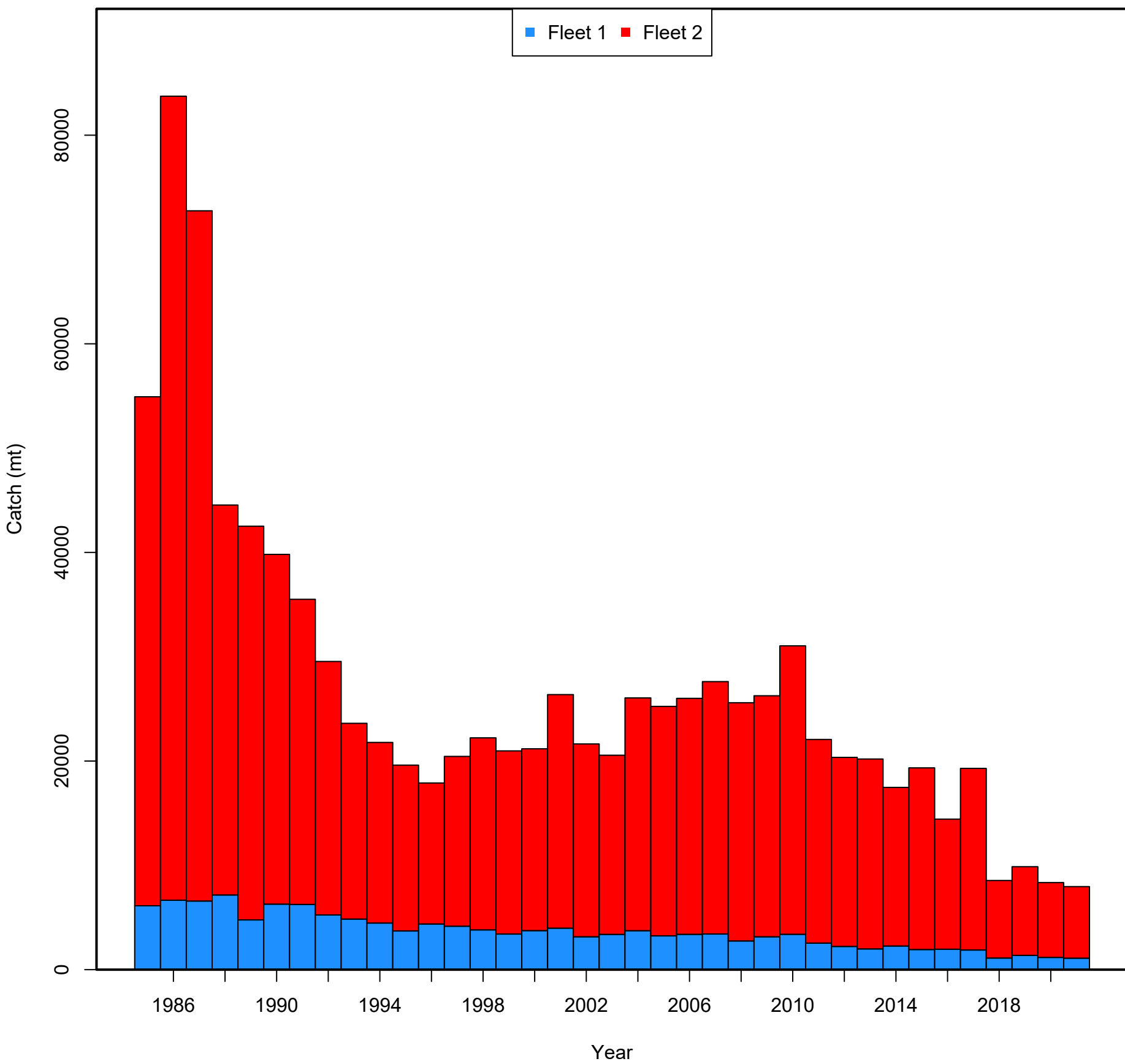
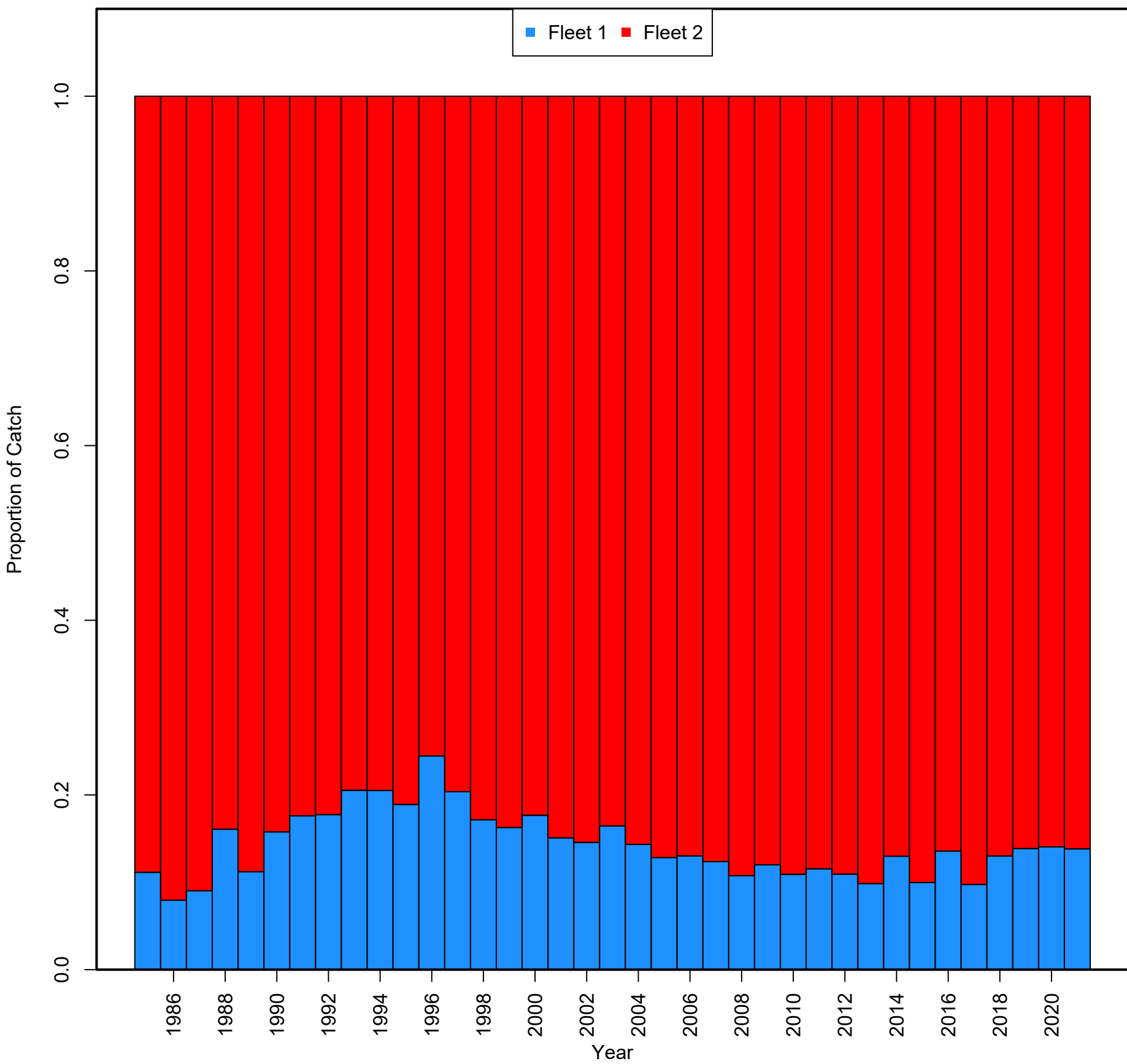


BF28W_M7: FINAL MODEL

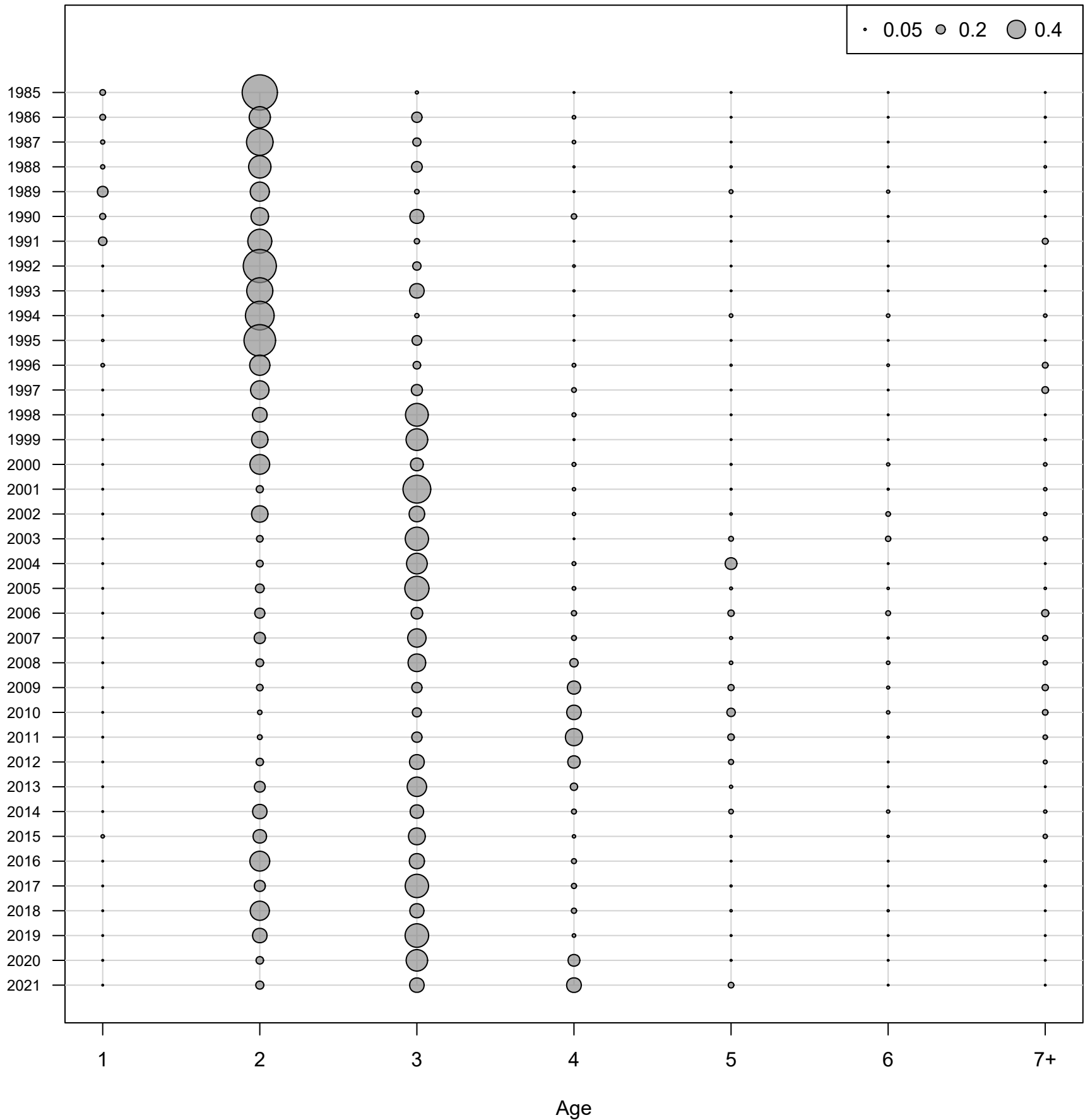
Final bluefish model with NAA transitions modeled as random effects correlated by age and year

