

File = asap3.dat

ASAP3 run on Tuesday, 02 Mar 2021 at 16:12:56

\\Users\\bai.li\\Documents\\Github\\RMAS\\vignettes\\003_ASAPCaseStudy\\asap3

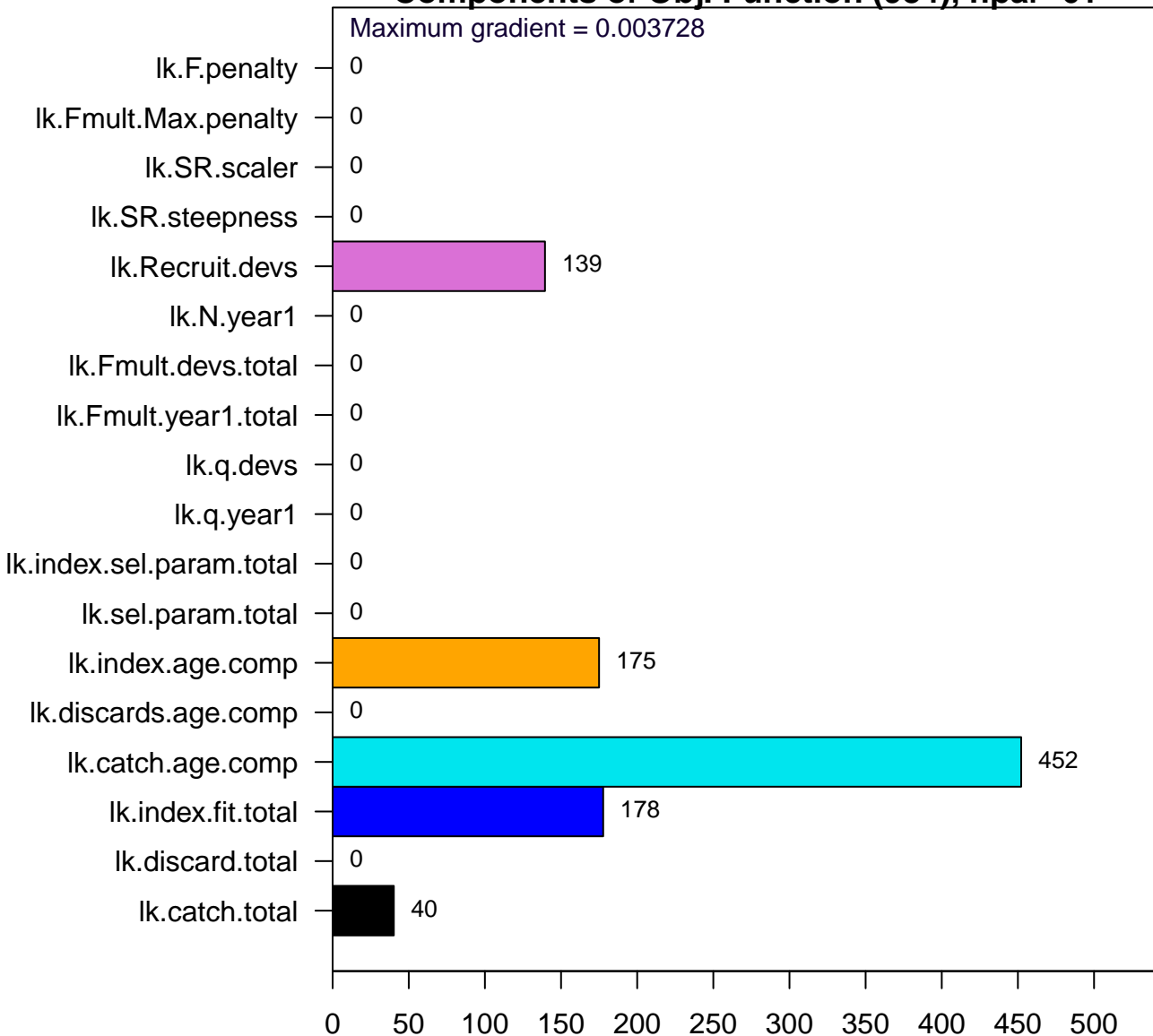
ASAPplots version = 0.2.17

Warning, maximum gradient > 0.001

npar = 61, maximum gradient = 0.00372755

Components of Obj. Function (984), npar=61

Maximum gradient = 0.003728



Likelihood Contribution

Model: asap3

Tuesday, 02 Mar 2021 at 16:12:56

Number of high correlations

2.0
1.5
1.0
0.5
0.0

0

10

20

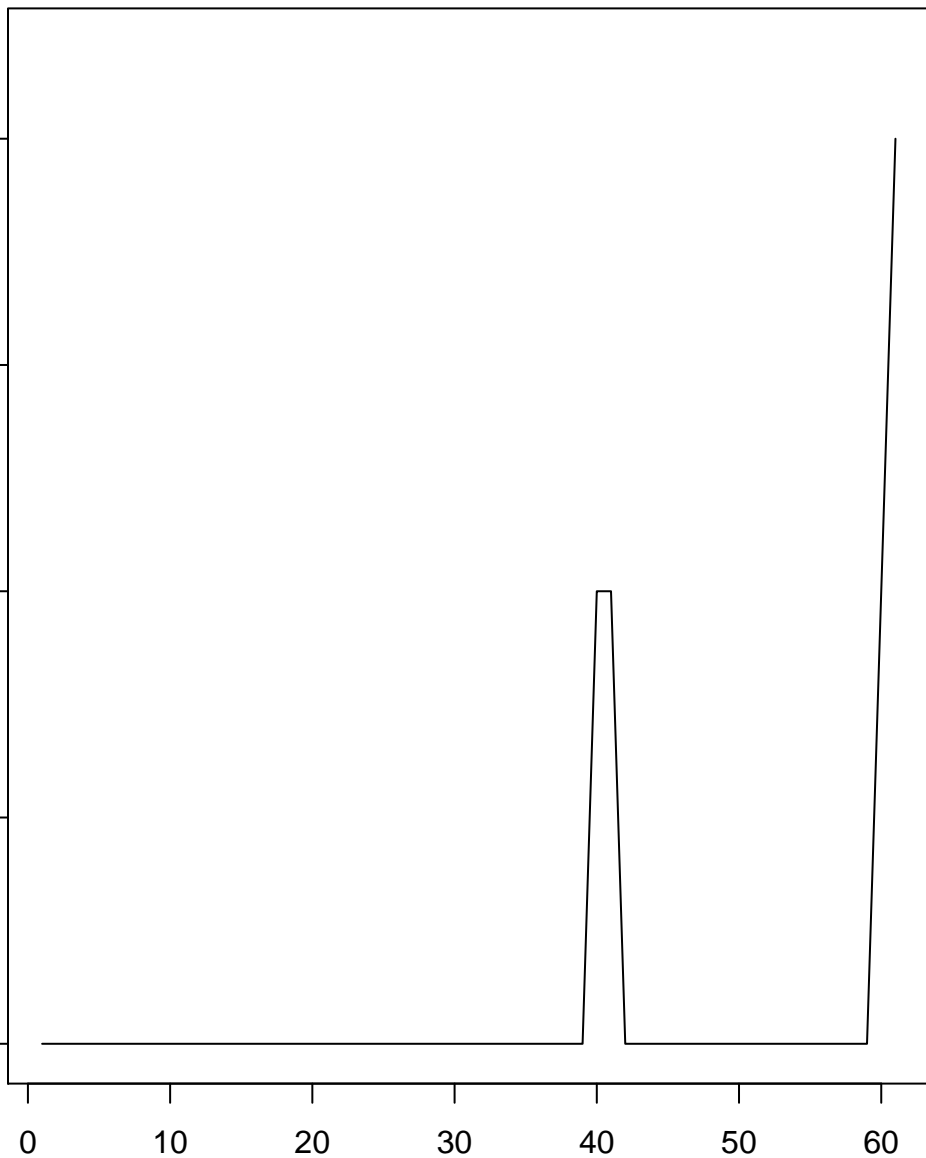
30

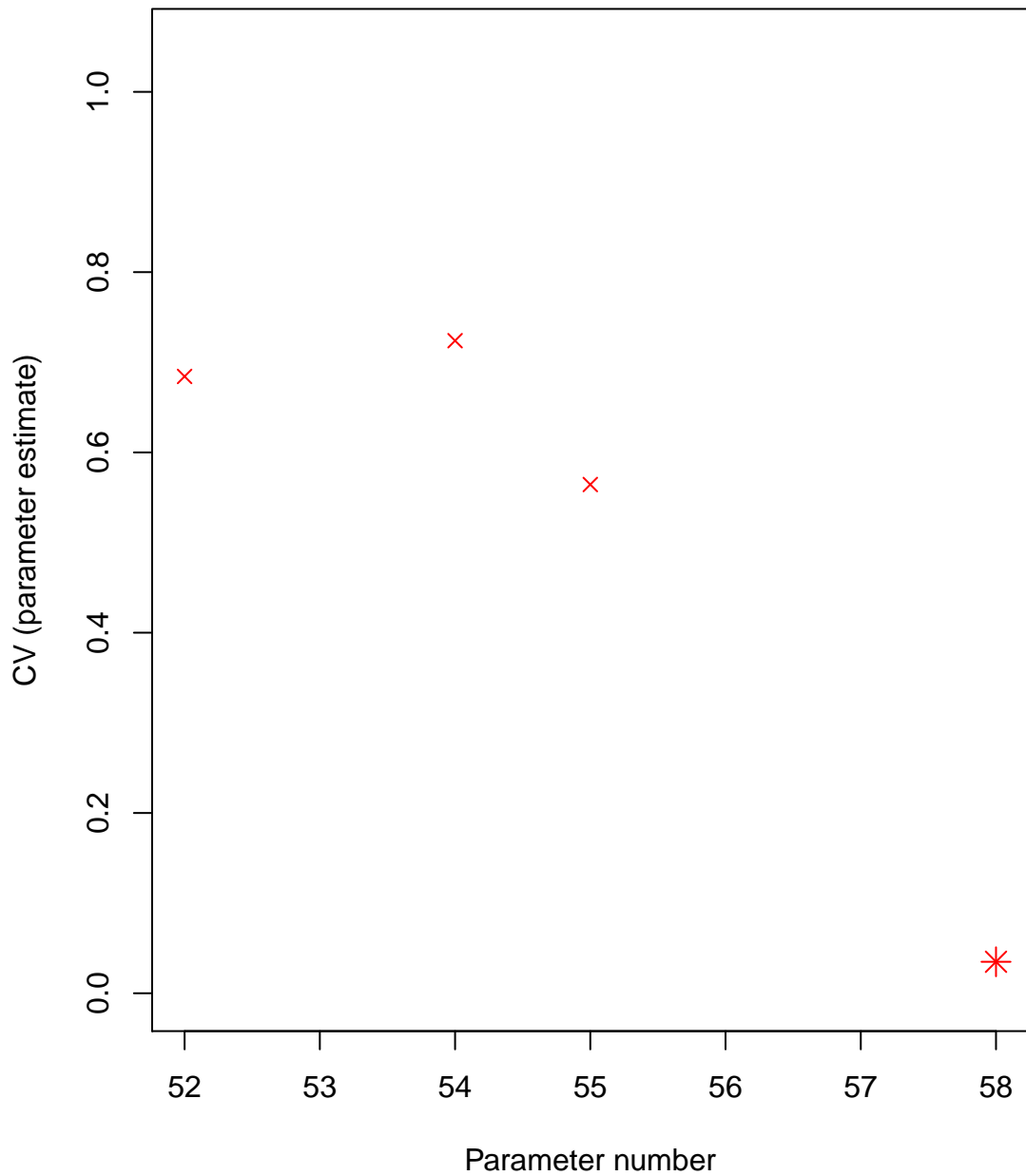
40

50

60

Parameter

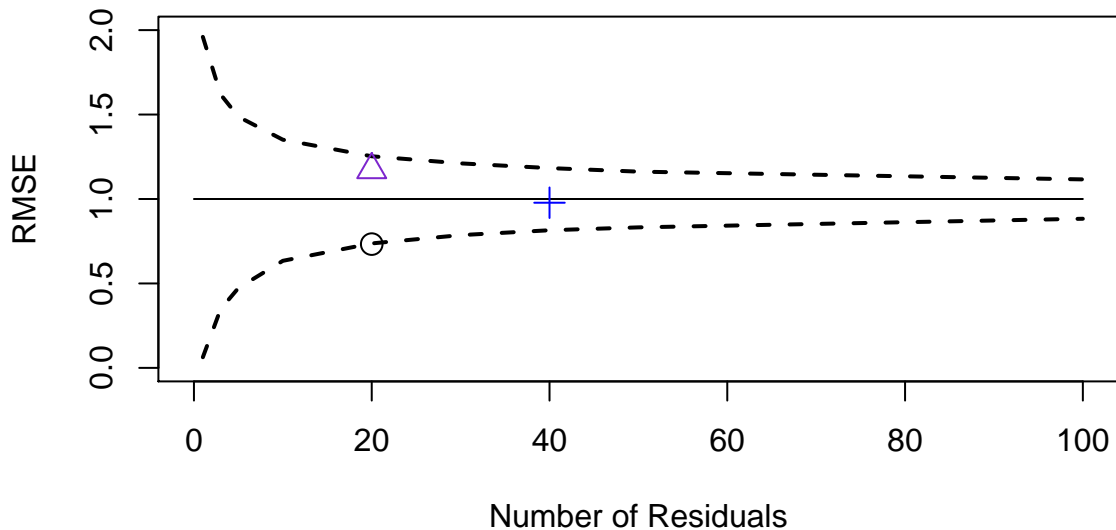




Root Mean Square Error computed from Standardized Residuals

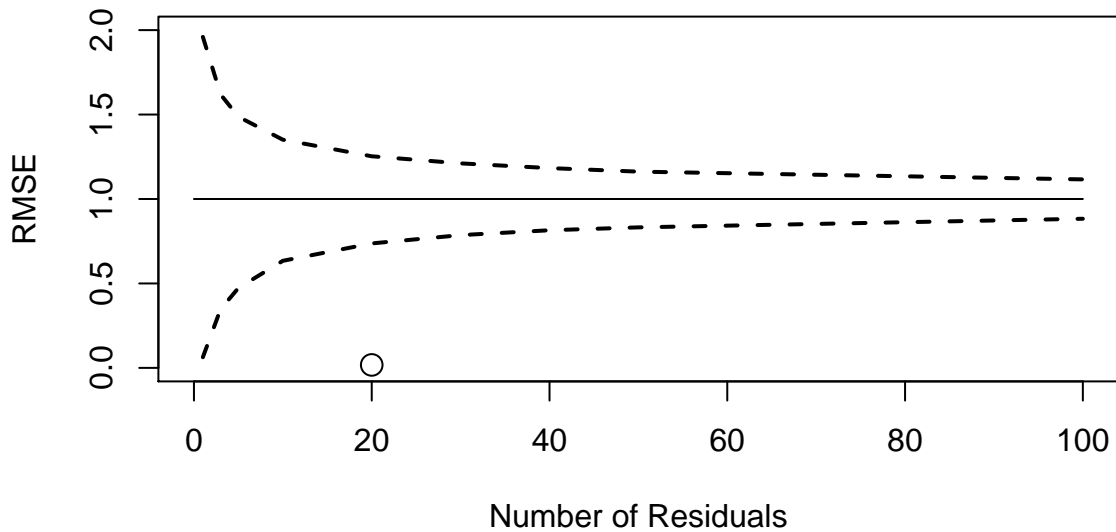
Component	# resids	RMSE
catch.tot	20	0.0175
discard.tot	0	0
ind01	20	0.733
ind02	20	1.17
ind.total	40	0.978
N.year1	0	0
Fmult.year1	0	0
Fmult.devs.total	0	0
recruit.devs	20	1.1
fleet.sel.params	0	0
index.sel.params	0	0
q.year1	0	0
q.devs	0	0
SR.steepness	0	0
SR.scaler	0	0

Root Mean Square Error for Indices



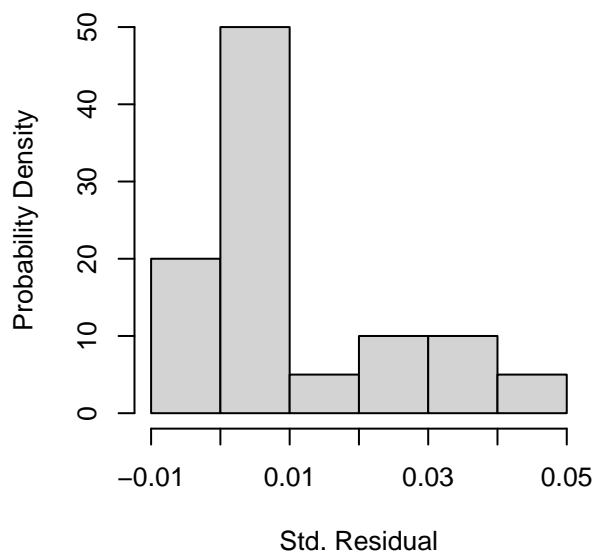
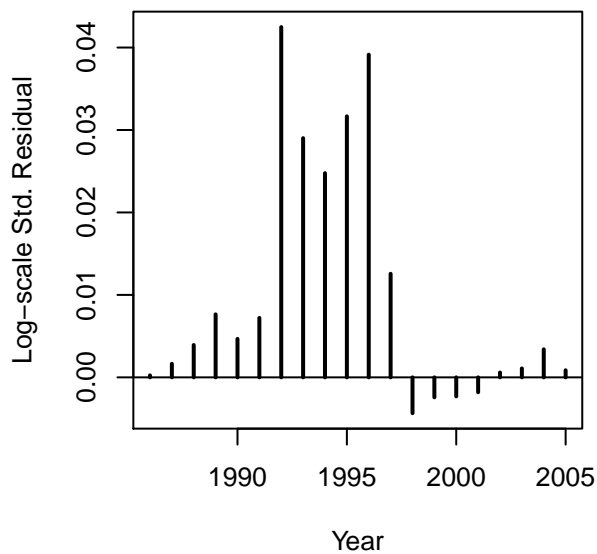
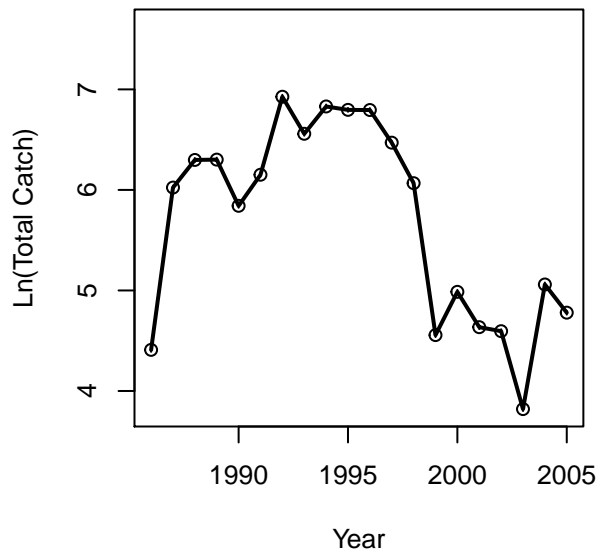
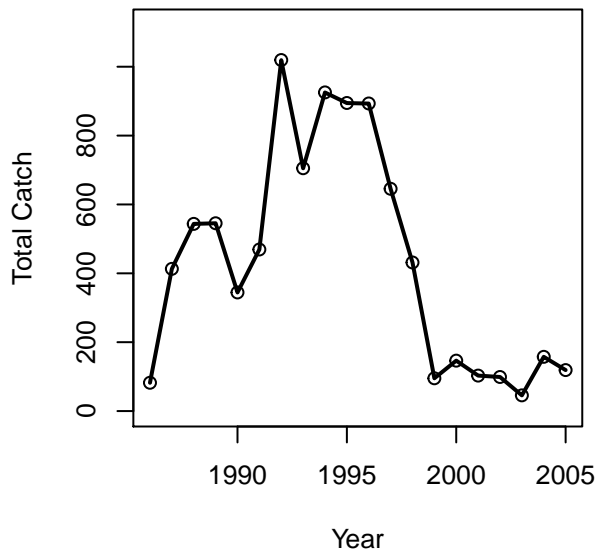
+ ind total
△ INDEX-2
○ INDEX-1

Root Mean Square Error for Catch



○ catch.tot

Fleet 1 Catch (FLEET-1)

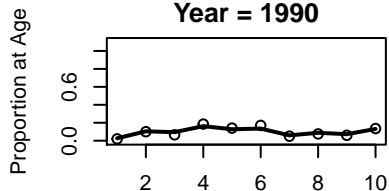


Catch

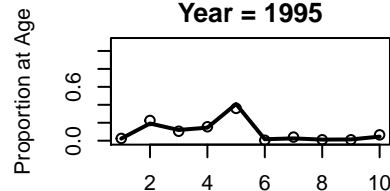
Fleet 1
FLEET-1



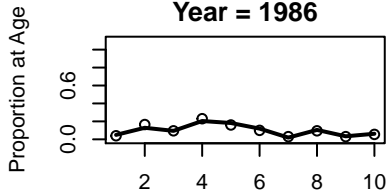
Year = 1990



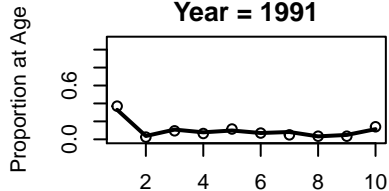
Year = 1995



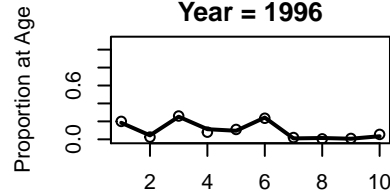
Year = 1986



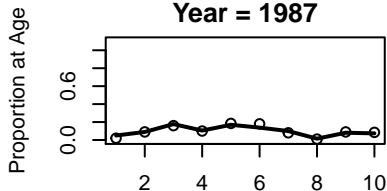
Year = 1991



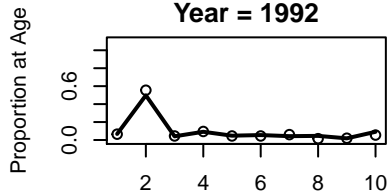
Year = 1996



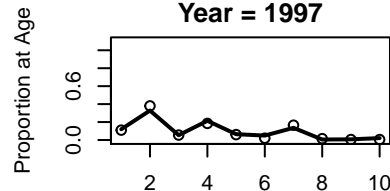
Year = 1987



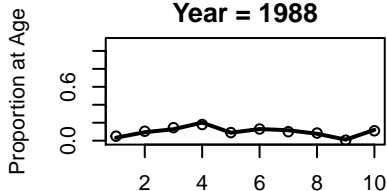
Year = 1992



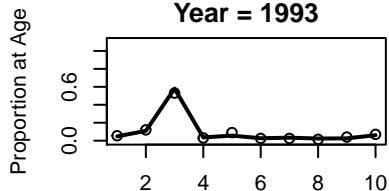
Year = 1997



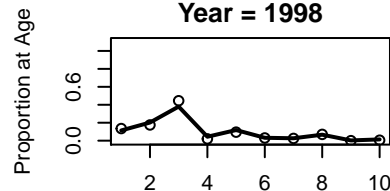
Year = 1988



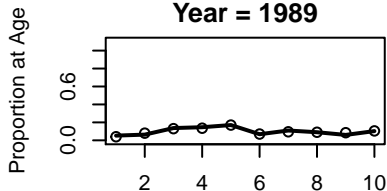
Year = 1993



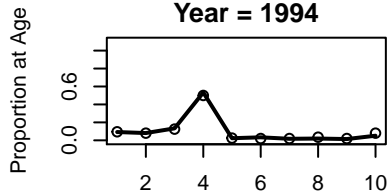
Year = 1998



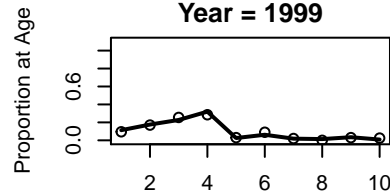
Year = 1989



Year = 1994

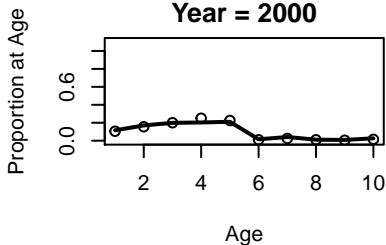


Year = 1999

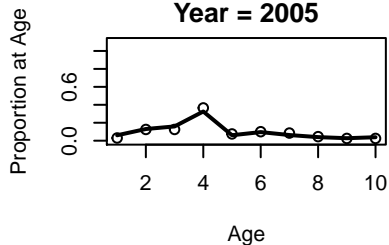


Catch

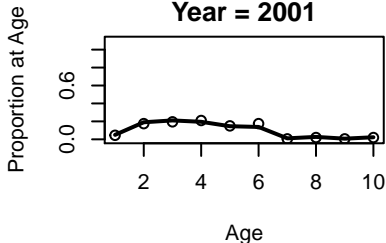
Year = 2000



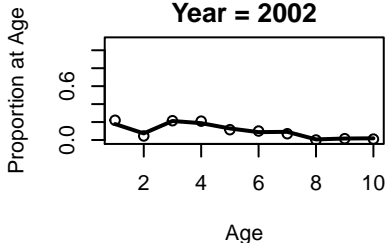
Year = 2005



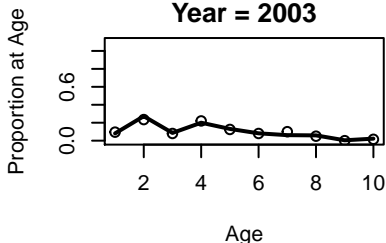
Year = 2001



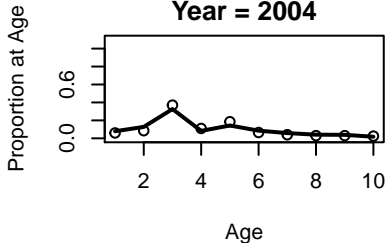
Year = 2002



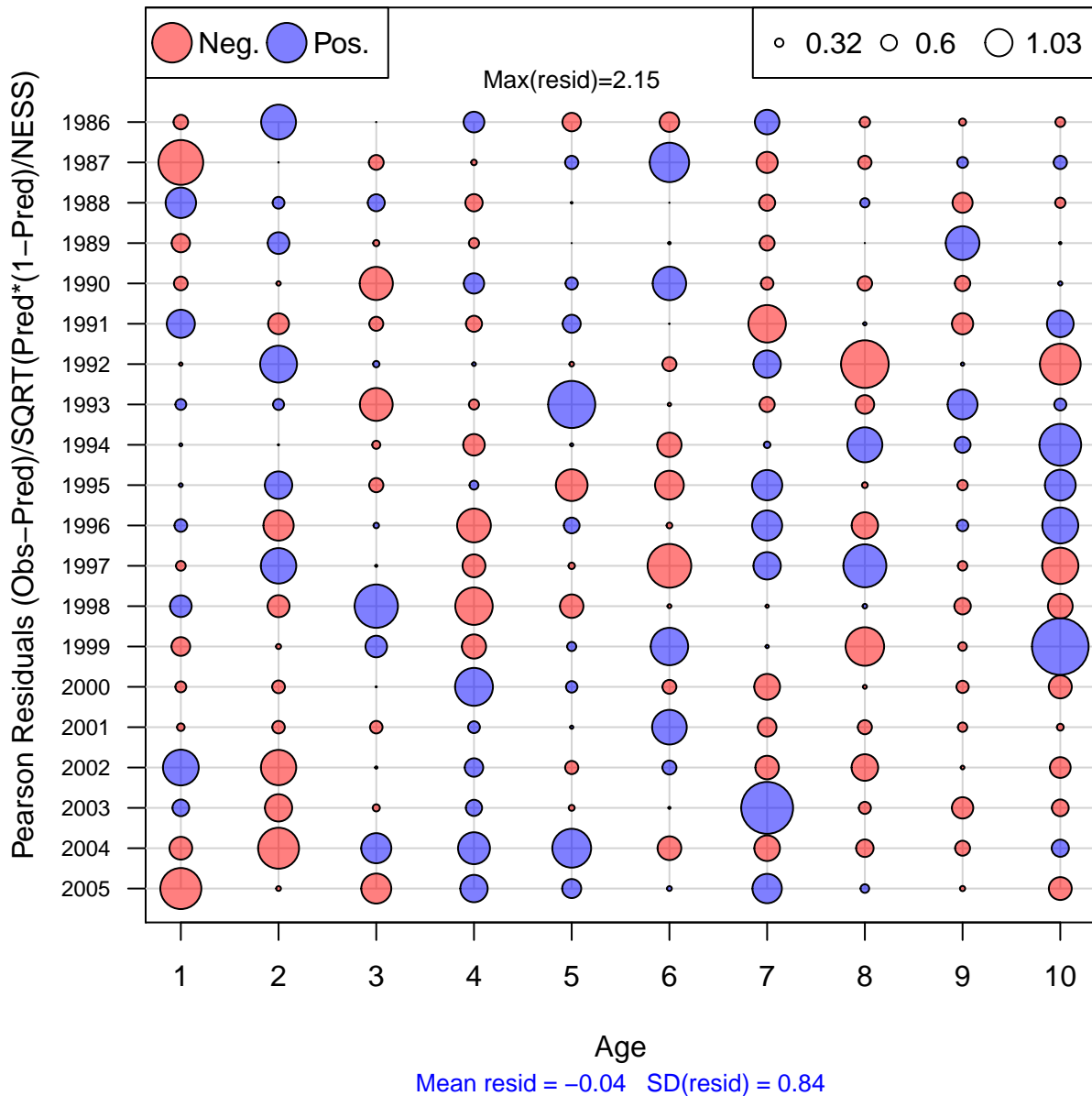
Year = 2003



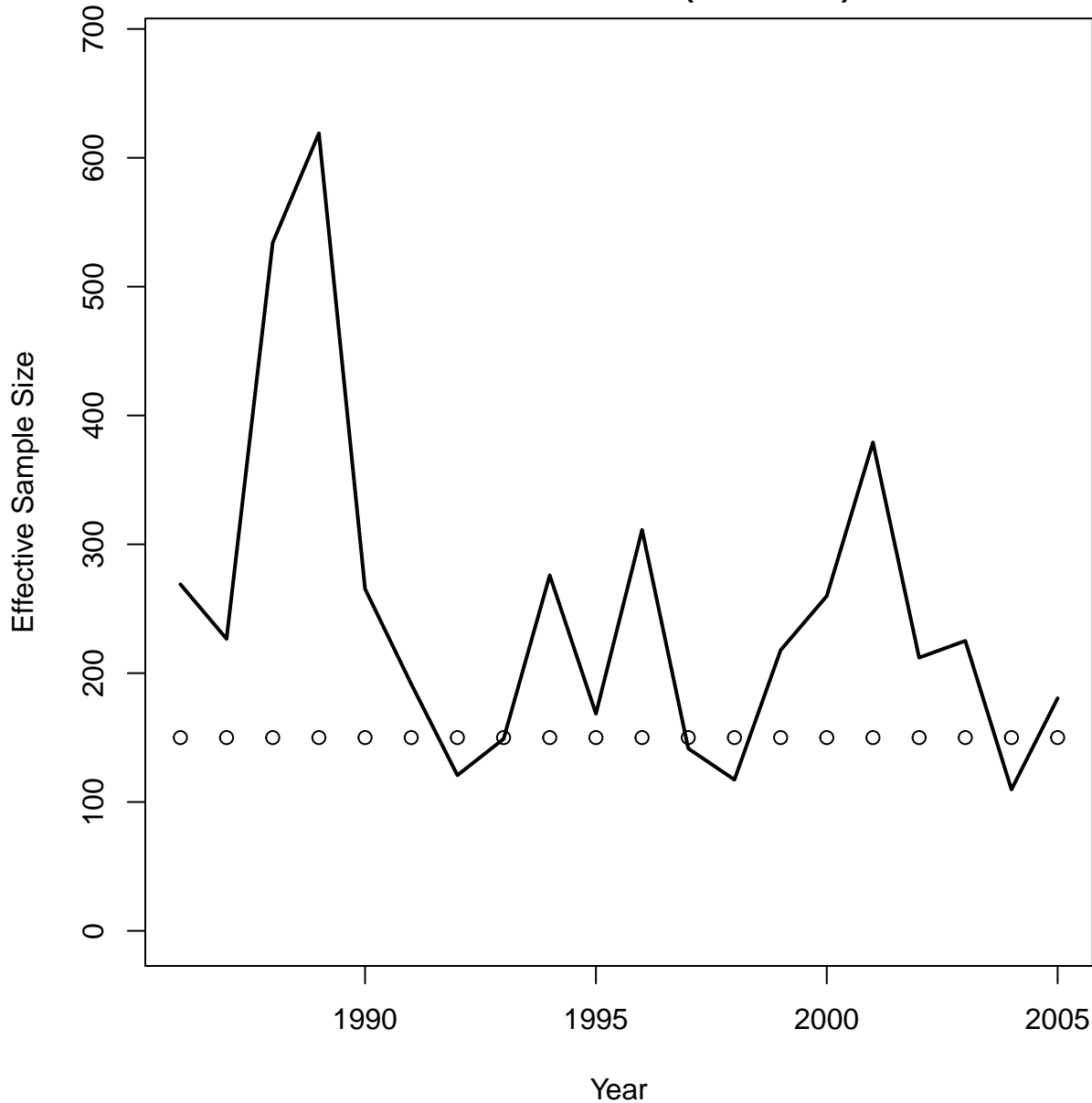
Year = 2004



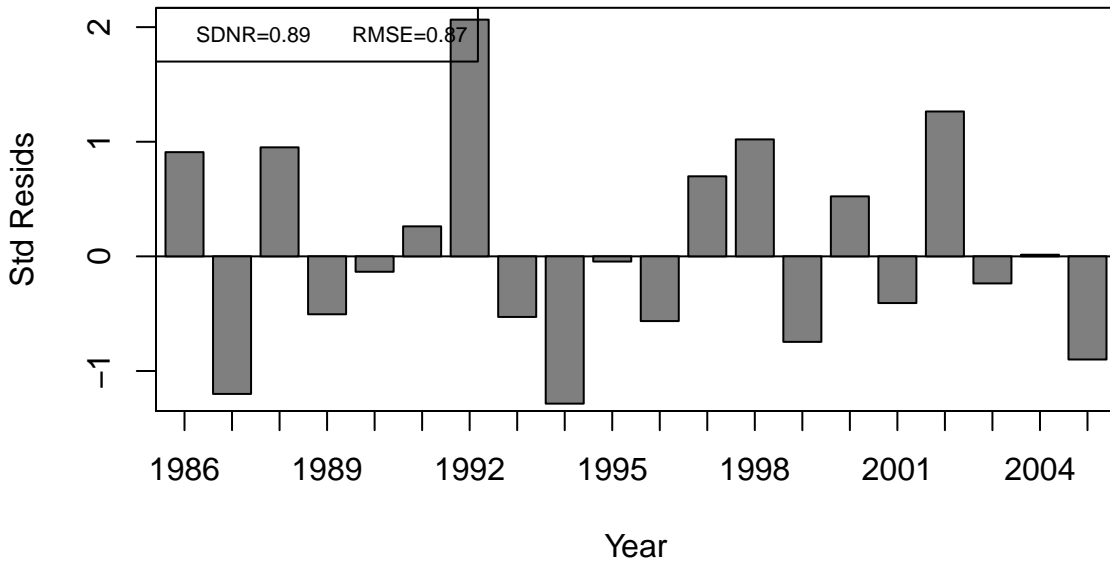
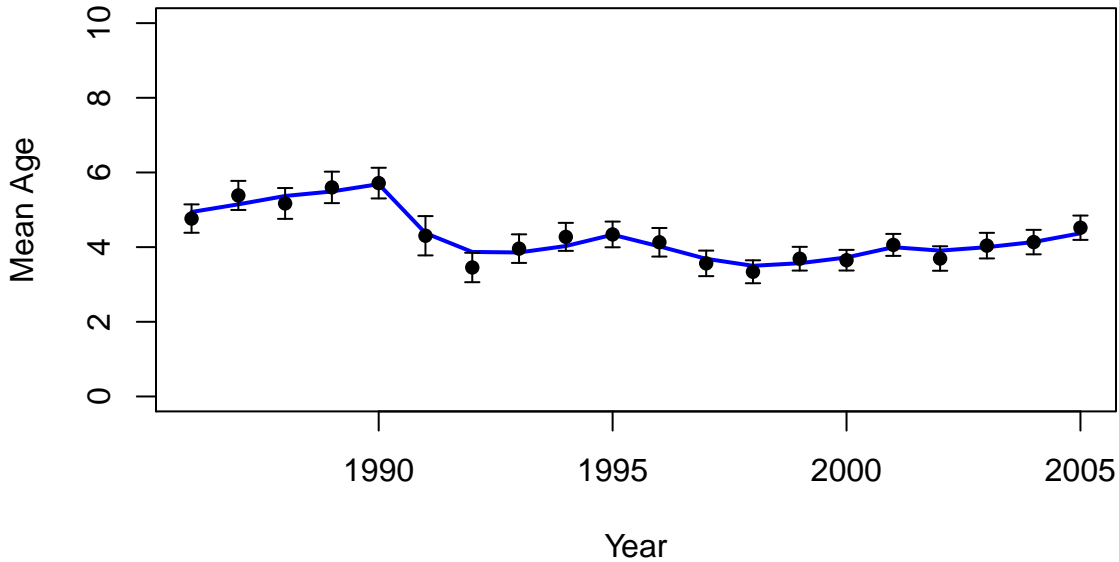
Age Comp Residuals for Catch by Fleet 1 (FLEET-1)



