

File = RunBupdate_NoLC_Final_FixFall_000.dat

ASAP3 run on Wednesday, 15 Nov 2017 at 09:34:09

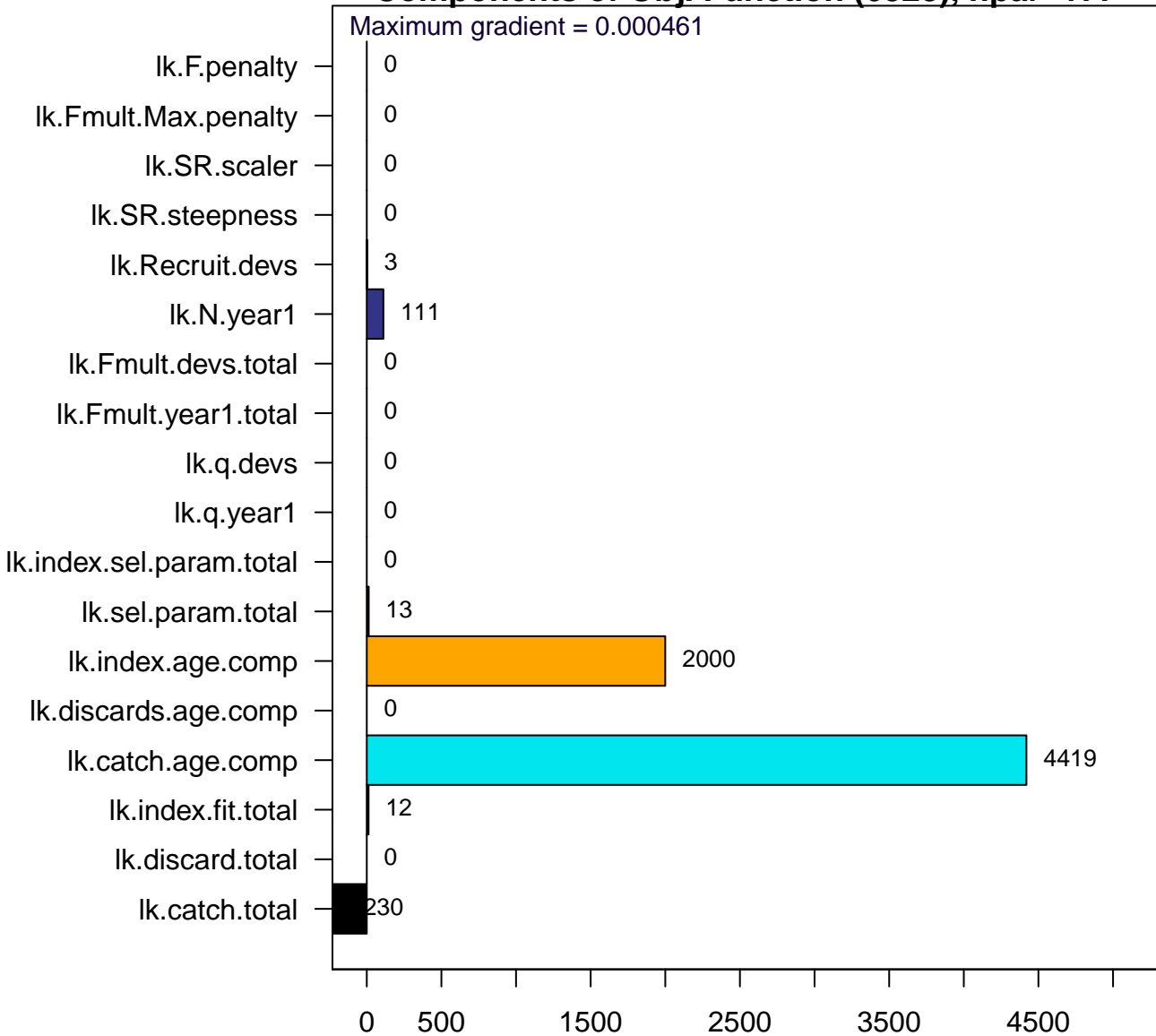
Methods WG\2017MeetingWoodsHoleNov13-17\Project1-RetroStateSpaceTra

ASAPplots version = 0.1.10

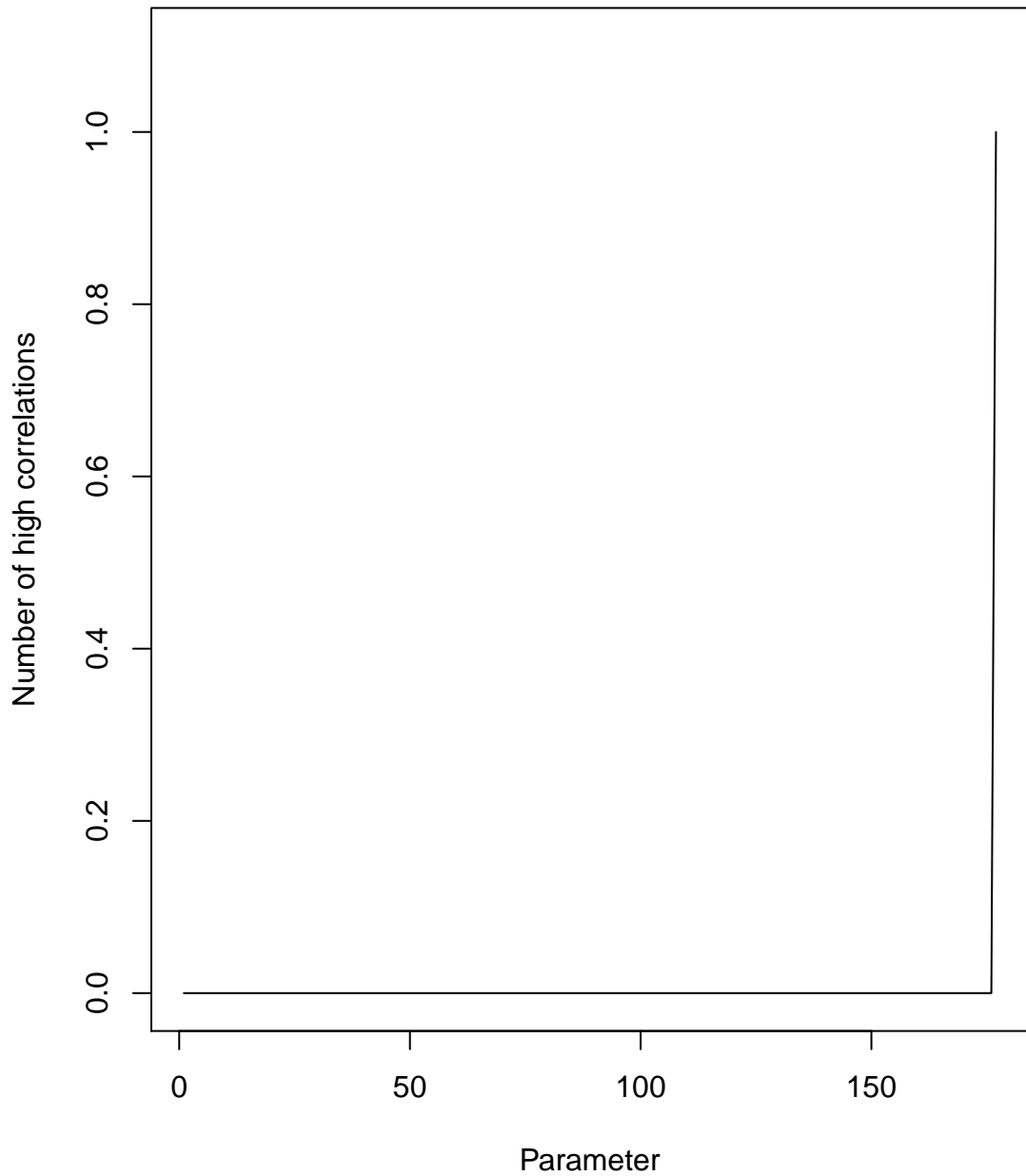
npar = 177, maximum gradient = 0.000461447

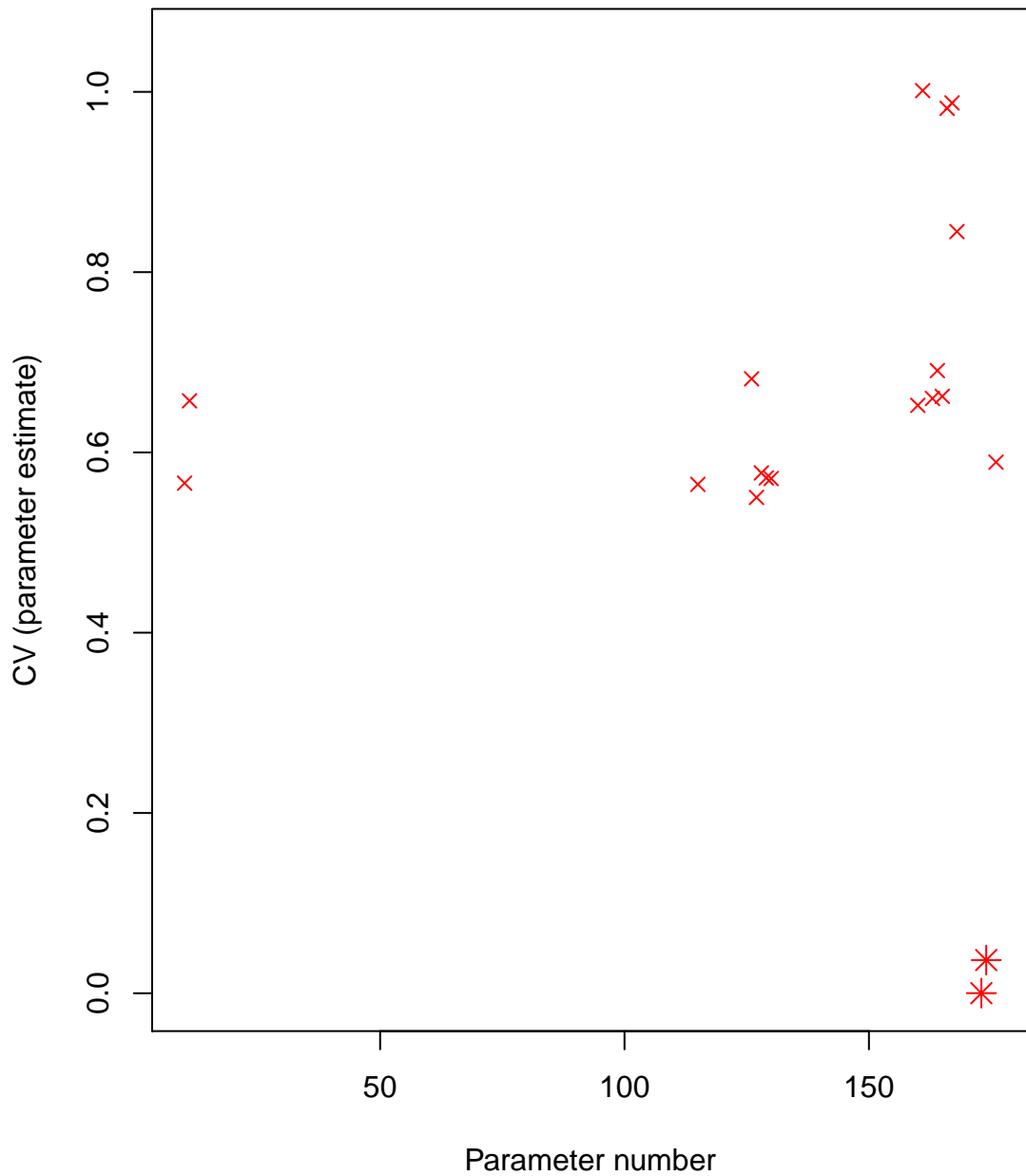
Components of Obj. Function (6328), npar=177

Maximum gradient = 0.000461



Likelihood Contribution

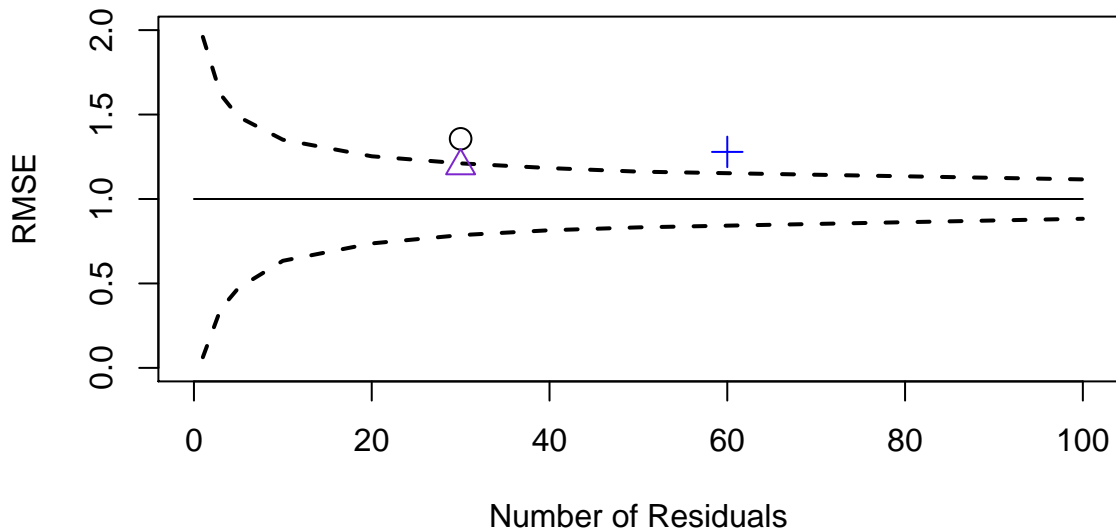




Root Mean Square Error computed from Standardized Residuals

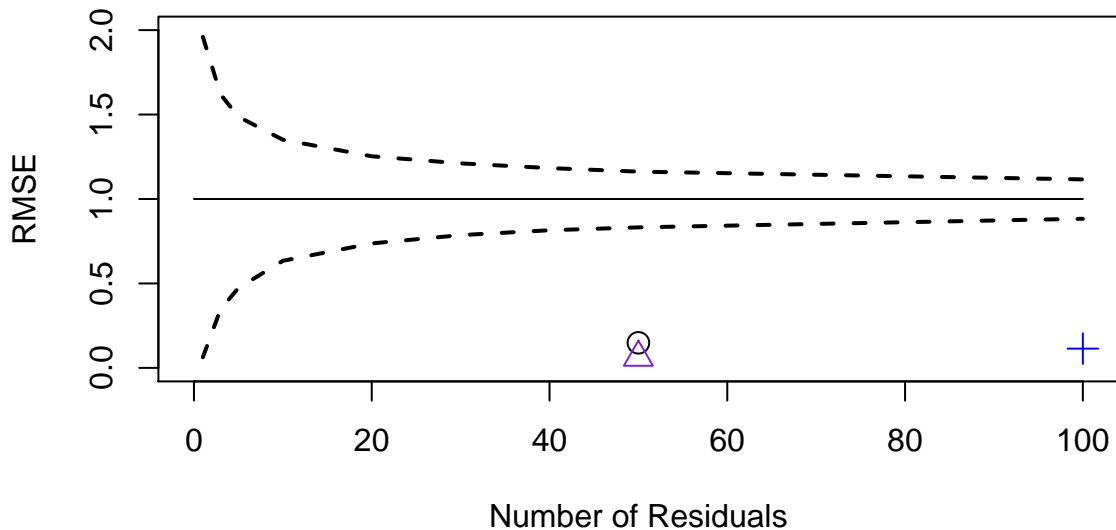
Component	# resids	RMSE
catch.fleet1	50	0.149
catch.fleet2	50	0.0623
catch.tot	100	0.114
discard.fleet1	0	0
discard.fleet2	0	0
discard.tot	0	0
ind01	30	1.36
ind02	30	1.2
ind.total	60	1.28
N.year1	7	0.546
Fmult.year1	0	0
Fmult.devs.fleet1	0	0
Fmult.devs.fleet2	0	0
Fmult.devs.total	0	0
recruit.devs	50	0.695
fleet.sel.params	8	1.91
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



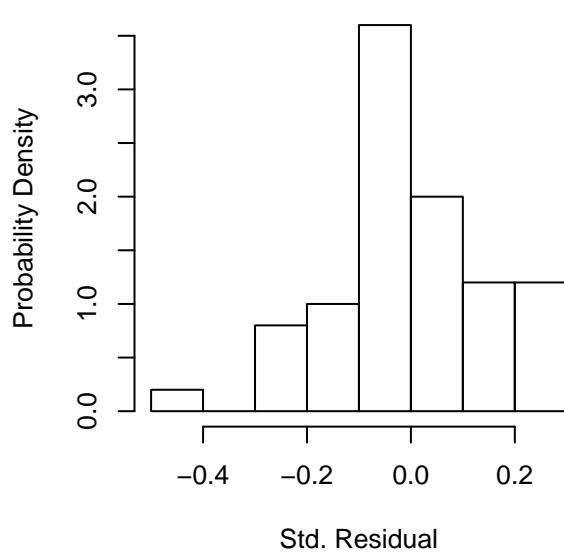
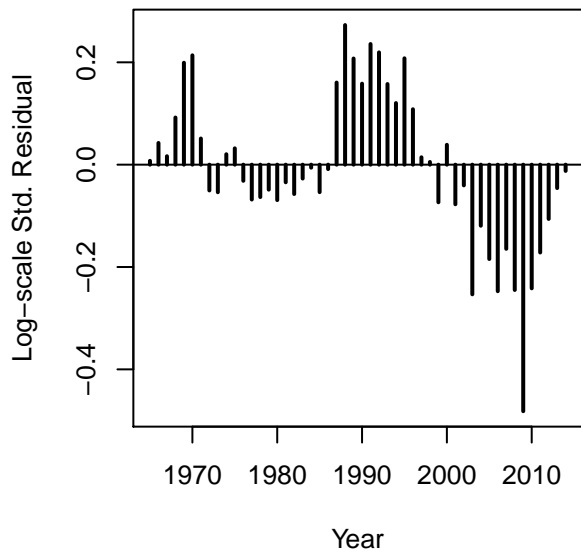
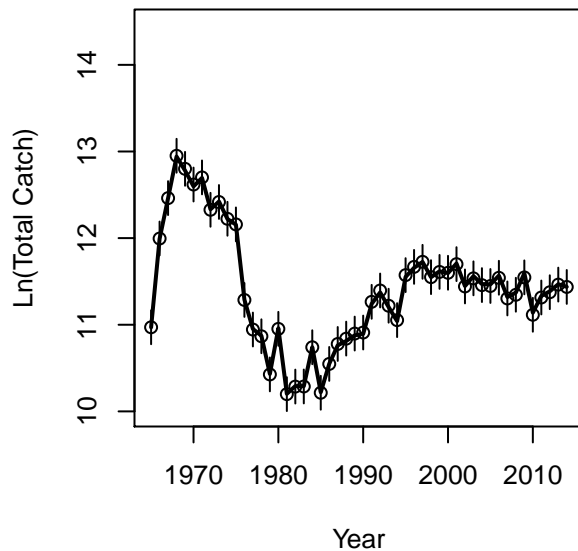
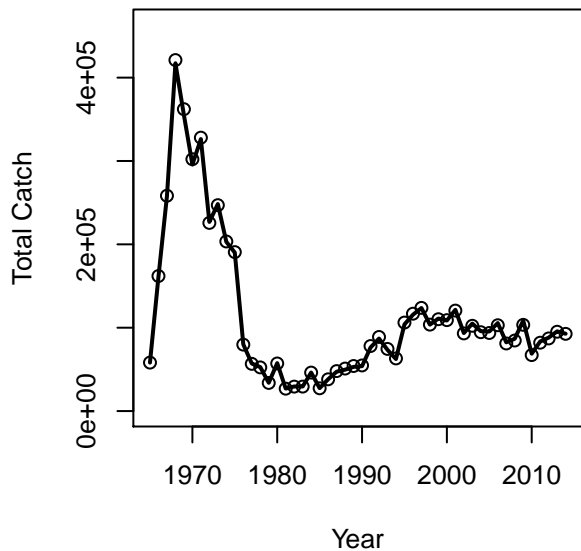
+ ind total
△ INDEX-2
○ INDEX-1

Root Mean Square Error for Catch

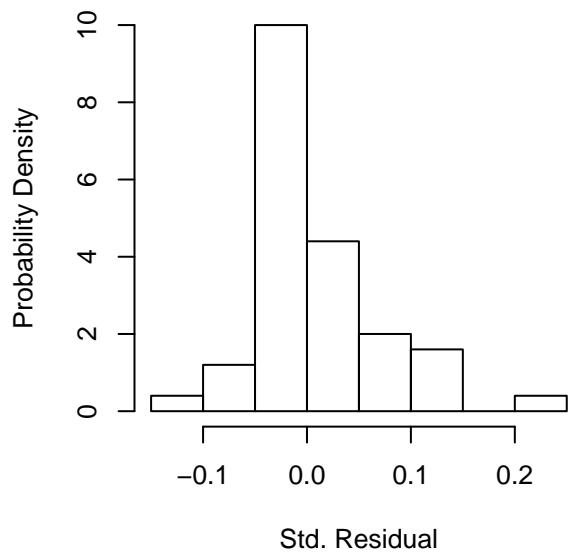
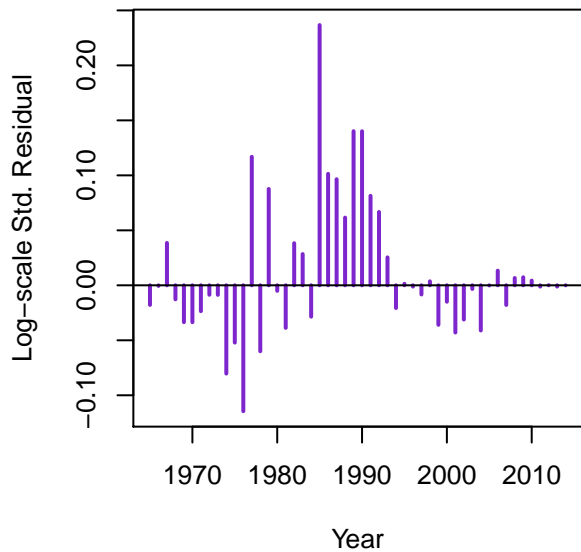
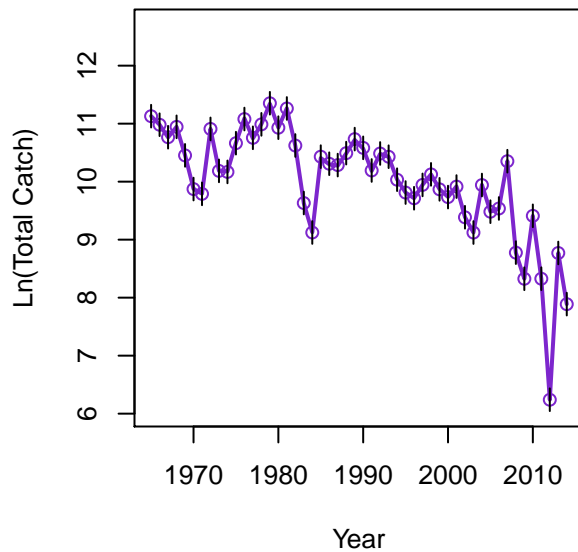
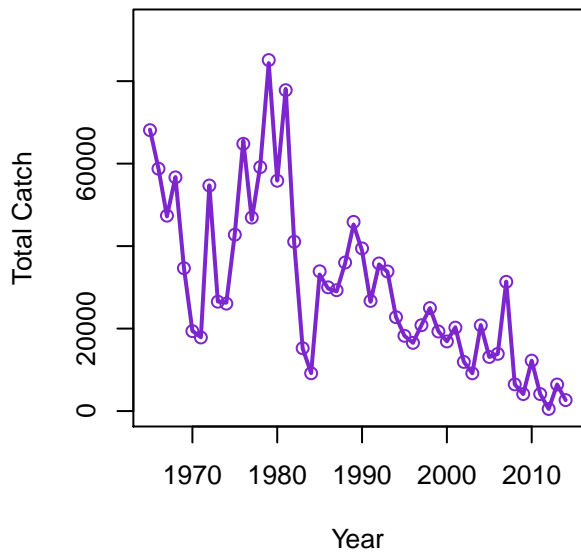


+ catch.tot
△ catch.fleet2
○ catch.fleet1

Fleet 1 Catch (FLEET-1)



Fleet 2 Catch (FLEET-2)

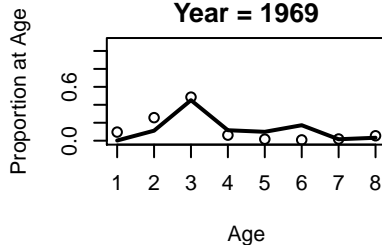


Catch

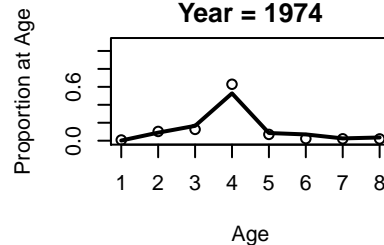
Fleet 1
FLEET-1



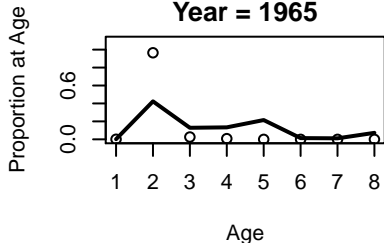
Year = 1969



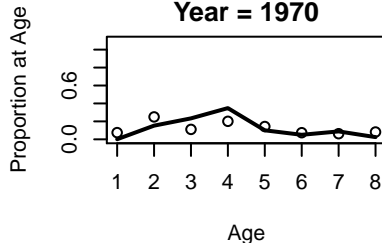
Year = 1974



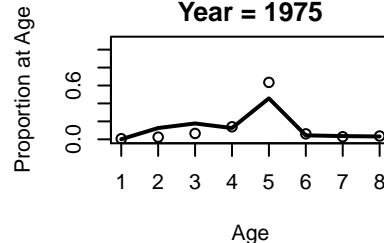
Year = 1965



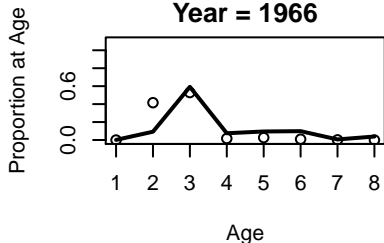
Year = 1970



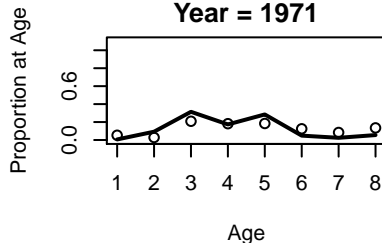
Year = 1975



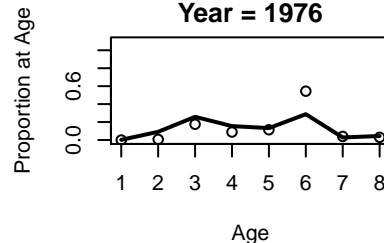
Year = 1966



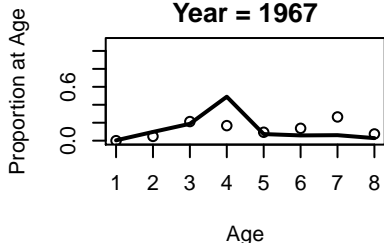
Year = 1971



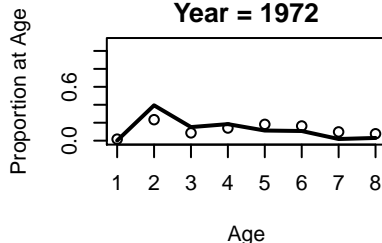
Year = 1976



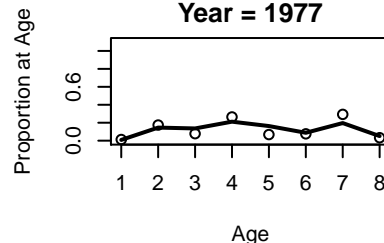
Year = 1967



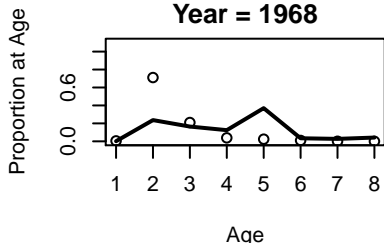
Year = 1972



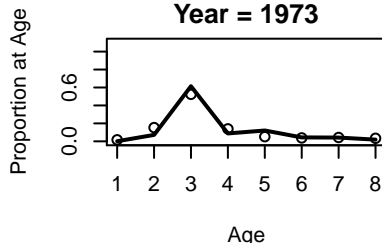
Year = 1977



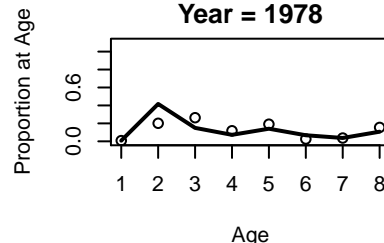
Year = 1968



Year = 1973

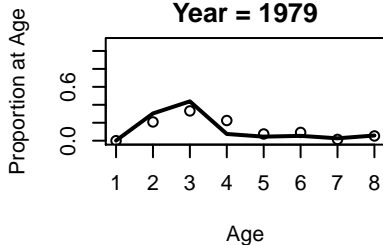


Year = 1978

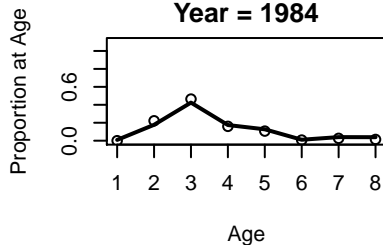


Catch

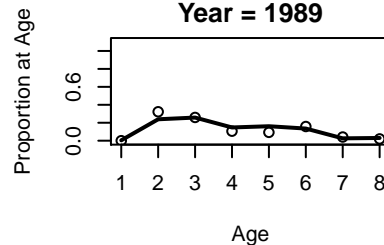
Year = 1979



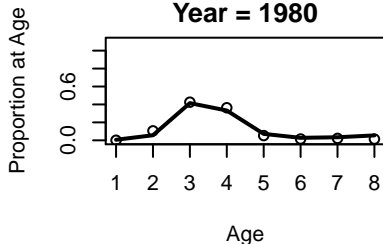
Year = 1984



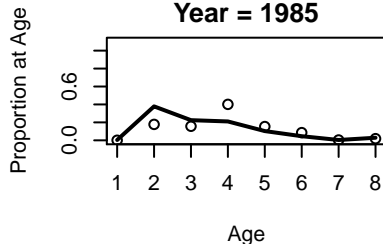
Year = 1989



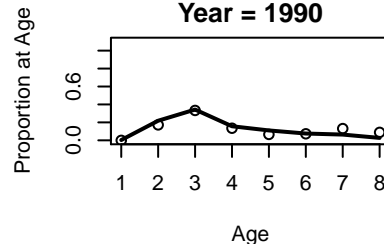
Year = 1980



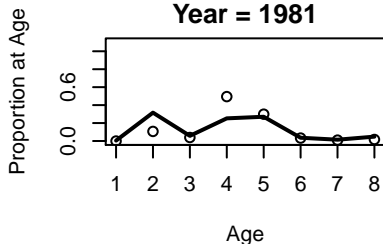
Year = 1985



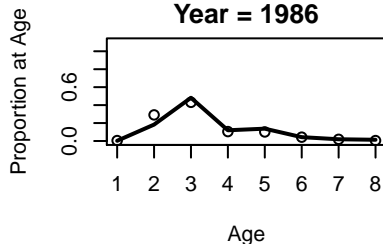
Year = 1990



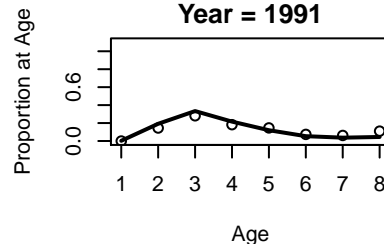
Year = 1981



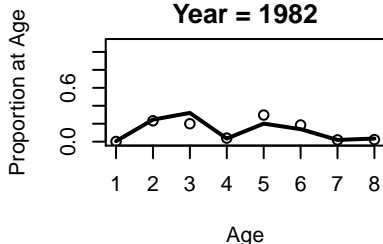
Year = 1986



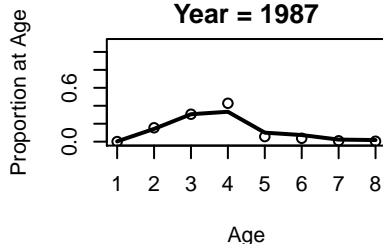
Year = 1991



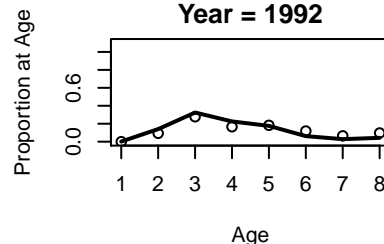
Year = 1982



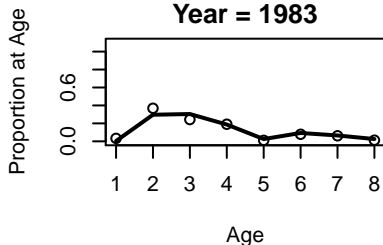
Year = 1987



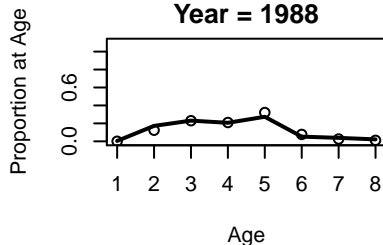
Year = 1992



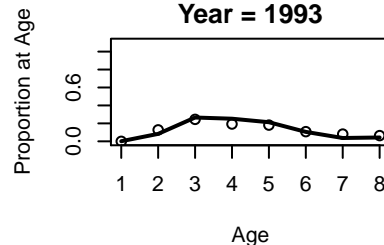
Year = 1983



Year = 1988

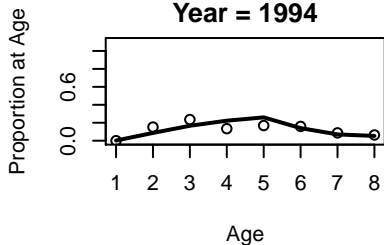


Year = 1993

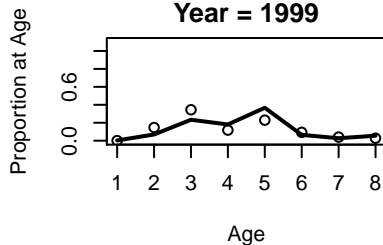


Catch

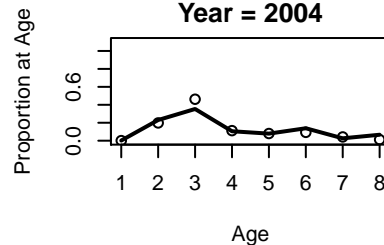
Year = 1994



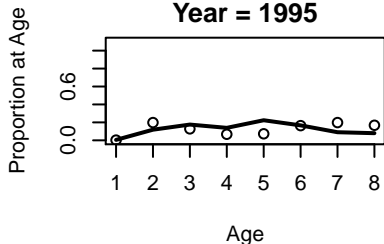
Year = 1999



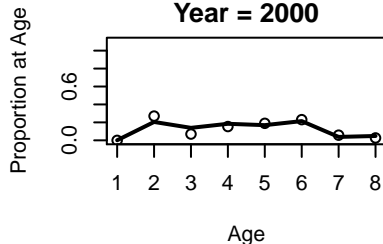
Year = 2004



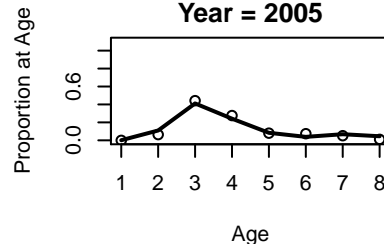
Year = 1995



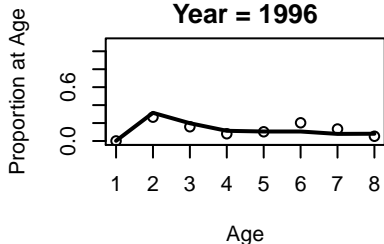
Year = 2000



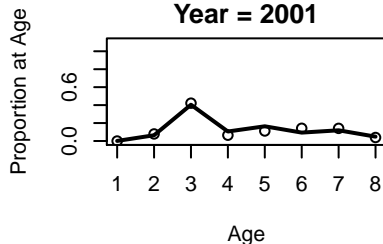
Year = 2005



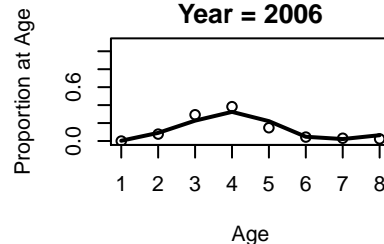
Year = 1996



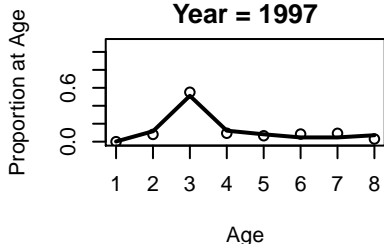
Year = 2001



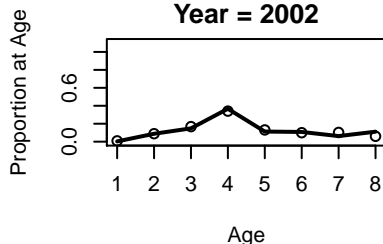
Year = 2006



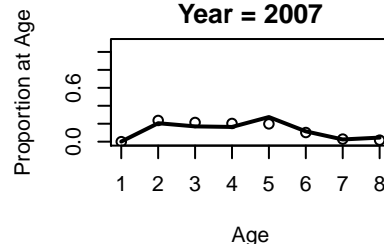
Year = 1997



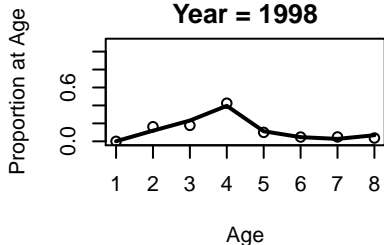
Year = 2002



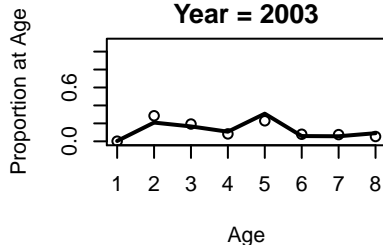
Year = 2007



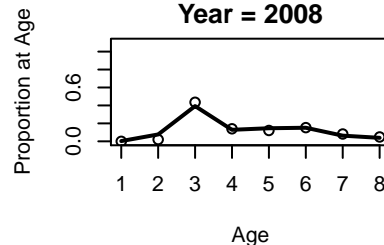
Year = 1998

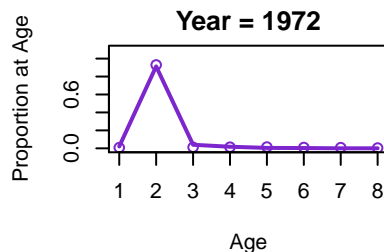
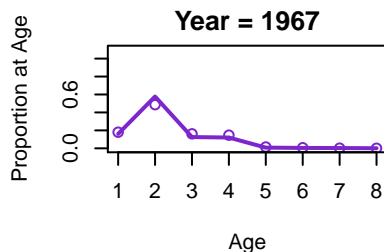
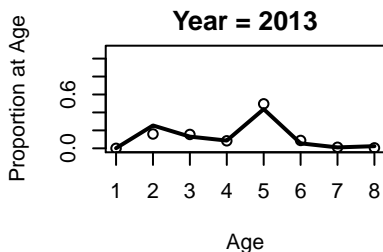
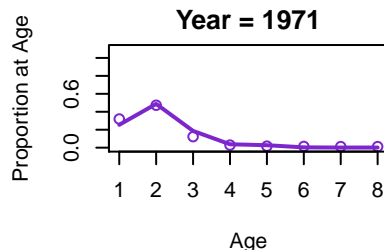
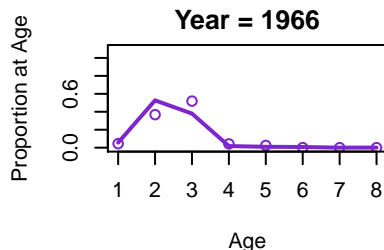
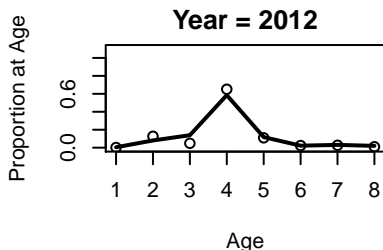
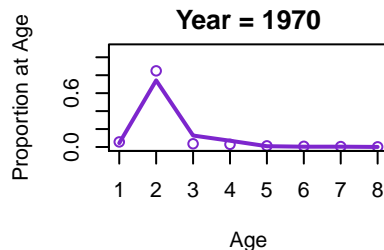
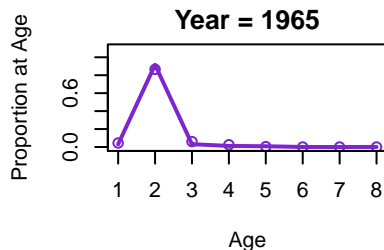
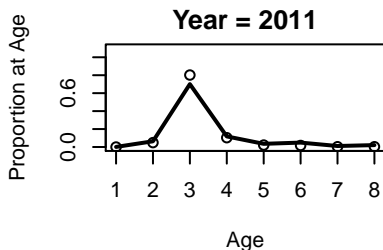
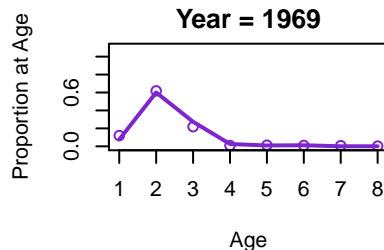
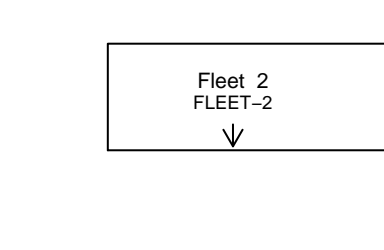
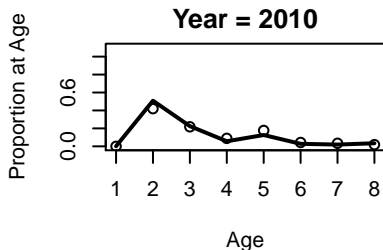
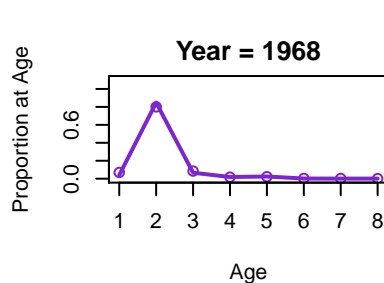
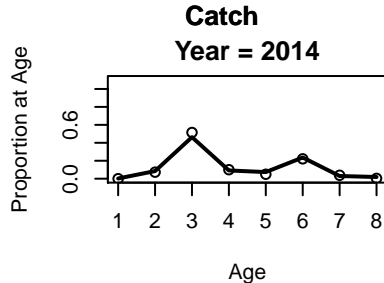
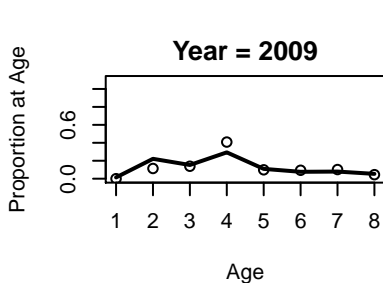


Year = 2003

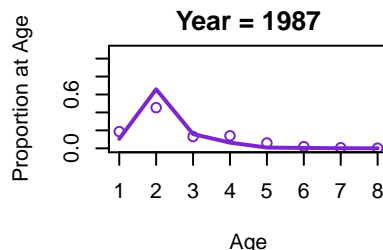
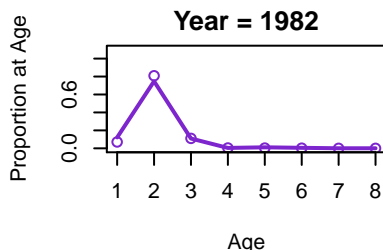
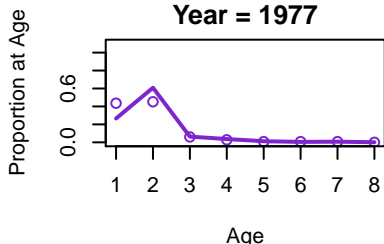
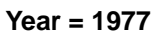
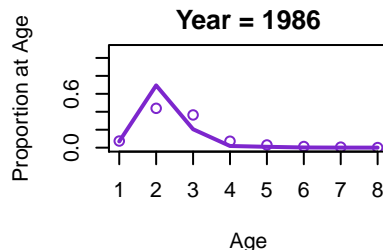
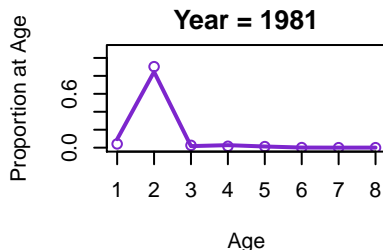
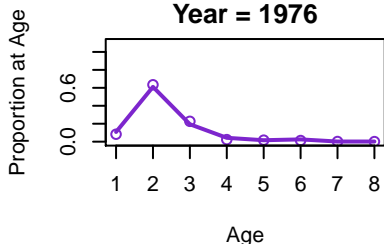
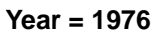
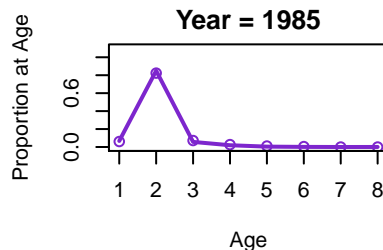
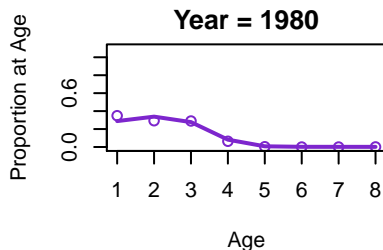
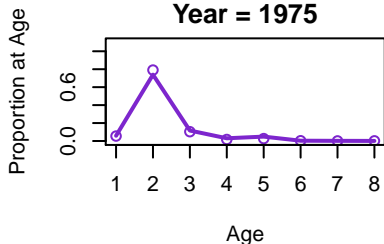
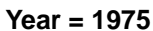
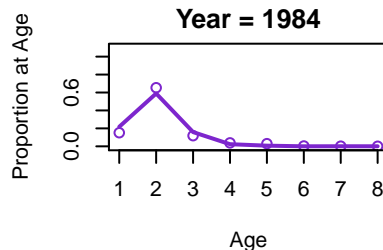
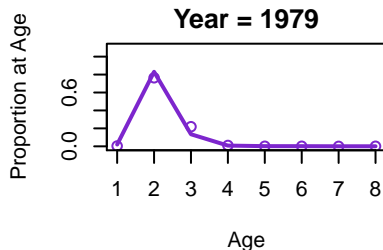
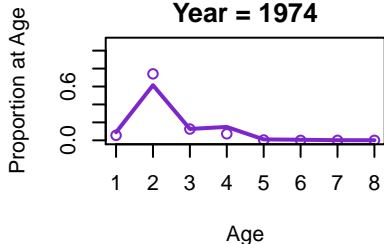
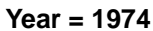
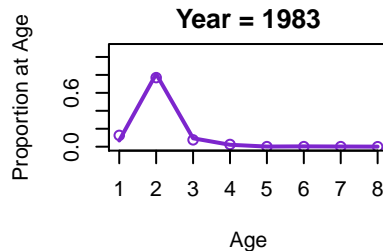
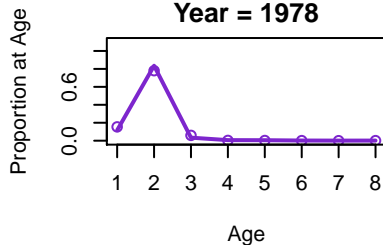
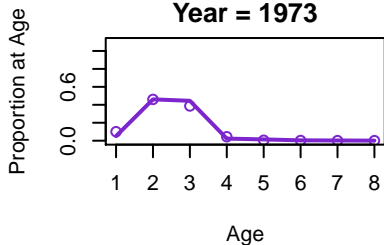
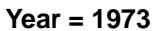


Year = 2008



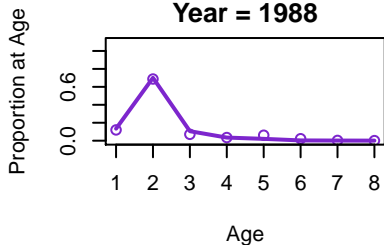


Year = 1978

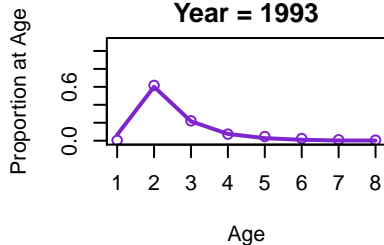


Catch

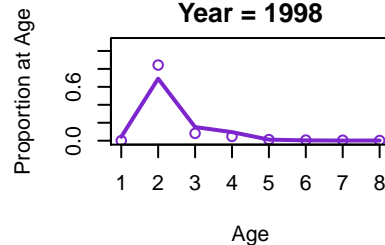
Year = 1988



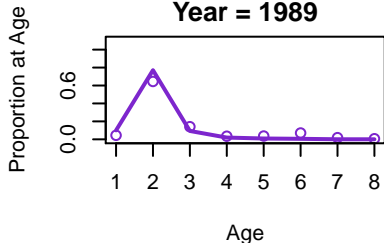
Year = 1993



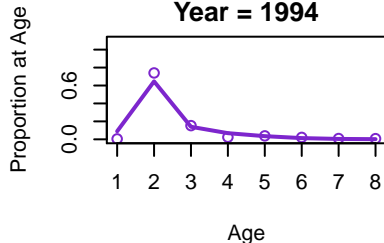
Year = 1998



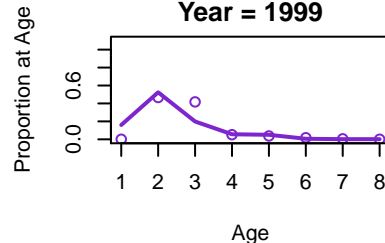
Year = 1989



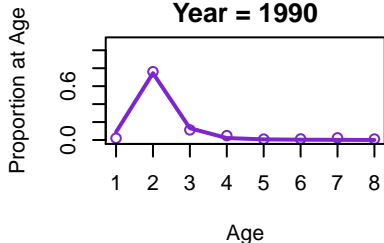
Year = 1994



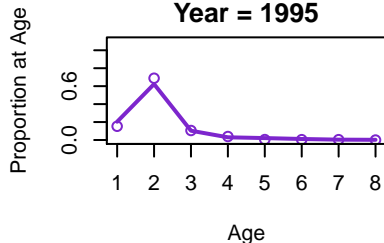
Year = 1999



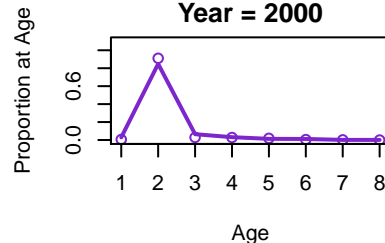
Year = 1990



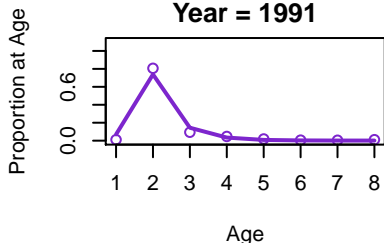
Year = 1995



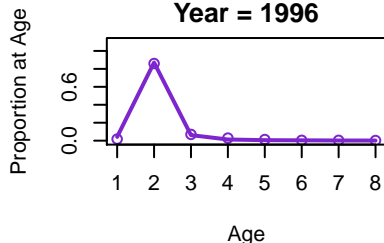
Year = 2000



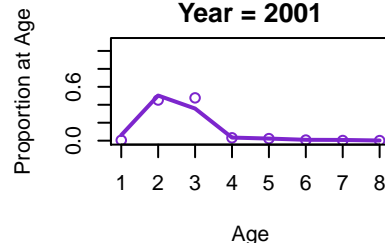
Year = 1991



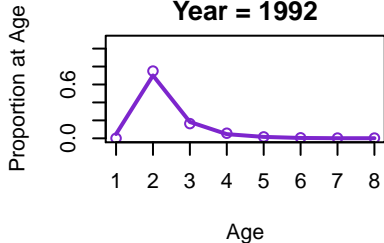
Year = 1996



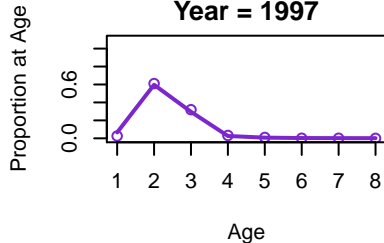
Year = 2001



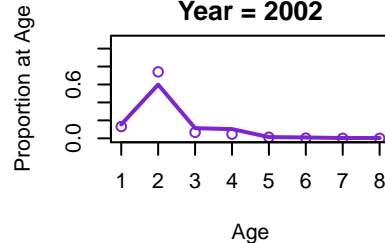
Year = 1992



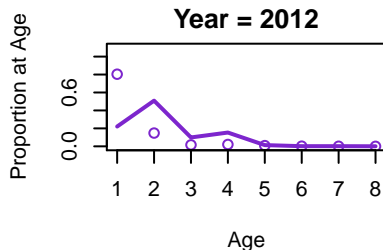
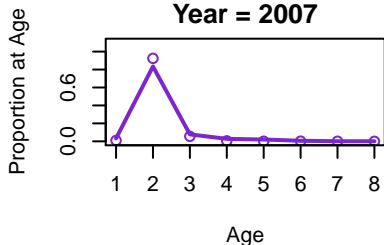
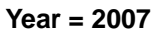
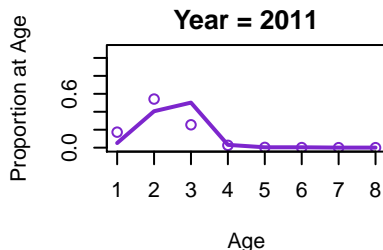
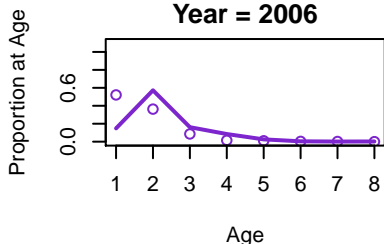
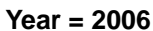
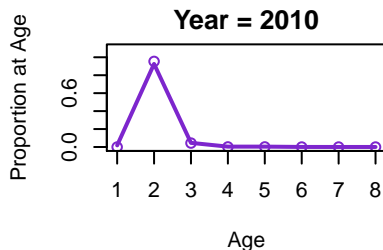
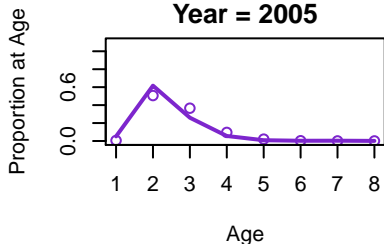
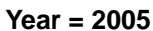
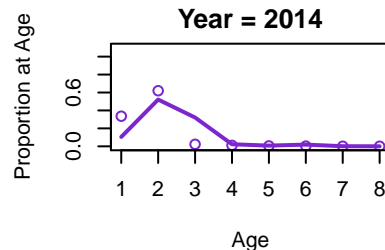
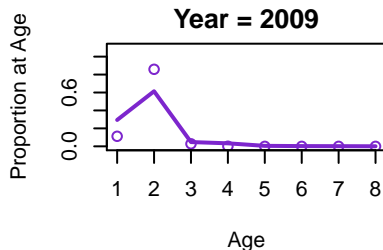
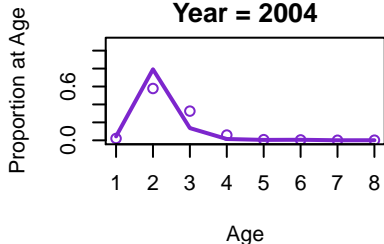
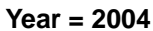
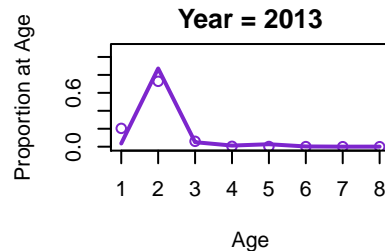
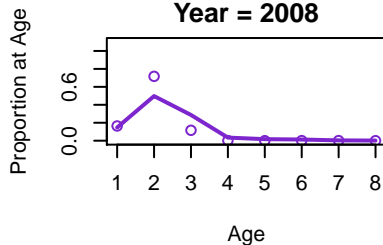
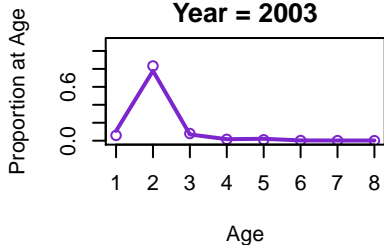
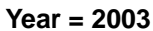
Year = 1997