DATA PLOTS

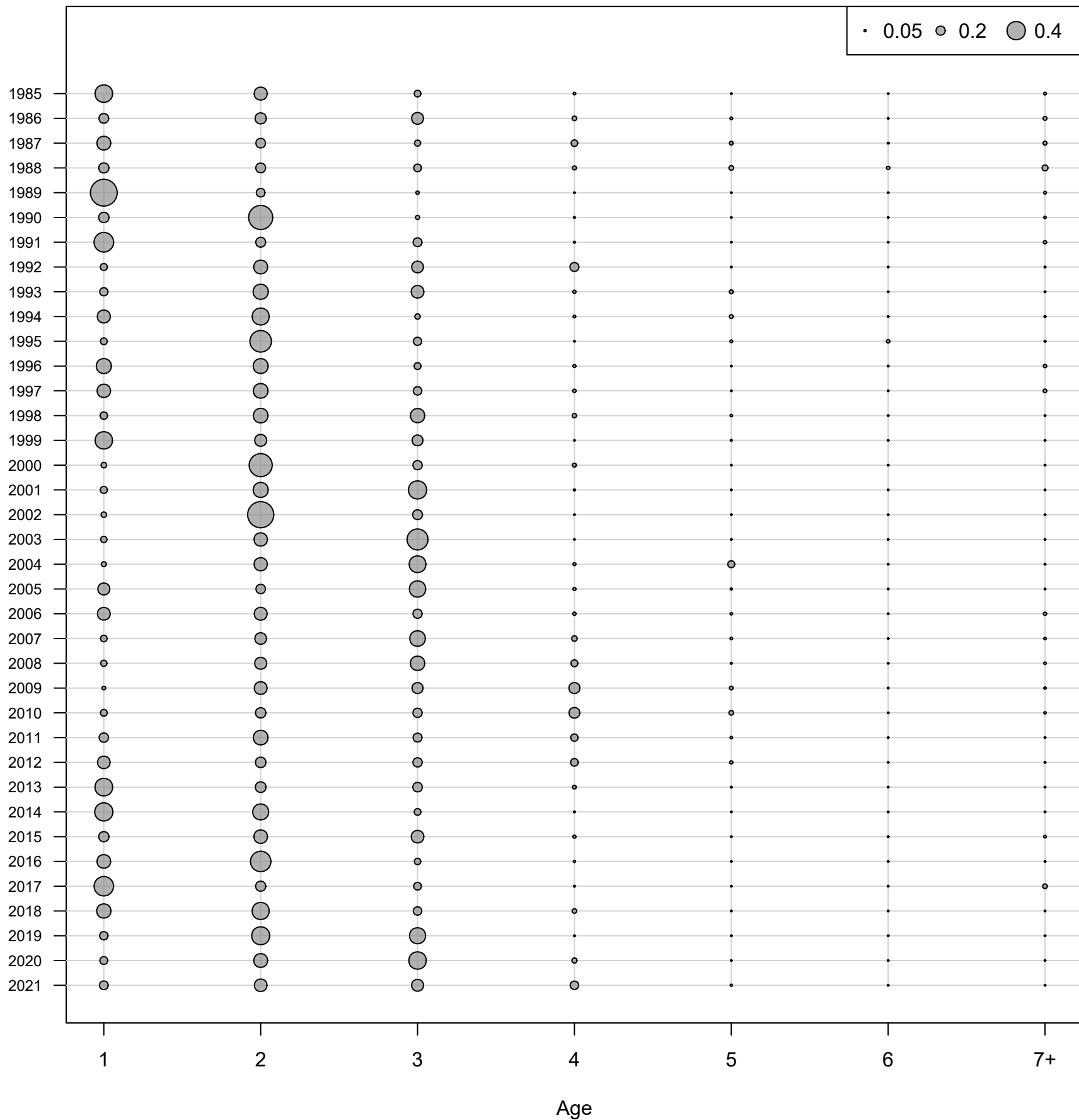


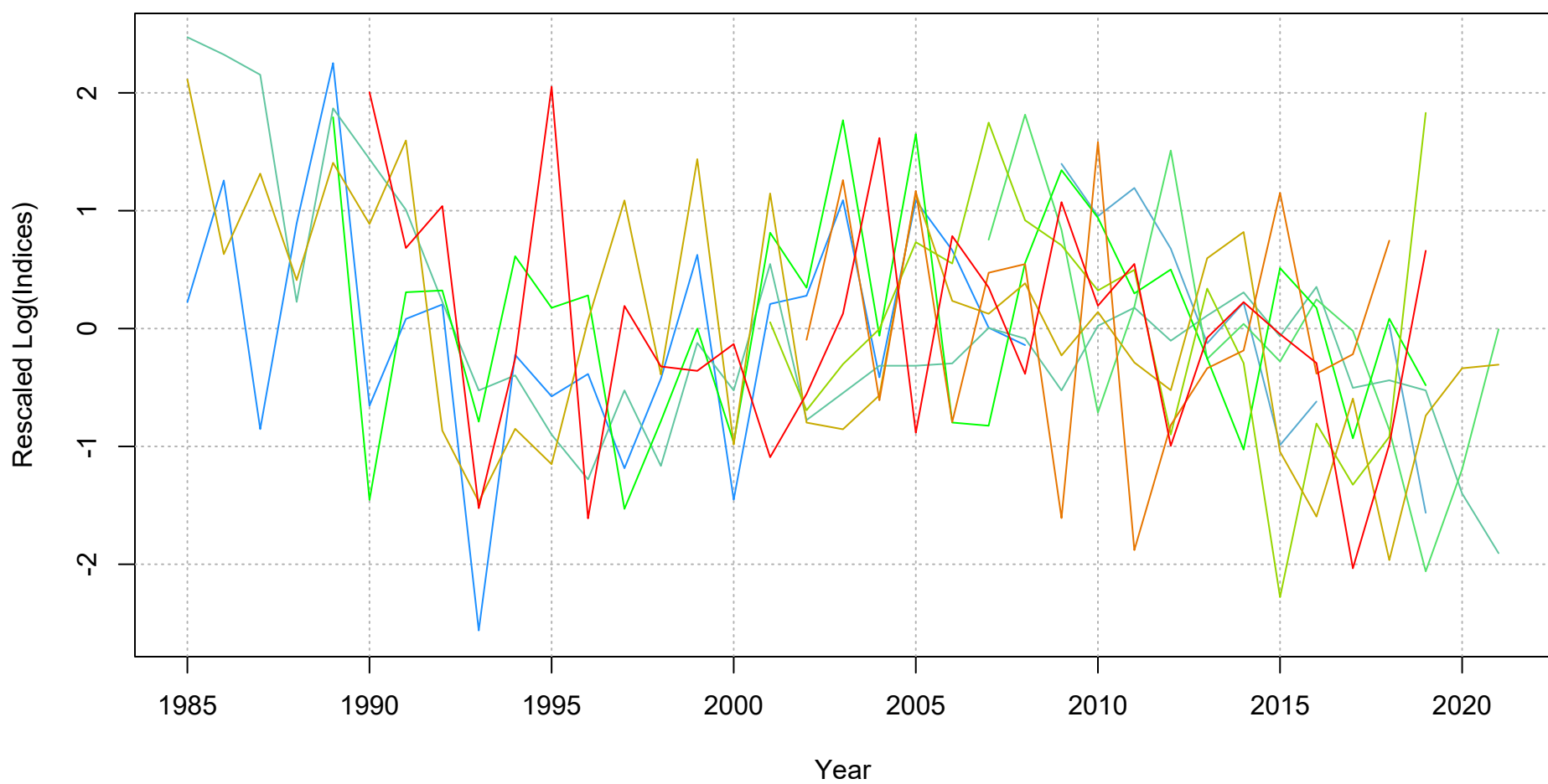
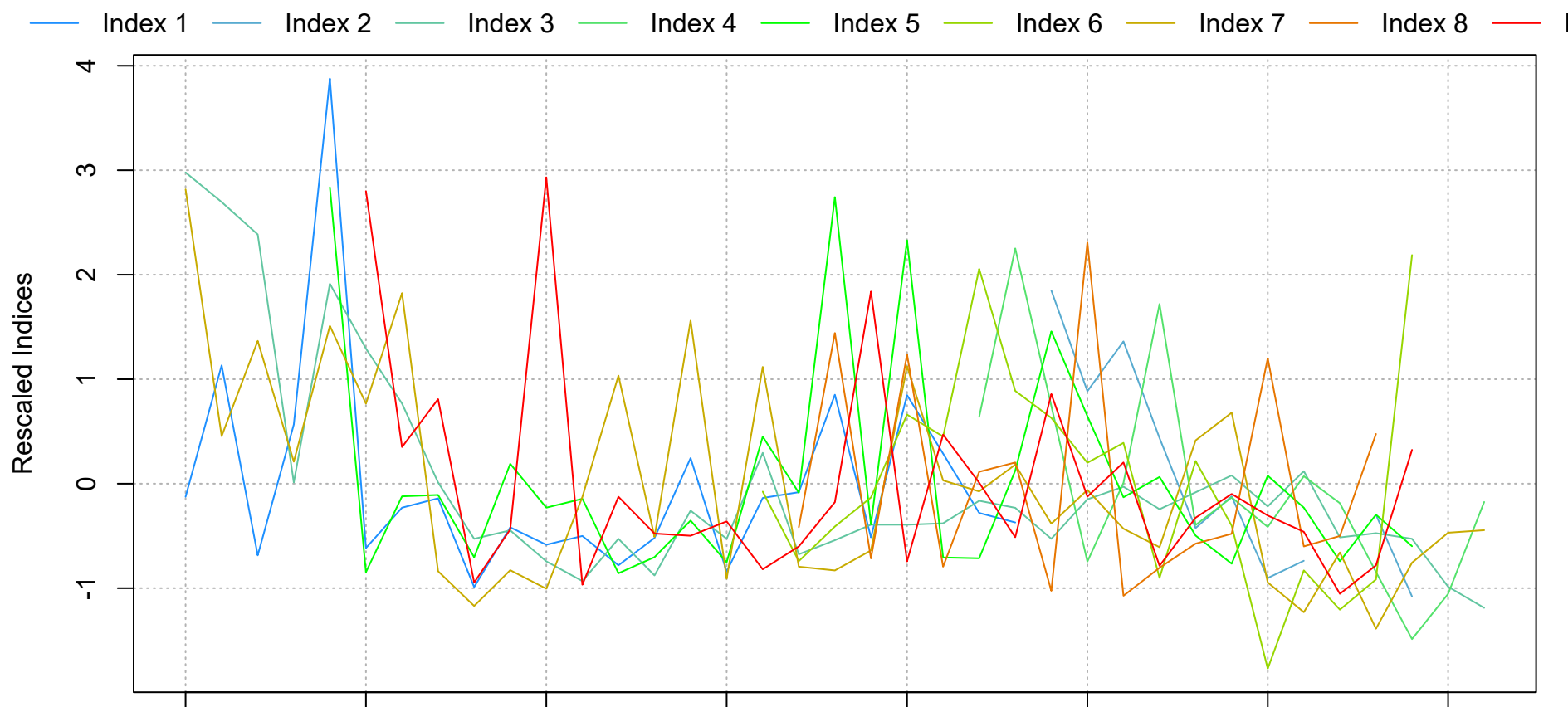