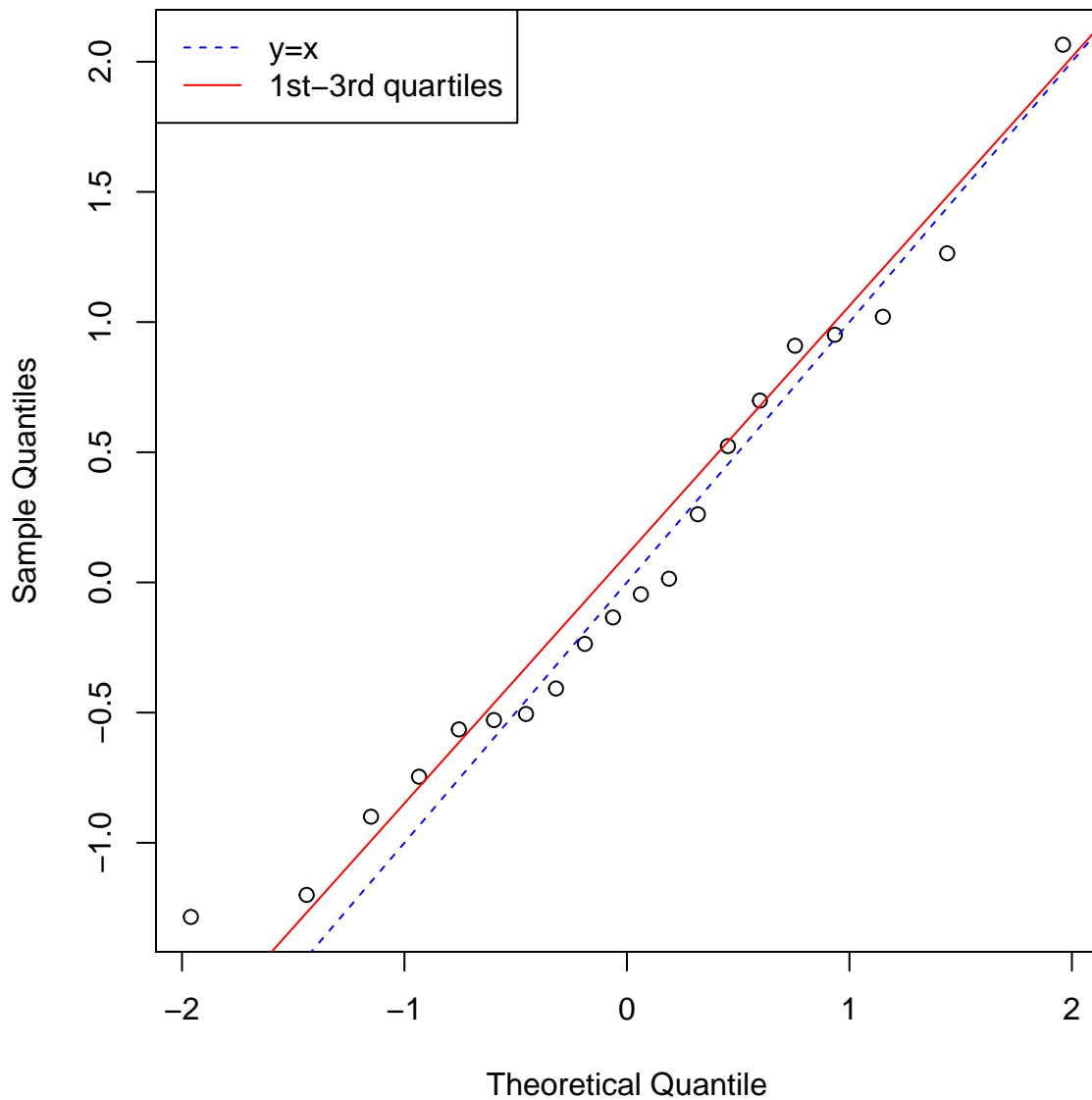
Catch Neff Fleet 1 (FLEET-1)



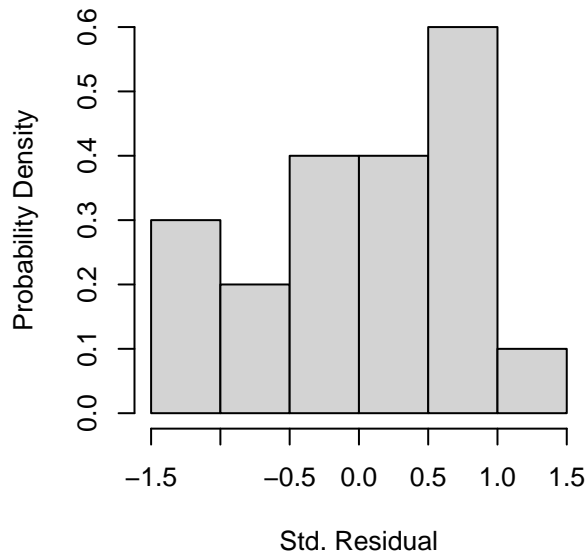
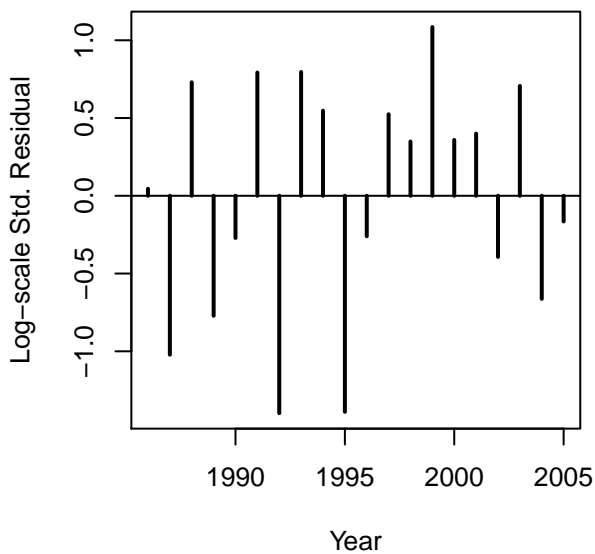
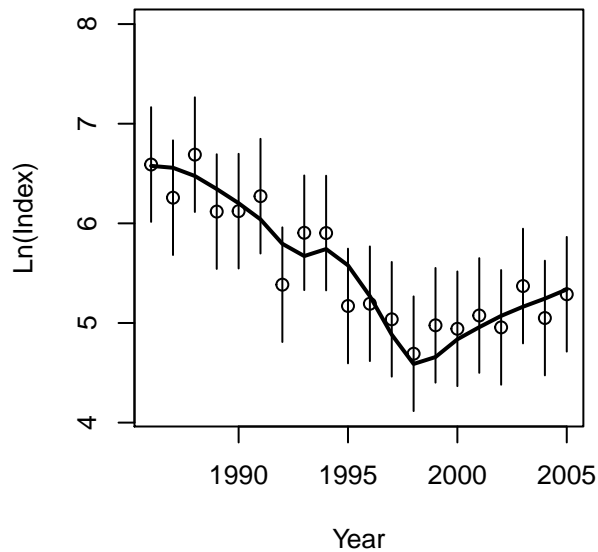
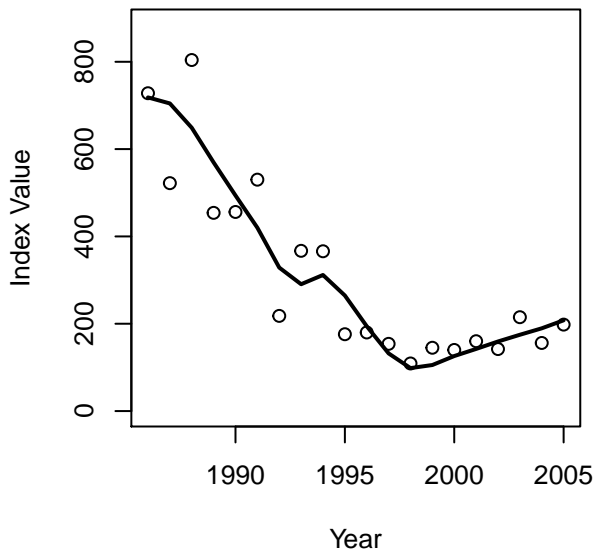
Catch Fleet 1 (FLEET-1) ESS = 150



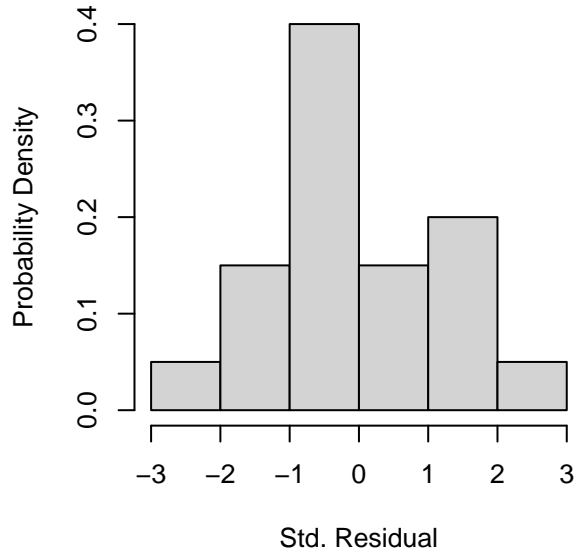
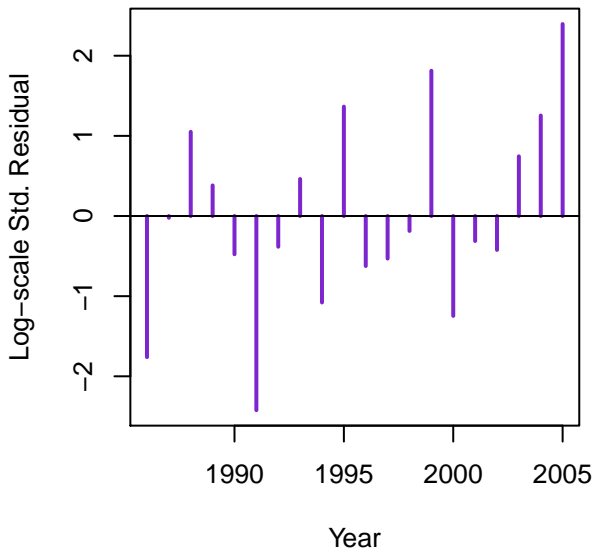
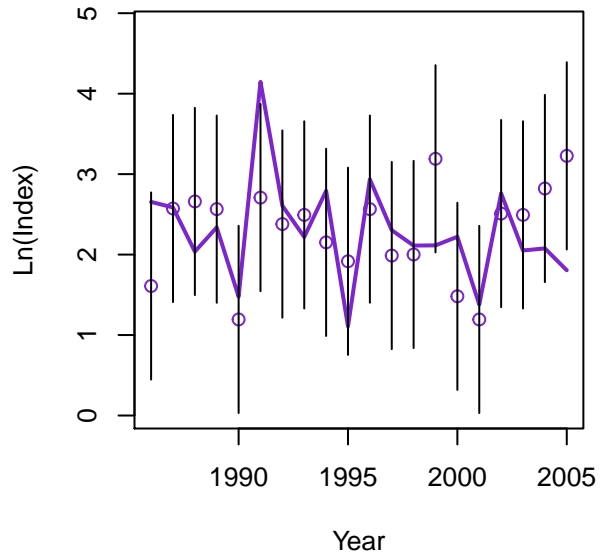
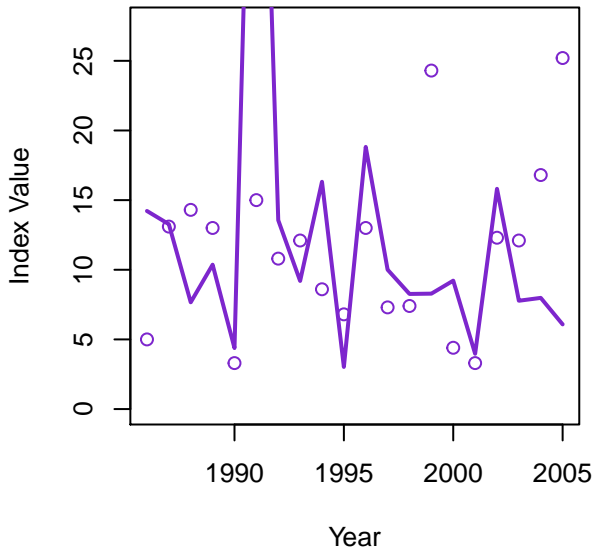
Catch Fleet 1 (FLEET-1) ESS = 150



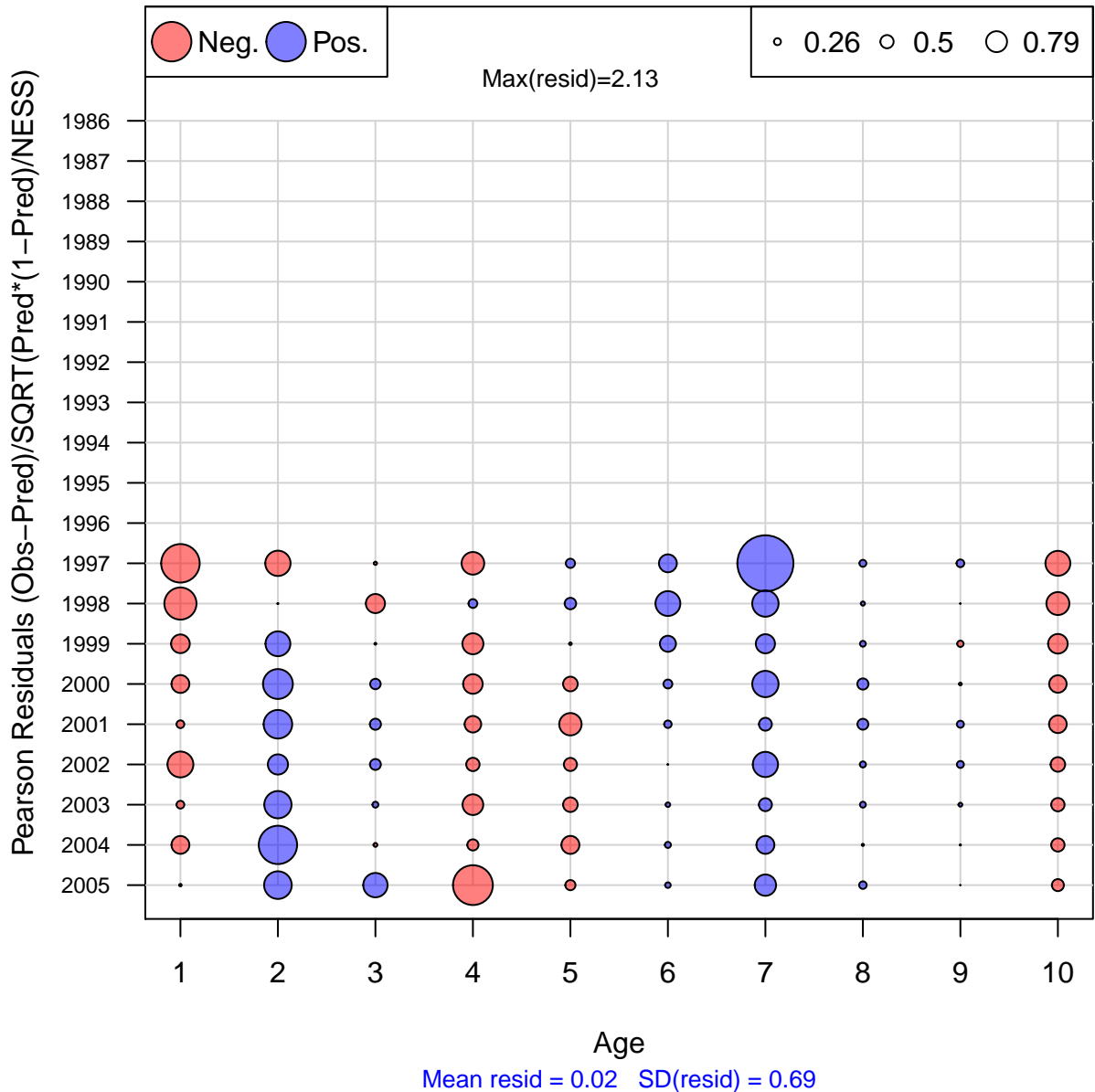
Index 1 (INDEX-1)



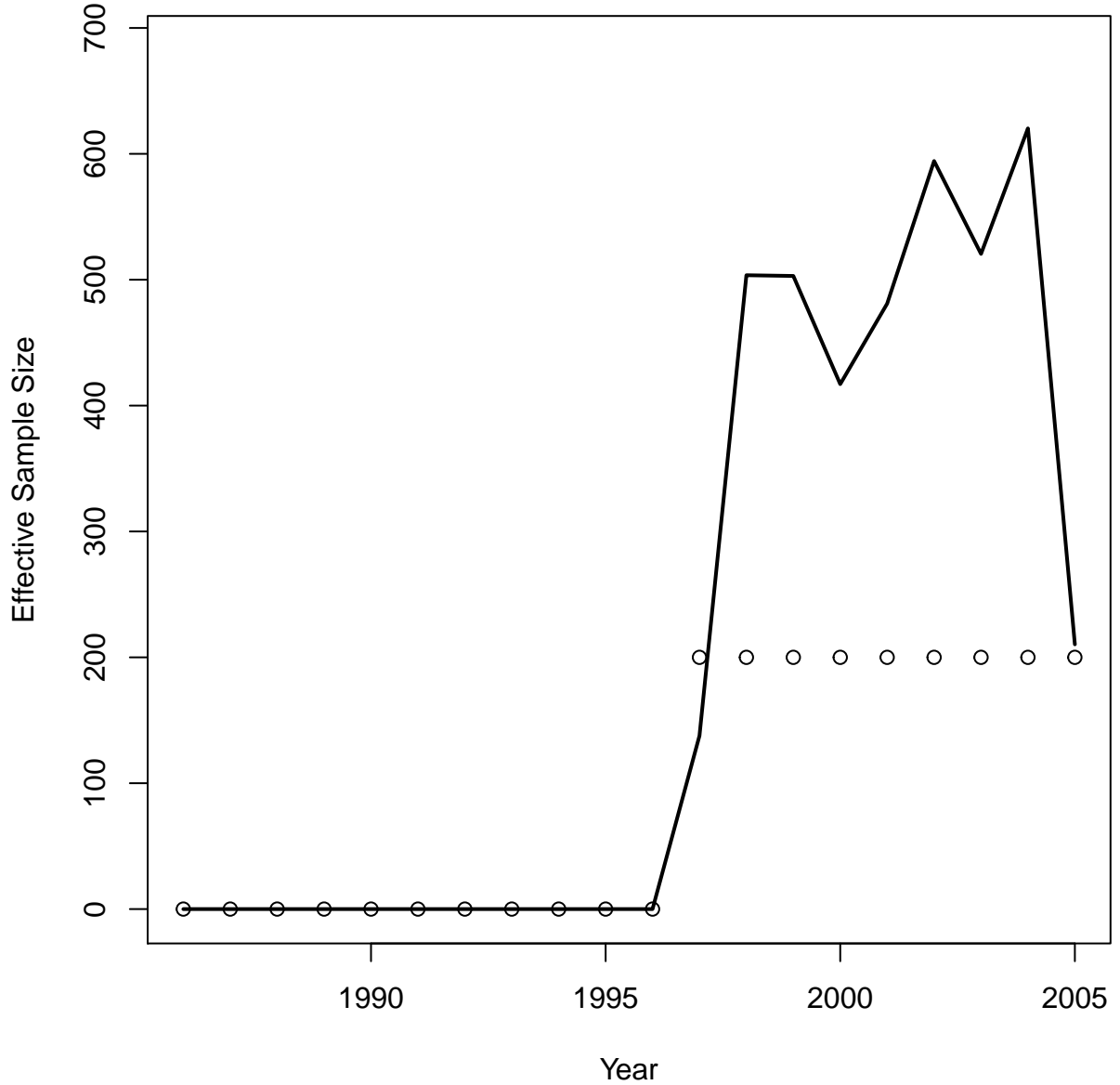
Index 2 (INDEX-2)



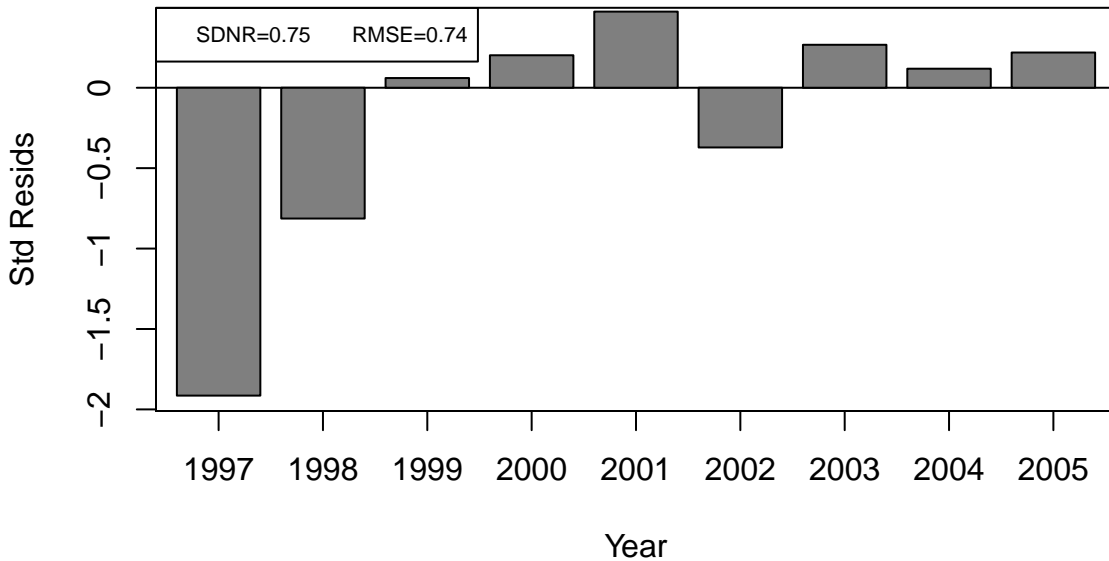
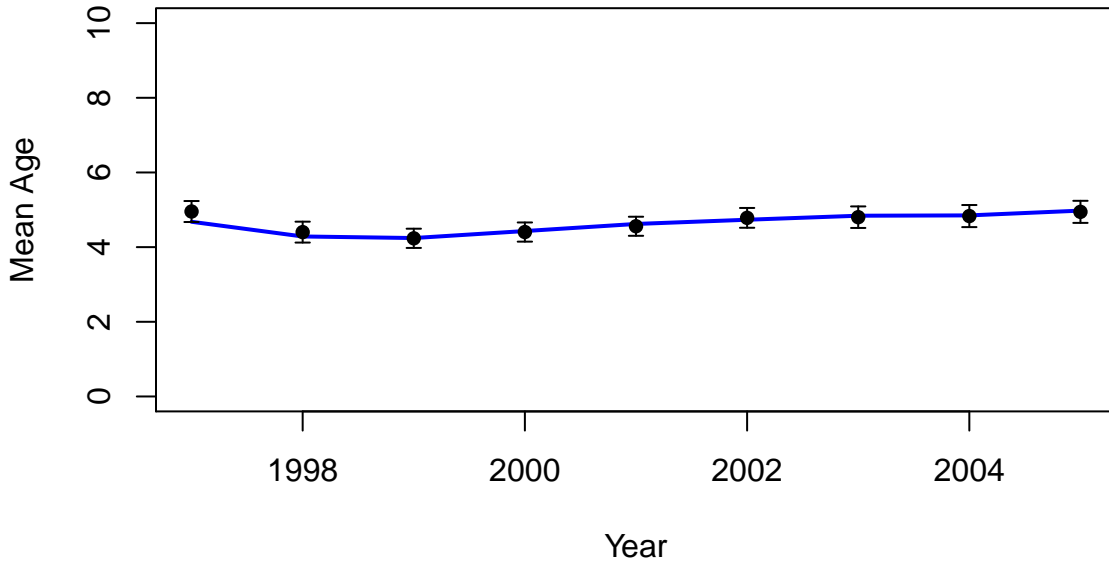
Age Comp Residuals for Index 1 (INDEX-1)



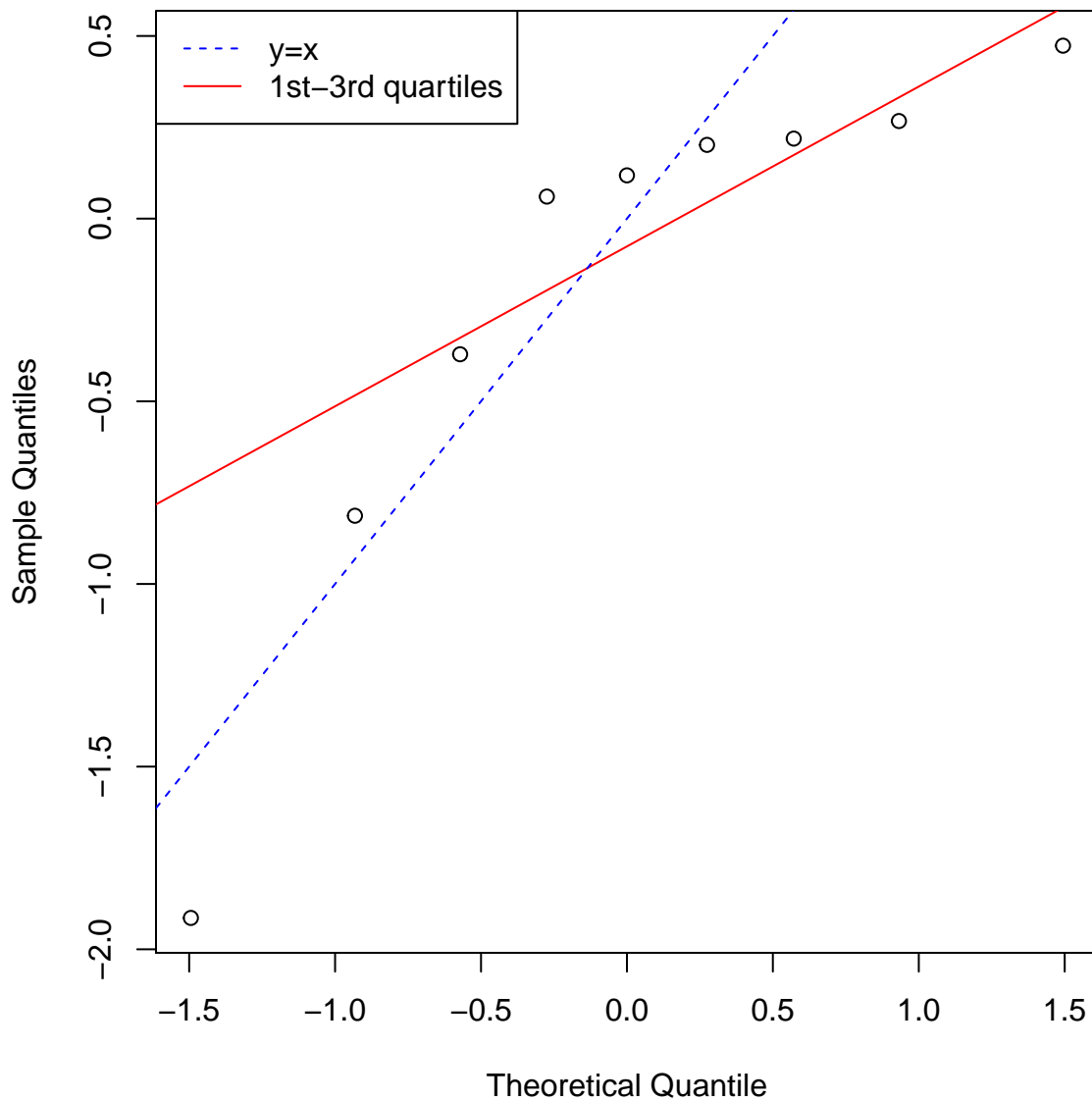
Index Neff 1 (INDEX-1)