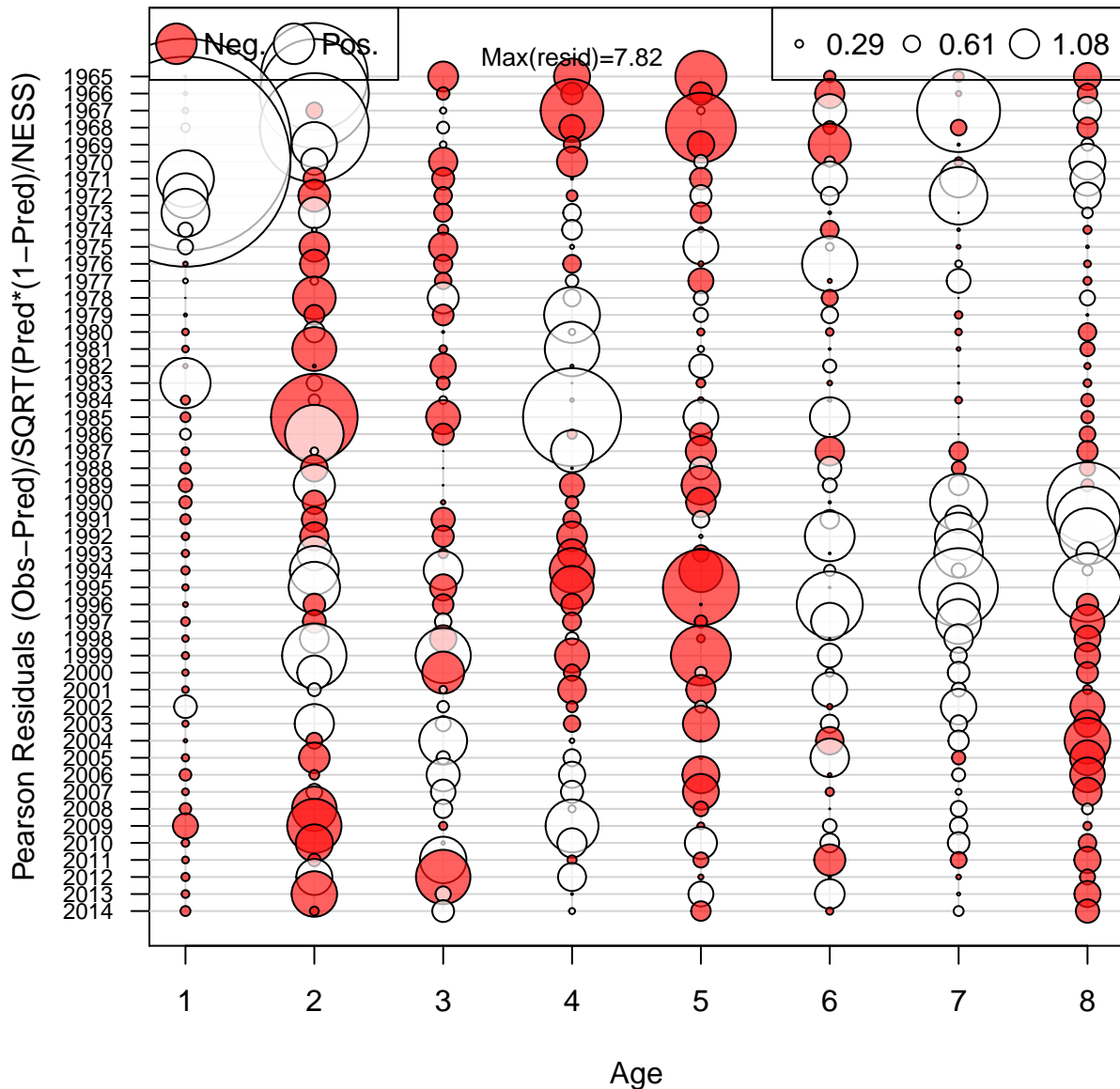
Year = 2002



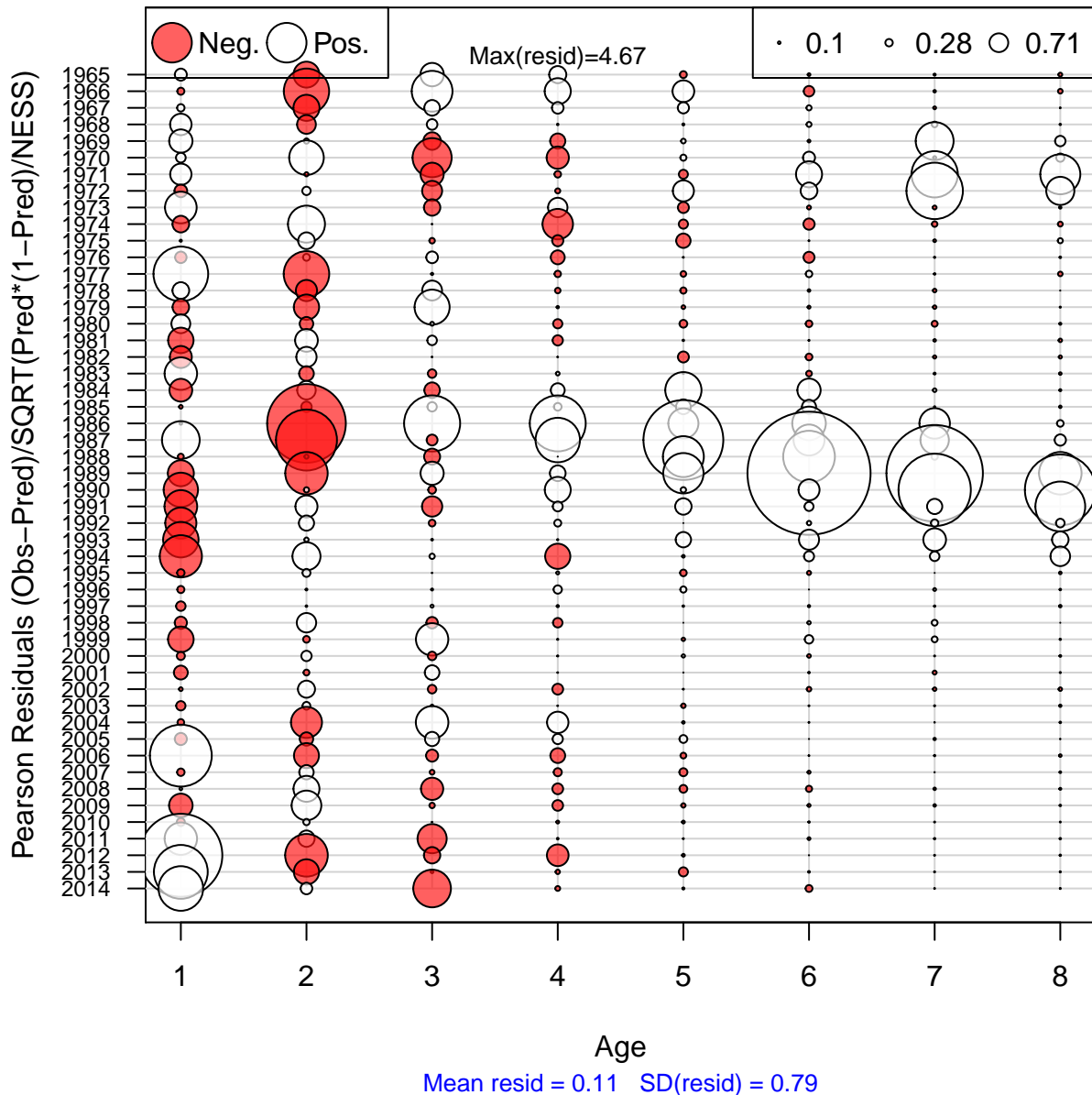
Year = 2008



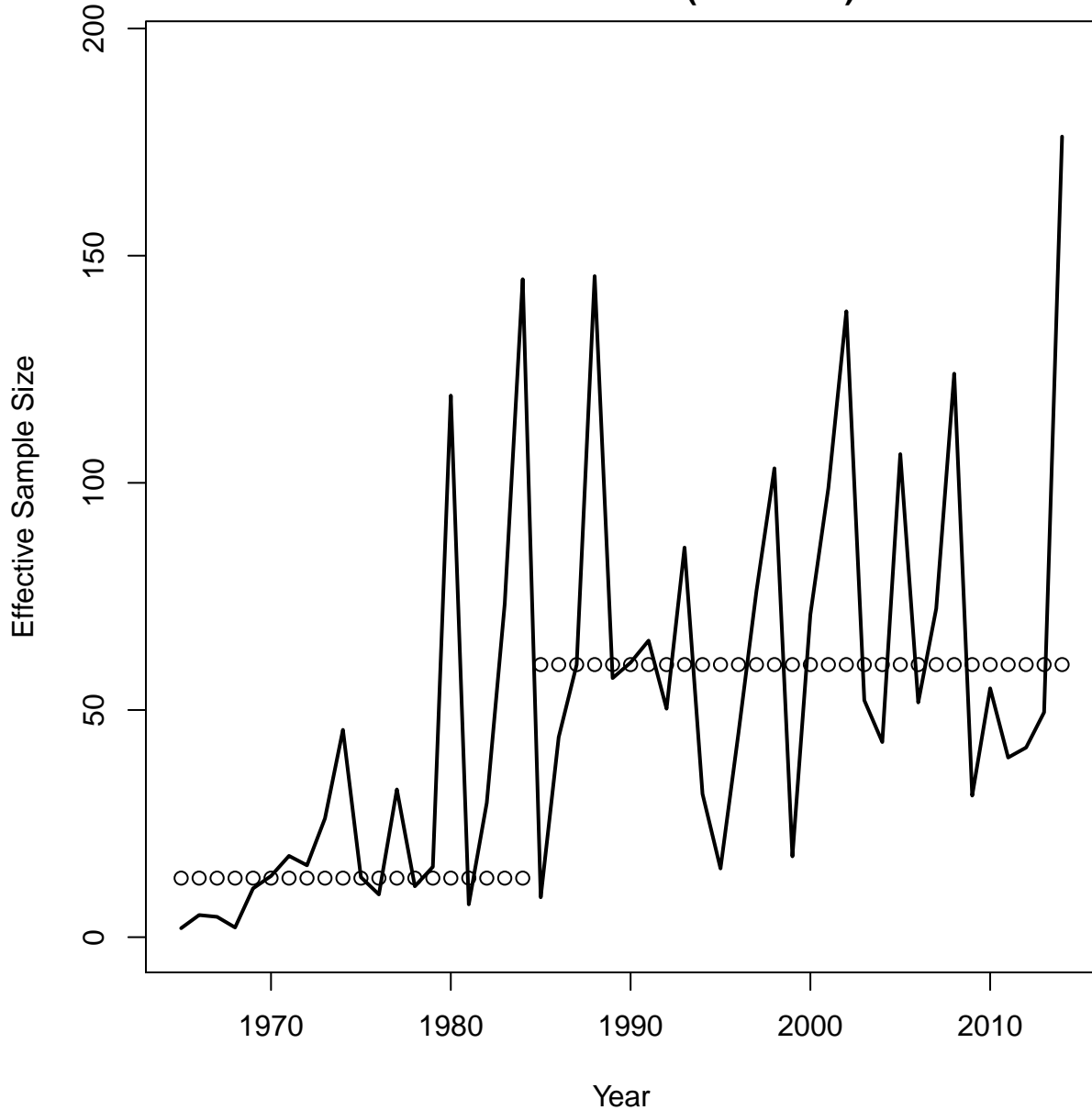
Age Comp Residuals for Catch by Fleet 1 (FLEET-1)



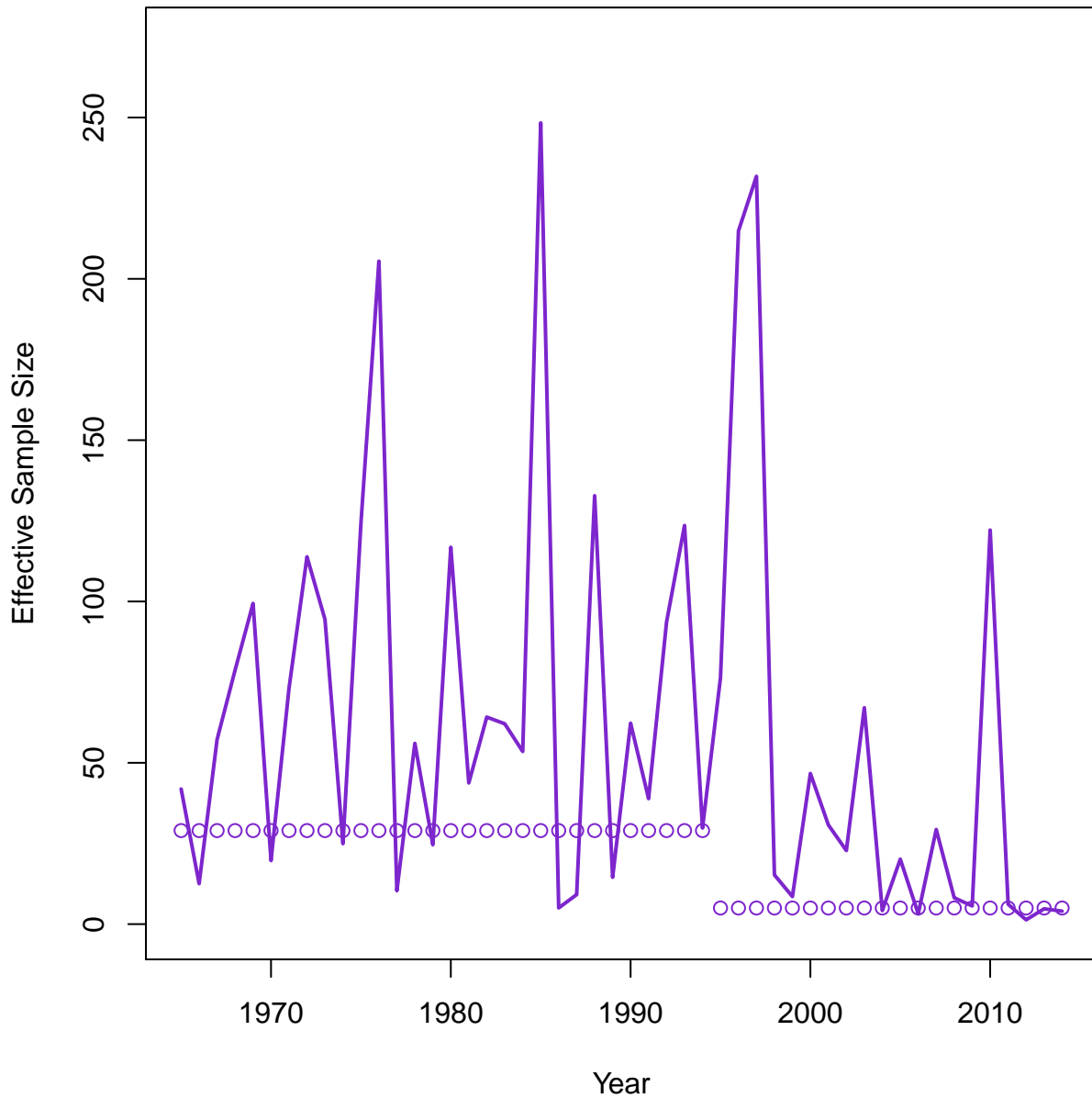
Age Comp Residuals for Catch by Fleet 2 (FLEET-2)



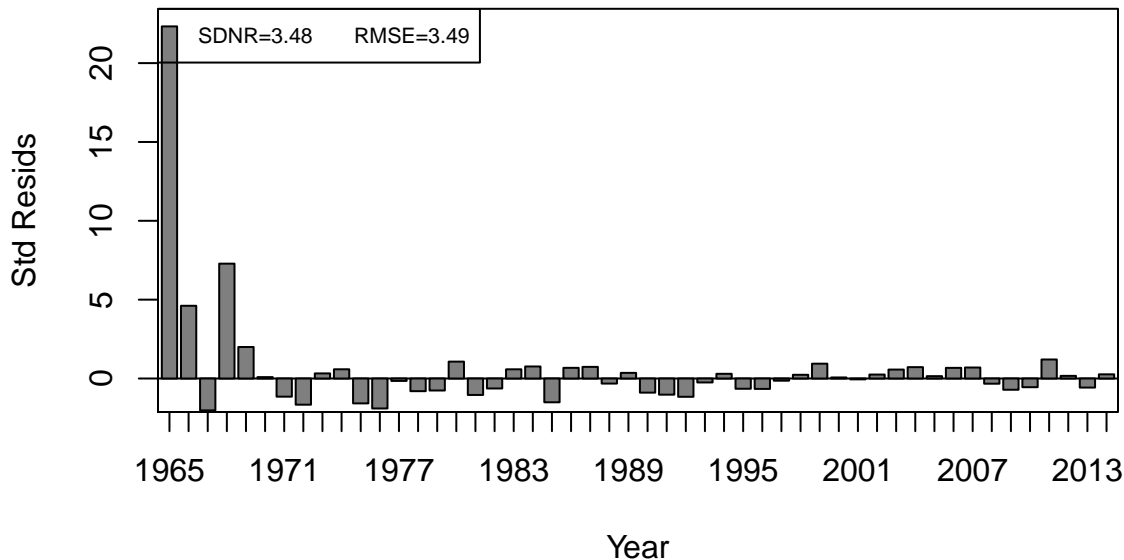
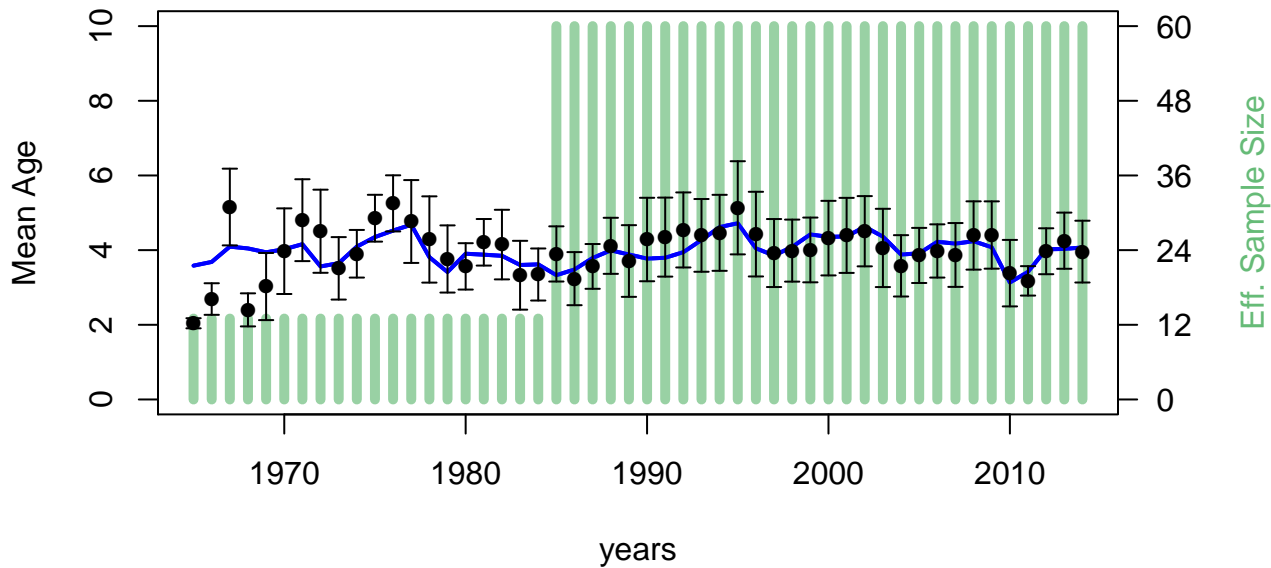
Catch Neff Fleet 1 (FLEET-1)



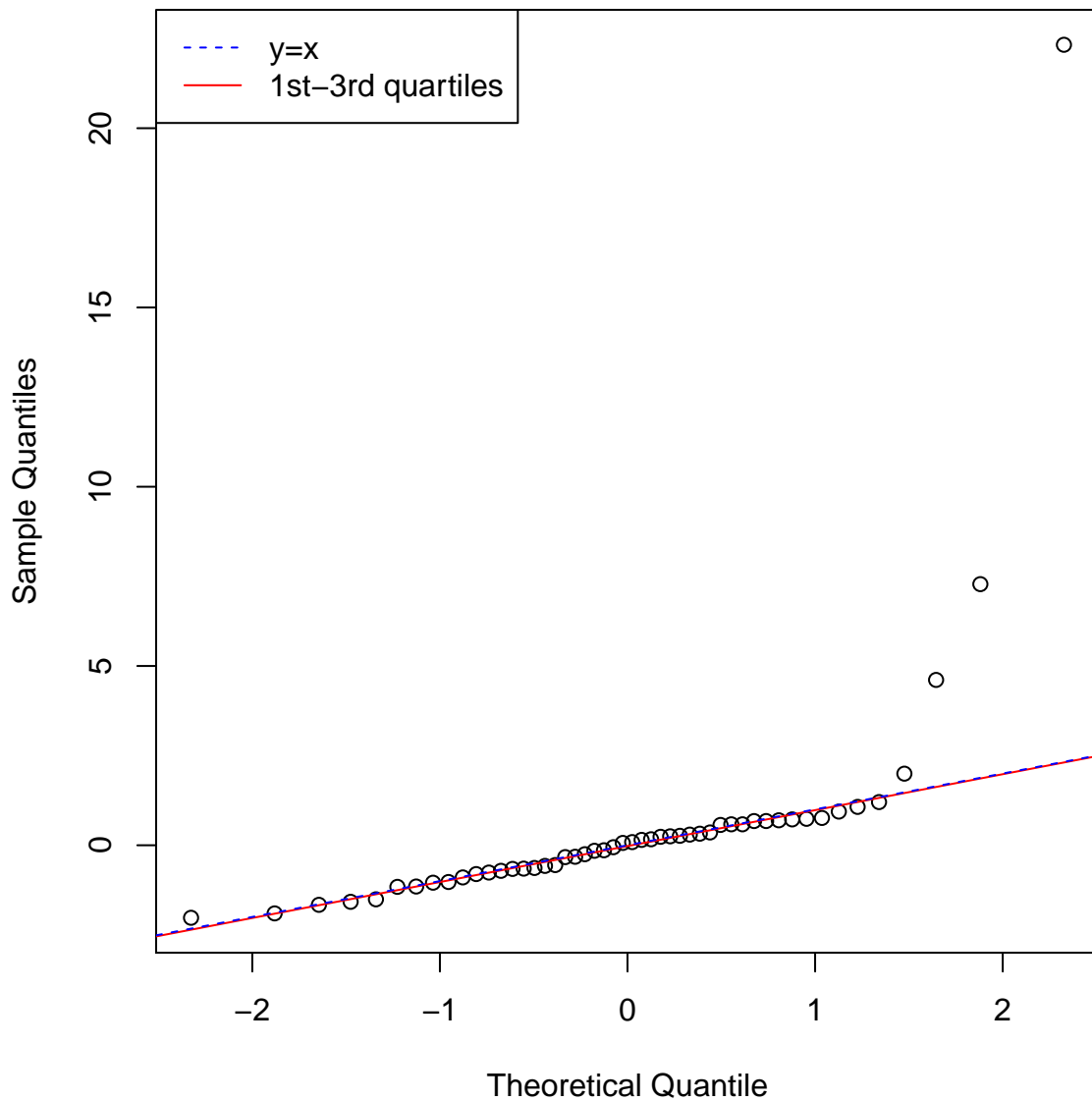
Catch Neff Fleet 2 (FLEET-2)



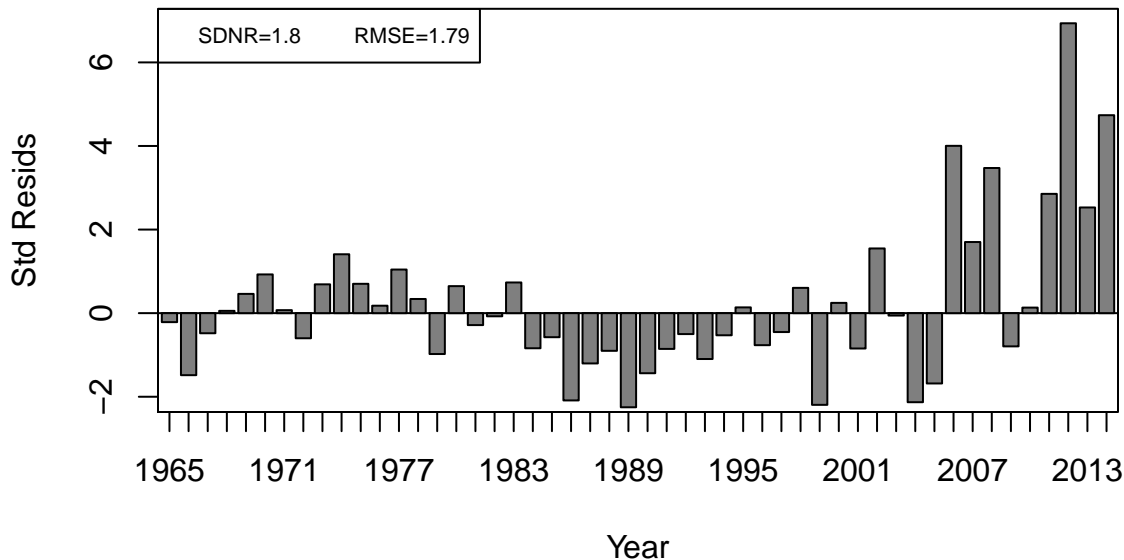
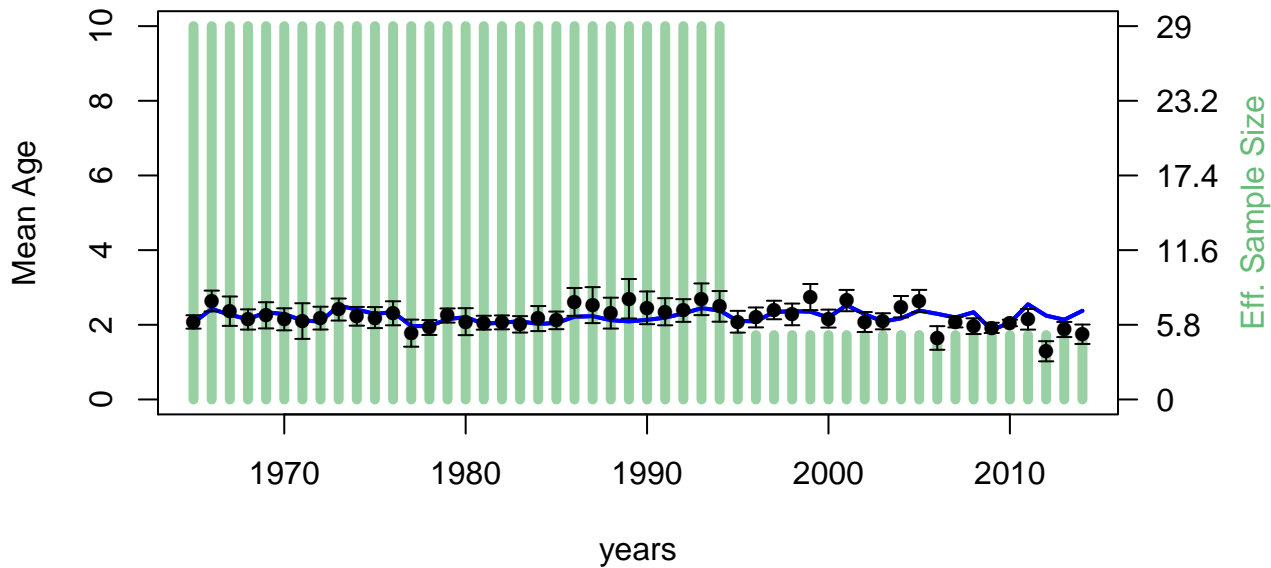
Catch Fleet 1 (FLEET-1)



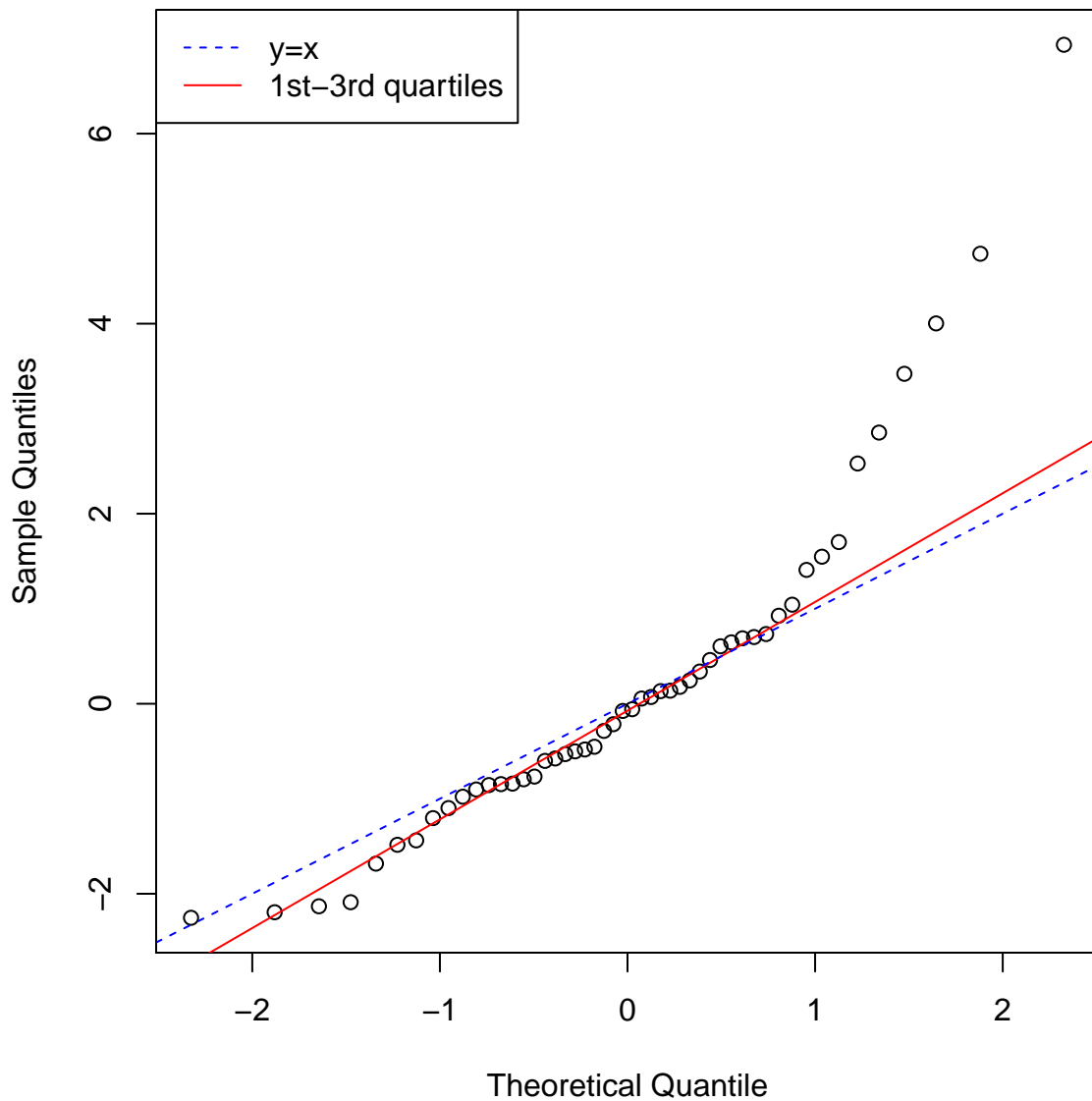
Catch Fleet 1 (FLEET-1)



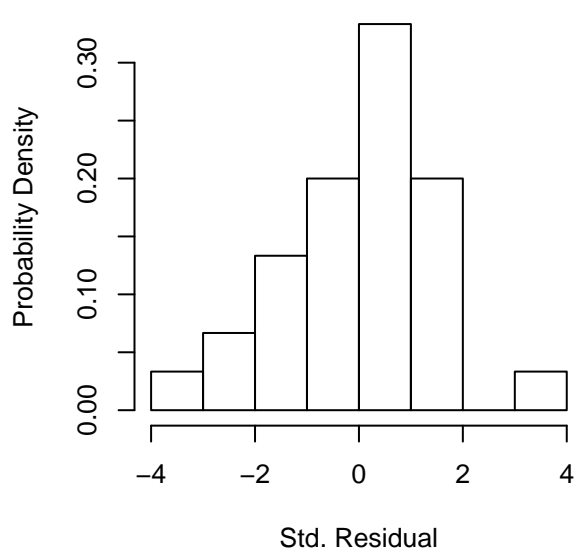
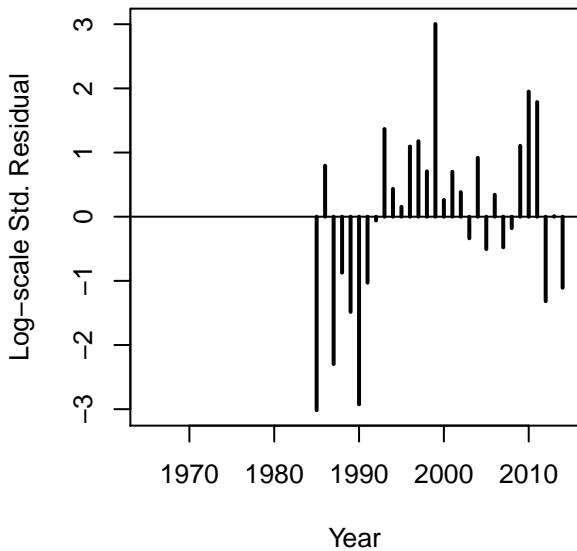
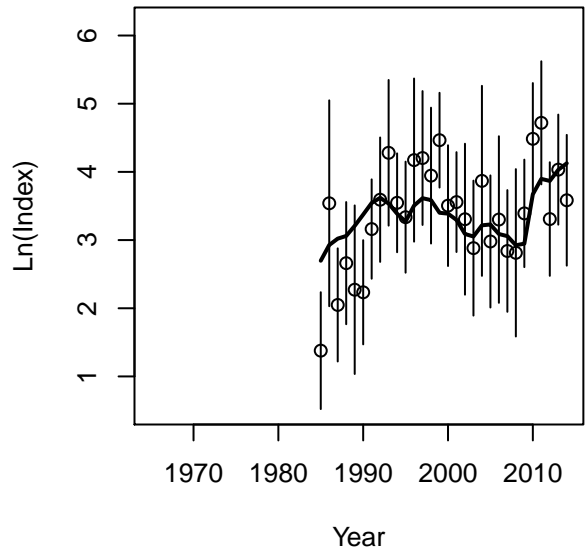
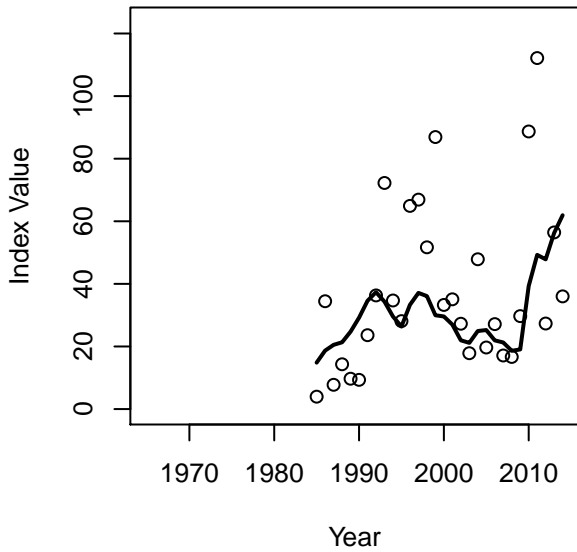
Catch Fleet 2 (FLEET-2)



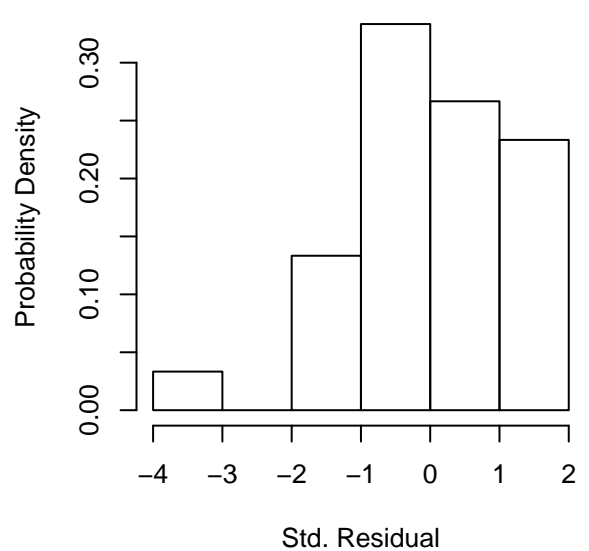
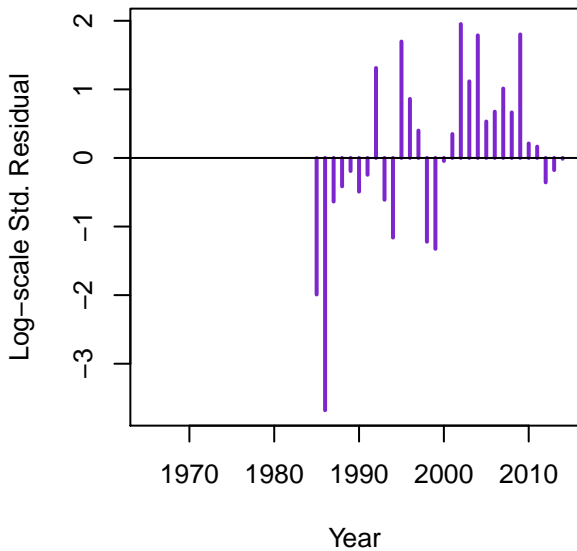
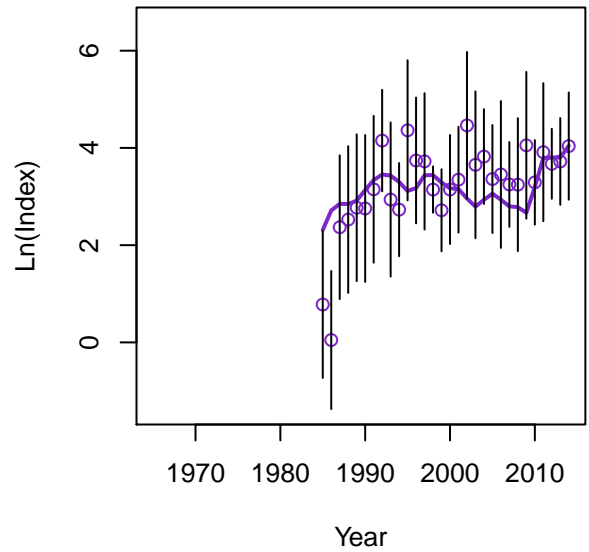
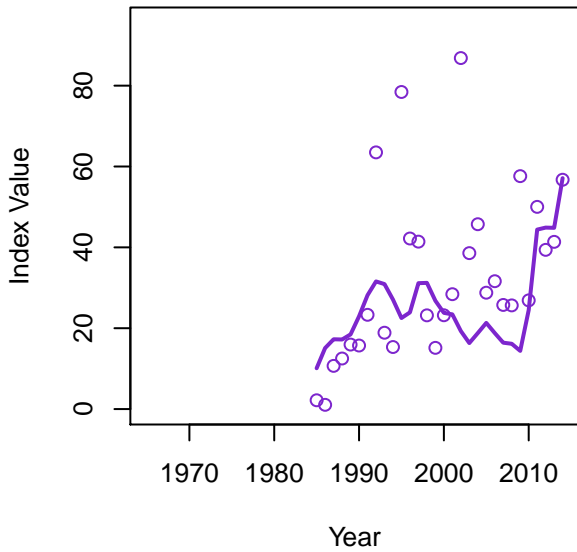
Catch Fleet 2 (FLEET-2)



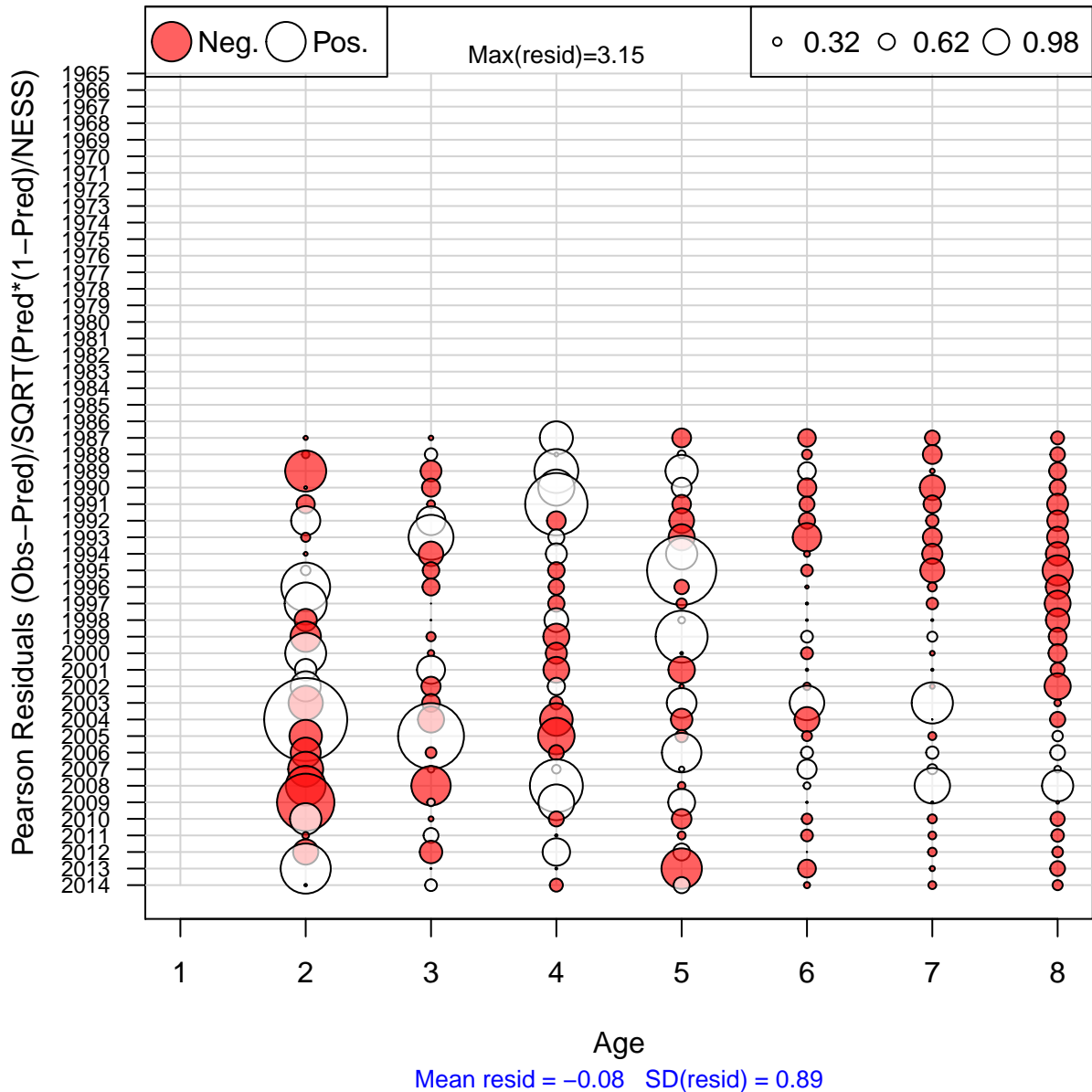
Index 1 (INDEX-1)



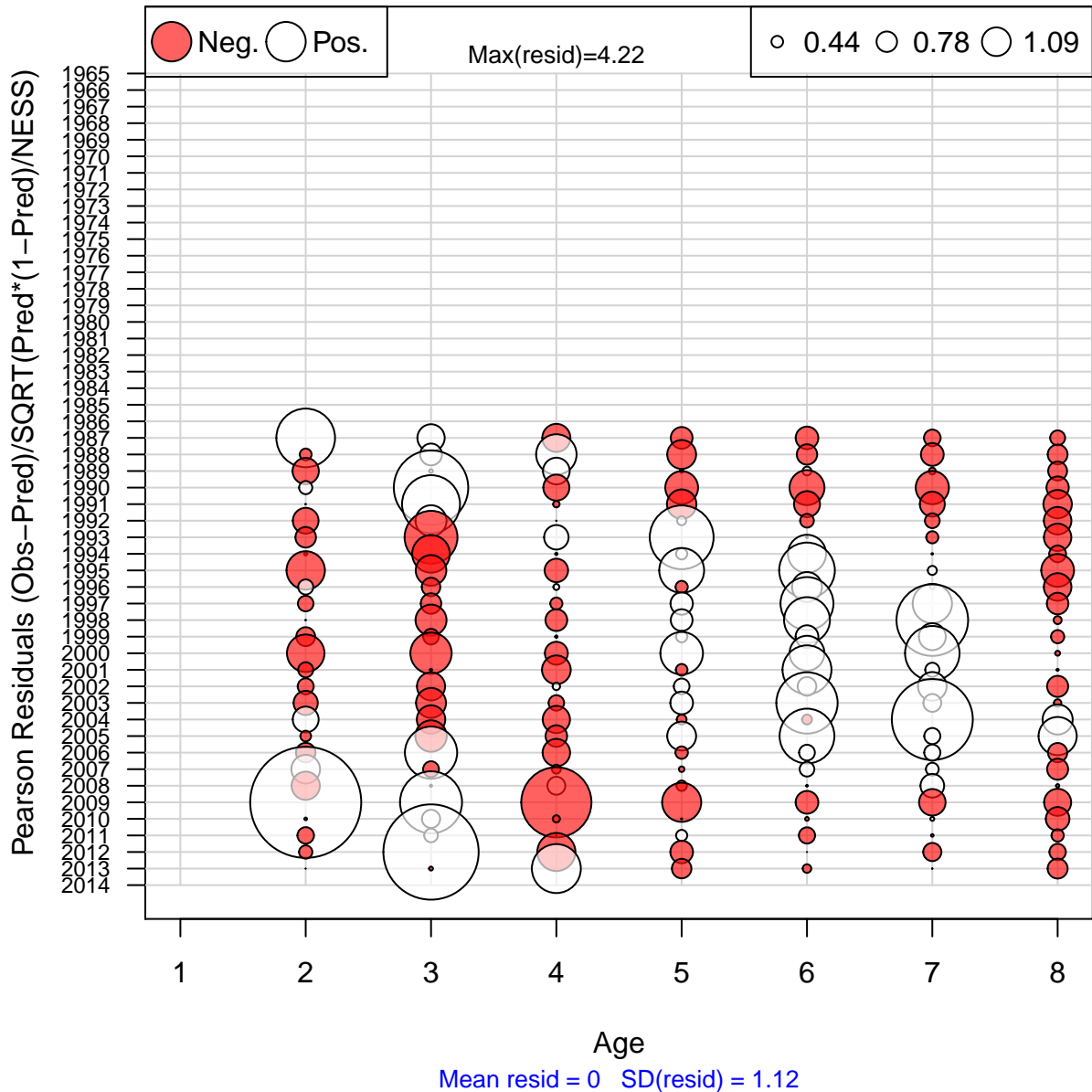
Index 2 (INDEX-2)