Age Comps for Catch for Fleet 1

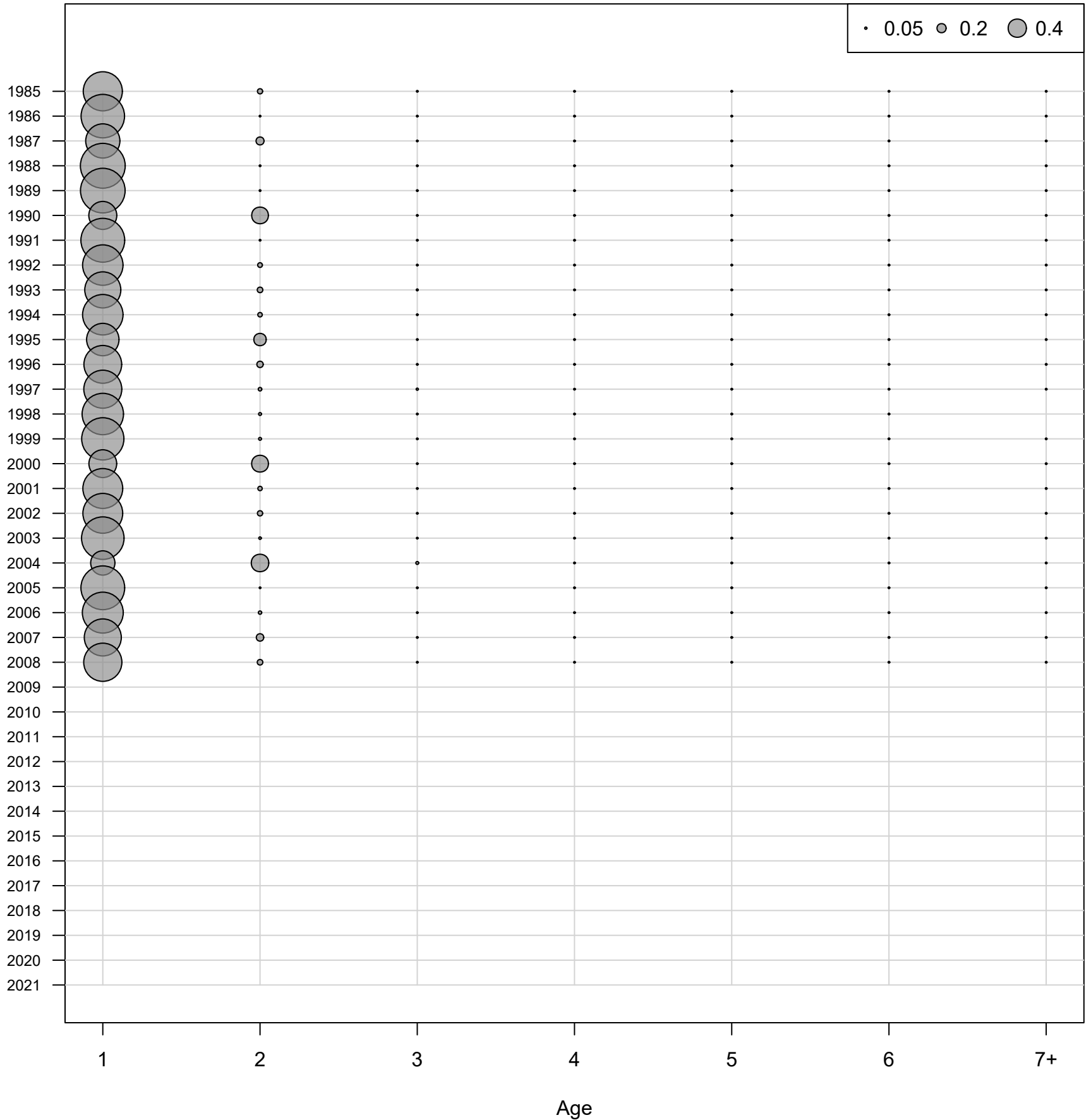


Age Comps for Catch for Fleet 2

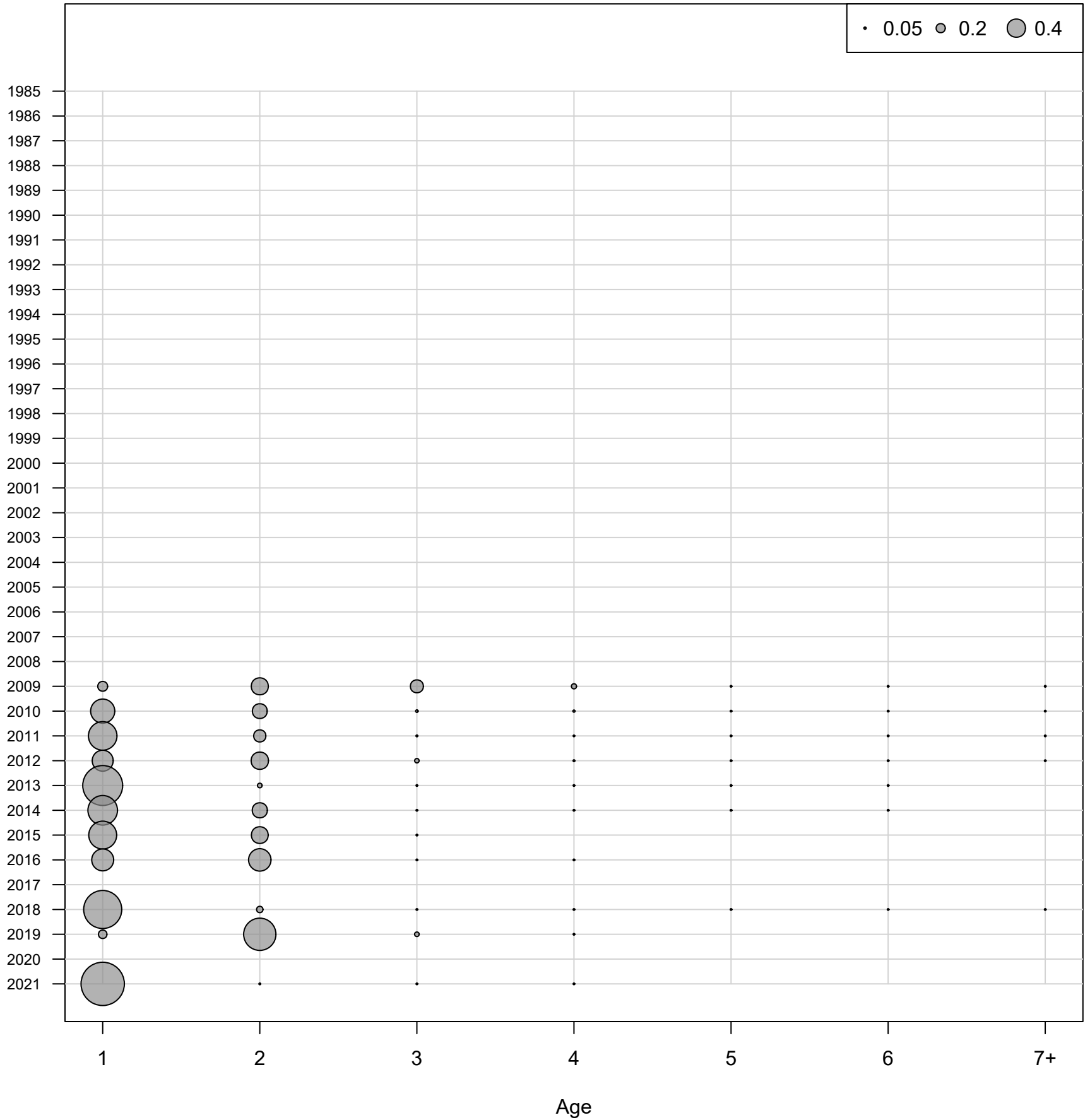




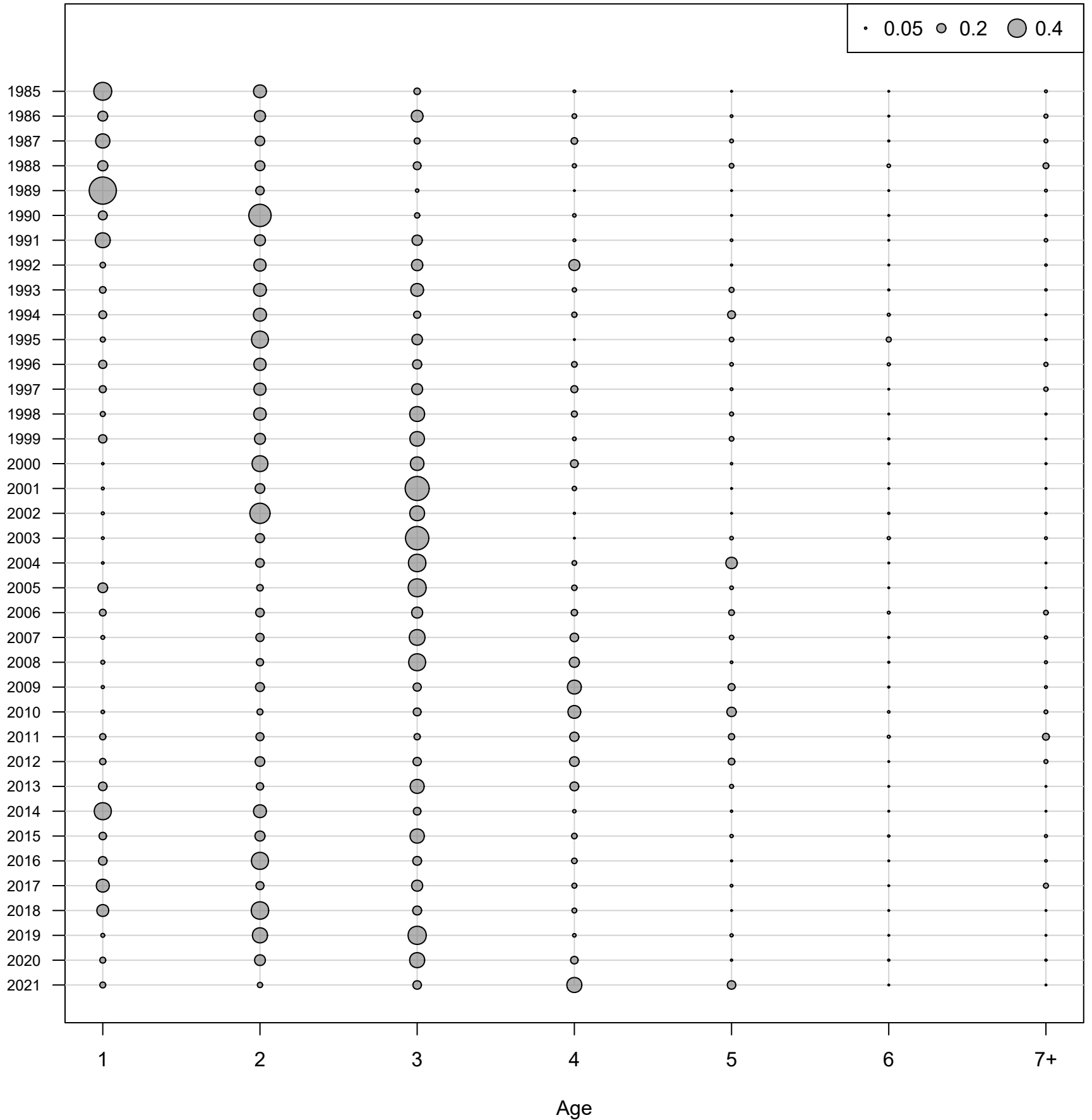
Age Comps for Index 1



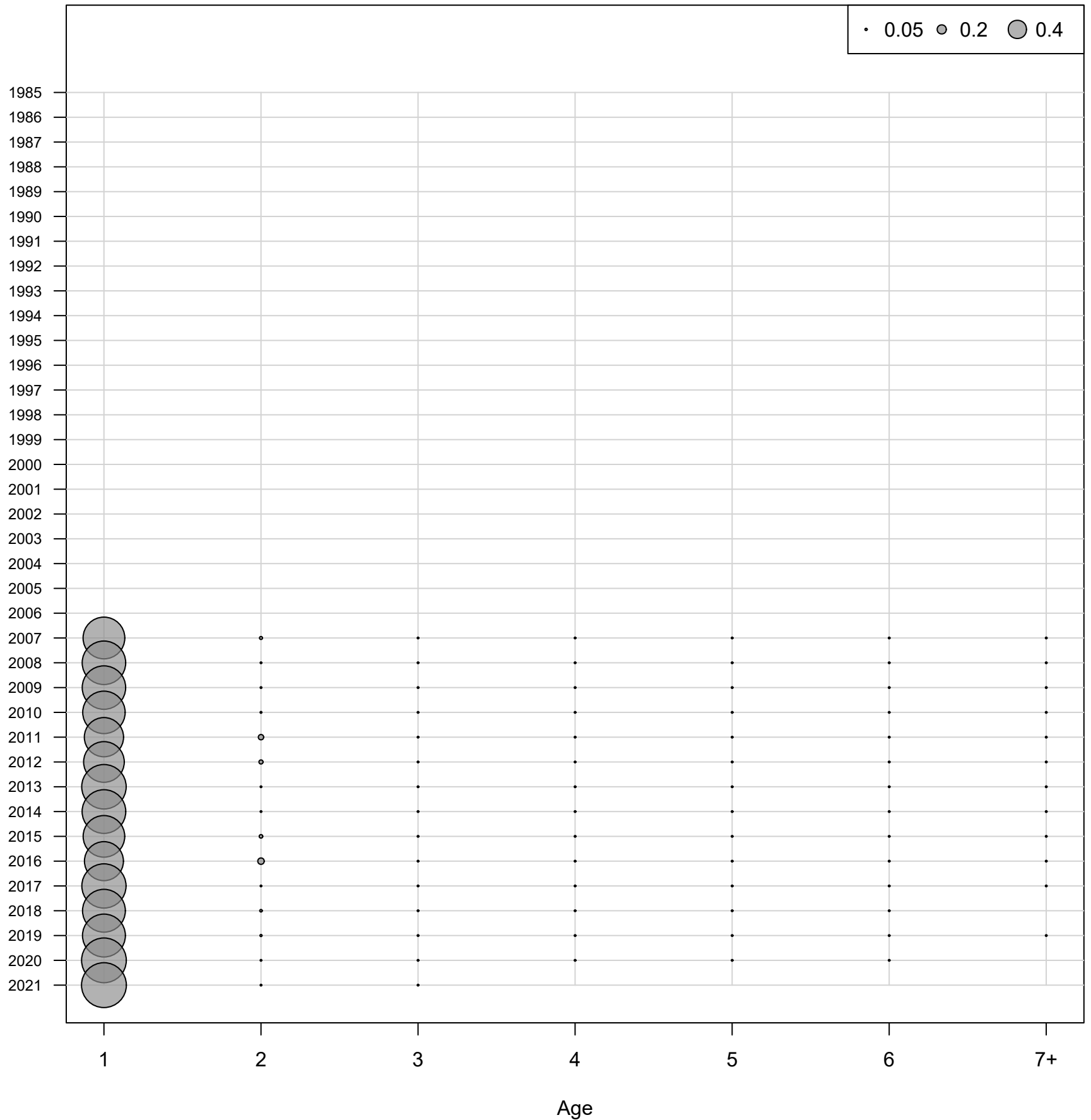
Age Comps for Index 2



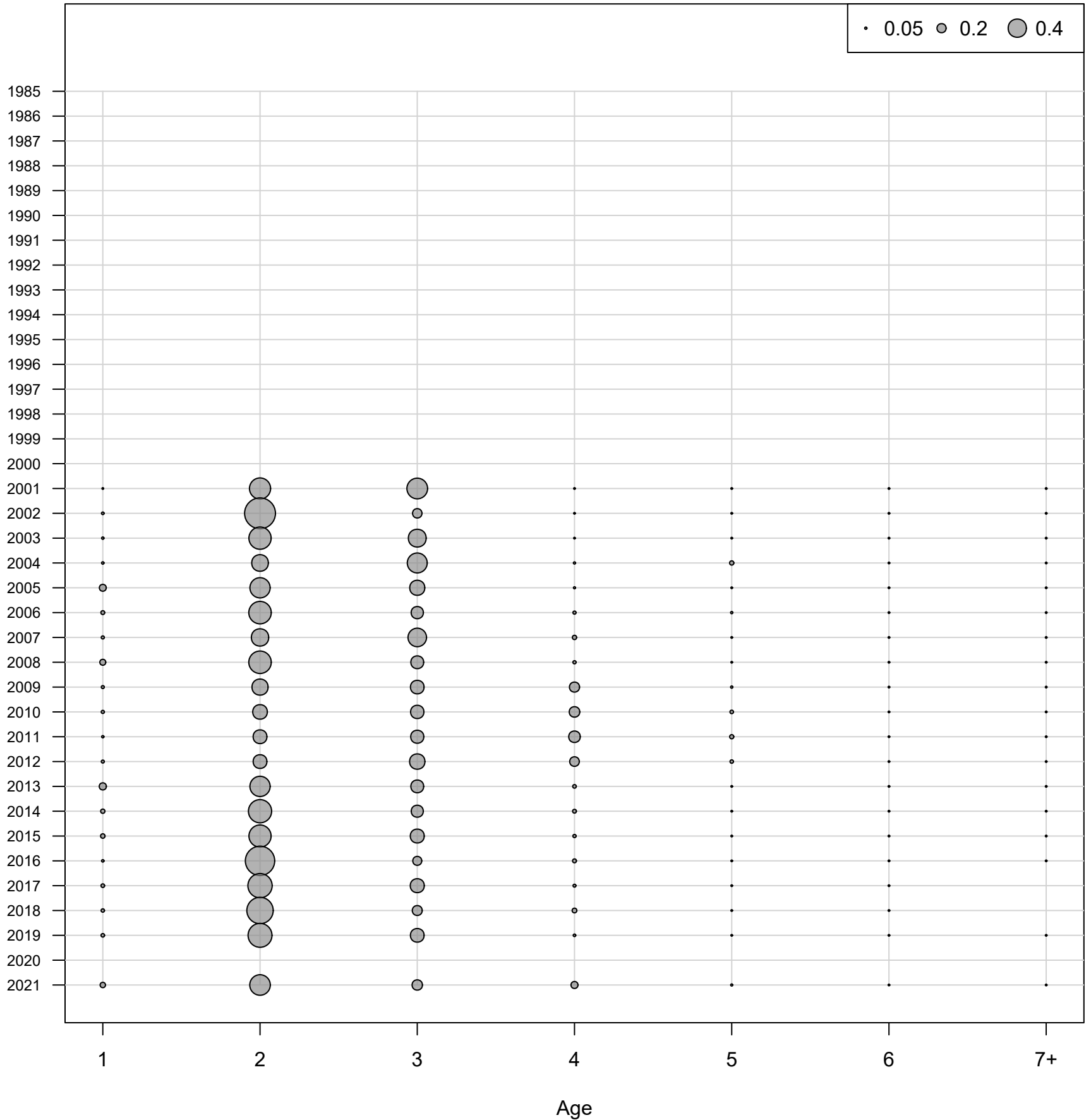
Age Comps for Index 3



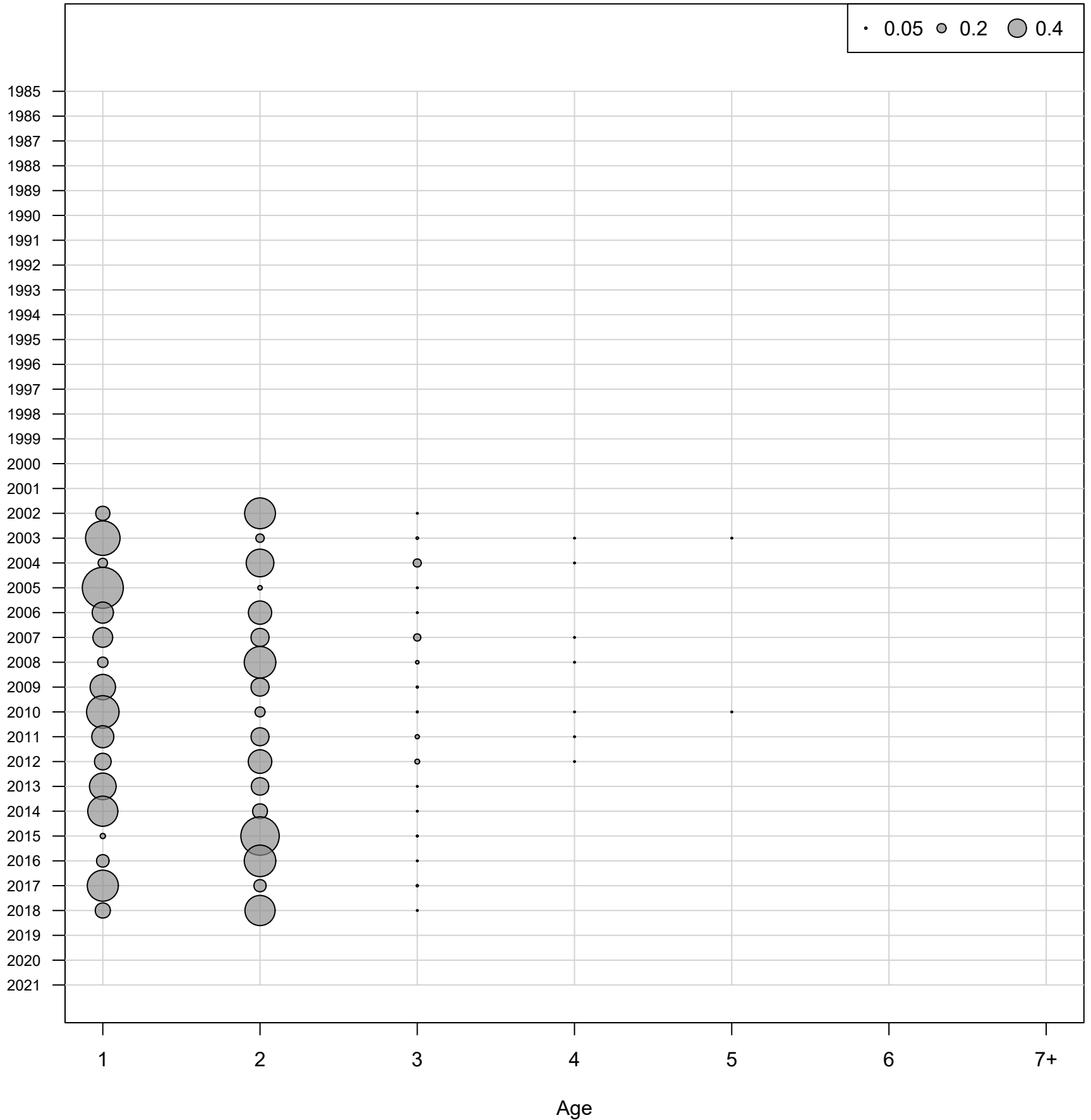
Age Comps for Index 4



Age Comps for Index 6



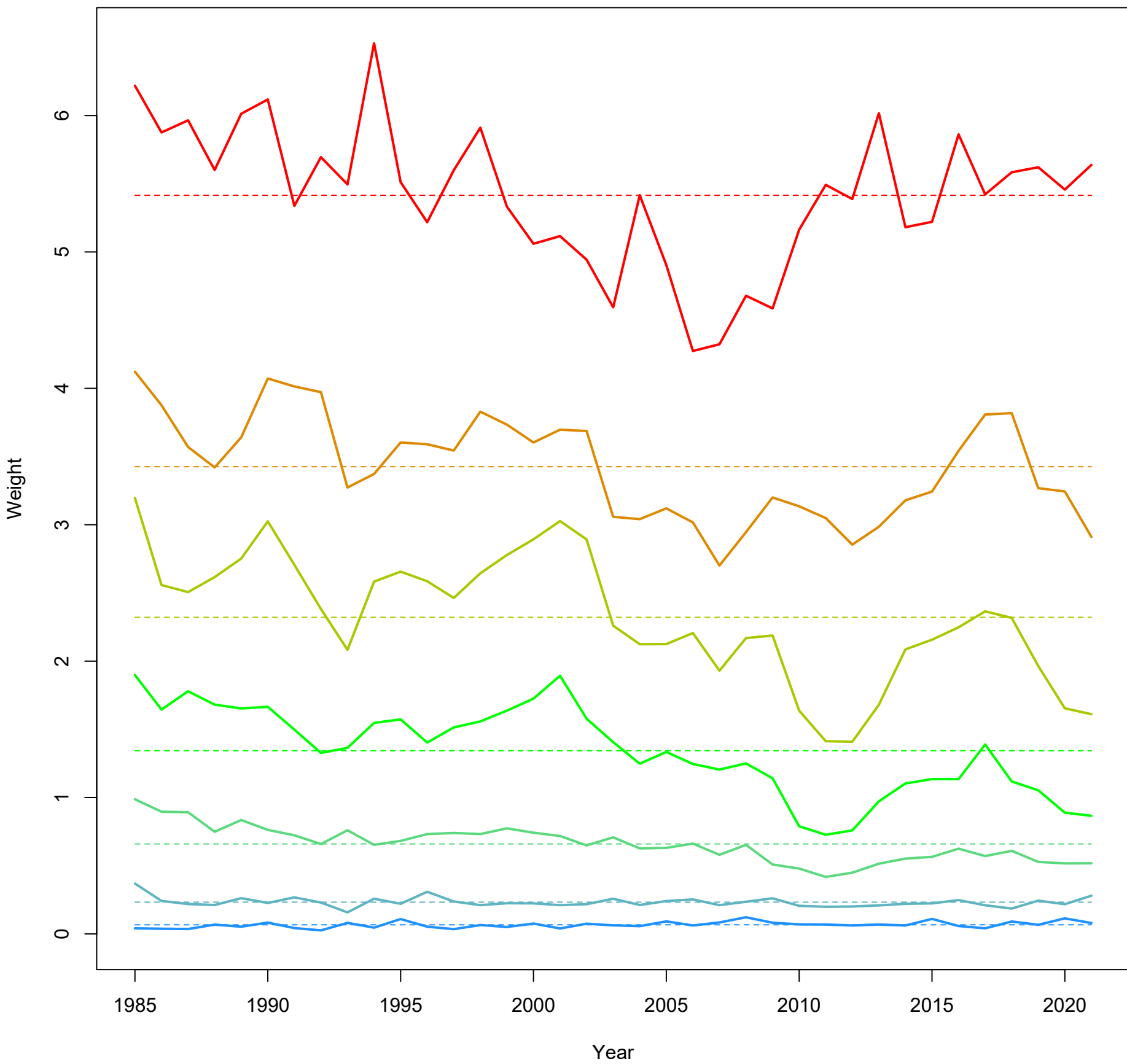
Age Comps for Index 8



Annual Weight-at-Age for SSB



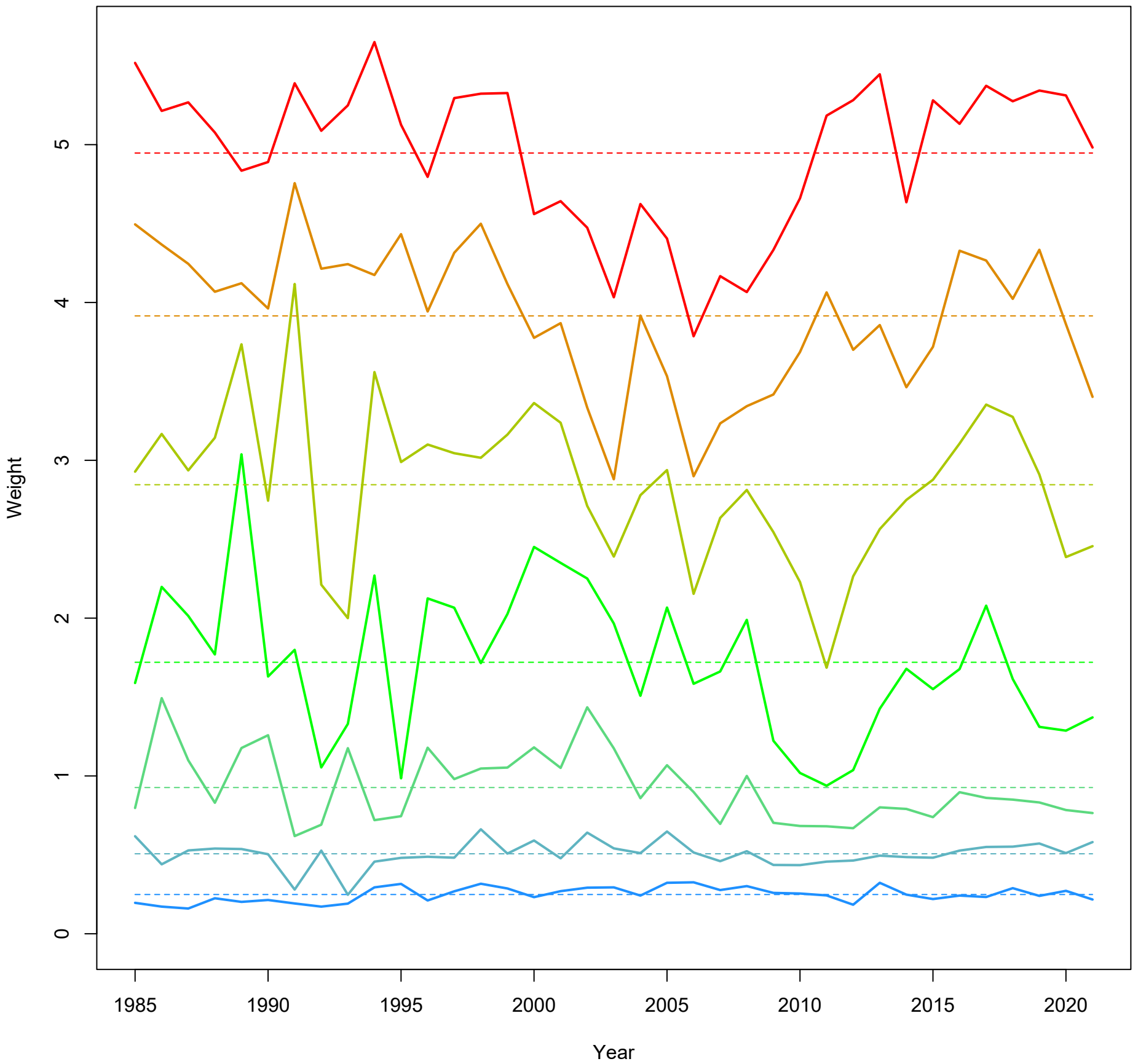
Annual Weight-at-Age for January 1 Biomass



Annual Weight-at-Age for Total Catch



Annual Weight-at-Age for Fleet 1



Annual Weight-at-Age for Fleet 2



Annual Weight-at-Age for Index 1



Annual Weight-at-Age for Index 2



Annual Weight-at-Age for Index 3



Annual Weight-at-Age for Index 4



Annual Weight-at-Age for Index 5