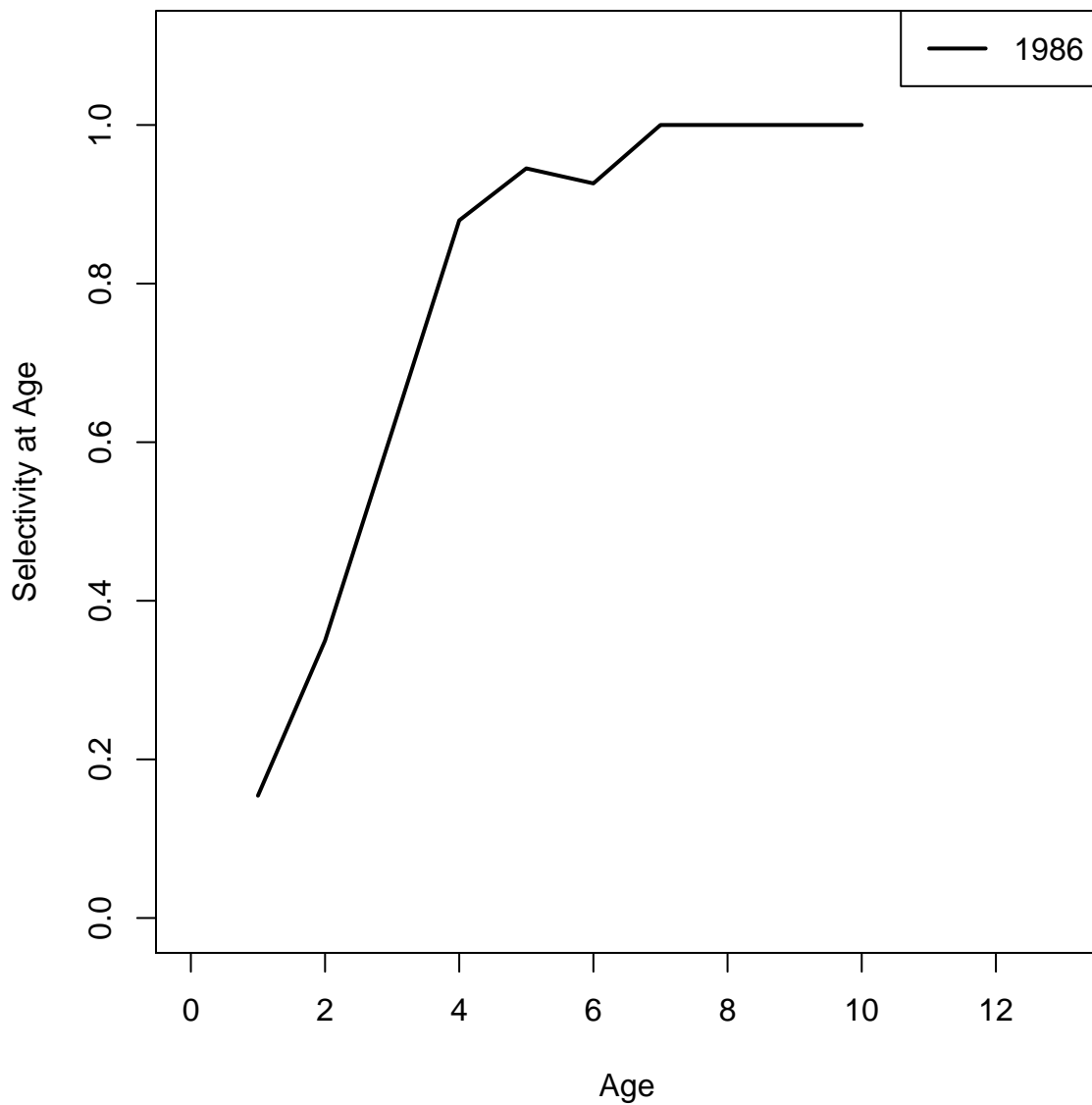
Index 1 (INDEX-1) ESS = 200

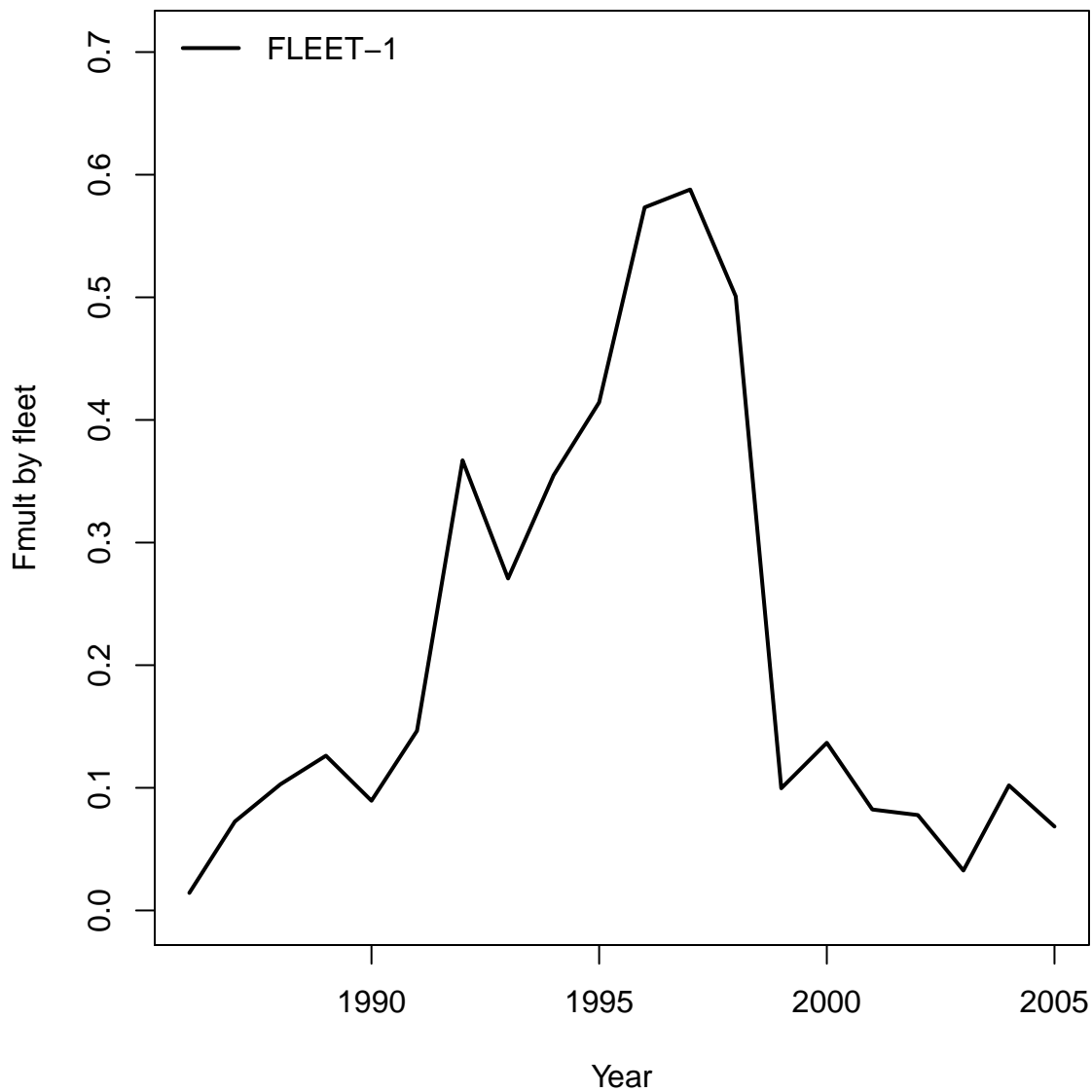


Index 1 (INDEX-1) ESS = 200

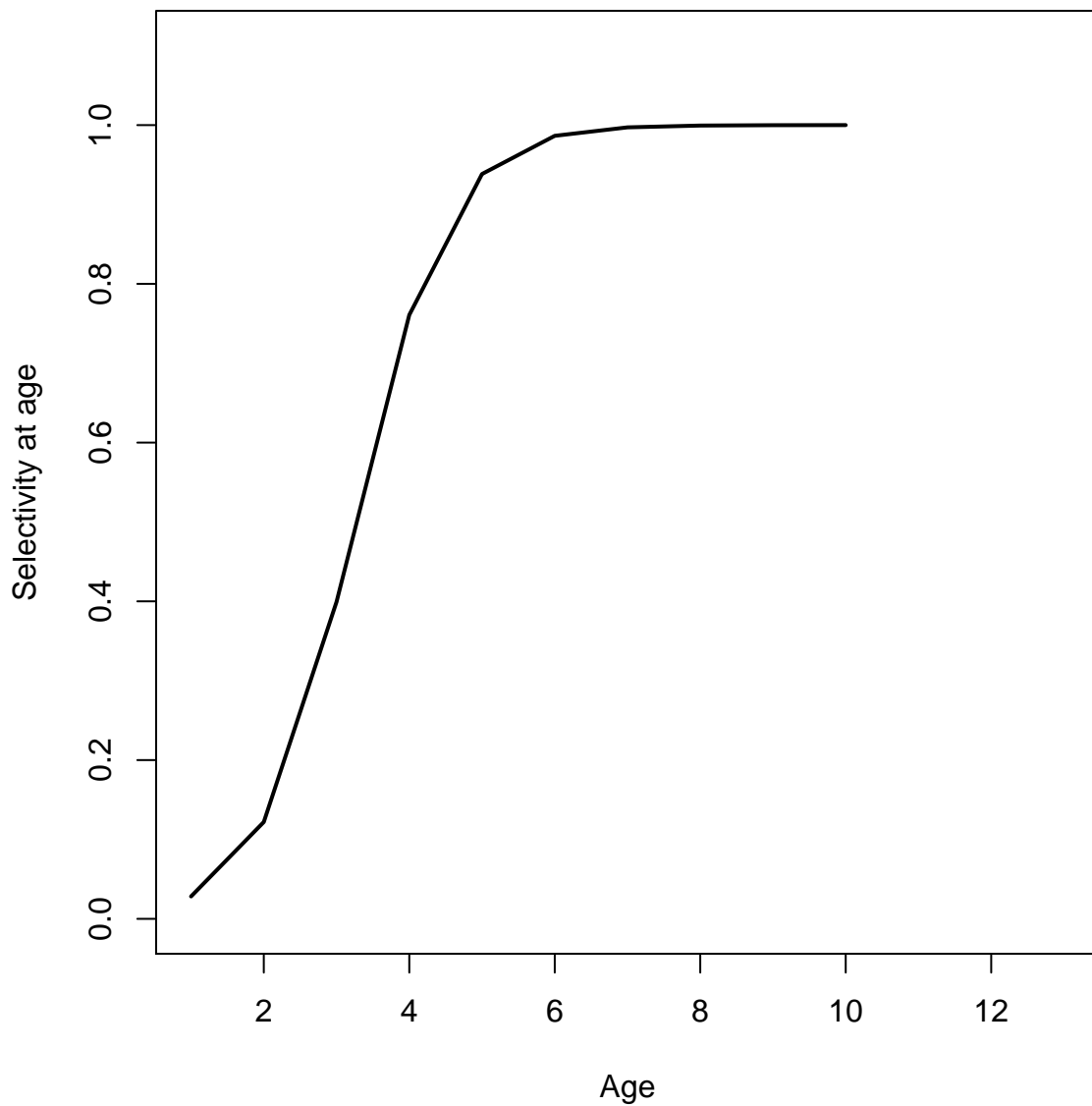


Fleet 1 (FLEET-1)

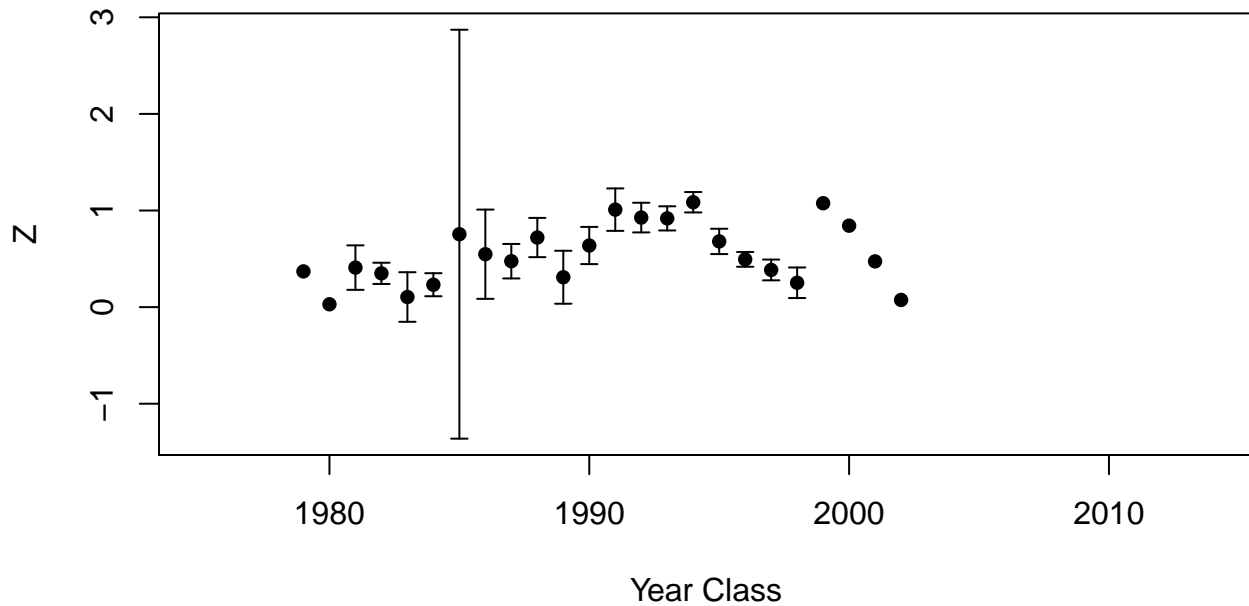
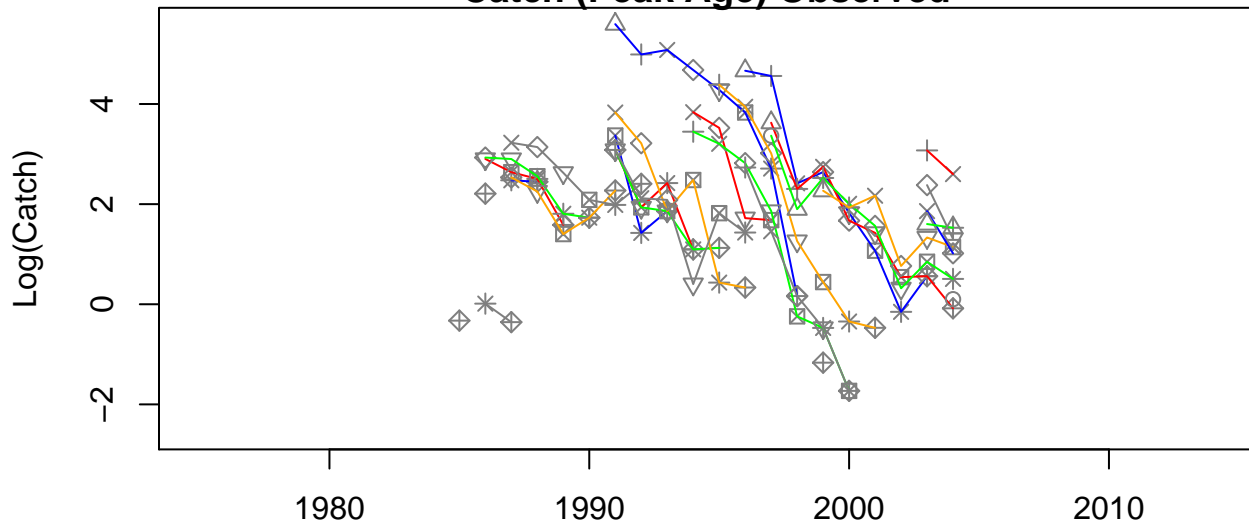




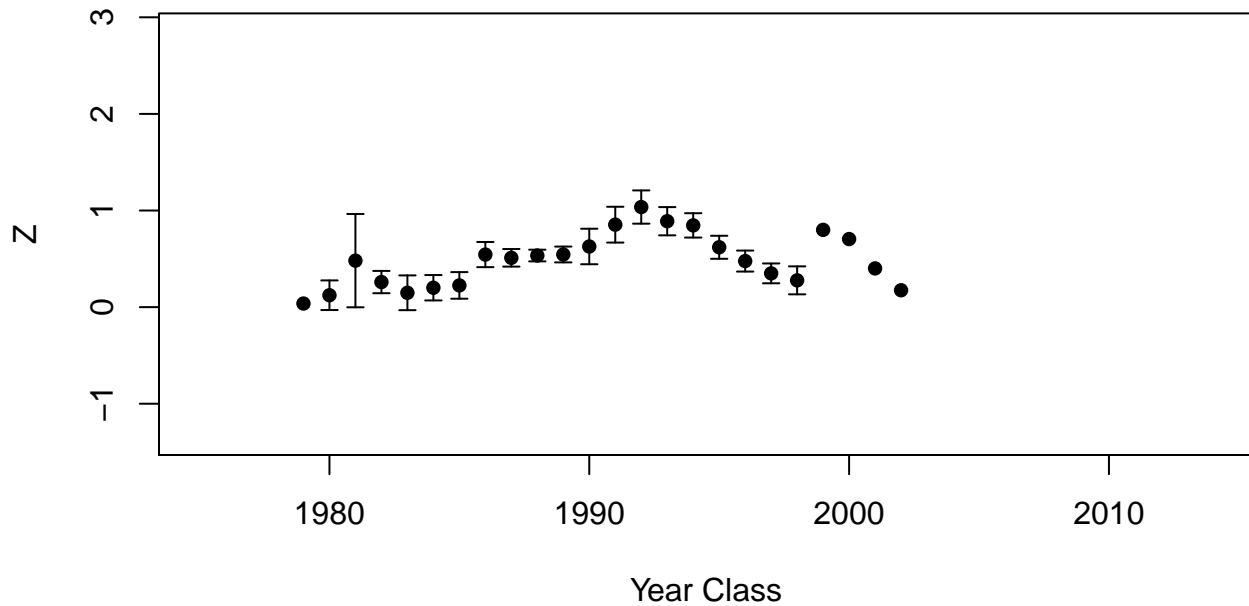
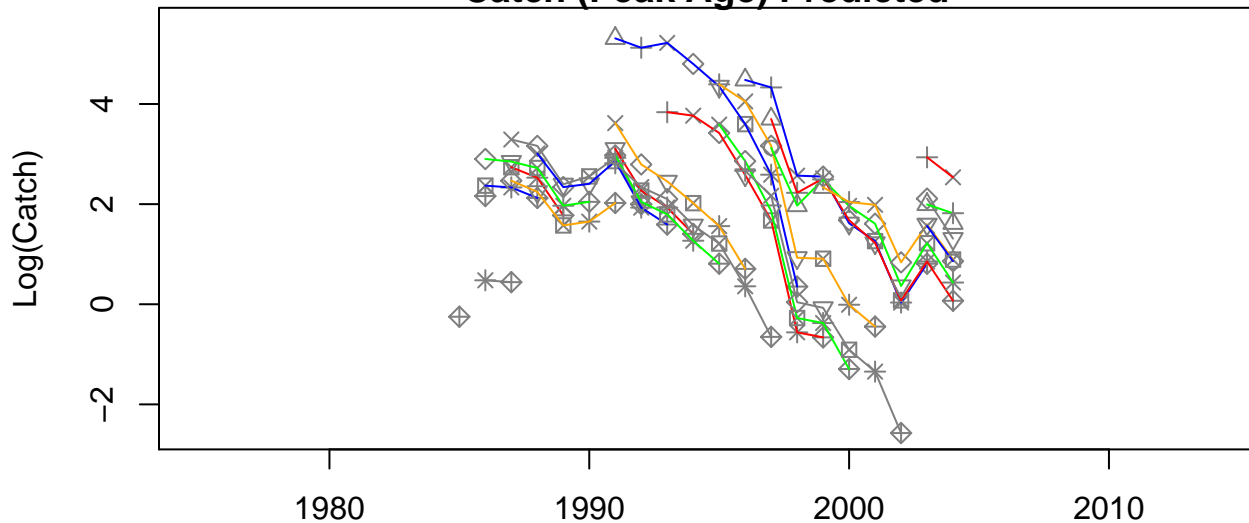
Indices



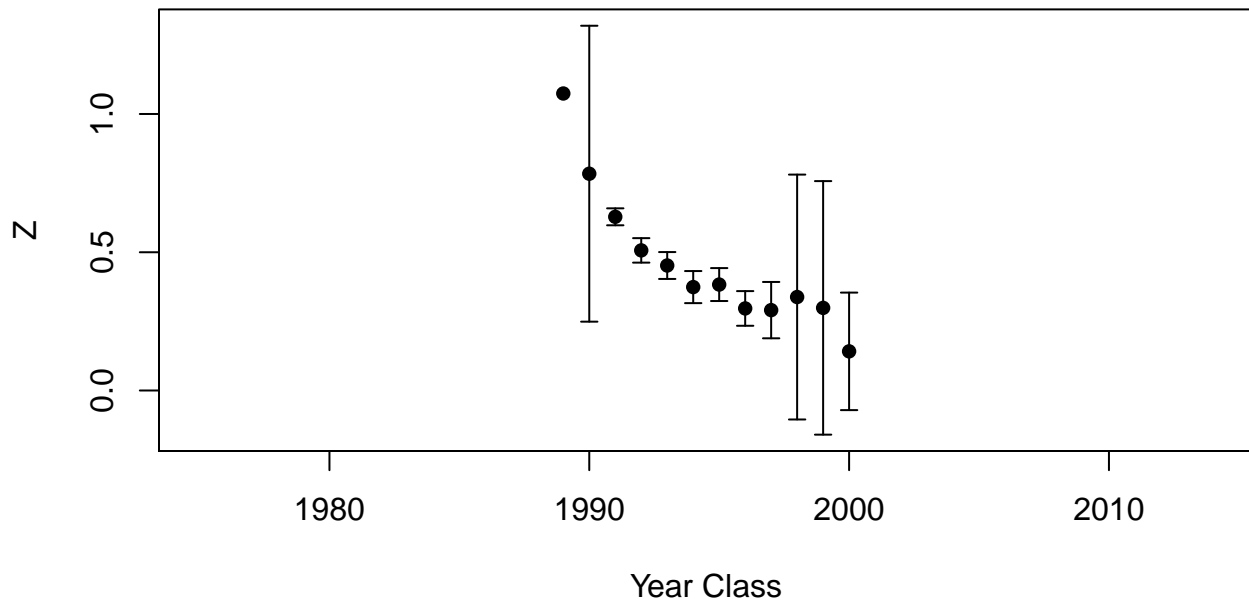
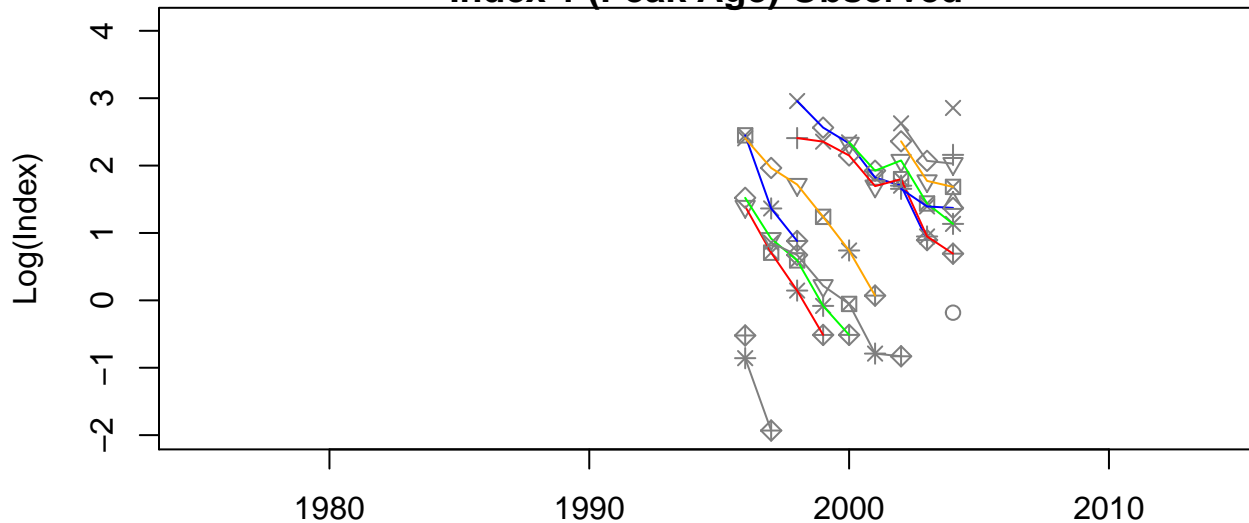
Catch (Peak Age) Observed

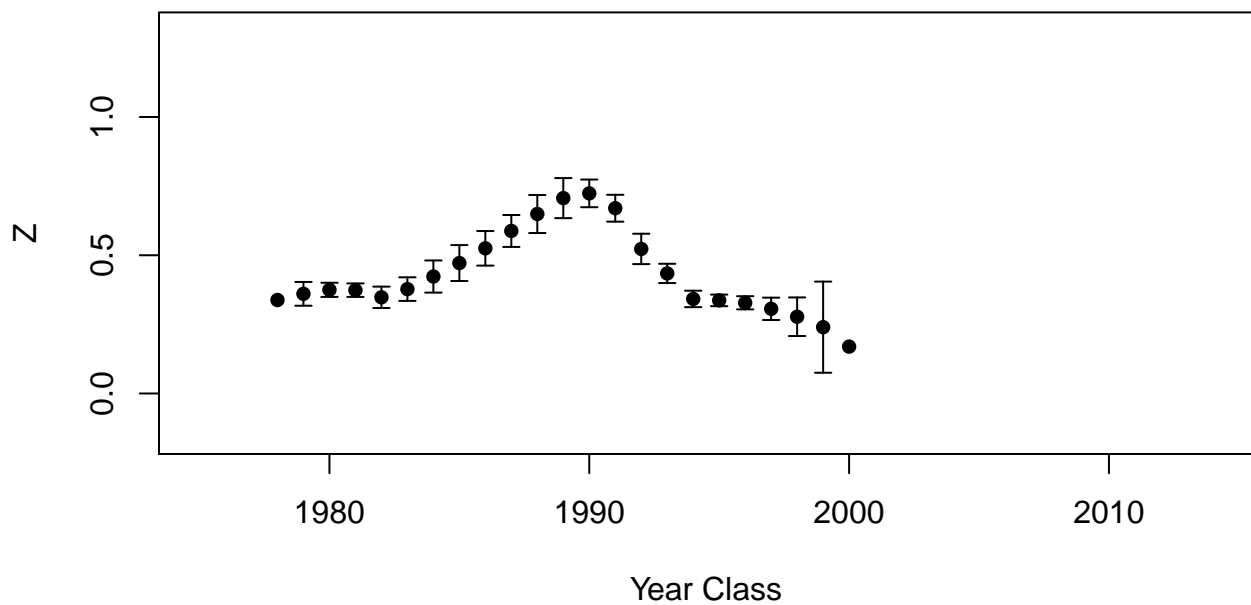
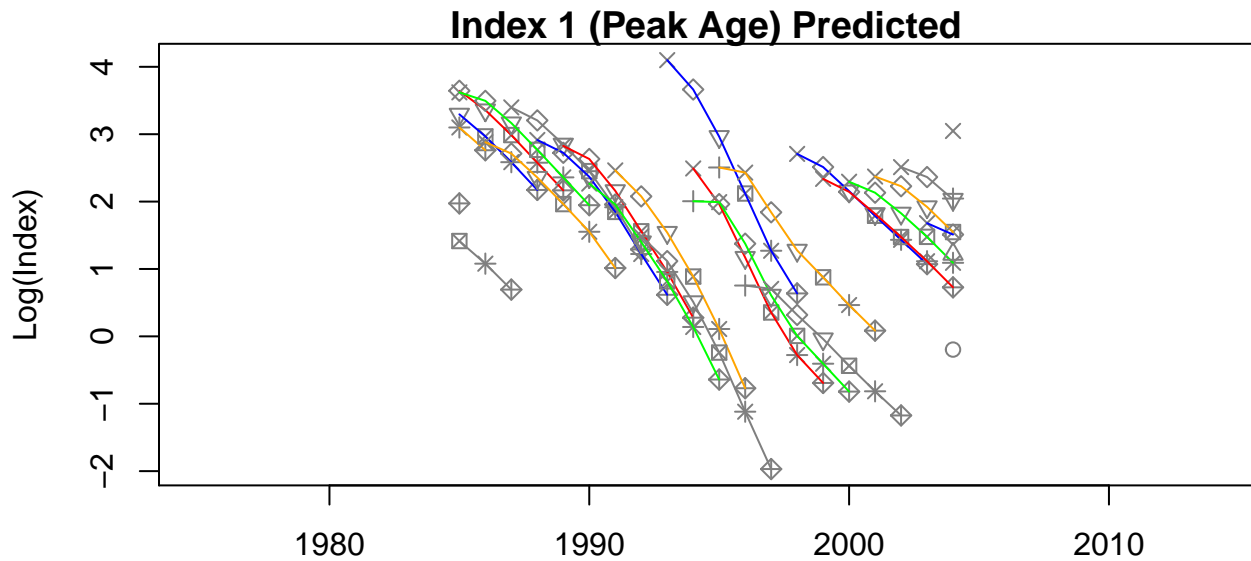


