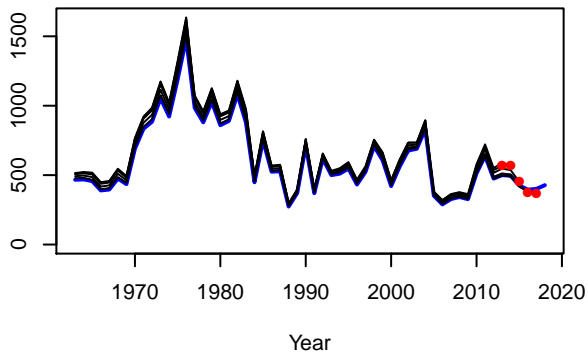
N at Age 5



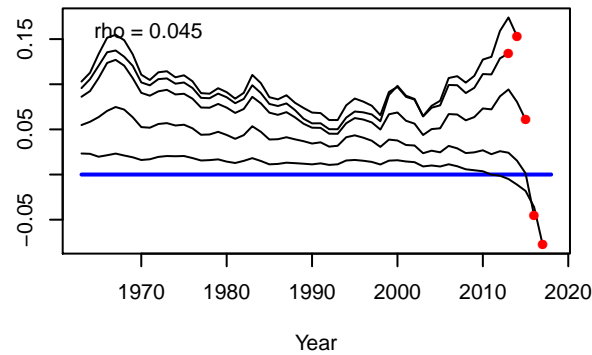
Relative Retro



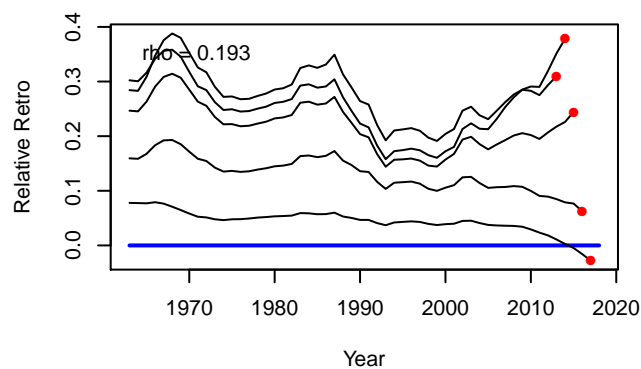
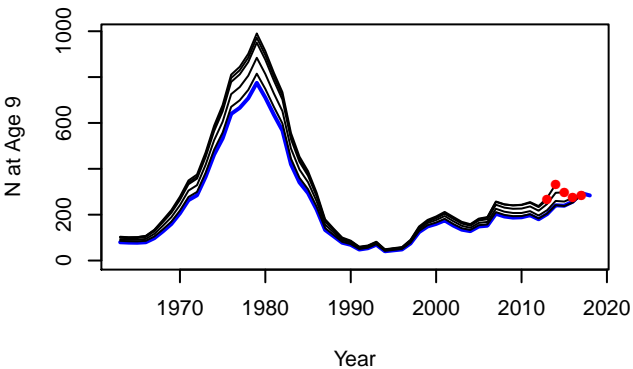
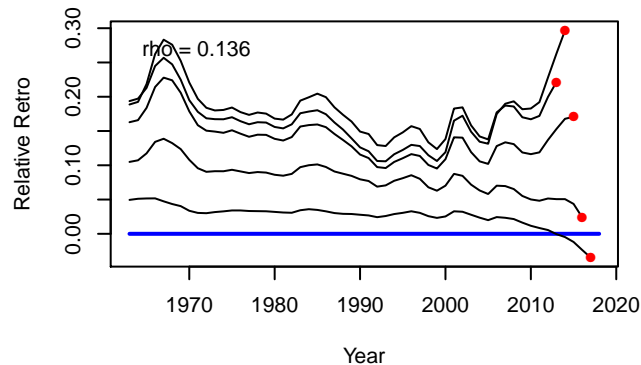
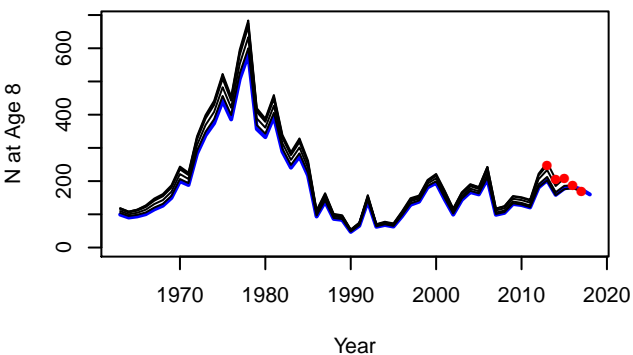
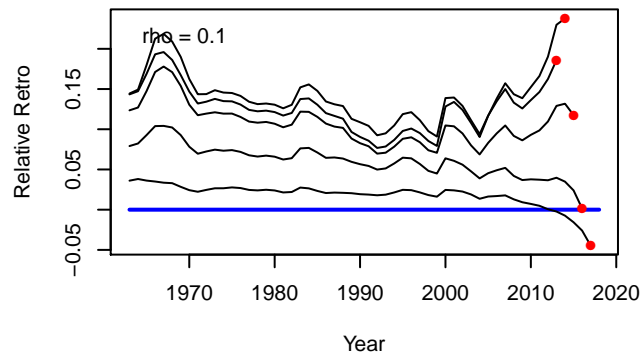
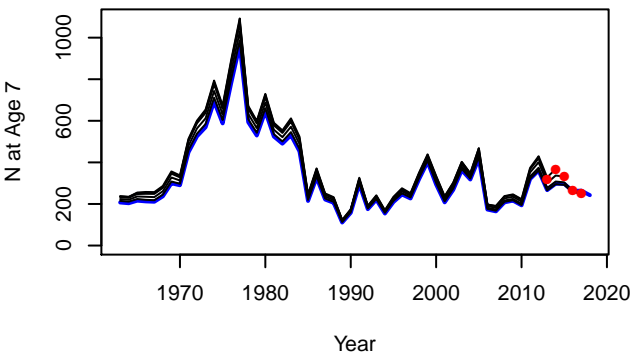
N at Age 6