Annual Weight-at-Age for Index 6



Annual Weight-at-Age for Index 7



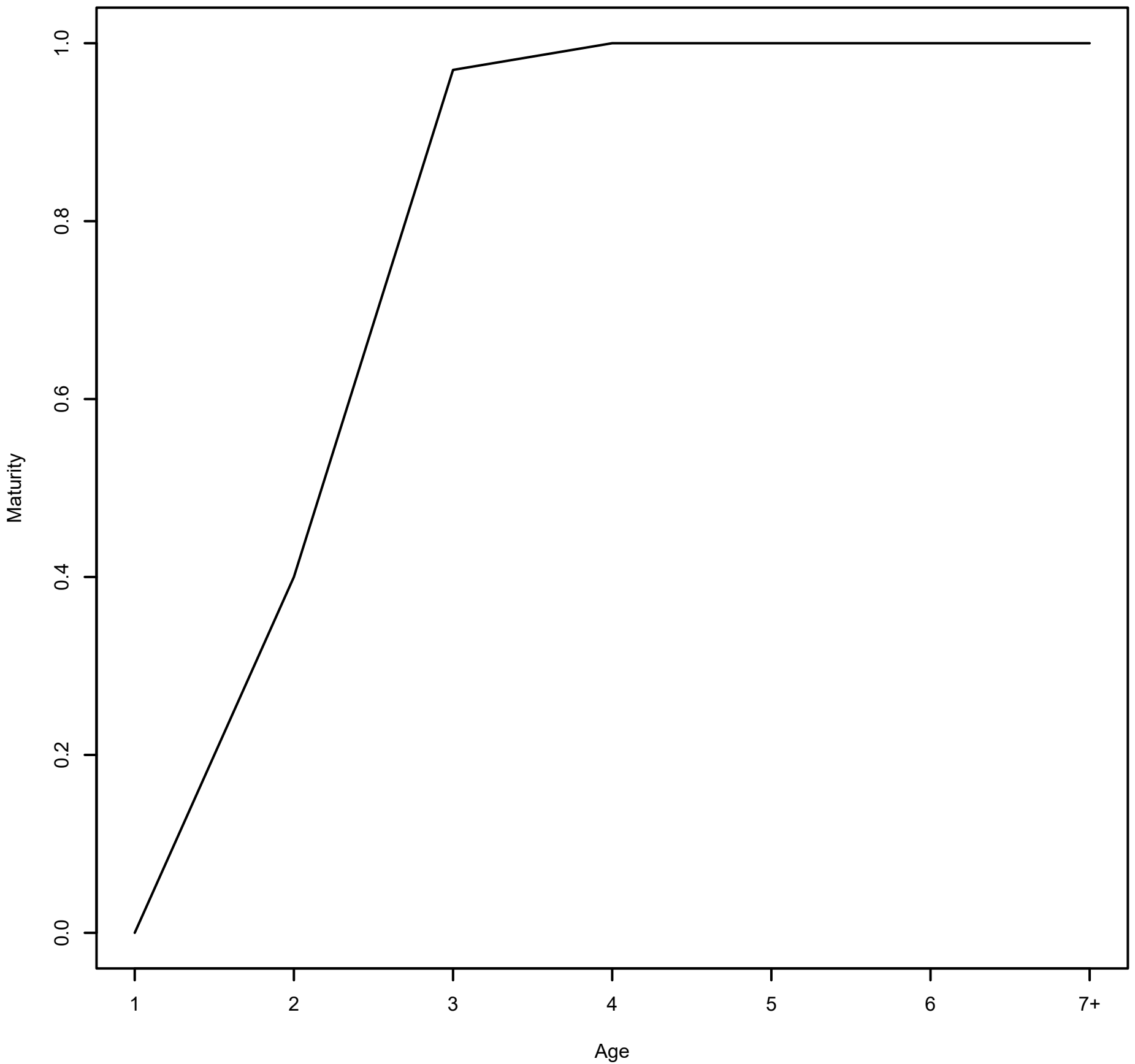
Annual Weight-at-Age for Index 8



Annual Weight-at-Age for Index 9



Maturity



BF28W_M7: FINAL MODEL

Final bluefish model with NAA transitions modeled as
random effects correlated by age and year

DIAGNOSTIC PLOTS

m7

Model years: 1985-2021

Projection years: none

Number of fleets: 2

Fleet Age Comp Models: Multinomial, Multinomial

Number of indices: 9

Models: Multinomial, Multinomial, Multinomial, Multinomial, Multinomial, Multinomial, Multinomial, Multinomial, Multinomial, Multinomial

Recruitment model: Random about mean

No Environmental covariates.

Number of Selectivity blocks: 14

Age-specific, Age-specific, Age-specific, Age-specific, Age-specific, Logistic(+), Age-specific, Age-specific, Age-specific, Age-specific

Fleet 1 Selectivity Blocks: c(1, 2)

Fleet 2 Selectivity Blocks: c(3, 4, 5)