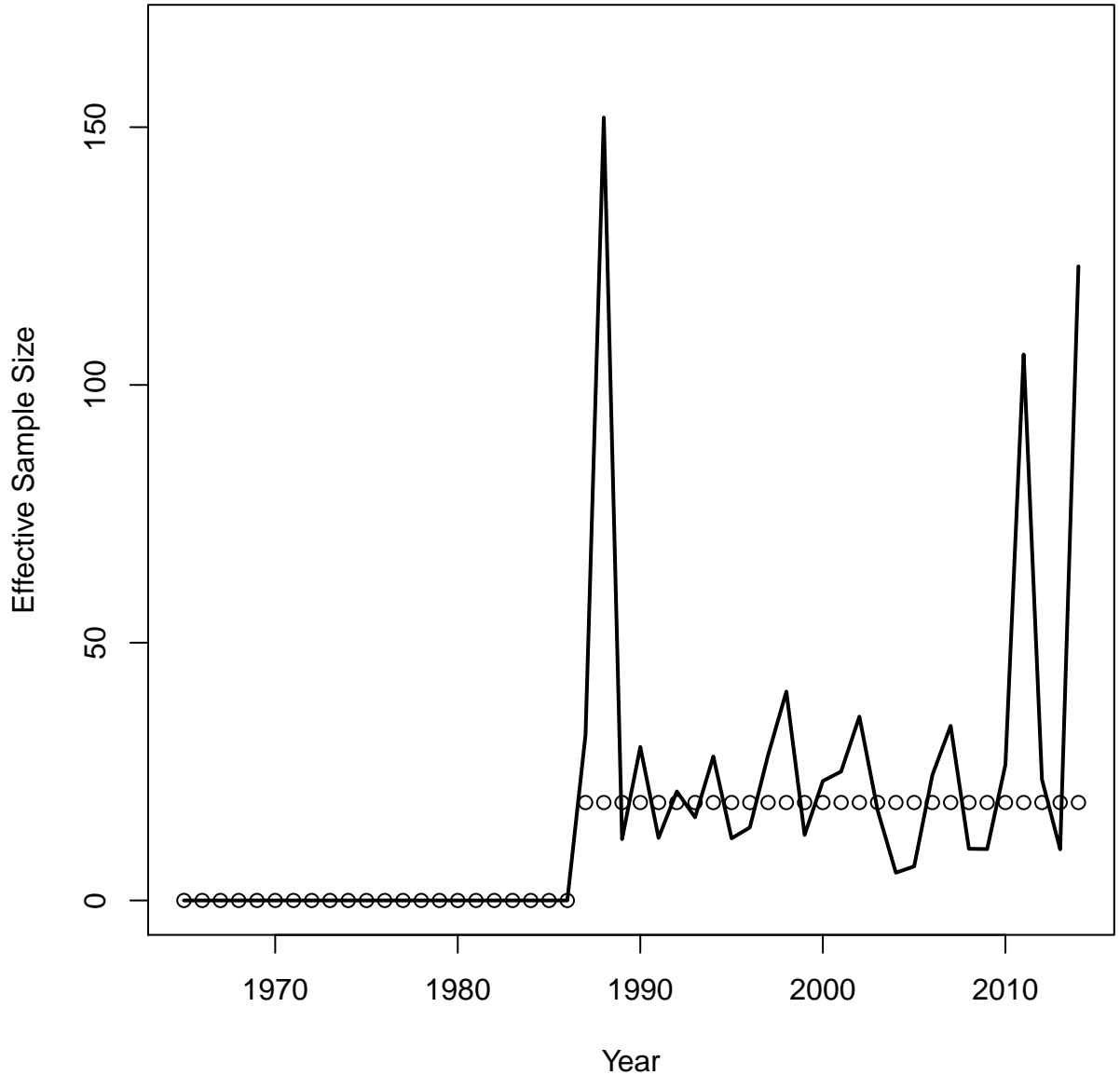
Age Comp Residuals for Index 1 (INDEX-1)



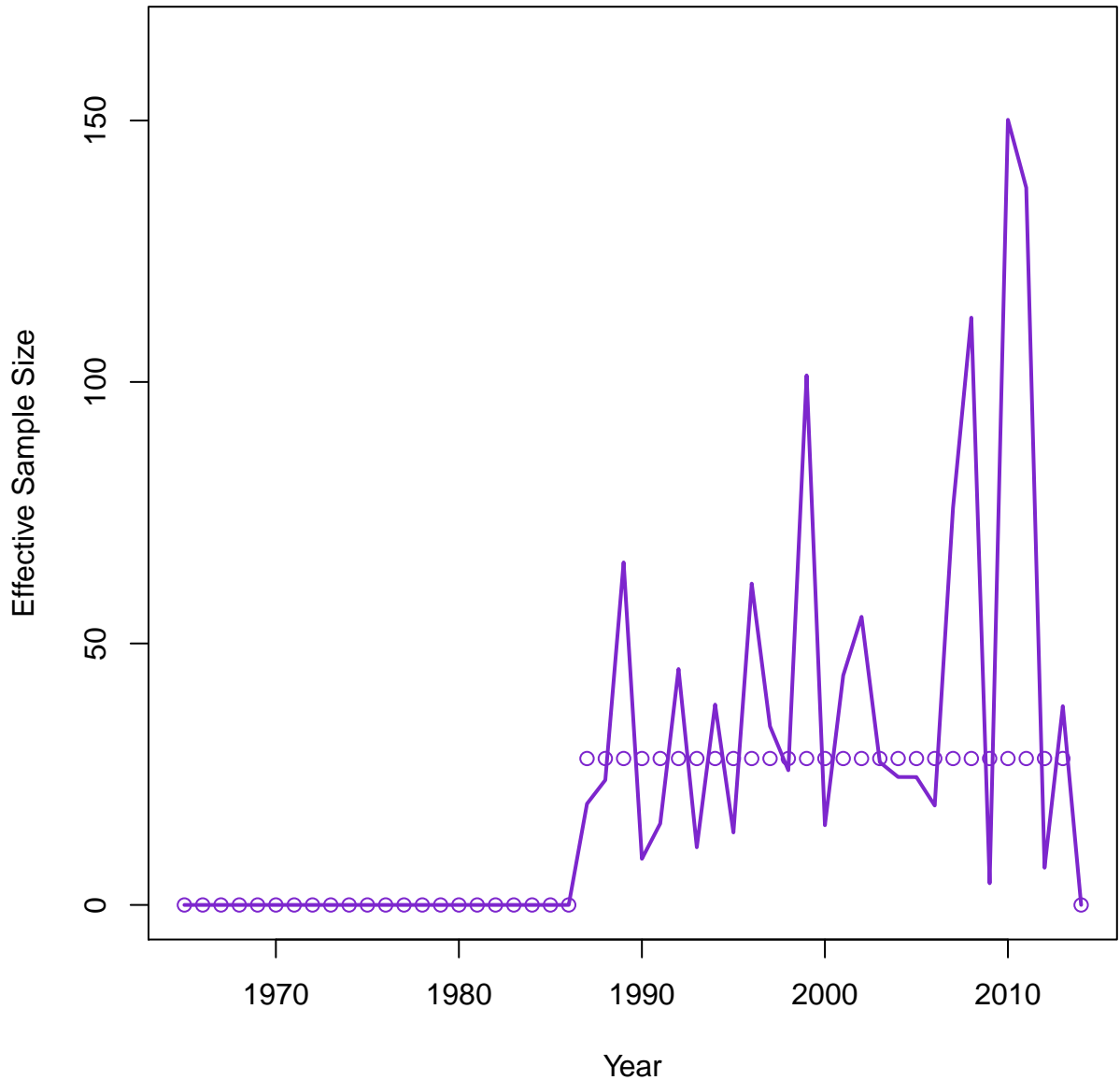
Age Comp Residuals for Index 2 (INDEX-2)



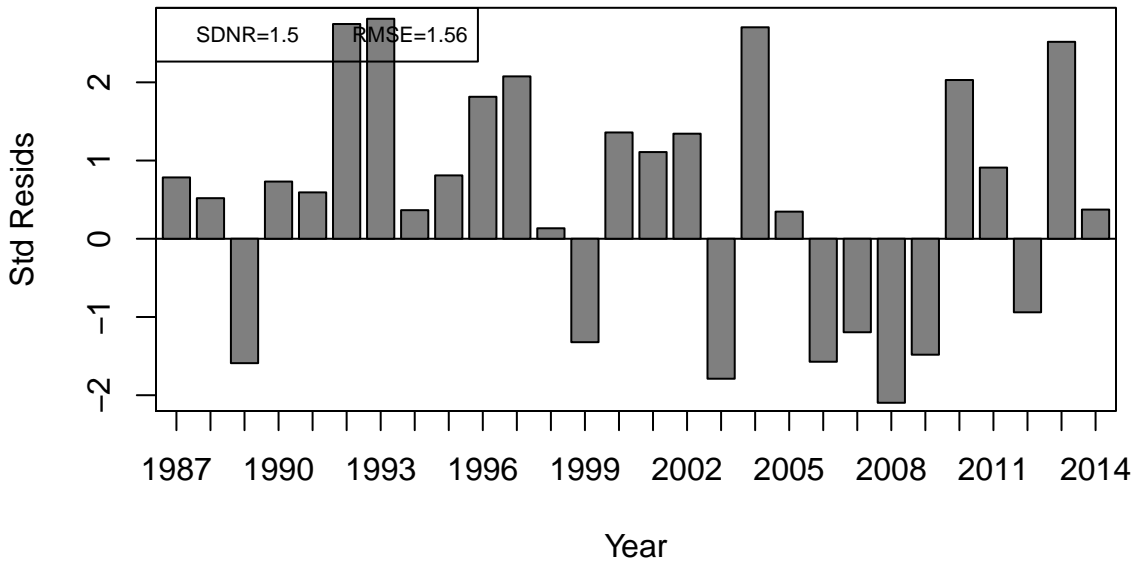
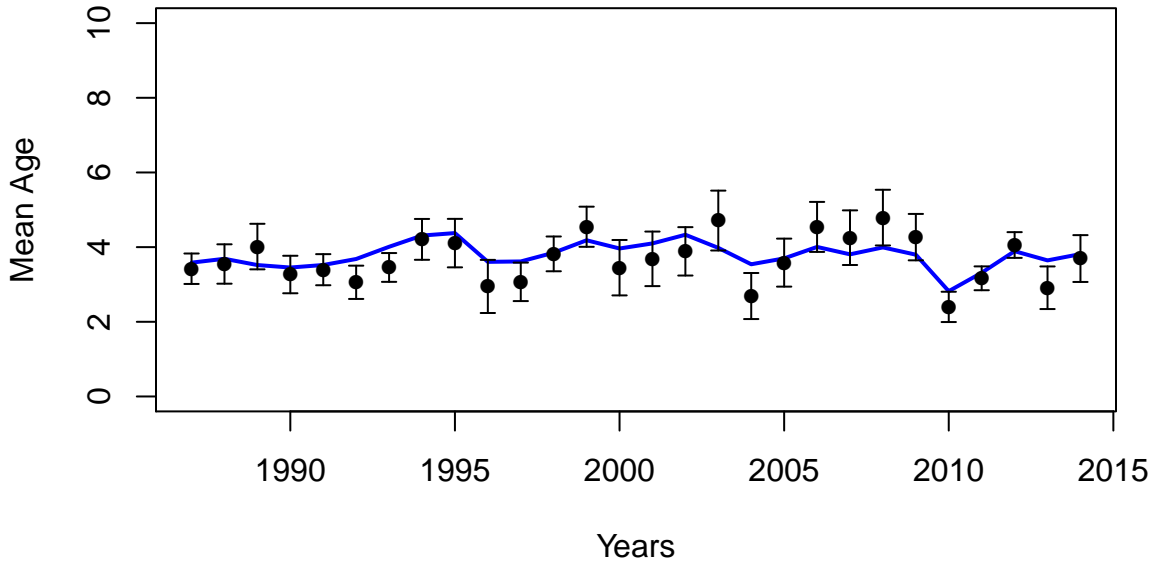
Index Neff 1 (INDEX-1)



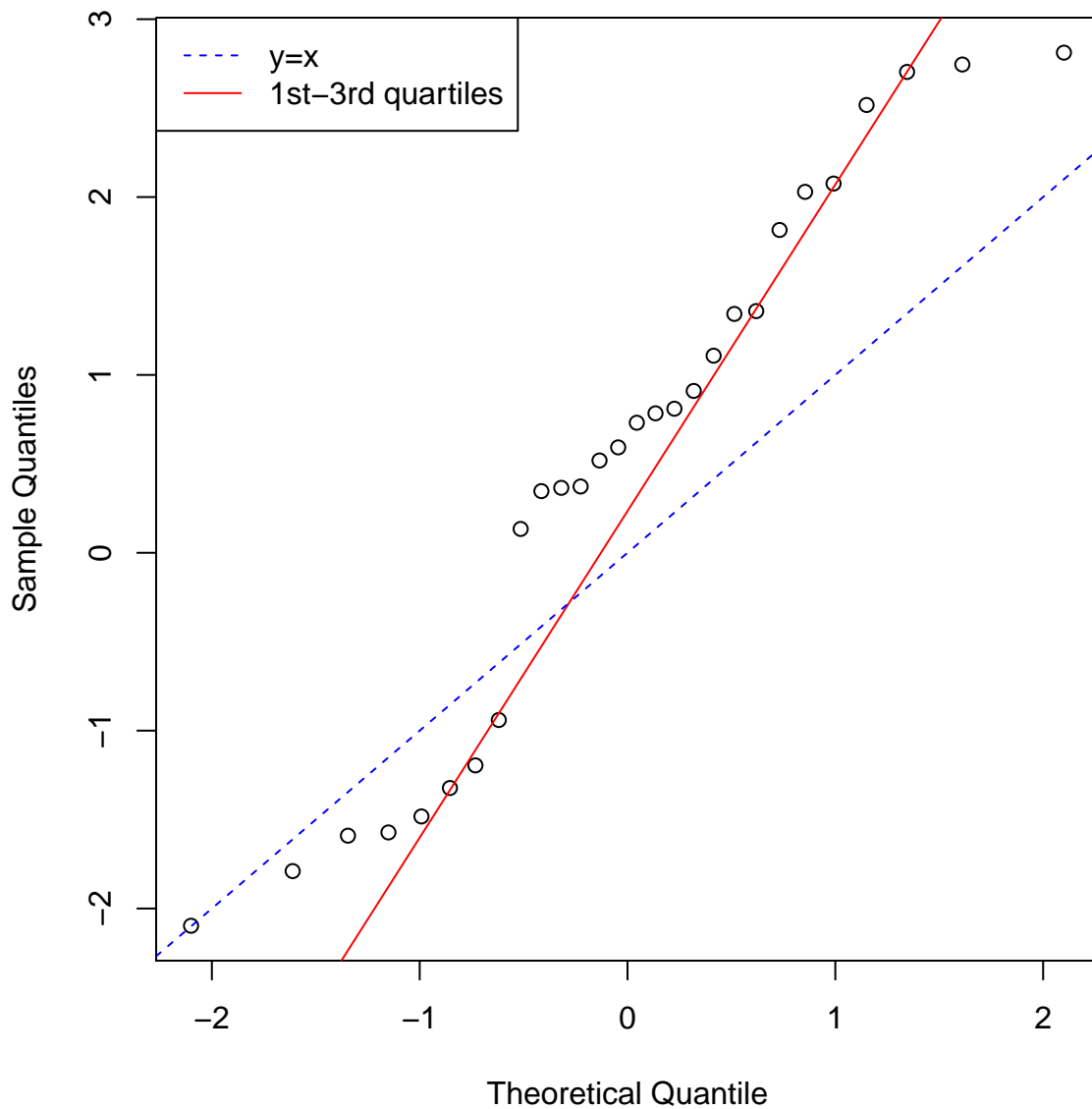
Index Neff 2 (INDEX-2)



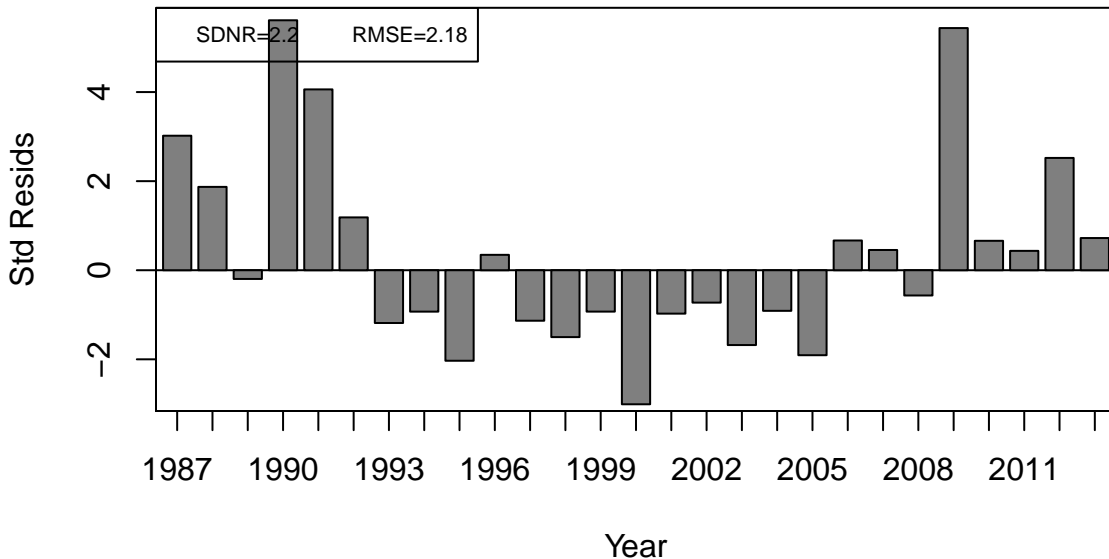
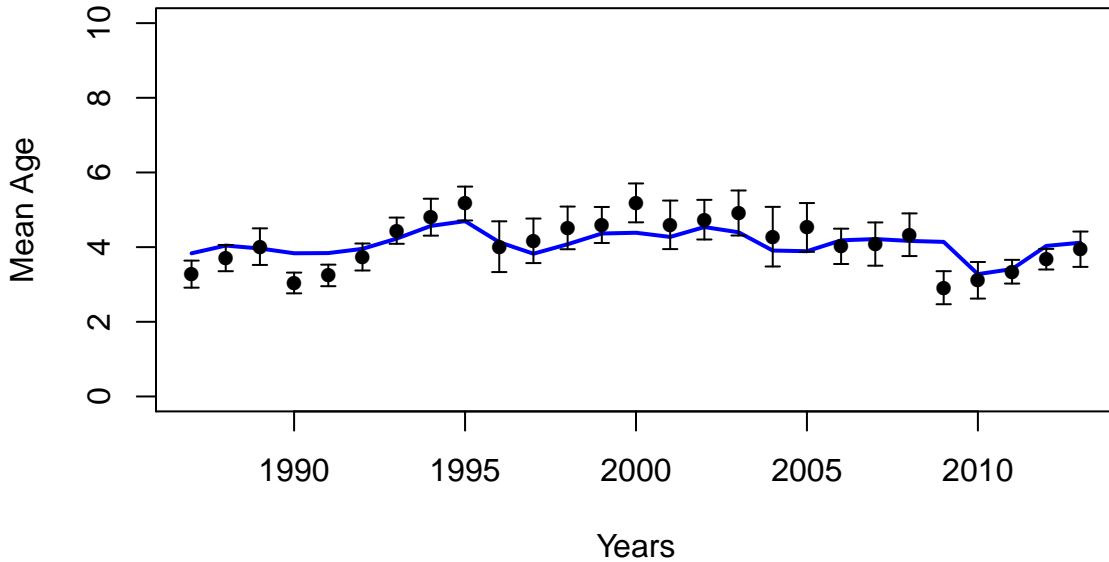
Index 1 (INDEX-1) ESS = 19



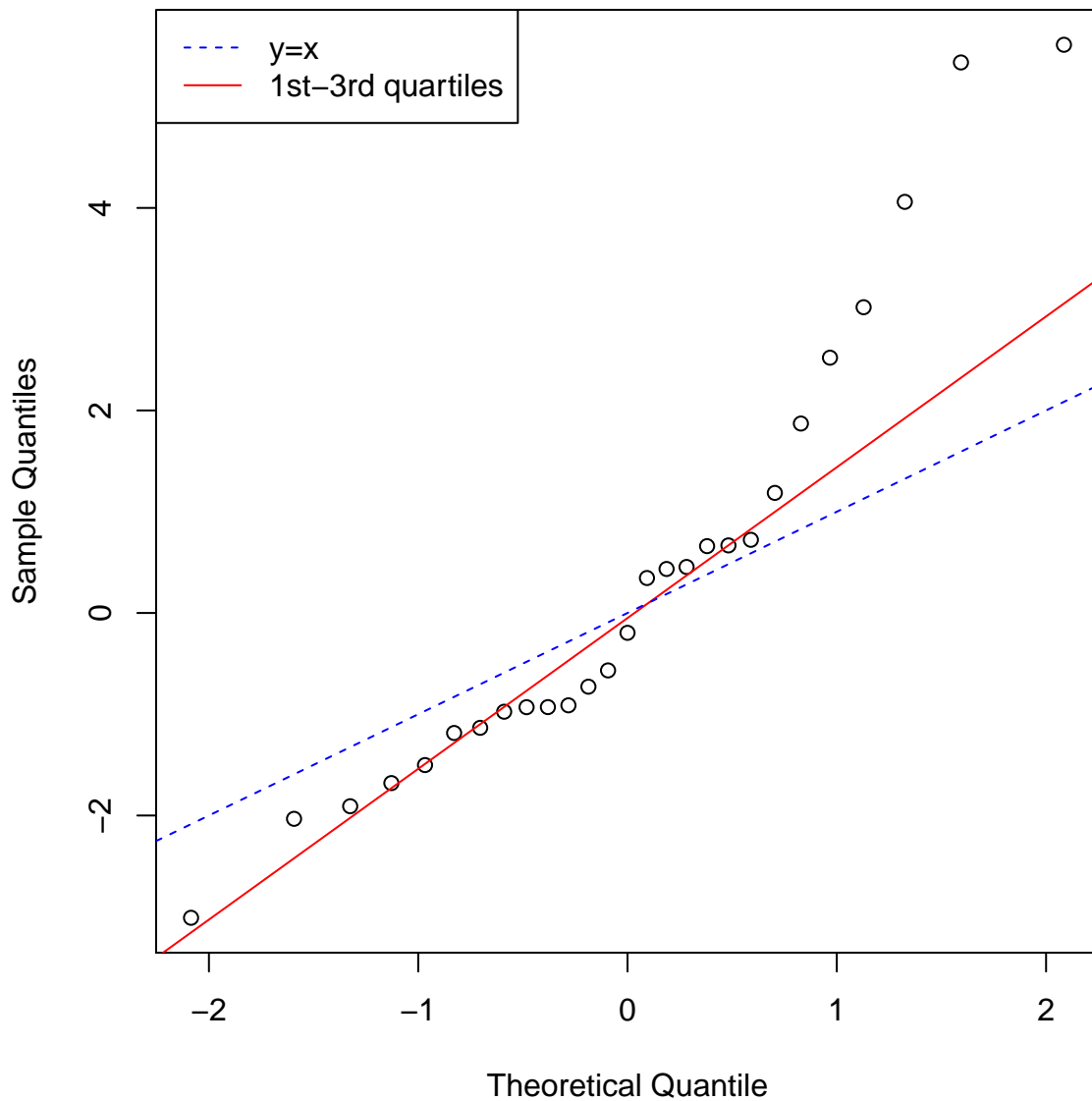
Index 1 (INDEX-1) ESS = 19



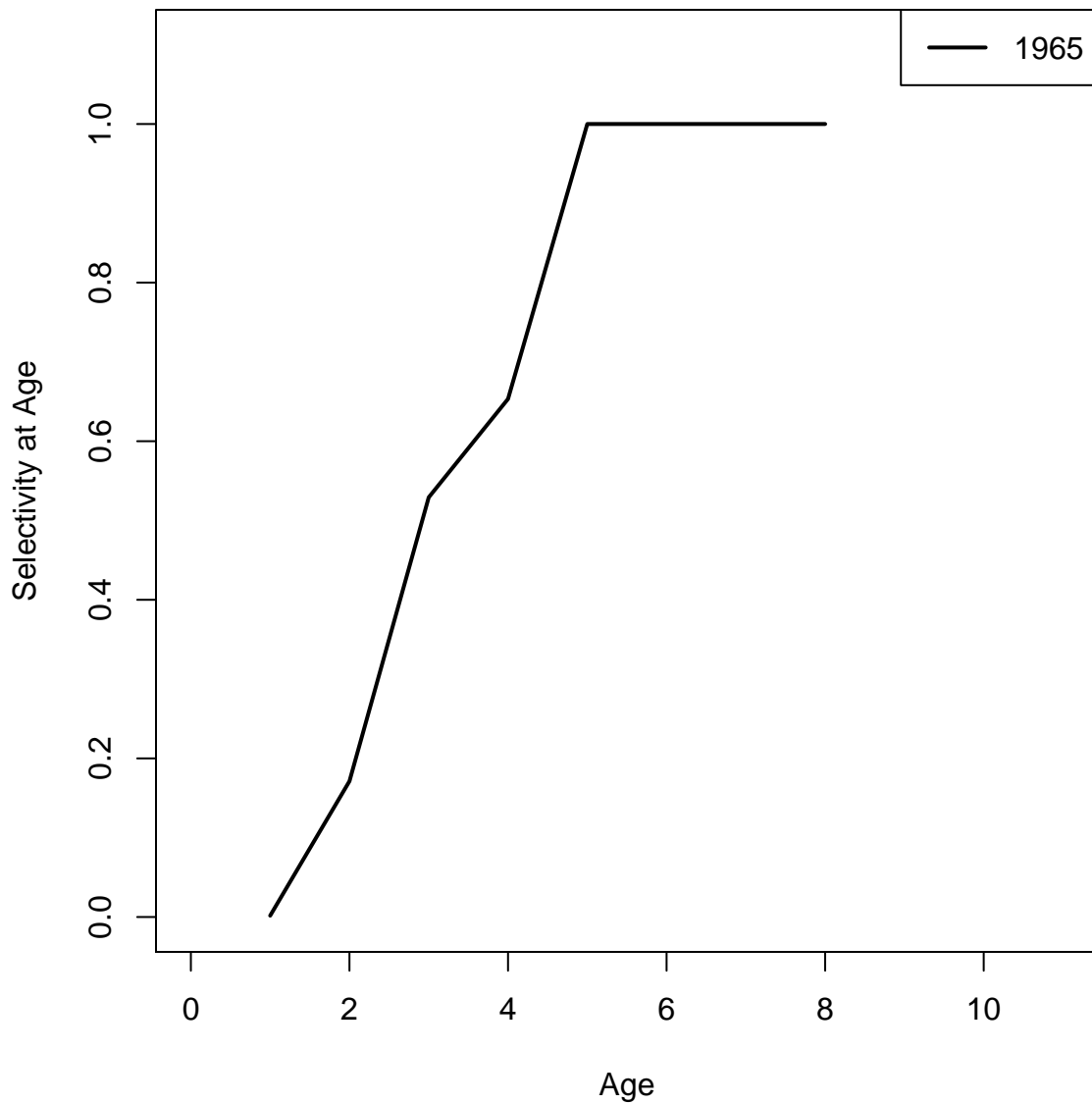
Index 2 (INDEX-2) ESS = 28



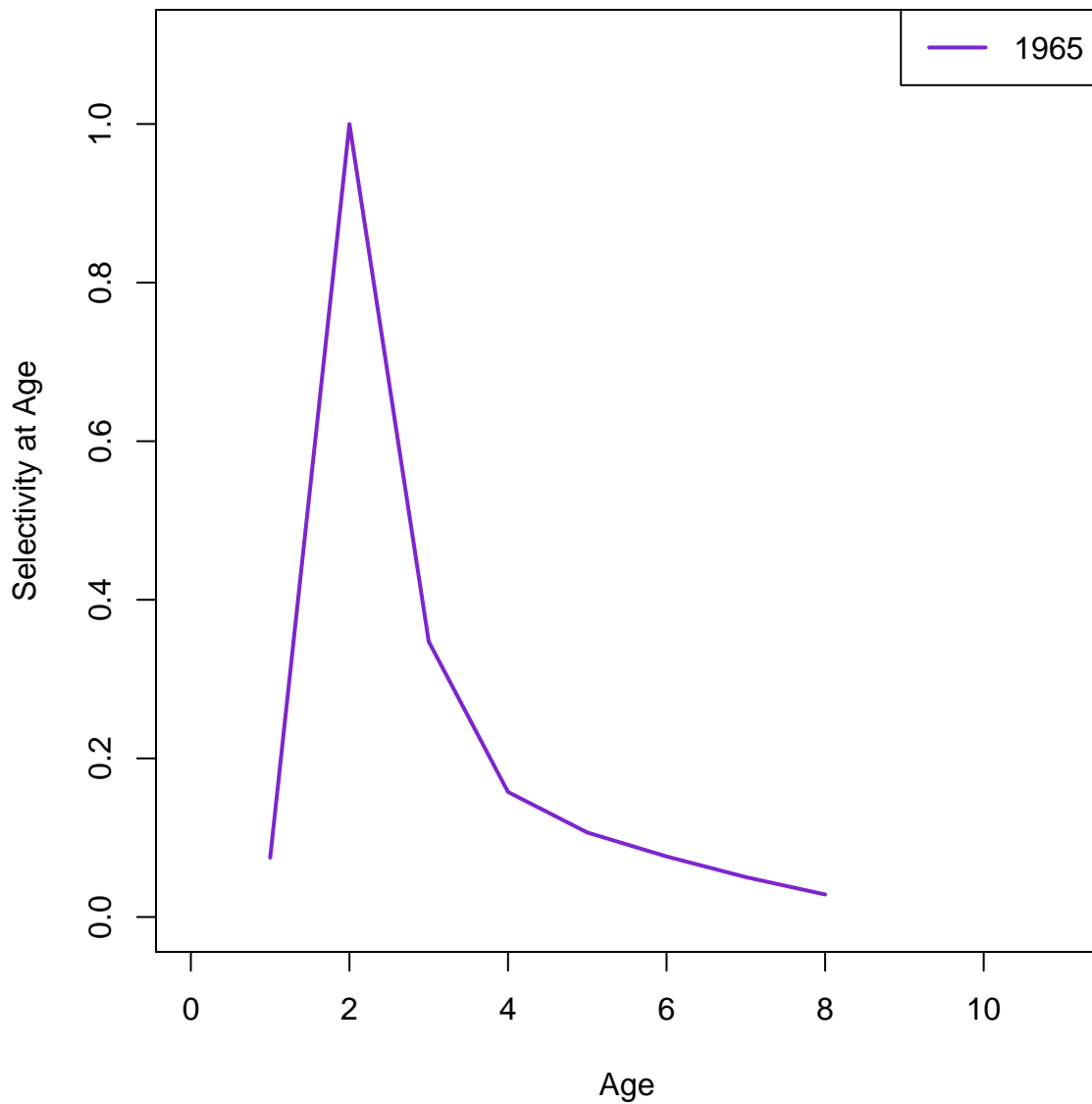
Index 2 (INDEX-2) ESS = 28

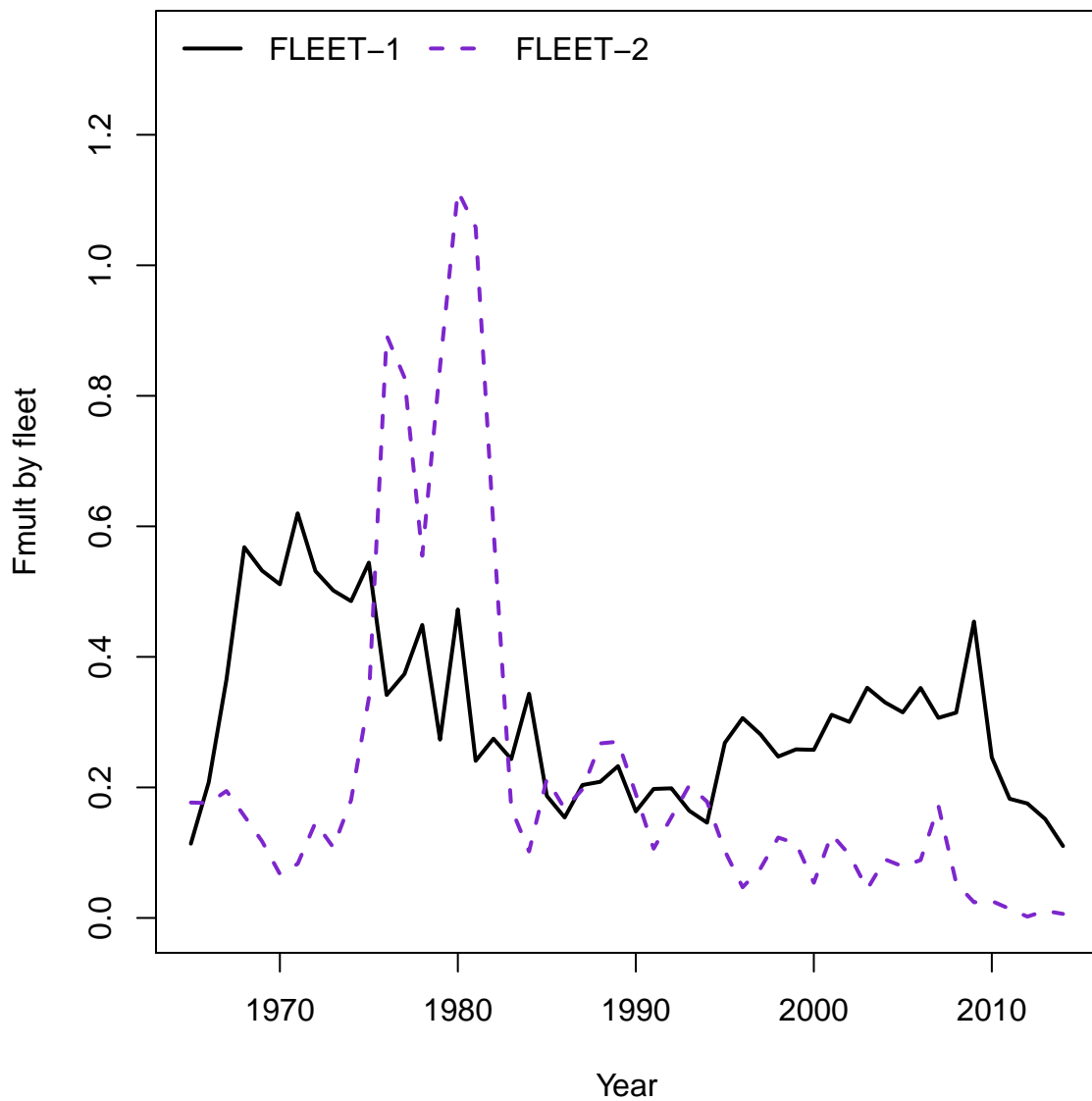


Fleet 1 (FLEET-1)

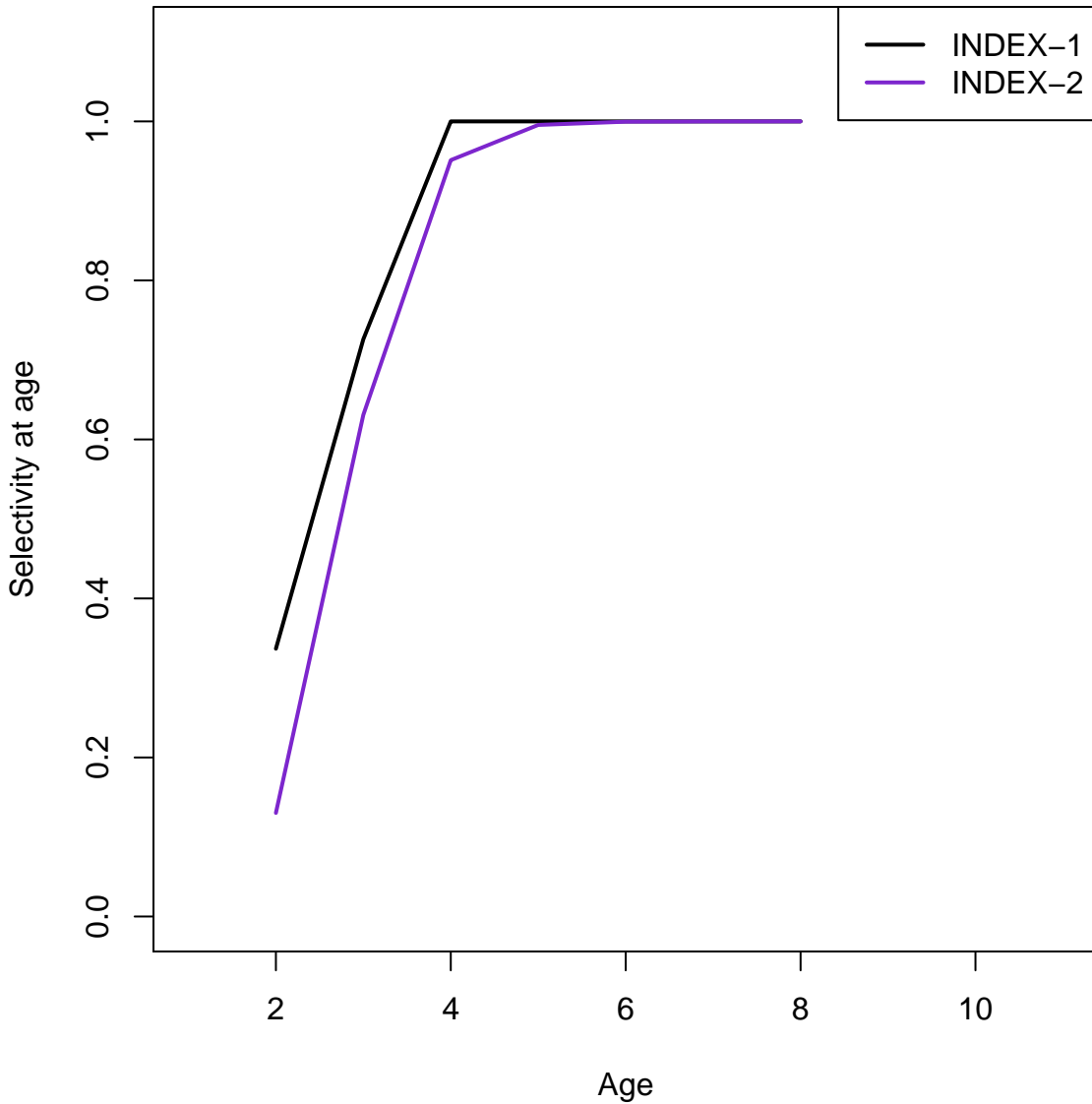


Fleet 2 (FLEET-2)

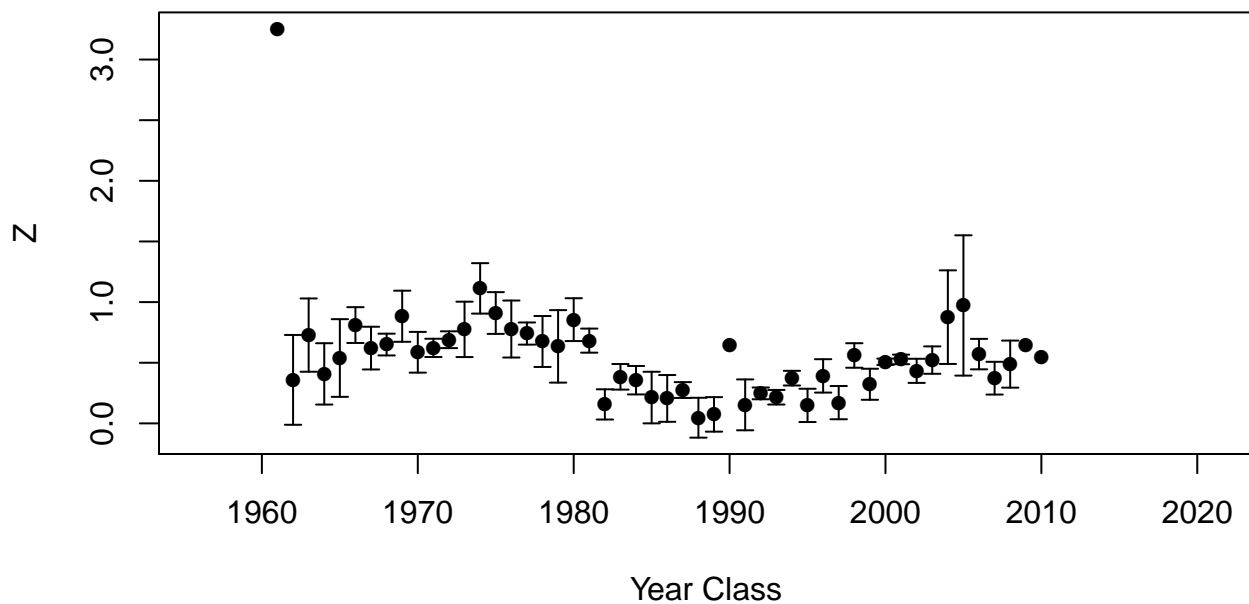
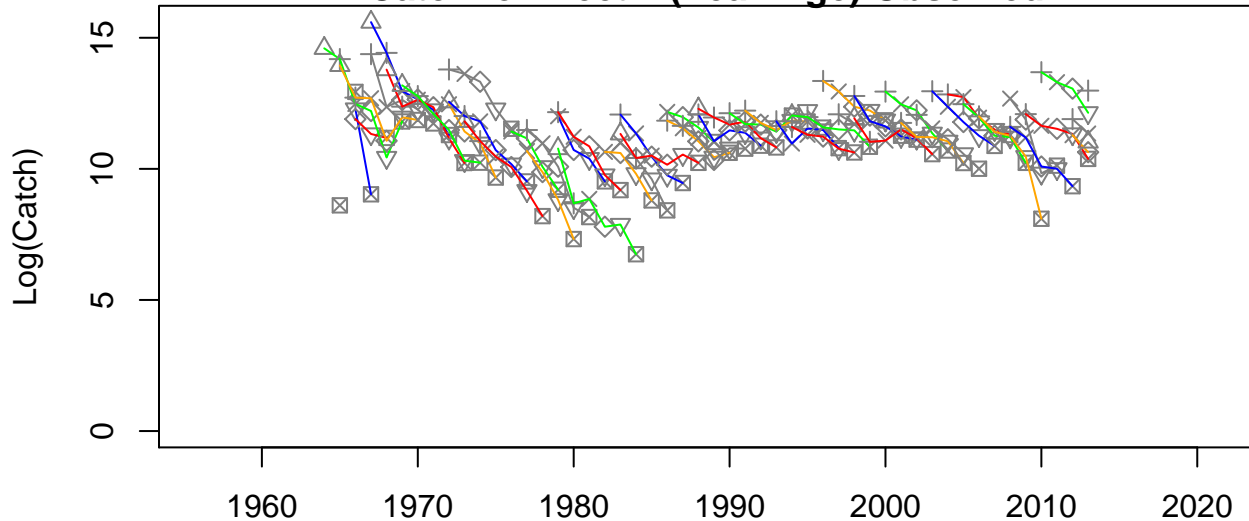




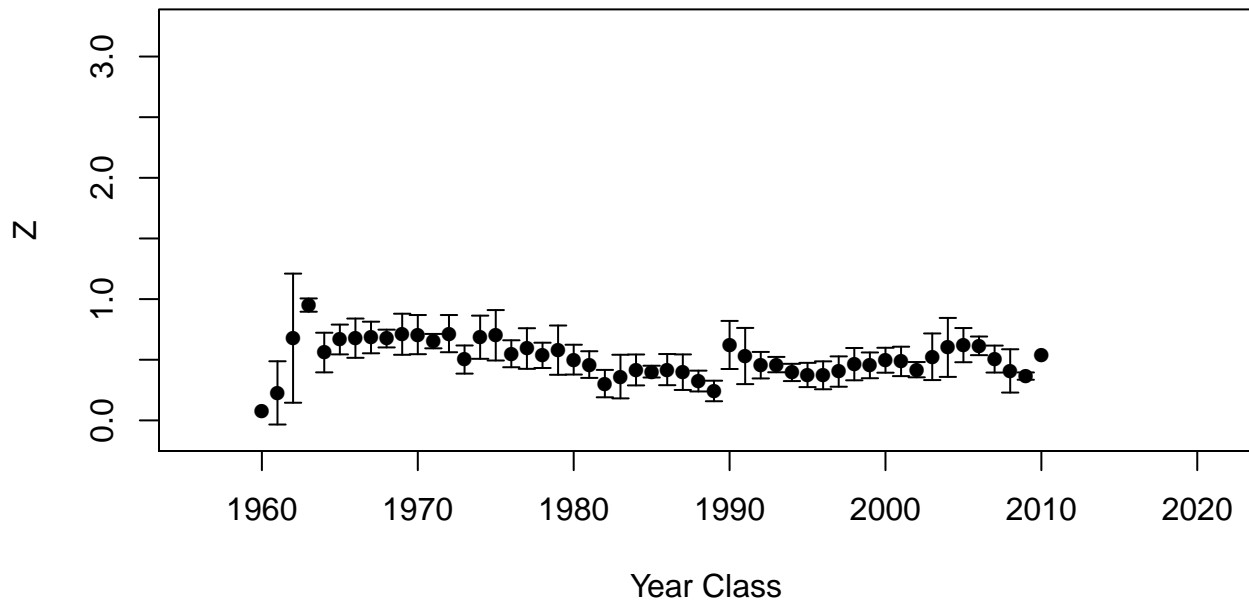
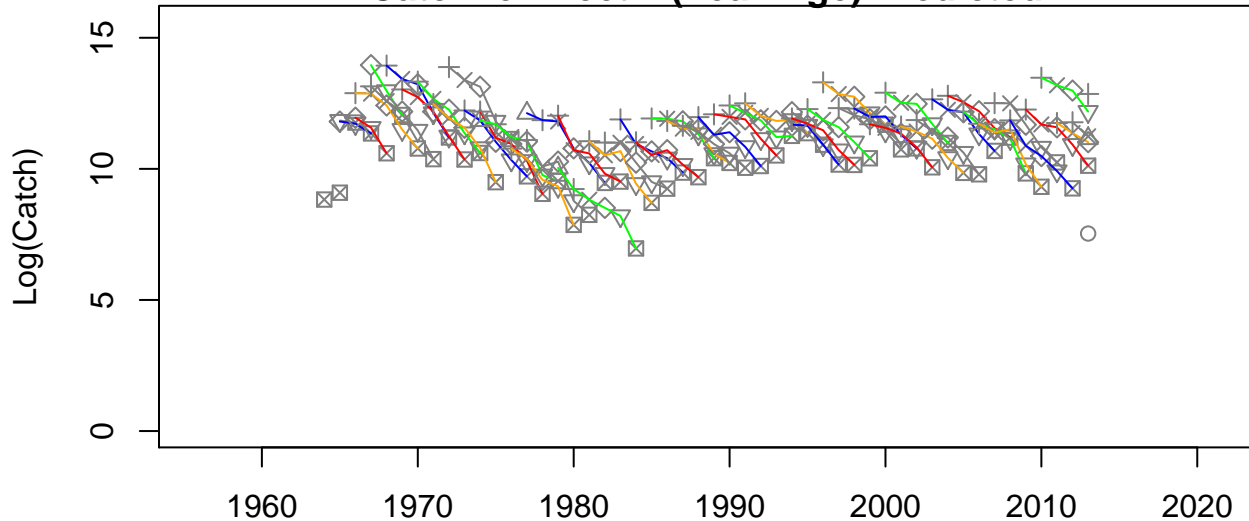
Indices

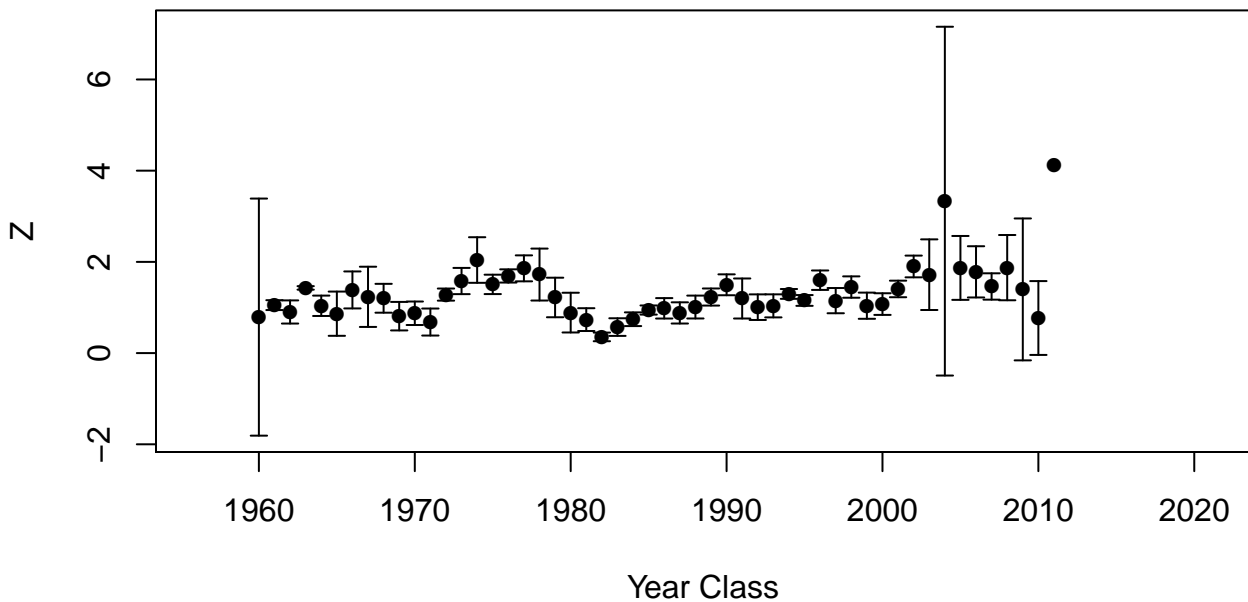
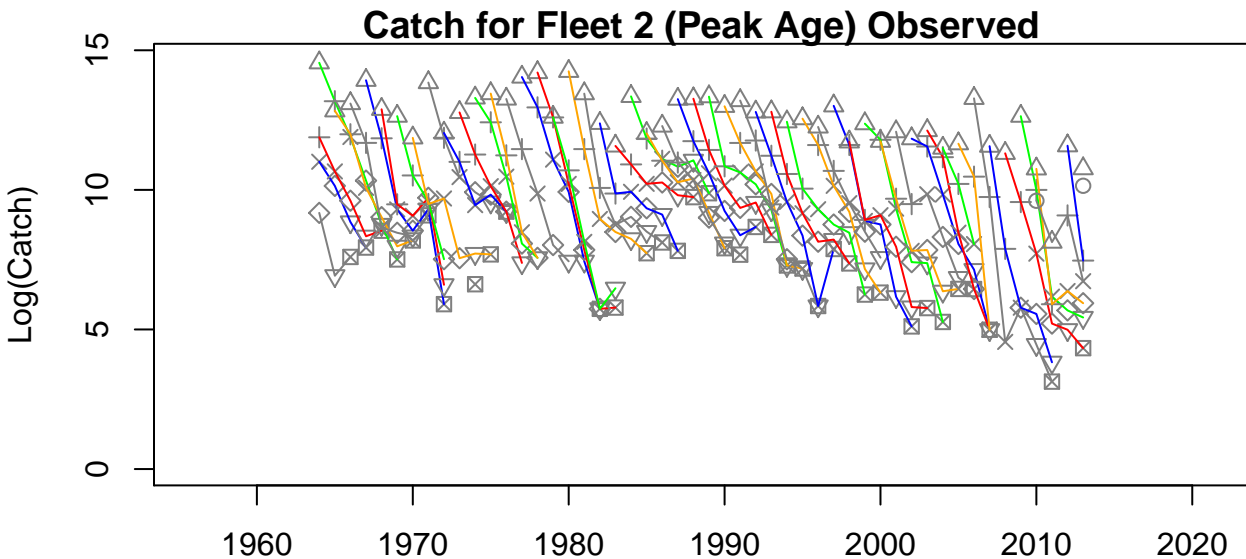