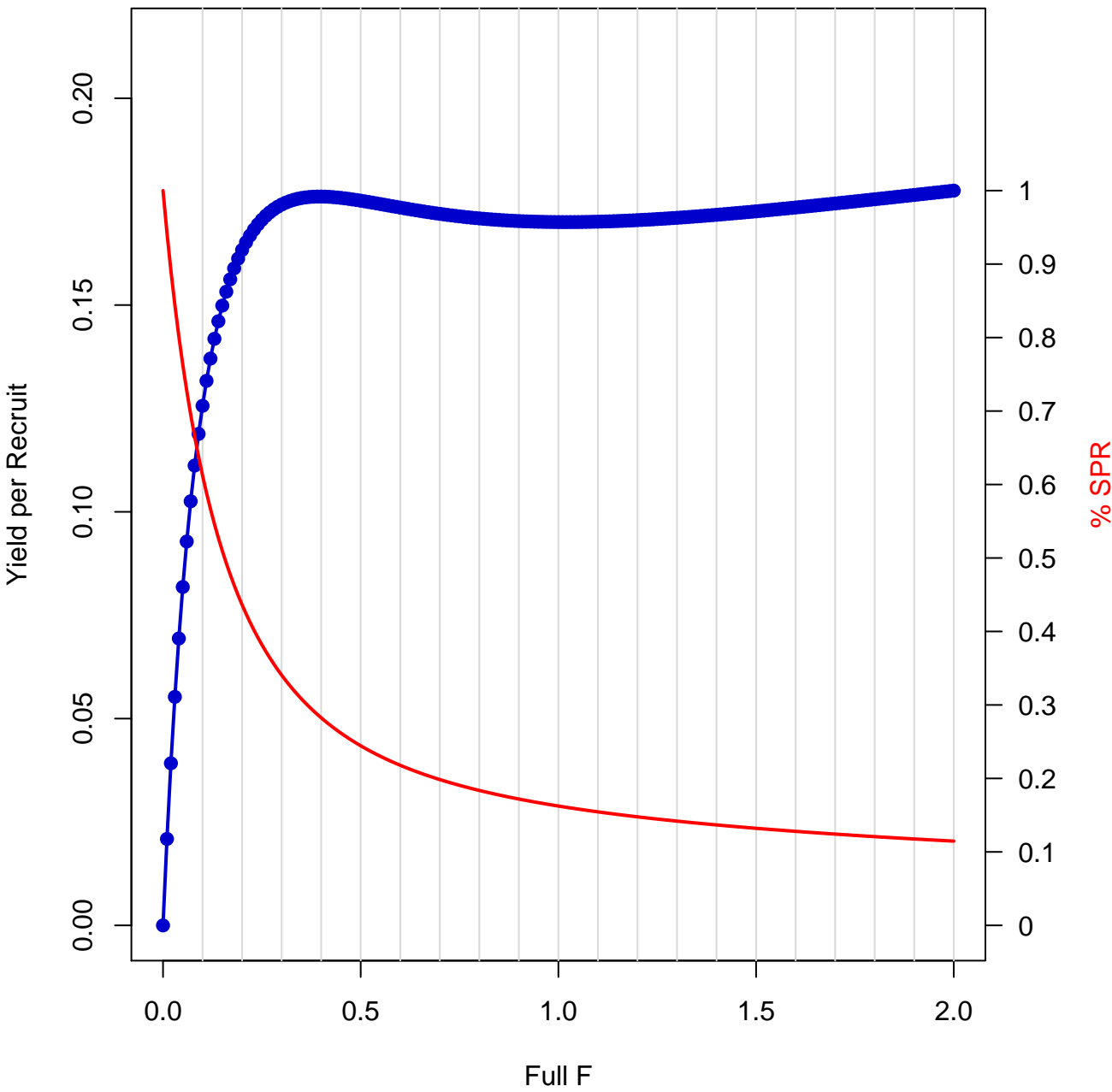
Relative Retro



Stock Numbers at Age



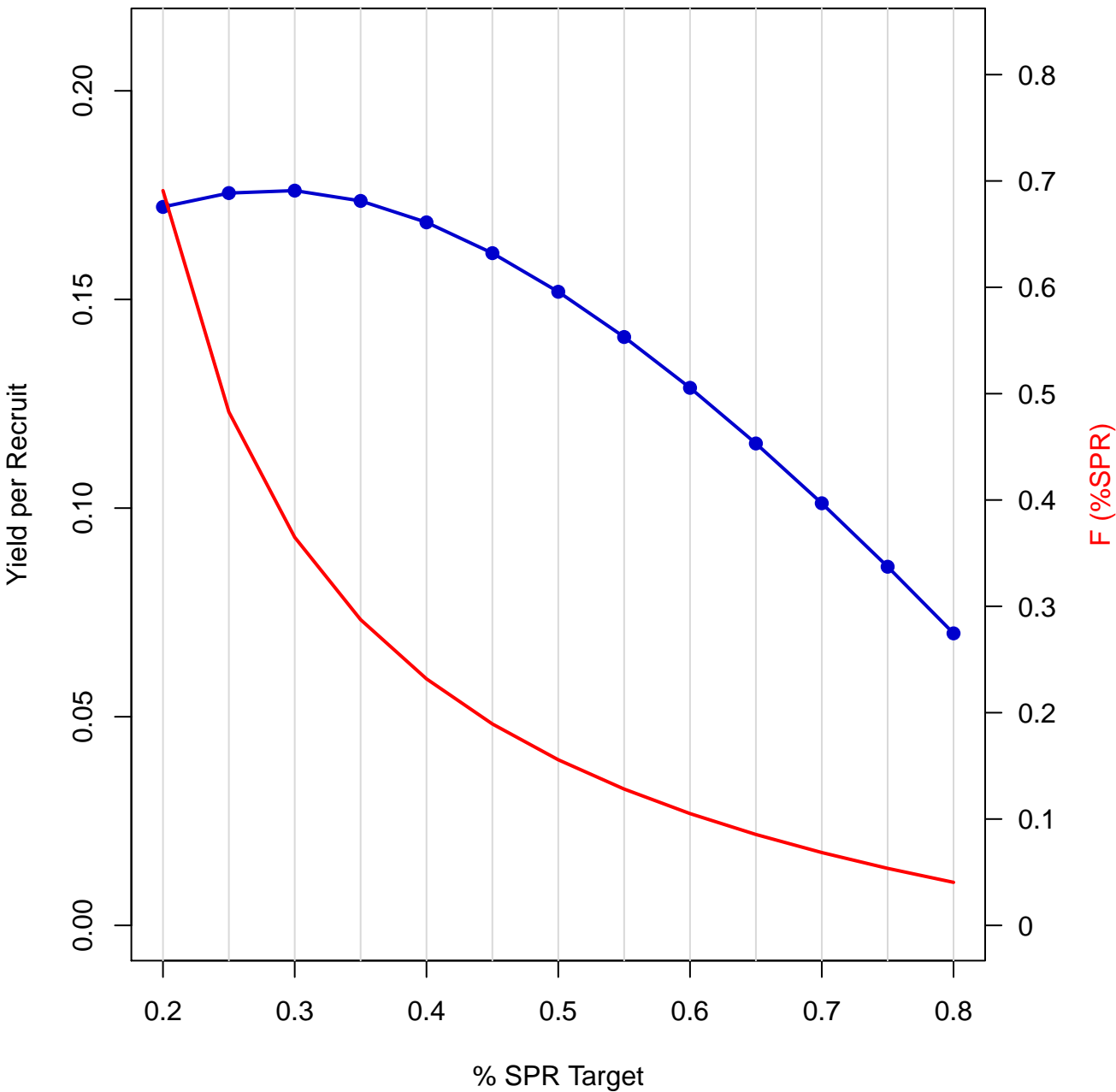
YPR-SPR Reference Points (Years Avg = 5)



YPR–SPR Reference Points (Years Avg = 5)