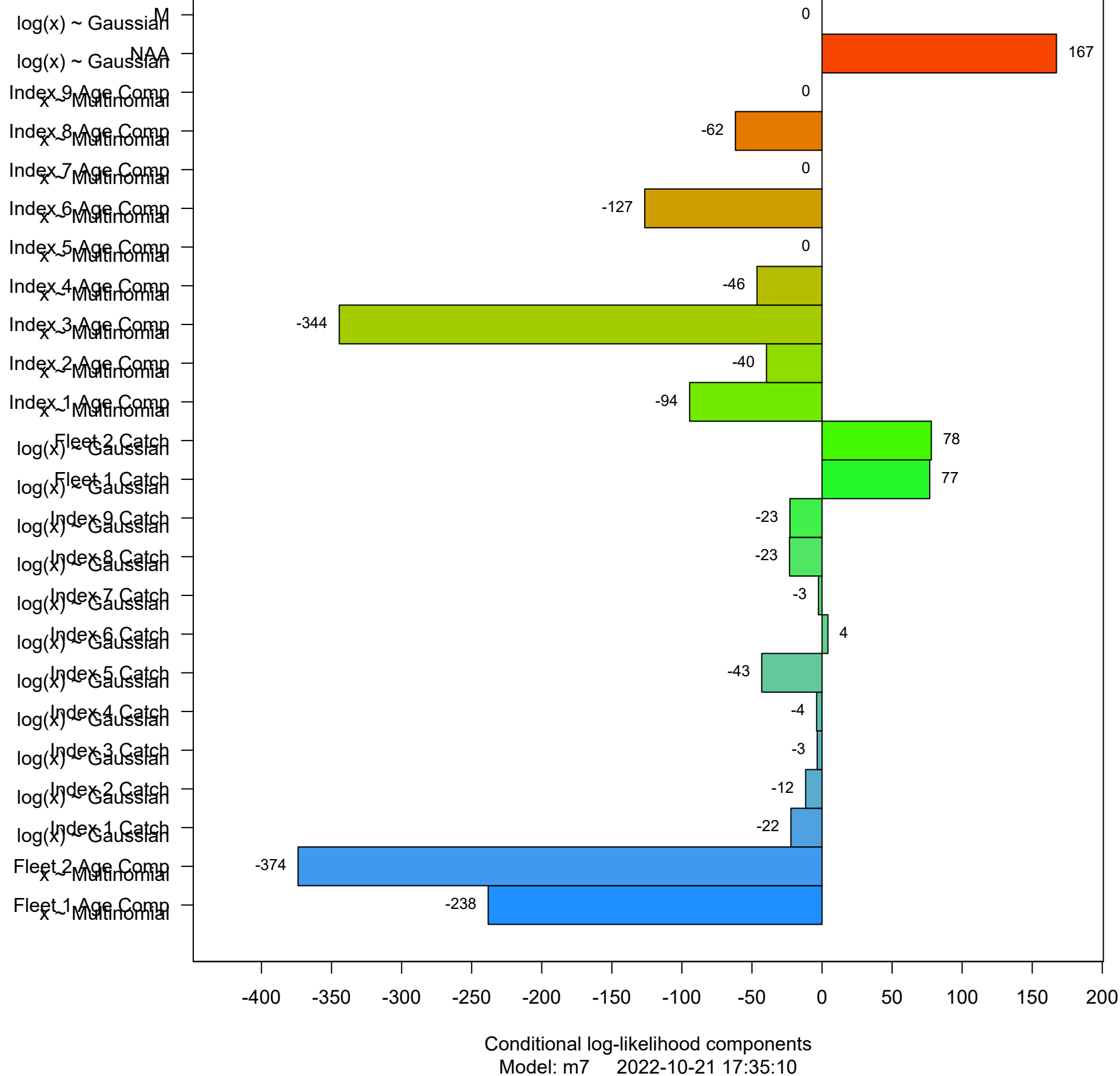
Index 1 Selectivity Blocks: 6

Index 2 Selectivity Blocks: 7

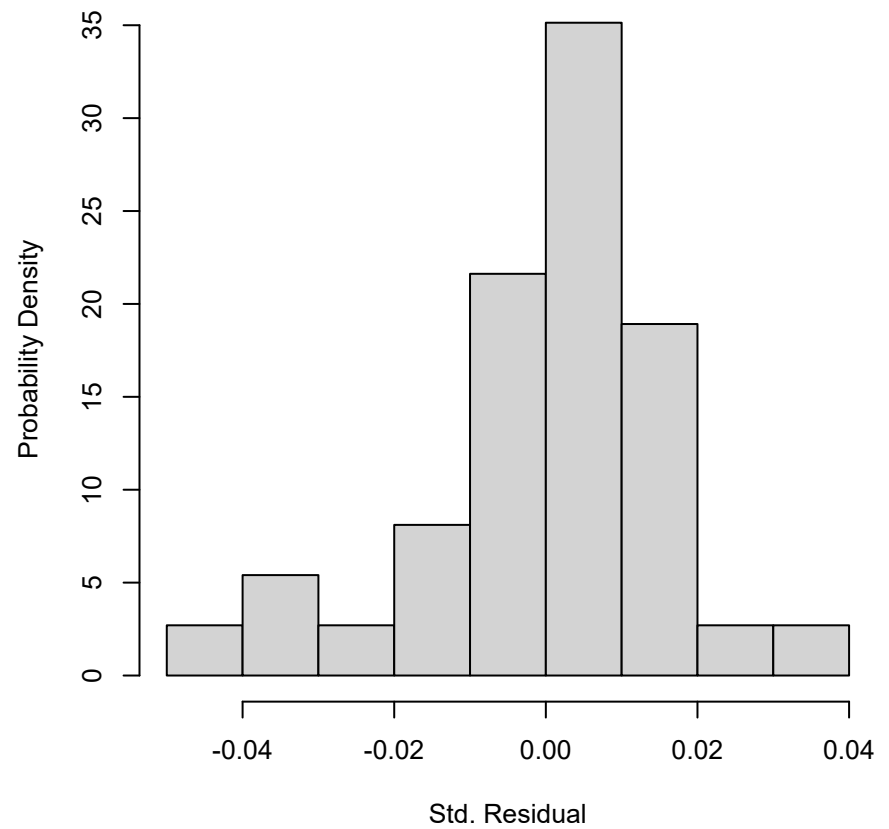
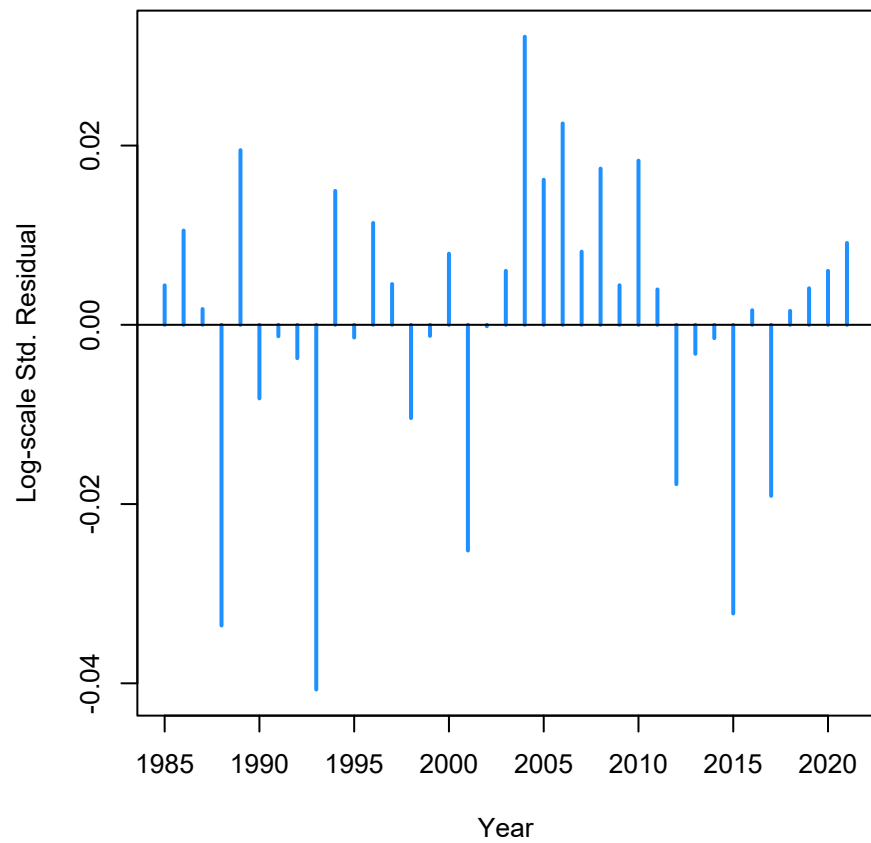
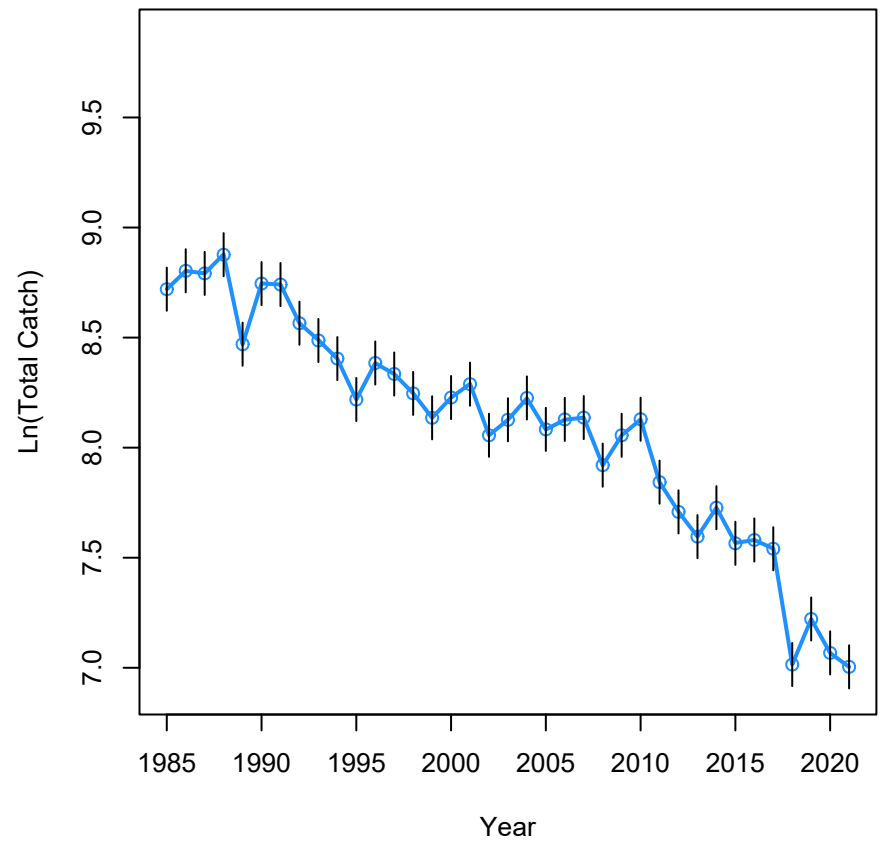
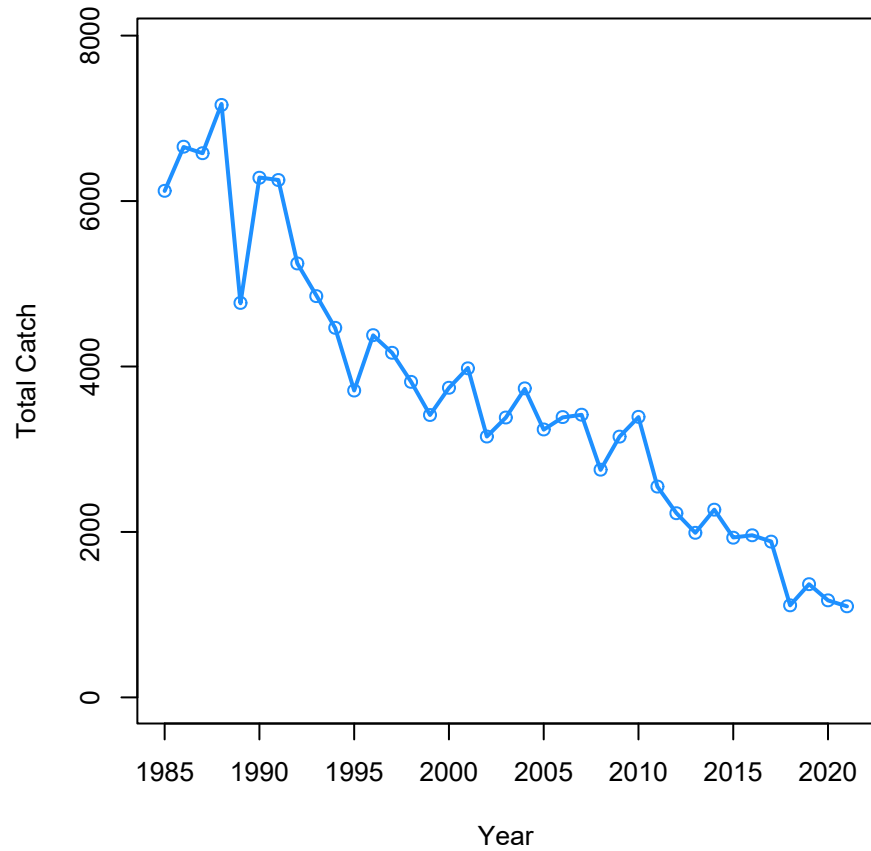
Index 3 Selectivity Blocks: 8