Catch (Peak Age) Predicted

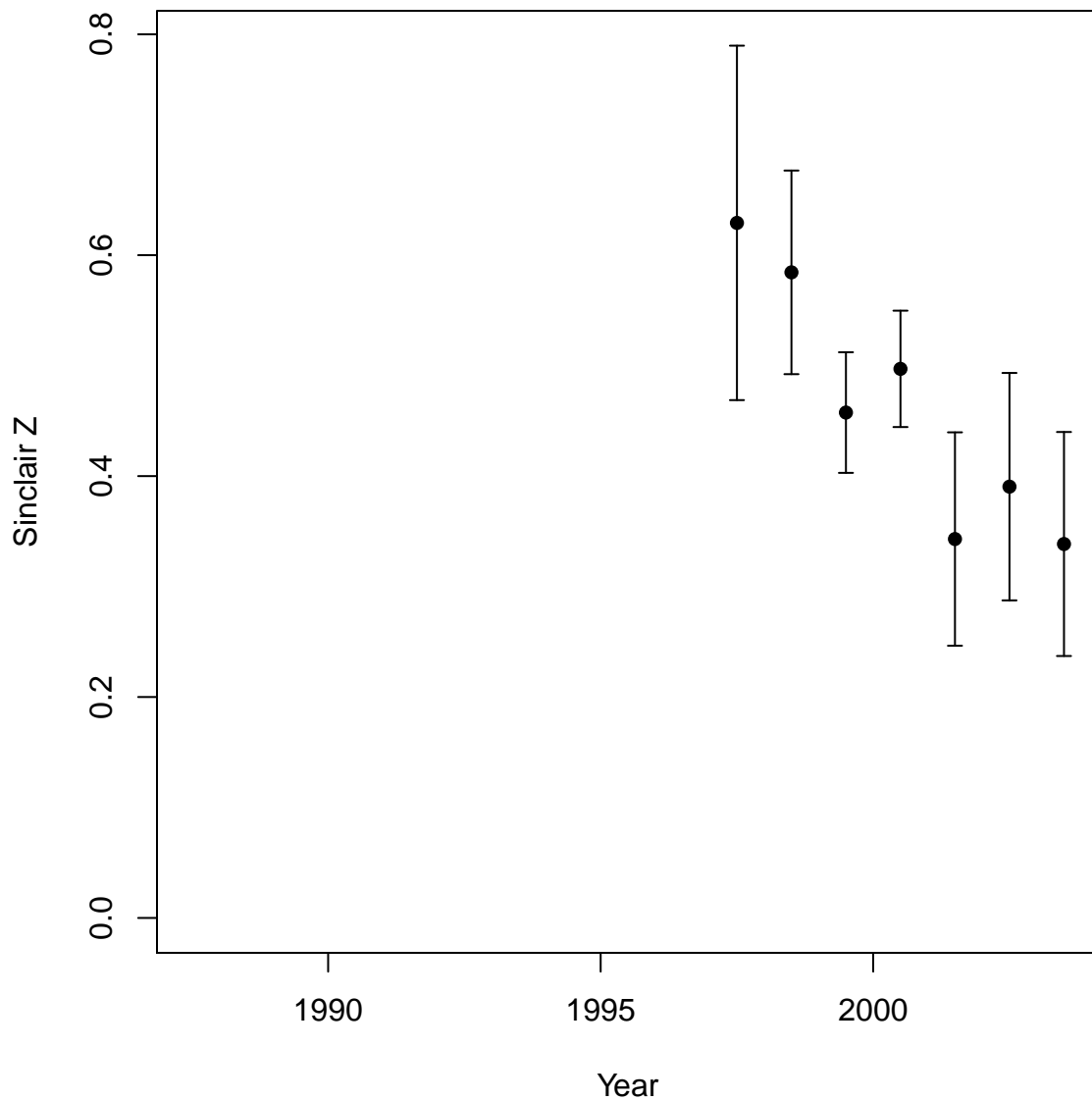


Index 1 (Peak Age) Observed

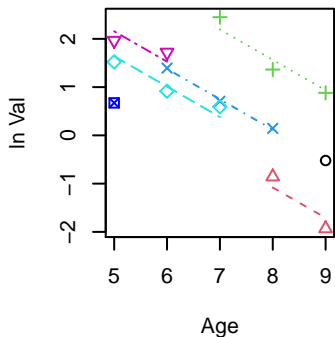




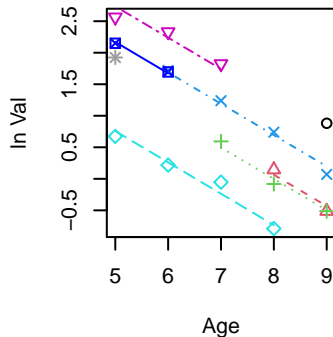
INDEX-1



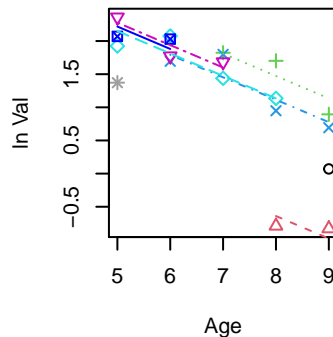
Years 1997 to 1999
Z = 0.629



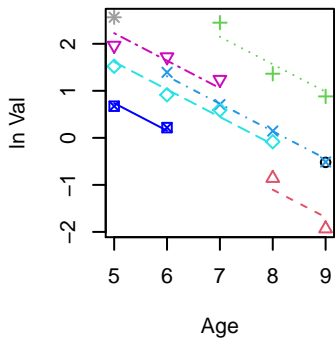
Years 1999 to 2002
Z = 0.497



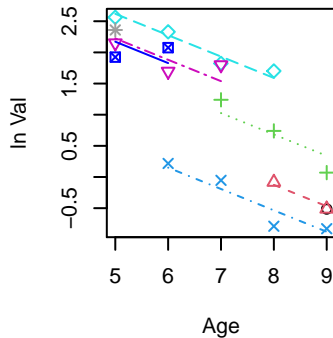
Years 2002 to 2005
Z = 0.339



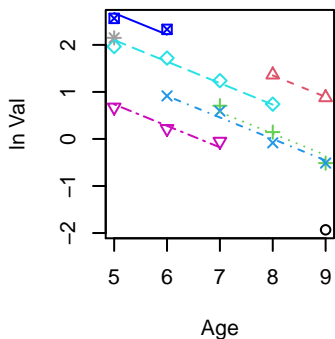
Years 1997 to 2000
Z = 0.584



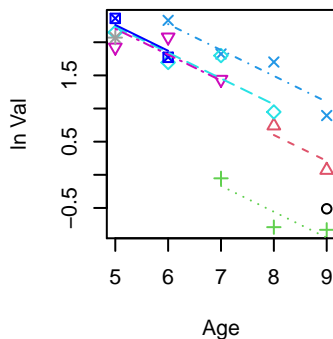
Years 2000 to 2003
Z = 0.343



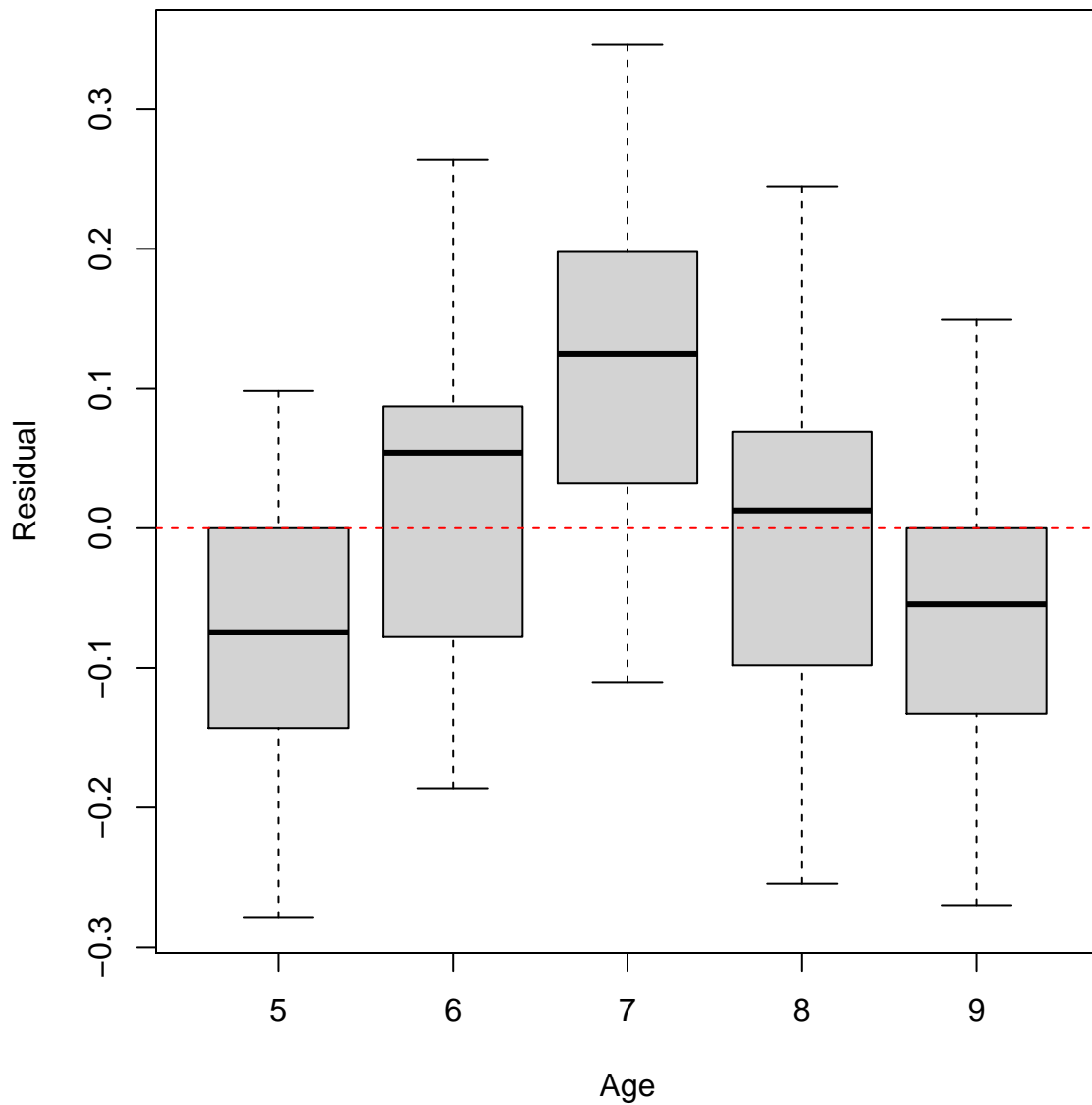
Years 1998 to 2001
Z = 0.458



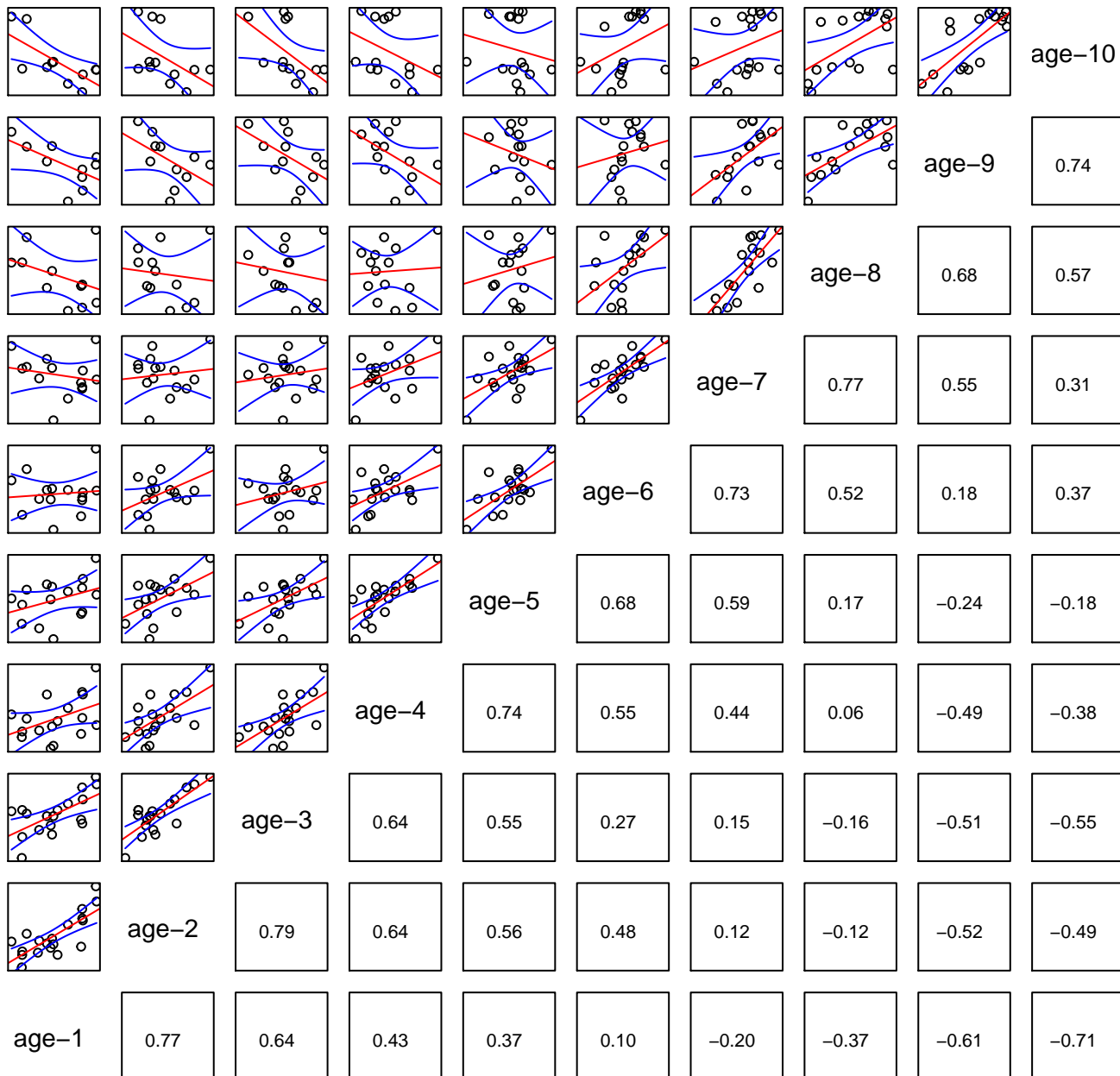
Years 2001 to 2004
Z = 0.39



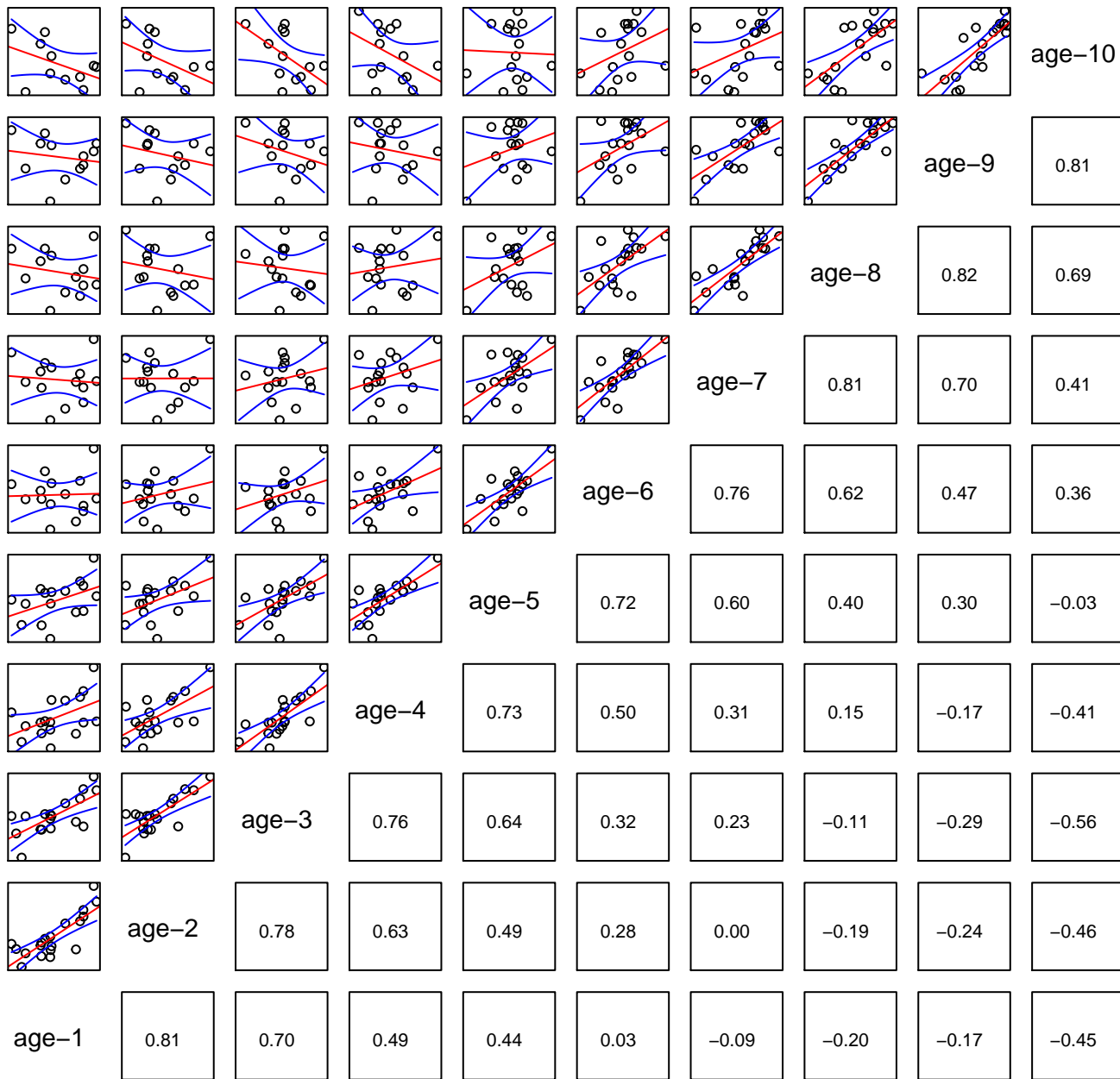
INDEX-1



Catch Observed



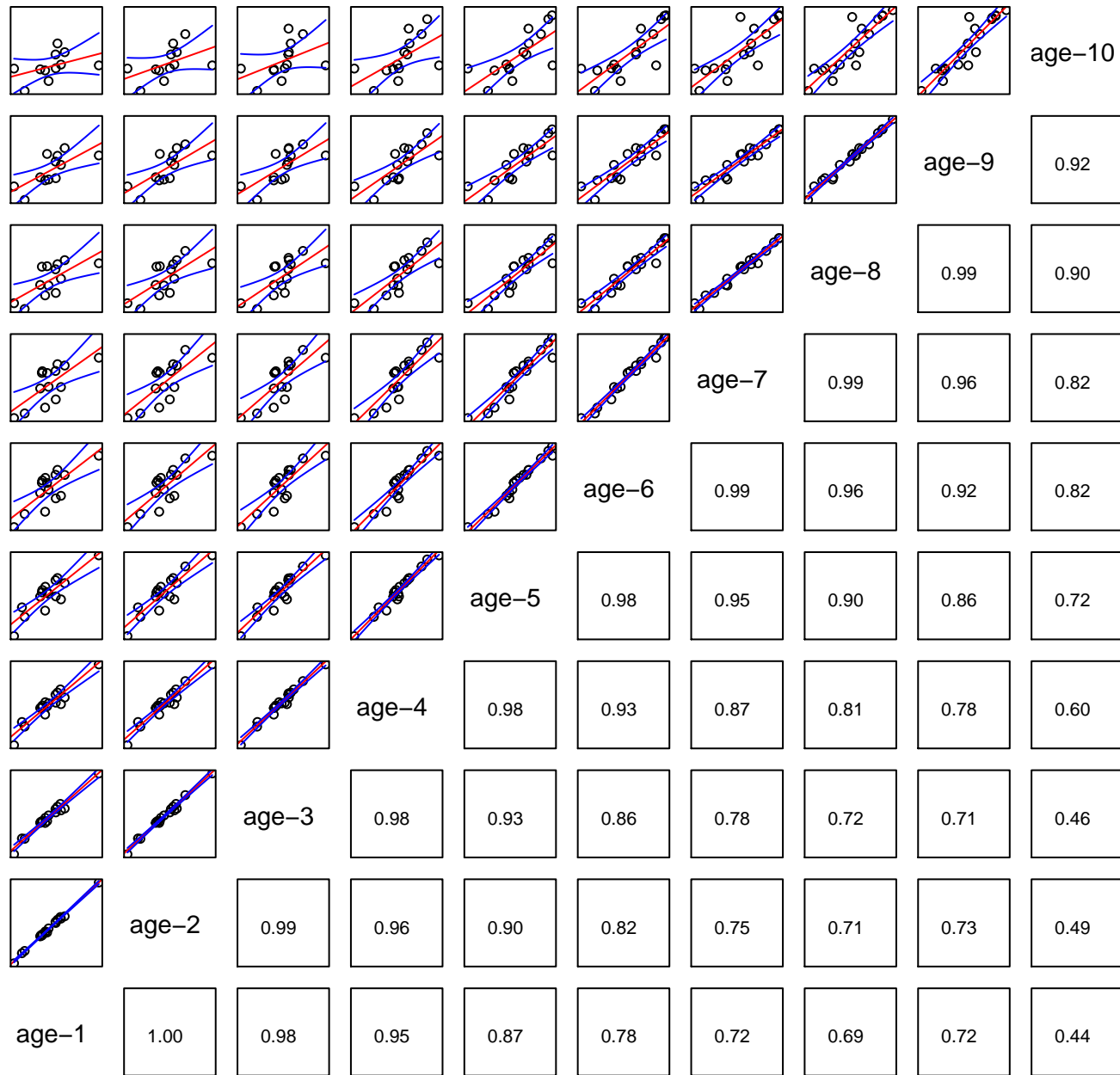
Catch Predicted

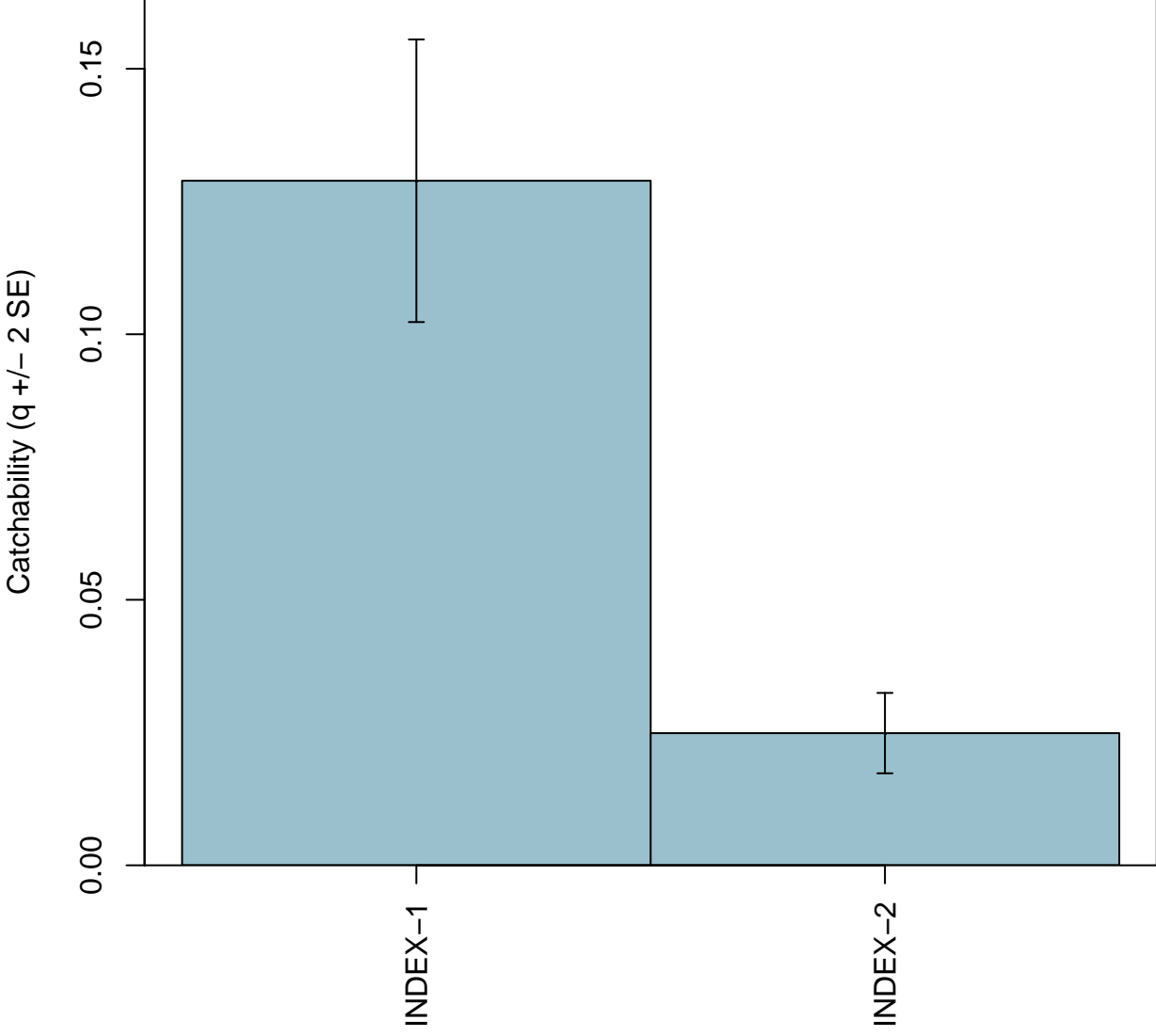


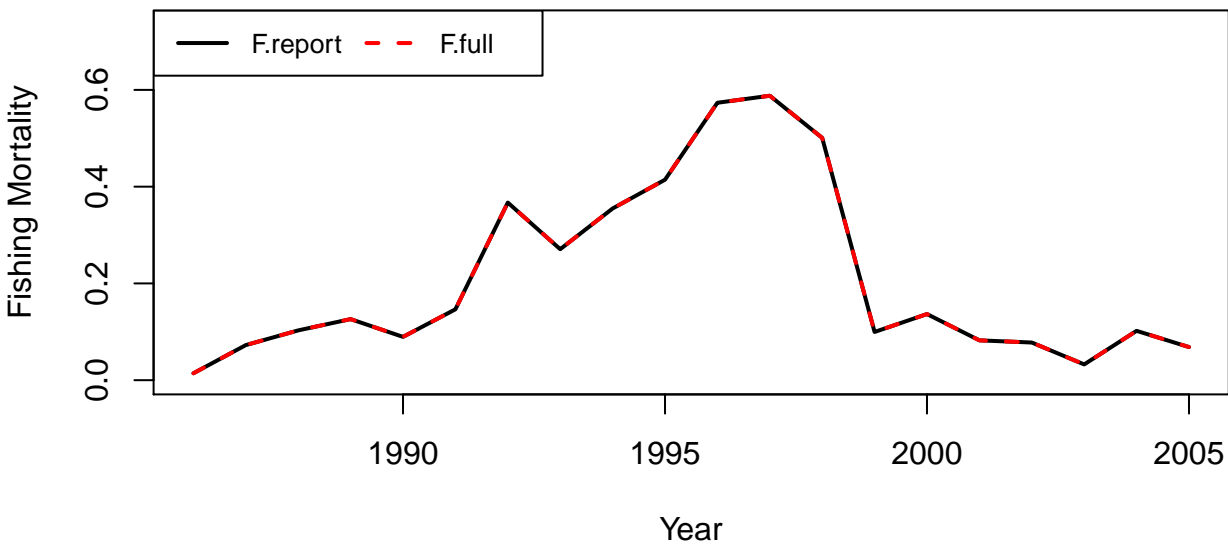
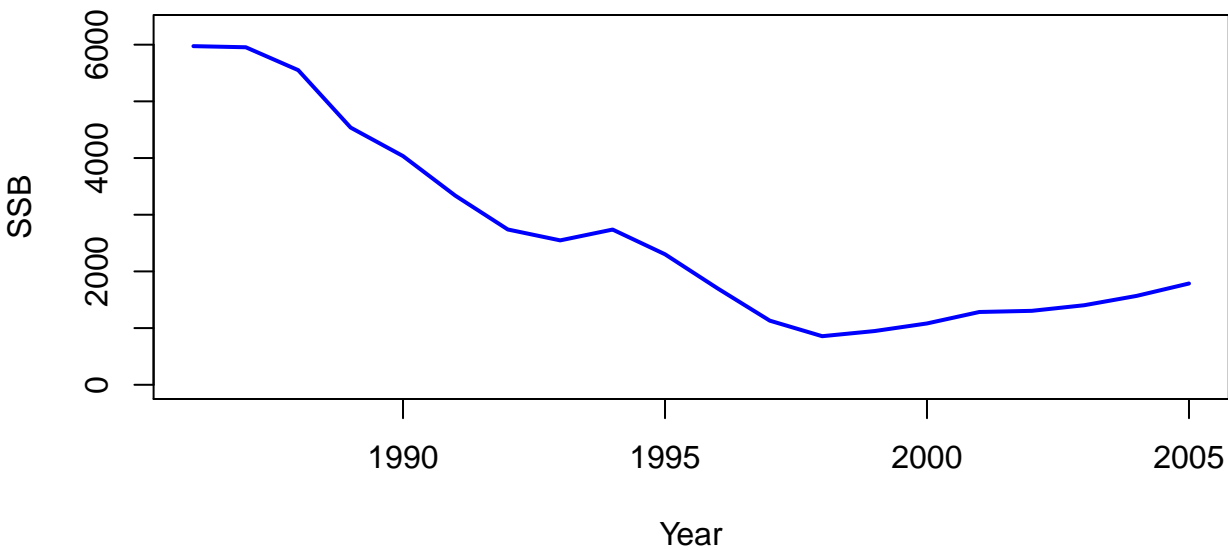
	Index 1 (INDEX-1) Observed																
									age-10								
								age-9	0.86								
								age-8	0.94	0.87							
								age-7	0.93	0.97	0.70						
								age-6	0.92	0.98	0.88	0.93					
								age-5	0.93	0.97	0.97	0.94	0.88				
								age-4	0.93	0.97	0.92	0.98	0.94	0.99			
								age-3	0.94	0.98	0.95	0.99	0.98	1.00	1.00		
								age-2	0.85	0.91	0.84	0.94	-0.16	0.87	1.00	NA	
								age-1	0.67	0.60	0.73	0.79	-0.05	0.25	-1.00	NA	NA