Catch for Fleet 1 (Peak Age) Observed

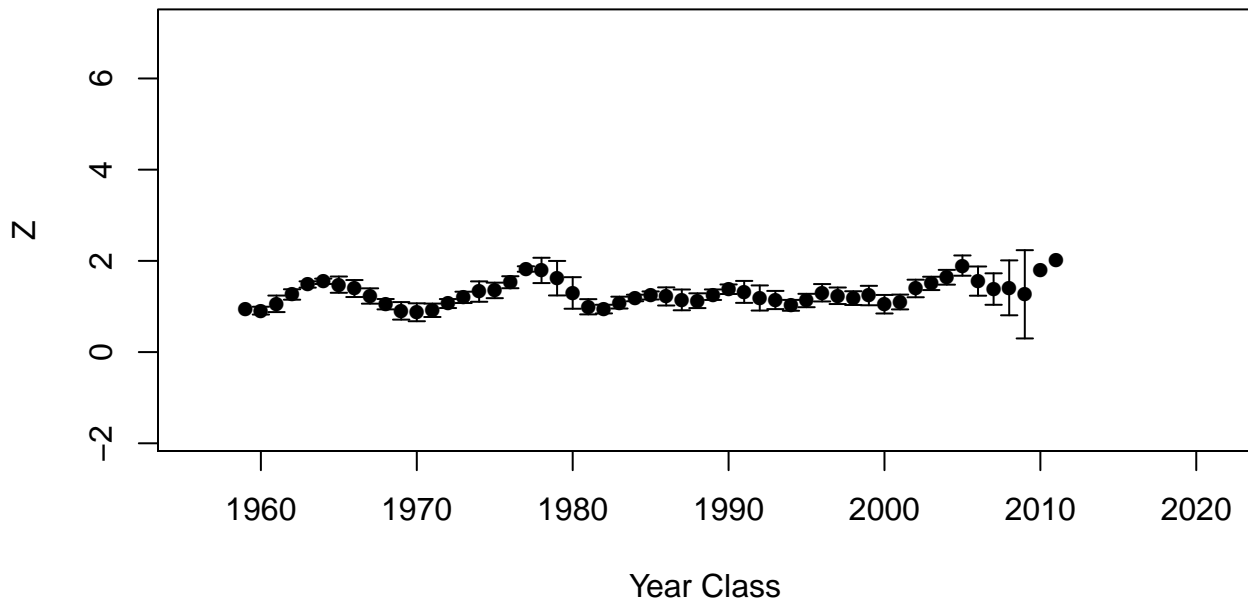
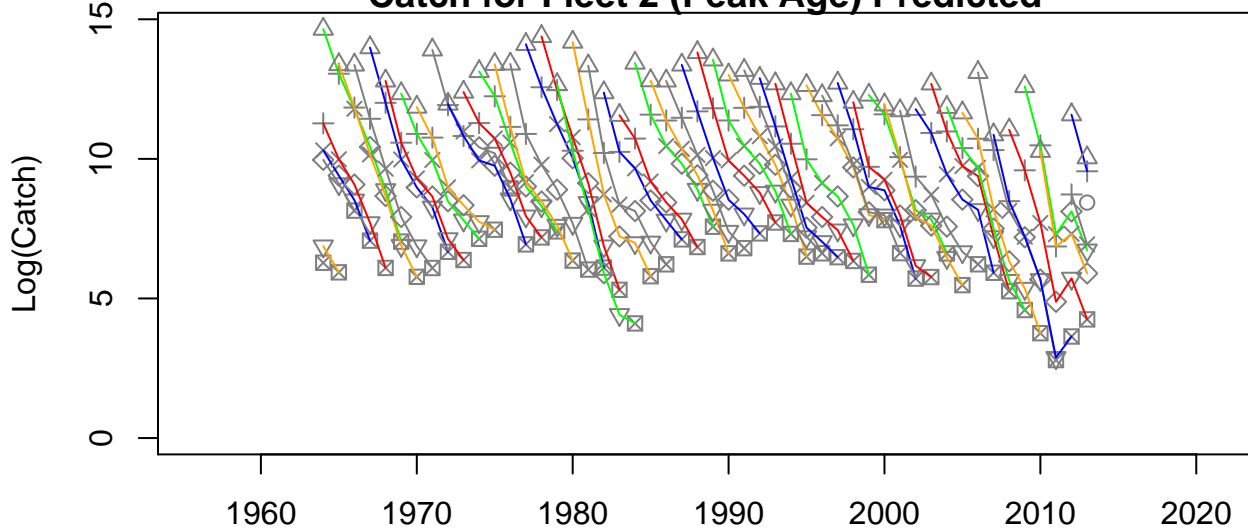


Catch for Fleet 1 (Peak Age) Predicted

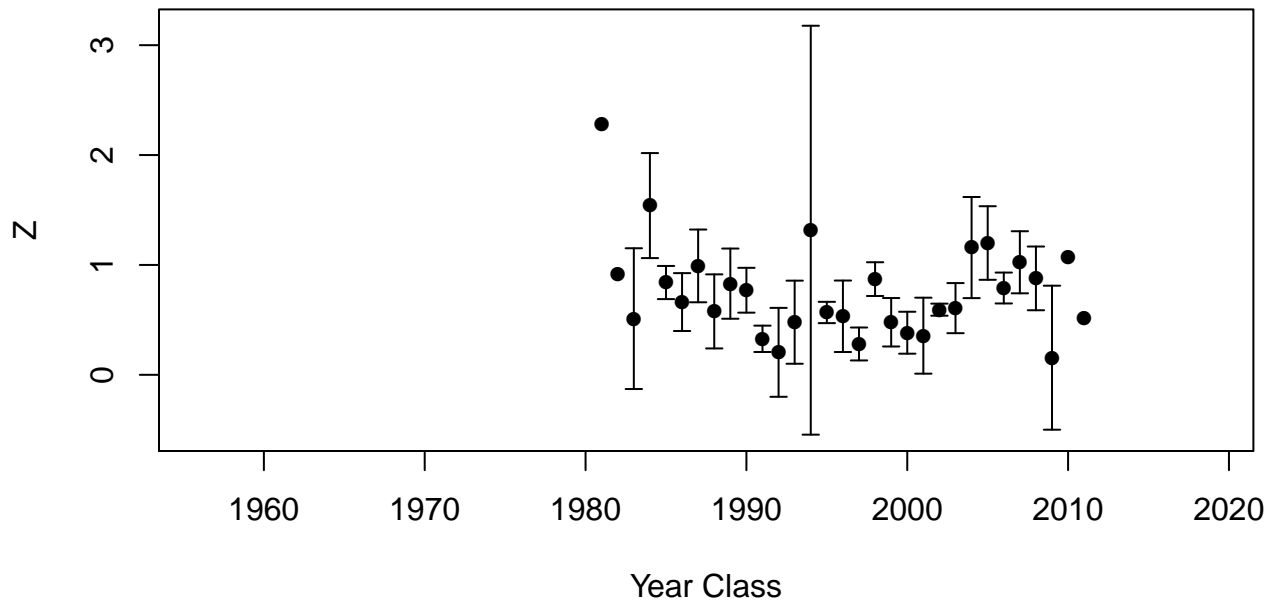
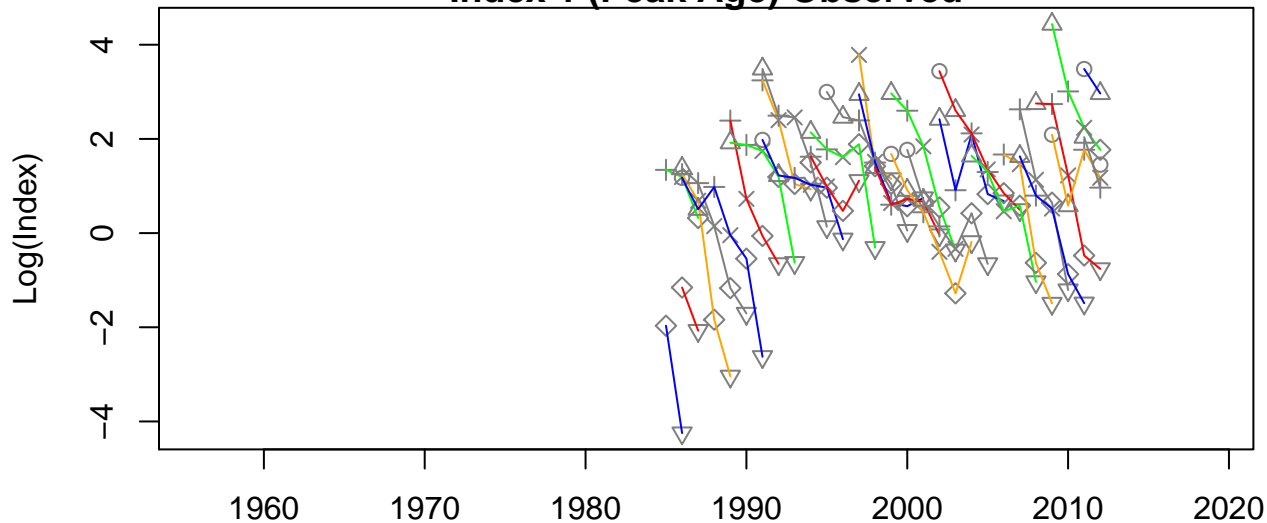




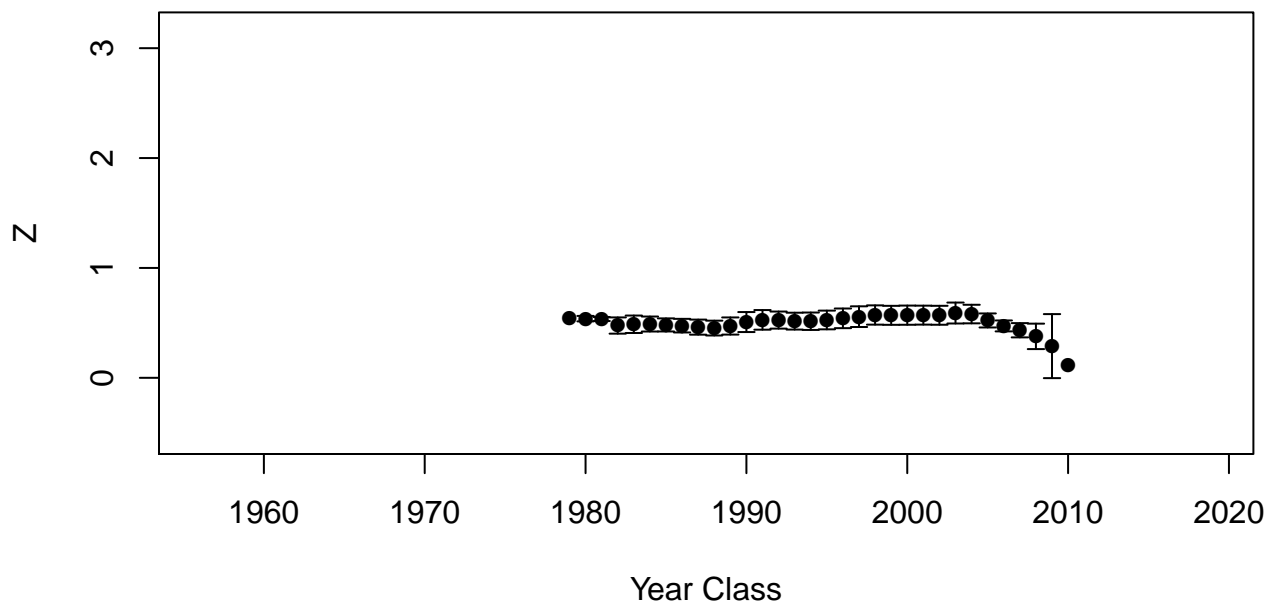
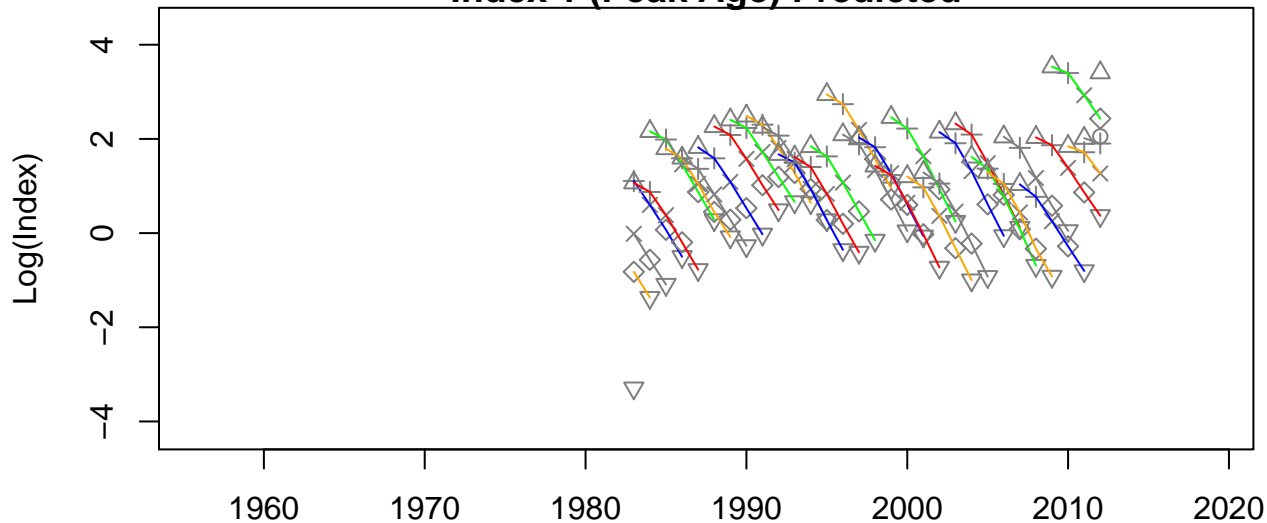
Catch for Fleet 2 (Peak Age) Predicted

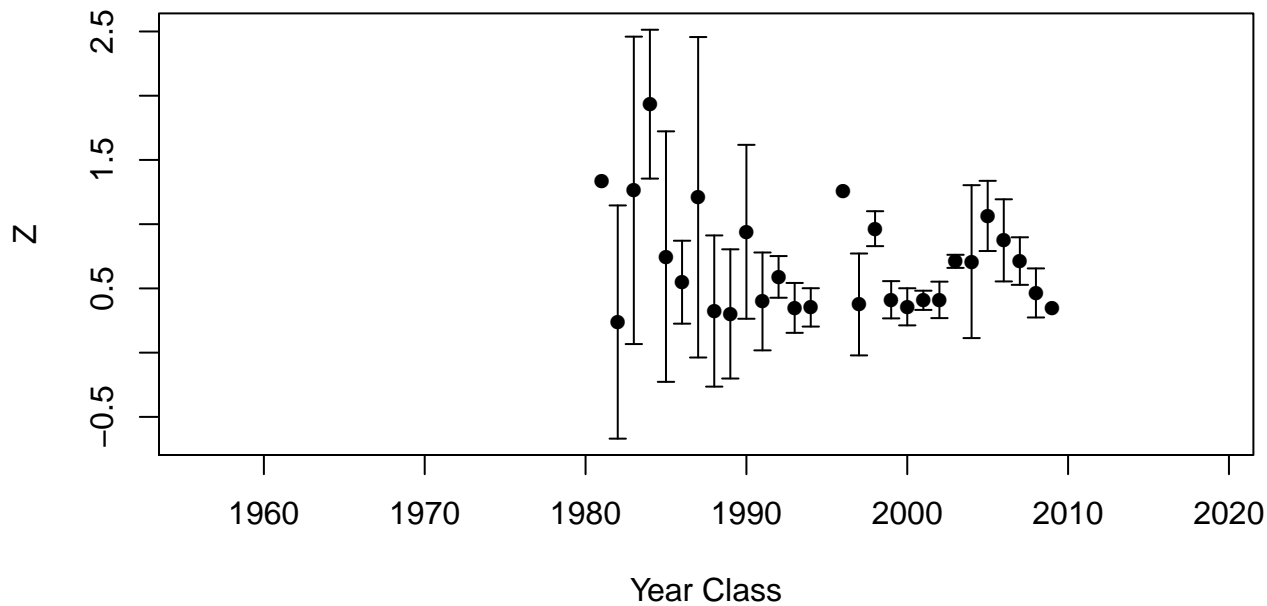
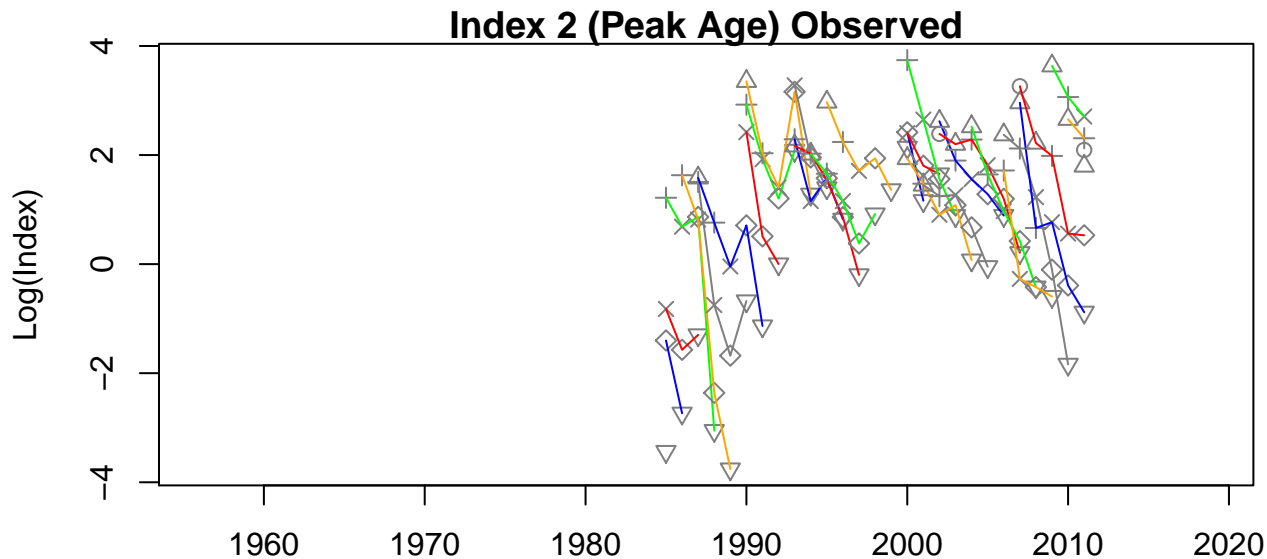


Index 1 (Peak Age) Observed

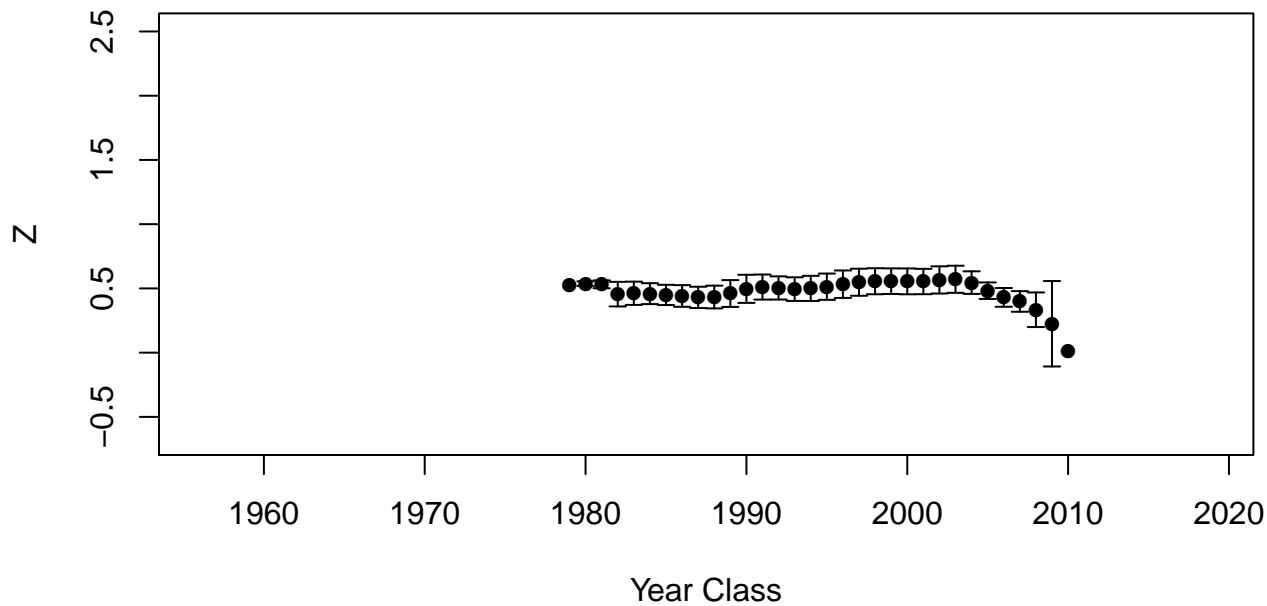
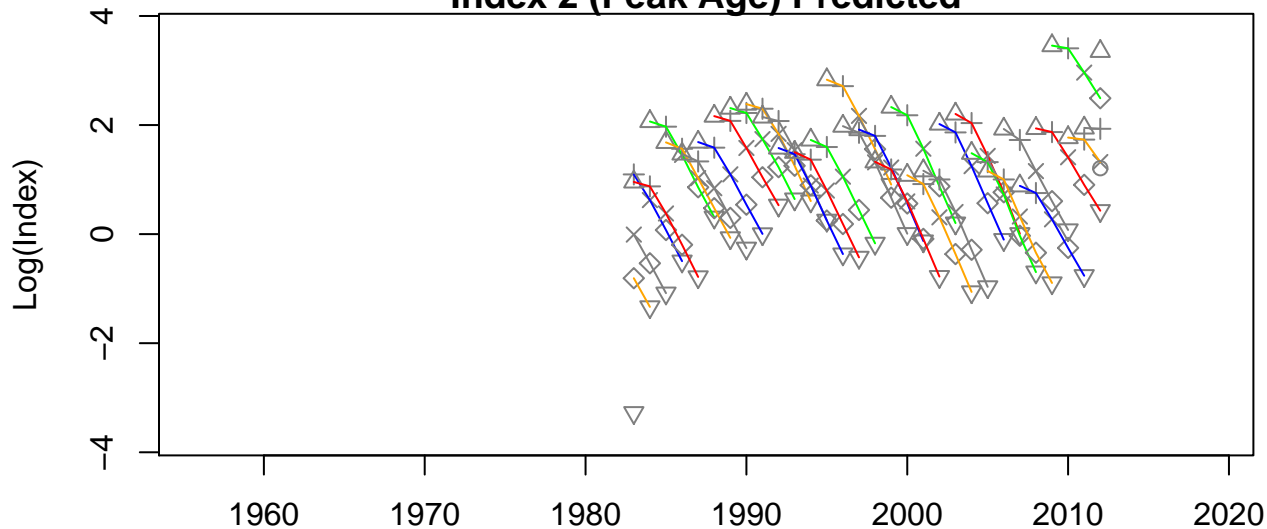


Index 1 (Peak Age) Predicted

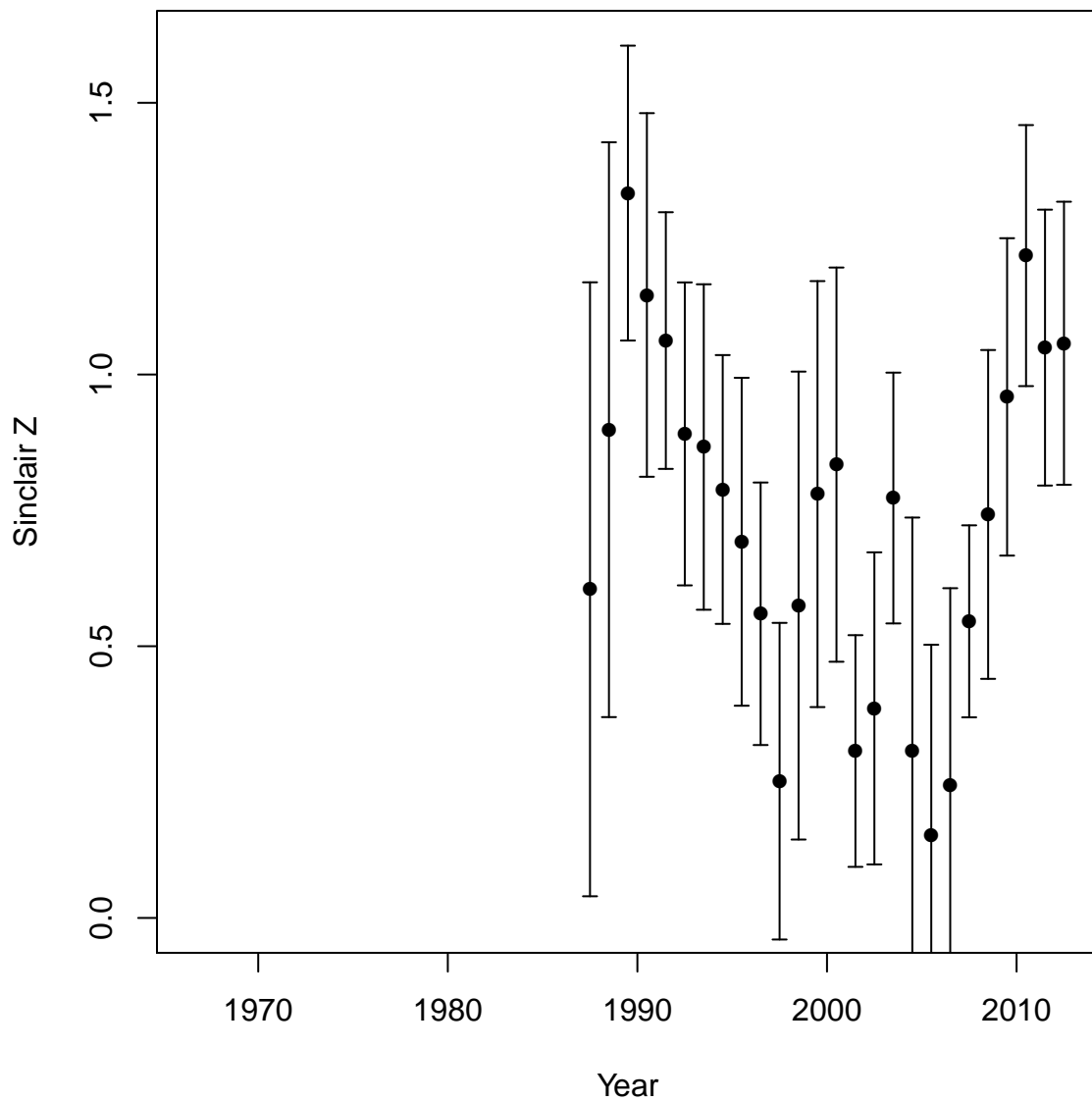




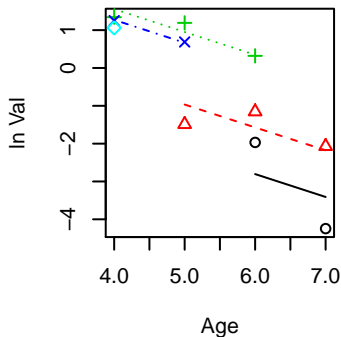
Index 2 (Peak Age) Predicted



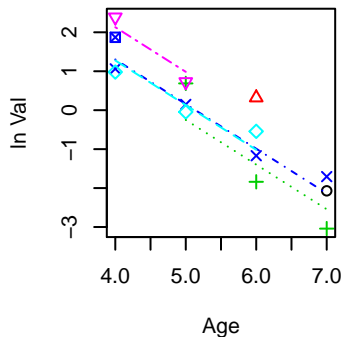
INDEX-1



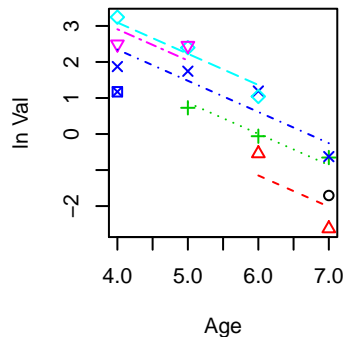
Years 1987 to 1989
Z = 0.605



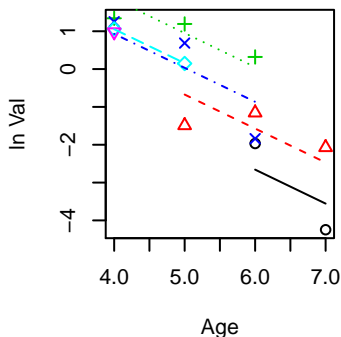
Years 1989 to 1992
Z = 1.146



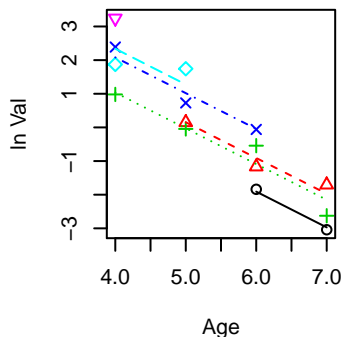
Years 1992 to 1995
Z = 0.867



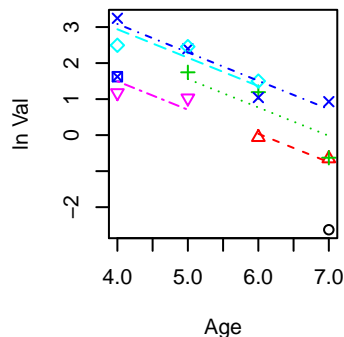
Years 1987 to 1990
Z = 0.898



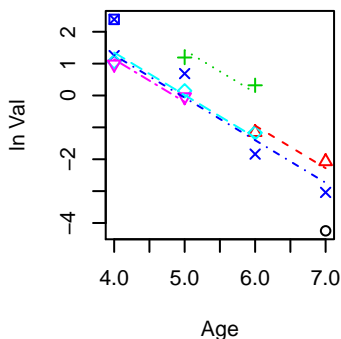
Years 1990 to 1993
Z = 1.063



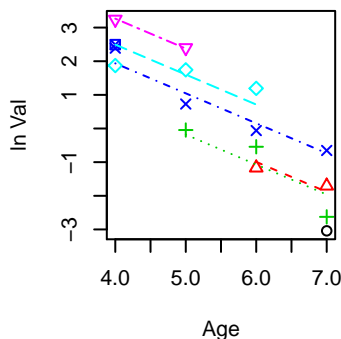
Years 1993 to 1996
Z = 0.788



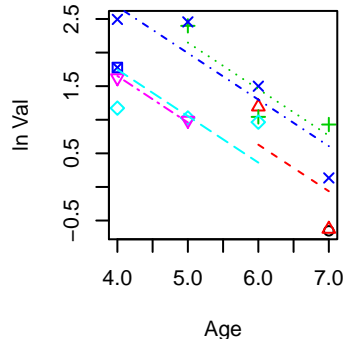
Years 1988 to 1991
Z = 1.334



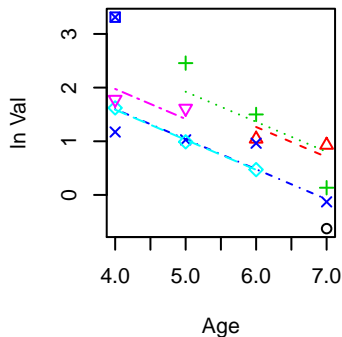
Years 1991 to 1994
Z = 0.891



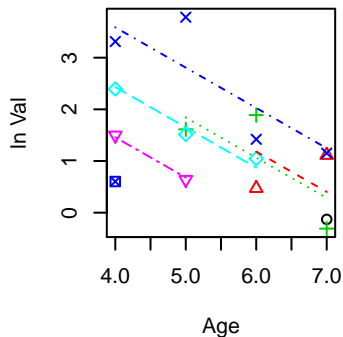
Years 1994 to 1997
Z = 0.692



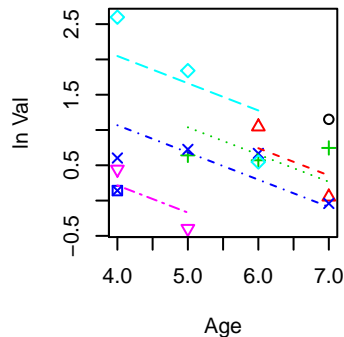
Years 1995 to 1998
Z = 0.56



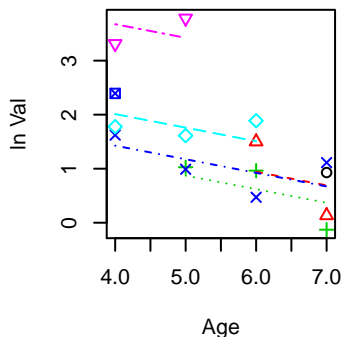
Years 1998 to 2001
Z = 0.78



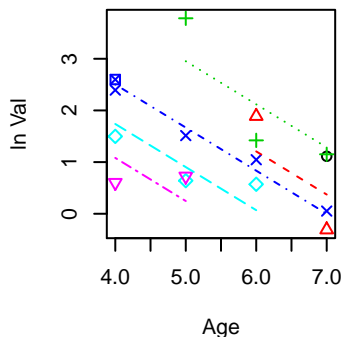
Years 2001 to 2004
Z = 0.386



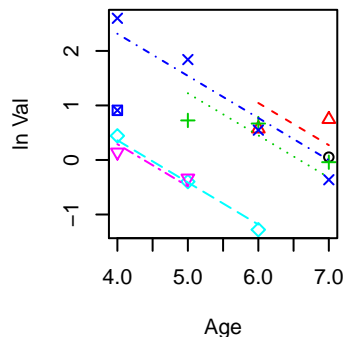
Years 1996 to 1999
Z = 0.252



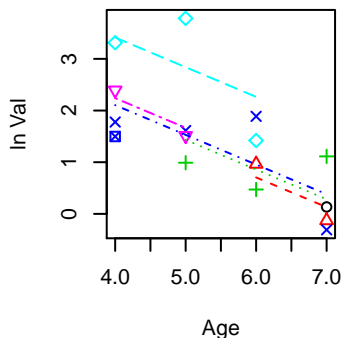
Years 1999 to 2002
Z = 0.834



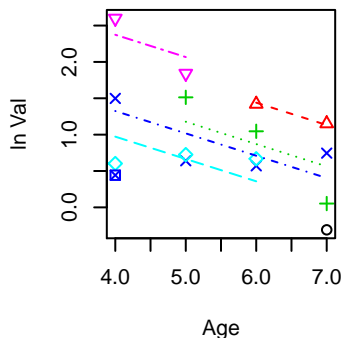
Years 2002 to 2005
Z = 0.773



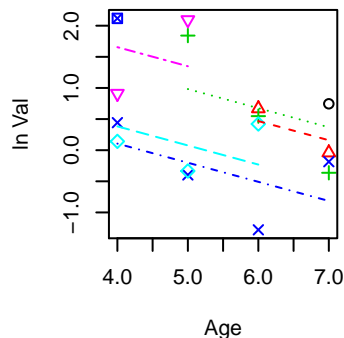
Years 1997 to 2000
Z = 0.575



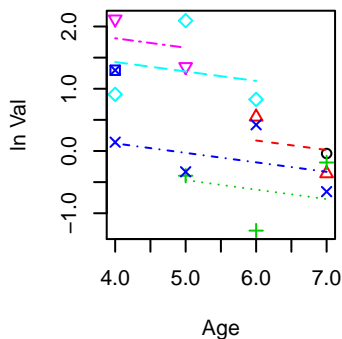
Years 2000 to 2003
Z = 0.307



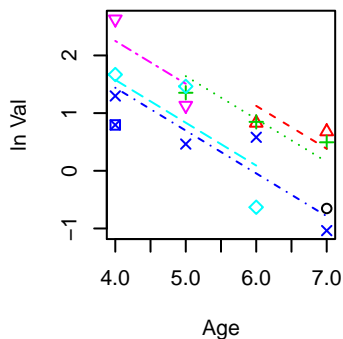
Years 2003 to 2006
Z = 0.307



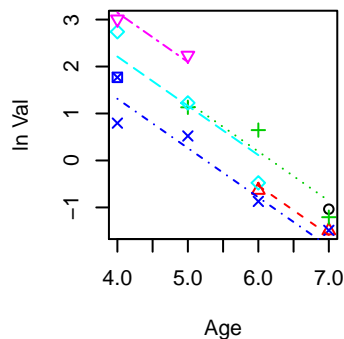
Years 2004 to 2007
Z = 0.152



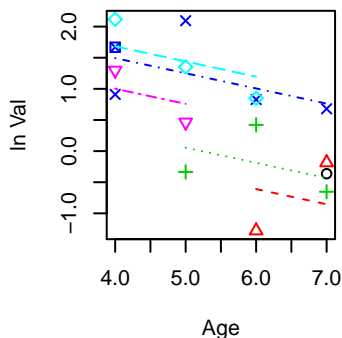
Years 2007 to 2010
Z = 0.743



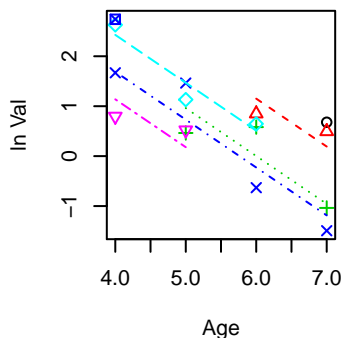
Years 2010 to 2013
Z = 1.05



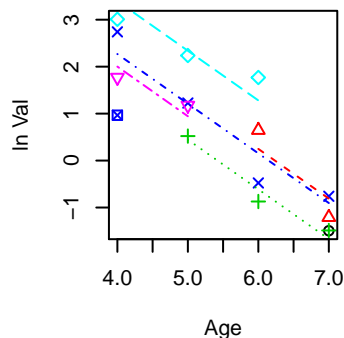
Years 2005 to 2008
Z = 0.244



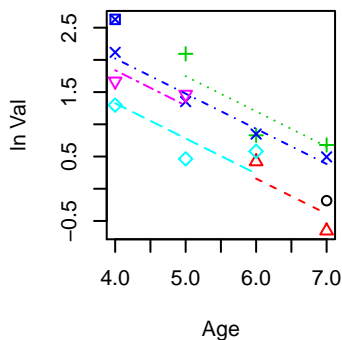
Years 2008 to 2011
Z = 0.959



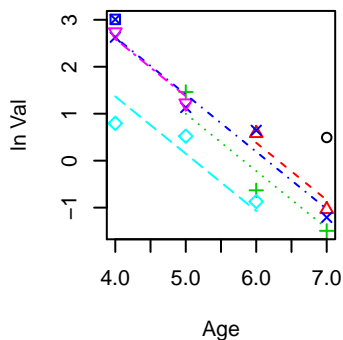
Years 2011 to 2014
Z = 1.058



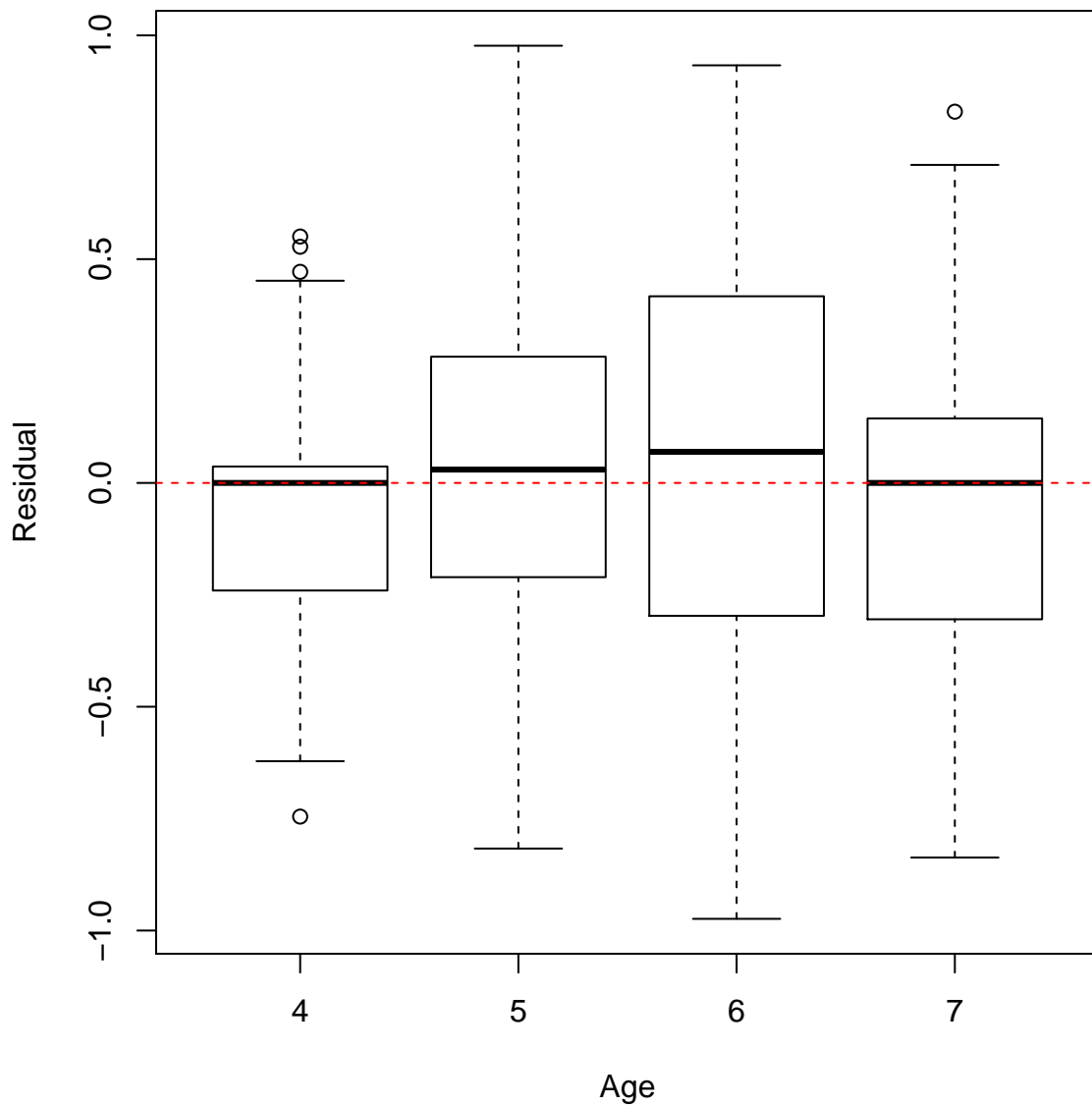
Years 2006 to 2009
Z = 0.546



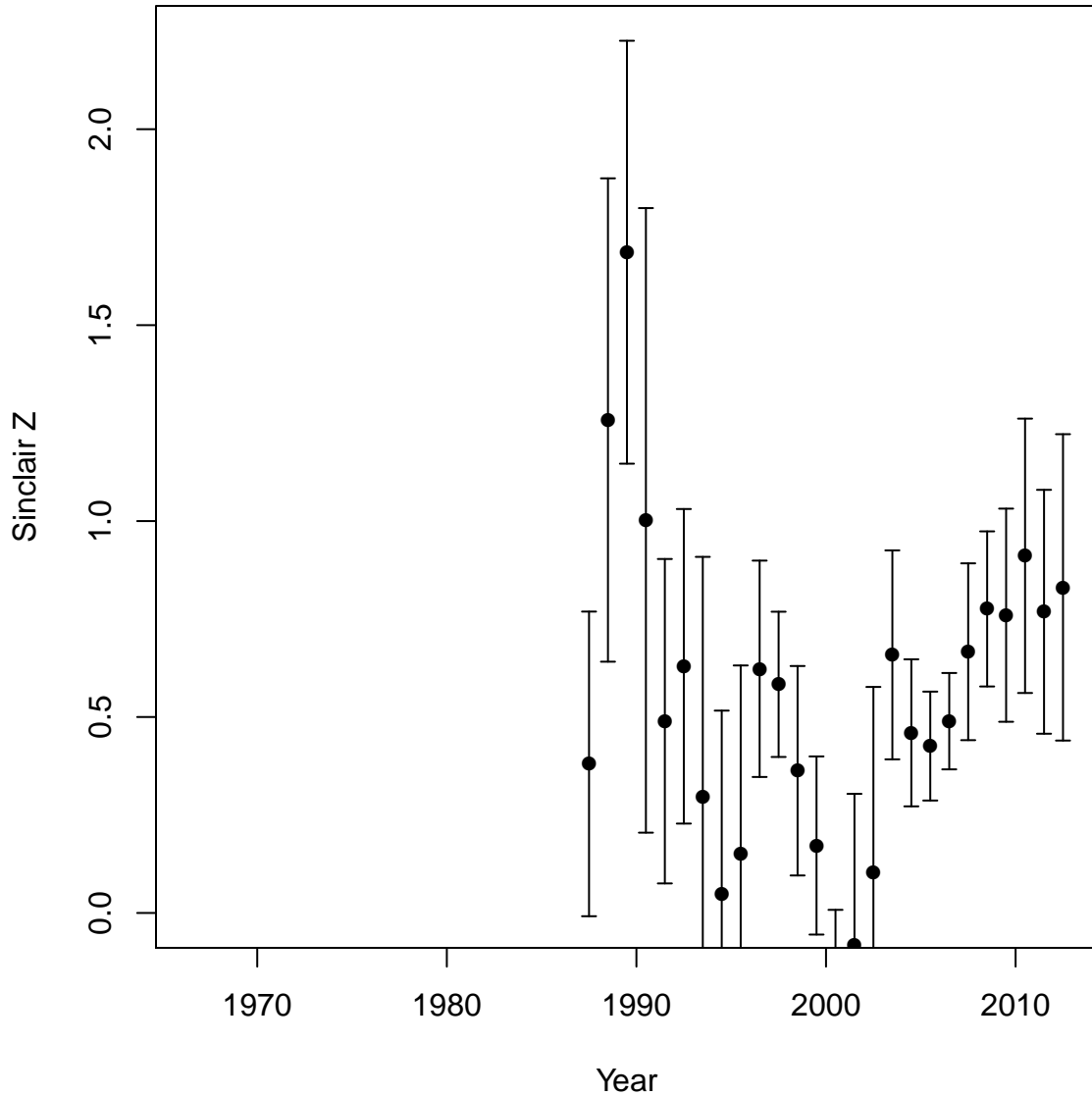
Years 2009 to 2012
Z = 1.219



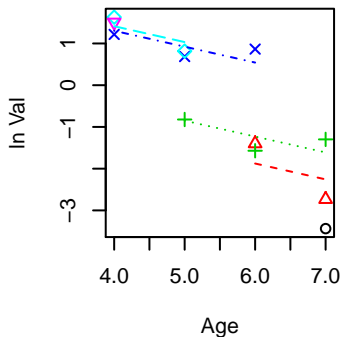
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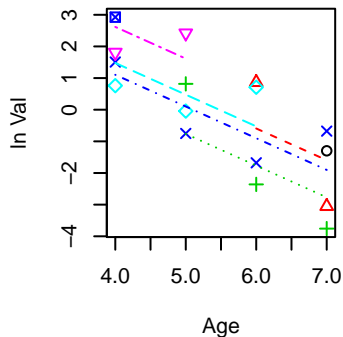
INDEX-2