Index 4 Selectivity Blocks: 9

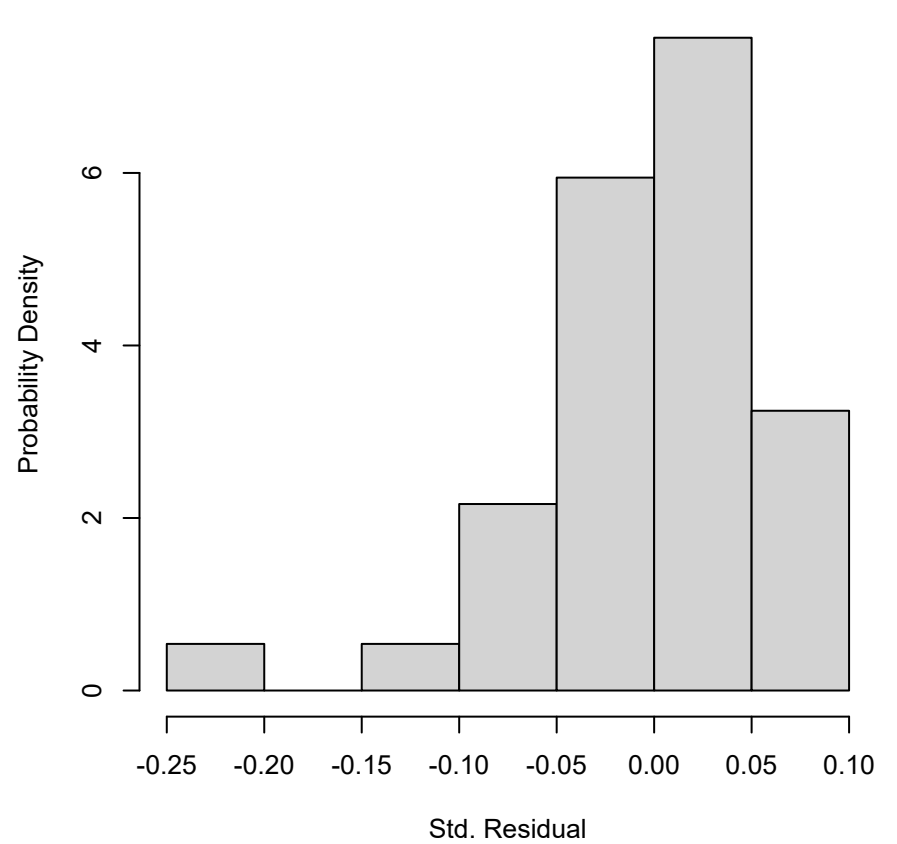
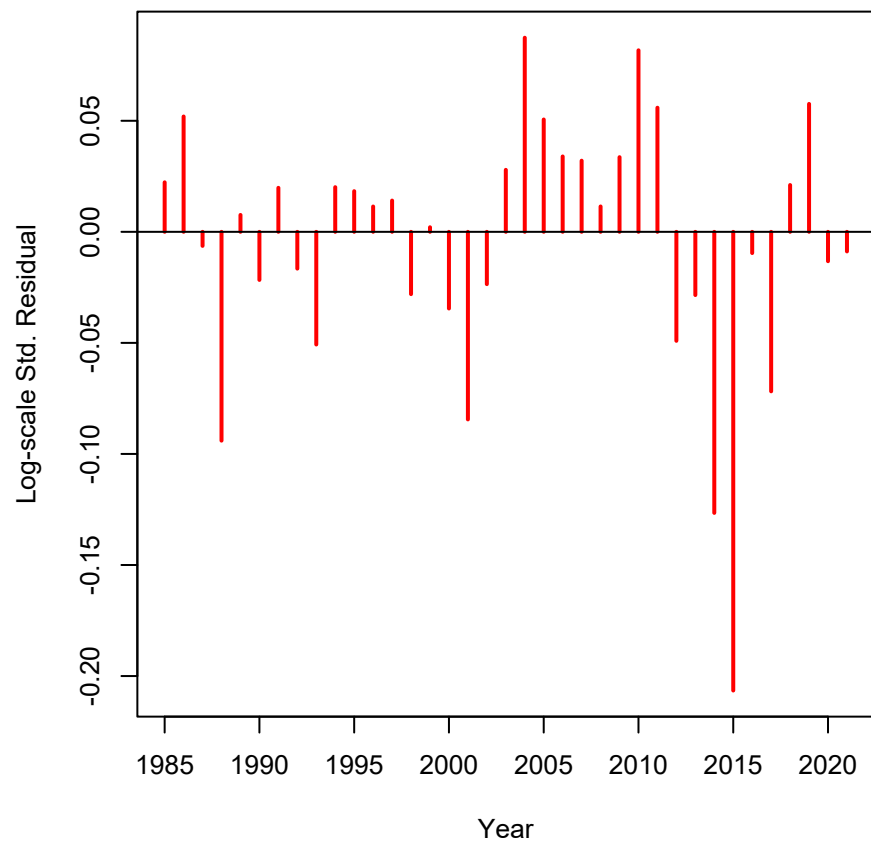
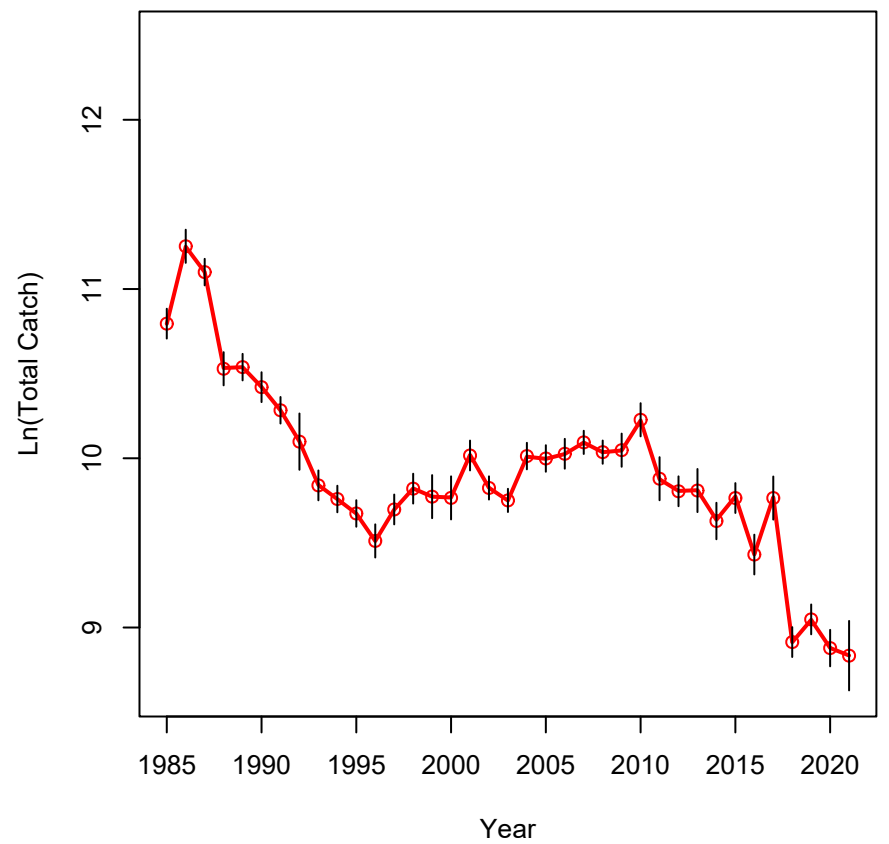
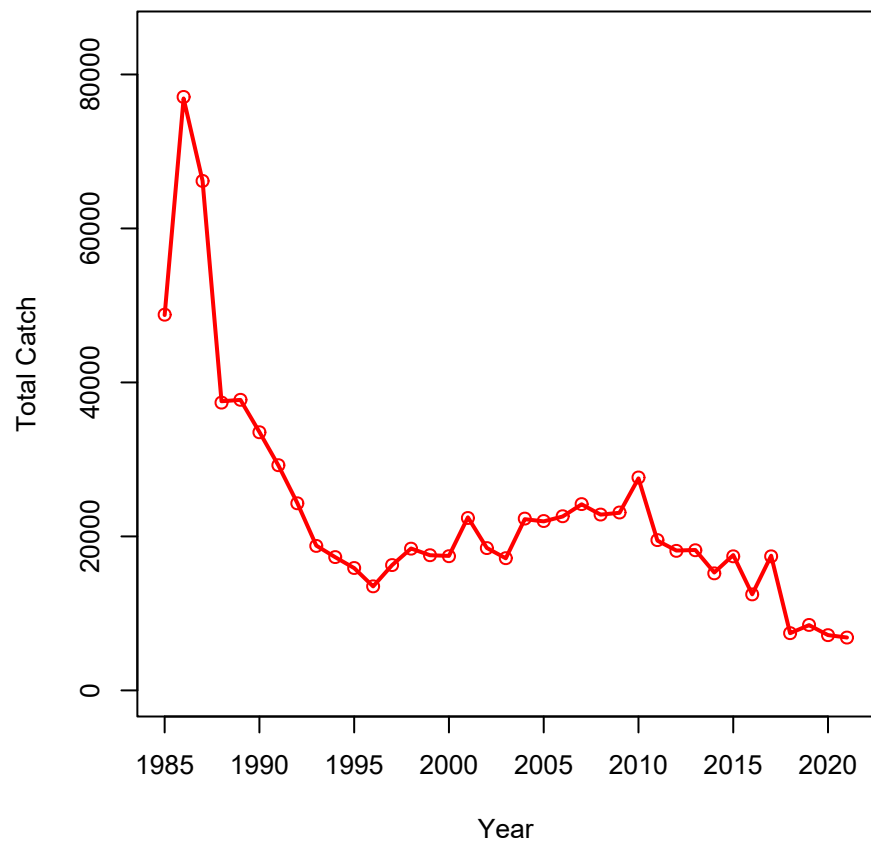
Index 5 Selectivity Blocks: 10



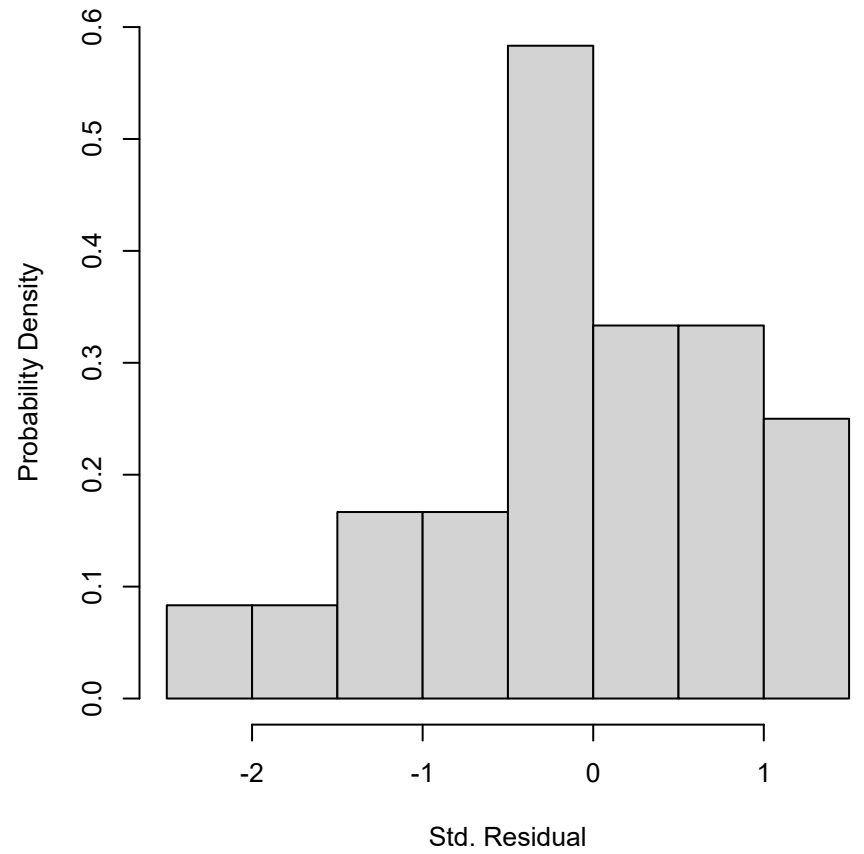
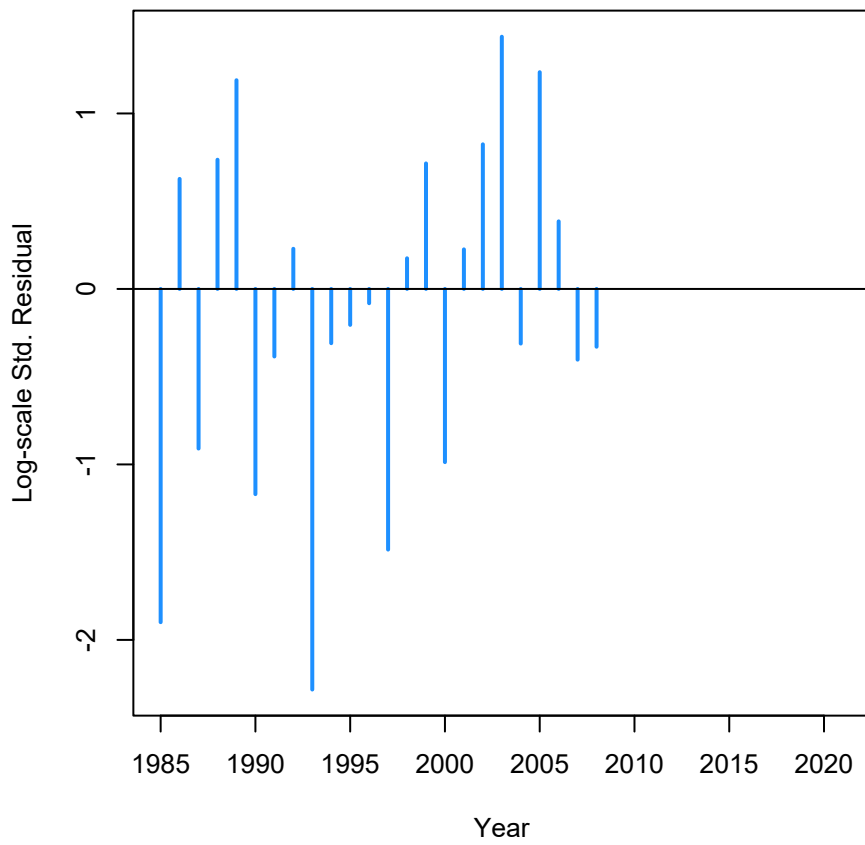
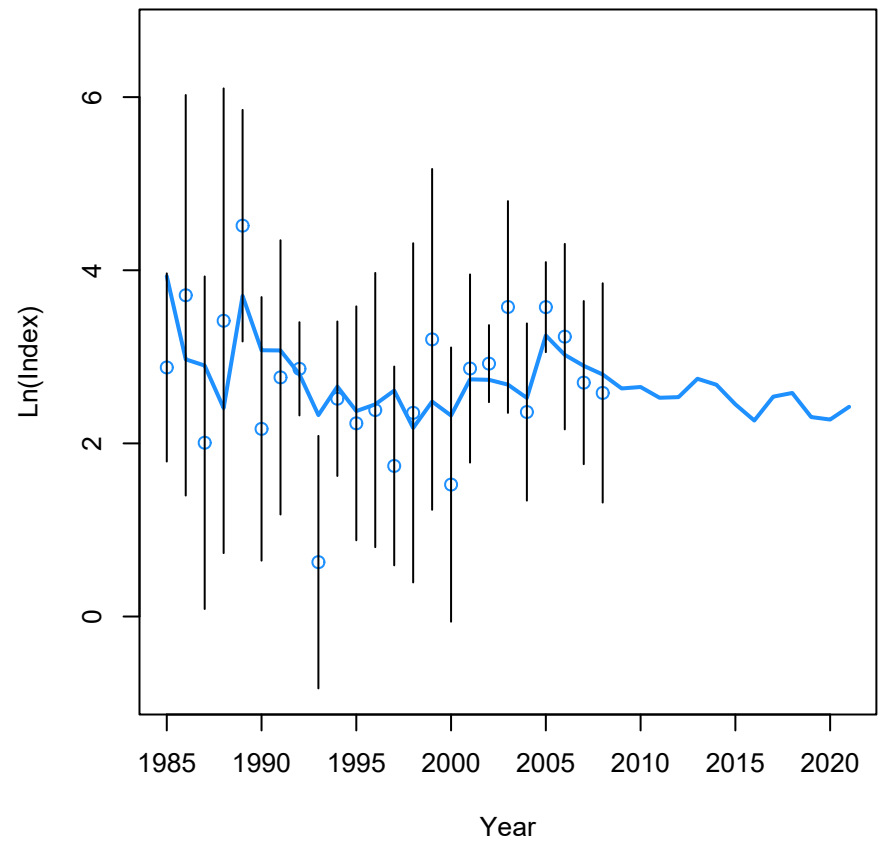
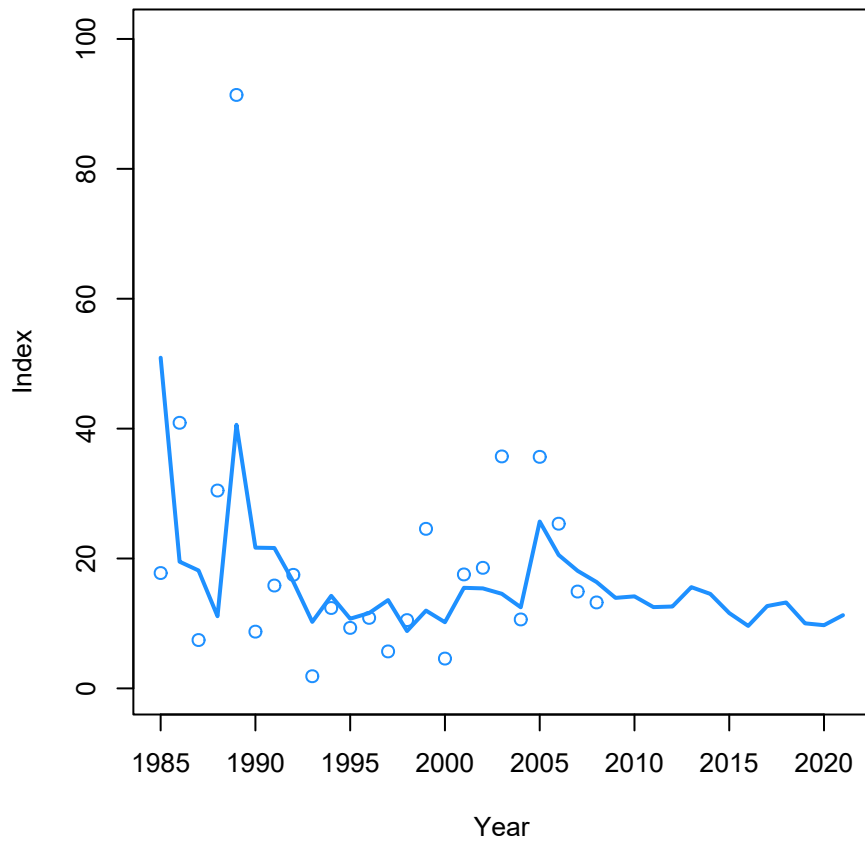
Fleet 1 Catch