NA

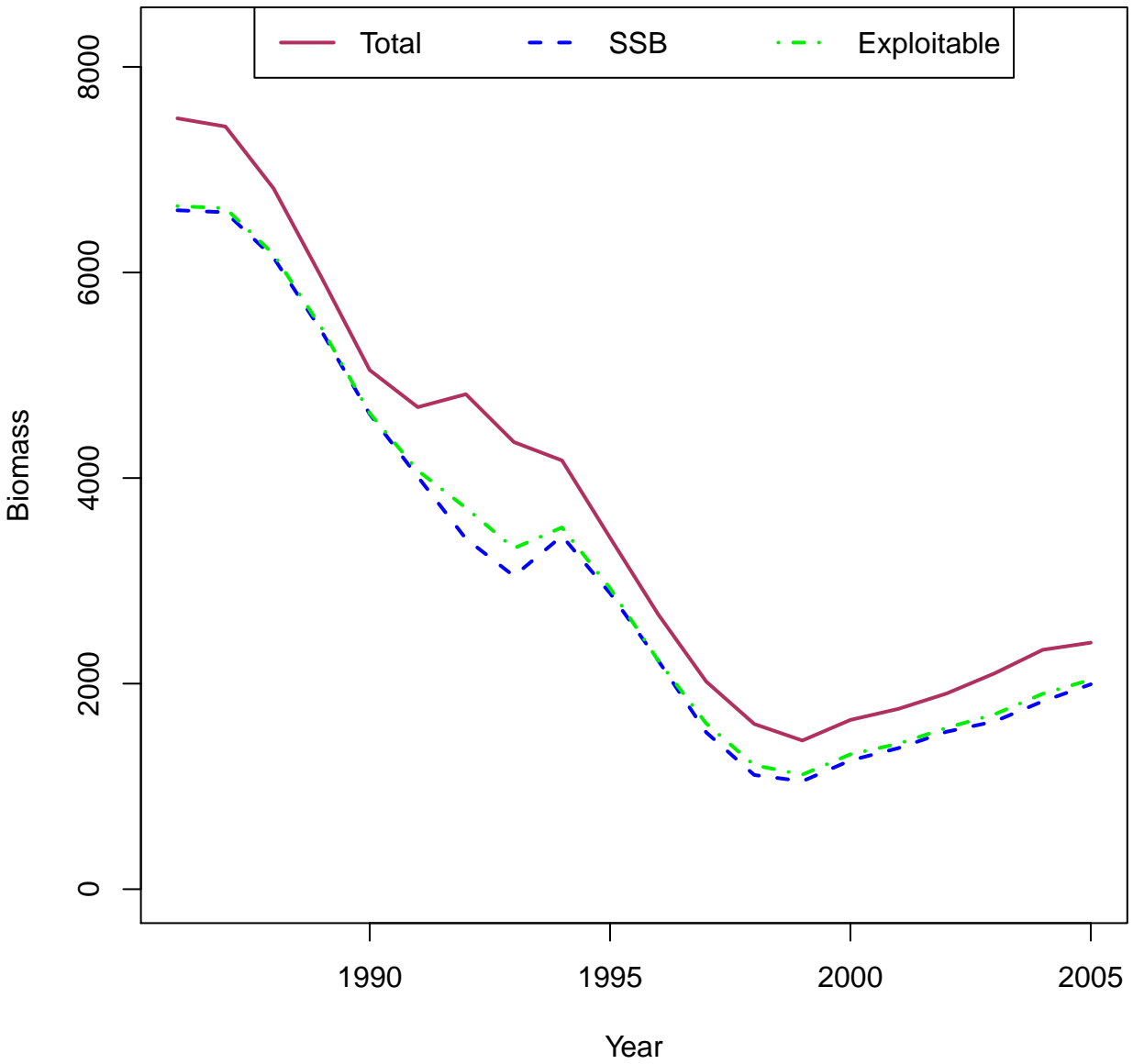
Index 1 (INDEX-1) Predicted

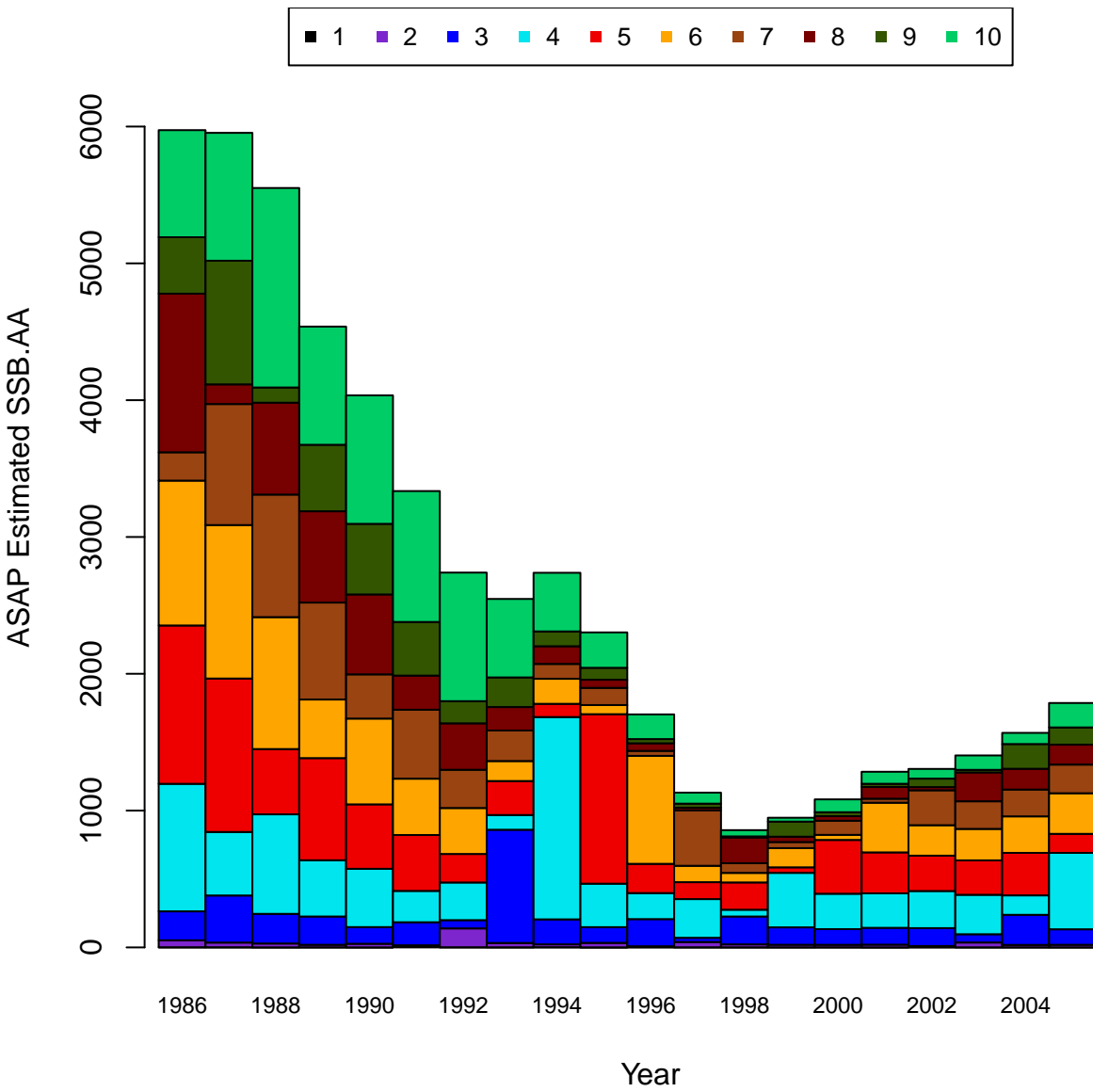


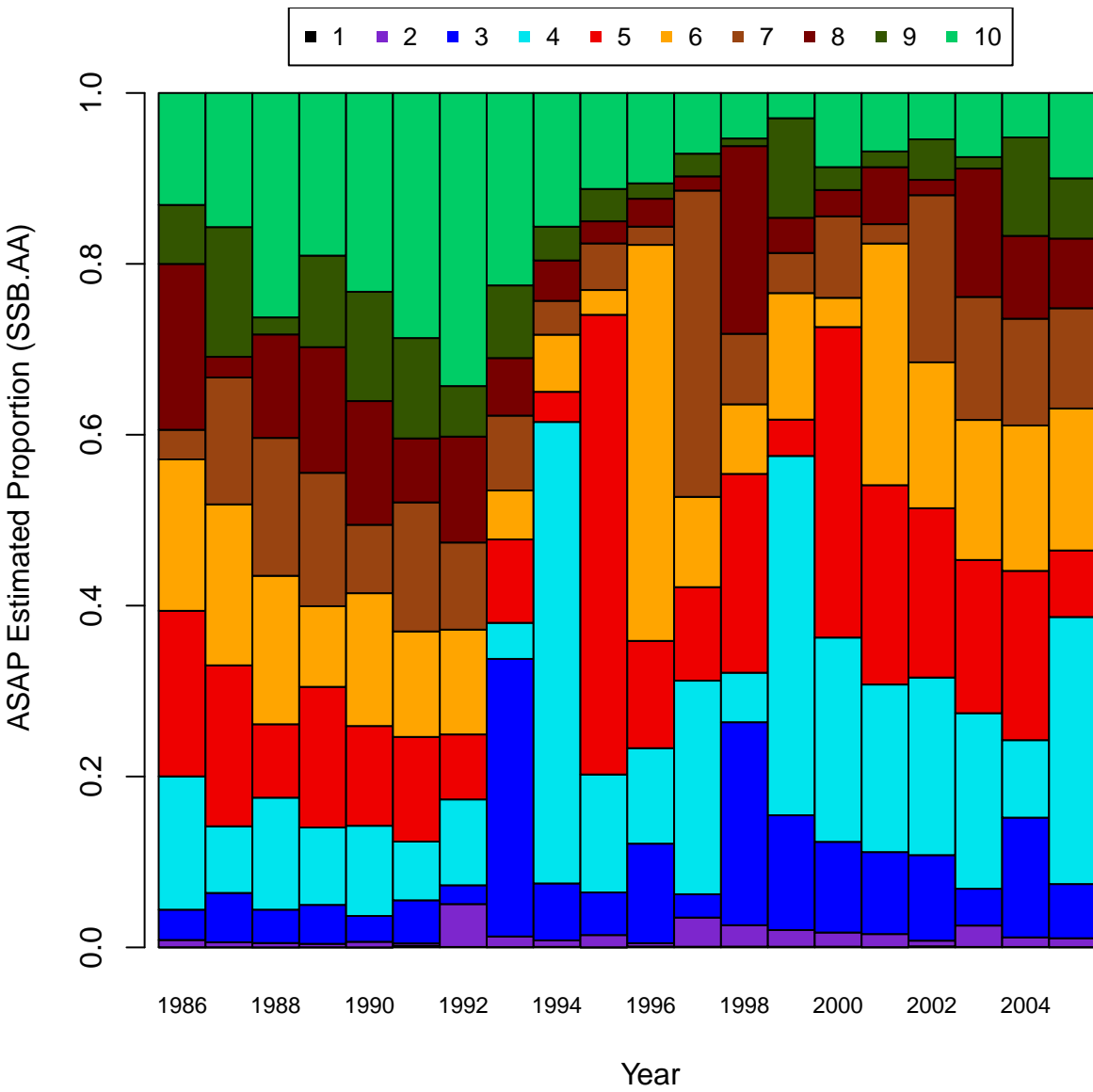


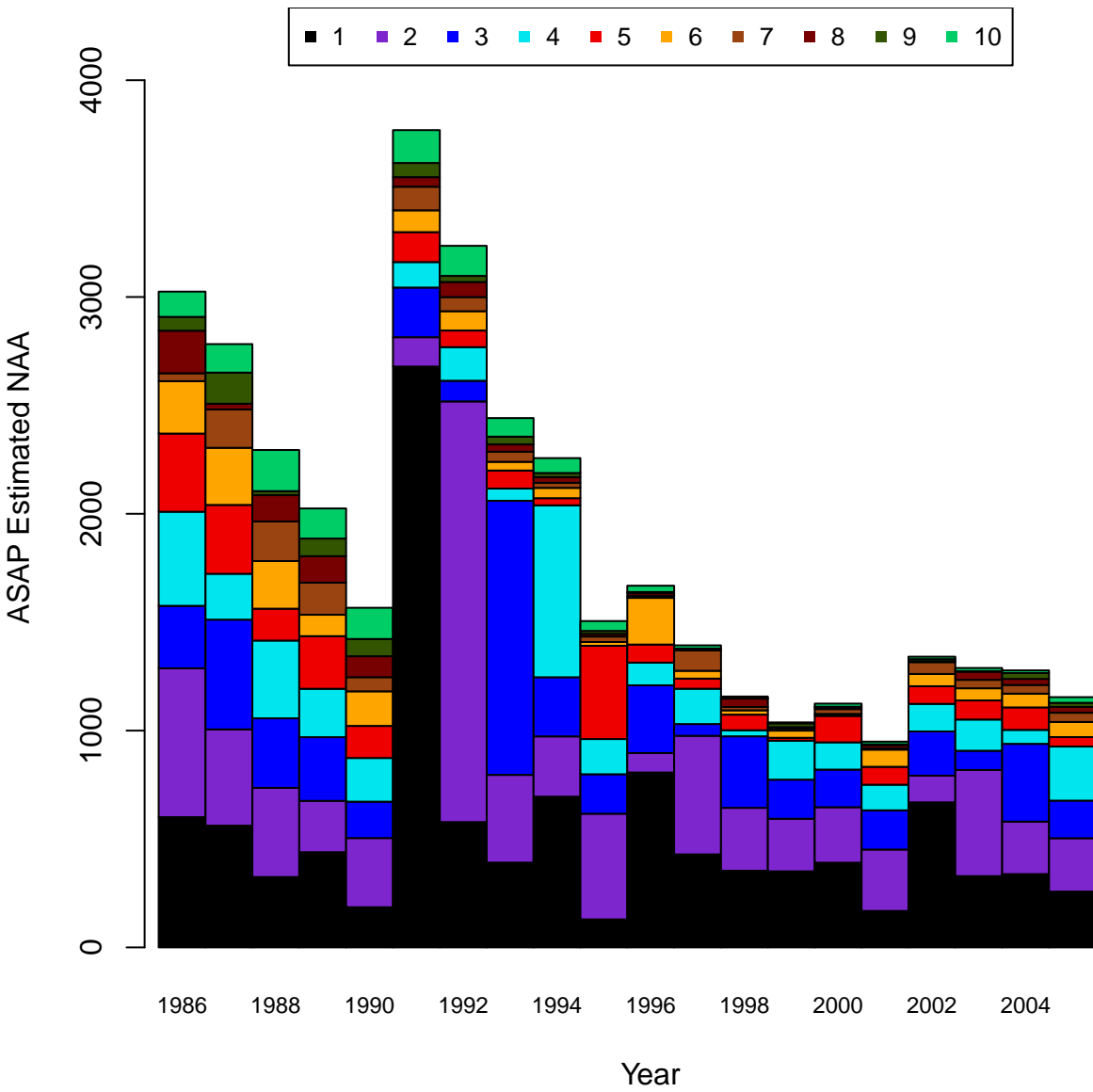


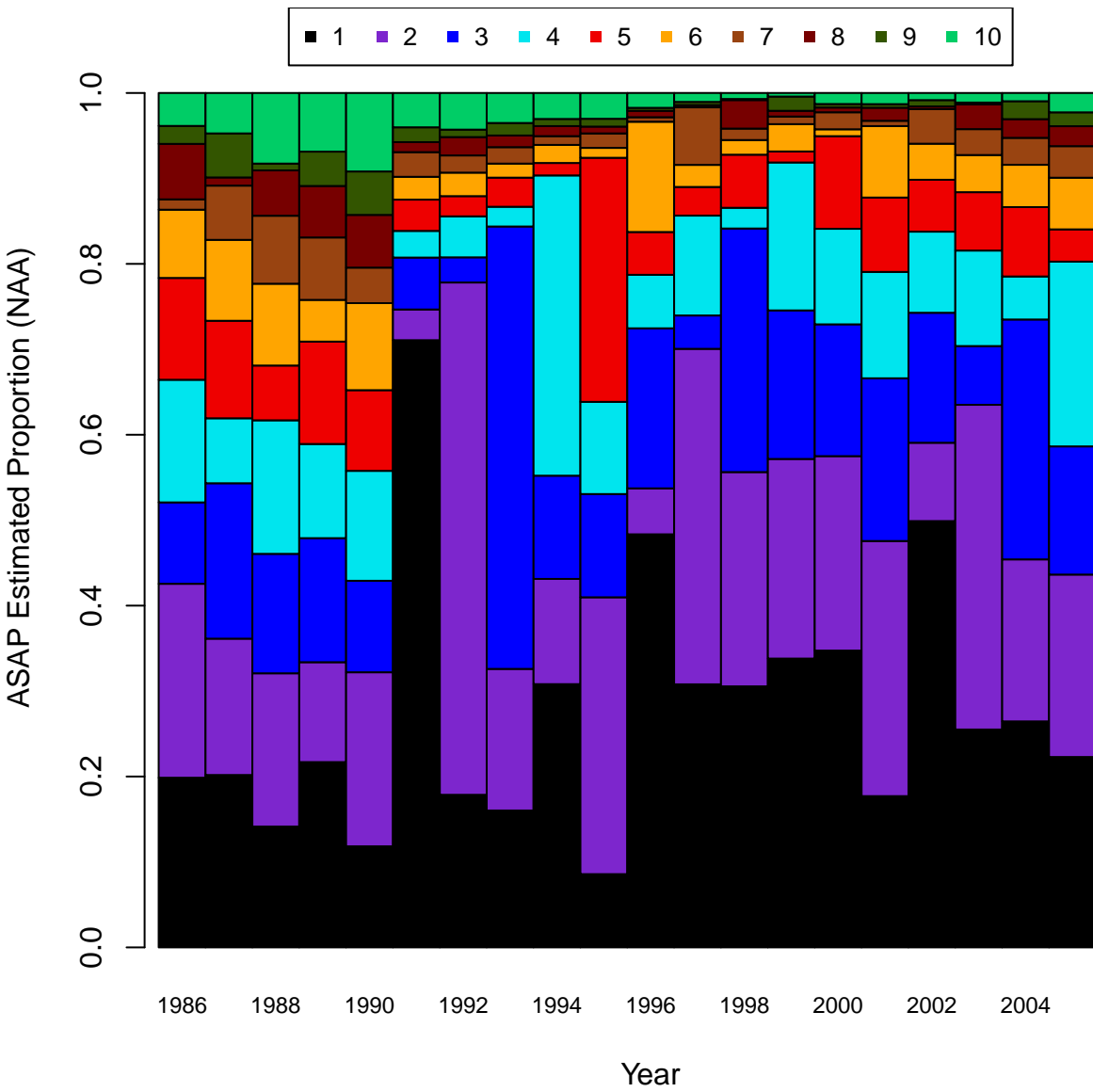
Comparison of January 1 Biomass

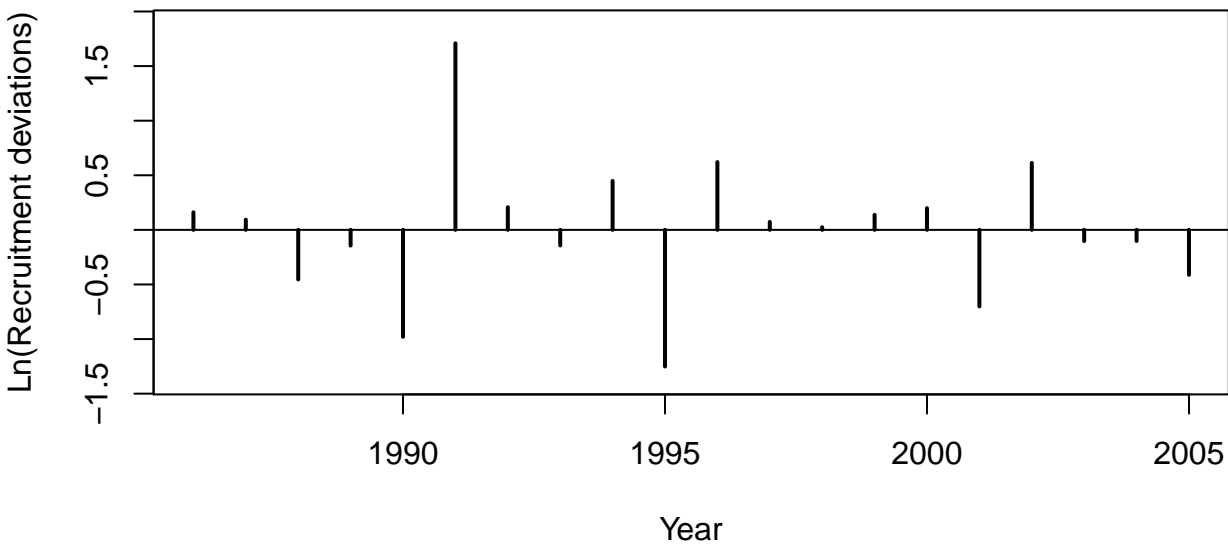
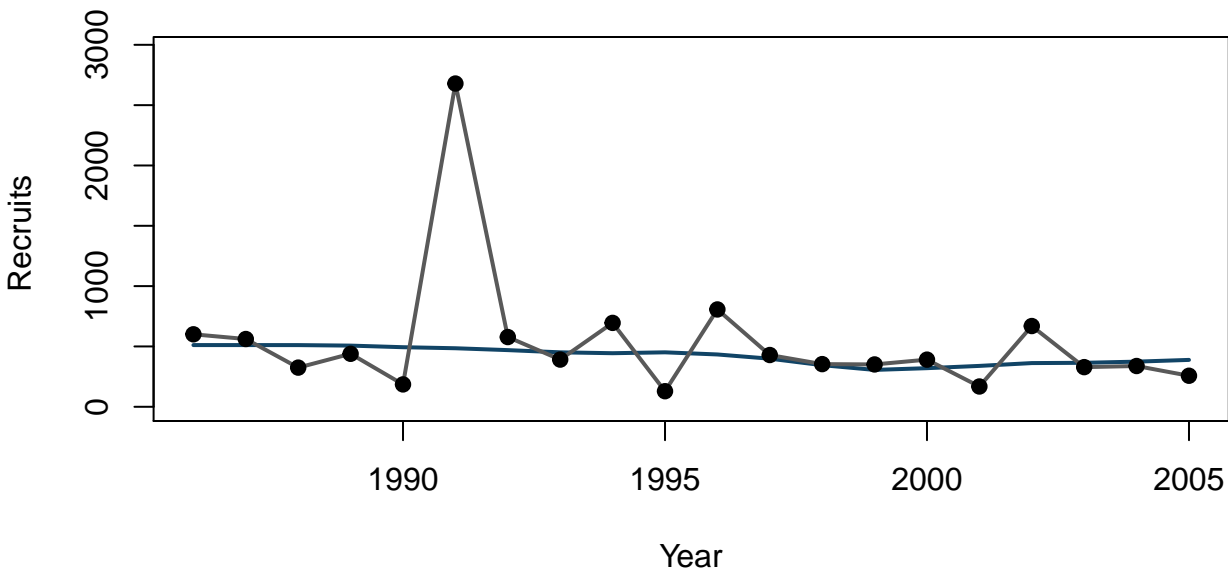