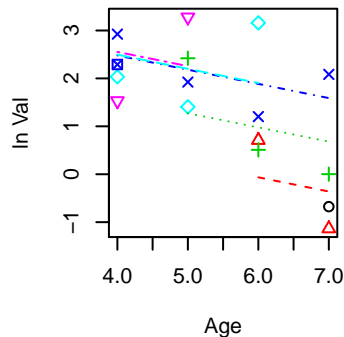
Years 1987 to 1989
Z = 0.38



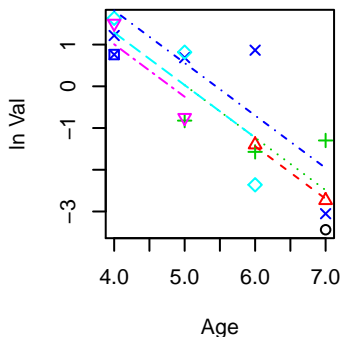
Years 1989 to 1992
Z = 1.002



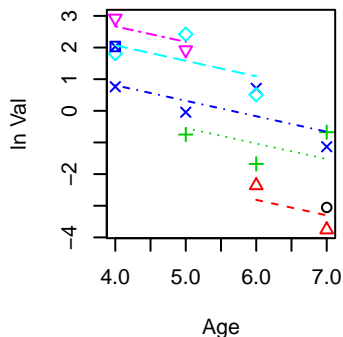
Years 1992 to 1995
Z = 0.296



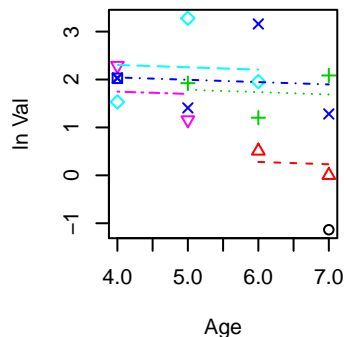
Years 1987 to 1990
Z = 1.258



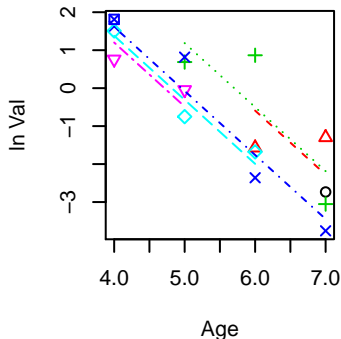
Years 1990 to 1993
Z = 0.489



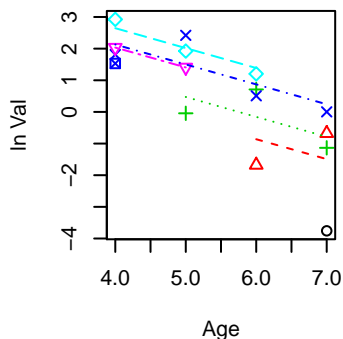
Years 1993 to 1996
Z = 0.049



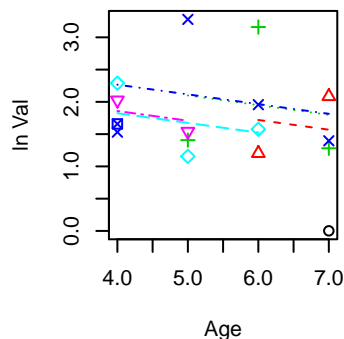
Years 1988 to 1991
Z = 1.686



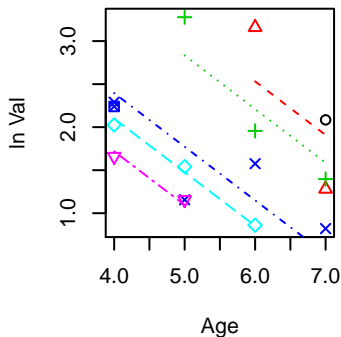
Years 1991 to 1994
Z = 0.629



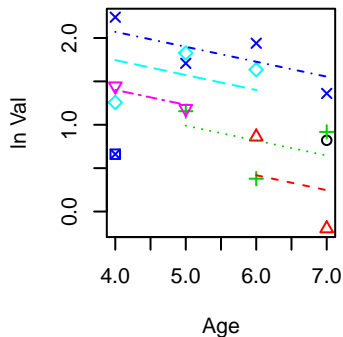
Years 1994 to 1997
Z = 0.15



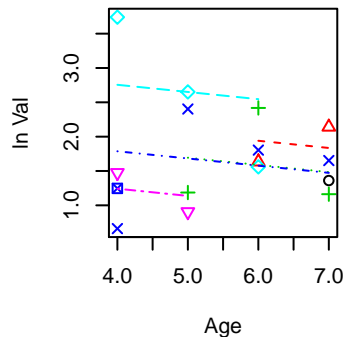
Years 1995 to 1998
Z = 0.623



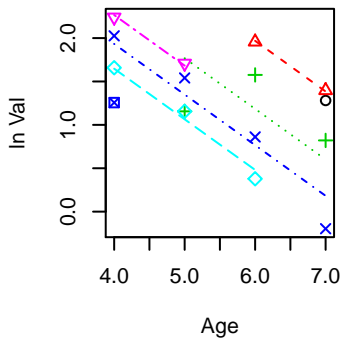
Years 1998 to 2001
Z = 0.172



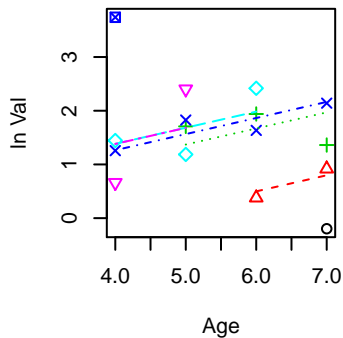
Years 2001 to 2004
Z = 0.105



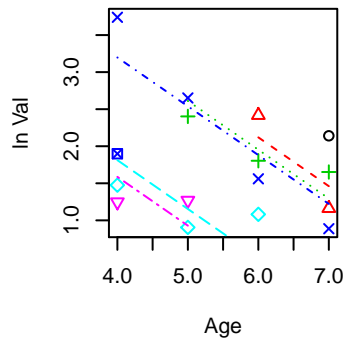
Years 1996 to 1999
Z = 0.583



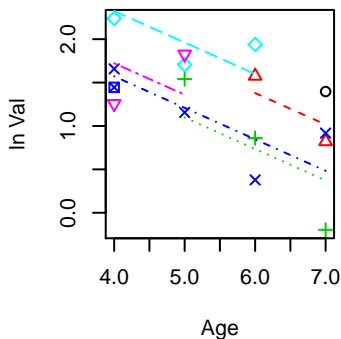
Years 1999 to 2002
Z = -0.3



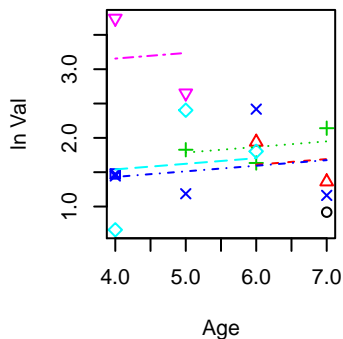
Years 2002 to 2005
Z = 0.659



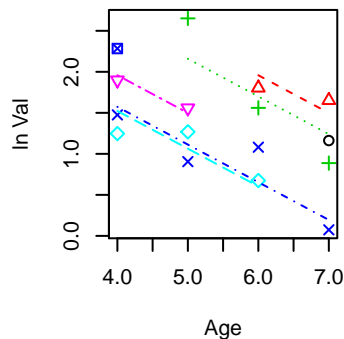
Years 1997 to 2000
Z = 0.363



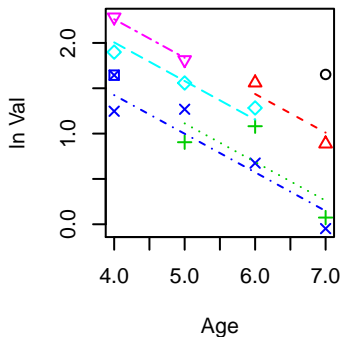
Years 2000 to 2003
Z = -0.082



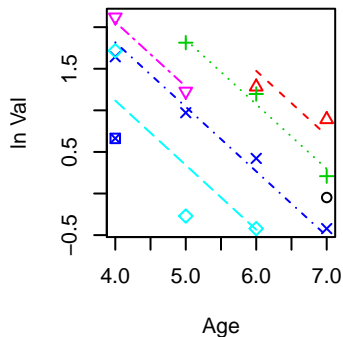
Years 2003 to 2006
Z = 0.46



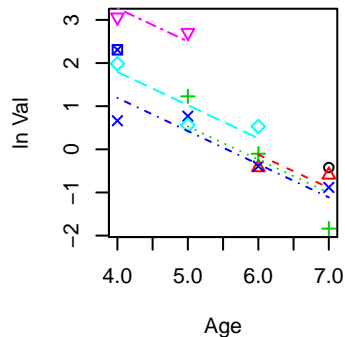
Years 2004 to 2007
Z = 0.426



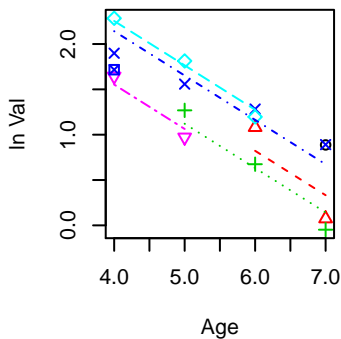
Years 2007 to 2010
Z = 0.776



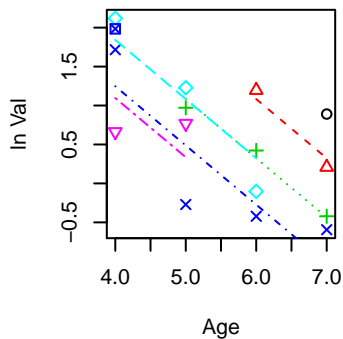
Years 2010 to 2013
Z = 0.769



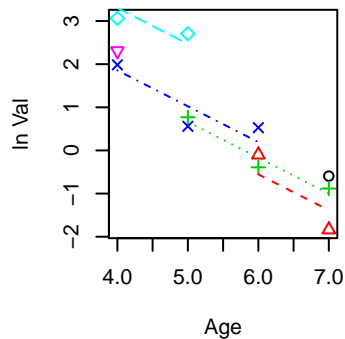
Years 2005 to 2008
Z = 0.489



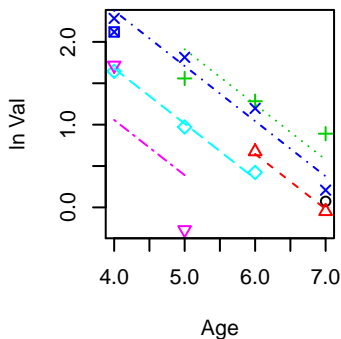
Years 2008 to 2011
Z = 0.76



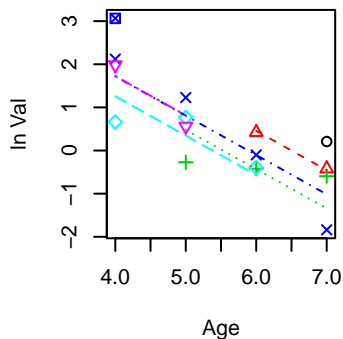
Years 2011 to 2013
Z = 0.831



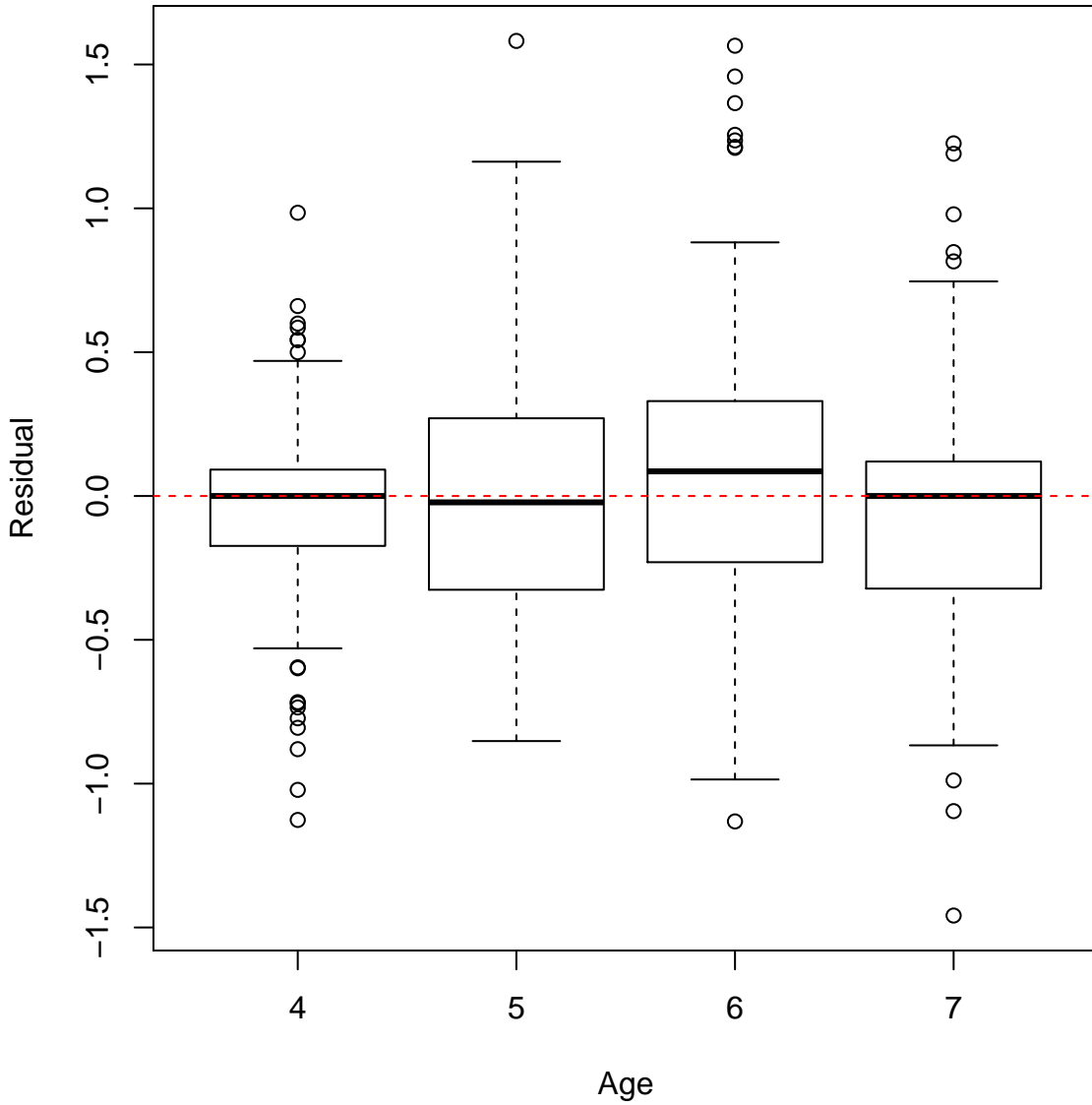
Years 2006 to 2009
Z = 0.667



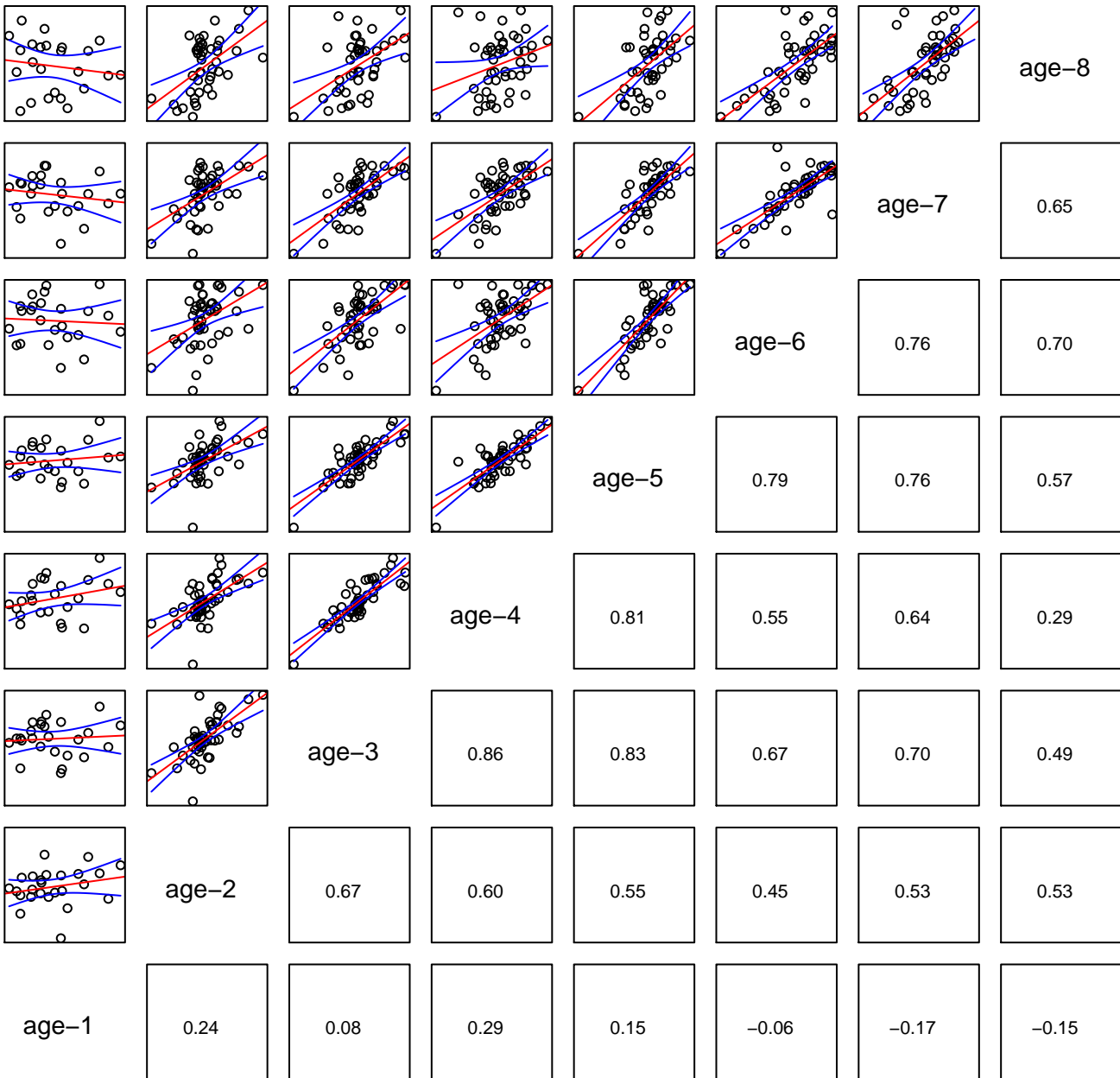
Years 2009 to 2012
Z = 0.911



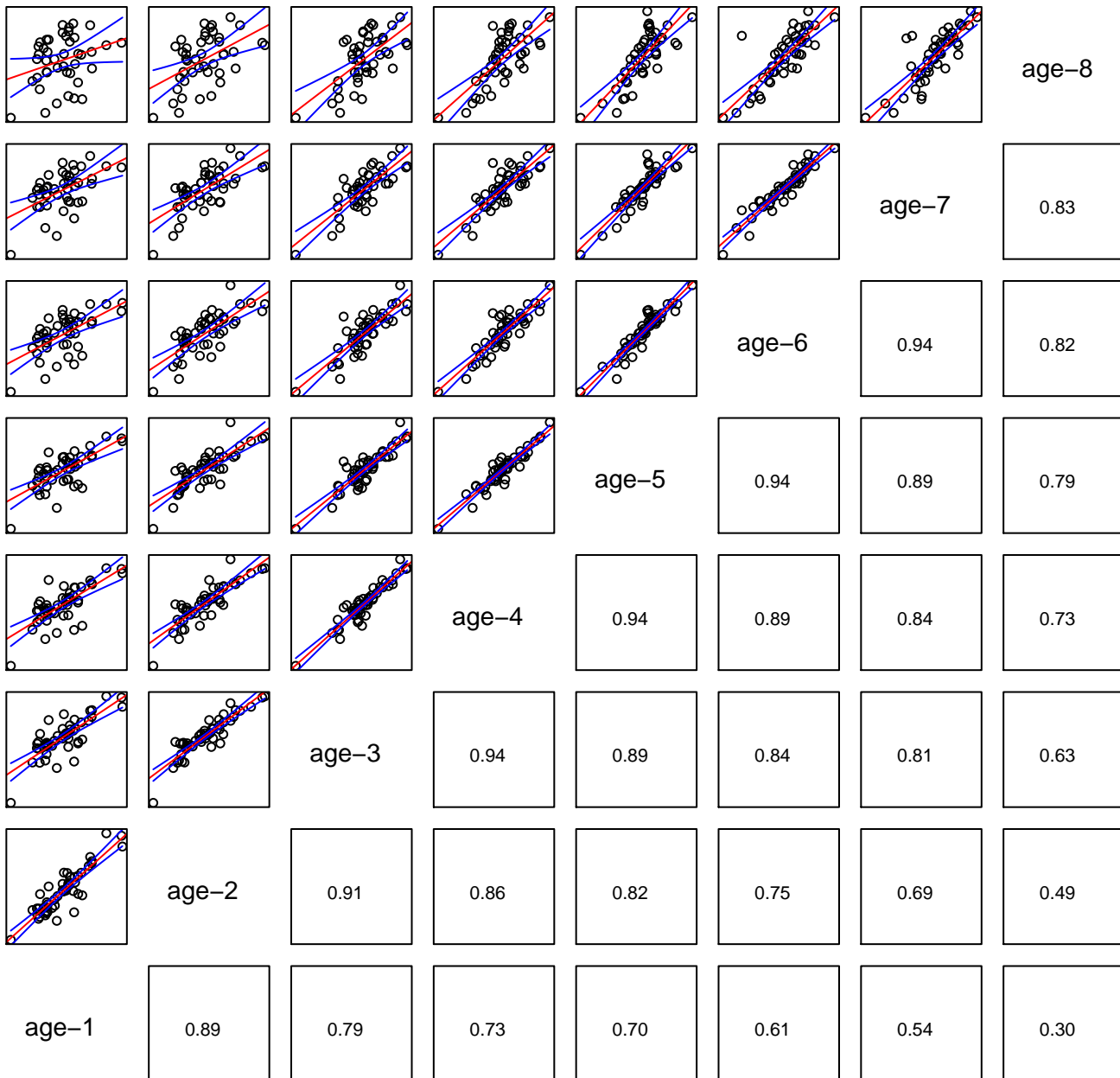
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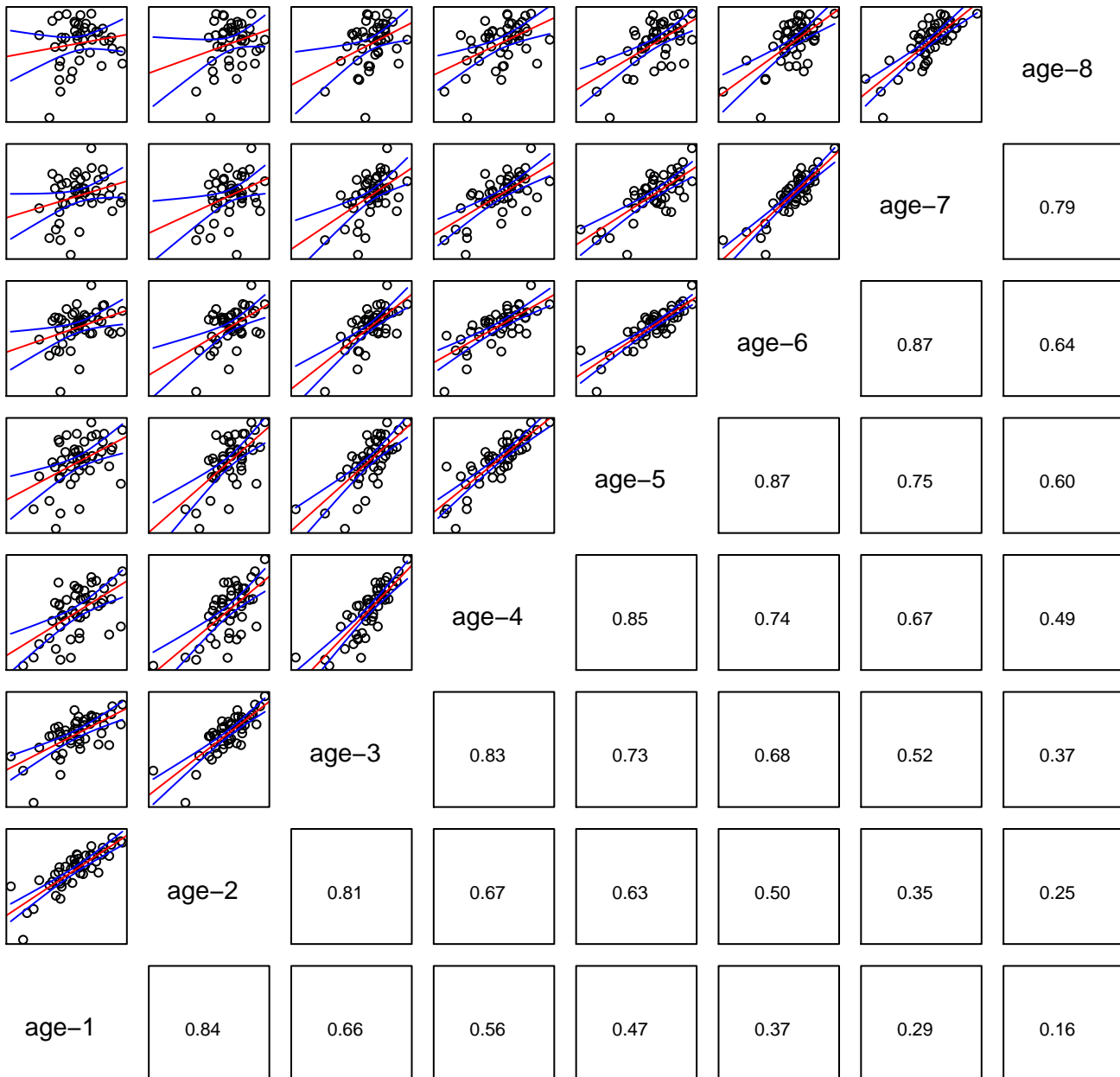
Catch for Fleet 1 Observed



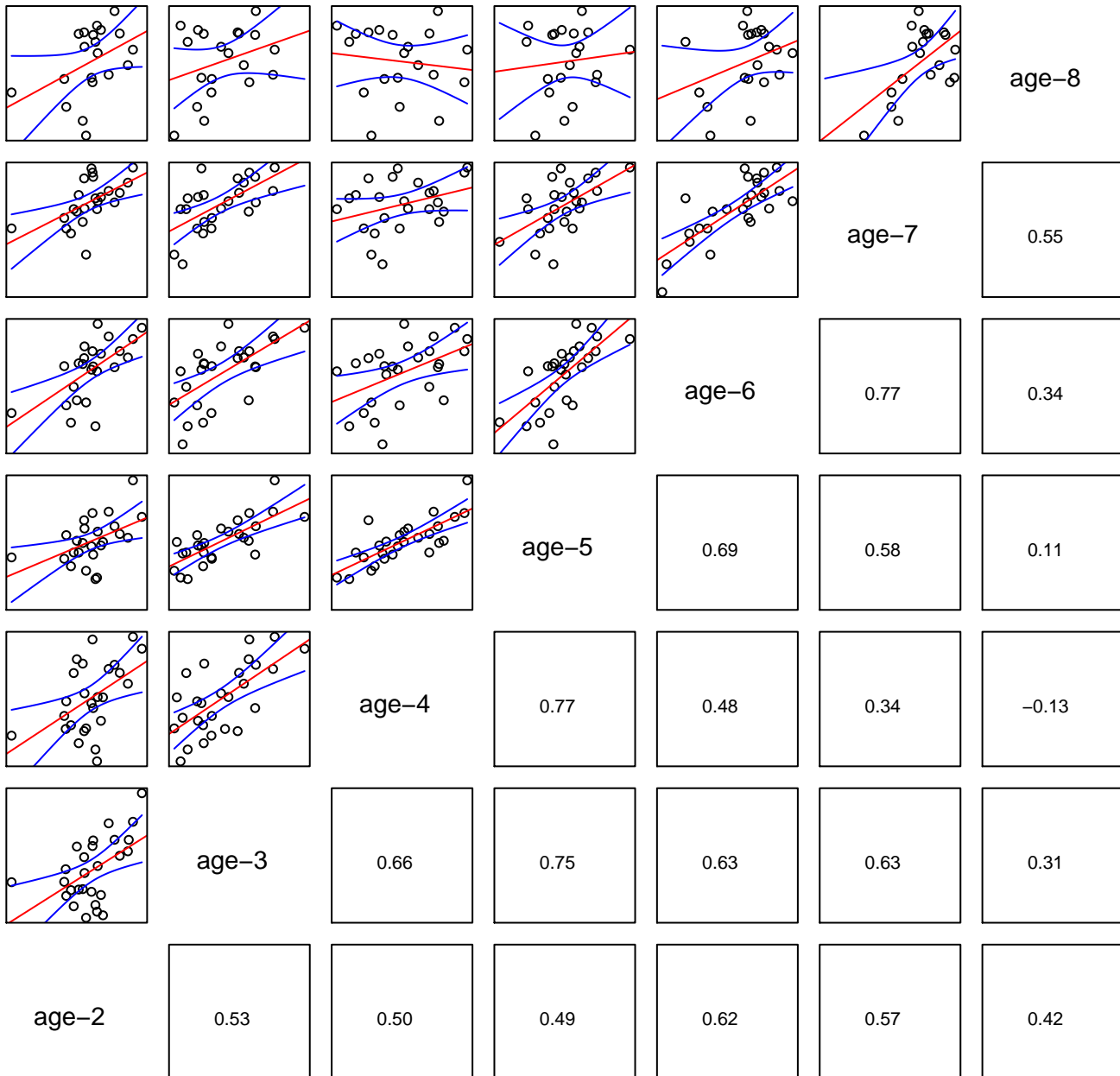
Catch for Fleet 1 Predicted



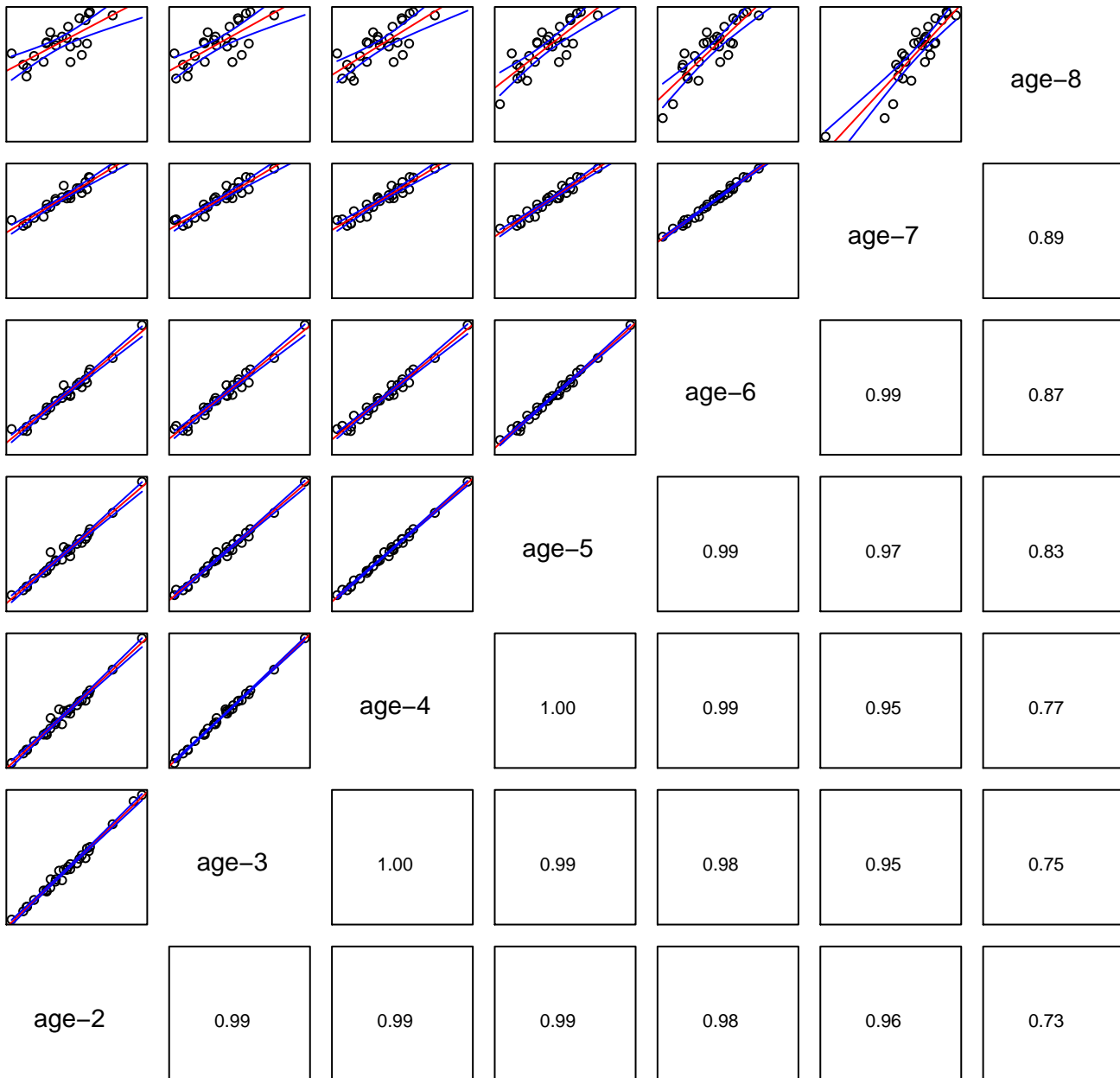
Catch for Fleet 2 Predicted



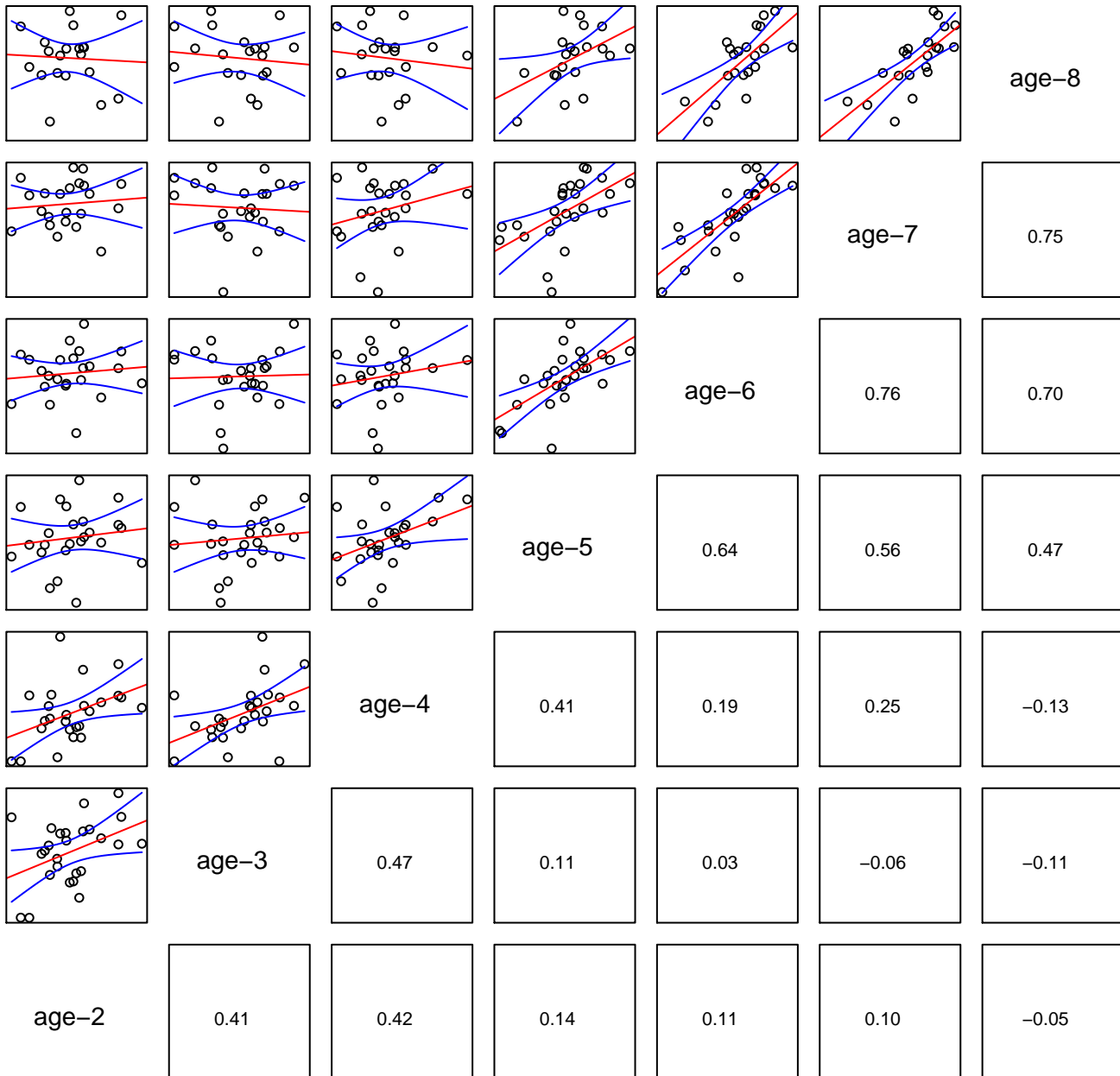
Index 1 Observed



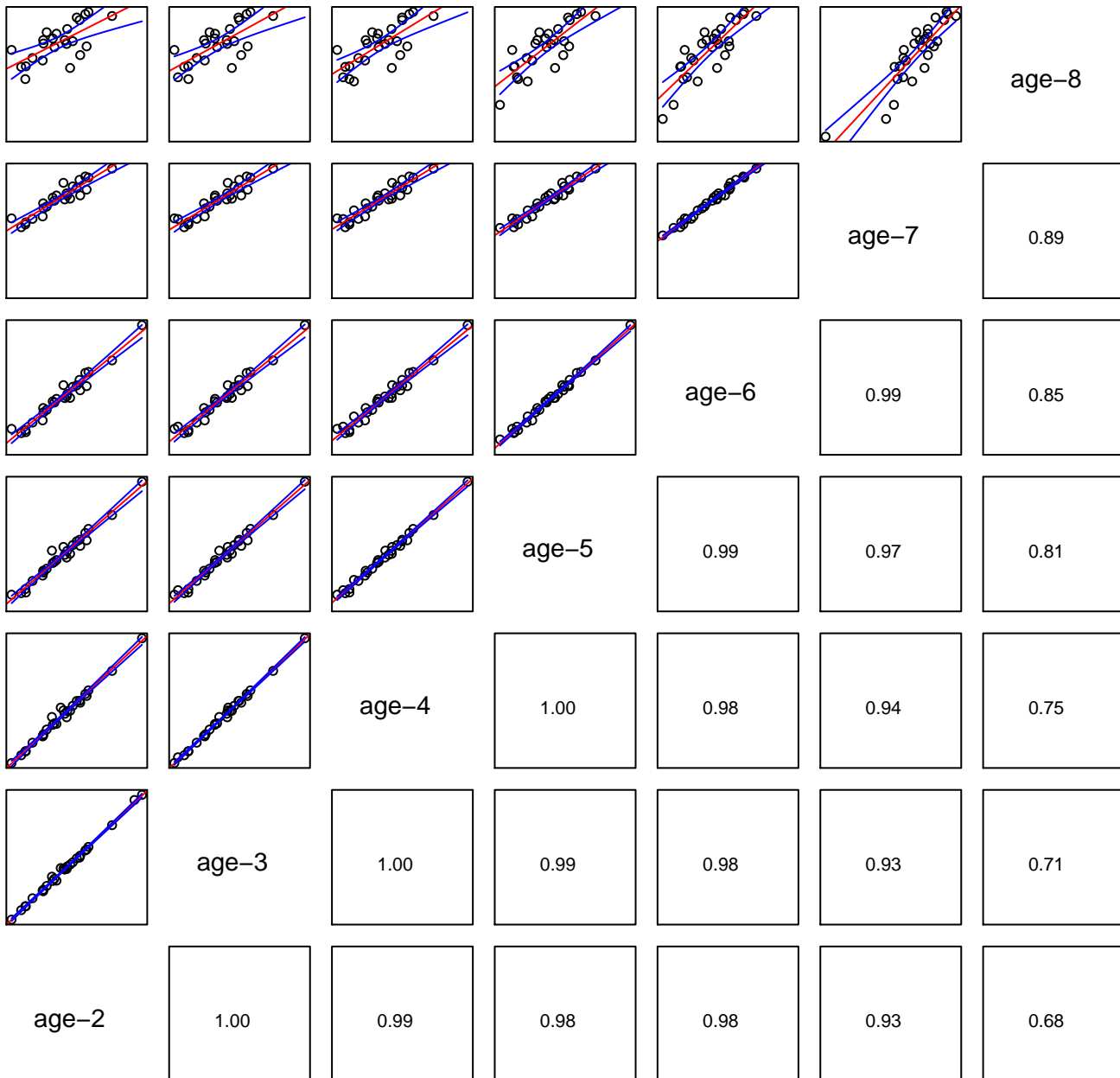
Index 1 Predicted

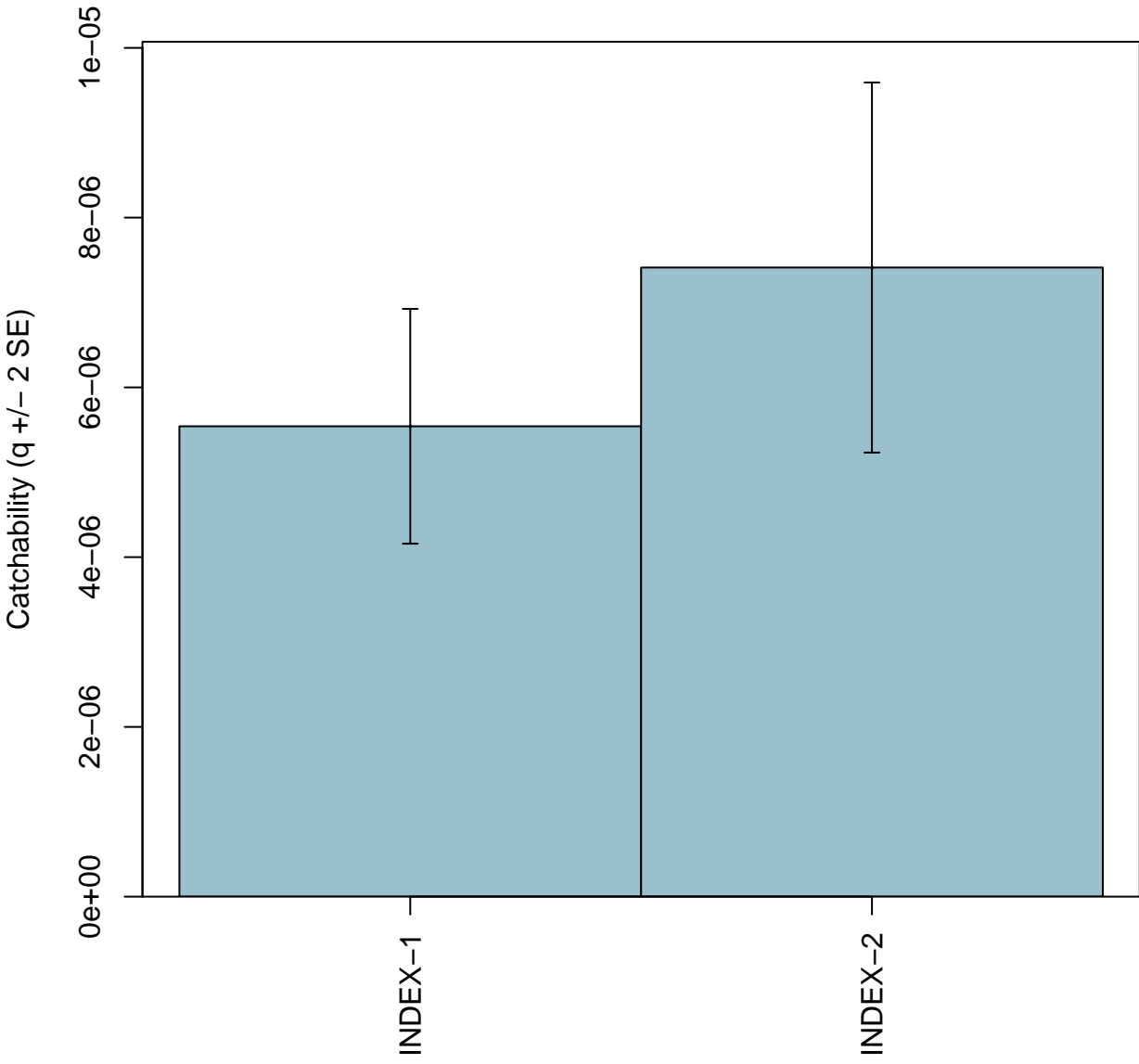


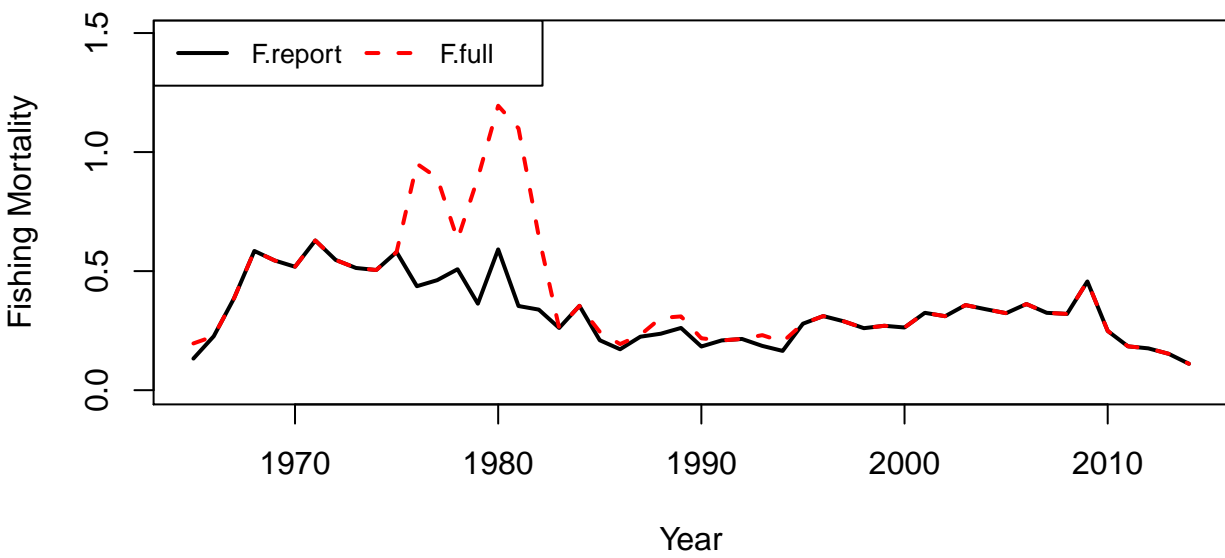
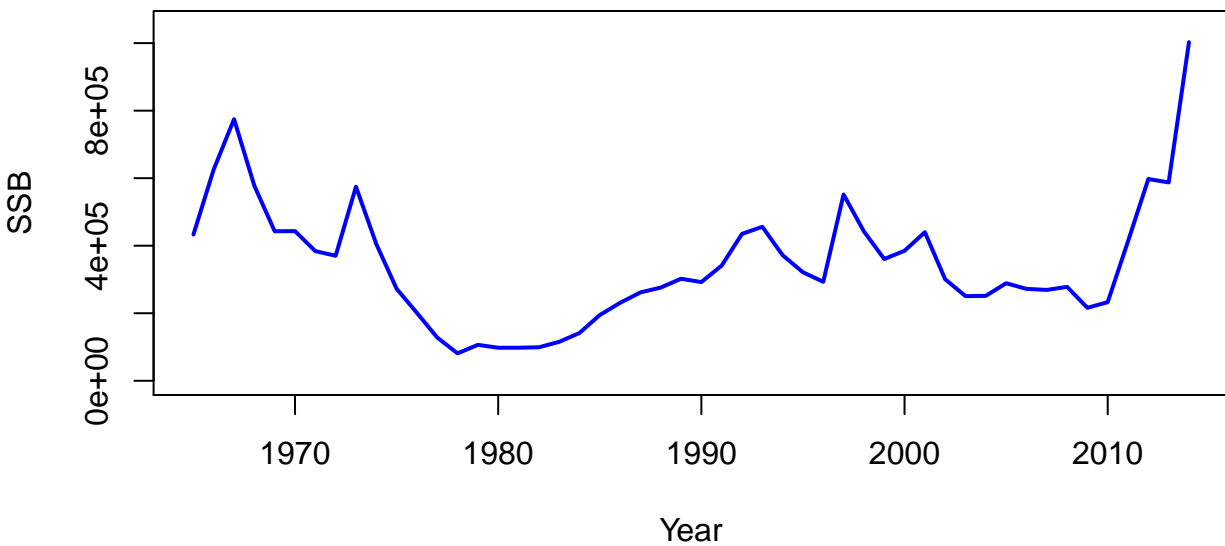
Index 2 Observed