F	YPR	SPR	F	YPR	SPR	F	YPR	SPR
0	0	1	0.35	0.1759	0.3083	0.7	0.1721	0.1985
0.01	0.0209	0.9427	0.36	0.176	0.3027	0.71	0.1719	0.1968
0.02	0.0392	0.8911	0.37	0.1761	0.2973	0.72	0.1718	0.1952
0.03	0.0553	0.8443	0.38	0.1762	0.2922	0.73	0.1717	0.1936
0.04	0.0694	0.8019	0.39	0.1762	0.2873	0.74	0.1716	0.1921
0.05	0.0818	0.7632	0.4	0.1762	0.2825	0.75	0.1714	0.1906
0.06	0.0928	0.7277	0.41	0.1762	0.278	0.76	0.1713	0.1891
0.07	0.1026	0.6953	0.42	0.1762	0.2737	0.77	0.1712	0.1877
0.08	0.1112	0.6654	0.43	0.1761	0.2695	0.78	0.1711	0.1863
0.09	0.1188	0.6378	0.44	0.176	0.2655	0.79	0.171	0.185
0.1	0.1256	0.6123	0.45	0.1759	0.2617	0.8	0.171	0.1836
0.11	0.1317	0.5887	0.46	0.1758	0.2579	0.81	0.1709	0.1823
0.12	0.1371	0.5668	0.47	0.1757	0.2544	0.82	0.1708	0.1811
0.13	0.1418	0.5464	0.48	0.1755	0.2509	0.83	0.1707	0.1798
0.14	0.1461	0.5274	0.49	0.1754	0.2476	0.84	0.1706	0.1786
0.15	0.1499	0.5096	0.5	0.1752	0.2444	0.85	0.1706	0.1775
0.16	0.1532	0.493	0.51	0.1751	0.2414	0.86	0.1705	0.1763
0.17	0.1562	0.4775	0.52	0.1749	0.2384	0.87	0.1705	0.1752
0.18	0.1589	0.4629	0.53	0.1748	0.2355	0.88	0.1704	0.1741
0.19	0.1612	0.4492	0.54	0.1746	0.2327	0.89	0.1704	0.173
0.2	0.1633	0.4363	0.55	0.1744	0.2301	0.9	0.1703	0.1719
0.21	0.1652	0.4242	0.56	0.1742	0.2275	0.91	0.1703	0.1709
0.22	0.1668	0.4127	0.57	0.1741	0.225	0.92	0.1702	0.1699
0.23	0.1682	0.4019	0.58	0.1739	0.2225	0.93	0.1702	0.1689
0.24	0.1695	0.3917	0.59	0.1737	0.2202	0.94	0.1702	0.1679
0.25	0.1706	0.382	0.6	0.1736	0.2179	0.95	0.1701	0.1669
0.26	0.1716	0.3729	0.61	0.1734	0.2157	0.96	0.1701	0.166
0.27	0.1724	0.3642	0.62	0.1732	0.2135	0.97	0.1701	0.1651
0.28	0.1731	0.3559	0.63	0.1731	0.2115	0.98	0.1701	0.1642
0.29	0.1738	0.3481	0.64	0.1729	0.2094	0.99	0.1701	0.1633
0.3	0.1743	0.3406	0.65	0.1728	0.2075	1	0.1701	0.1624
0.31	0.1747	0.3335	0.66	0.1726	0.2056	1.01	0.1701	0.1616
0.32	0.1751	0.3268	0.67	0.1725	0.2037	1.02	0.1701	0.1607
0.33	0.1754	0.3203	0.68	0.1723	0.2019	1.03	0.1701	0.1599
0.34	0.1757	0.3142	0.69	0.1722	0.2002	1.04	0.1701	0.1591

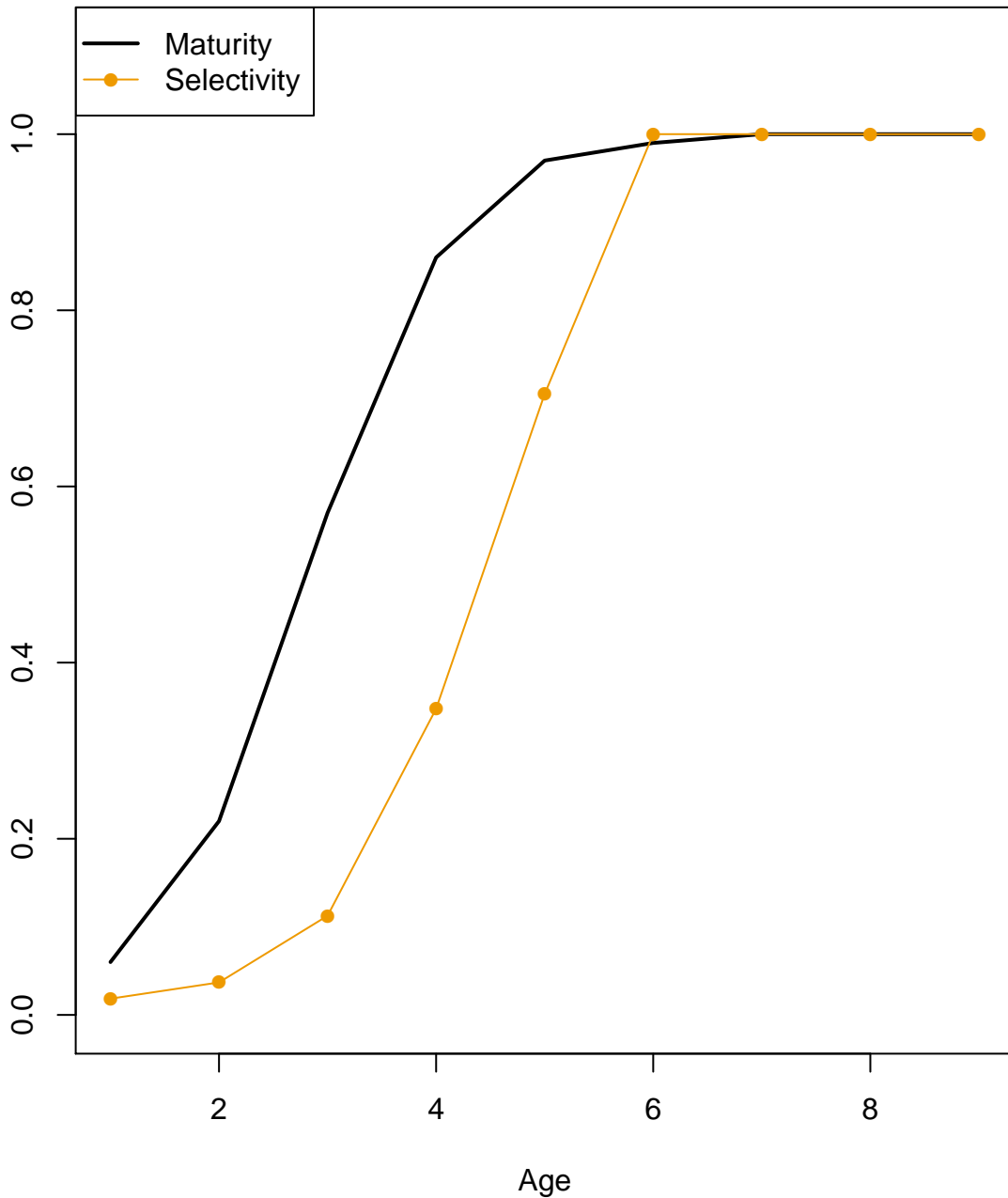
SPR Target Reference Points (Years Avg = 5)