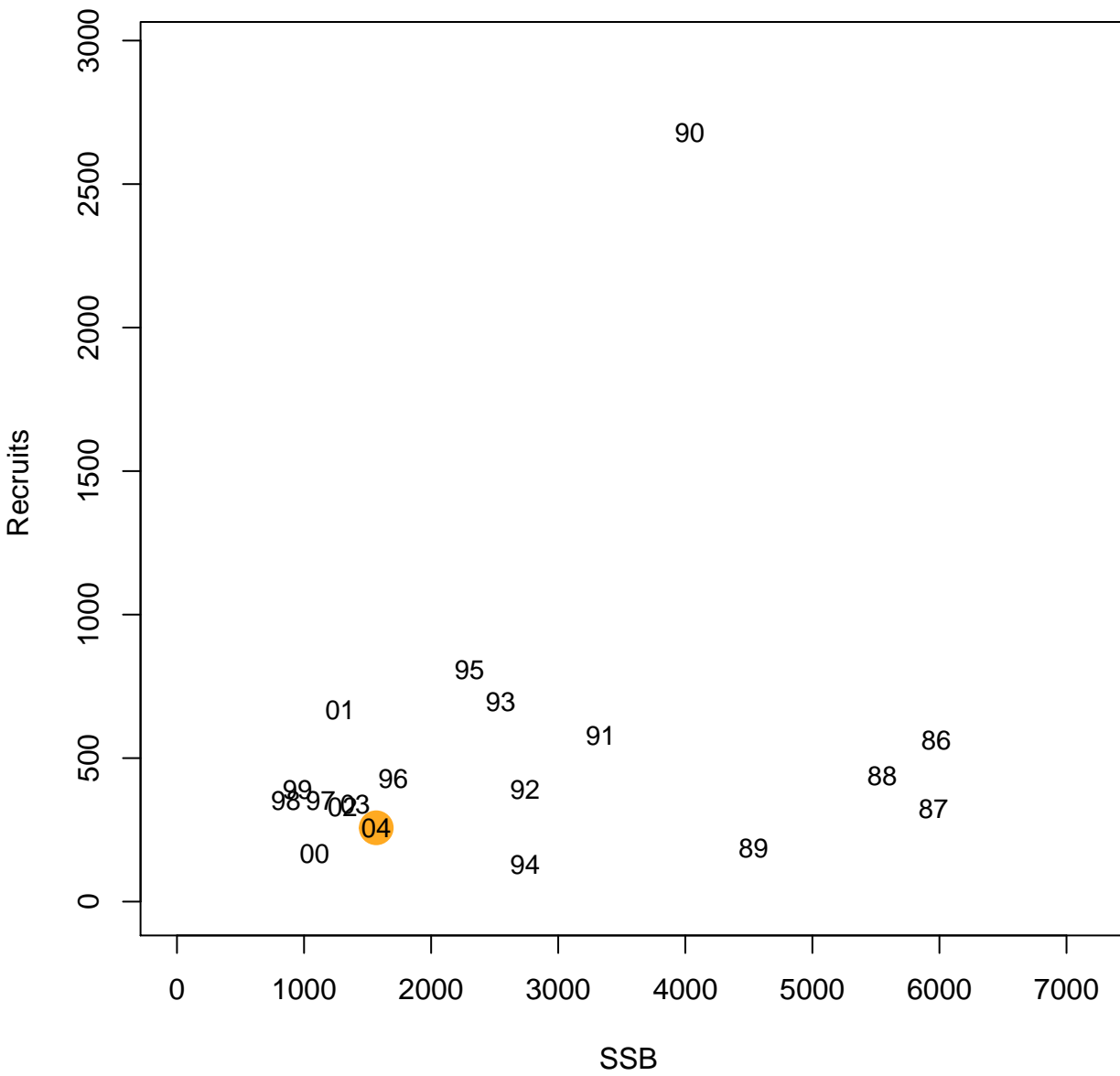


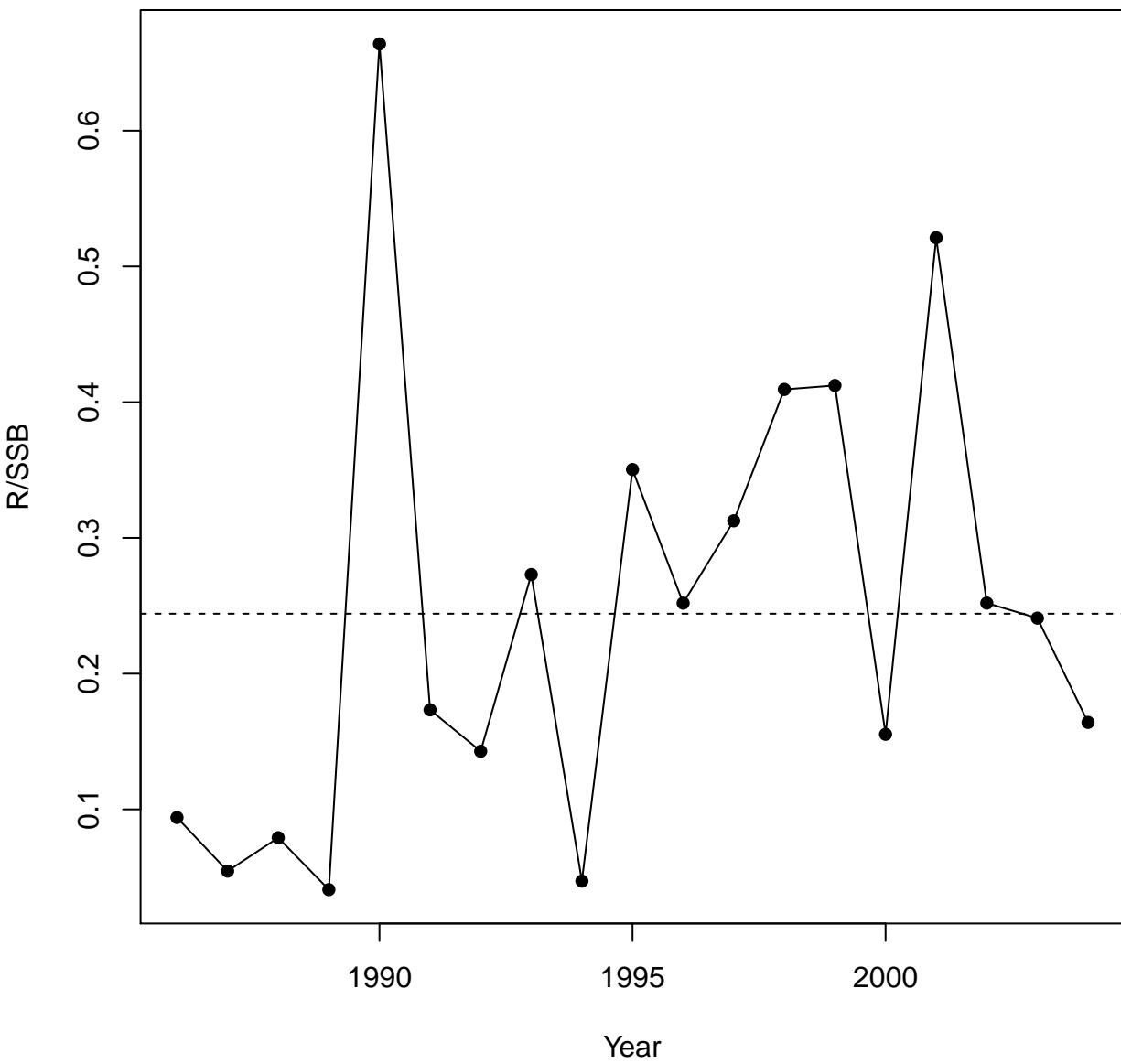


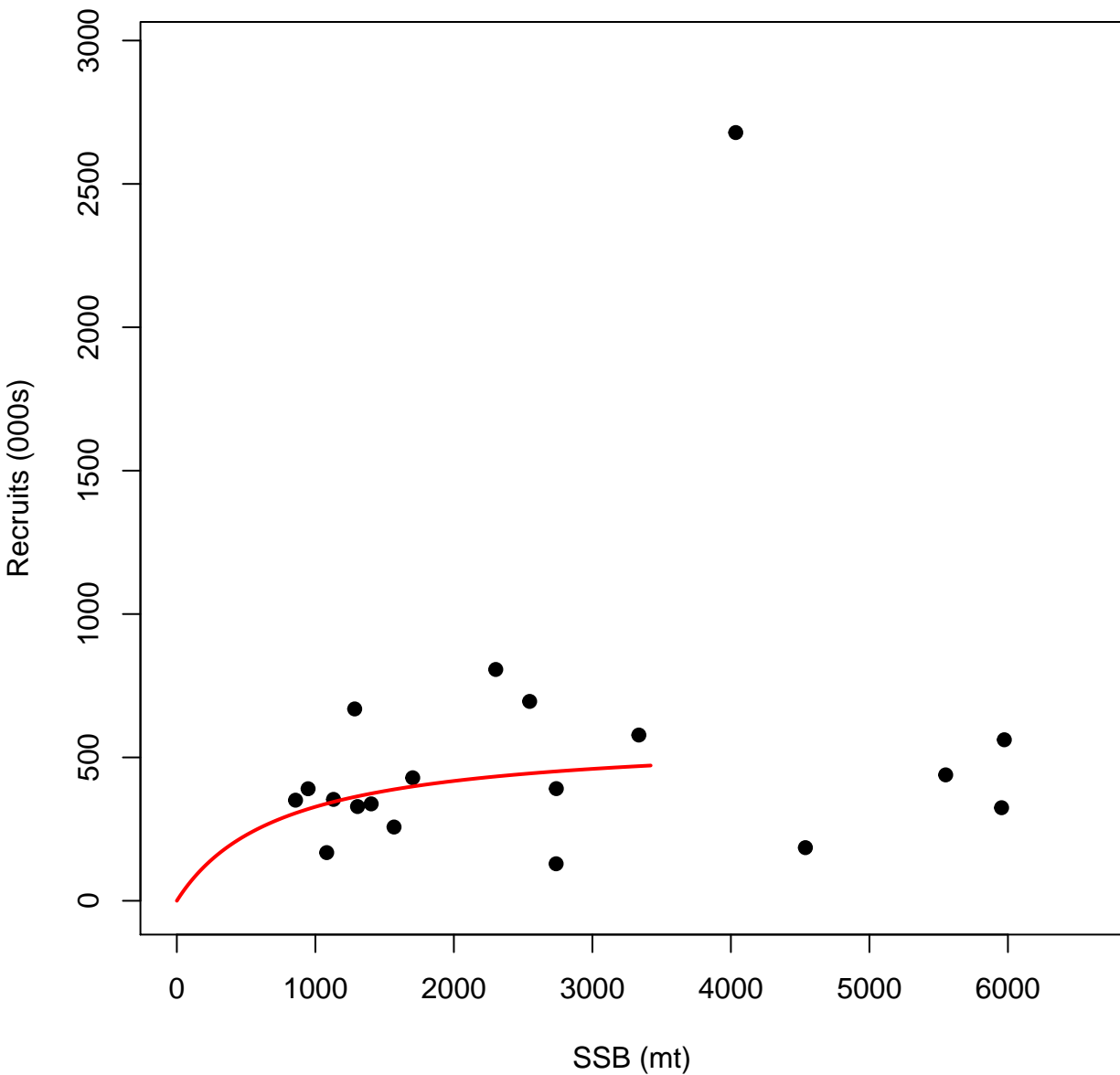


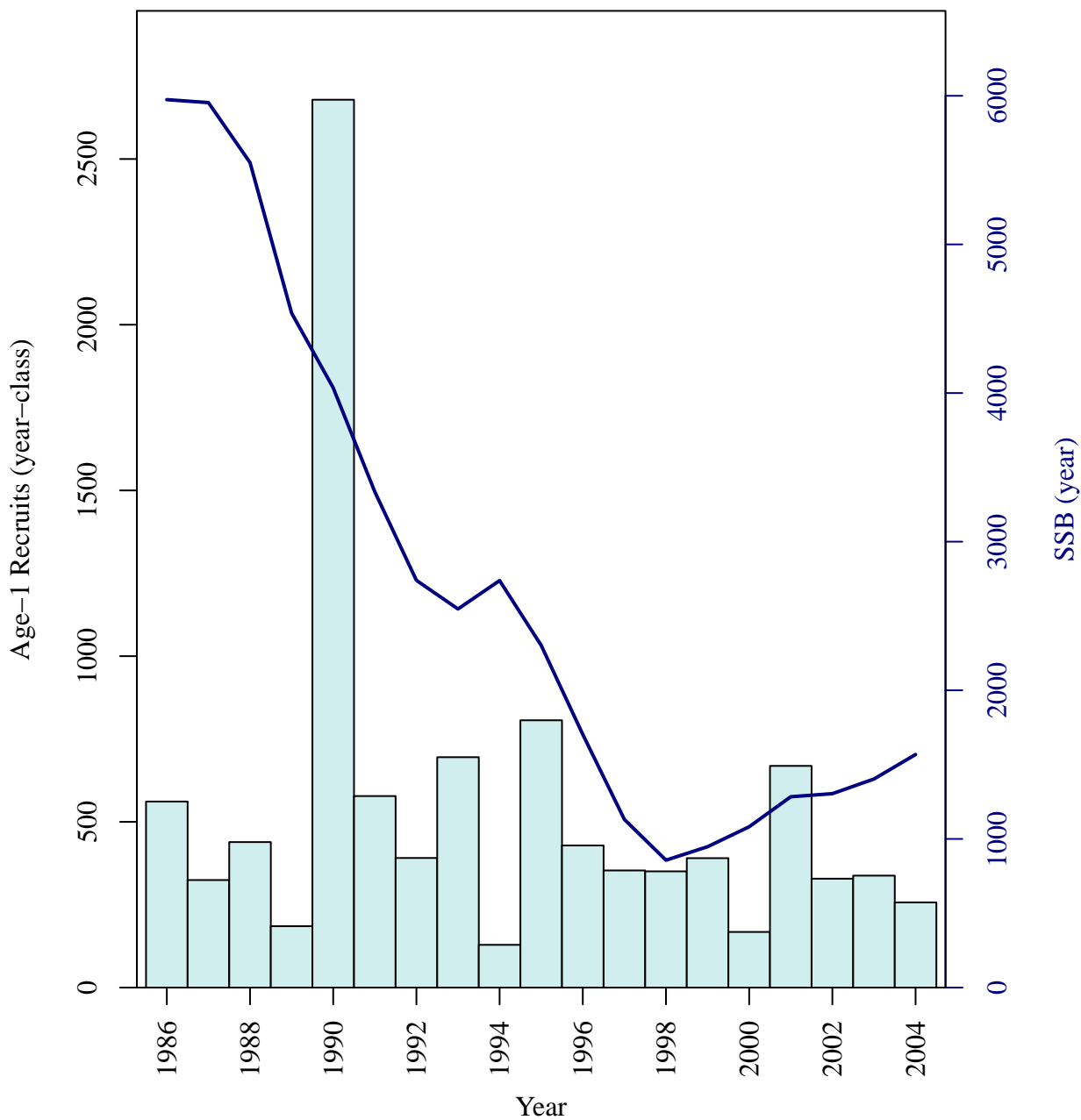


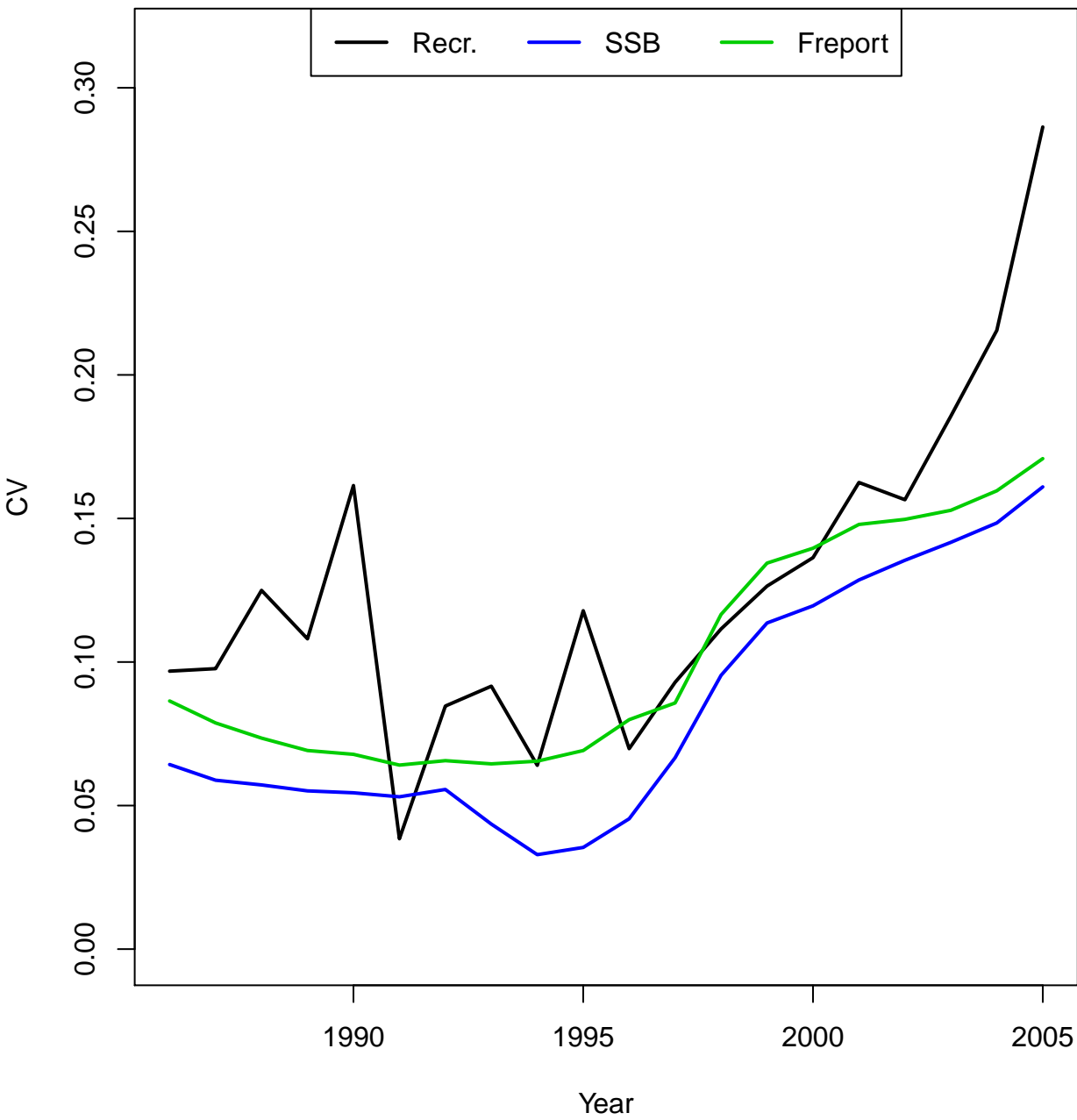




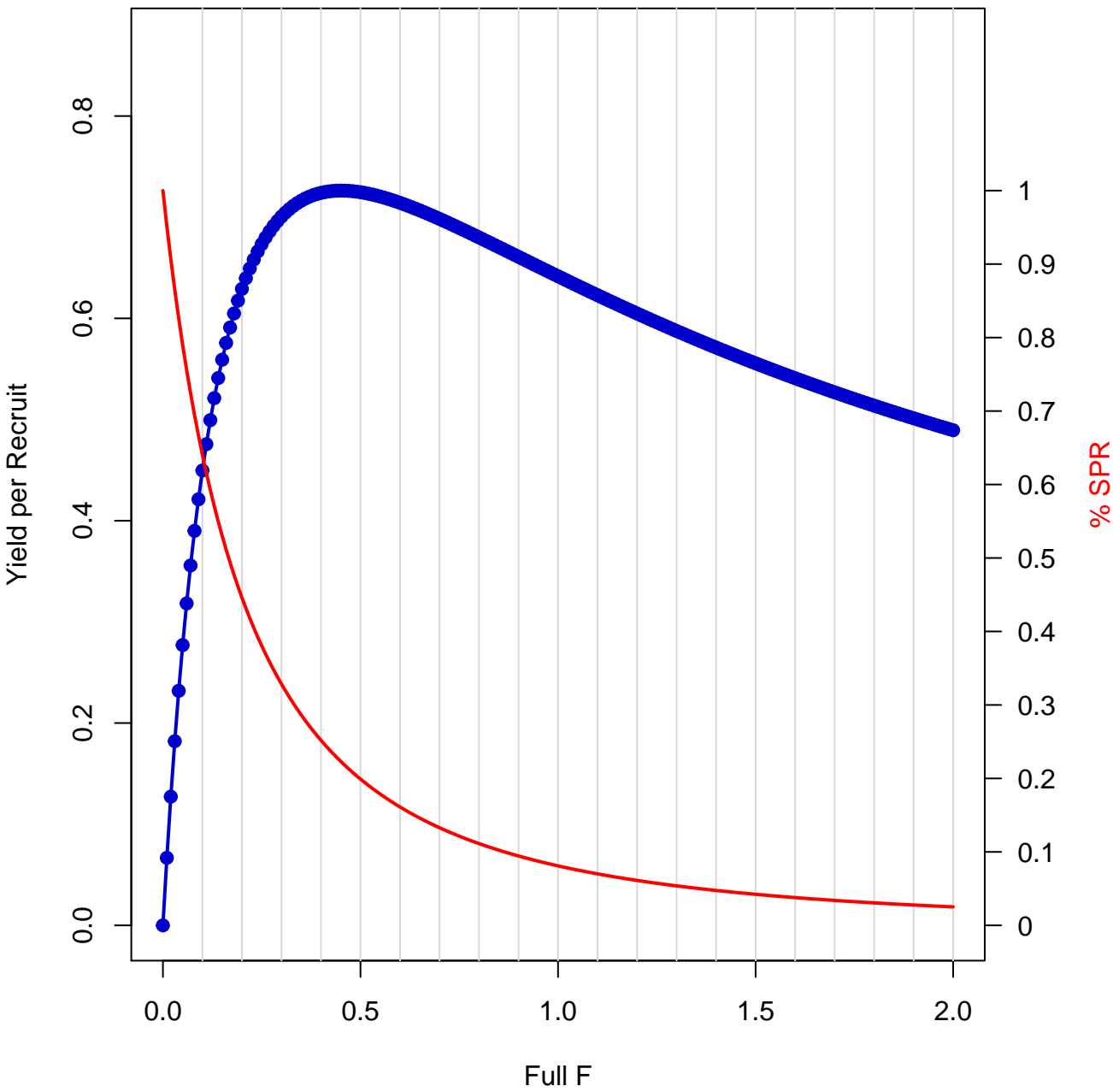








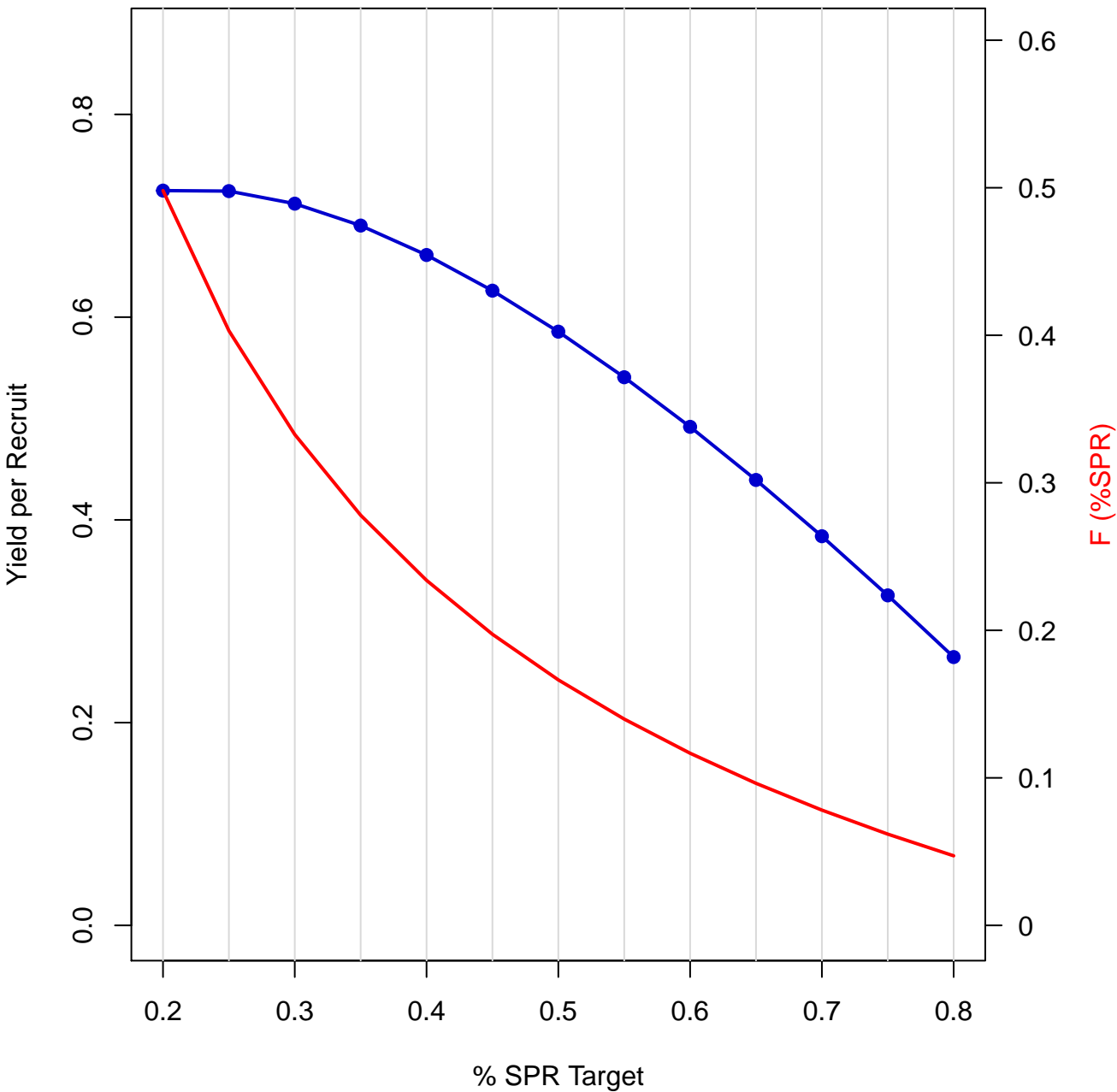
YPR-SPR Reference Points (Years Avg = 5)



YPR–SPR Reference Points (Years Avg = 5)

F	YPR	SPR	F	YPR	SPR	F	YPR	SPR
0	0	1	0.35	0.7163	0.2865	0.7	0.6983	0.1329
0.01	0.0668	0.9516	0.36	0.7184	0.279	0.71	0.6966	0.1305
0.02	0.1272	0.9068	0.37	0.7202	0.2719	0.72	0.6948	0.1281
0.03	0.1821	0.8651	0.38	0.7217	0.265	0.73	0.693	0.1258
0.04	0.2318	0.8262	0.39	0.723	0.2583	0.74	0.6912	0.1236
0.05	0.2771	0.79	0.4	0.724	0.2519	0.75	0.6894	0.1214
0.06	0.3183	0.7561	0.41	0.7249	0.2458	0.76	0.6875	0.1193
0.07	0.3558	0.7244	0.42	0.7255	0.2398	0.77	0.6857	0.1172
0.08	0.39	0.6946	0.43	0.7259	0.2341	0.78	0.6838	0.1152
0.09	0.4212	0.6667	0.44	0.7262	0.2286	0.79	0.6819	0.1132
0.1	0.4496	0.6405	0.45	0.7263	0.2232	0.8	0.68	0.1113
0.11	0.4756	0.6158	0.46	0.7262	0.2181	0.81	0.6781	0.1094
0.12	0.4994	0.5925	0.47	0.726	0.2131	0.82	0.6762	0.1076
0.13	0.5211	0.5705	0.48	0.7257	0.2083	0.83	0.6743	0.1058
0.14	0.541	0.5497	0.49	0.7253	0.2036	0.84	0.6724	0.1041
0.15	0.5592	0.53	0.5	0.7247	0.1991	0.85	0.6705	0.1024
0.16	0.5758	0.5114	0.51	0.724	0.1948	0.86	0.6685	0.1007
0.17	0.591	0.4938	0.52	0.7232	0.1906	0.87	0.6666	0.0991
0.18	0.6048	0.477	0.53	0.7224	0.1865	0.88	0.6647	0.0975
0.19	0.6175	0.4611	0.54	0.7214	0.1825	0.89	0.6628	0.096
0.2	0.6291	0.446	0.55	0.7204	0.1787	0.9	0.6608	0.0944
0.21	0.6397	0.4317	0.56	0.7193	0.175	0.91	0.6589	0.093
0.22	0.6493	0.418	0.57	0.7181	0.1714	0.92	0.657	0.0915
0.23	0.6581	0.4049	0.58	0.7169	0.1679	0.93	0.655	0.0901
0.24	0.6661	0.3925	0.59	0.7156	0.1645	0.94	0.6531	0.0887
0.25	0.6734	0.3806	0.6	0.7142	0.1612	0.95	0.6512	0.0873
0.26	0.68	0.3692	0.61	0.7128	0.158	0.96	0.6493	0.086
0.27	0.6859	0.3584	0.62	0.7113	0.1549	0.97	0.6474	0.0847
0.28	0.6913	0.348	0.63	0.7098	0.1518	0.98	0.6454	0.0835
0.29	0.6962	0.3381	0.64	0.7083	0.1489	0.99	0.6435	0.0822
0.3	0.7006	0.3285	0.65	0.7067	0.146	1	0.6416	0.081
0.31	0.7045	0.3194	0.66	0.7051	0.1433	1.01	0.6397	0.0798
0.32	0.708	0.3107	0.67	0.7035	0.1406	1.02	0.6378	0.0786
0.33	0.7111	0.3023	0.68	0.7018	0.138	1.03	0.6359	0.0775
0.34	0.7139	0.2942	0.69	0.7001	0.1354	1.04	0.6341	0.0764

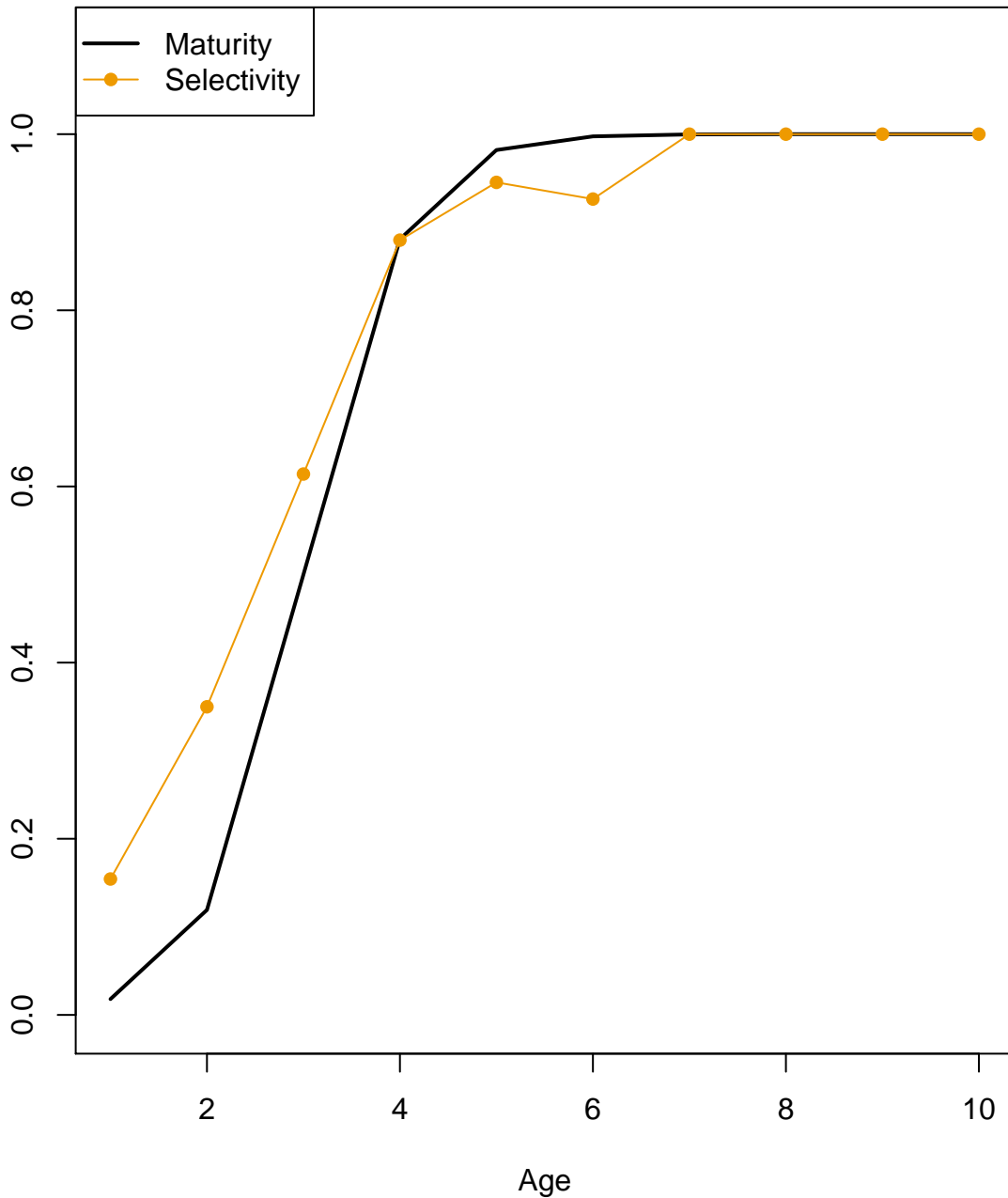
SPR Target Reference Points (Years Avg = 5)



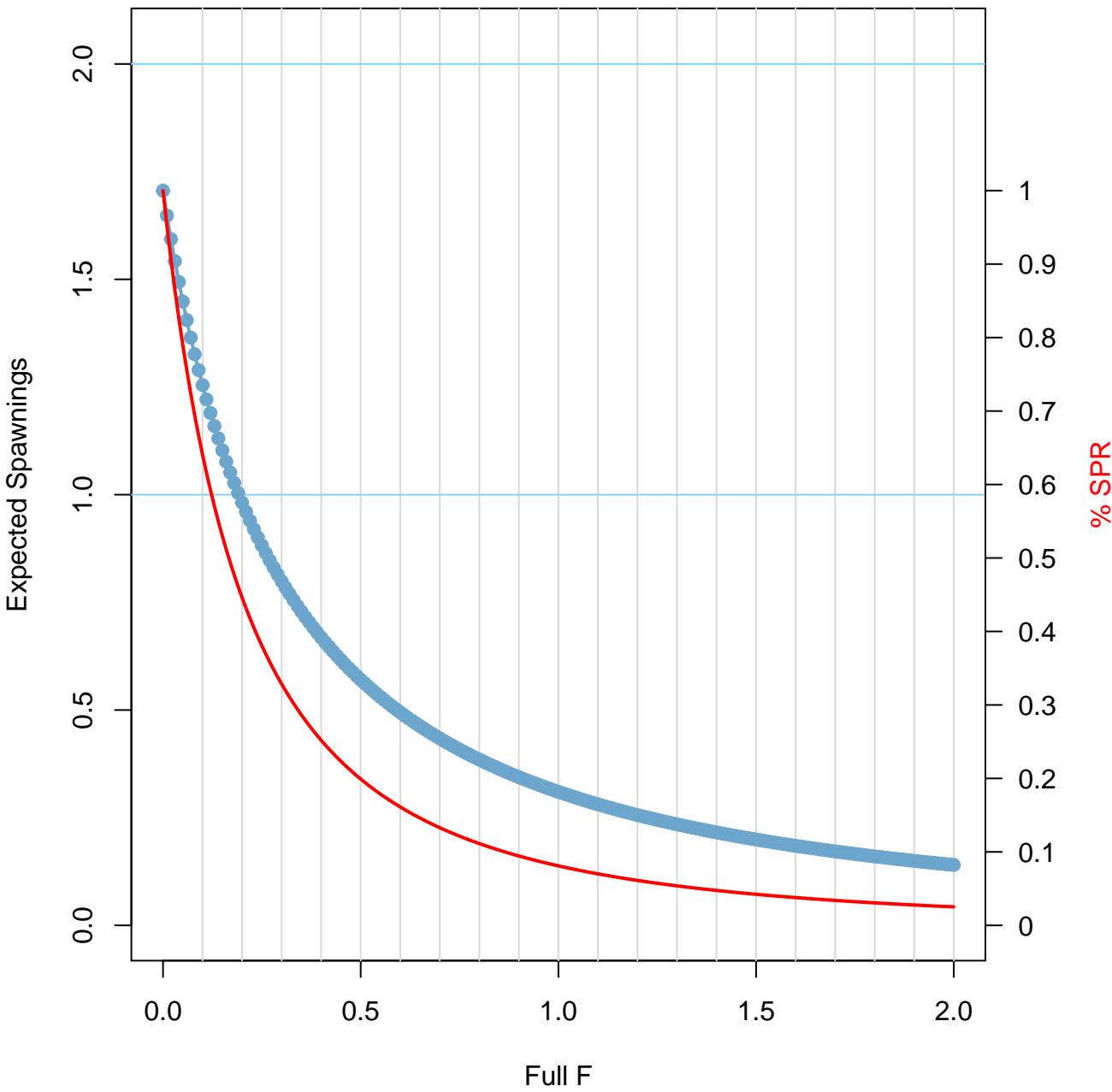
SPR Target Reference Points (Years Avg = 5)

% SPR	F(%SPR)	YPR
0.2	0.4981	0.7248
0.25	0.4031	0.7243
0.3	0.3328	0.7119
0.35	0.278	0.6903
0.4	0.2339	0.6613
0.45	0.1973	0.6261
0.5	0.1664	0.5857
0.55	0.1398	0.5407
0.6	0.1167	0.4918
0.65	0.0963	0.4394
0.7	0.0781	0.3839
0.75	0.0619	0.3255
0.8	0.0472	0.2647

Selectivity or Maturity at age



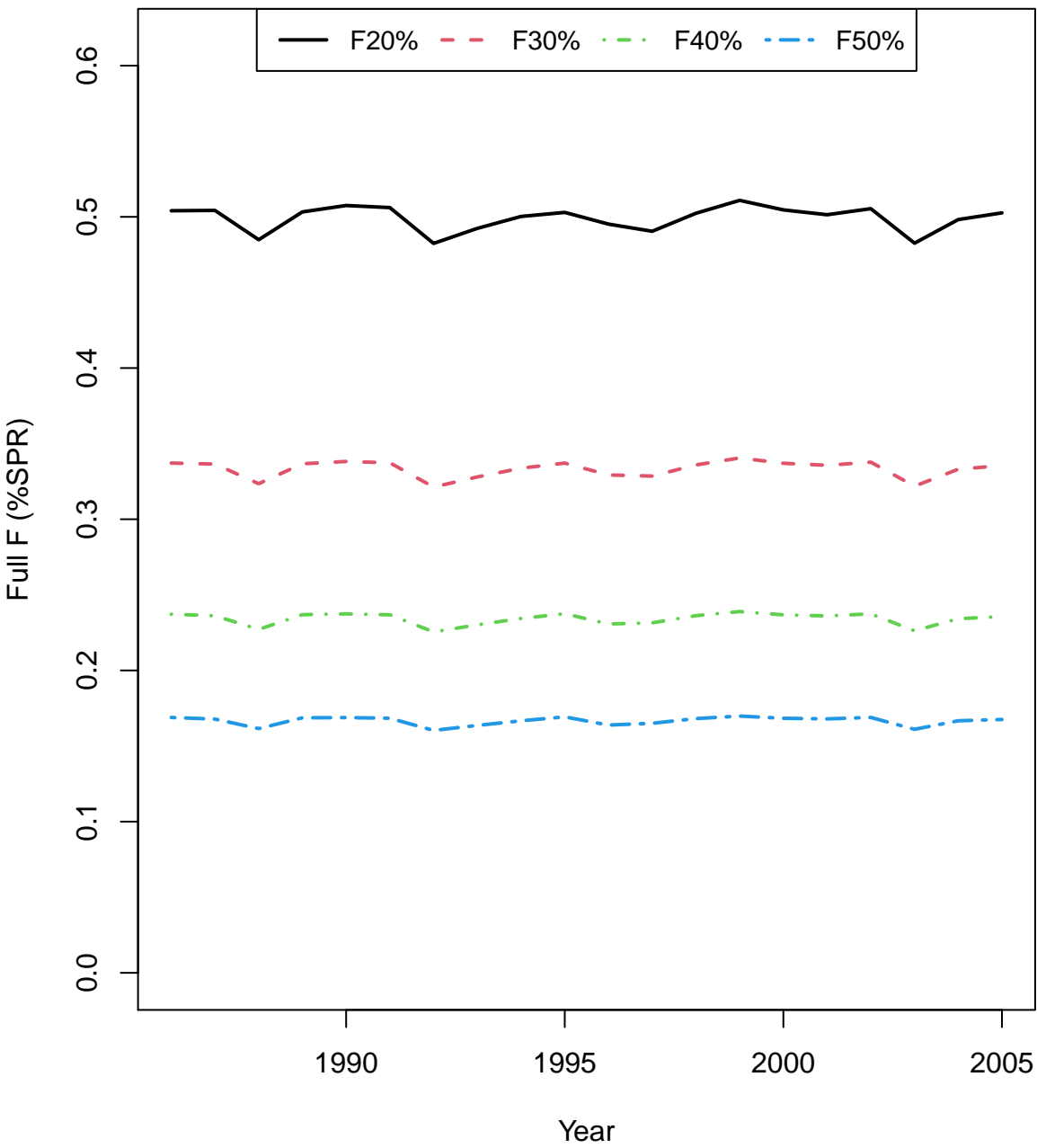
Expected Spawns and SPR Reference Points (Years Avg = 5)



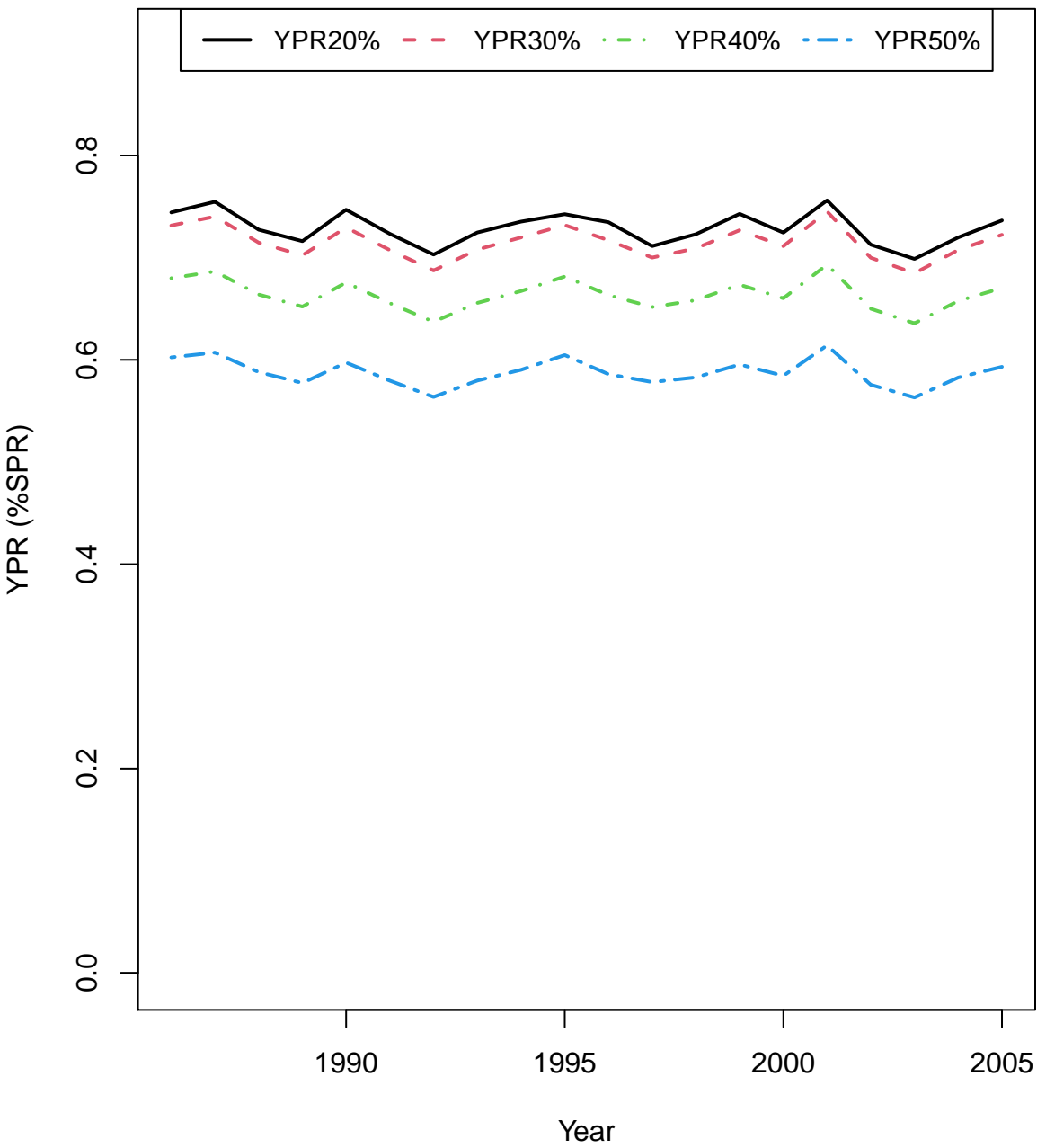
Expected Spawnings & SPR Reference Points (Years Avg = 5)

F	E[Sp]	SPR	F	E[Sp]	SPR	F	E[Sp]	SPR
0	1.706	1	0.35	0.7287	0.2865	0.7	0.4341	0.1329
0.01	1.6479	0.9516	0.36	0.7159	0.279	0.71	0.4287	0.1305
0.02	1.5934	0.9068	0.37	0.7035	0.2719	0.72	0.4234	0.1281
0.03	1.5422	0.8651	0.38	0.6914	0.265	0.73	0.4183	0.1258
0.04	1.4939	0.8262	0.39	0.6797	0.2583	0.74	0.4132	0.1236
0.05	1.4484	0.79	0.4	0.6684	0.2519	0.75	0.4083	0.1214
0.06	1.4053	0.7561	0.41	0.6573	0.2458	0.76	0.4034	0.1193
0.07	1.3646	0.7244	0.42	0.6466	0.2398	0.77	0.3986	0.1172
0.08	1.326	0.6946	0.43	0.6362	0.2341	0.78	0.394	0.1152
0.09	1.2893	0.6667	0.44	0.626	0.2286	0.79	0.3894	0.1132
0.1	1.2544	0.6405	0.45	0.6161	0.2232	0.8	0.3849	0.1113
0.11	1.2212	0.6158	0.46	0.6065	0.2181	0.81	0.3805	0.1094
0.12	1.1896	0.5925	0.47	0.5972	0.2131	0.82	0.3761	0.1076
0.13	1.1594	0.5705	0.48	0.588	0.2083	0.83	0.3719	0.1058
0.14	1.1306	0.5497	0.49	0.5791	0.2036	0.84	0.3677	0.1041
0.15	1.1031	0.53	0.5	0.5705	0.1991	0.85	0.3636	0.1024
0.16	1.0767	0.5114	0.51	0.562	0.1948	0.86	0.3596	0.1007
0.17	1.0514	0.4938	0.52	0.5538	0.1906	0.87	0.3556	0.0991
0.18	1.0272	0.477	0.53	0.5457	0.1865	0.88	0.3517	0.0975
0.19	1.004	0.4611	0.54	0.5379	0.1825	0.89	0.3479	0.096
0.2	0.9816	0.446	0.55	0.5302	0.1787	0.9	0.3442	0.0944
0.21	0.9602	0.4317	0.56	0.5228	0.175	0.91	0.3405	0.093
0.22	0.9395	0.418	0.57	0.5155	0.1714	0.92	0.3369	0.0915
0.23	0.9197	0.4049	0.58	0.5083	0.1679	0.93	0.3333	0.0901
0.24	0.9005	0.3925	0.59	0.5013	0.1645	0.94	0.3298	0.0887
0.25	0.8821	0.3806	0.6	0.4945	0.1612	0.95	0.3264	0.0873
0.26	0.8643	0.3692	0.61	0.4879	0.158	0.96	0.323	0.086
0.27	0.8471	0.3584	0.62	0.4814	0.1549	0.97	0.3197	0.0847
0.28	0.8305	0.348	0.63	0.475	0.1518	0.98	0.3164	0.0835
0.29	0.8145	0.3381	0.64	0.4688	0.1489	0.99	0.3132	0.0822
0.3	0.799	0.3285	0.65	0.4627	0.146	1	0.31	0.081
0.31	0.784	0.3194	0.66	0.4567	0.1433	1.01	0.3069	0.0798
0.32	0.7695	0.3107	0.67	0.4509	0.1406	1.02	0.3039	0.0786
0.33	0.7555	0.3023	0.68	0.4451	0.138	1.03	0.3009	0.0775
0.34	0.7419	0.2942	0.69	0.4395	0.1354	1.04	0.2979	0.0764