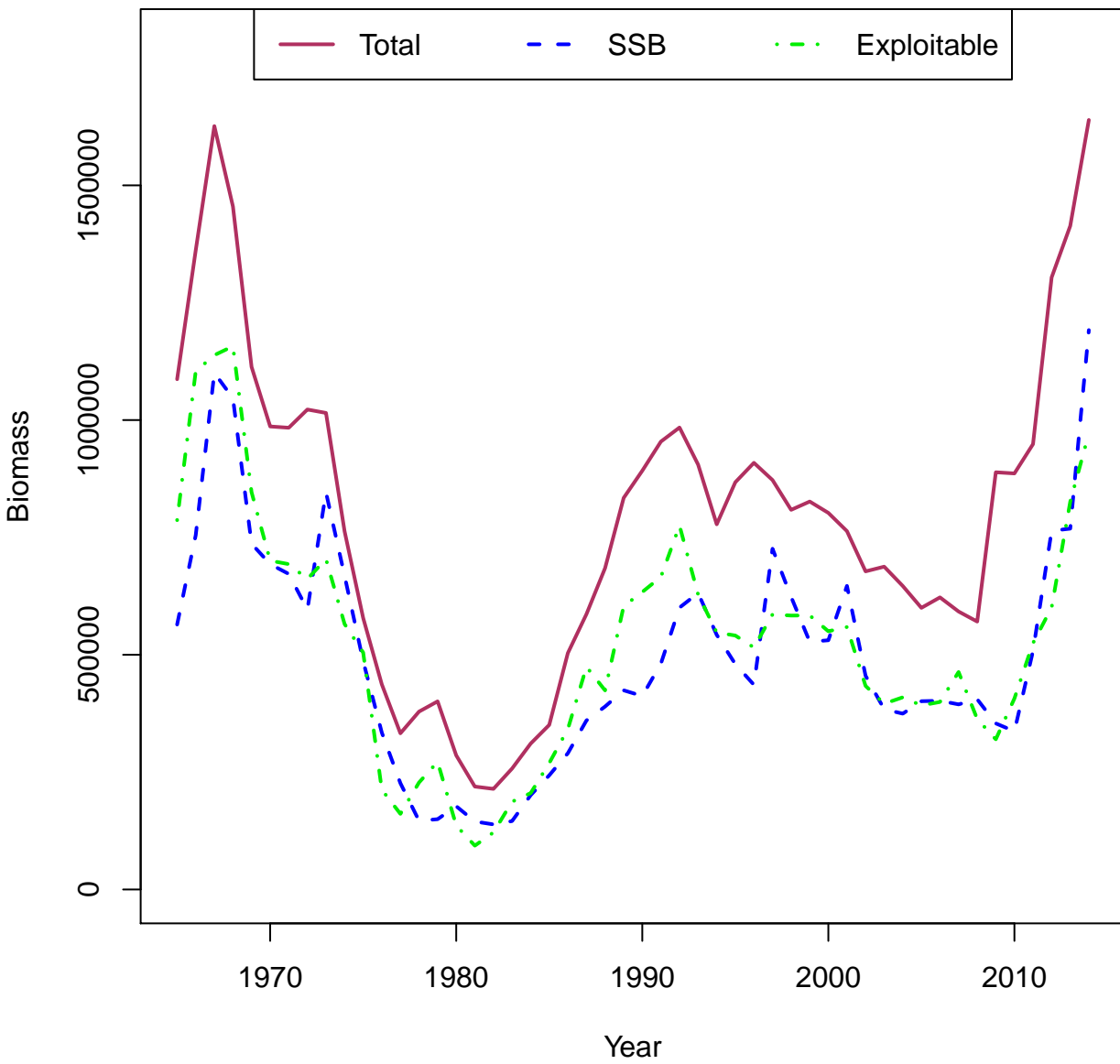
Index 2 Predicted



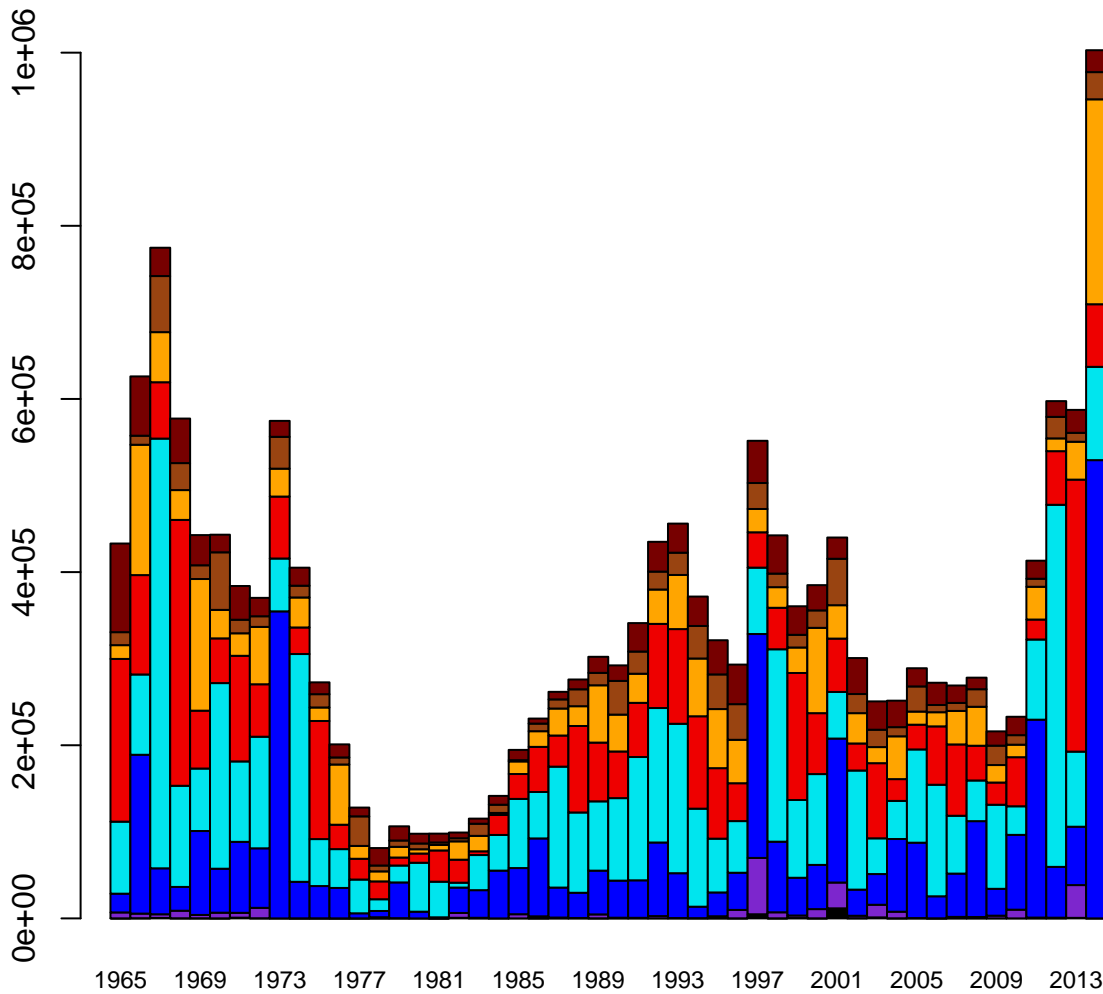




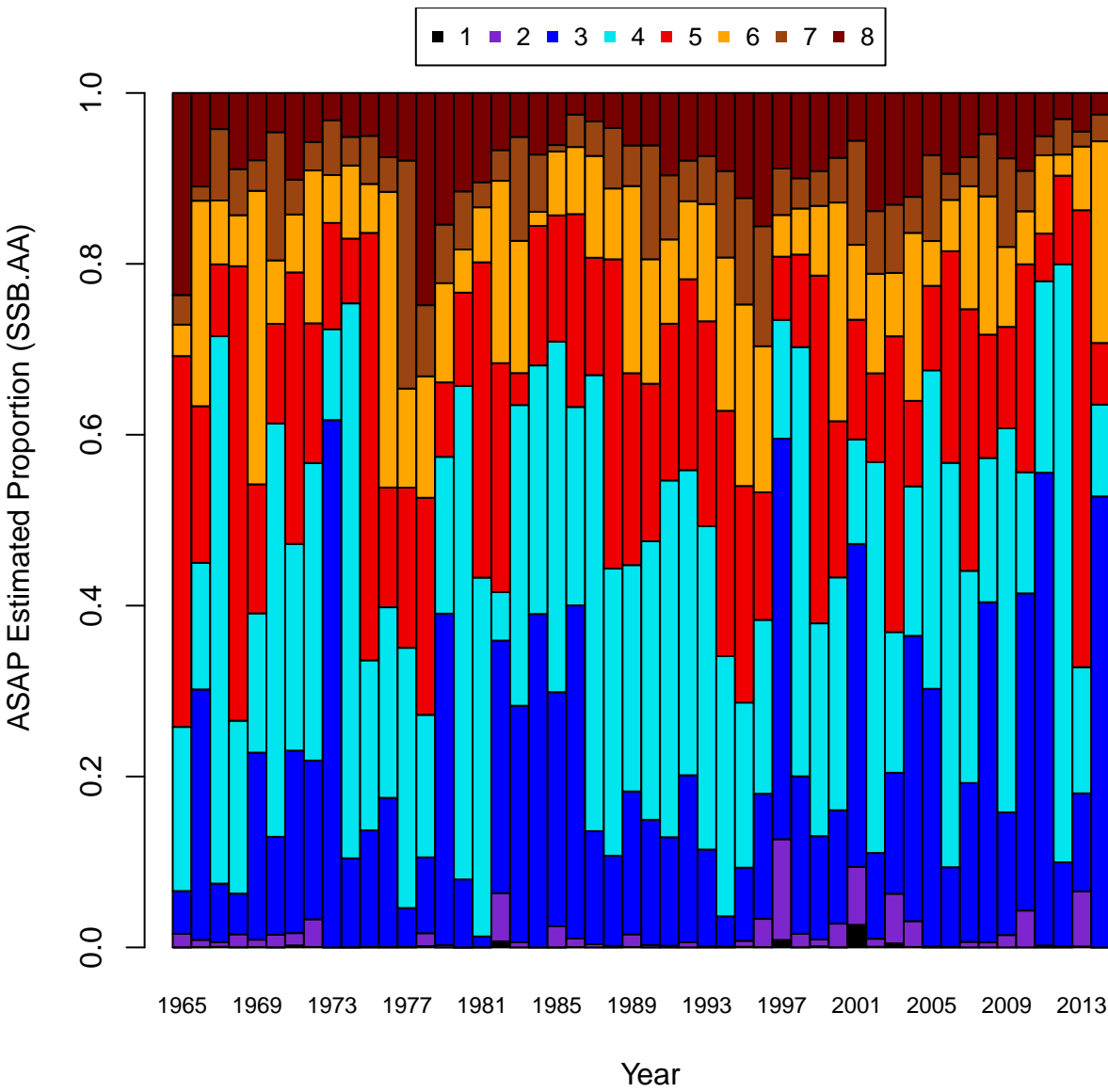
Comparison of January 1 Biomass

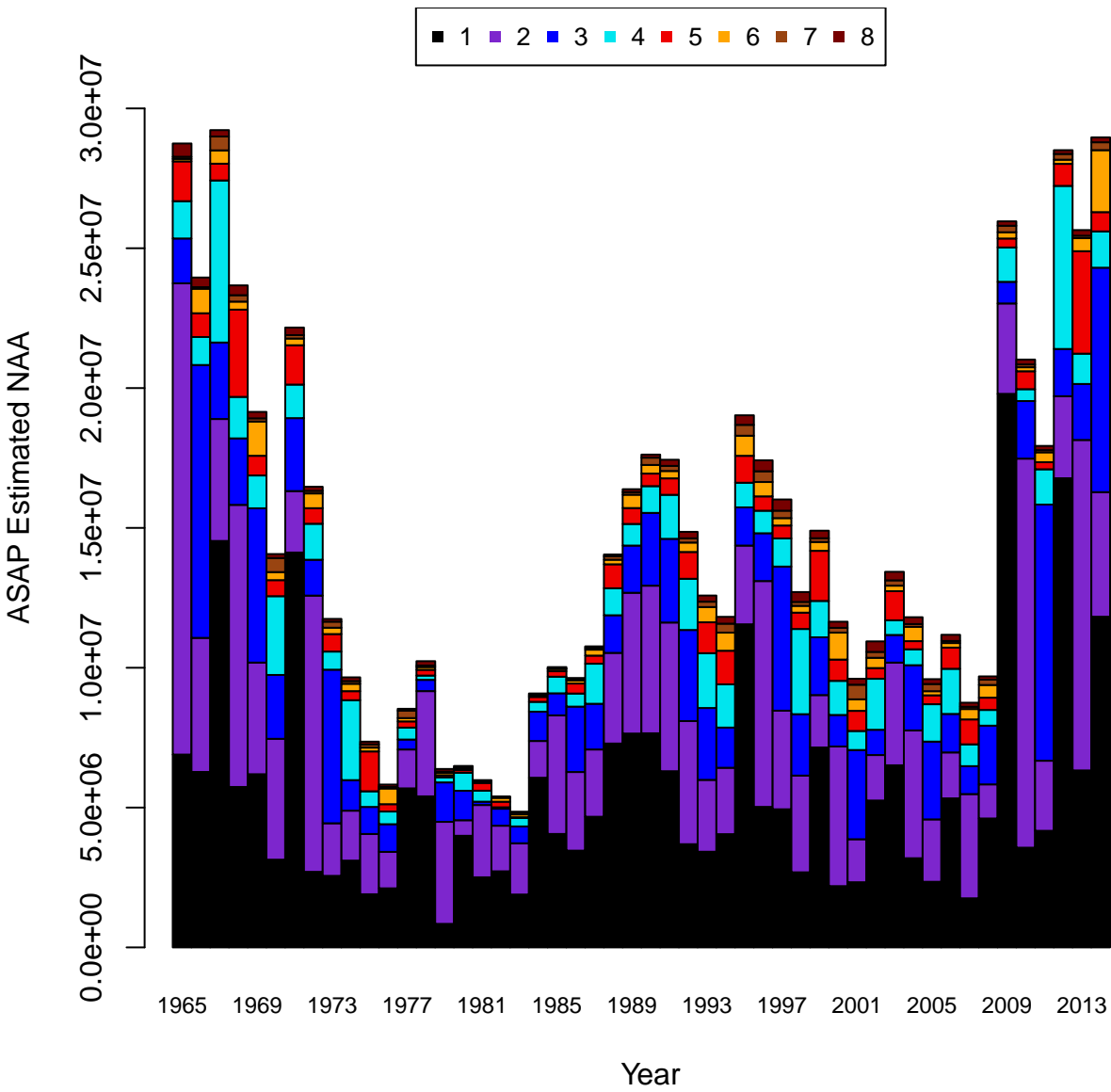


ASAP Estimated SSB.AA

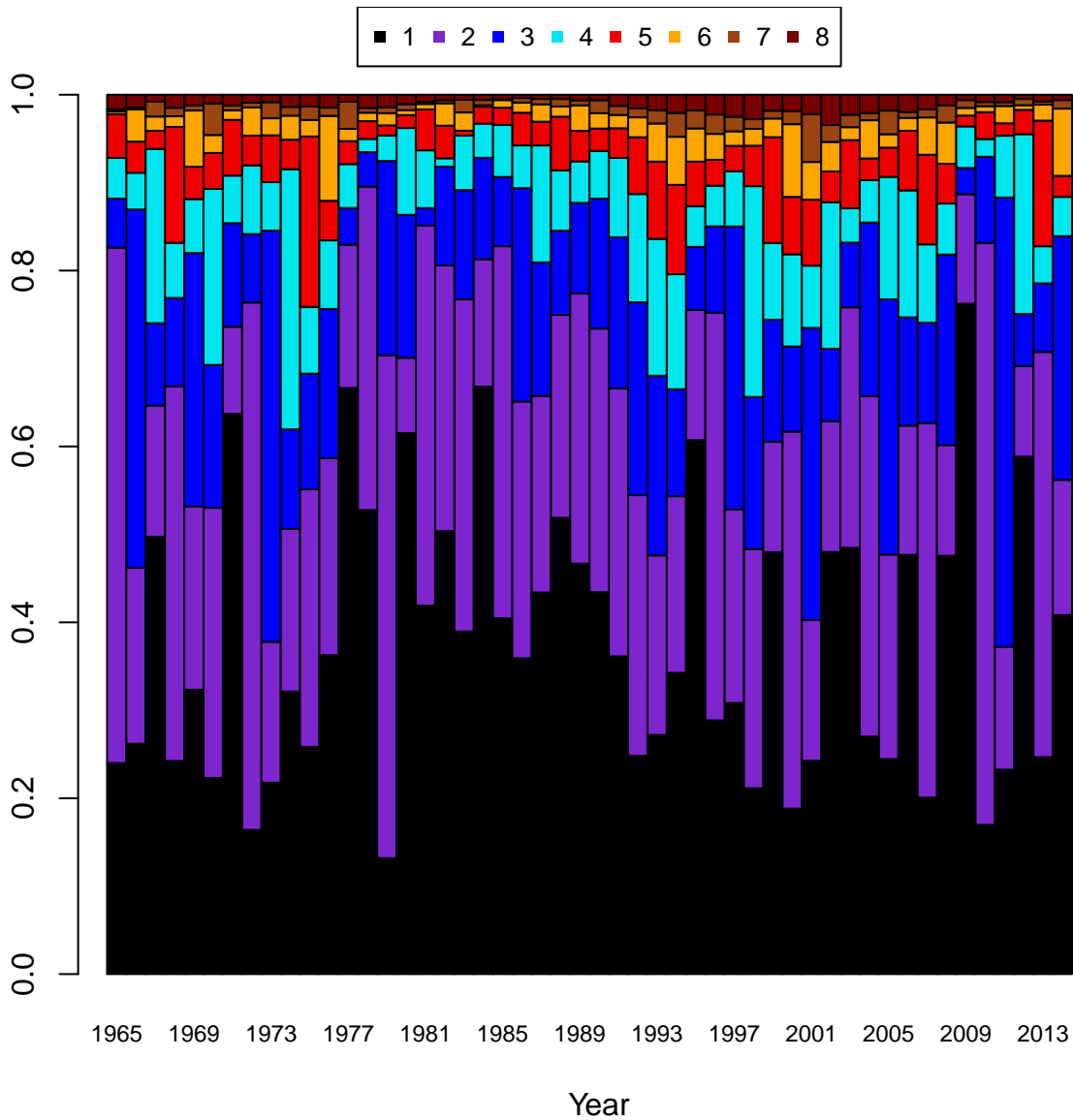


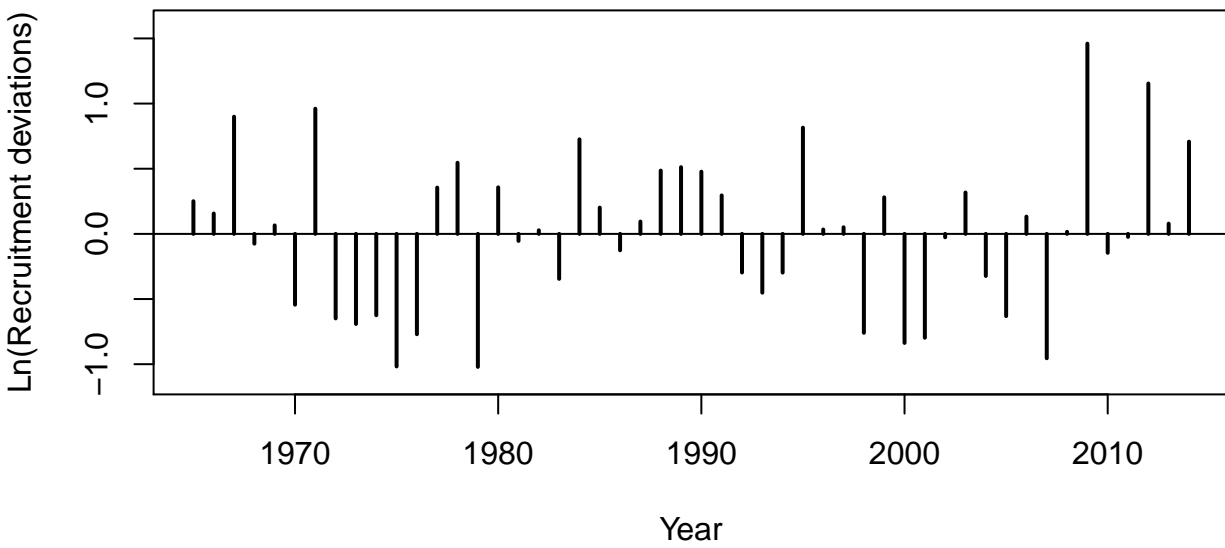
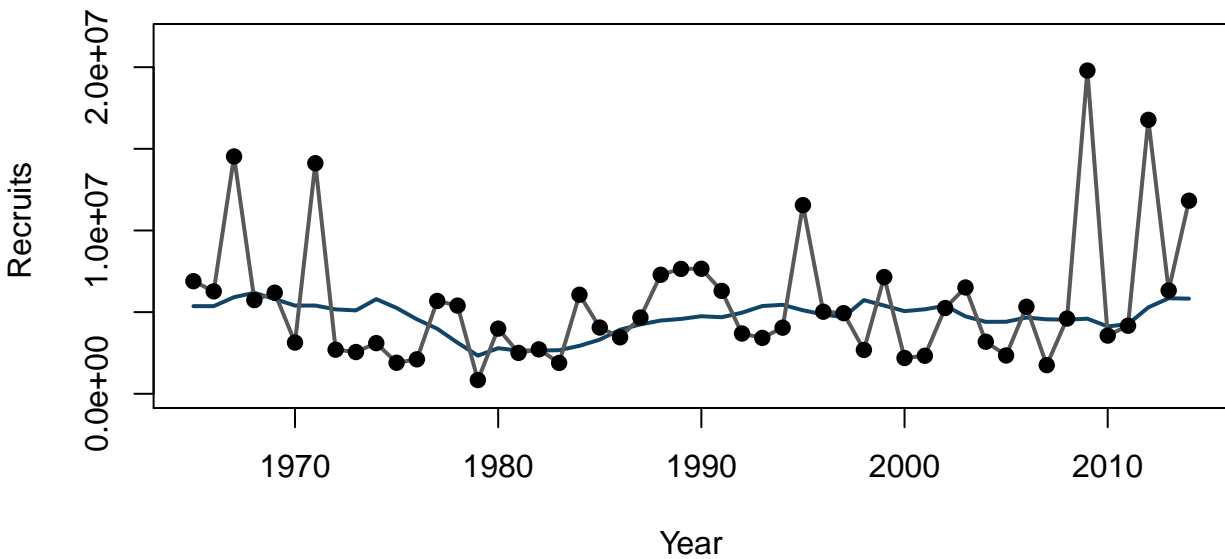
Year

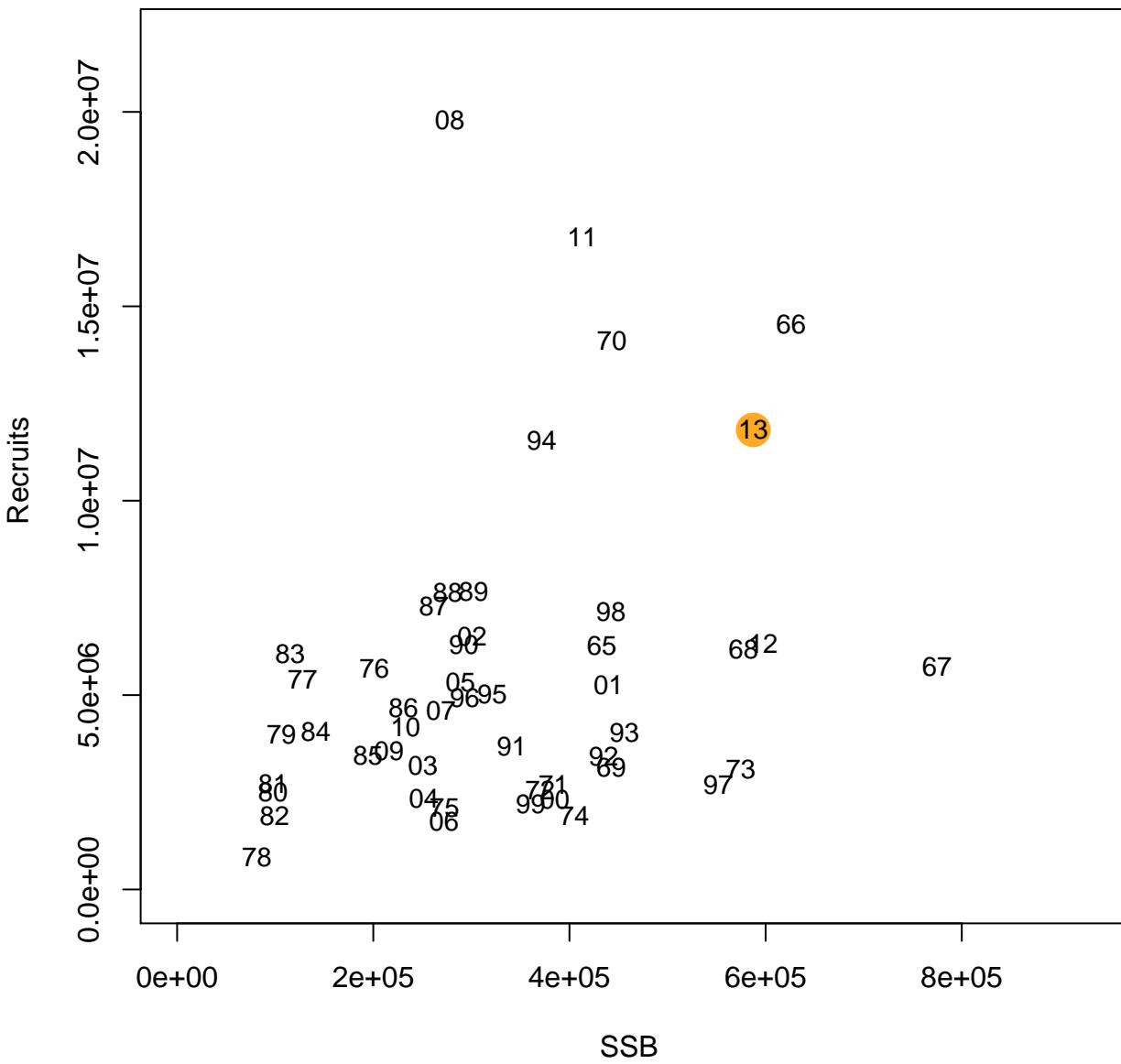


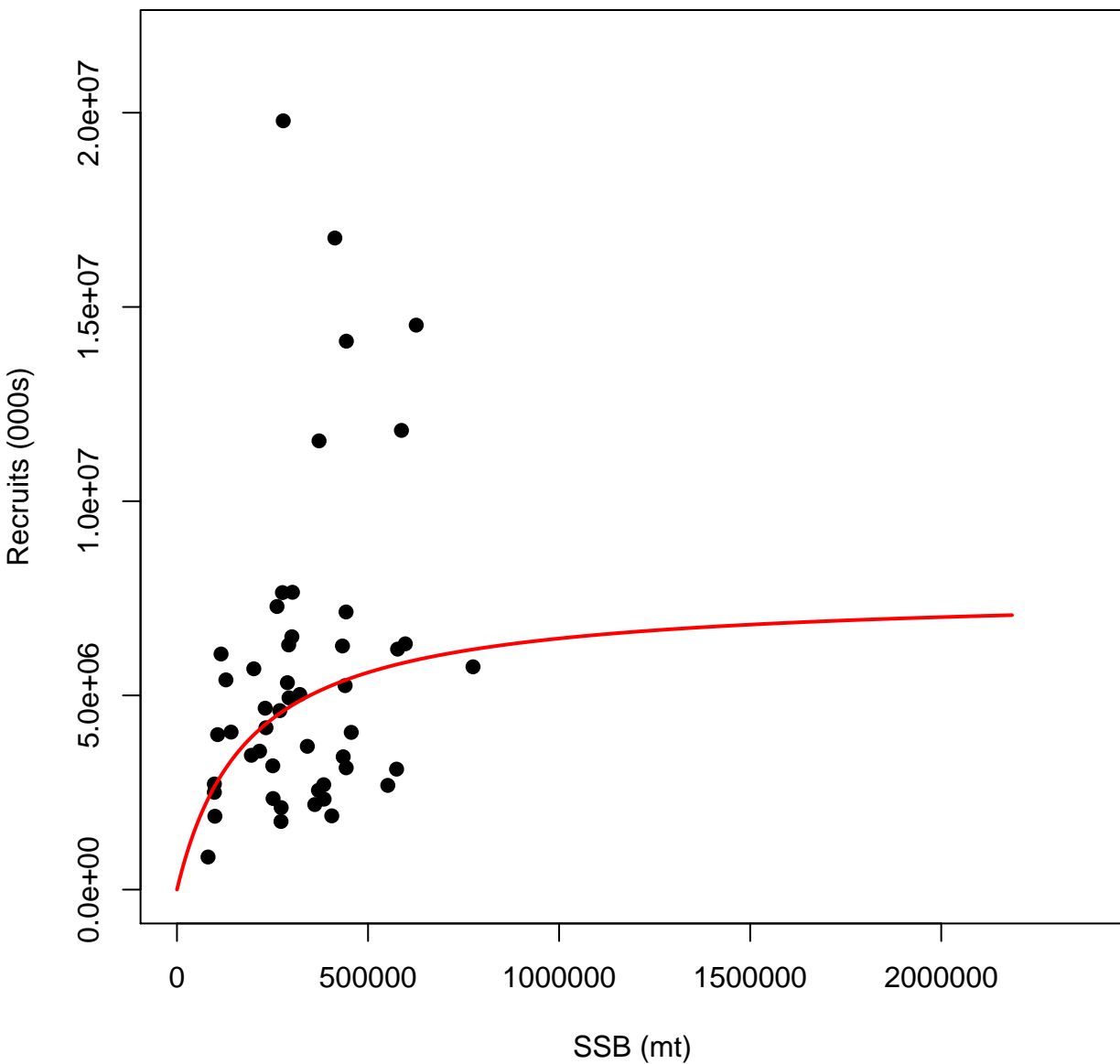


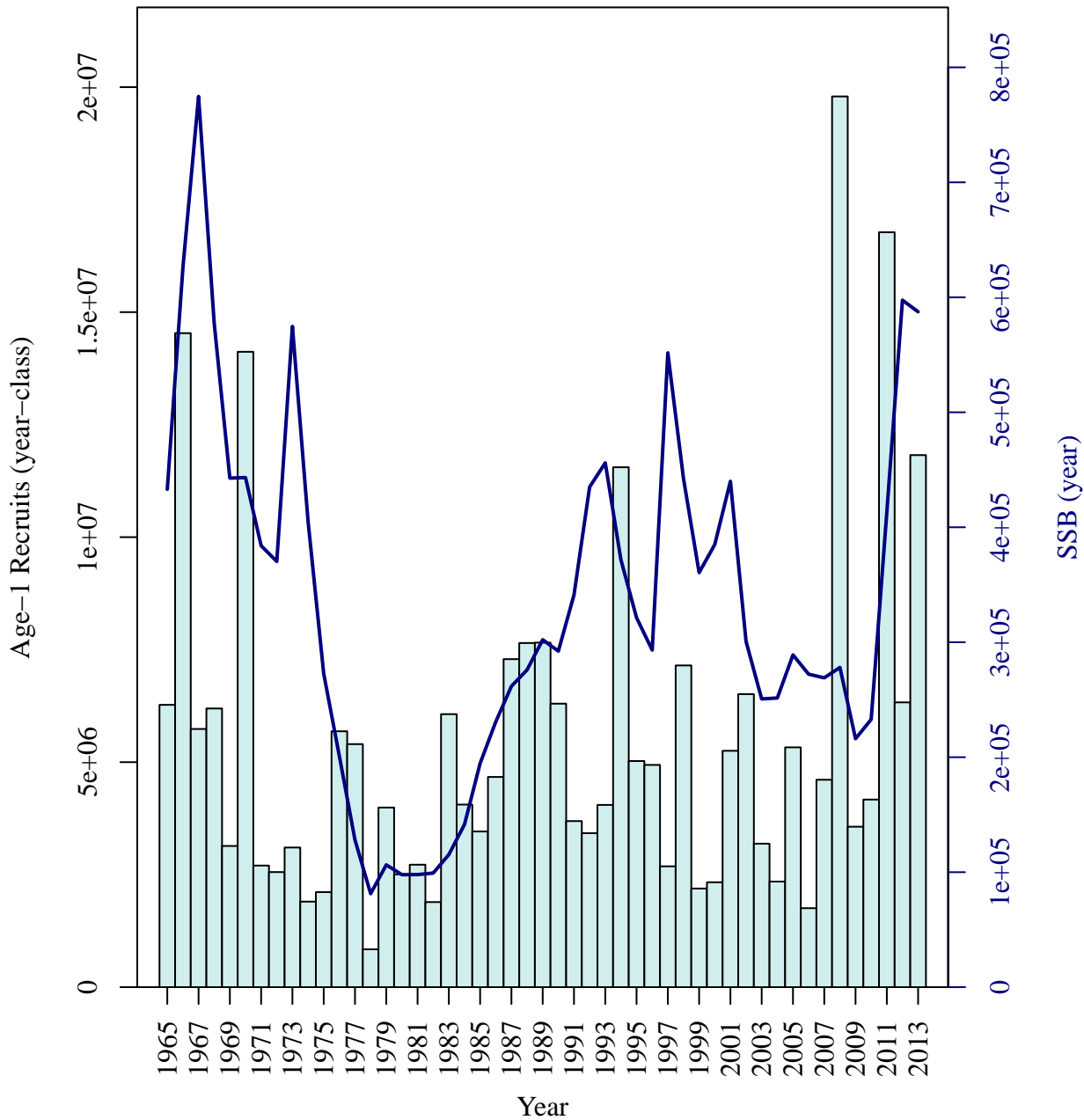
ASAP Estimated Proportion (NAA)



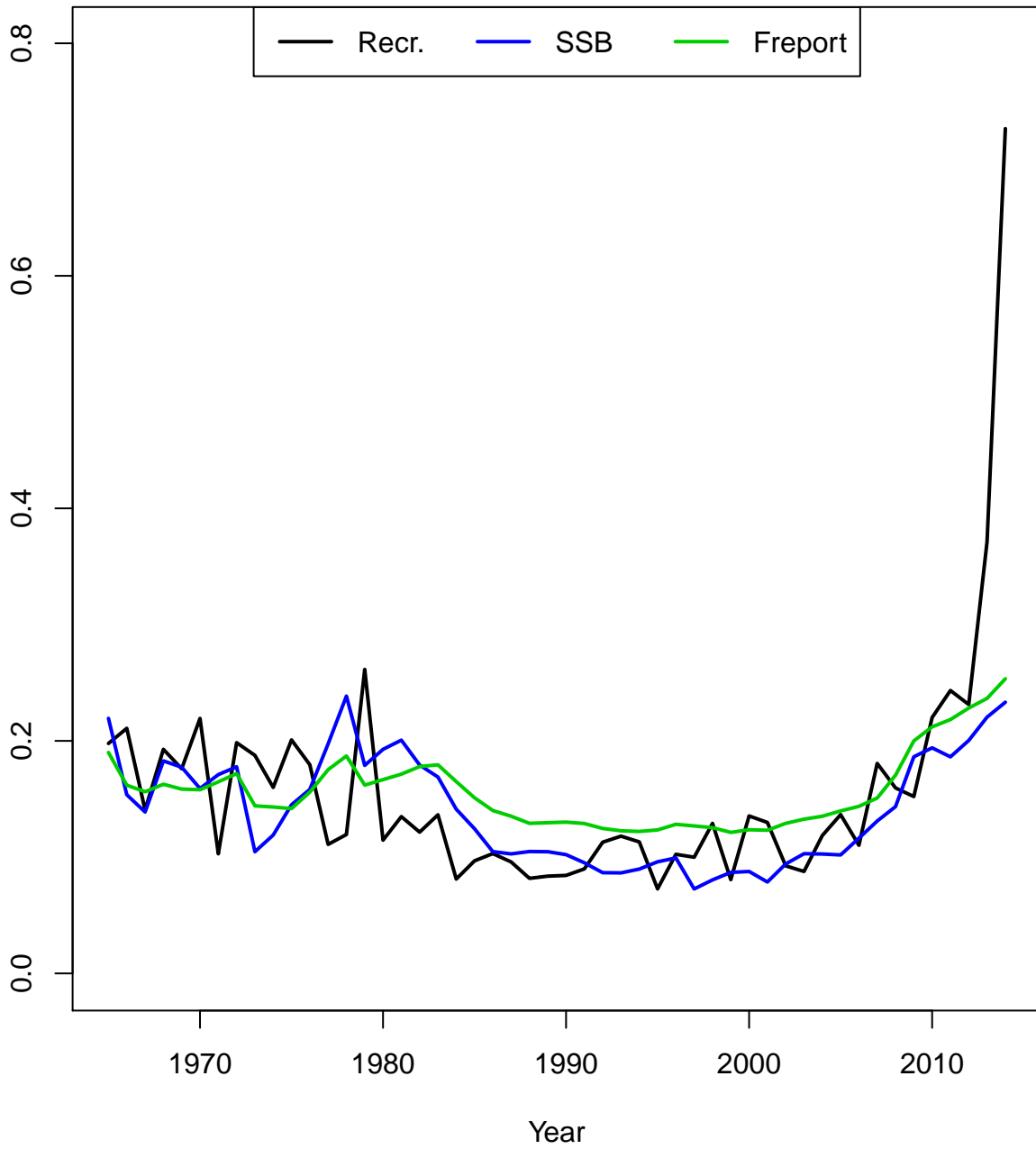




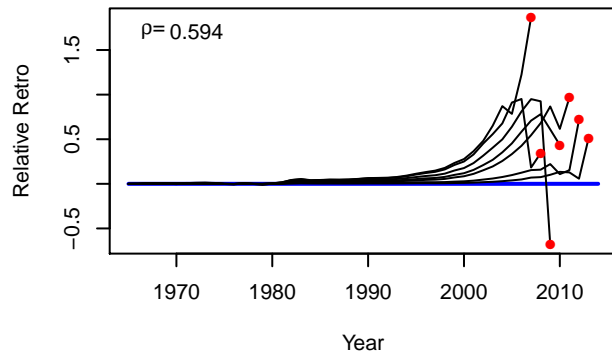
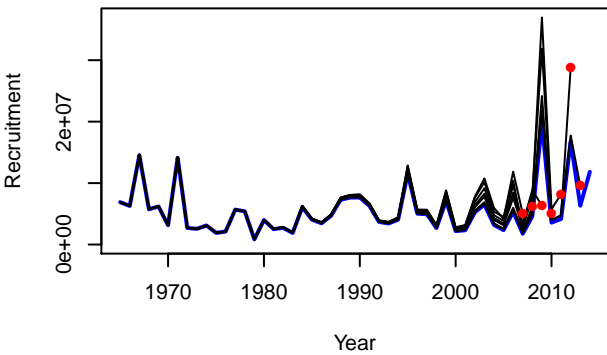
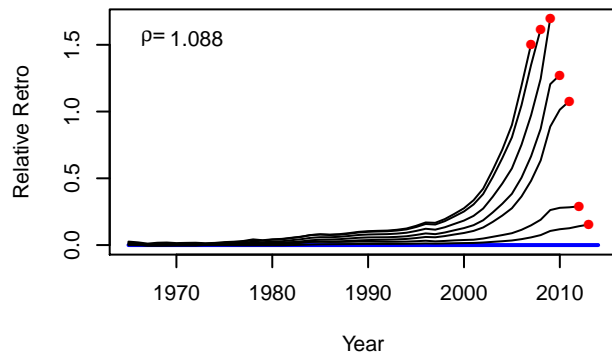
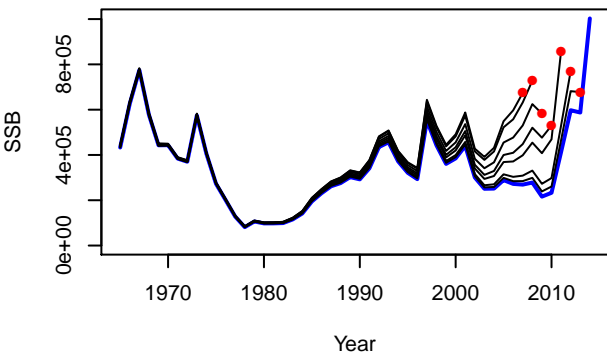
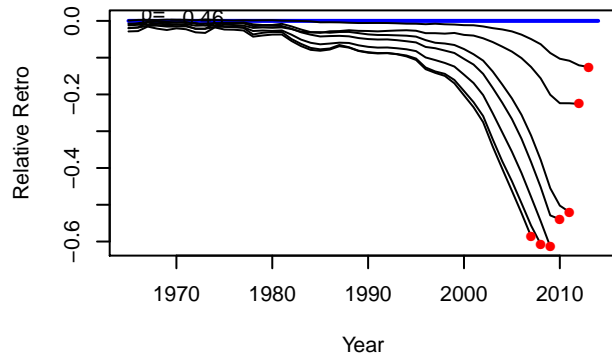
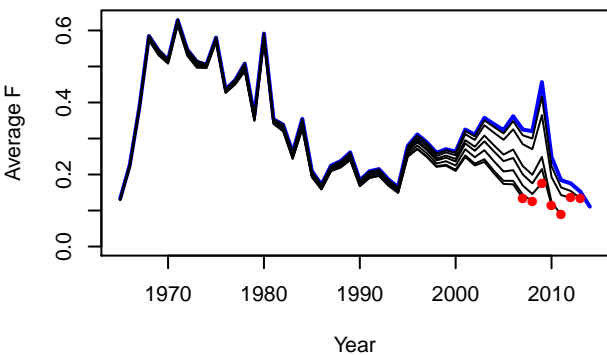




CV

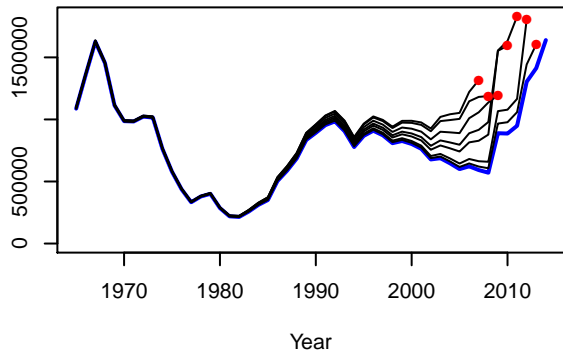


F, SSB, R

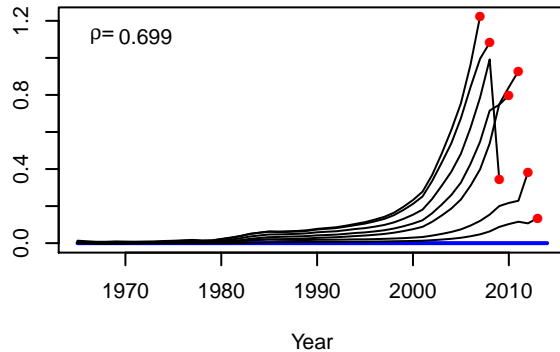


Jan-1 B, Exploitable B, Total Stock N

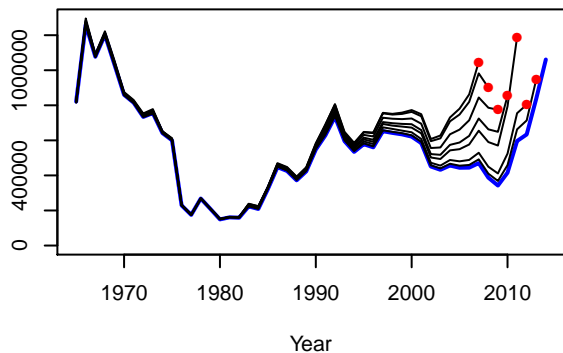
Jan-1 B



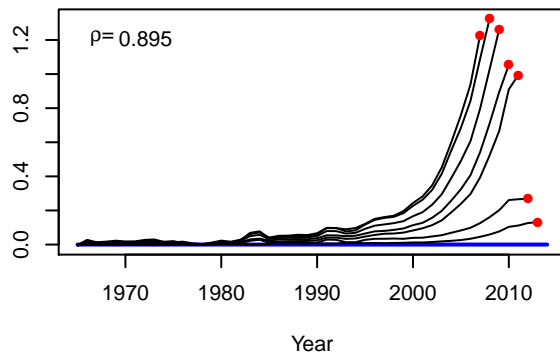
Relative Retro



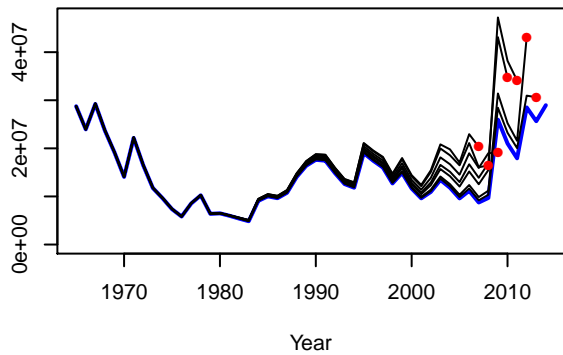
Exploitable B



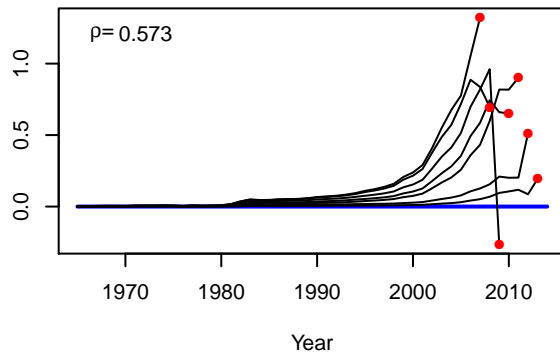
Relative Retro



Total Stock N

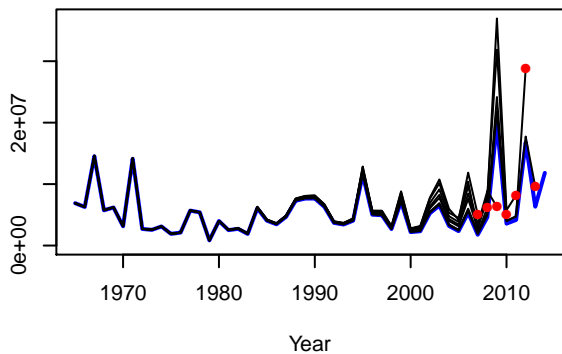


Relative Retro

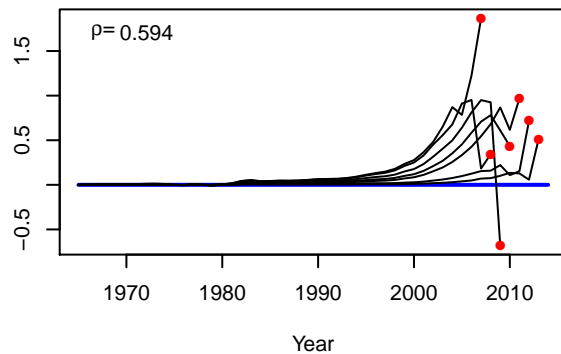


Stock Numbers at Age

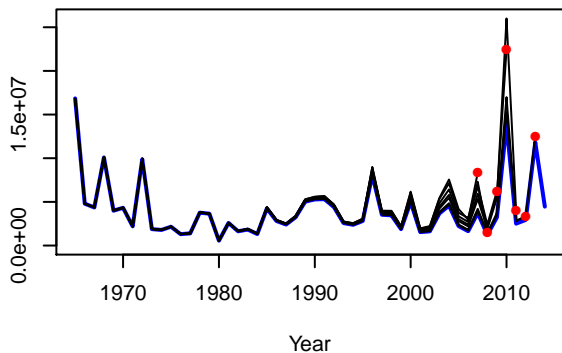
N at Age 1



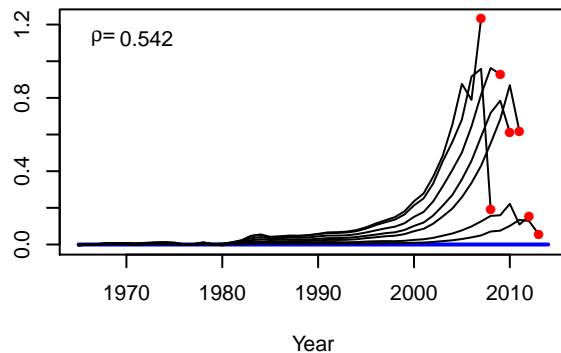
Relative Retro



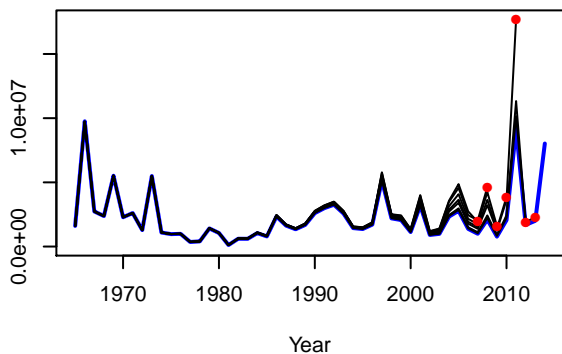
N at Age 2



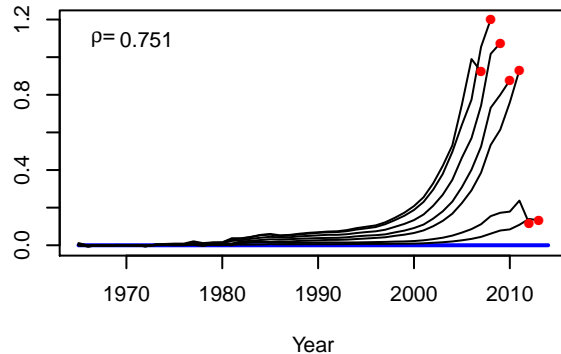
Relative Retro



N at Age 3

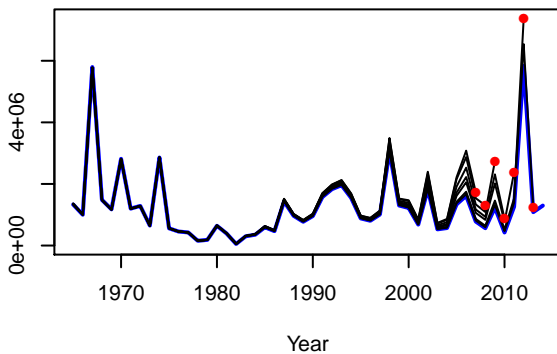


Relative Retro

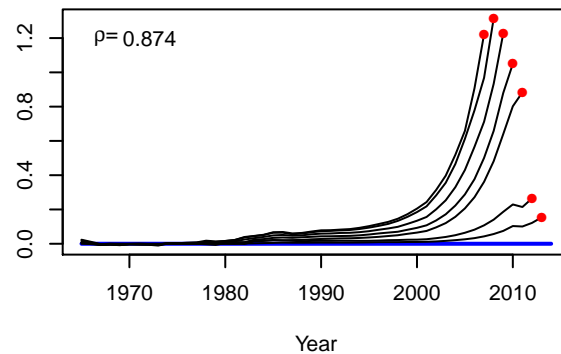


Stock Numbers at Age

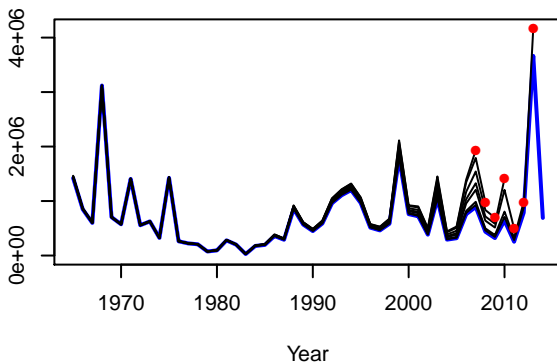
N at Age 4



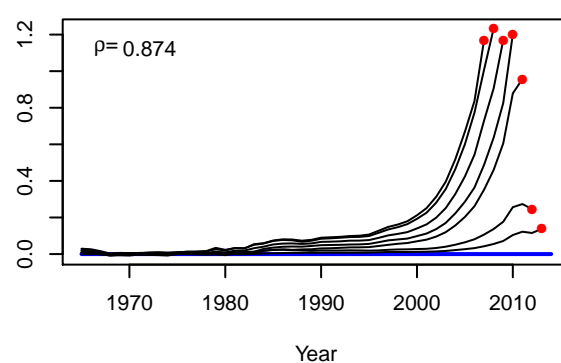
Relative Retro



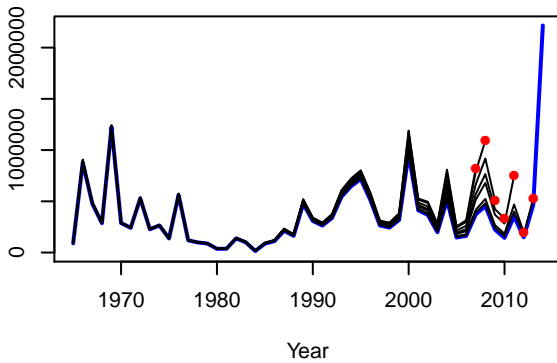
N at Age 5



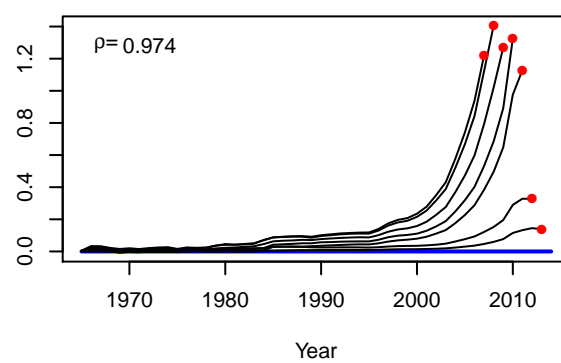
Relative Retro



N at Age 6

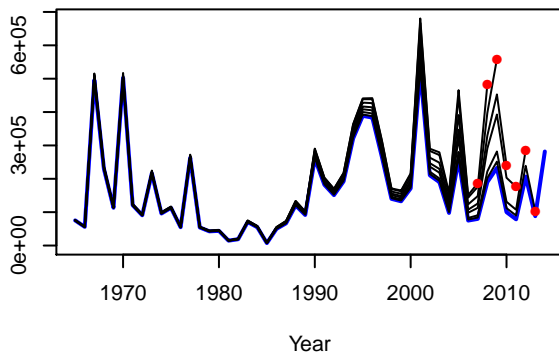


Relative Retro

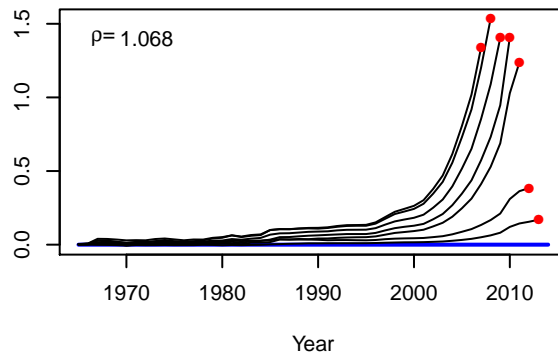


Stock Numbers at Age

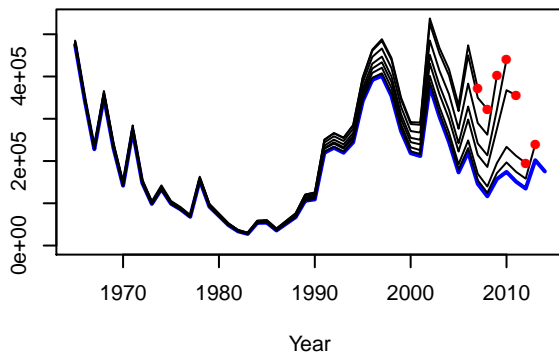
N at Age 7



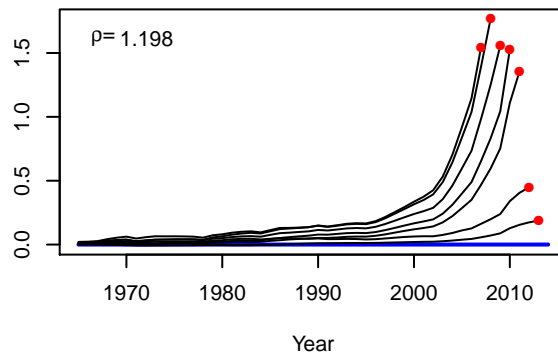
Relative Retro



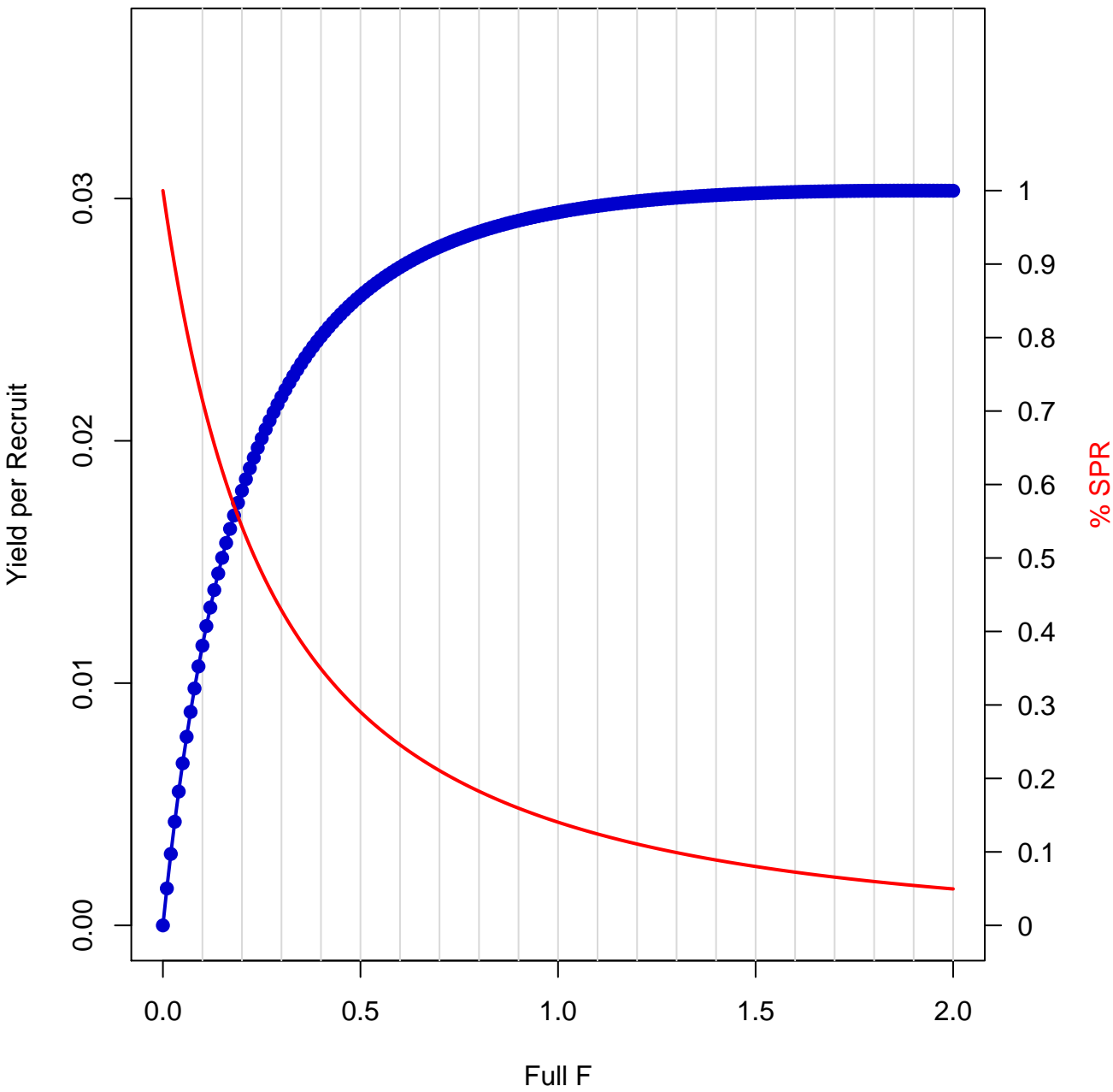
N at Age 8



Relative Retro



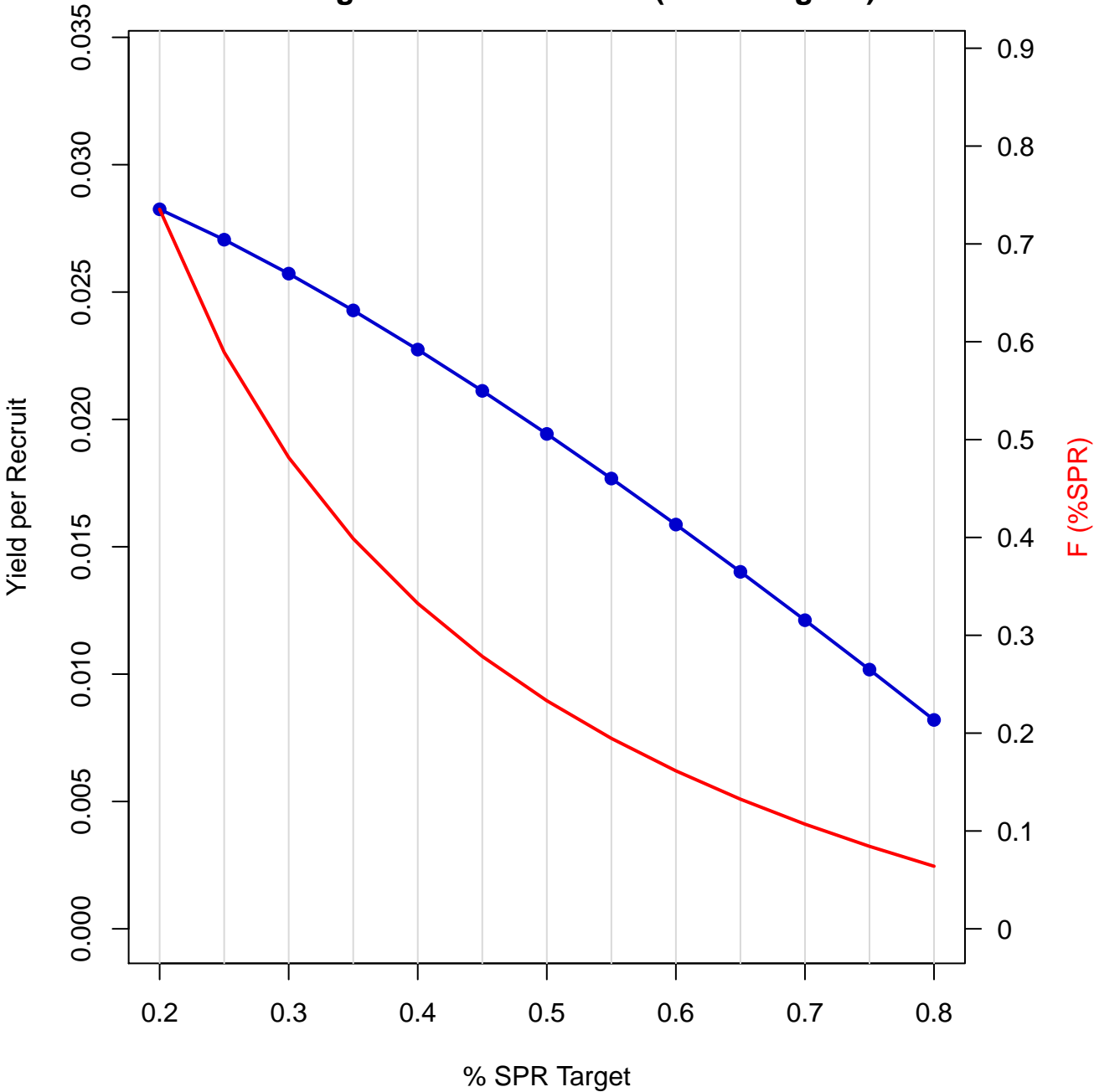
YPR-SPR Reference Points (Years Avg = 5)