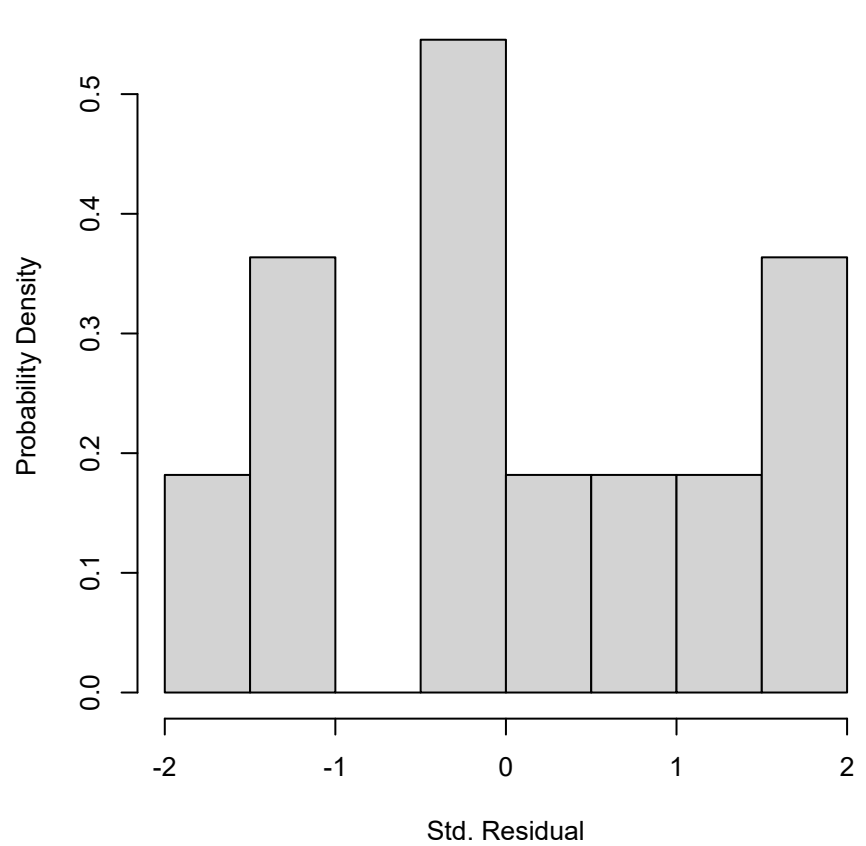
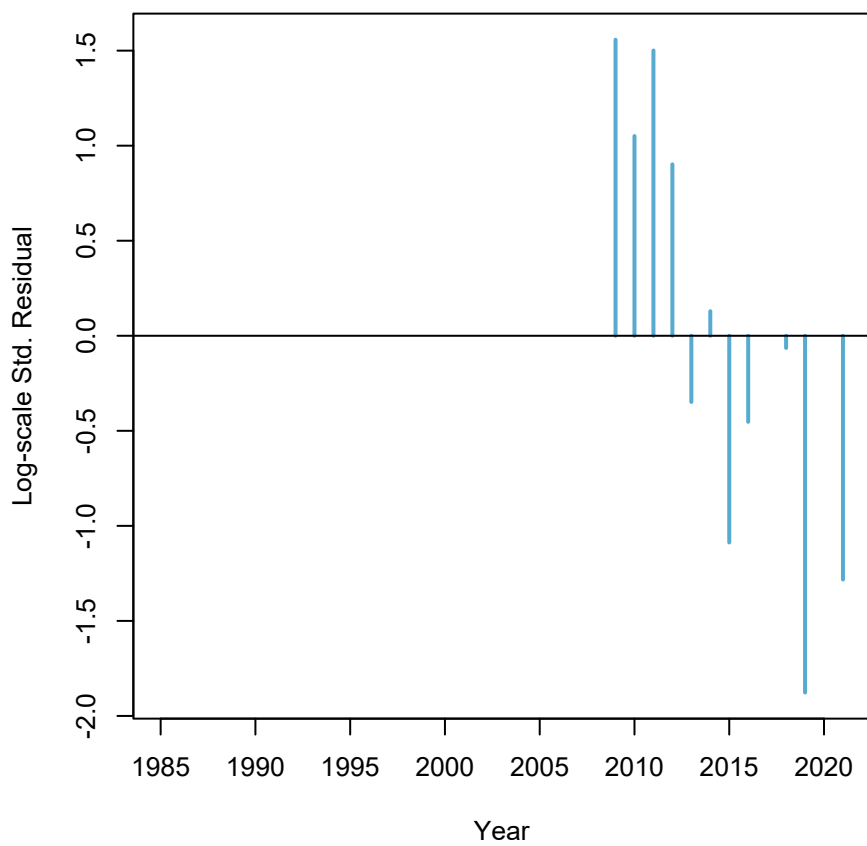
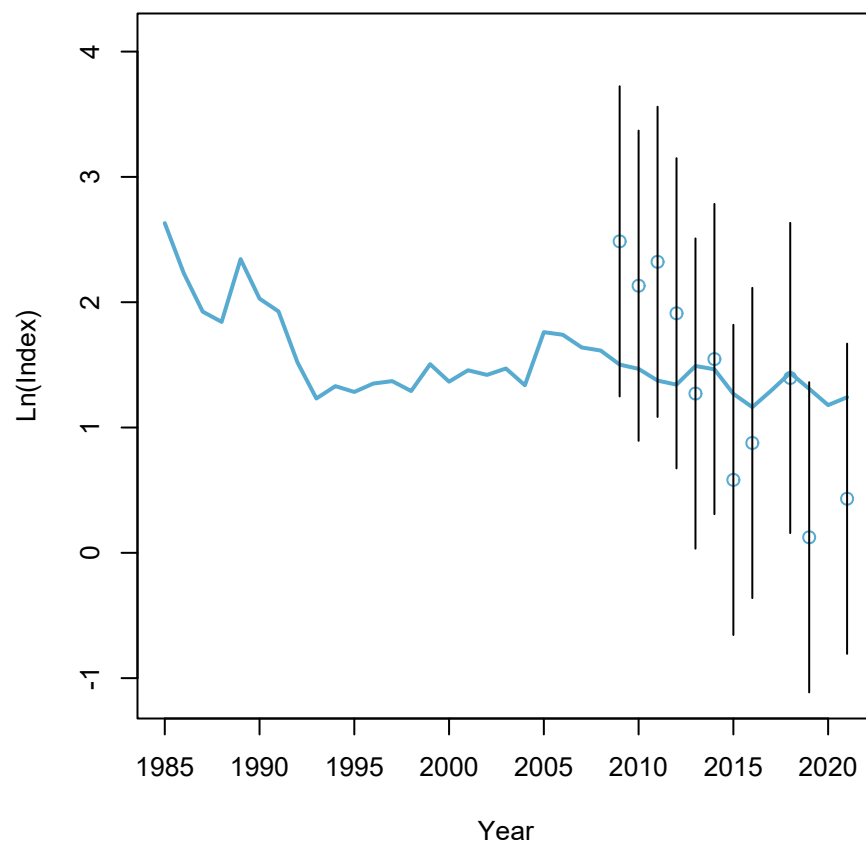
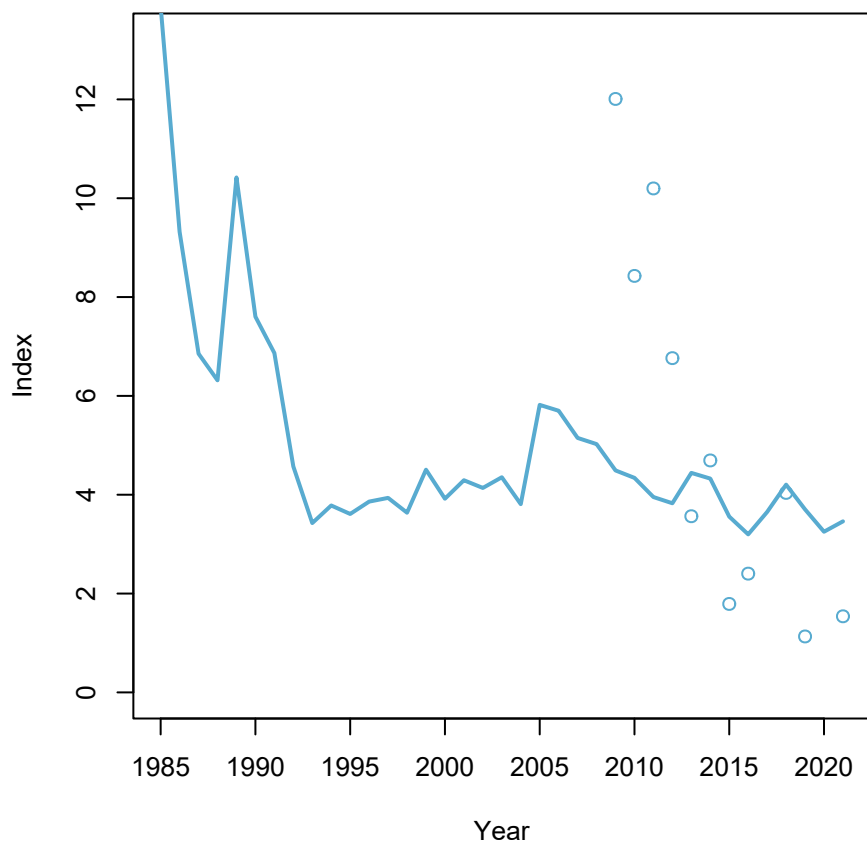
Fleet 2 Catch



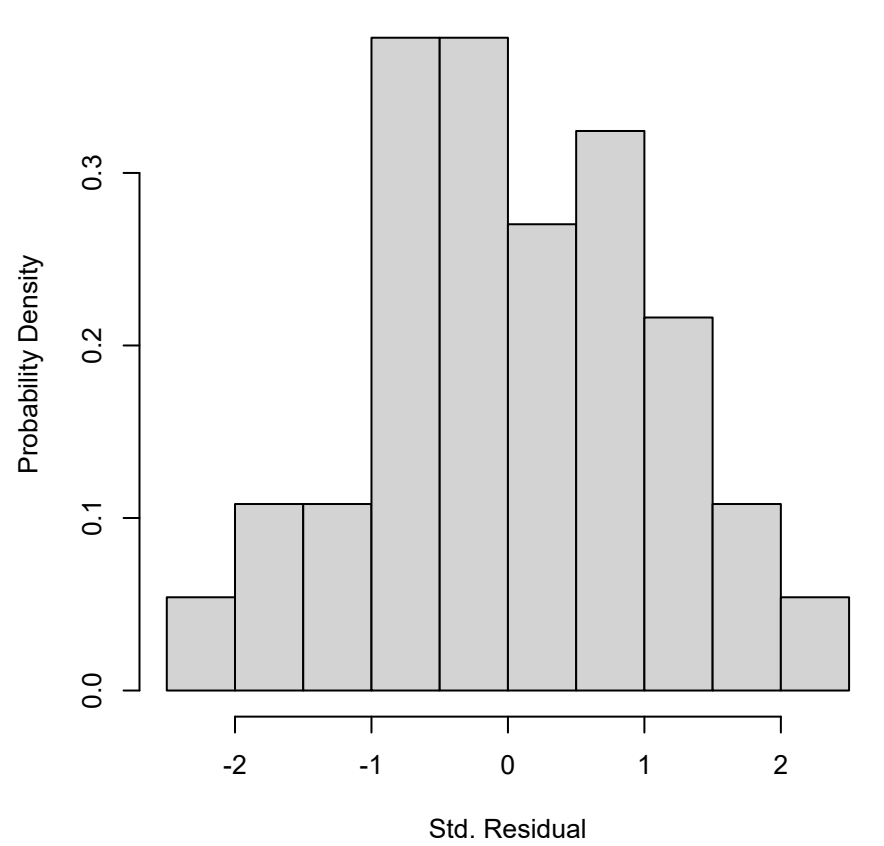
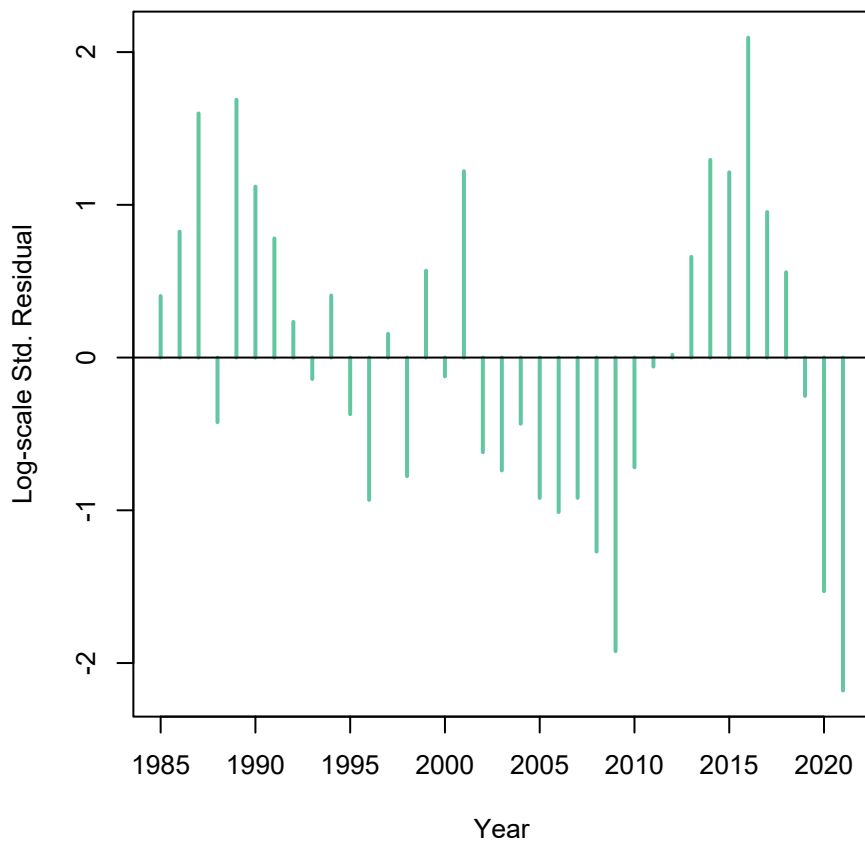
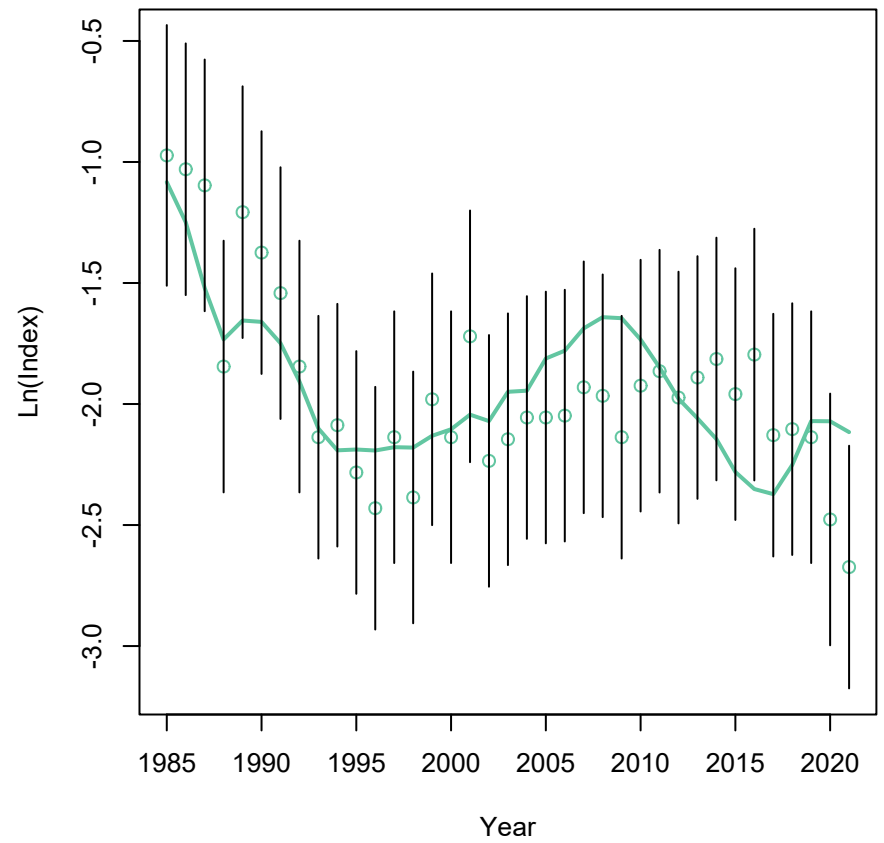
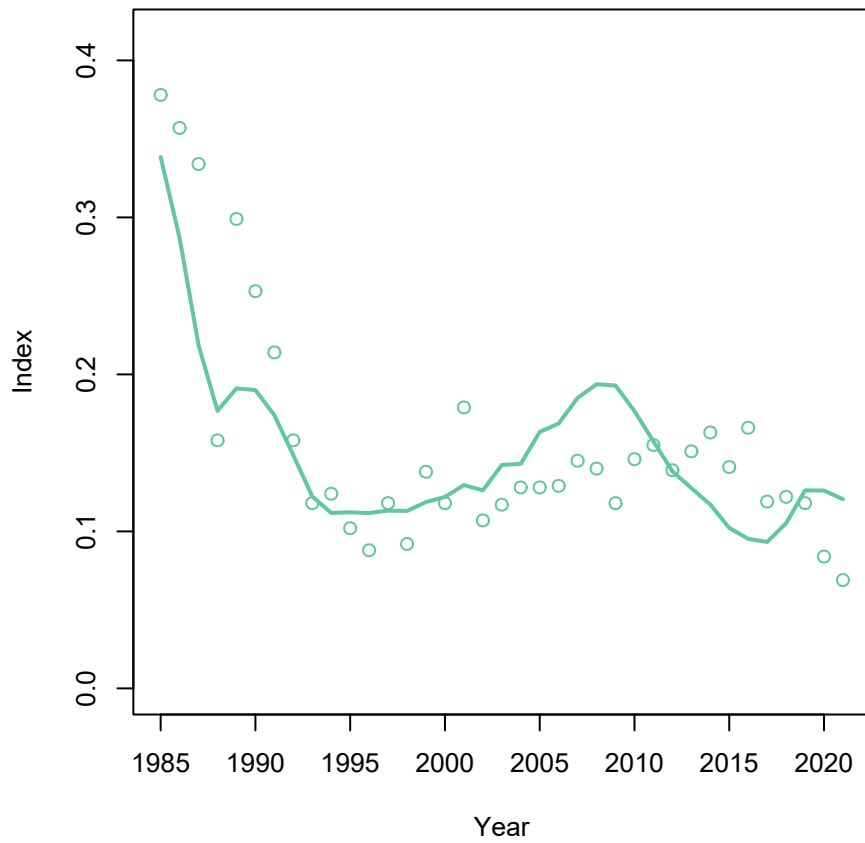
Index 1