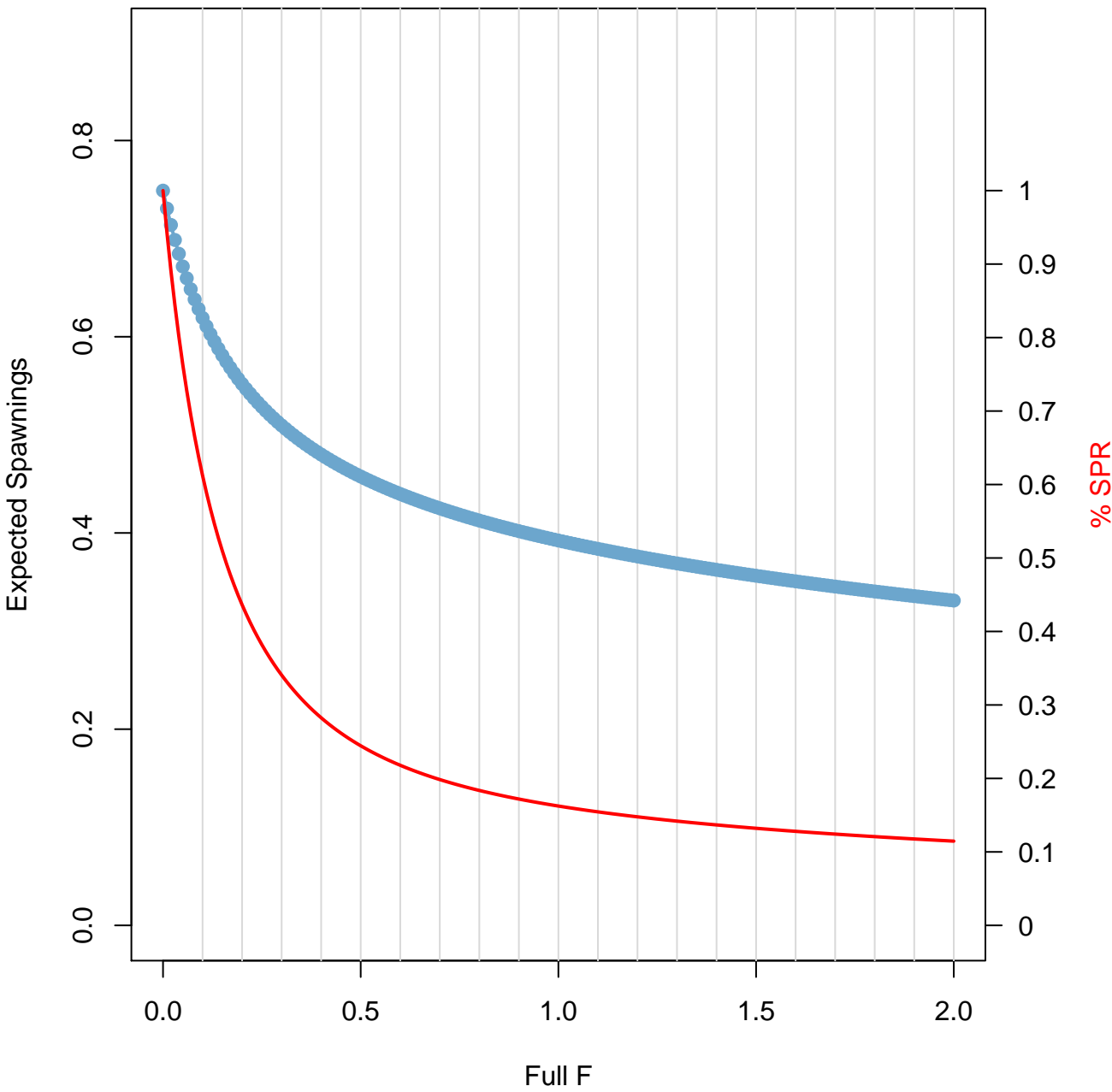
SPR Target Reference Points (Years Avg = 5)

% SPR	F(%SPR)	YPR
0.2	0.6909	0.1722
0.25	0.4828	0.1755
0.3	0.365	0.1761
0.35	0.2875	0.1736
0.4	0.2318	0.1685
0.45	0.1894	0.1611
0.5	0.1557	0.1518
0.55	0.1282	0.141
0.6	0.1051	0.1288
0.65	0.0855	0.1155
0.7	0.0685	0.1012
0.75	0.0536	0.086
0.8	0.0405	0.07

Selectivity or Maturity at age



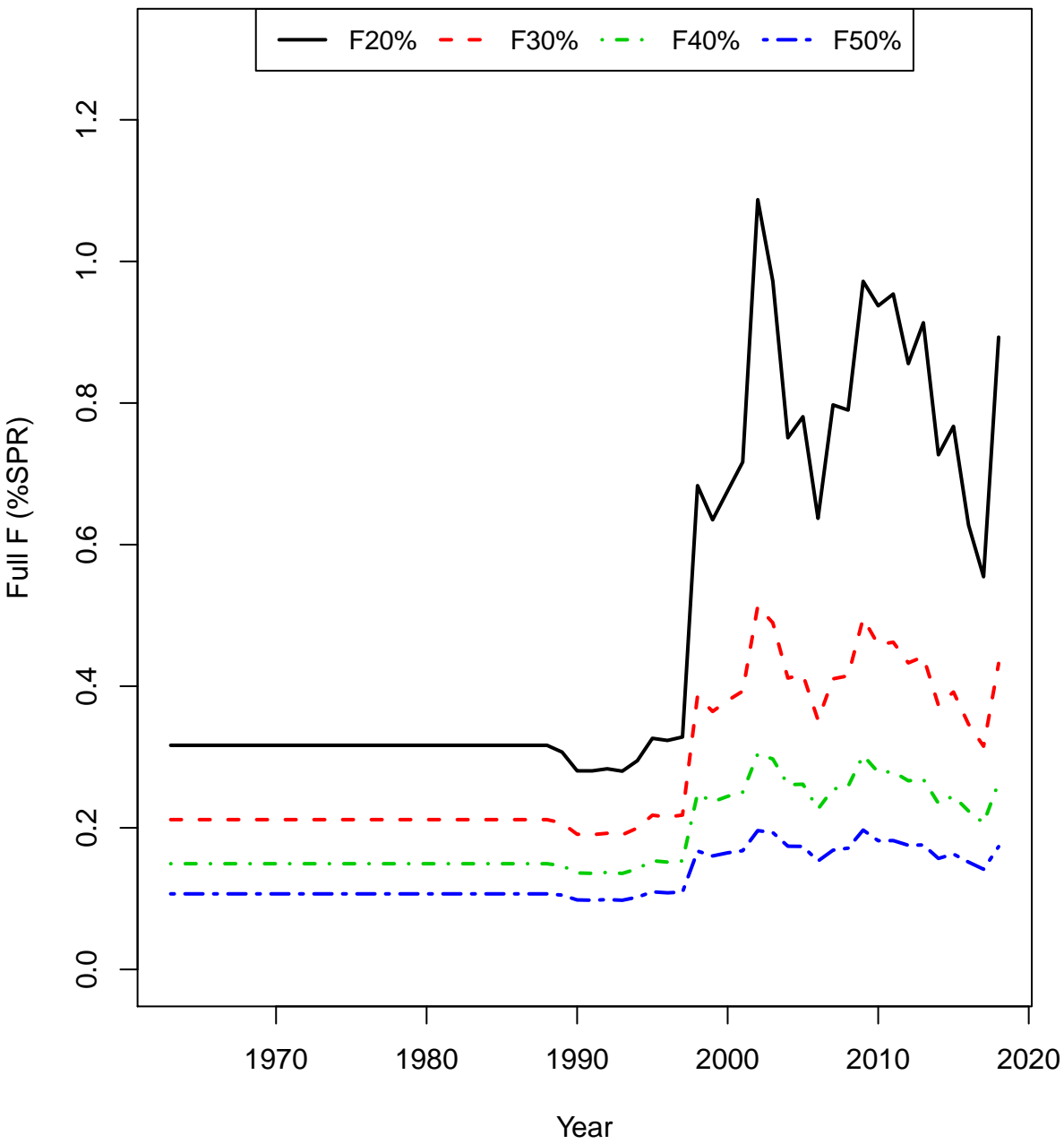
Expected Spawns and SPR Reference Points (Years Avg = 5)