YPR–SPR Reference Points (Years Avg = 5)

F	YPR	SPR	F	YPR	SPR	F	YPR	SPR
0	0	1	0.35	0.0232	0.3858	0.7	0.028	0.2107
0.01	0.0015	0.9636	0.36	0.0234	0.378	0.71	0.0281	0.2076
0.02	0.0029	0.9293	0.37	0.0237	0.3704	0.72	0.0281	0.2045
0.03	0.0043	0.897	0.38	0.0239	0.3631	0.73	0.0282	0.2016
0.04	0.0055	0.8665	0.39	0.0241	0.356	0.74	0.0283	0.1987
0.05	0.0067	0.8377	0.4	0.0243	0.3492	0.75	0.0283	0.1958
0.06	0.0078	0.8105	0.41	0.0245	0.3425	0.76	0.0284	0.1931
0.07	0.0088	0.7846	0.42	0.0247	0.336	0.77	0.0285	0.1903
0.08	0.0098	0.7602	0.43	0.0249	0.3297	0.78	0.0285	0.1877
0.09	0.0107	0.7369	0.44	0.0251	0.3236	0.79	0.0286	0.1851
0.1	0.0115	0.7148	0.45	0.0252	0.3177	0.8	0.0286	0.1825
0.11	0.0124	0.6938	0.46	0.0254	0.312	0.81	0.0287	0.18
0.12	0.0131	0.6737	0.47	0.0255	0.3064	0.82	0.0287	0.1775
0.13	0.0138	0.6546	0.48	0.0257	0.3009	0.83	0.0288	0.1751
0.14	0.0145	0.6364	0.49	0.0258	0.2956	0.84	0.0288	0.1728
0.15	0.0152	0.619	0.5	0.026	0.2905	0.85	0.0289	0.1705
0.16	0.0158	0.6024	0.51	0.0261	0.2855	0.86	0.0289	0.1682
0.17	0.0164	0.5864	0.52	0.0263	0.2806	0.87	0.029	0.1659
0.18	0.0169	0.5712	0.53	0.0264	0.2758	0.88	0.029	0.1638
0.19	0.0174	0.5566	0.54	0.0265	0.2712	0.89	0.029	0.1616
0.2	0.0179	0.5426	0.55	0.0266	0.2667	0.9	0.0291	0.1595
0.21	0.0184	0.5291	0.56	0.0267	0.2623	0.91	0.0291	0.1574
0.22	0.0189	0.5162	0.57	0.0269	0.258	0.92	0.0292	0.1554
0.23	0.0193	0.5038	0.58	0.027	0.2538	0.93	0.0292	0.1534
0.24	0.0197	0.4919	0.59	0.0271	0.2497	0.94	0.0292	0.1515
0.25	0.0201	0.4804	0.6	0.0272	0.2457	0.95	0.0293	0.1495
0.26	0.0205	0.4693	0.61	0.0273	0.2418	0.96	0.0293	0.1476
0.27	0.0208	0.4587	0.62	0.0274	0.2381	0.97	0.0293	0.1458
0.28	0.0212	0.4484	0.63	0.0274	0.2343	0.98	0.0294	0.144
0.29	0.0215	0.4385	0.64	0.0275	0.2307	0.99	0.0294	0.1422
0.3	0.0218	0.4289	0.65	0.0276	0.2272	1	0.0294	0.1404
0.31	0.0221	0.4197	0.66	0.0277	0.2237	1.01	0.0295	0.1387
0.32	0.0224	0.4108	0.67	0.0278	0.2203	1.02	0.0295	0.137
0.33	0.0227	0.4022	0.68	0.0279	0.217	1.03	0.0295	0.1353
0.34	0.0229	0.3939	0.69	0.0279	0.2138	1.04	0.0295	0.1337

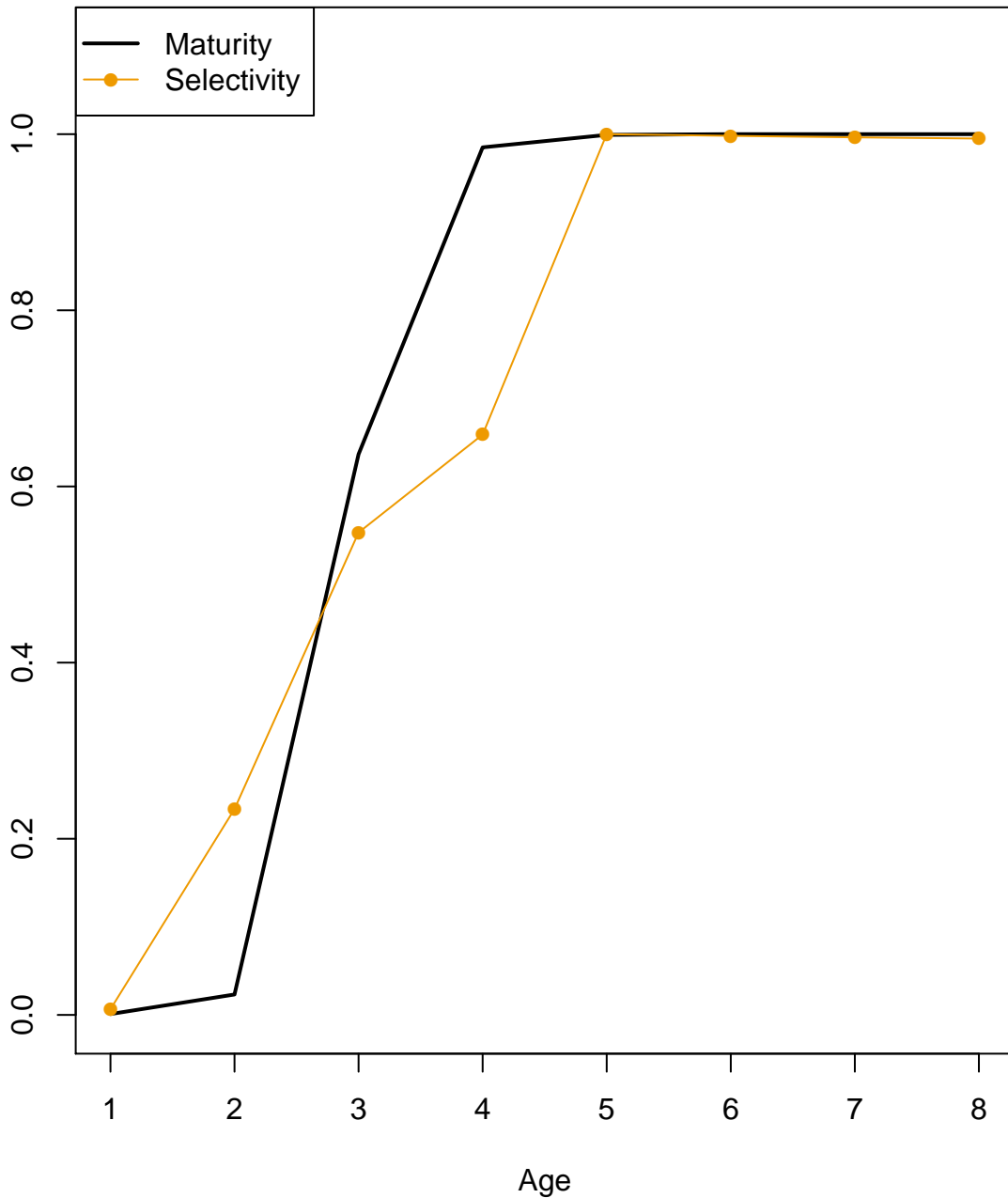
SPR Target Reference Points (Years Avg = 5)



SPR Target Reference Points (Years Avg = 5)

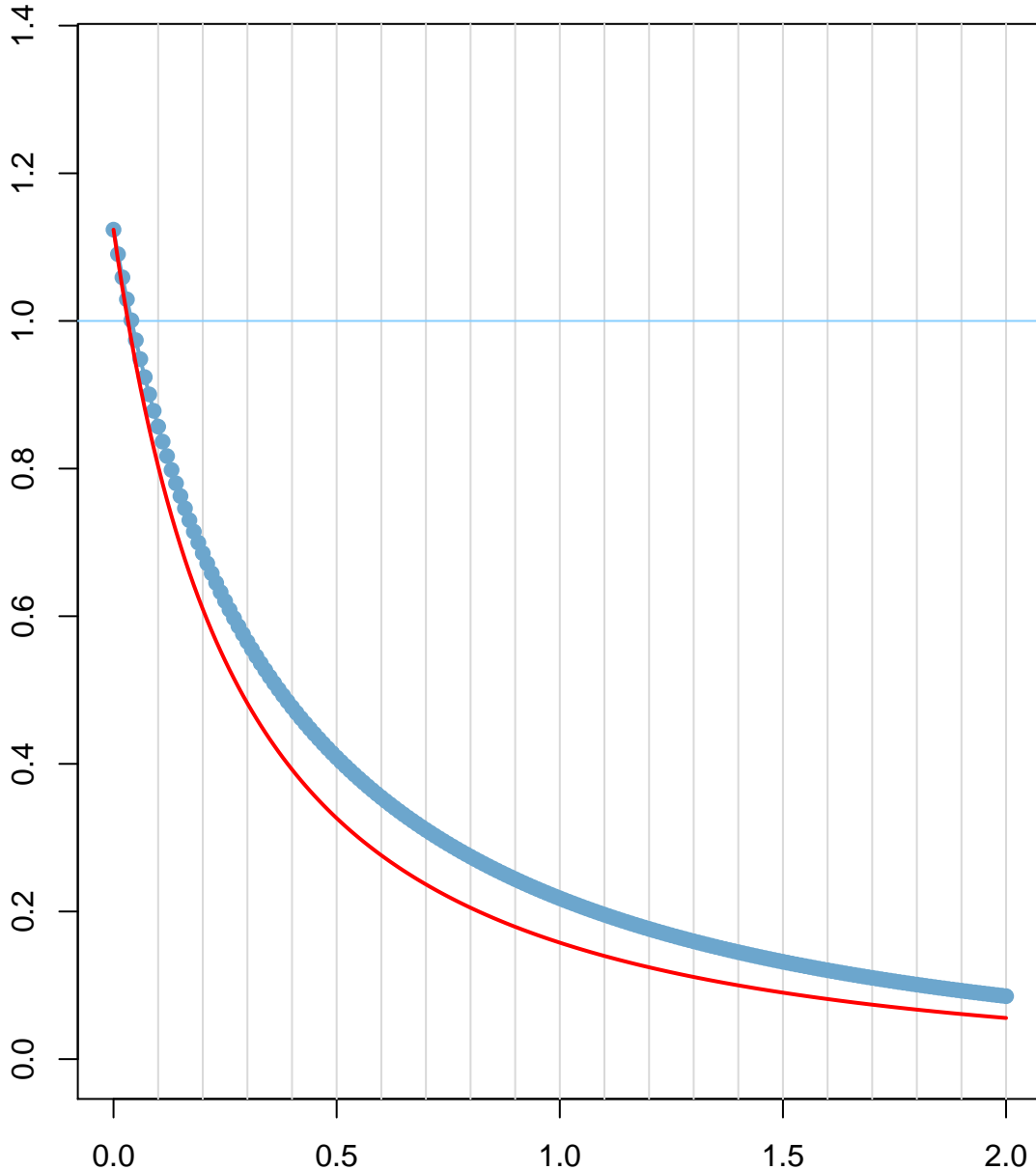
% SPR	F(%SPR)	YPR
0.2	0.7354	0.0283
0.25	0.5893	0.0271
0.3	0.4817	0.0257
0.35	0.3988	0.0243
0.4	0.3326	0.0227
0.45	0.2784	0.0211
0.5	0.2331	0.0194
0.55	0.1946	0.0177
0.6	0.1615	0.0159
0.65	0.1325	0.014
0.7	0.107	0.0121
0.75	0.0843	0.0102
0.8	0.064	0.0082

Selectivity or Maturity at age



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

Expected Spawnings



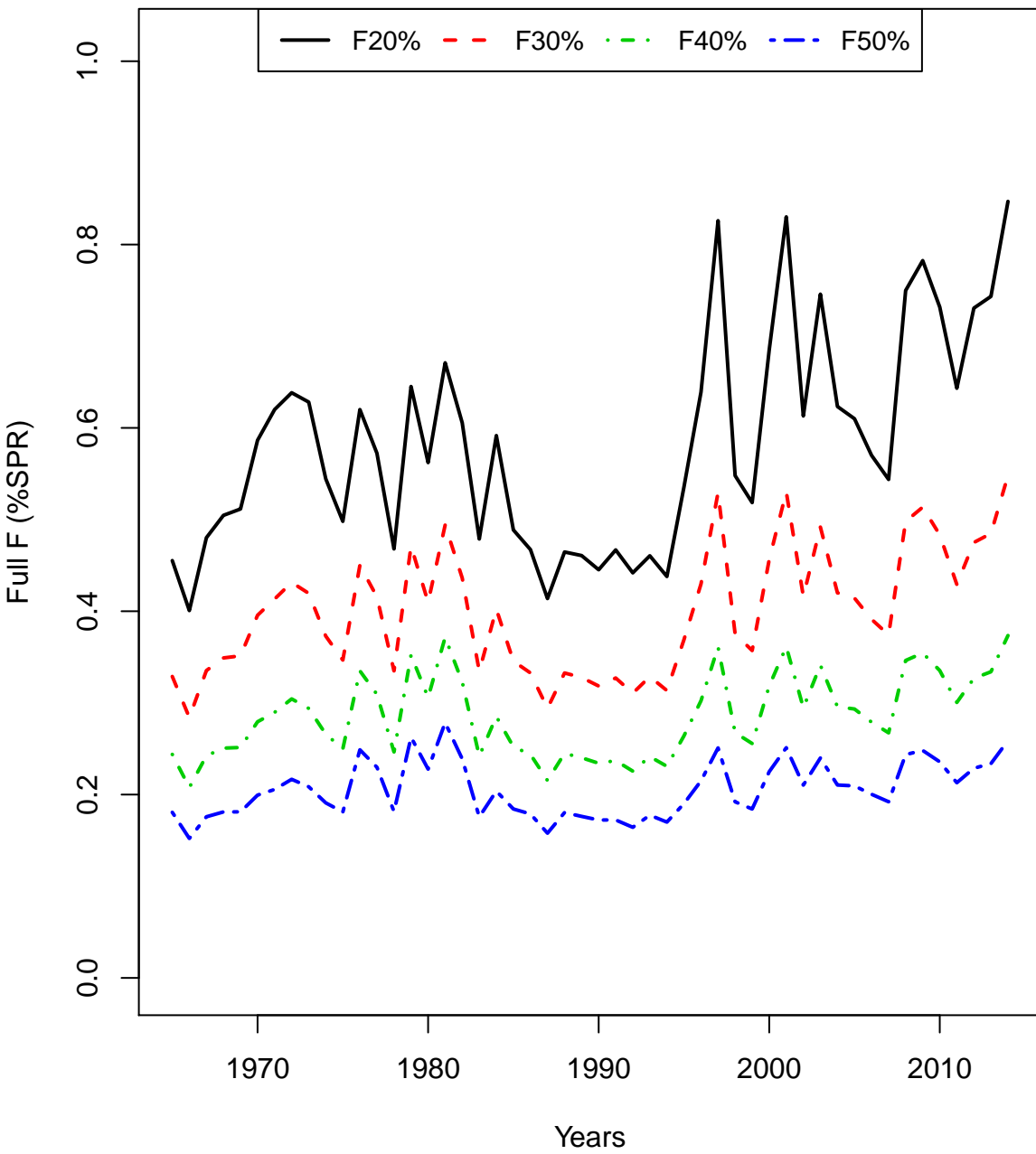
% SPR

Full F

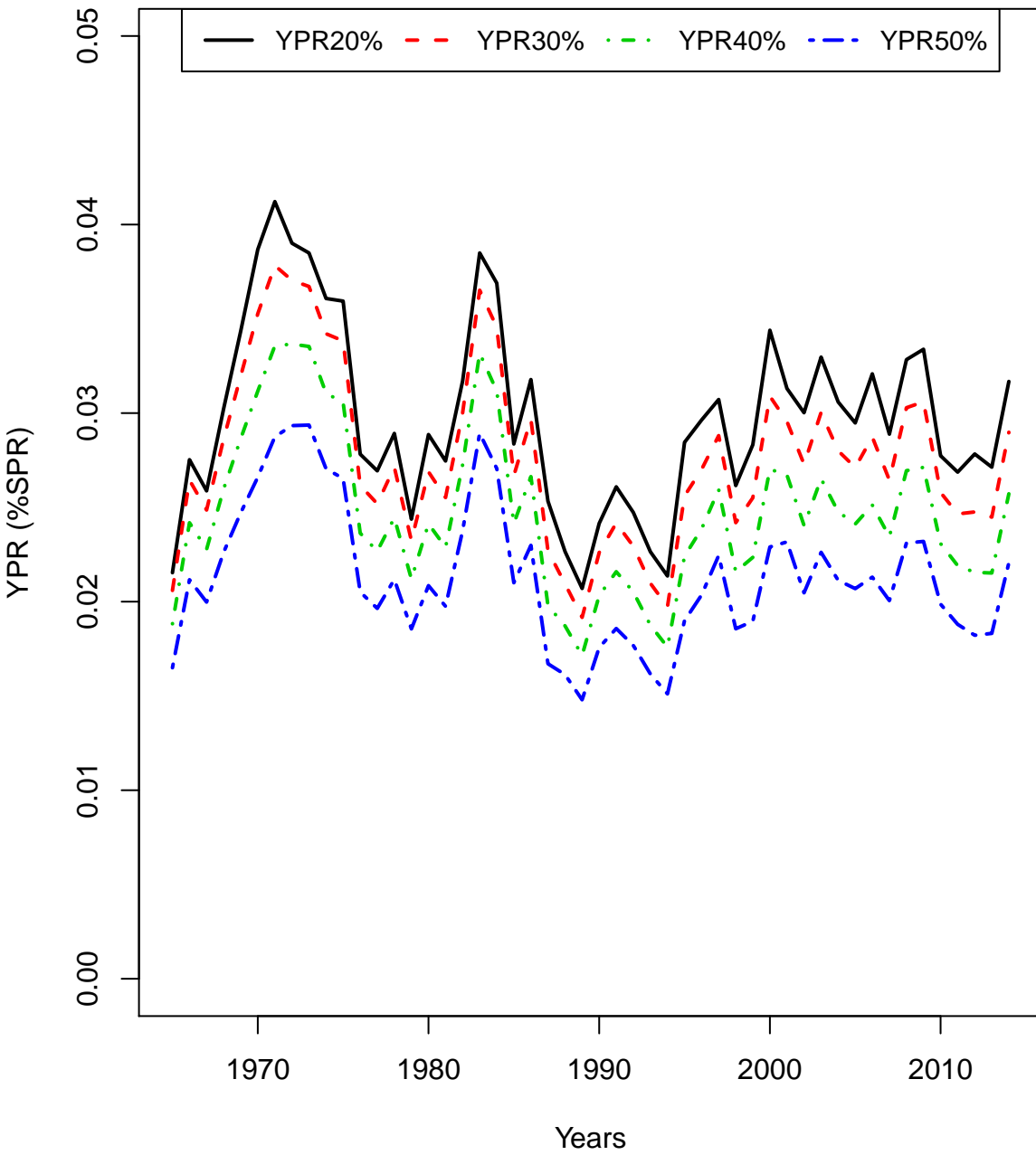
Expected Spawnings & SPR Reference Points (Years Avg = 5)

F	E[Sp]	SPR	F	E[Sp]	SPR	F	E[Sp]	SPR
0	1.1237	1	0.35	0.5181	0.3858	0.7	0.3106	0.2107
0.01	1.0905	0.9636	0.36	0.5094	0.378	0.71	0.3067	0.2076
0.02	1.059	0.9293	0.37	0.5009	0.3704	0.72	0.3028	0.2045
0.03	1.0292	0.897	0.38	0.4927	0.3631	0.73	0.299	0.2016
0.04	1.0009	0.8665	0.39	0.4846	0.356	0.74	0.2953	0.1987
0.05	0.974	0.8377	0.4	0.4768	0.3492	0.75	0.2916	0.1958
0.06	0.9483	0.8105	0.41	0.4692	0.3425	0.76	0.288	0.1931
0.07	0.9239	0.7846	0.42	0.4618	0.336	0.77	0.2845	0.1903
0.08	0.9006	0.7602	0.43	0.4546	0.3297	0.78	0.281	0.1877
0.09	0.8783	0.7369	0.44	0.4475	0.3236	0.79	0.2776	0.1851
0.1	0.8569	0.7148	0.45	0.4406	0.3177	0.8	0.2743	0.1825
0.11	0.8365	0.6938	0.46	0.4339	0.312	0.81	0.271	0.18
0.12	0.8169	0.6737	0.47	0.4274	0.3064	0.82	0.2678	0.1775
0.13	0.7981	0.6546	0.48	0.421	0.3009	0.83	0.2646	0.1751
0.14	0.7801	0.6364	0.49	0.4147	0.2956	0.84	0.2615	0.1728
0.15	0.7628	0.619	0.5	0.4086	0.2905	0.85	0.2584	0.1705
0.16	0.7461	0.6024	0.51	0.4027	0.2855	0.86	0.2554	0.1682
0.17	0.7301	0.5864	0.52	0.3968	0.2806	0.87	0.2524	0.1659
0.18	0.7146	0.5712	0.53	0.3911	0.2758	0.88	0.2495	0.1638
0.19	0.6997	0.5566	0.54	0.3856	0.2712	0.89	0.2466	0.1616
0.2	0.6854	0.5426	0.55	0.3801	0.2667	0.9	0.2438	0.1595
0.21	0.6715	0.5291	0.56	0.3748	0.2623	0.91	0.241	0.1574
0.22	0.6581	0.5162	0.57	0.3695	0.258	0.92	0.2383	0.1554
0.23	0.6452	0.5038	0.58	0.3644	0.2538	0.93	0.2356	0.1534
0.24	0.6327	0.4919	0.59	0.3594	0.2497	0.94	0.233	0.1515
0.25	0.6205	0.4804	0.6	0.3545	0.2457	0.95	0.2304	0.1495
0.26	0.6088	0.4693	0.61	0.3497	0.2418	0.96	0.2278	0.1476
0.27	0.5975	0.4587	0.62	0.345	0.2381	0.97	0.2253	0.1458
0.28	0.5865	0.4484	0.63	0.3404	0.2343	0.98	0.2228	0.144
0.29	0.5758	0.4385	0.64	0.3359	0.2307	0.99	0.2203	0.1422
0.3	0.5655	0.4289	0.65	0.3315	0.2272	1	0.2179	0.1404
0.31	0.5554	0.4197	0.66	0.3271	0.2237	1.01	0.2155	0.1387
0.32	0.5457	0.4108	0.67	0.3229	0.2203	1.02	0.2132	0.137
0.33	0.5362	0.4022	0.68	0.3187	0.217	1.03	0.2109	0.1353
0.34	0.527	0.3939	0.69	0.3146	0.2138	1.04	0.2086	0.1337

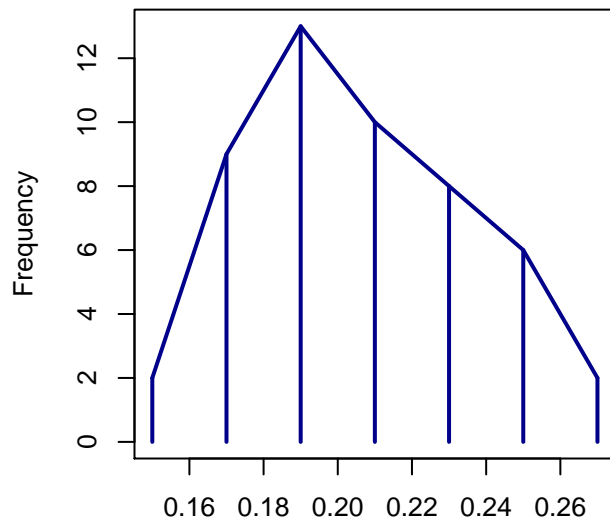
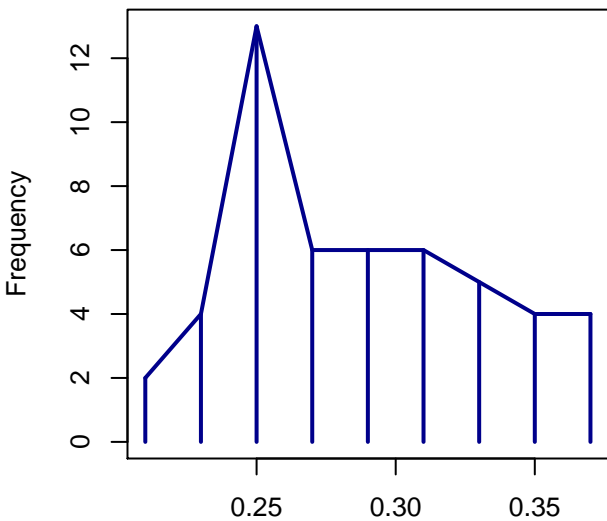
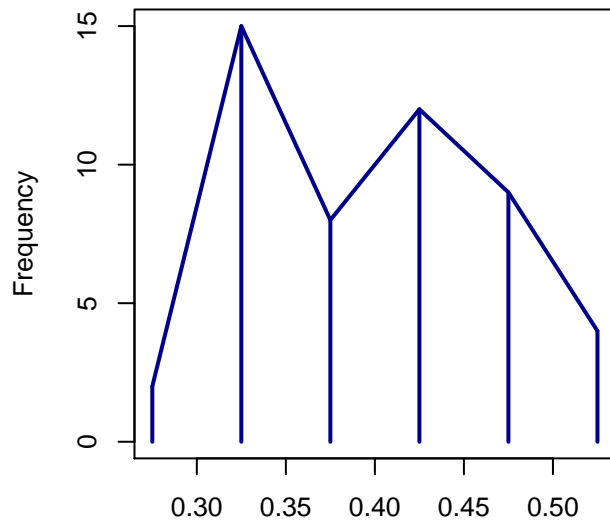
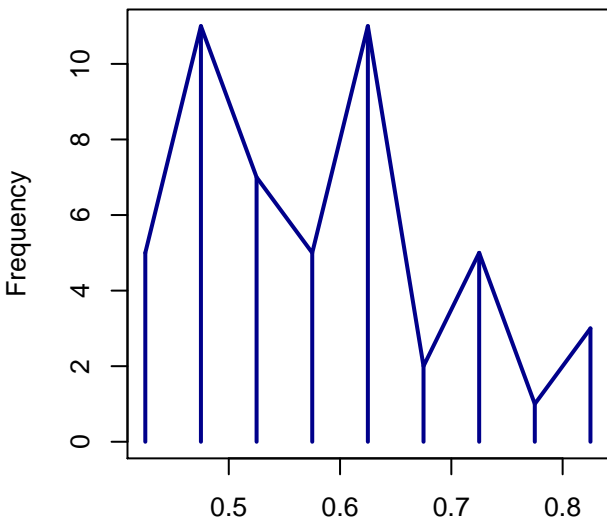
Annual F(%SPR) Reference Points



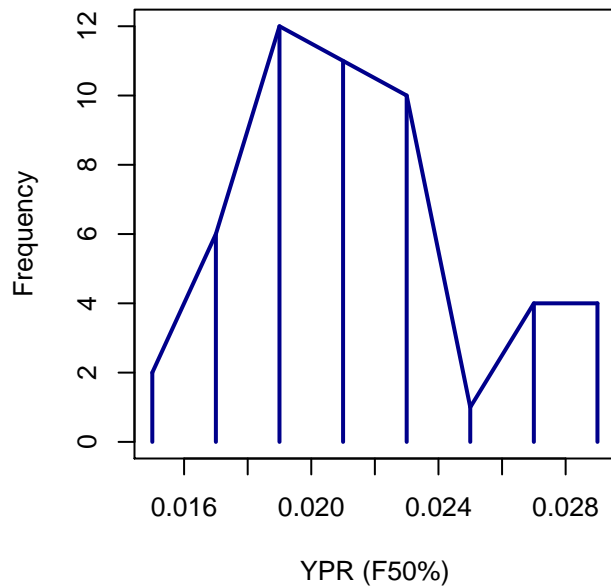
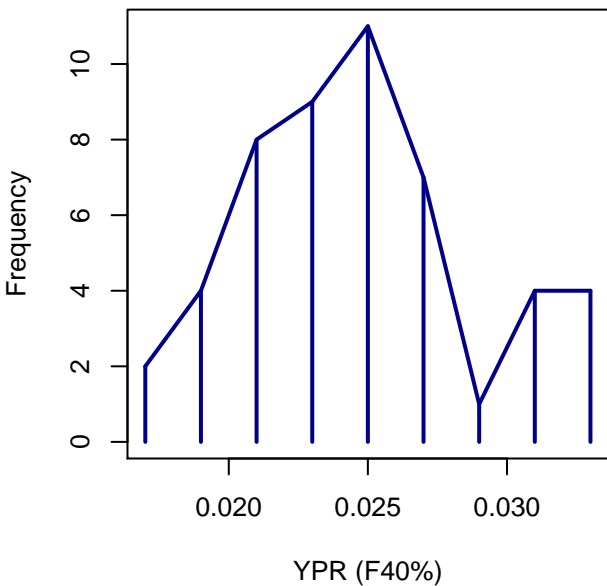
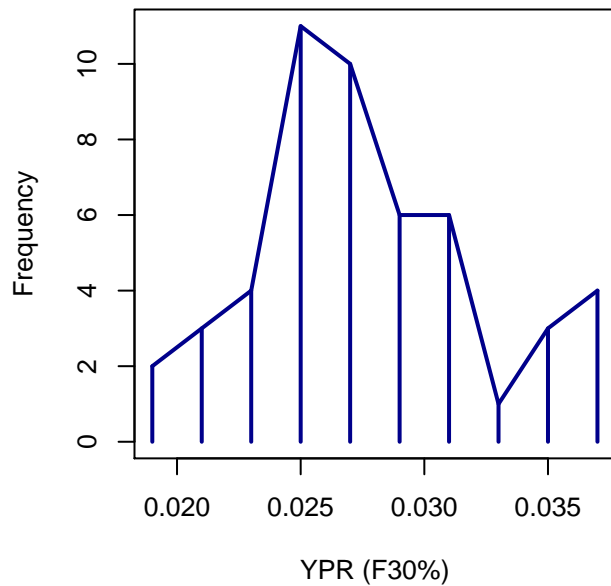
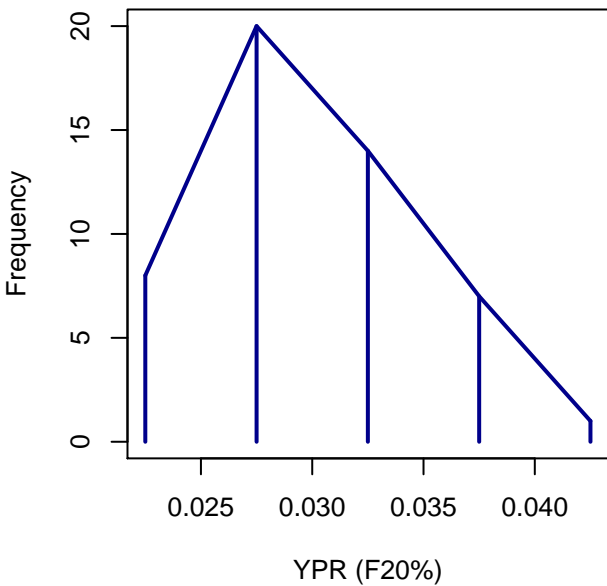
Annual YPR(%SPR) Reference Points



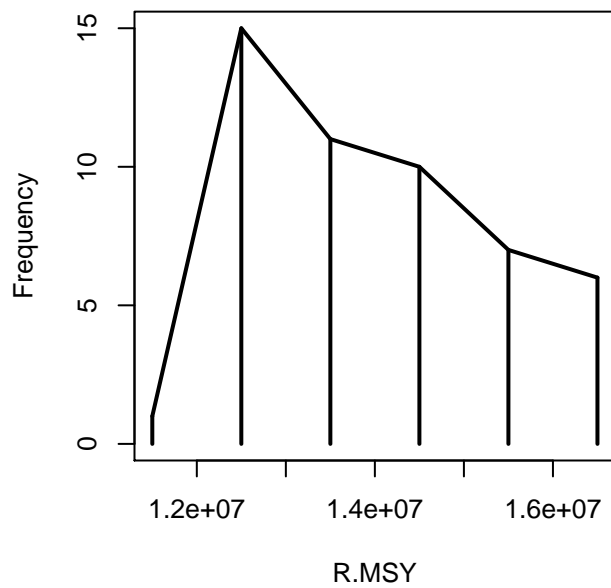
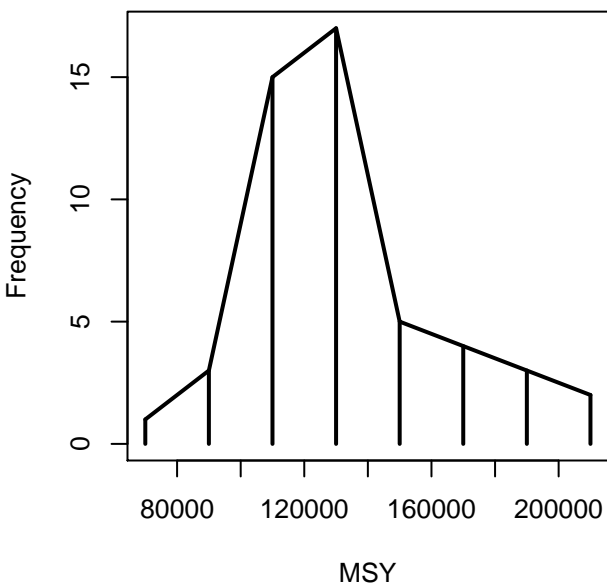
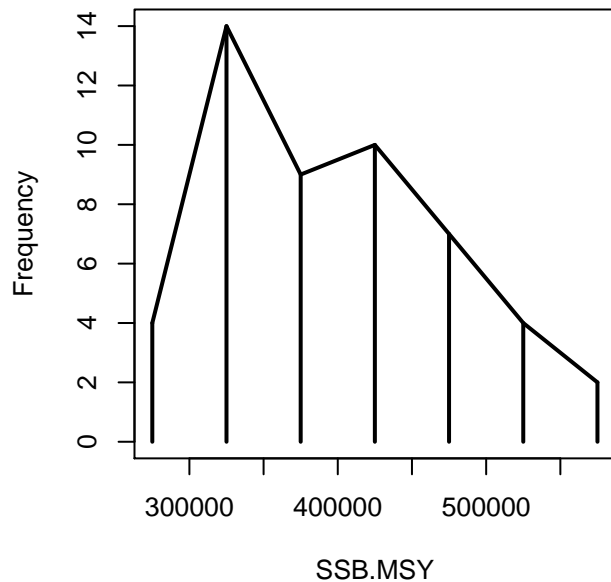
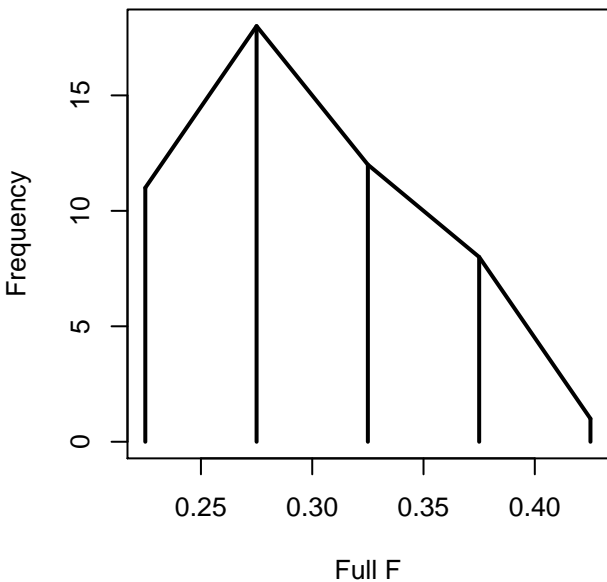
Annual F (%SPR) Reference Points



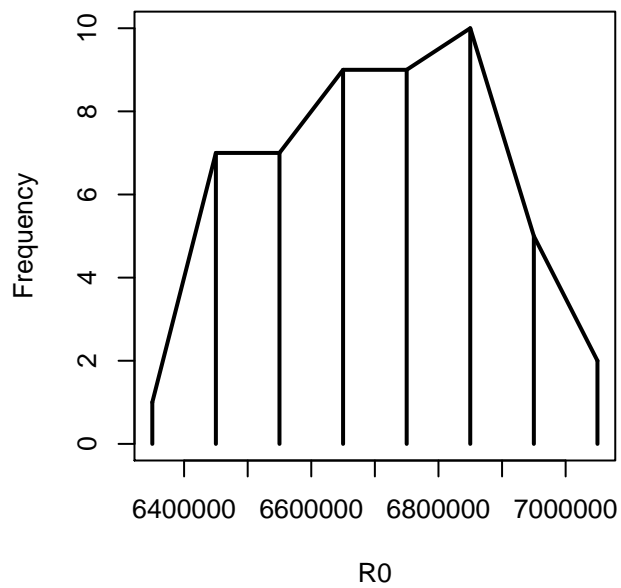
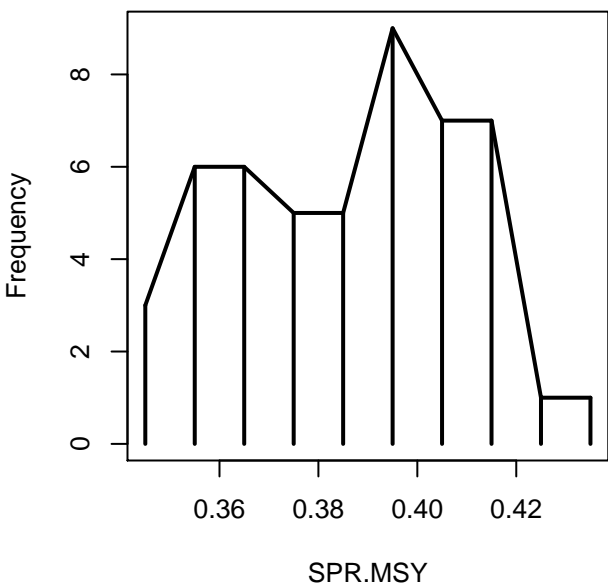
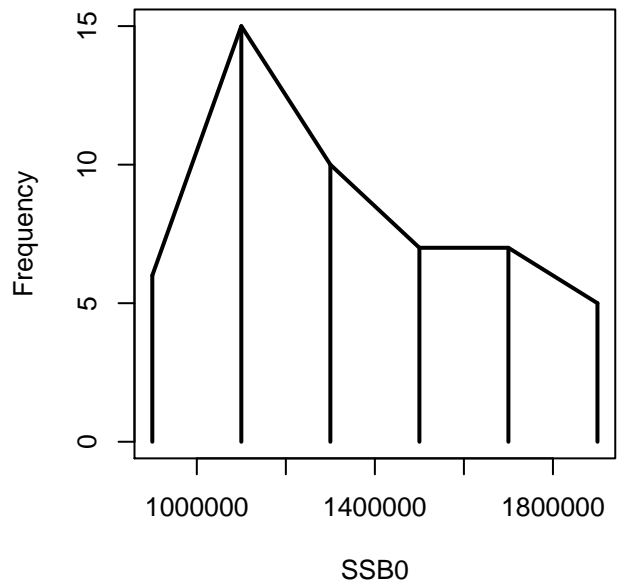
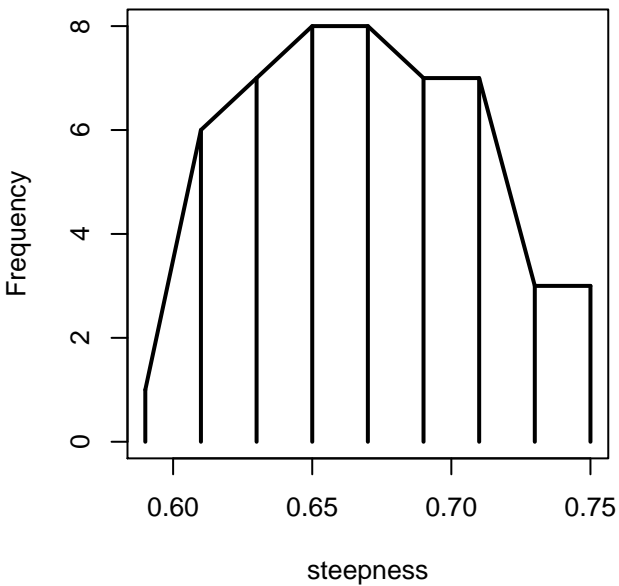
Annual YPR (%SPR) Reference Points



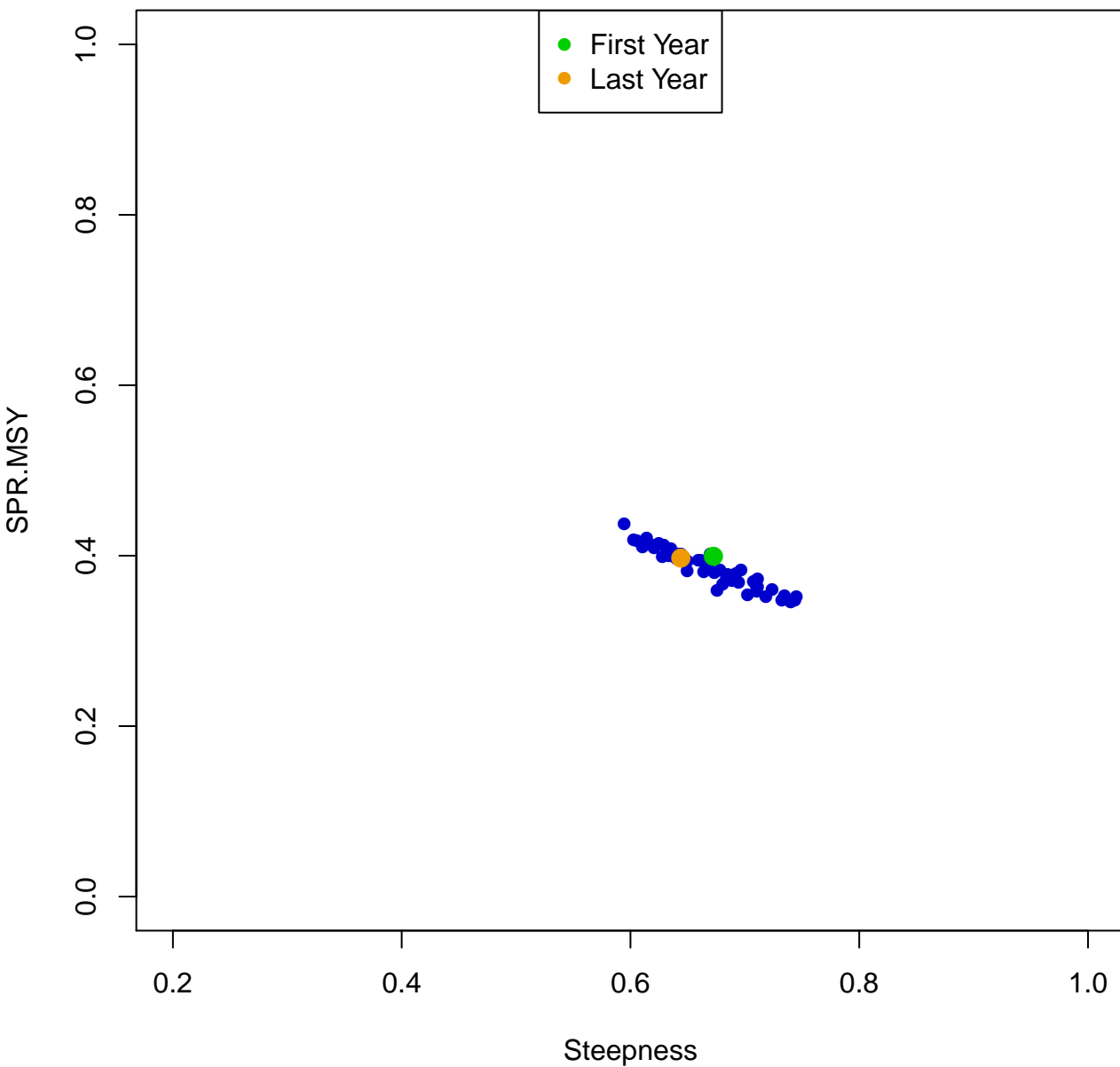
Annual MSY Reference Points (from S-R curve)



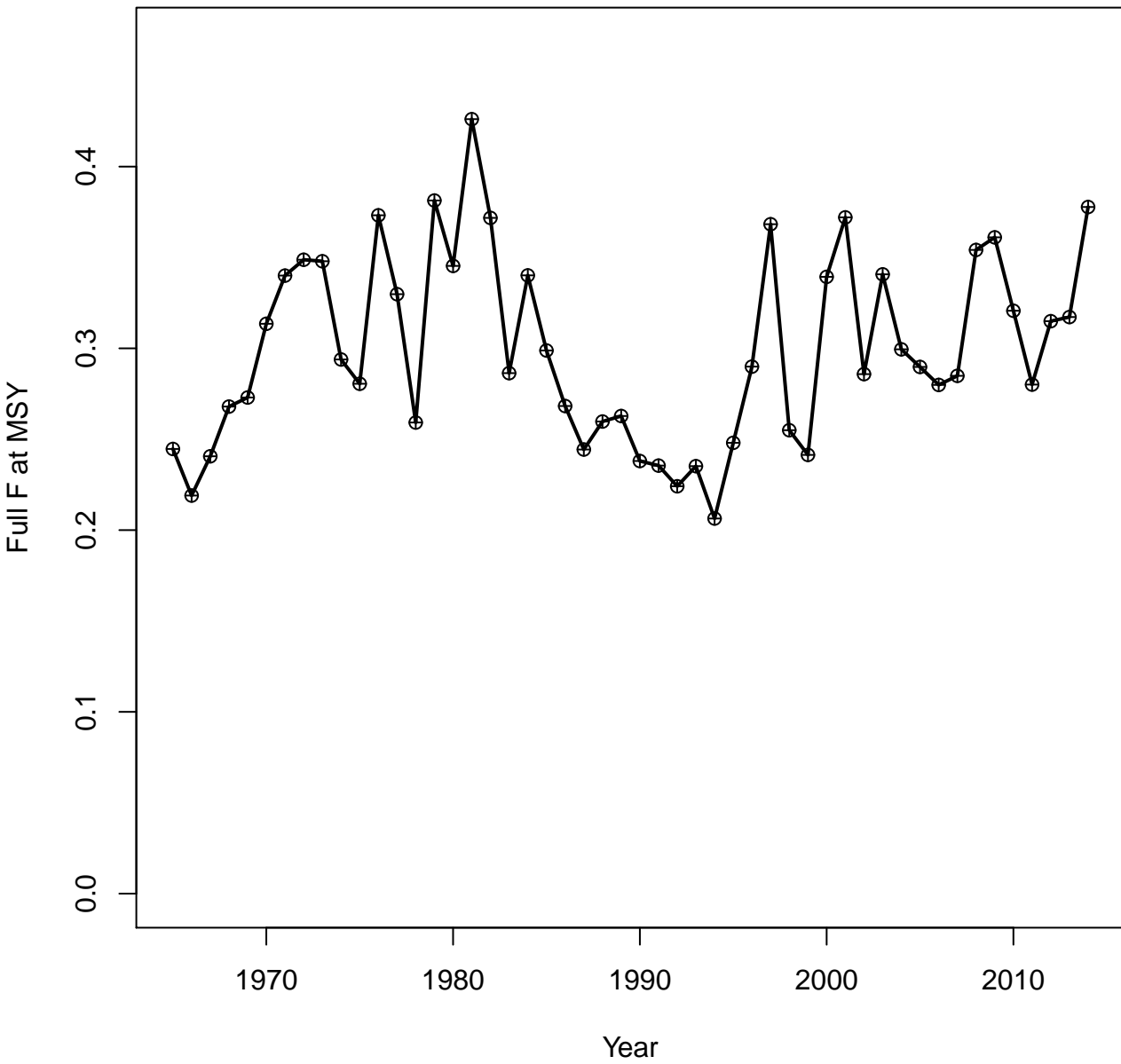
Annual MSY Reference Points (from S-R curve)



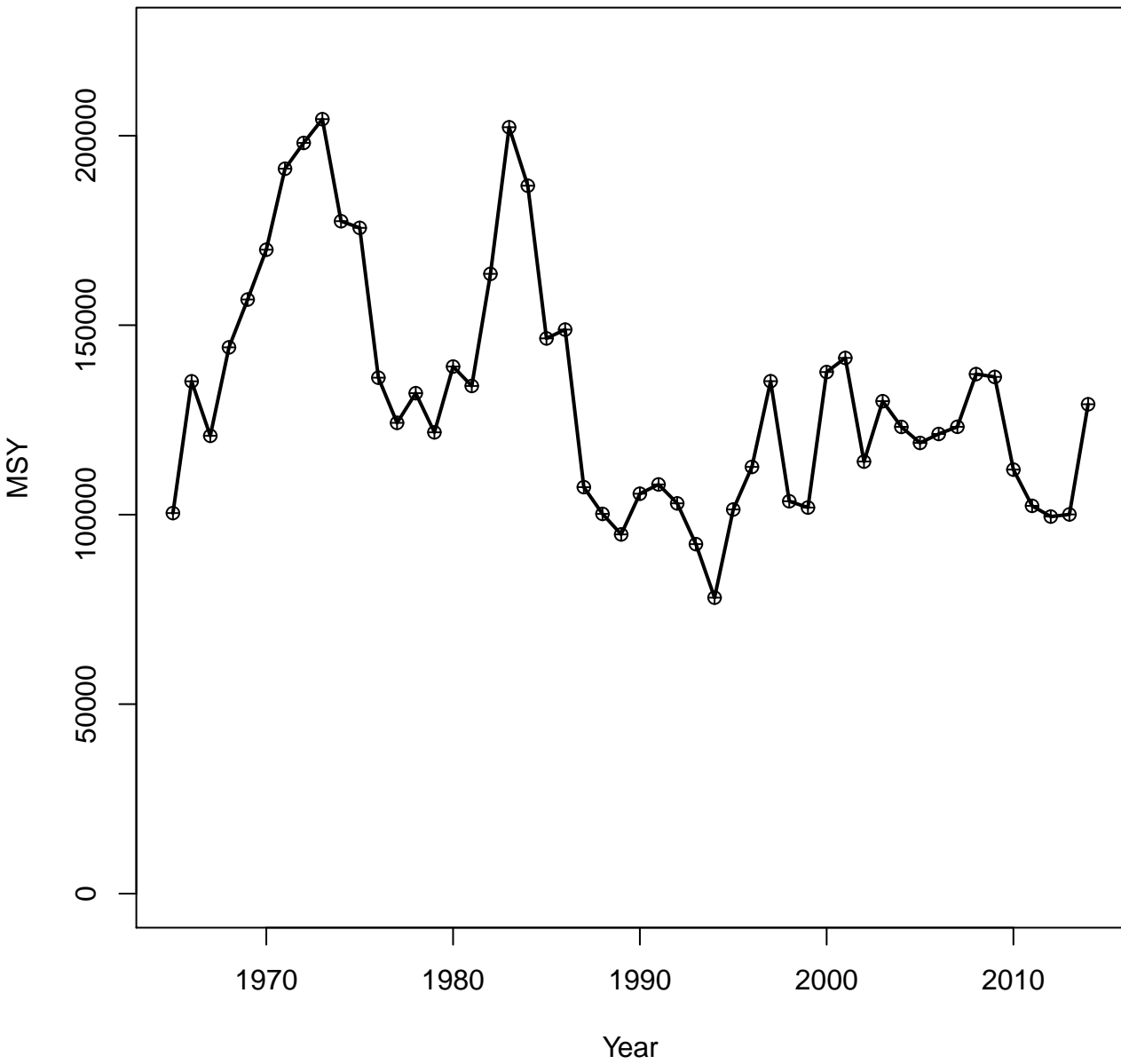
Annual Steepness and SPR.MSY (from S-R curve)