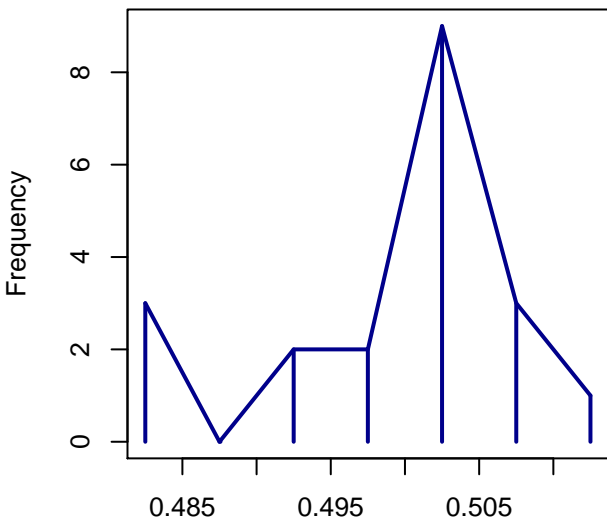
Annual F(%SPR) Reference Points



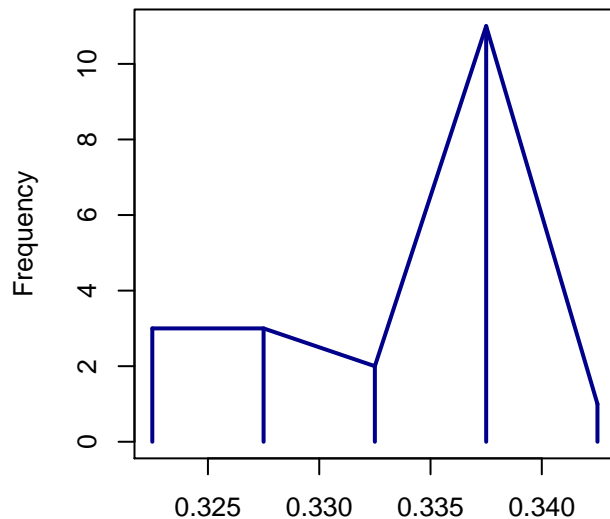
Annual YPR(%SPR) Reference Points



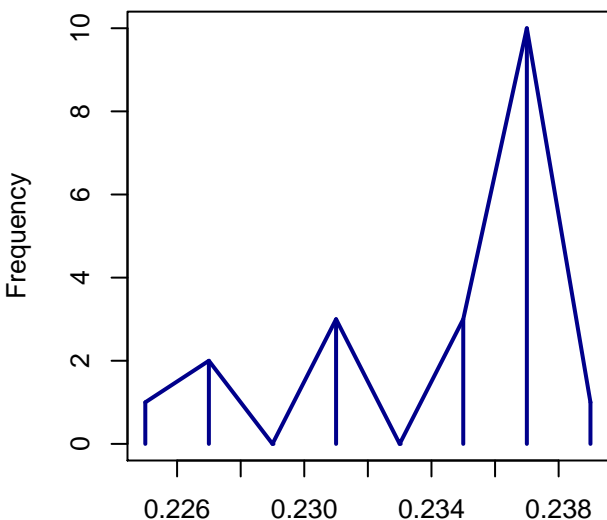
Annual F (%SPR) Reference Points



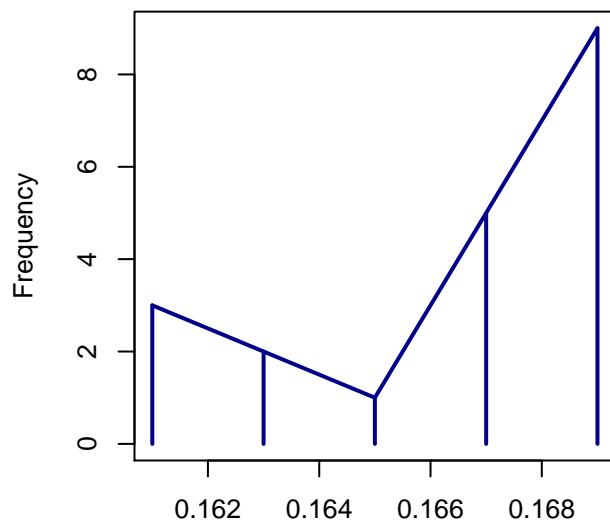
Full F20%



Full F30%

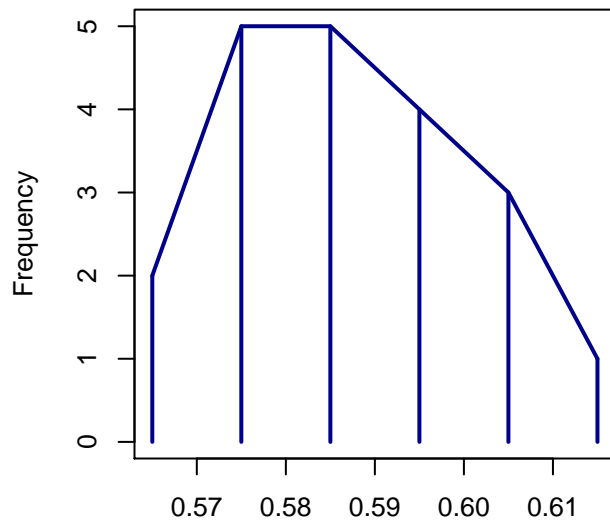
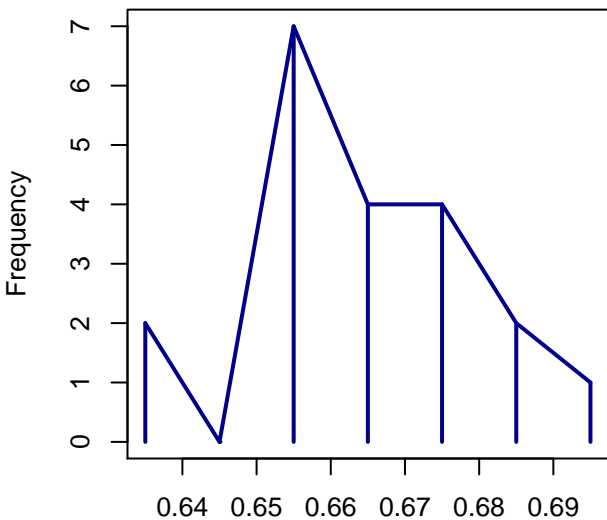
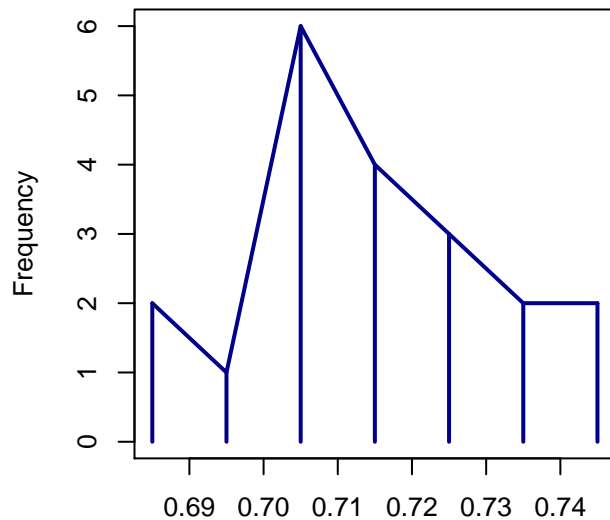
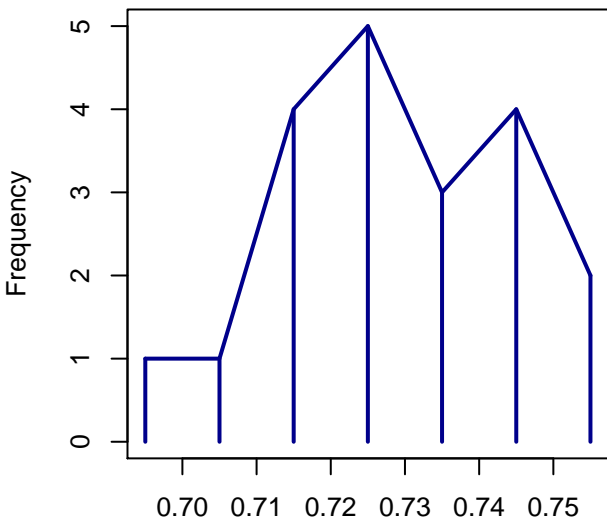


Full F40%

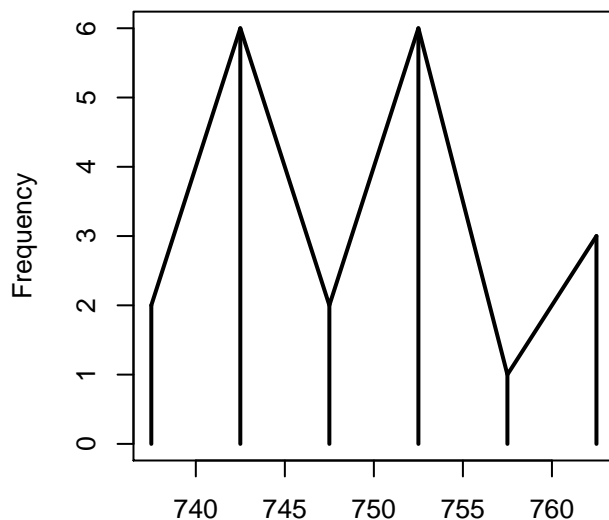
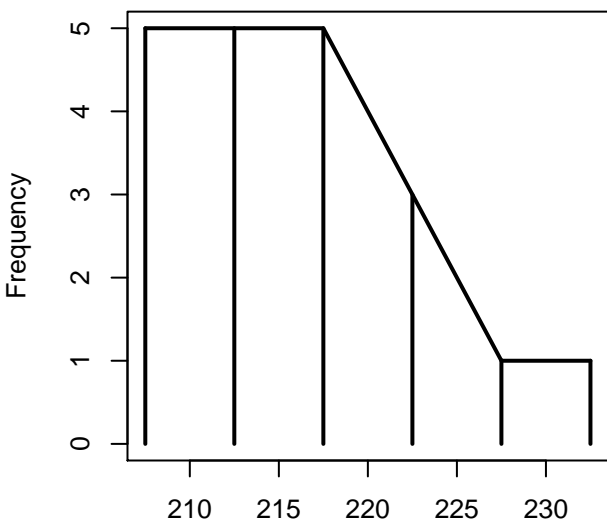
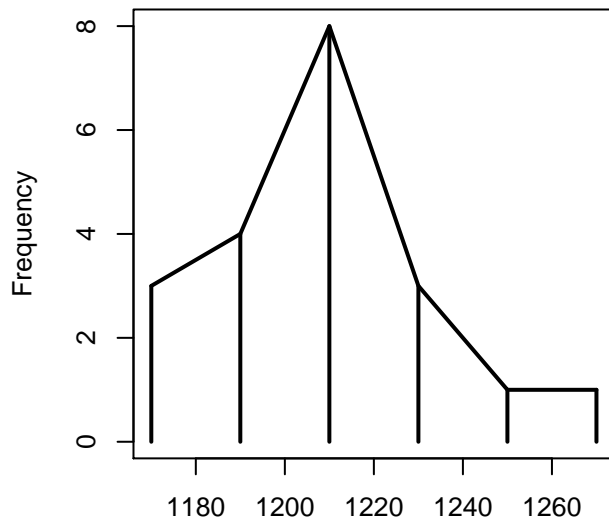
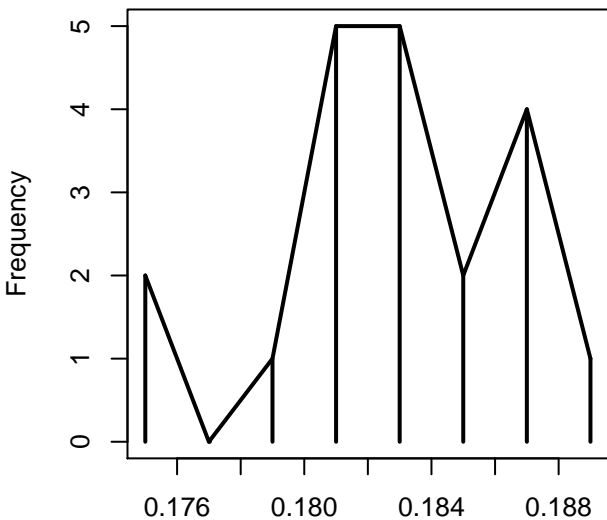


Full F50%

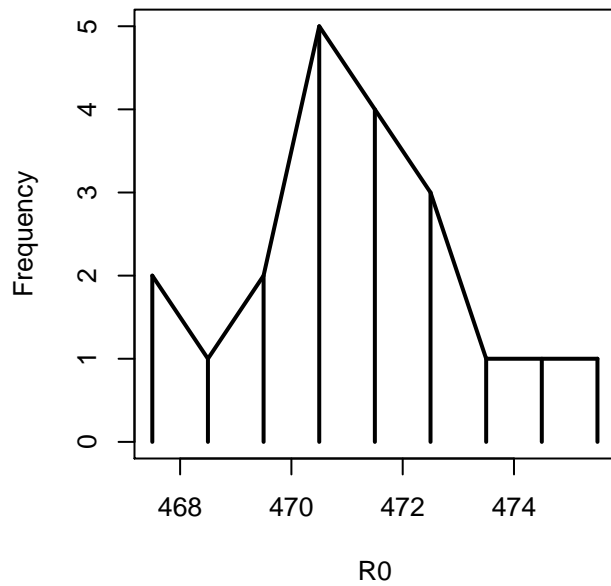
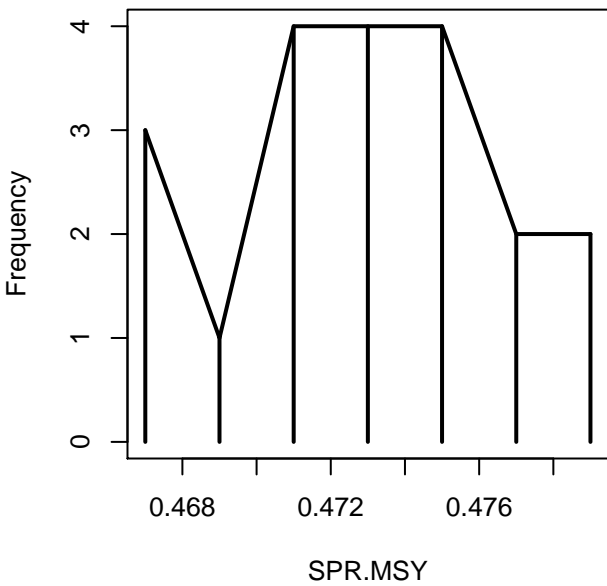
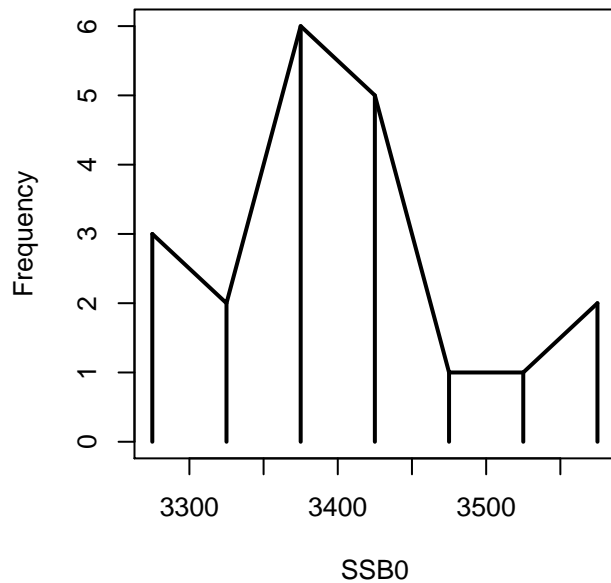
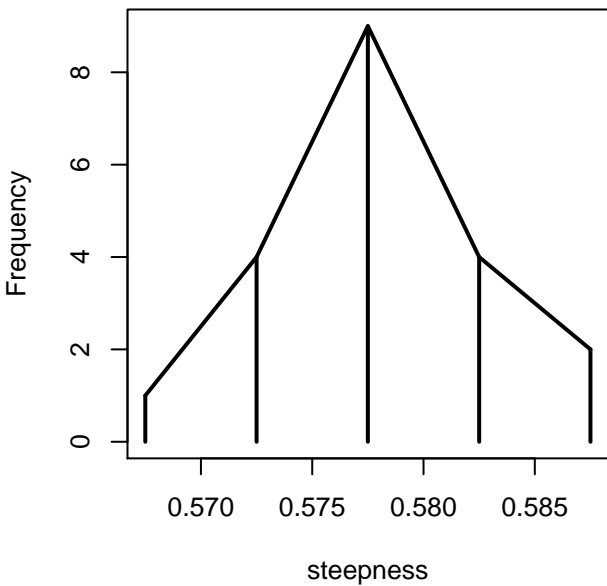
Annual YPR (%SPR) Reference Points



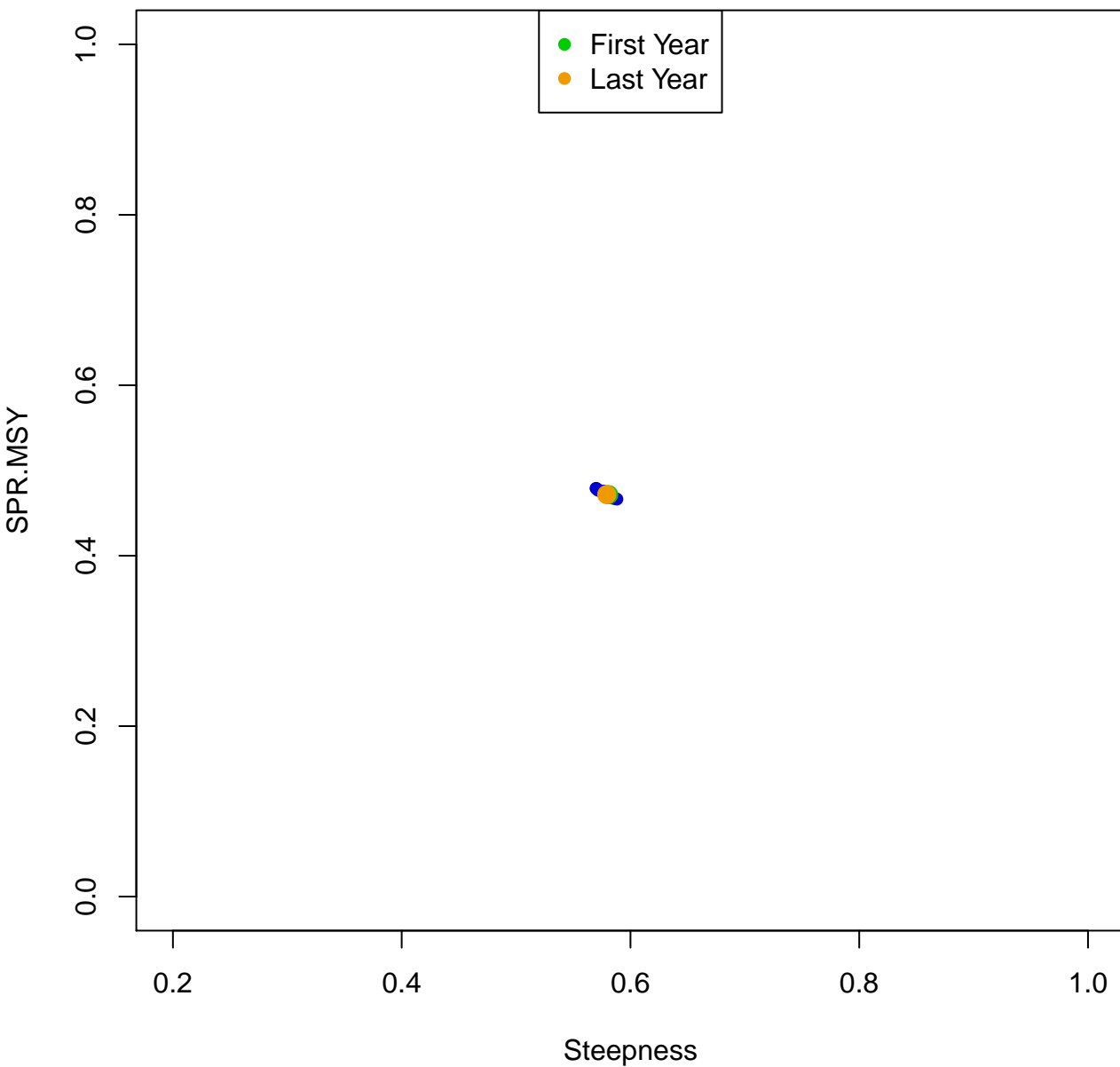
Annual MSY Reference Points (from S-R curve)



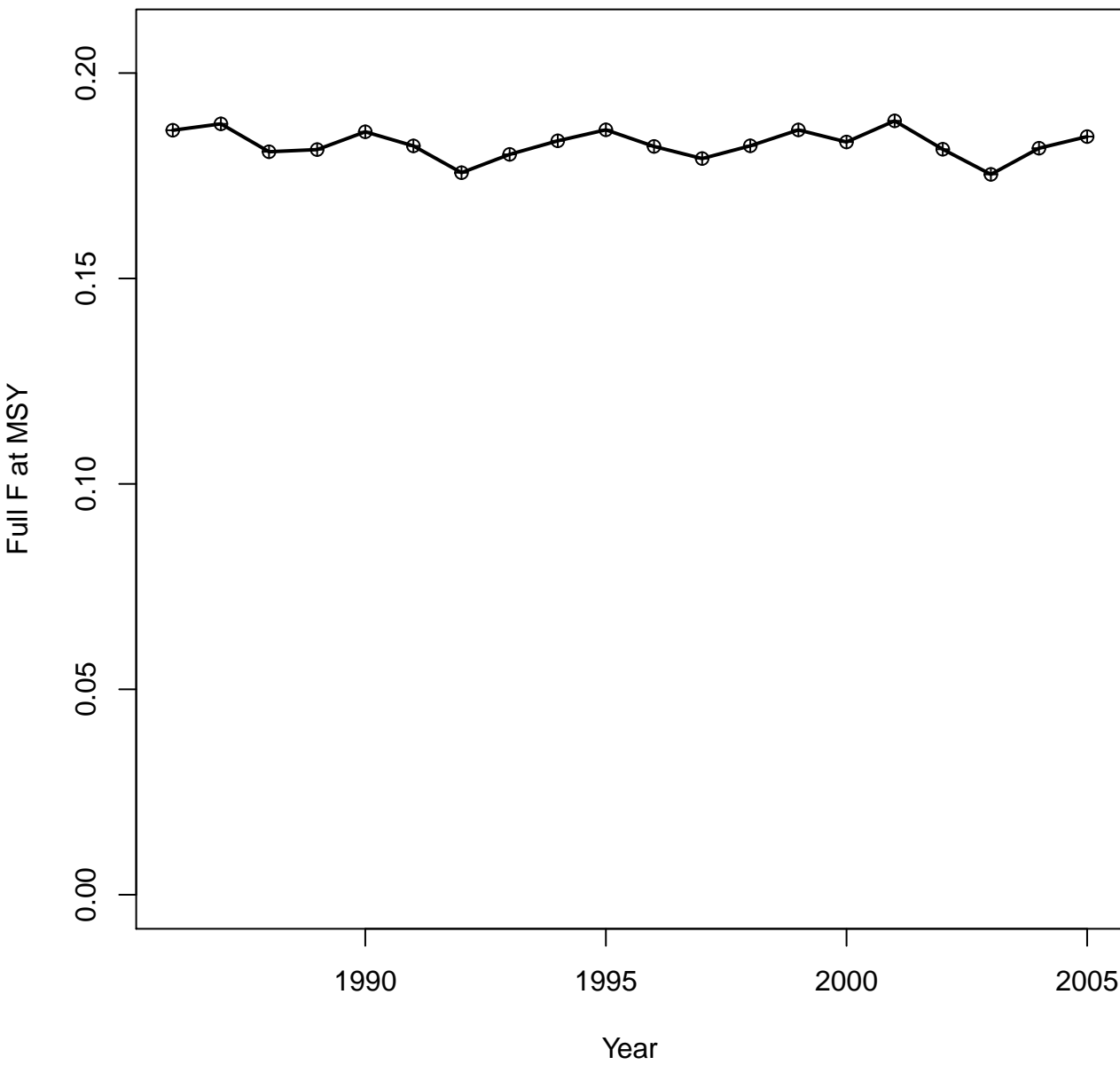
Annual MSY Reference Points (from S-R curve)



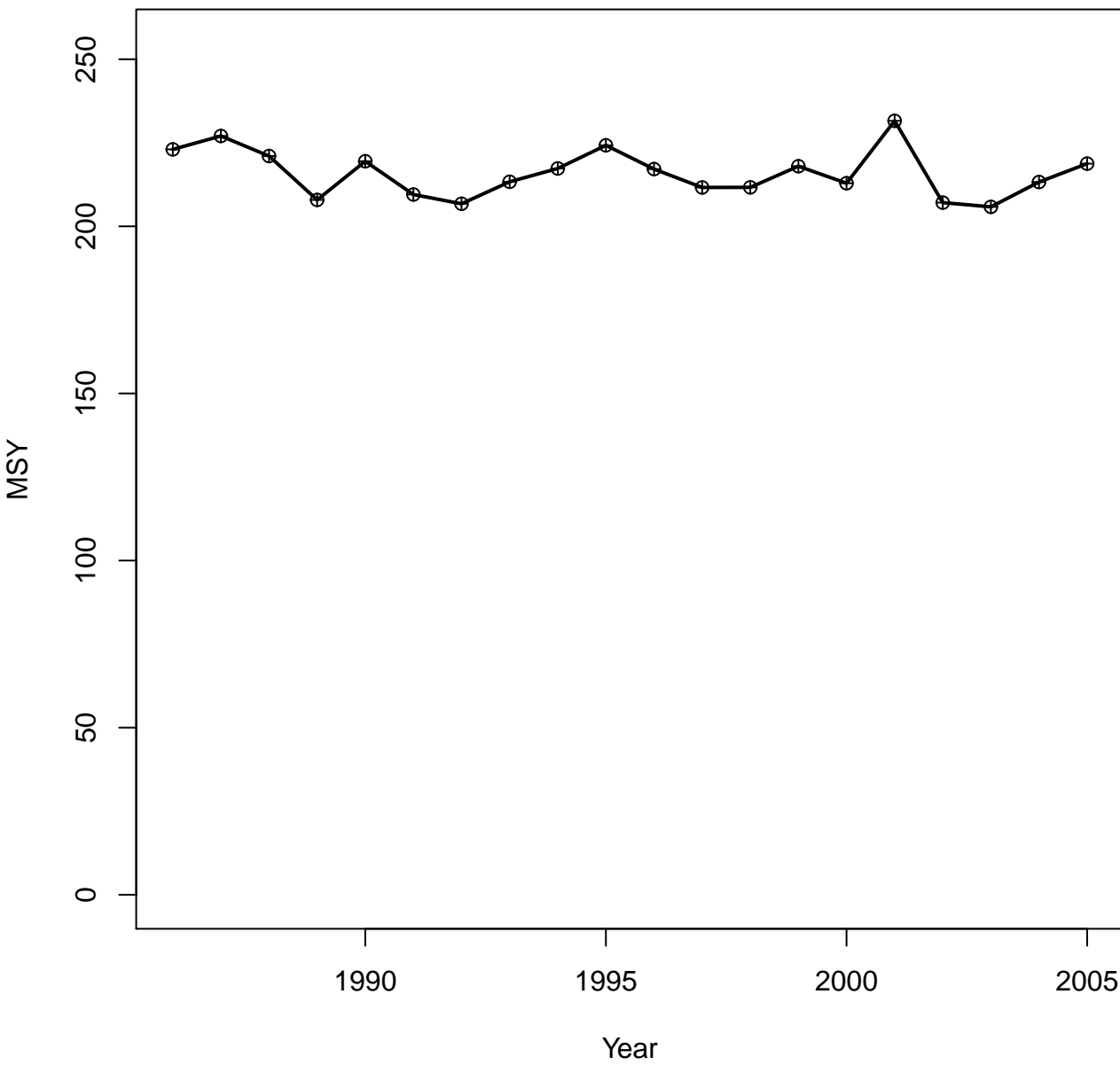
Annual Steepness and SPR.MSY (from S-R curve)



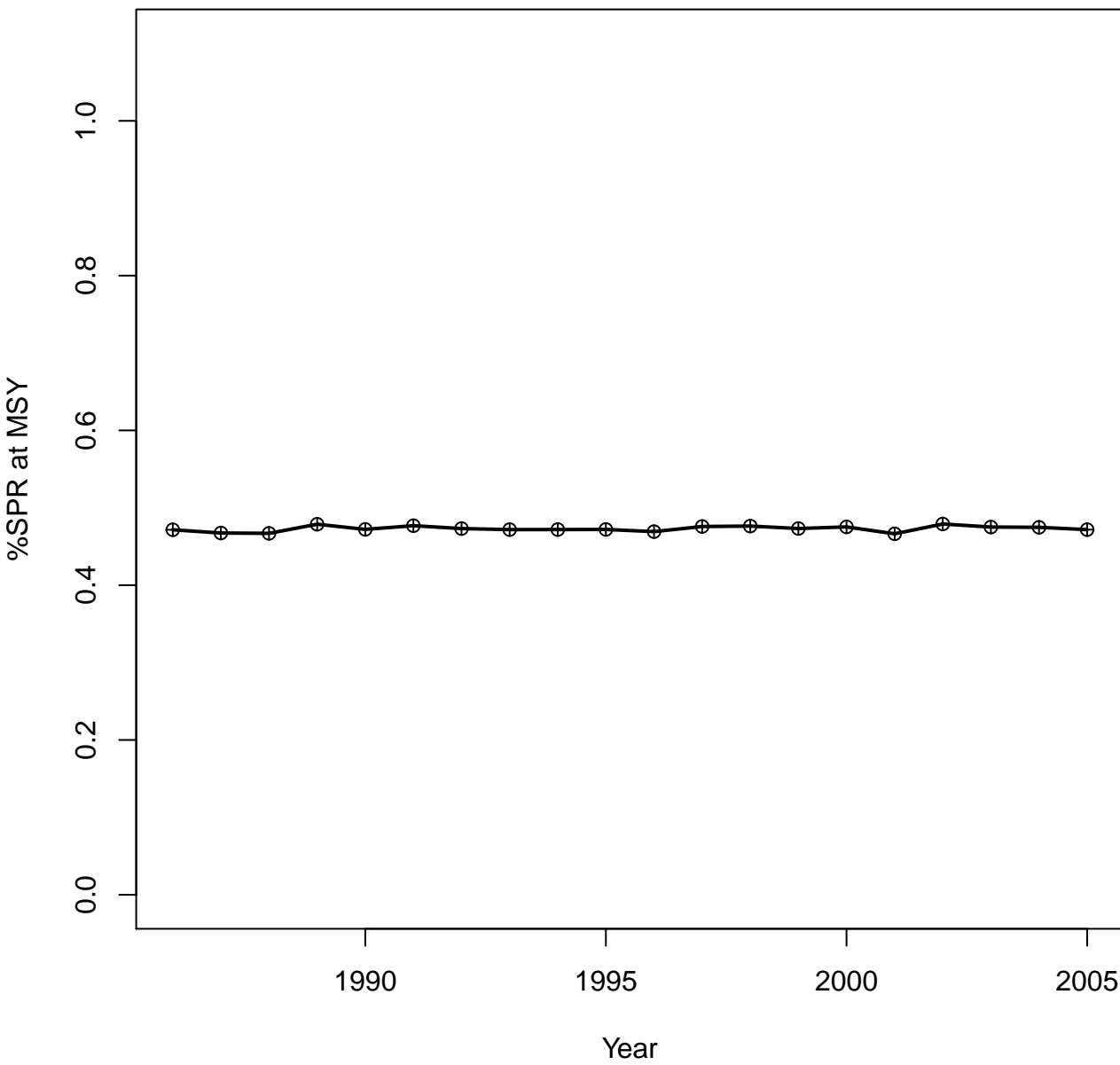
Annual MSY Reference Points (from S-R curve)