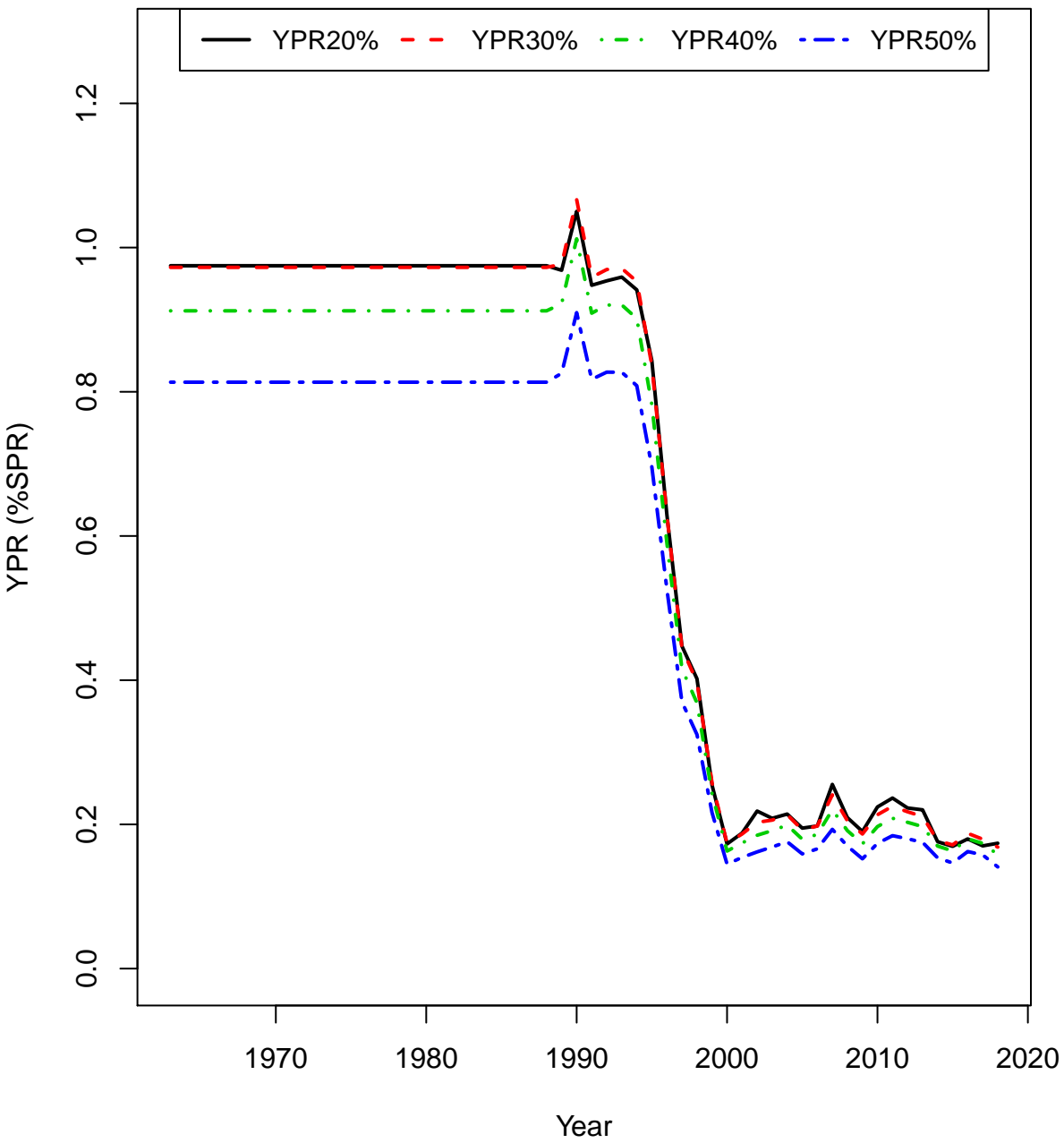
Expected Spawnings & SPR Reference Points (Years Avg = 5)

F	E[Sp]	SPR	F	E[Sp]	SPR	F	E[Sp]	SPR
0	0.749	1	0.35	0.4936	0.3083	0.7	0.4251	0.1985
0.01	0.7306	0.9427	0.36	0.4907	0.3027	0.71	0.4238	0.1968
0.02	0.714	0.8911	0.37	0.4879	0.2973	0.72	0.4225	0.1952
0.03	0.6987	0.8443	0.38	0.4852	0.2922	0.73	0.4212	0.1936
0.04	0.6846	0.8019	0.39	0.4825	0.2873	0.74	0.4199	0.1921
0.05	0.6716	0.7632	0.4	0.4799	0.2825	0.75	0.4187	0.1906
0.06	0.6596	0.7277	0.41	0.4774	0.278	0.76	0.4174	0.1891
0.07	0.6485	0.6953	0.42	0.475	0.2737	0.77	0.4162	0.1877
0.08	0.6381	0.6654	0.43	0.4726	0.2695	0.78	0.415	0.1863
0.09	0.6283	0.6378	0.44	0.4703	0.2655	0.79	0.4138	0.185
0.1	0.6192	0.6123	0.45	0.468	0.2617	0.8	0.4127	0.1836
0.11	0.6107	0.5887	0.46	0.4658	0.2579	0.81	0.4115	0.1823
0.12	0.6027	0.5668	0.47	0.4637	0.2544	0.82	0.4104	0.1811
0.13	0.5951	0.5464	0.48	0.4616	0.2509	0.83	0.4093	0.1798
0.14	0.5879	0.5274	0.49	0.4596	0.2476	0.84	0.4082	0.1786
0.15	0.5811	0.5096	0.5	0.4576	0.2444	0.85	0.4071	0.1775
0.16	0.5747	0.493	0.51	0.4556	0.2414	0.86	0.406	0.1763
0.17	0.5686	0.4775	0.52	0.4537	0.2384	0.87	0.405	0.1752
0.18	0.5627	0.4629	0.53	0.4518	0.2355	0.88	0.4039	0.1741
0.19	0.5572	0.4492	0.54	0.45	0.2327	0.89	0.4029	0.173
0.2	0.5519	0.4363	0.55	0.4482	0.2301	0.9	0.4019	0.1719
0.21	0.5468	0.4242	0.56	0.4464	0.2275	0.91	0.4009	0.1709
0.22	0.542	0.4127	0.57	0.4447	0.225	0.92	0.3999	0.1699
0.23	0.5374	0.4019	0.58	0.443	0.2225	0.93	0.3989	0.1689
0.24	0.5329	0.3917	0.59	0.4414	0.2202	0.94	0.3979	0.1679
0.25	0.5287	0.382	0.6	0.4398	0.2179	0.95	0.397	0.1669
0.26	0.5246	0.3729	0.61	0.4382	0.2157	0.96	0.396	0.166
0.27	0.5206	0.3642	0.62	0.4366	0.2135	0.97	0.3951	0.1651
0.28	0.5168	0.3559	0.63	0.4351	0.2115	0.98	0.3942	0.1642
0.29	0.5131	0.3481	0.64	0.4336	0.2094	0.99	0.3932	0.1633
0.3	0.5096	0.3406	0.65	0.4321	0.2075	1	0.3923	0.1624
0.31	0.5062	0.3335	0.66	0.4307	0.2056	1.01	0.3914	0.1616
0.32	0.5029	0.3268	0.67	0.4292	0.2037	1.02	0.3906	0.1607
0.33	0.4997	0.3203	0.68	0.4278	0.2019	1.03	0.3897	0.1599
0.34	0.4966	0.3142	0.69	0.4265	0.2002	1.04	0.3888	0.1591