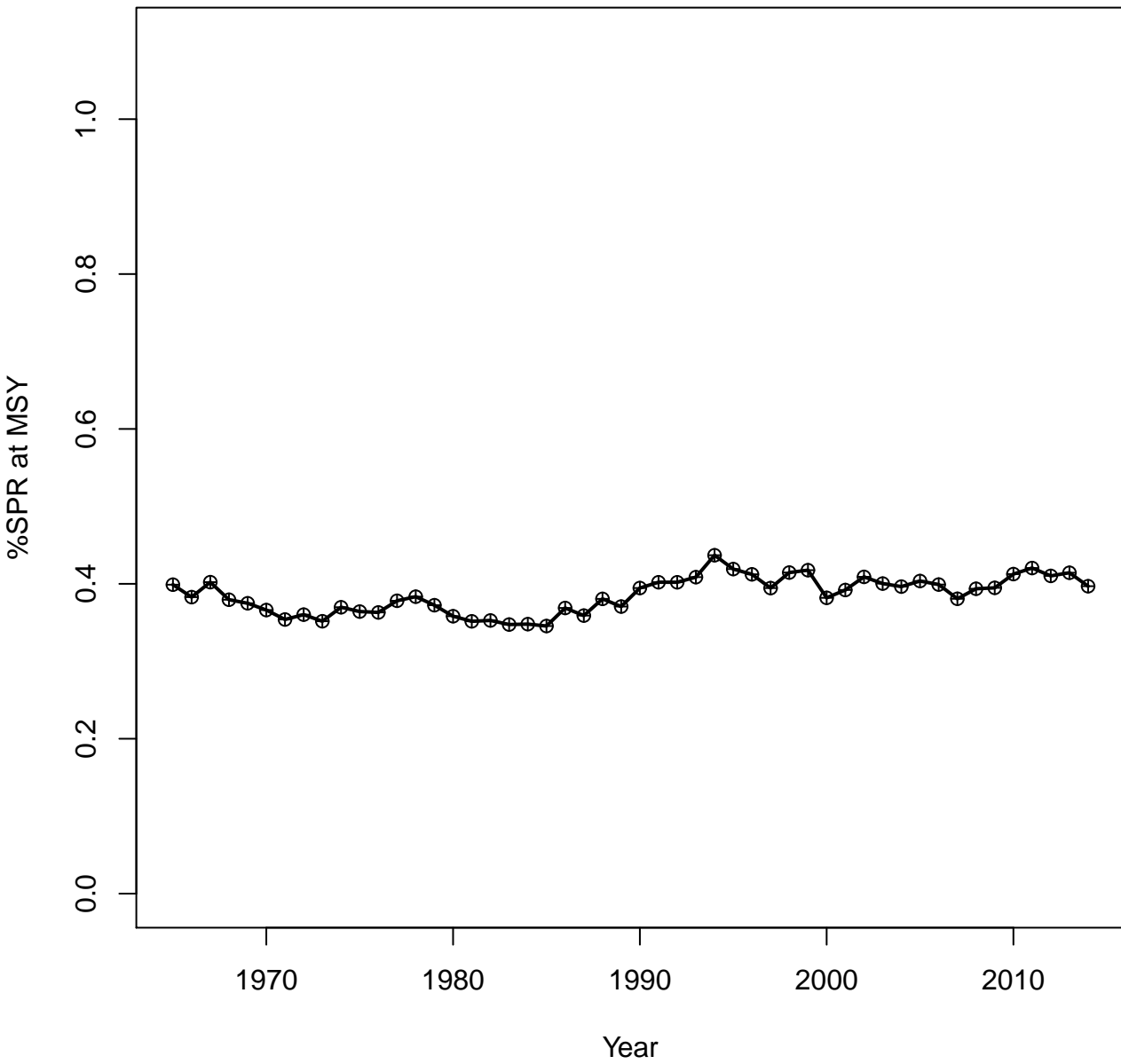
Annual MSY Reference Points (from S-R curve)



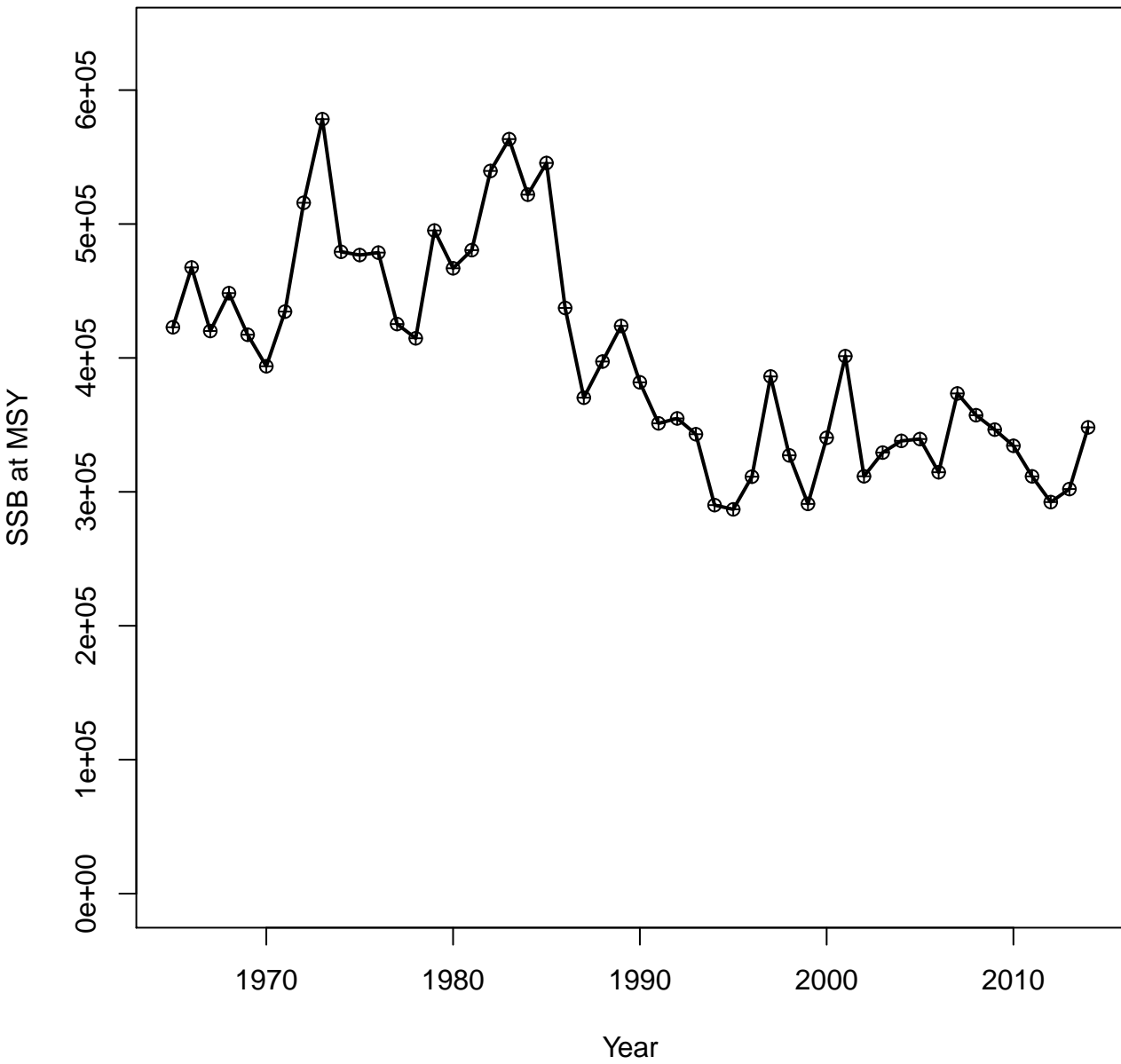
Annual MSY Reference Points (from S-R curve)



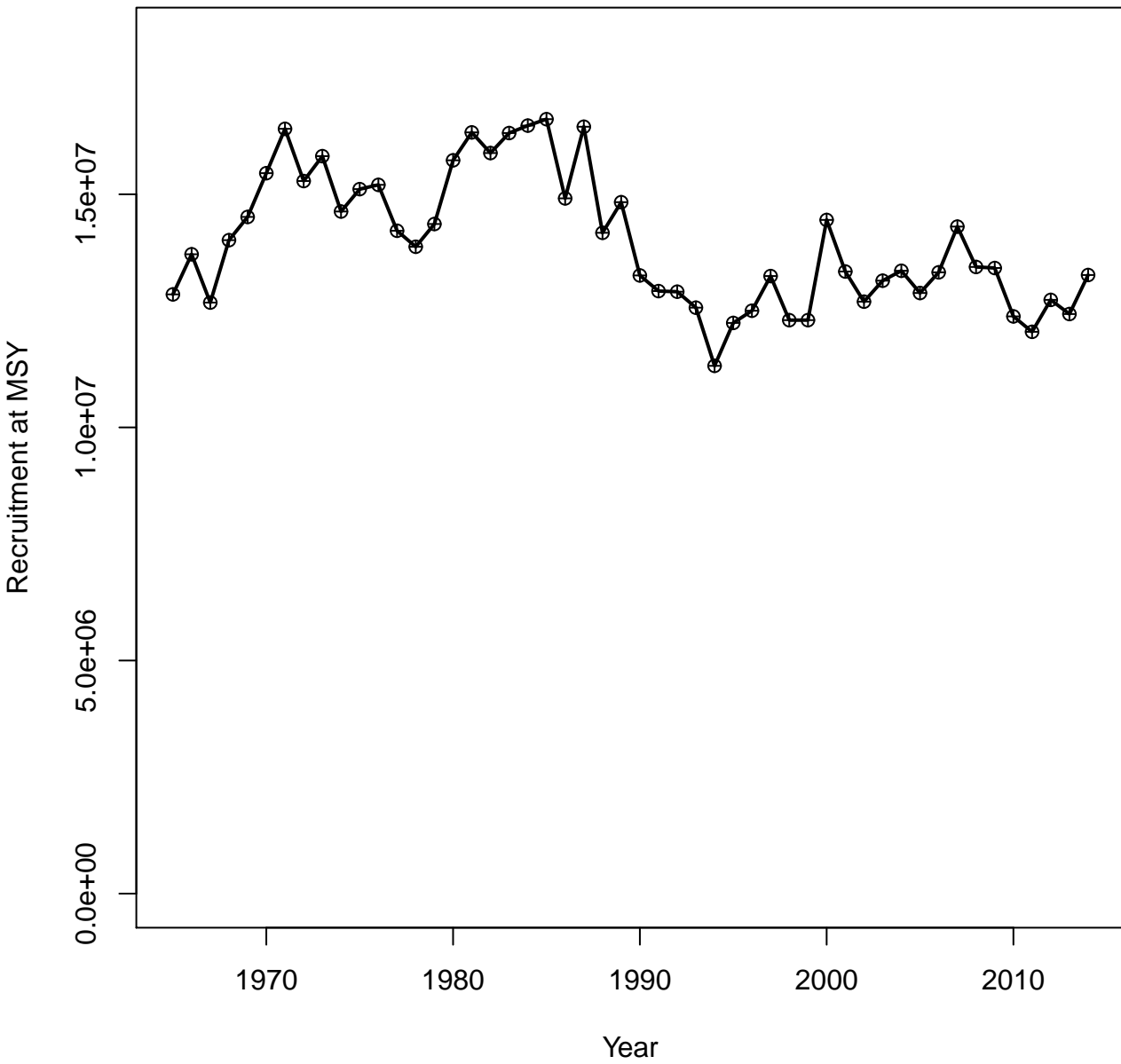
Annual MSY Reference Points (from S-R curve)

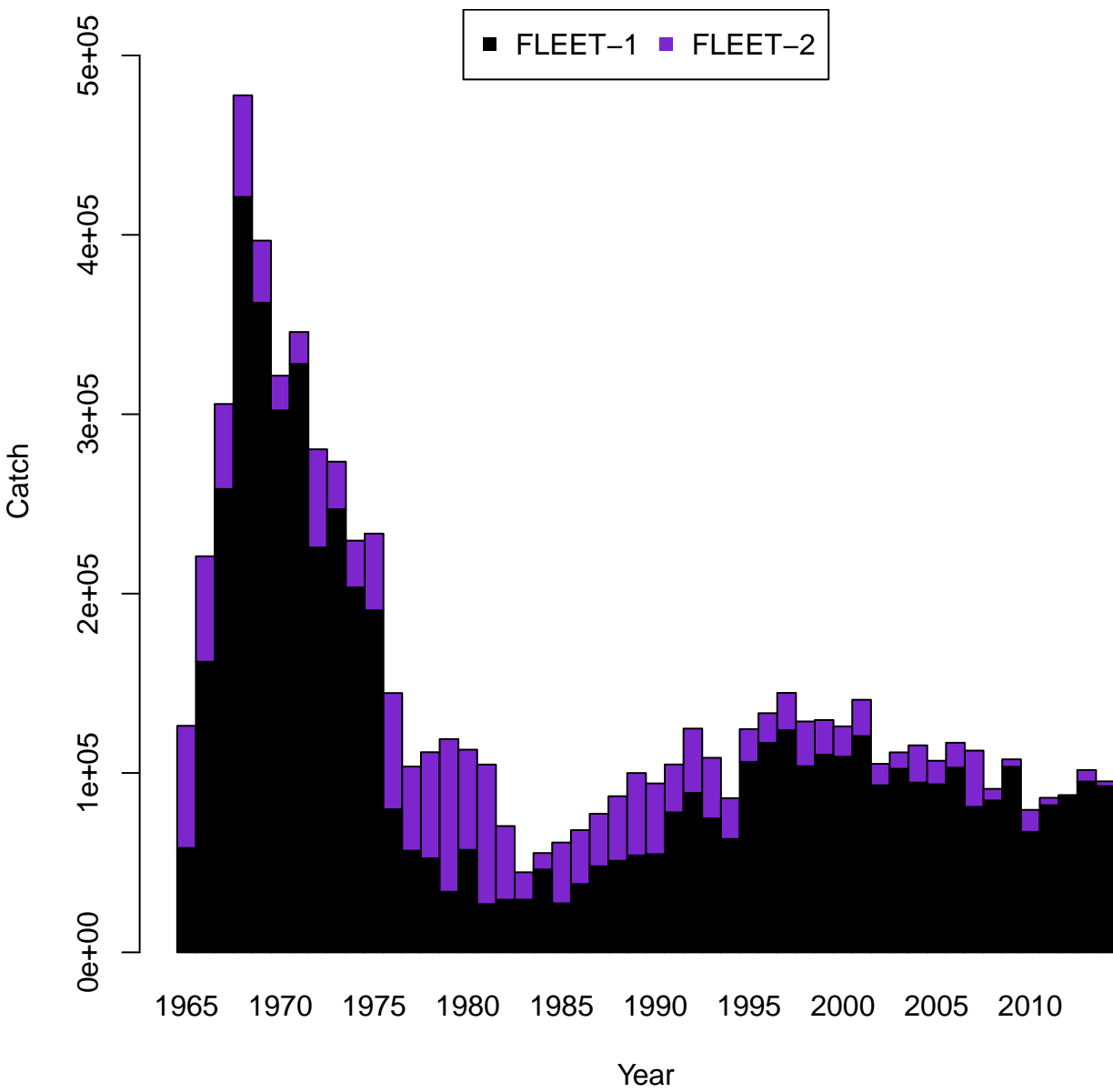


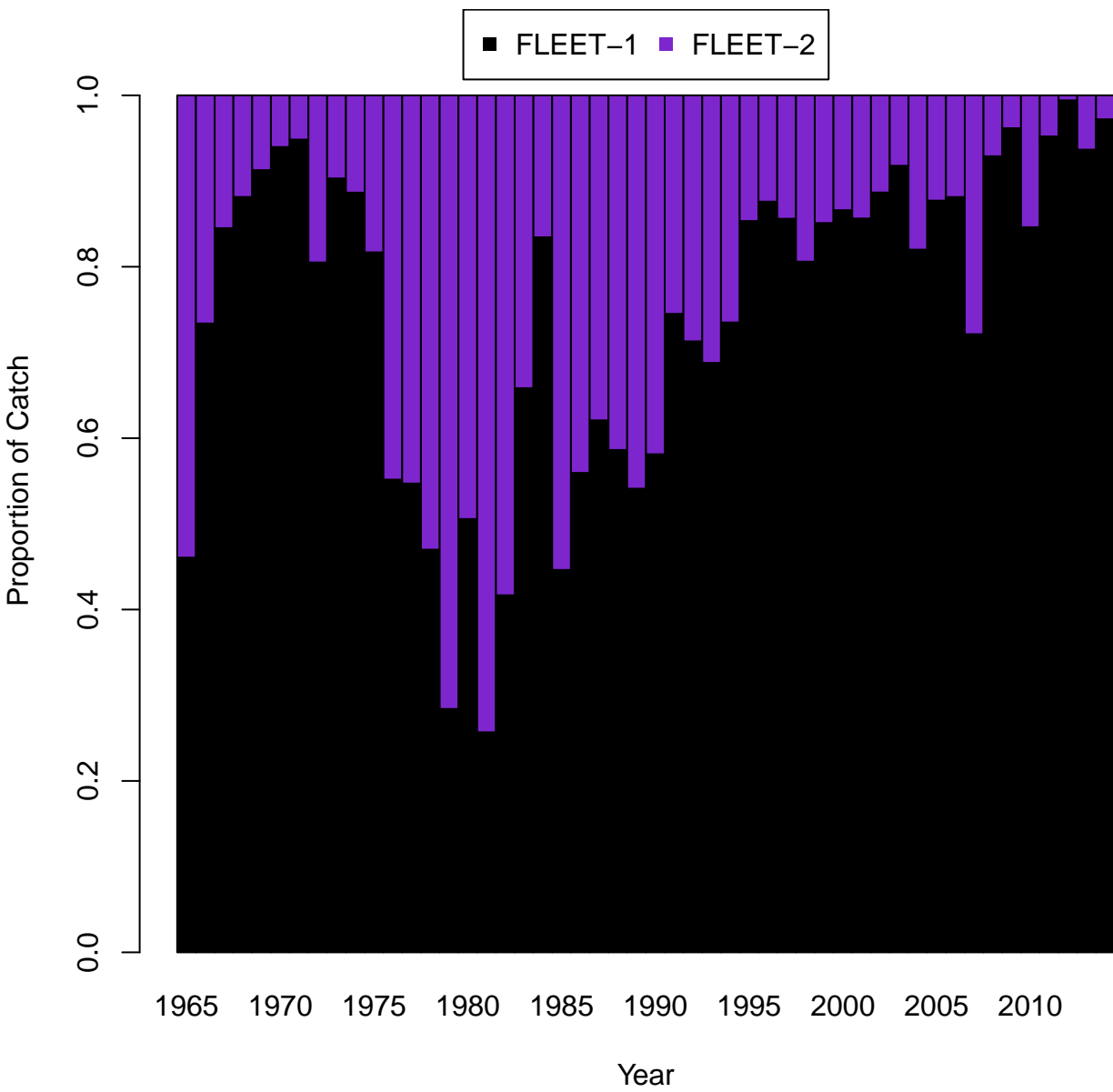
Annual MSY Reference Points (from S-R curve)



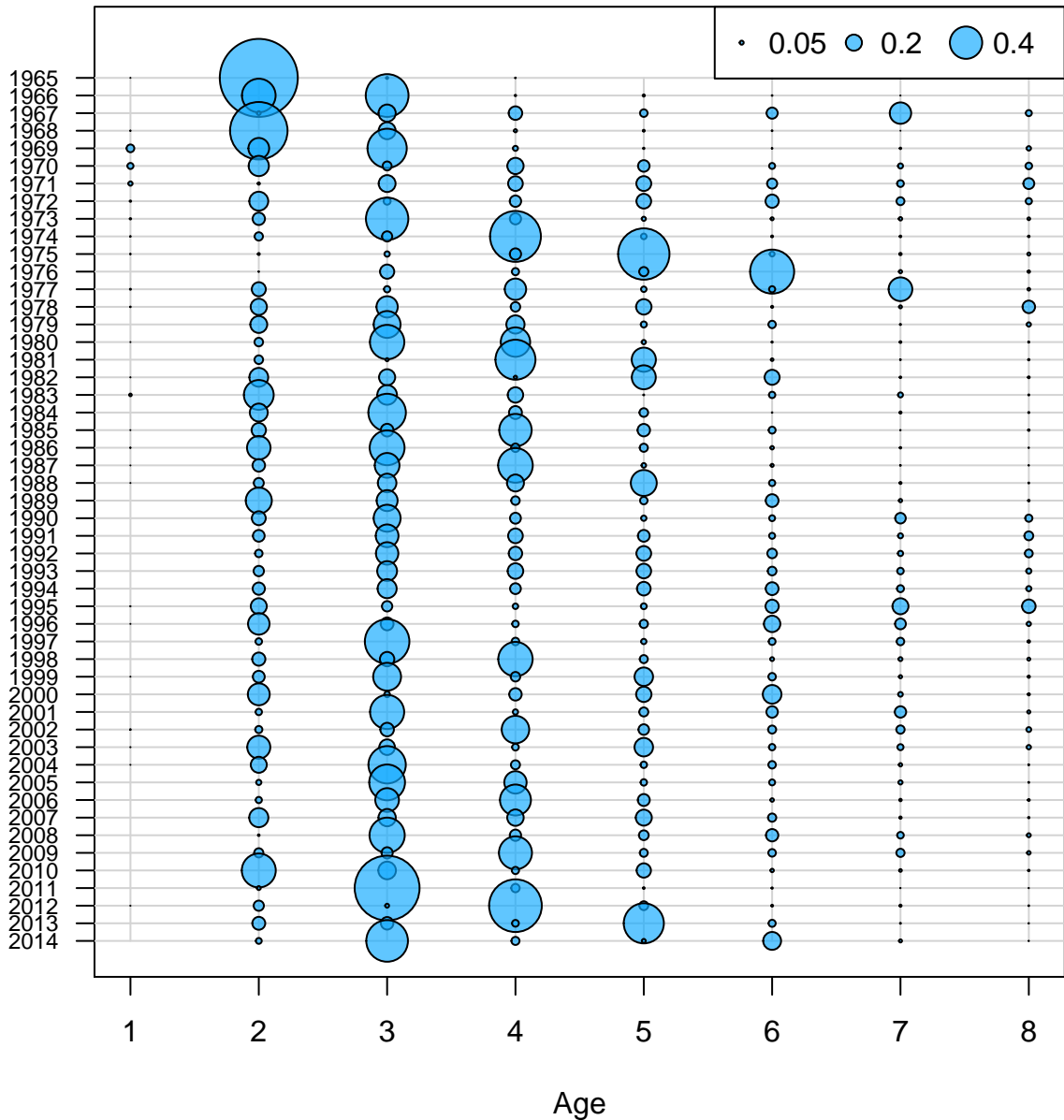
Annual MSY Reference Points (from S-R curve)



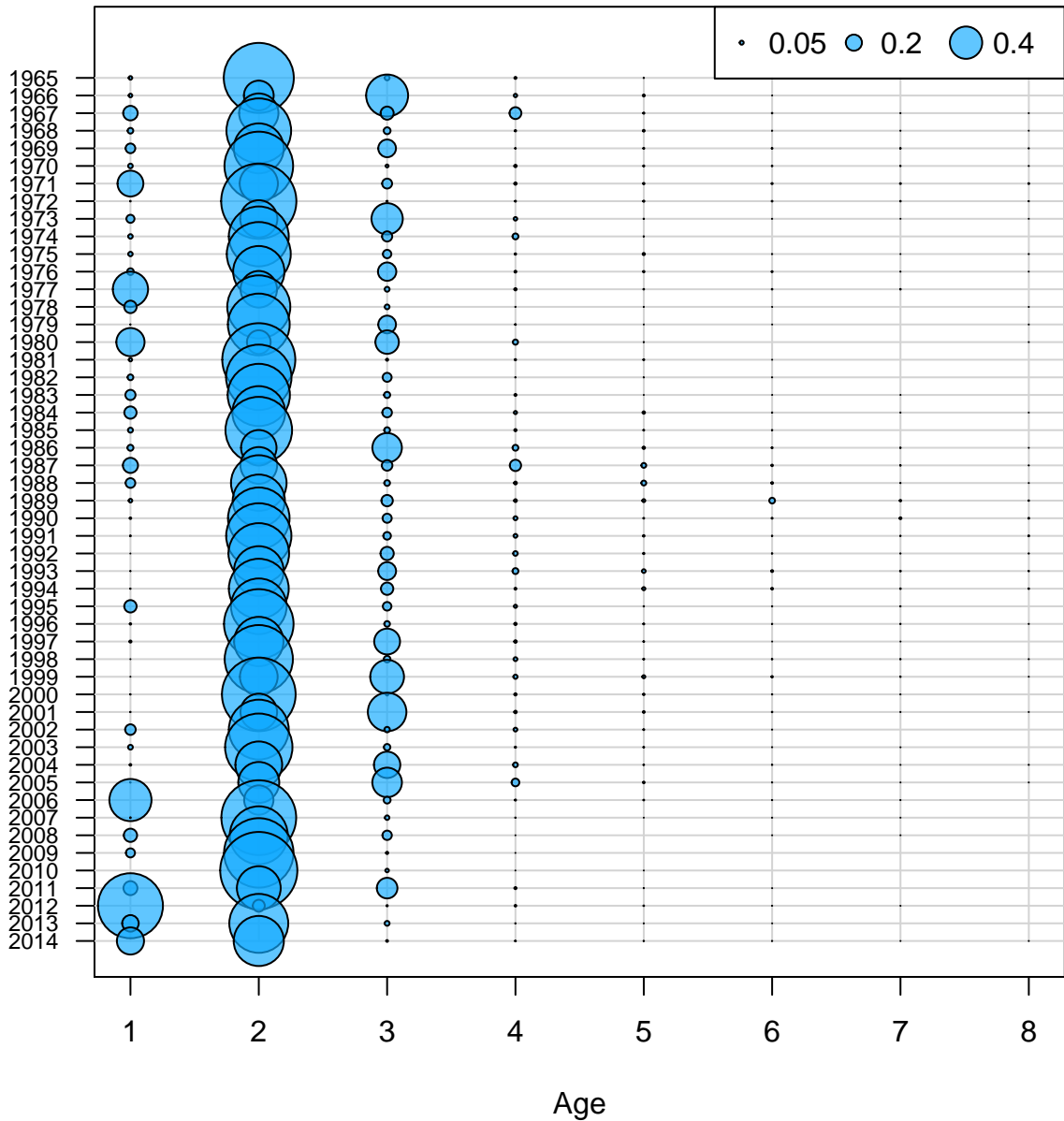


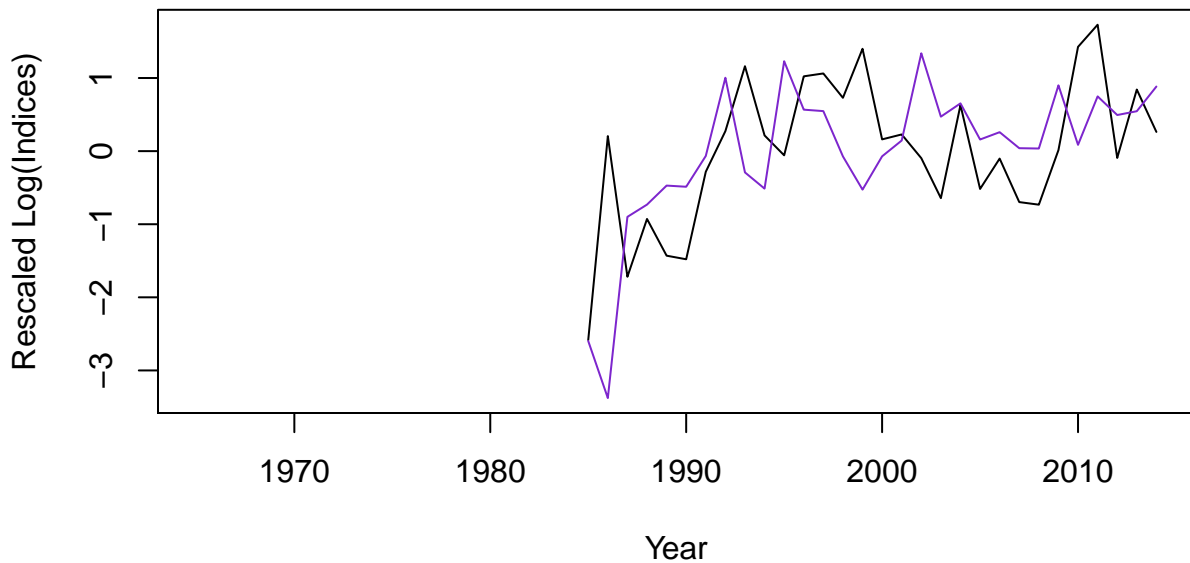
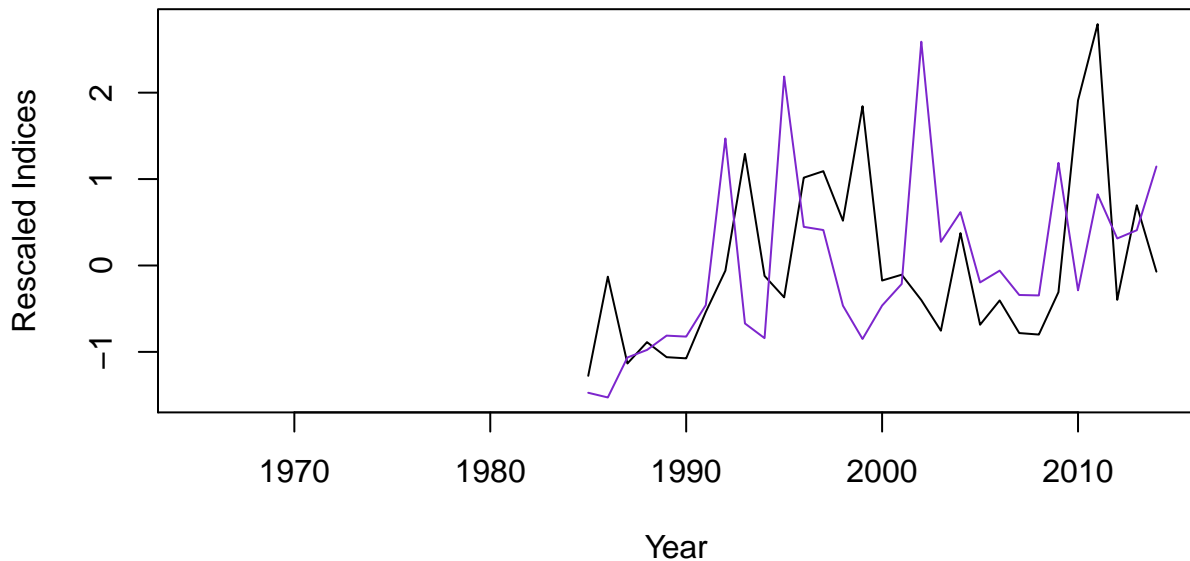


Age Comps for Catch by Fleet 1 (FLEET-1)



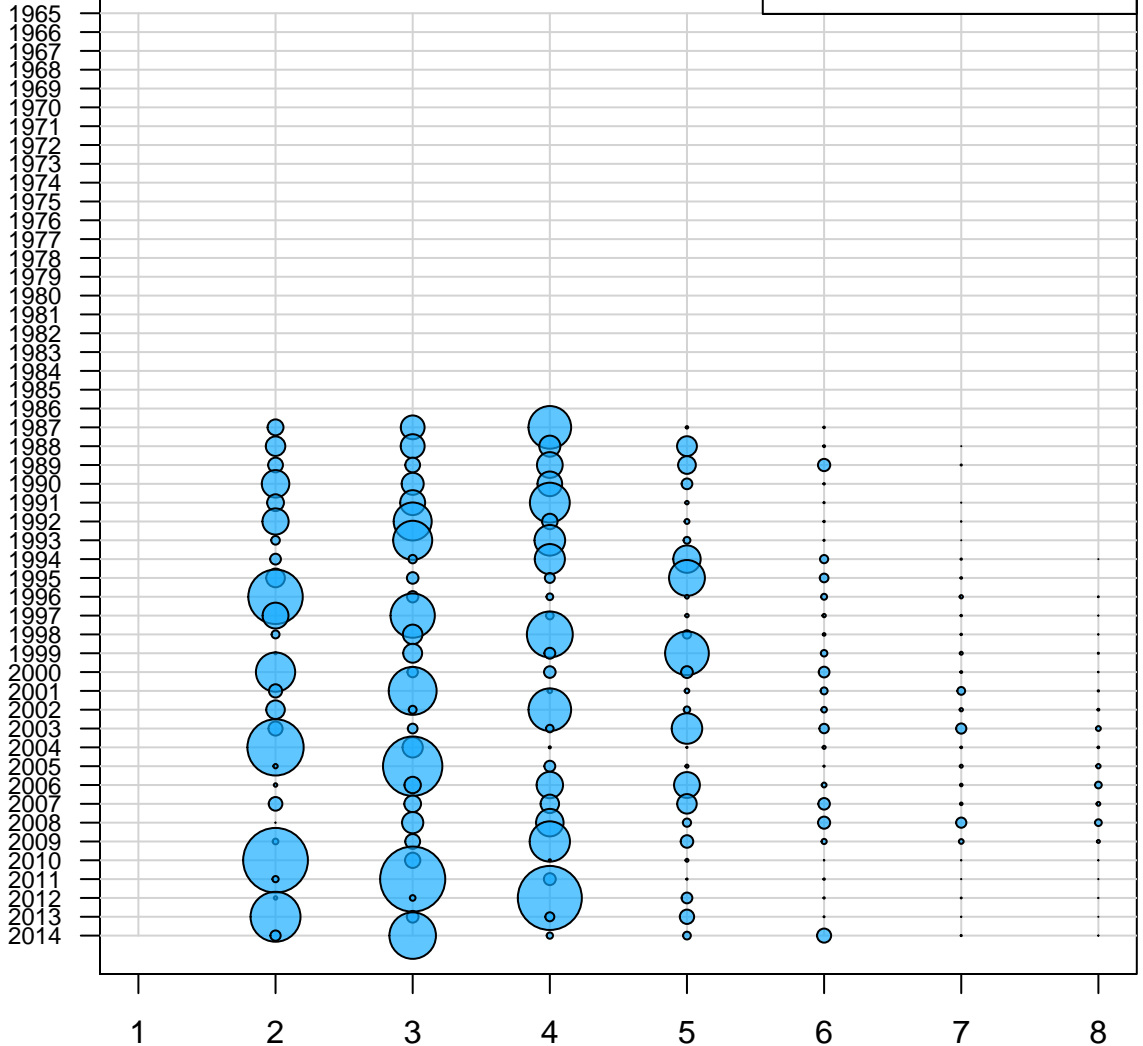
Age Comps for Catch by Fleet 2 (FLEET-2)





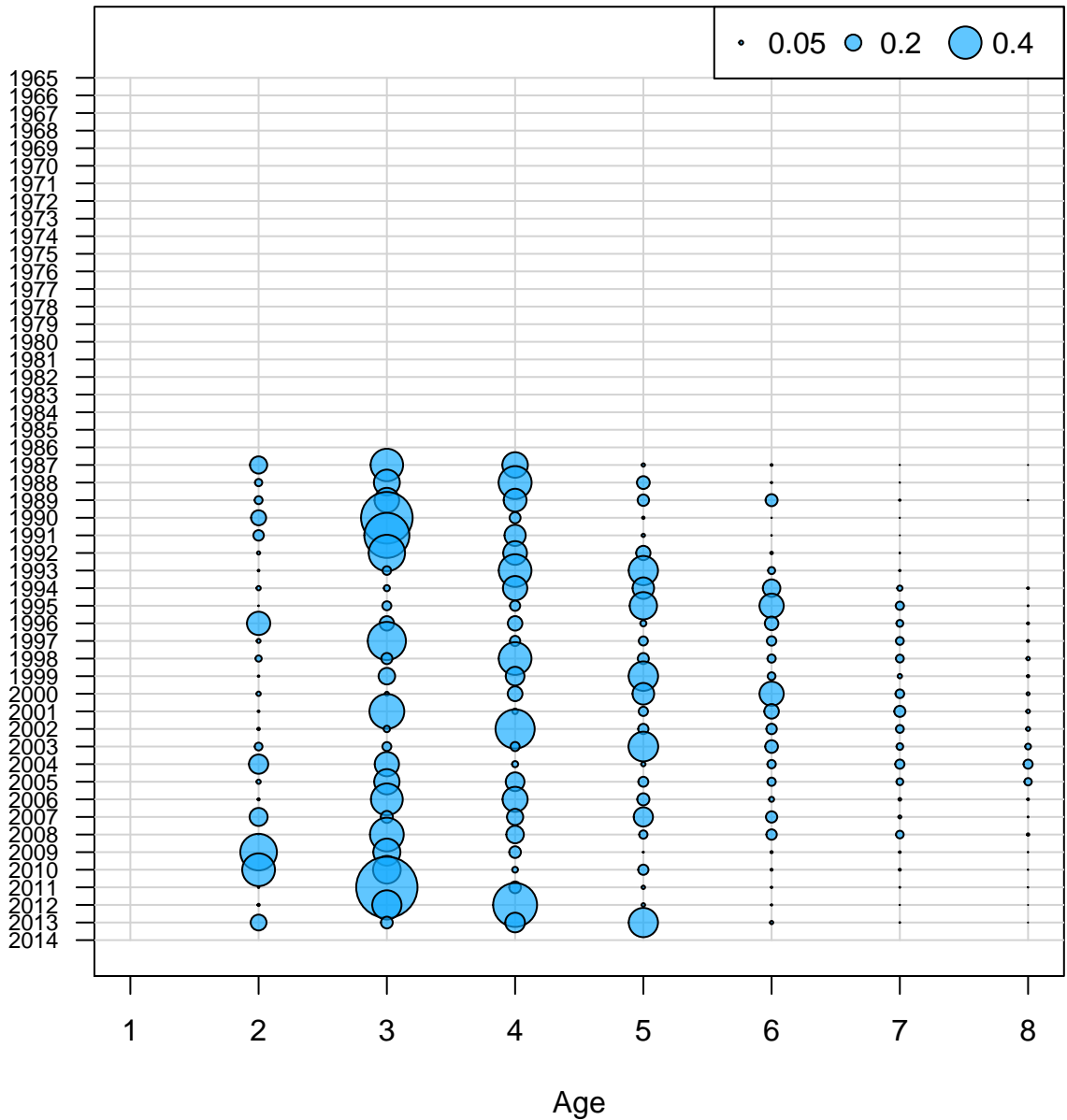
Age Comps for Index 1 (INDEX-1)

• 0.05 • 0.2 • 0.4

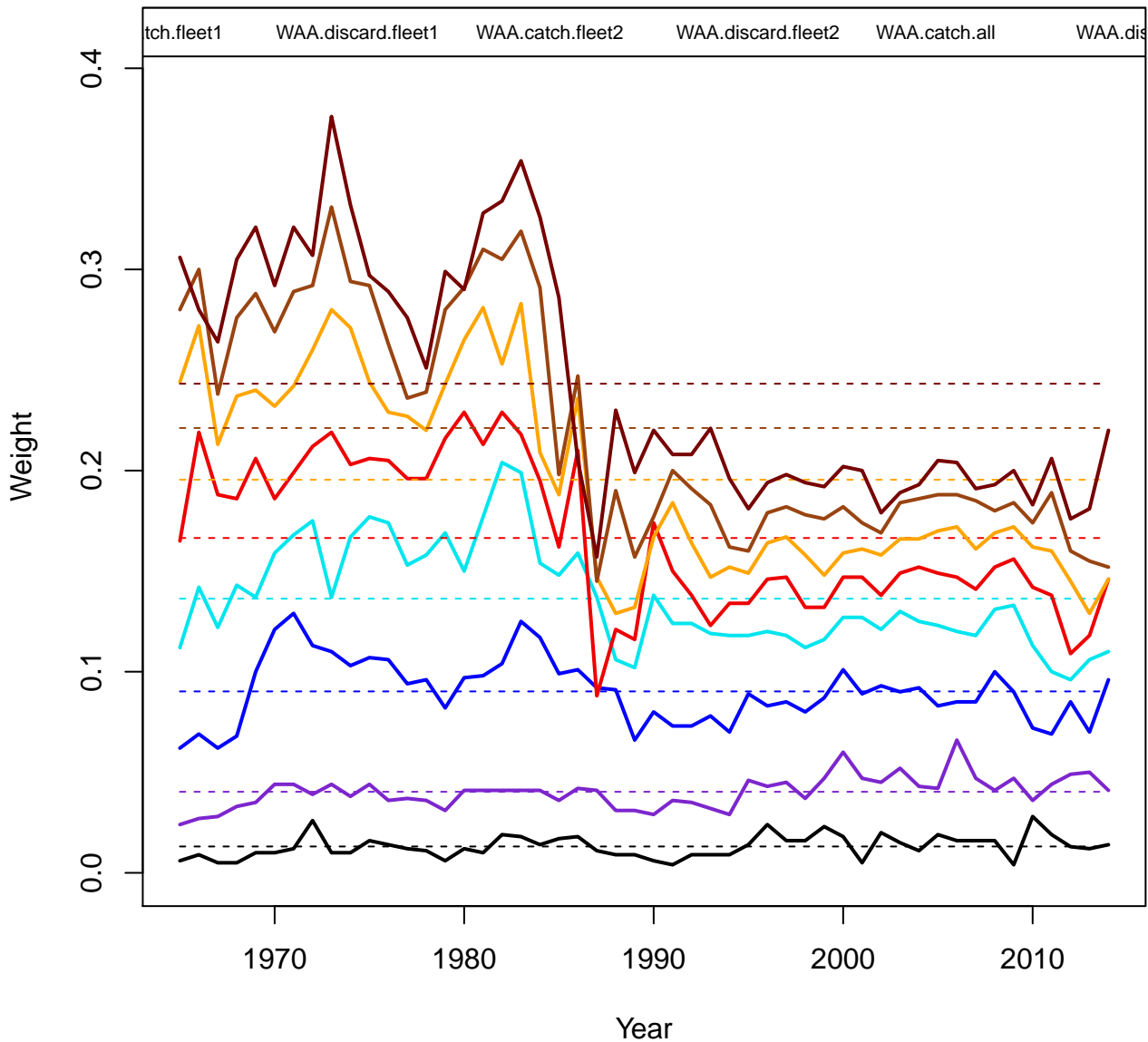


Age

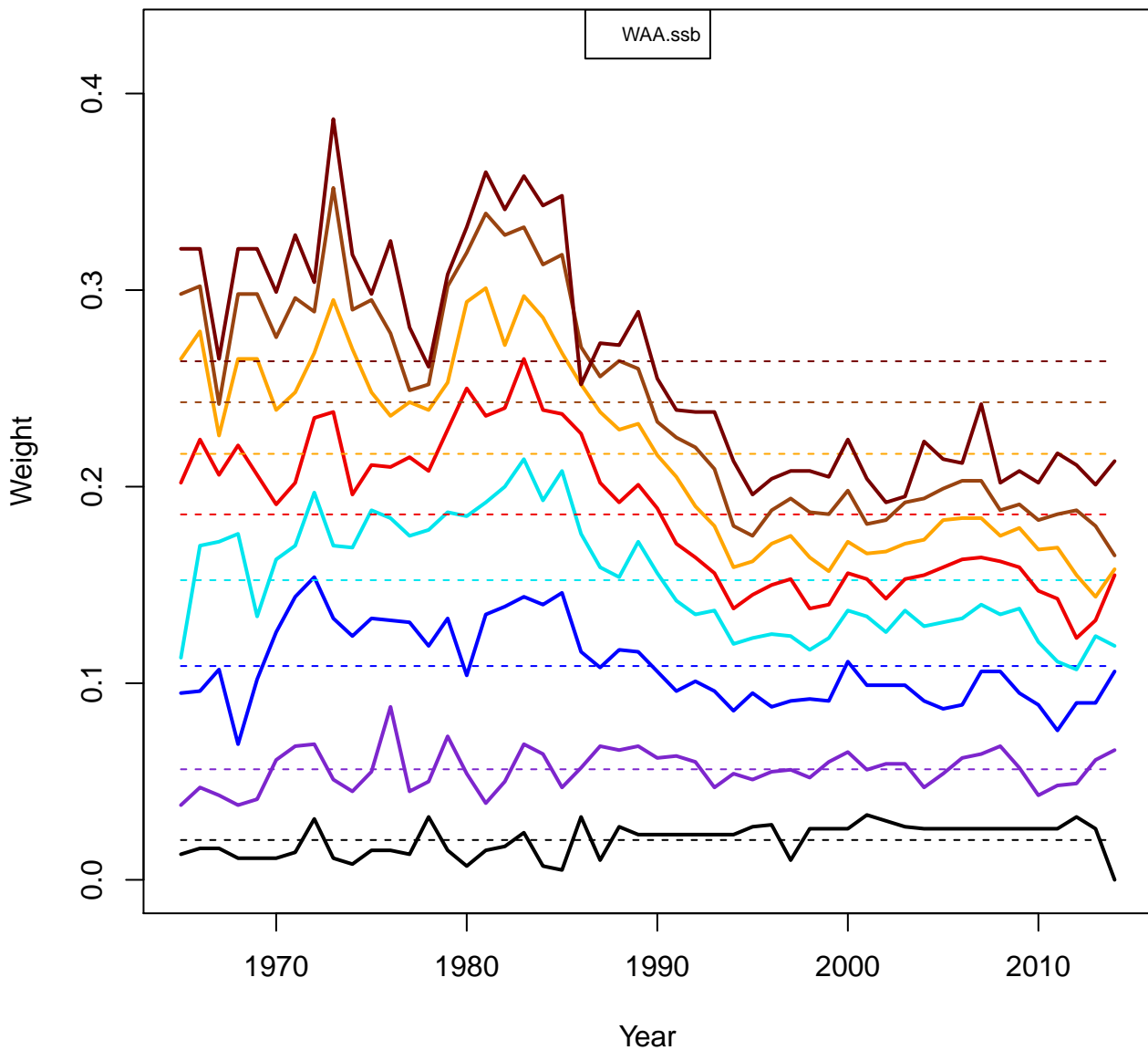
Age Comps for Index 2 (INDEX-2)



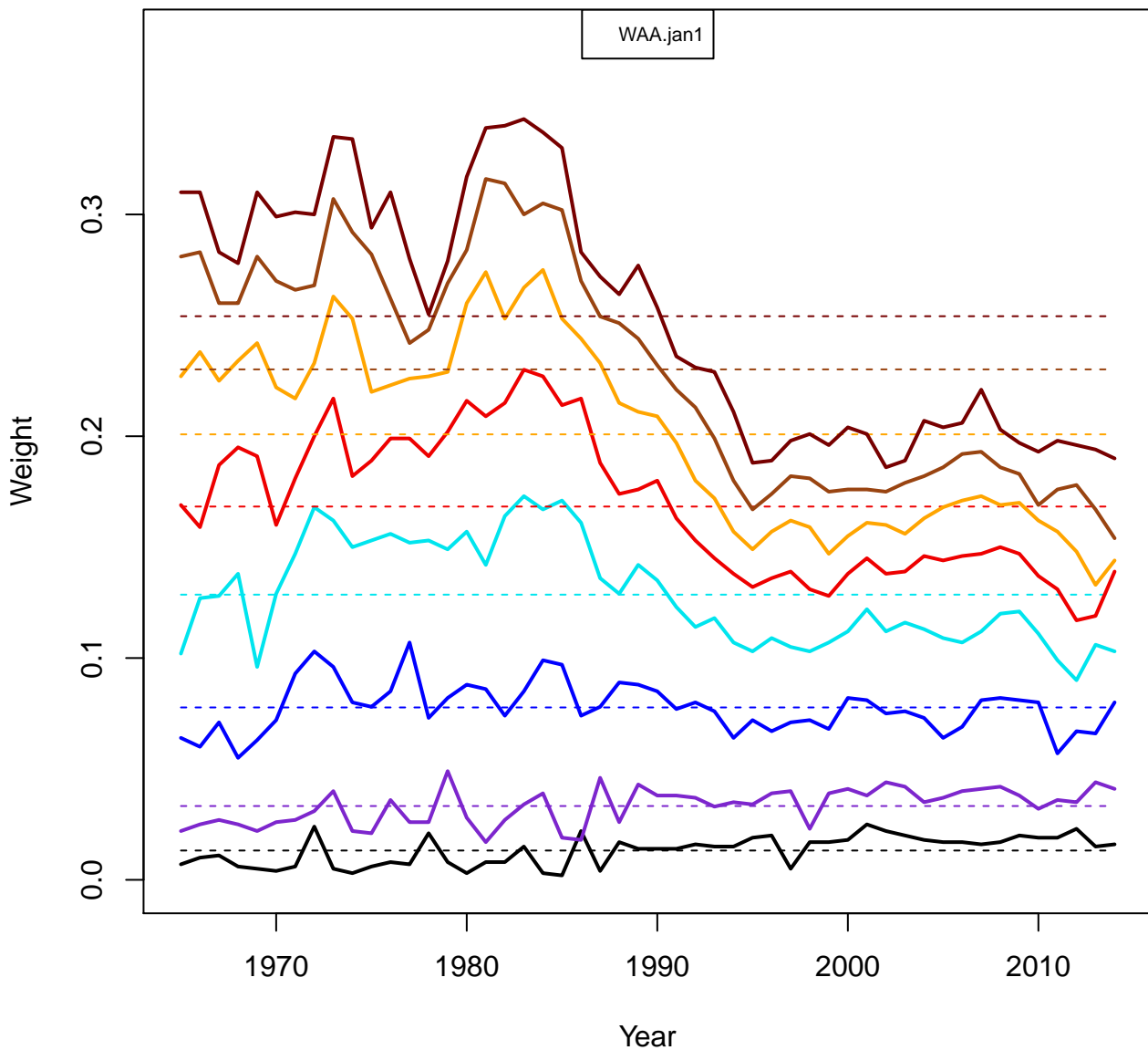
WAA matrix 1



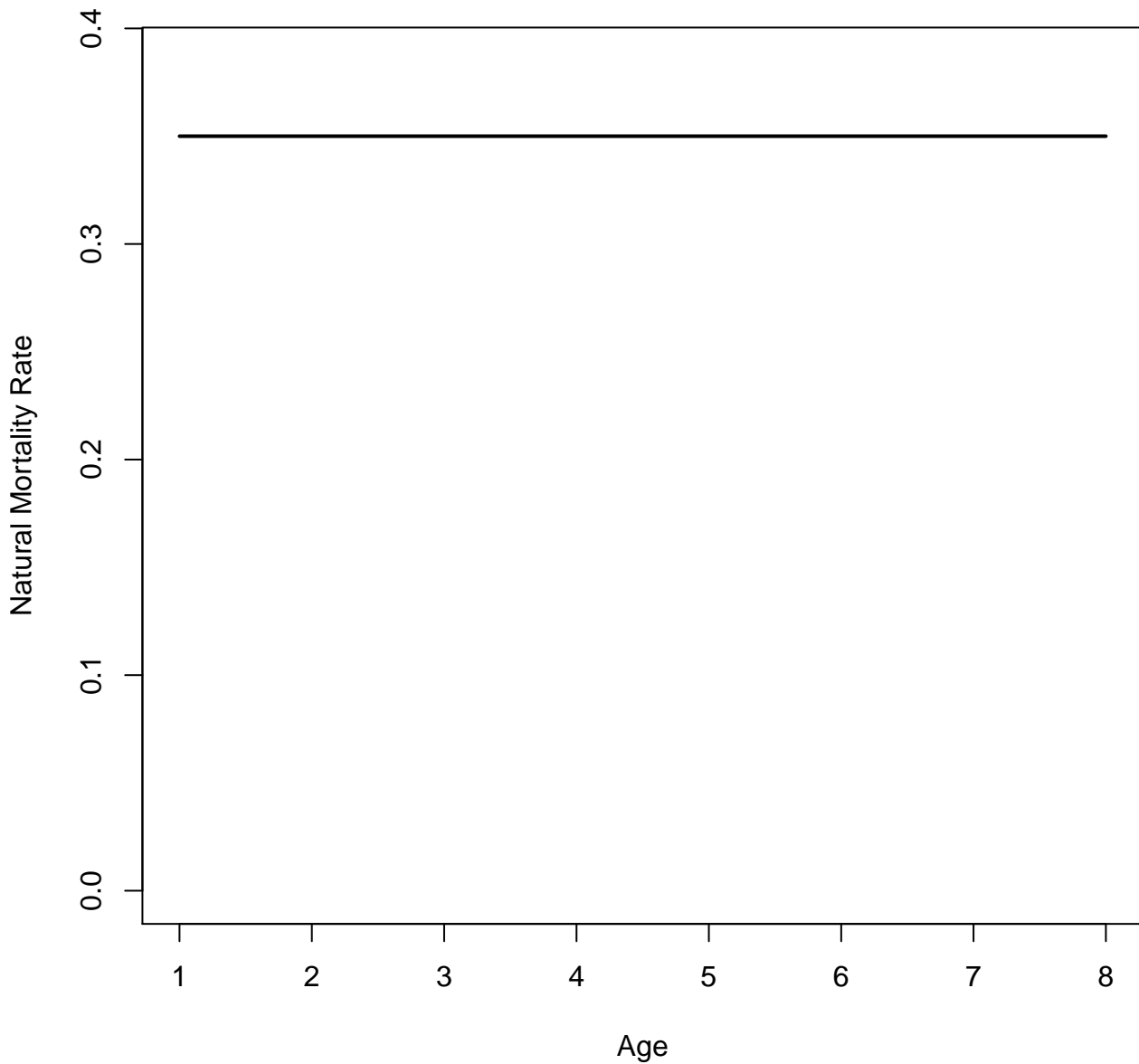
WAA matrix 2



WAA matrix 3



M



Maturity