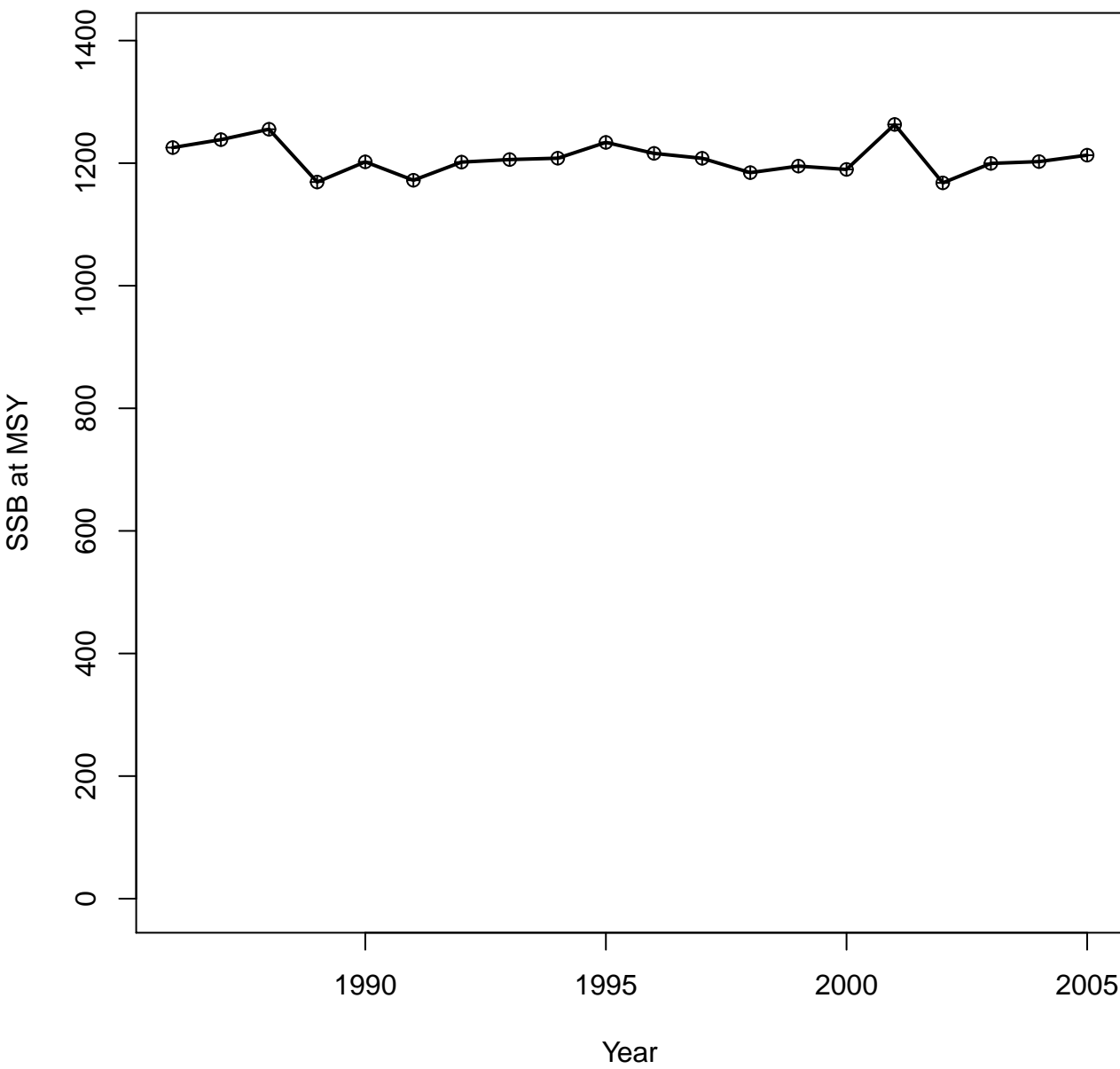
Annual MSY Reference Points (from S-R curve)



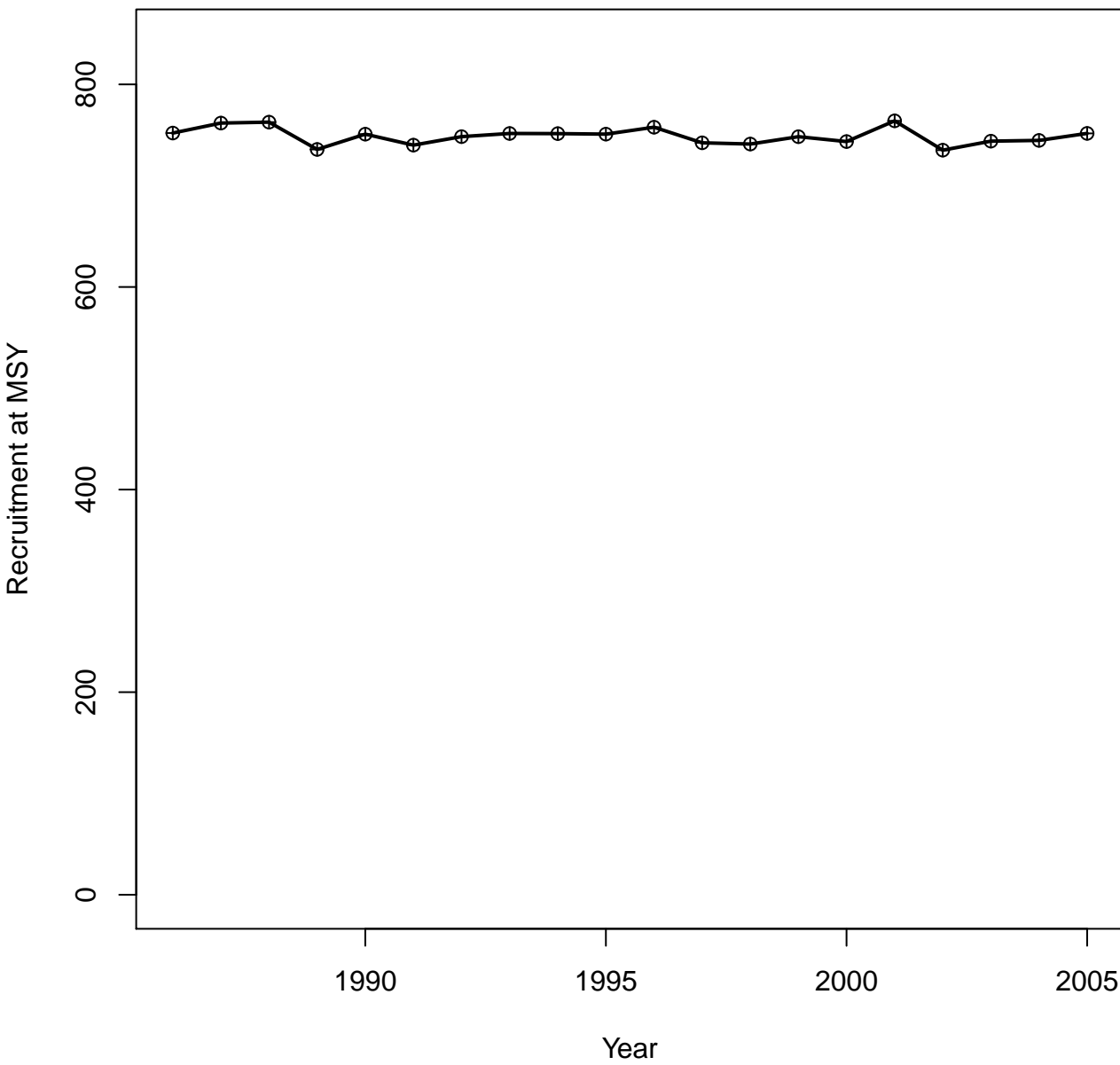
Annual MSY Reference Points (from S-R curve)

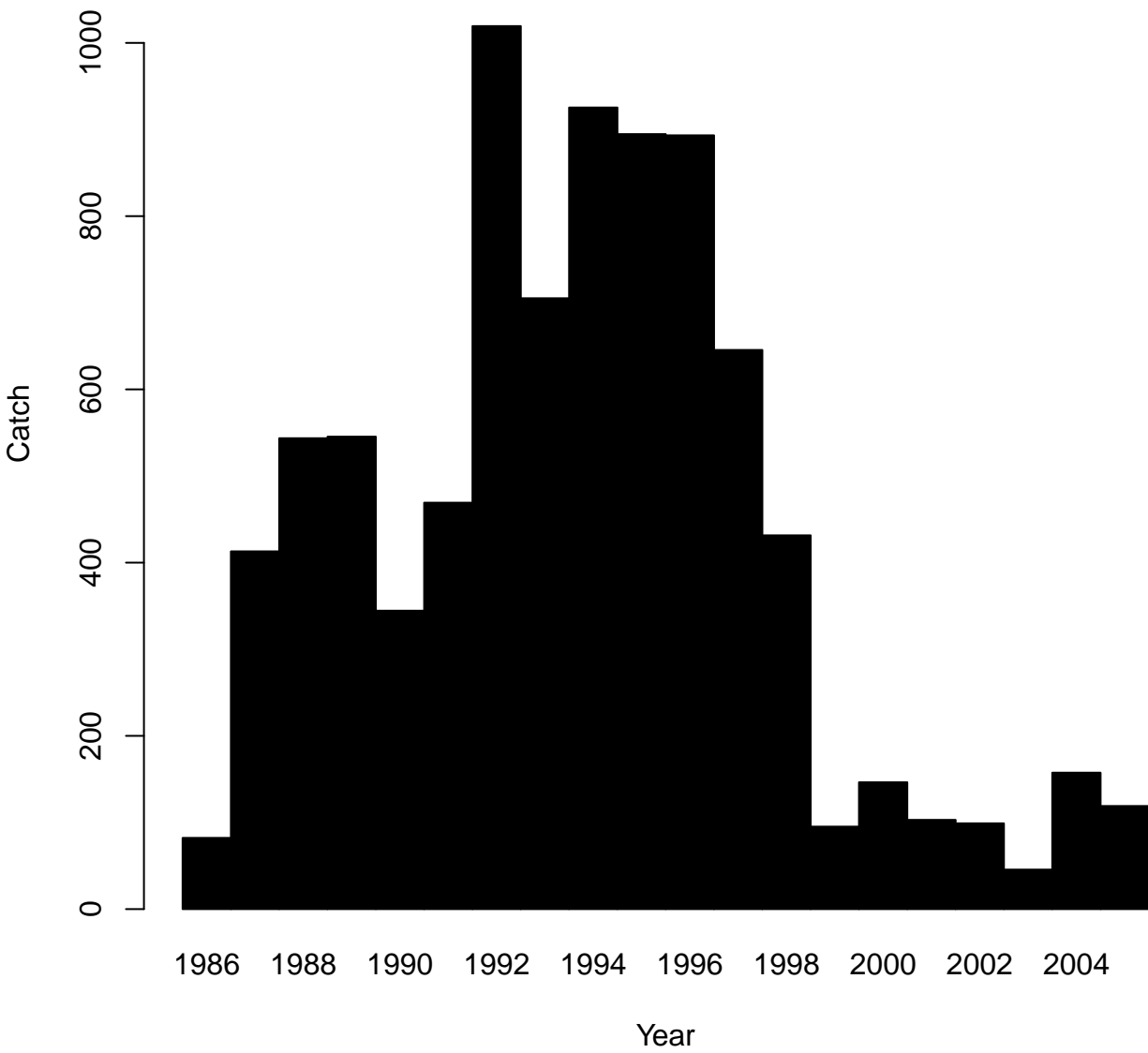


Annual MSY Reference Points (from S-R curve)

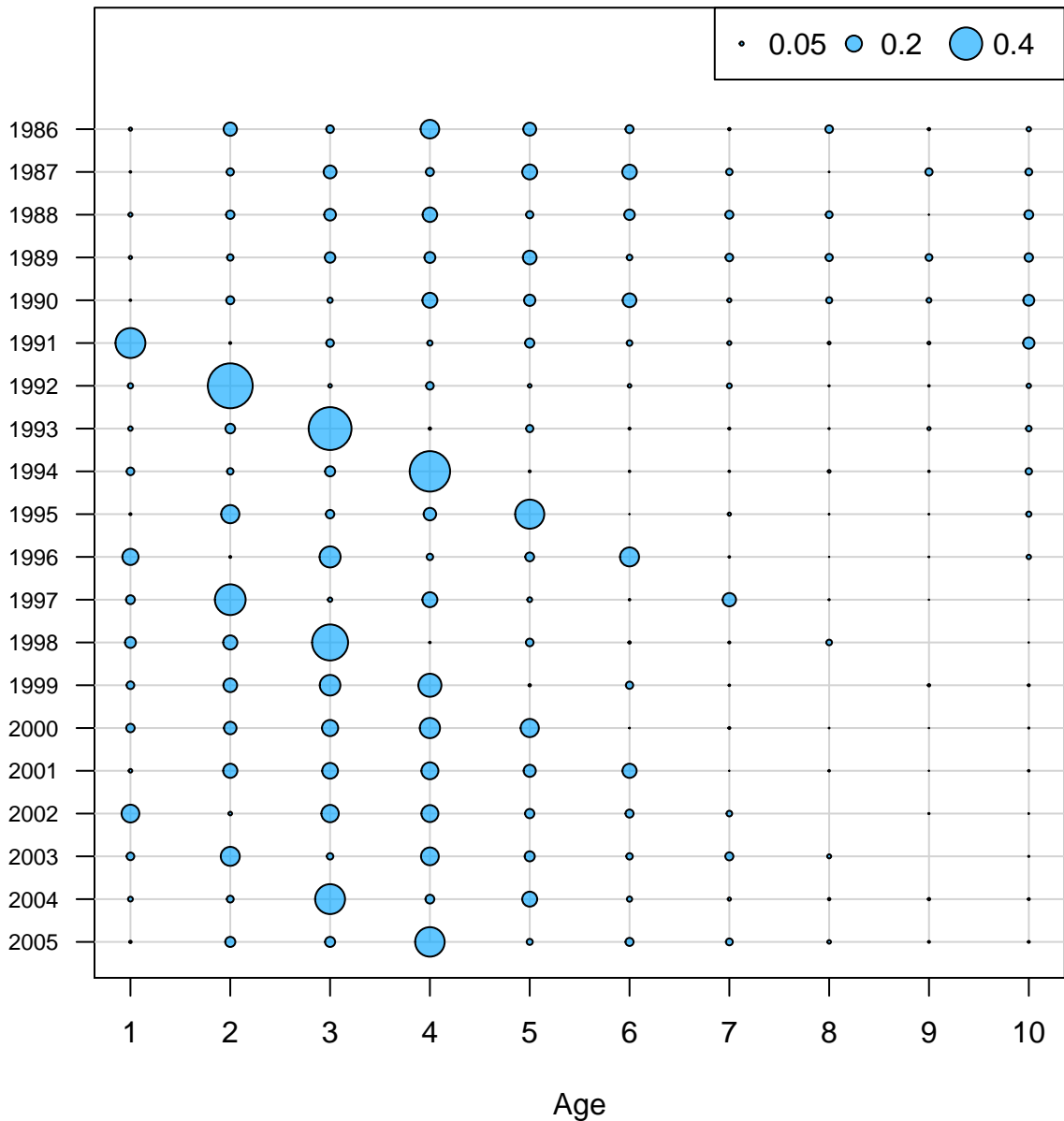


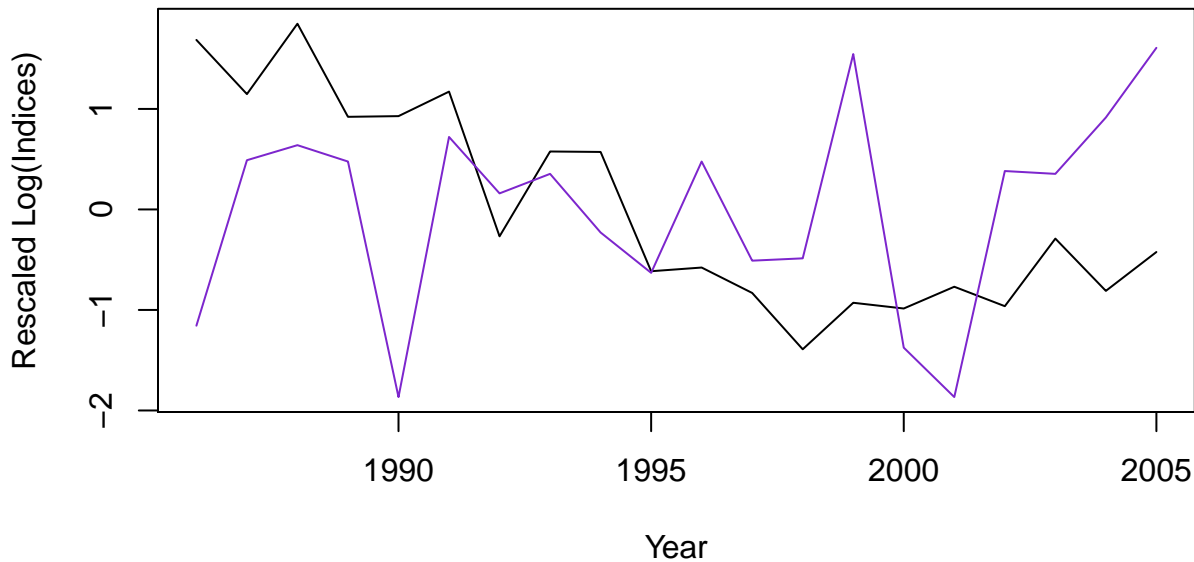
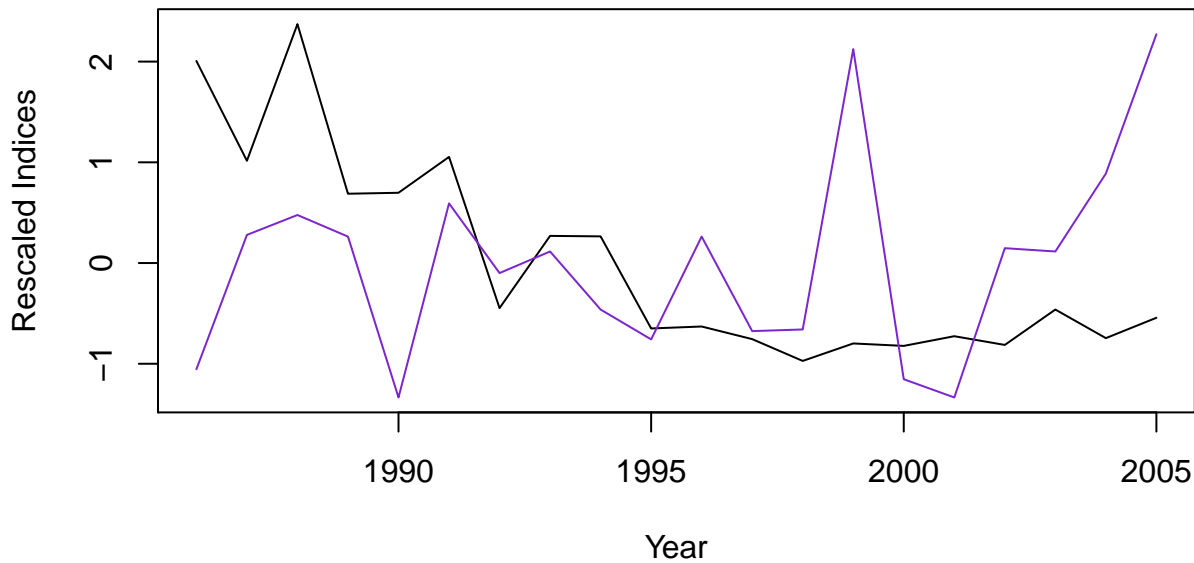
Annual MSY Reference Points (from S-R curve)





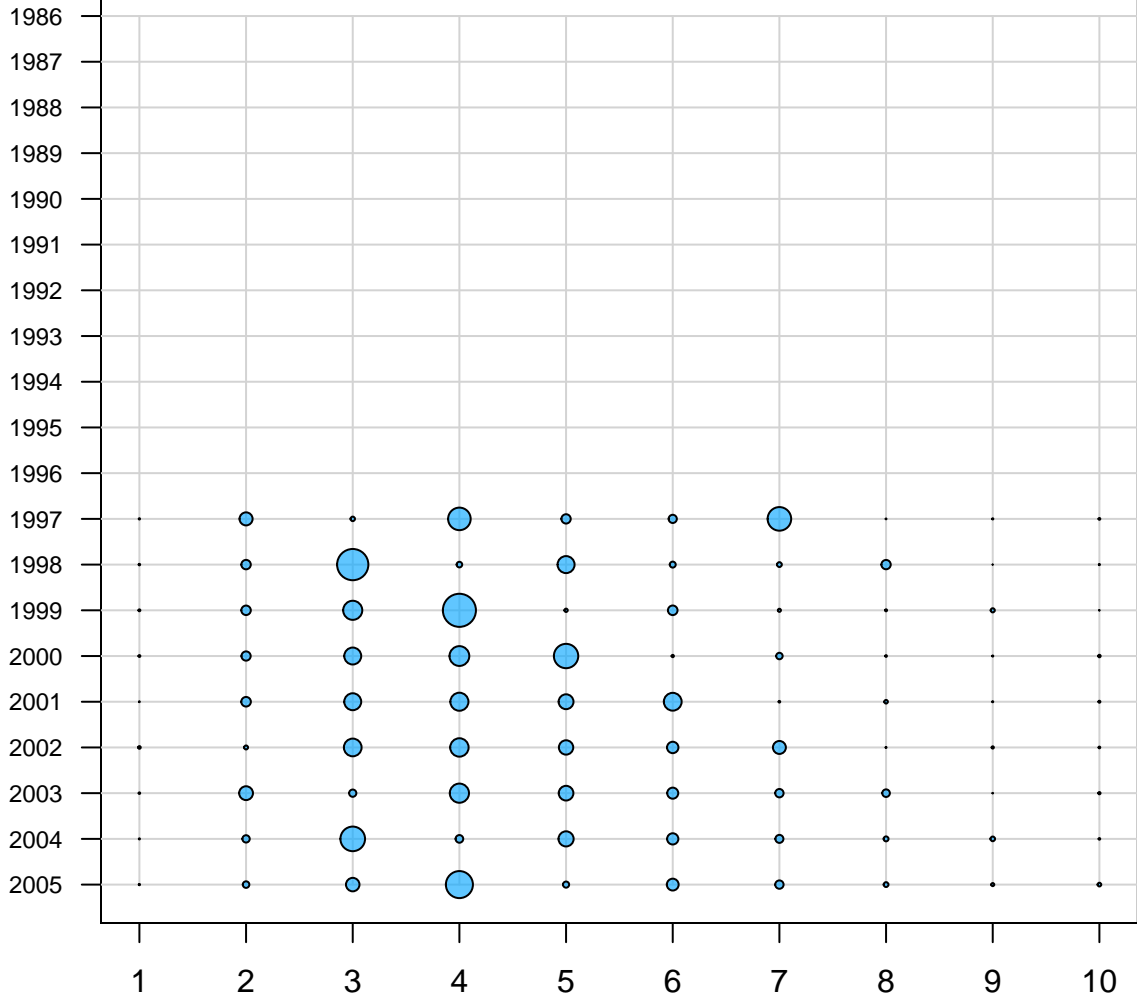
Age Comps for Catch by Fleet 1 (FLEET-1)





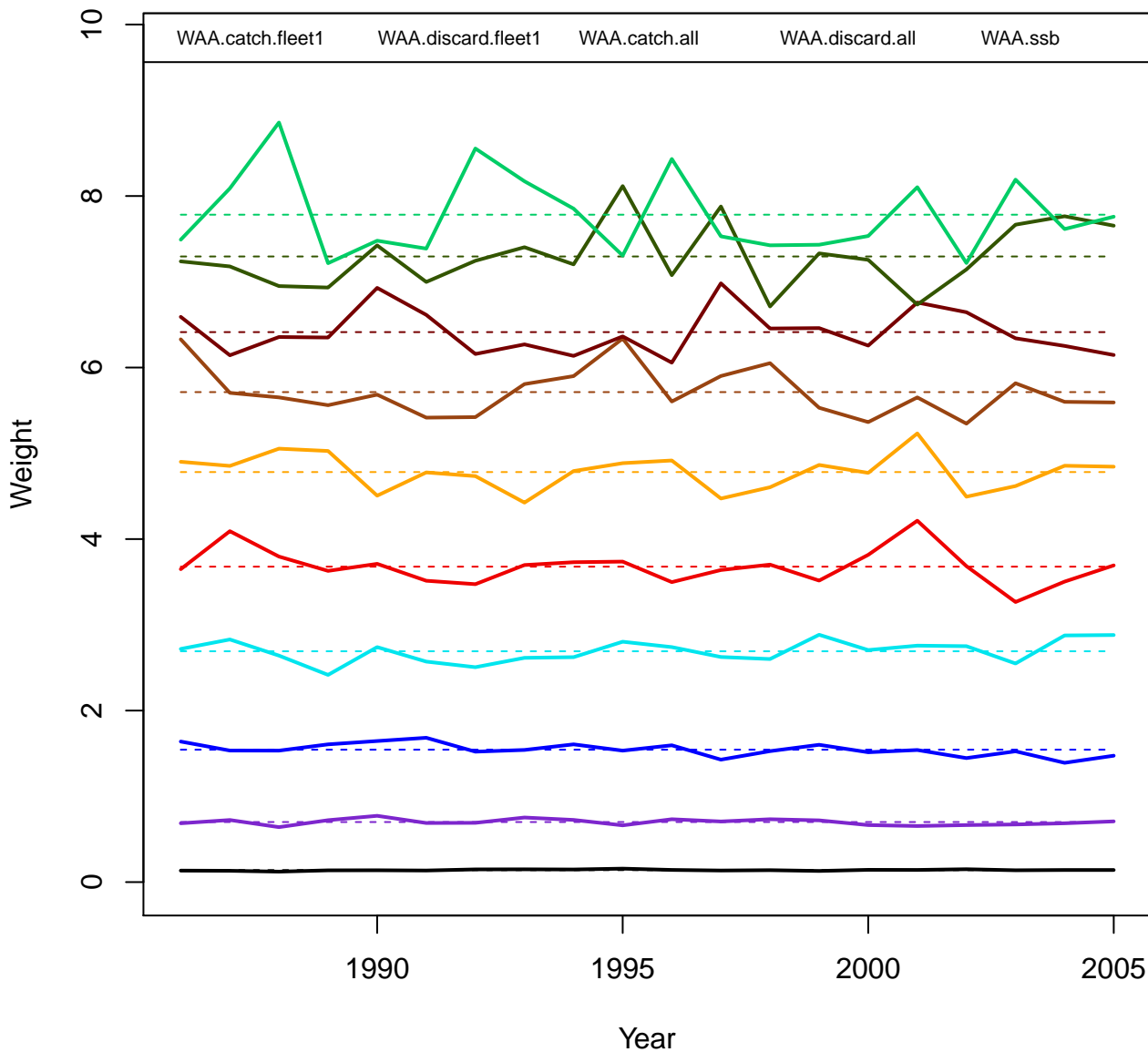
Age Comps for Index 1 (INDEX-1)

• 0.05 ● 0.2 ● 0.4

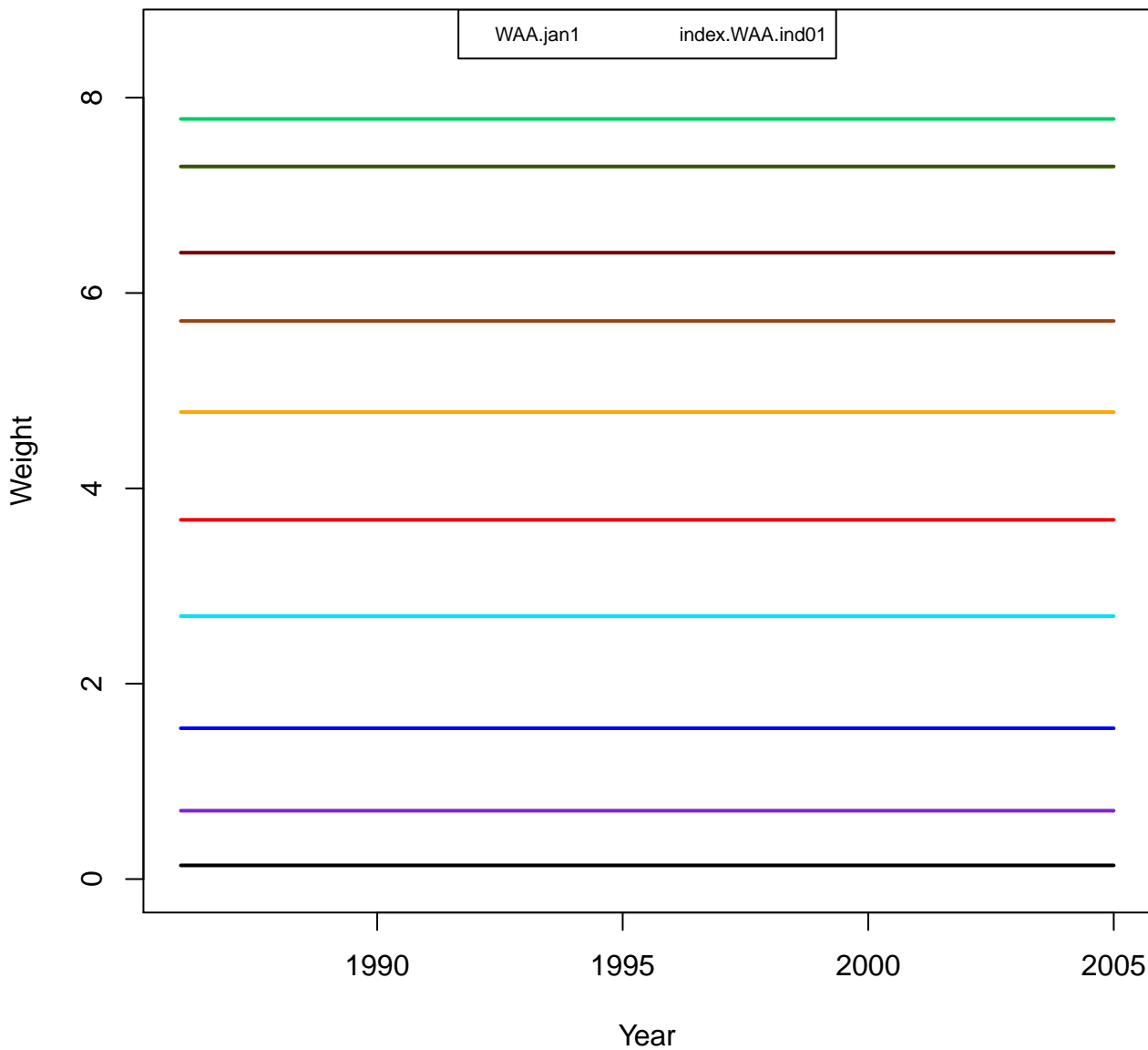


Age

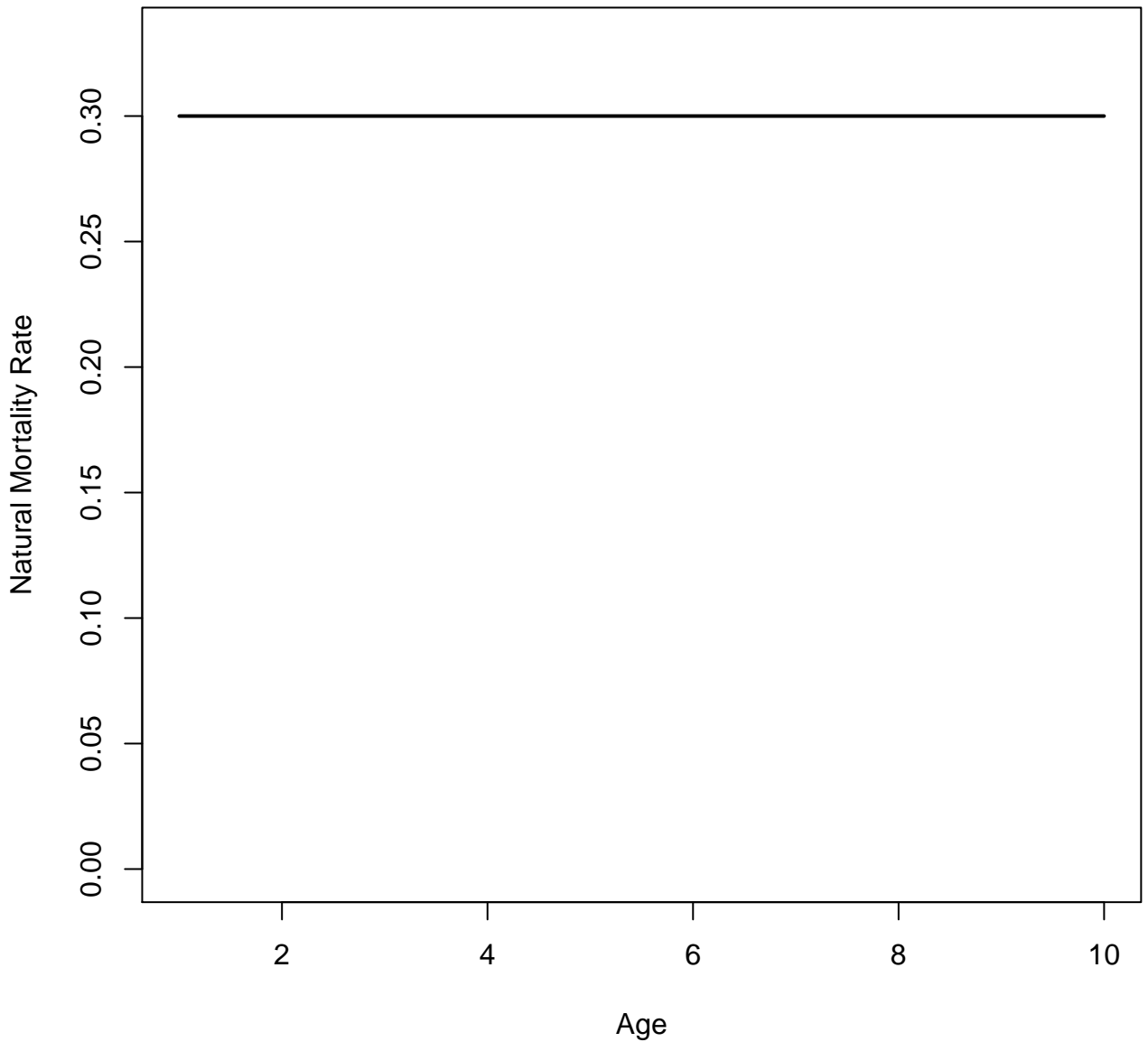
WAA matrix 1



WAA matrix 2



M



Maturity