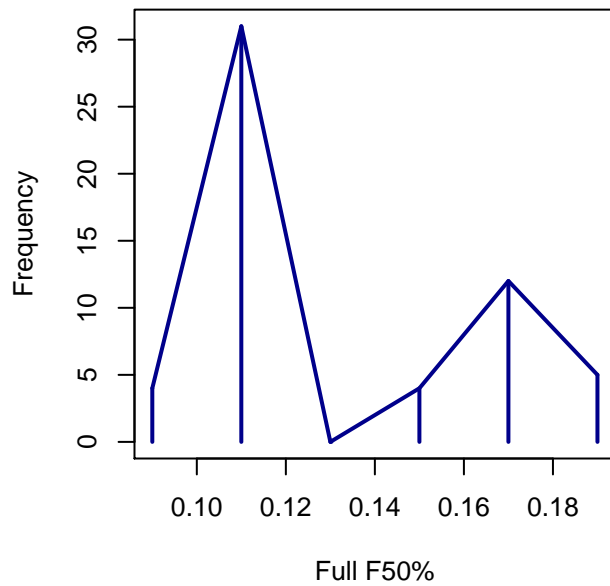
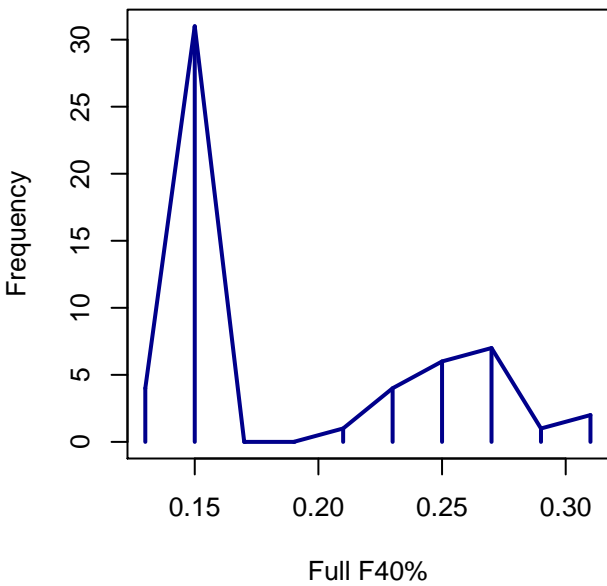
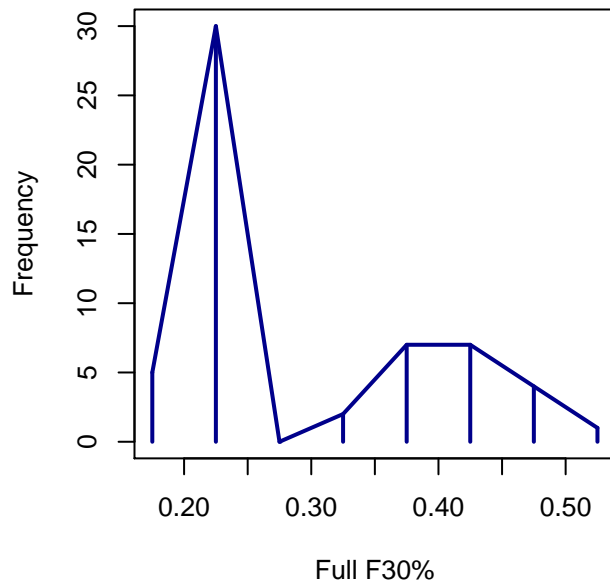
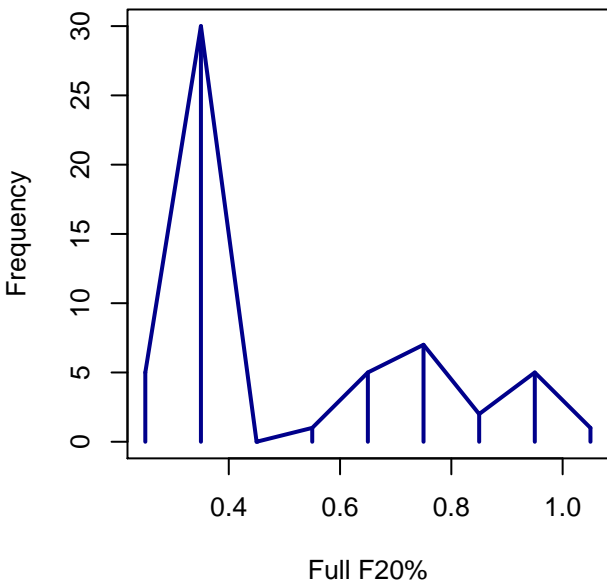
Annual F(%SPR) Reference Points



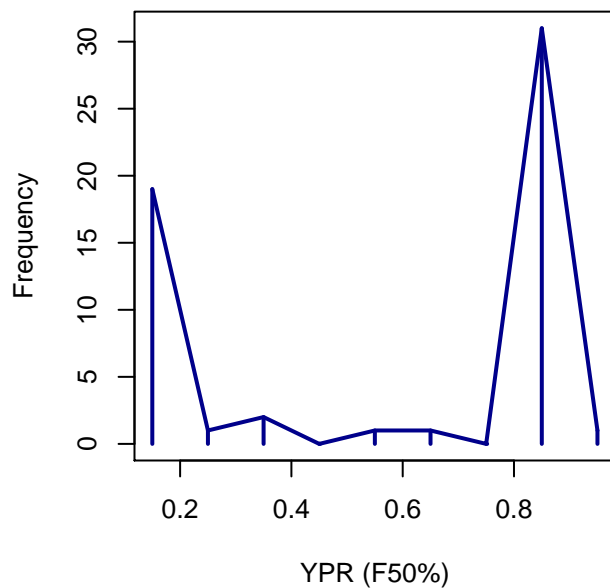
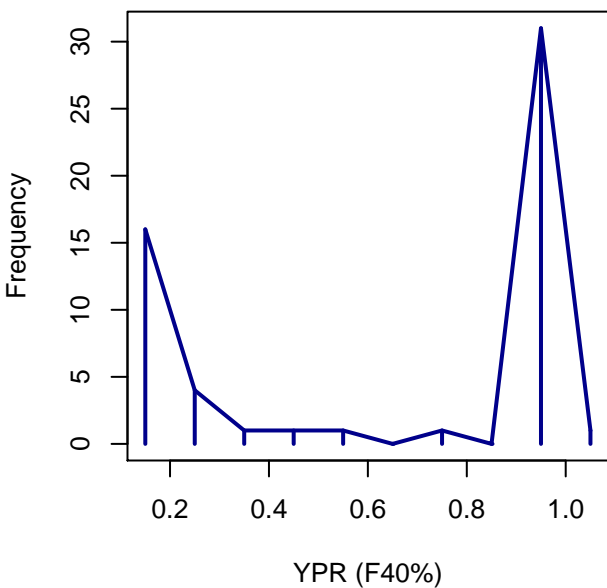
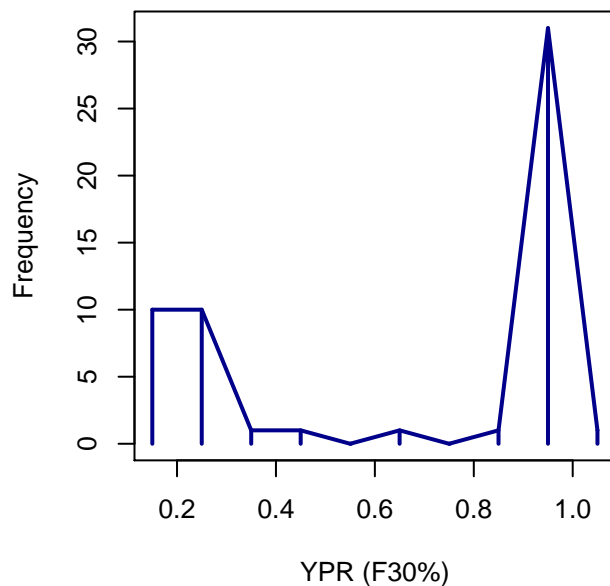
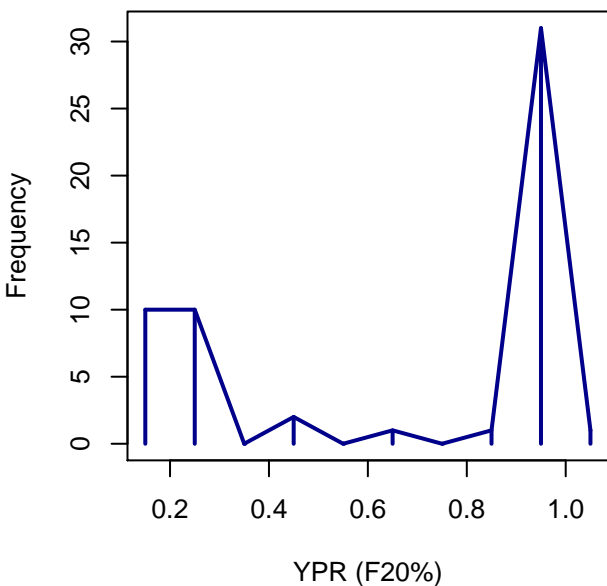
Annual YPR(%SPR) Reference Points



Annual F (%SPR) Reference Points



Annual YPR (%SPR) Reference Points



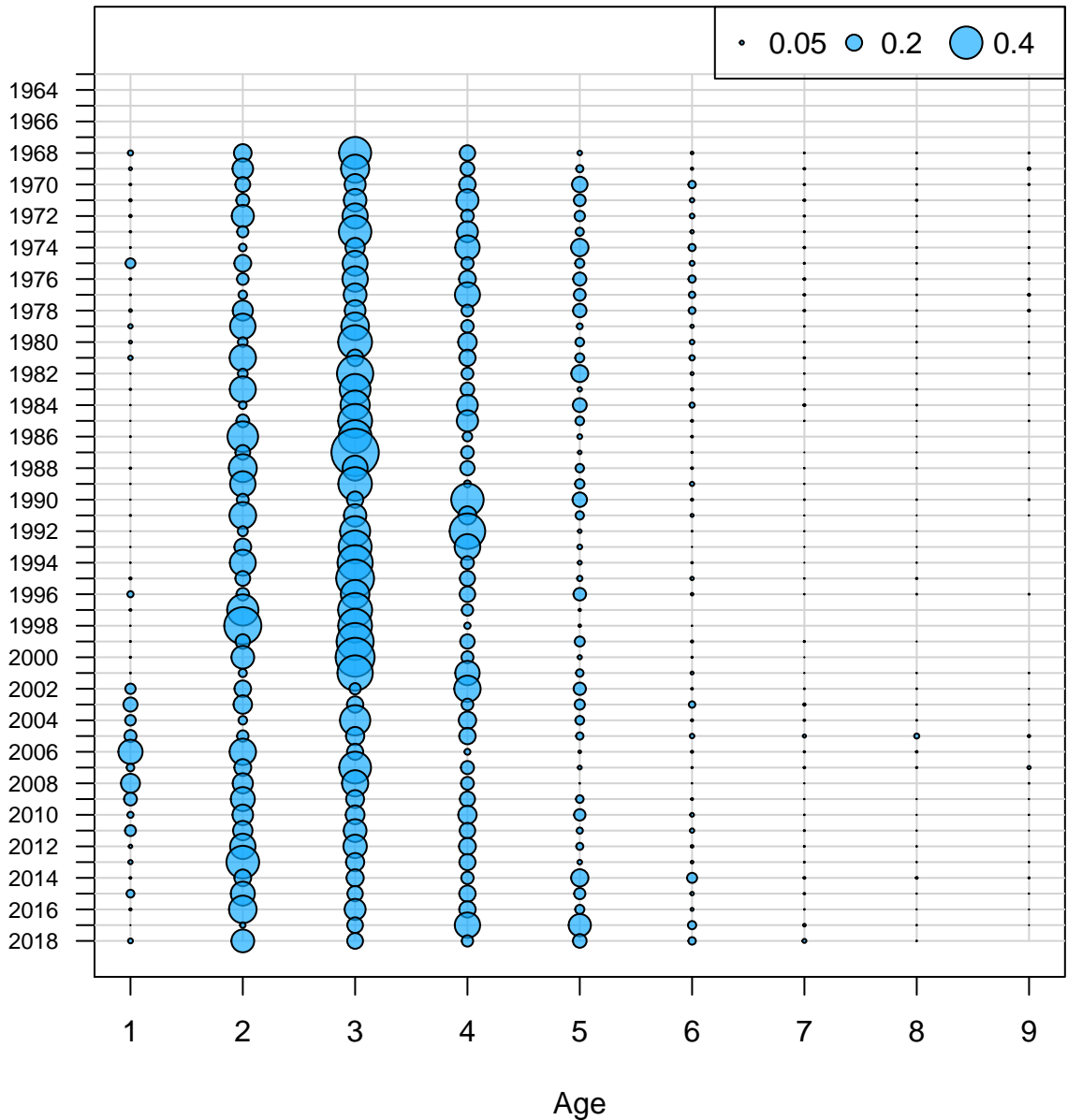


Age Comps for Catch by Fleet 1 (FLEET-1)





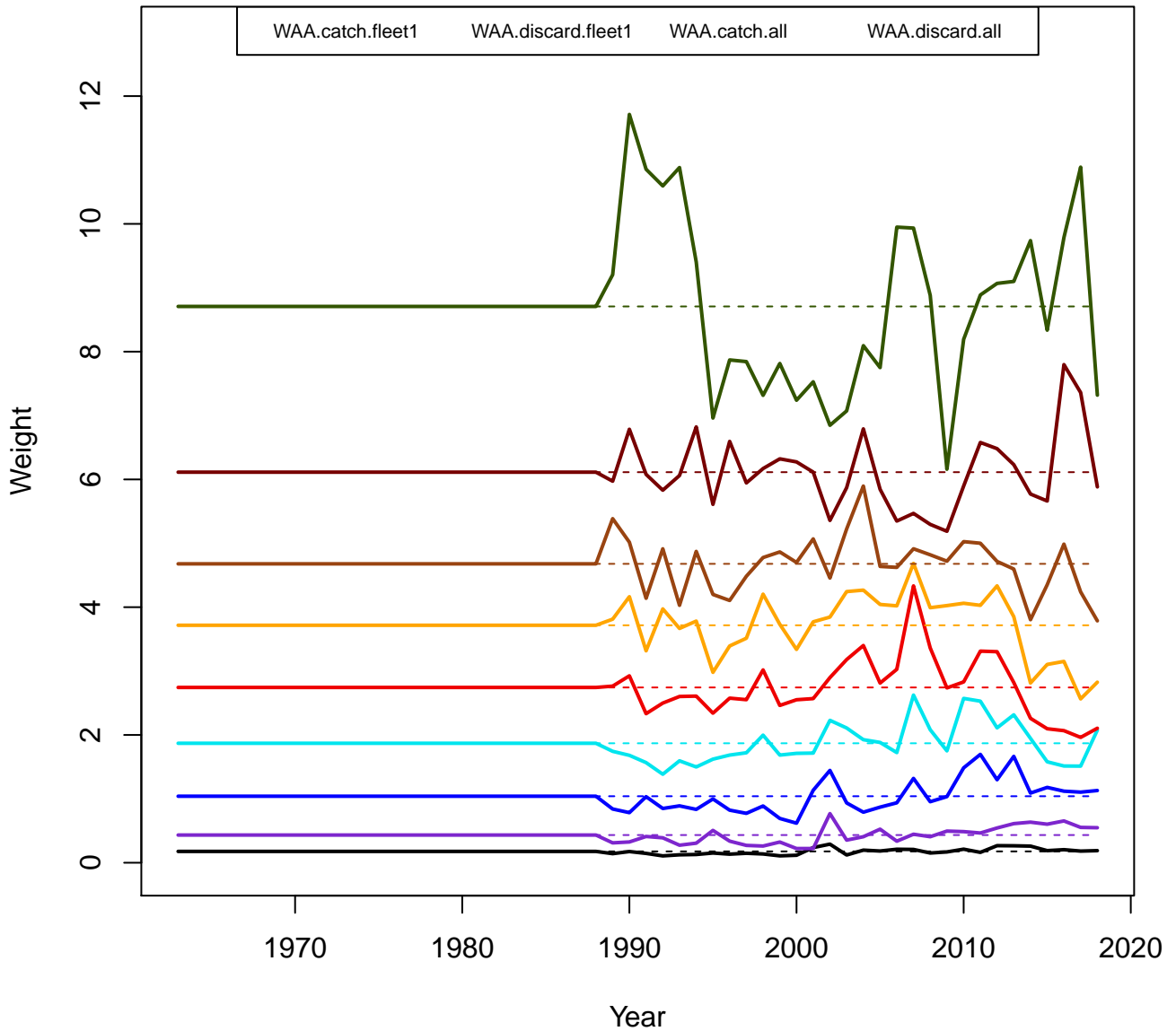
Age Comps for Index 1 (INDEX-1)



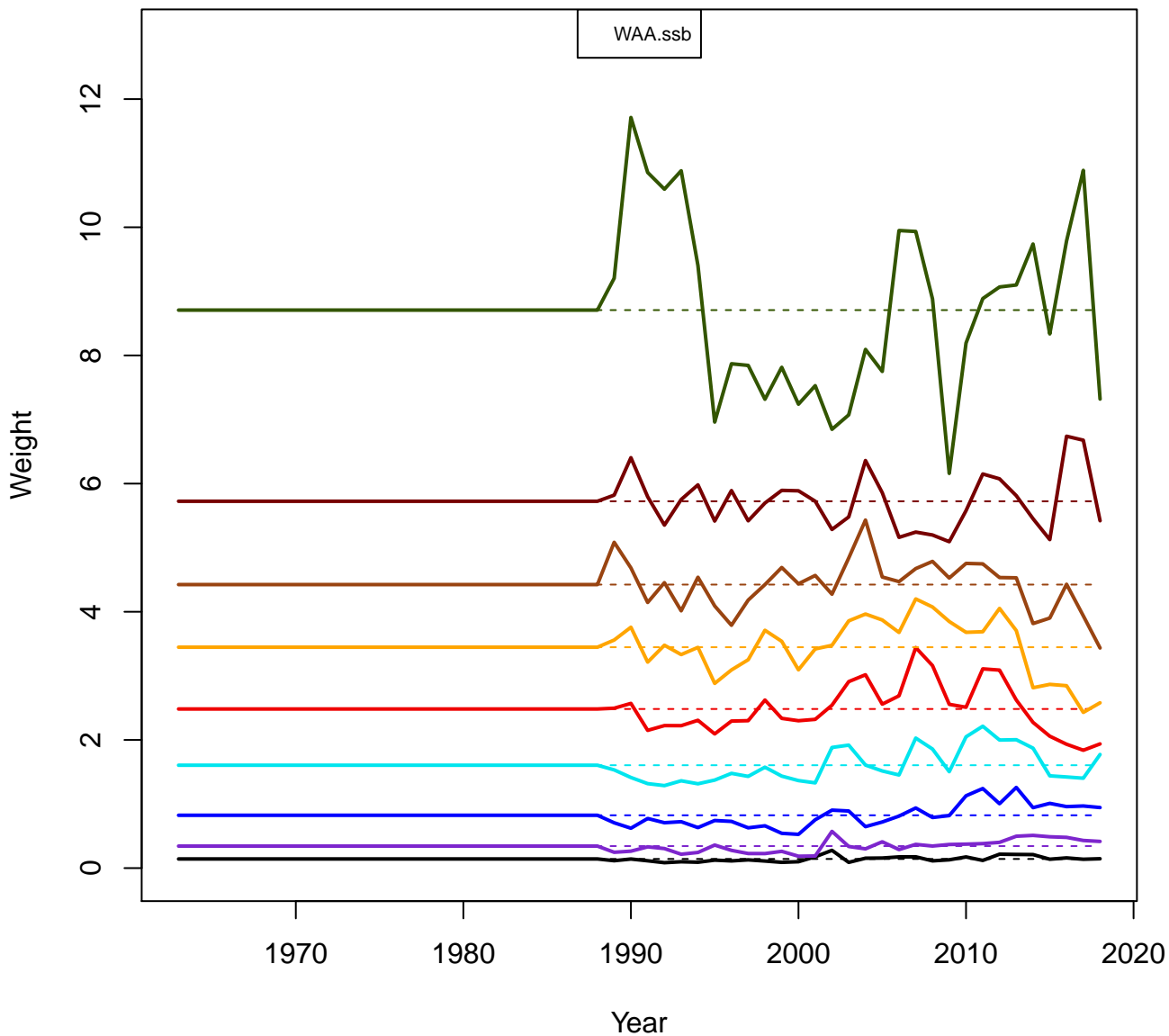
Age Comps for Index 2 (INDEX-2)



WAA matrix 1



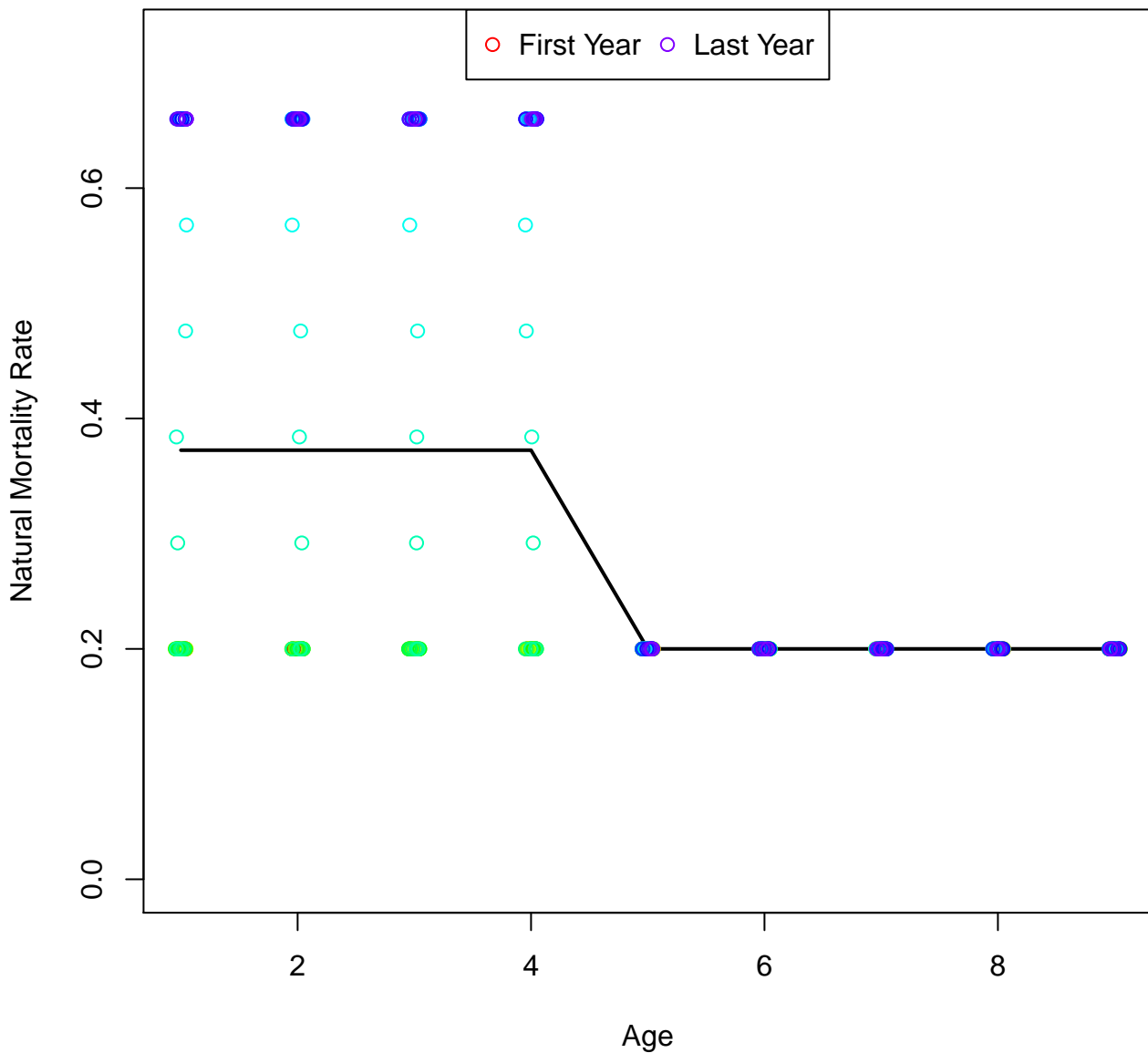
WAA matrix 2



WAA matrix 3



M



Maturity