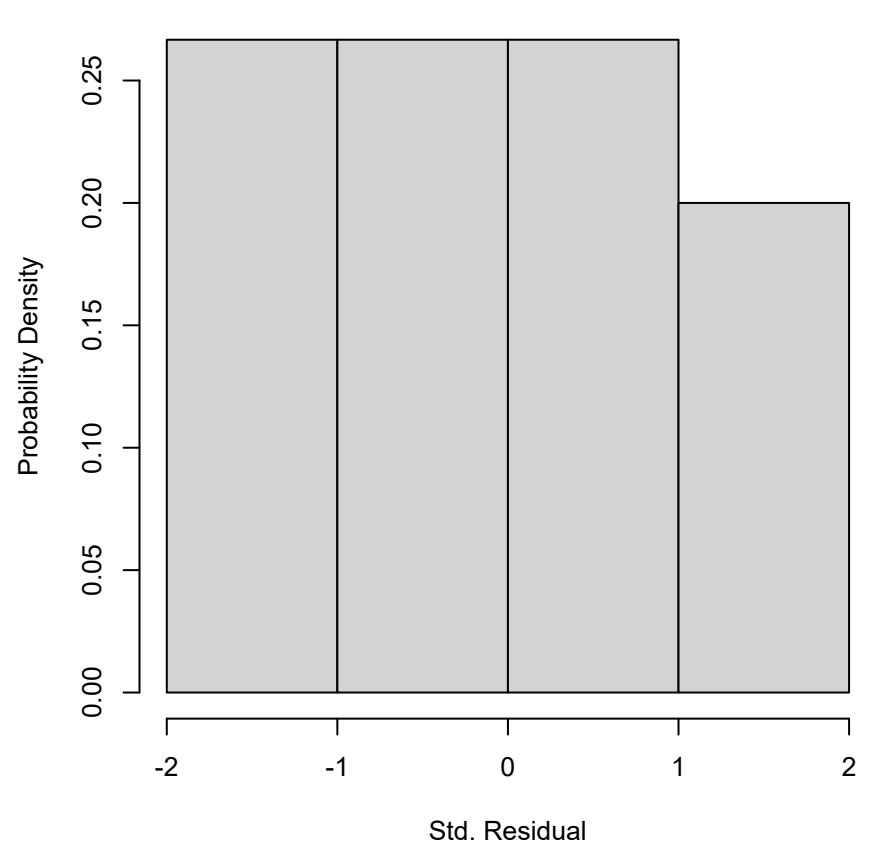
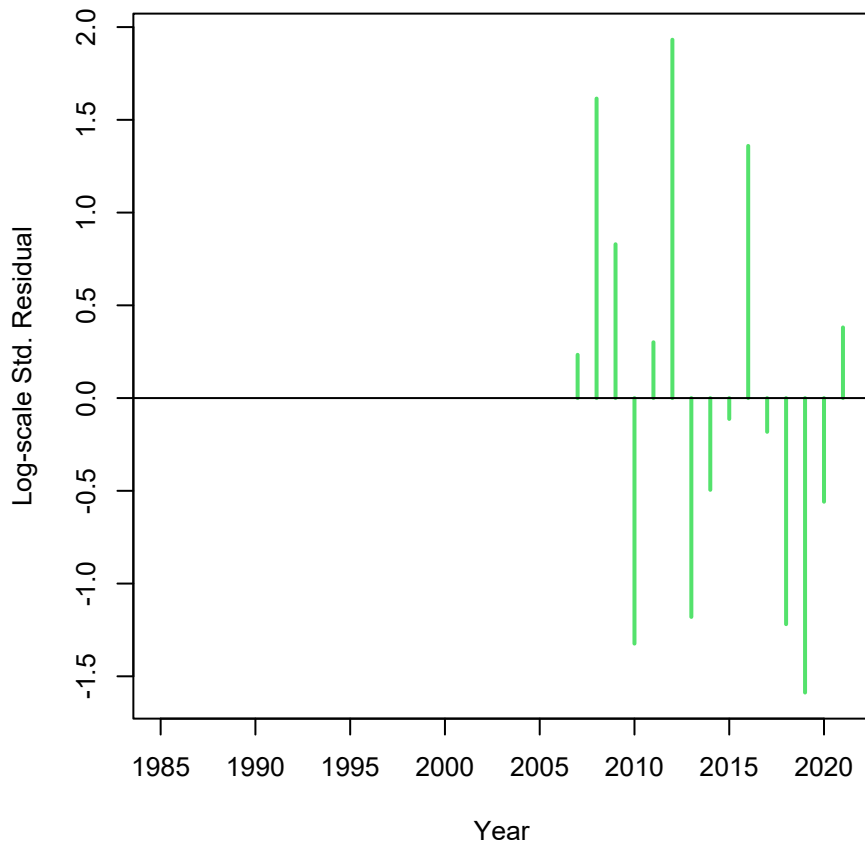
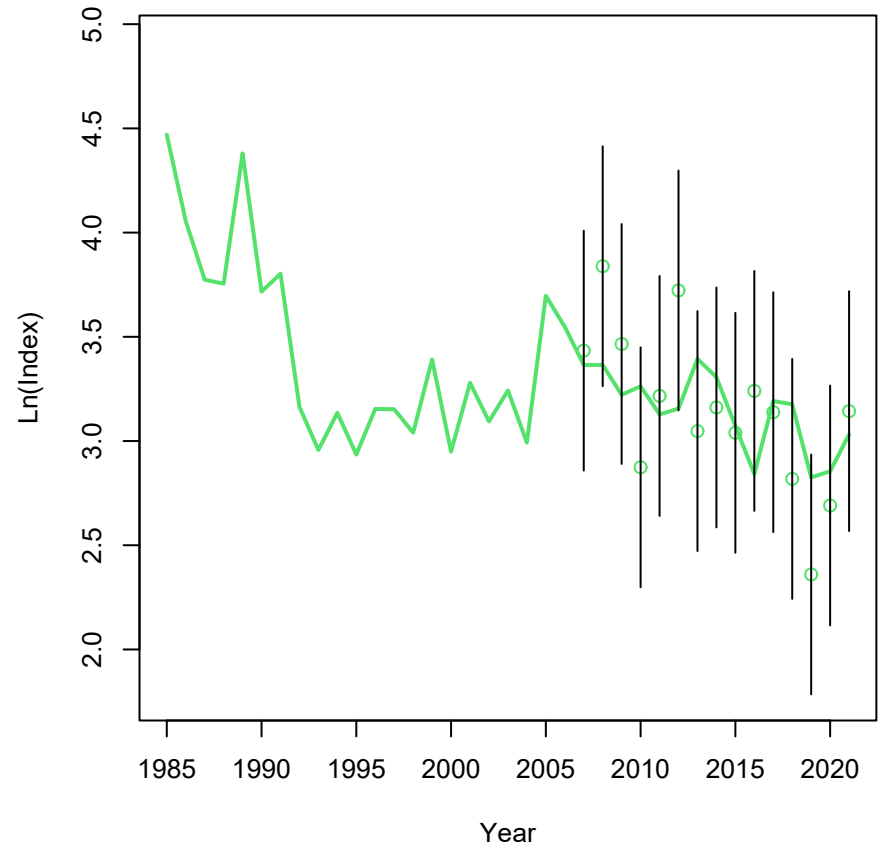
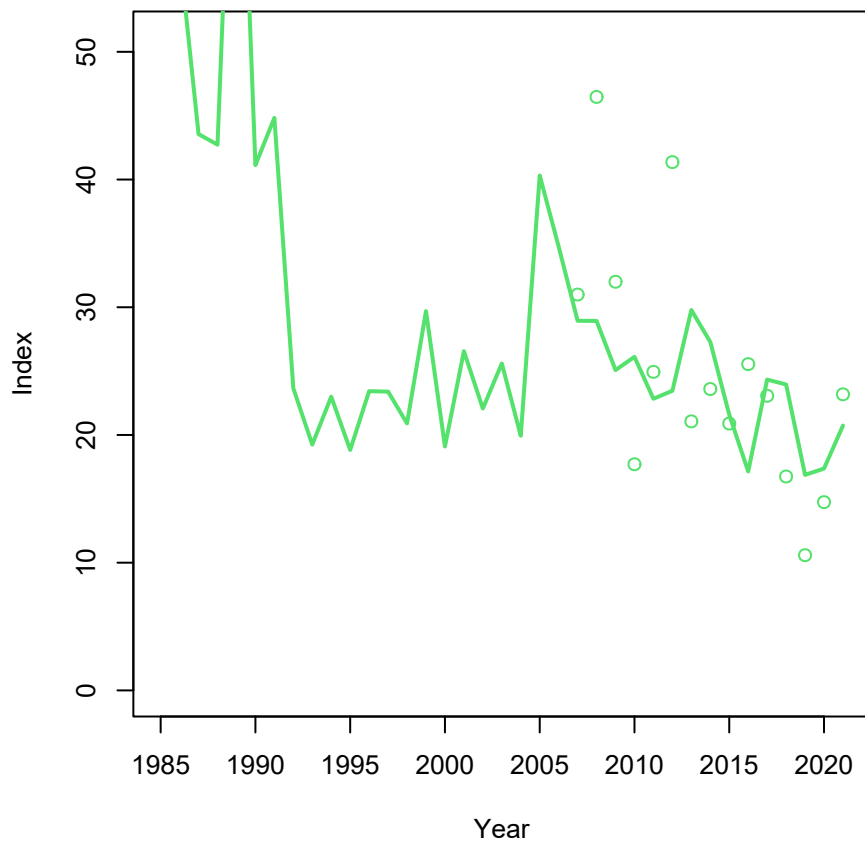
Index 2



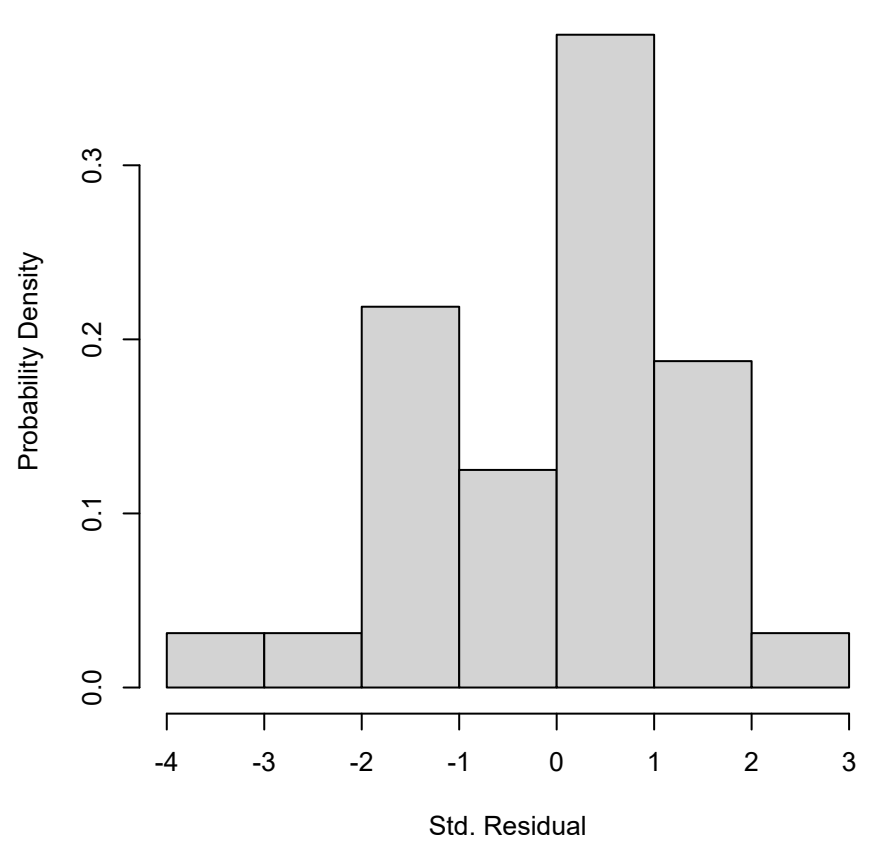
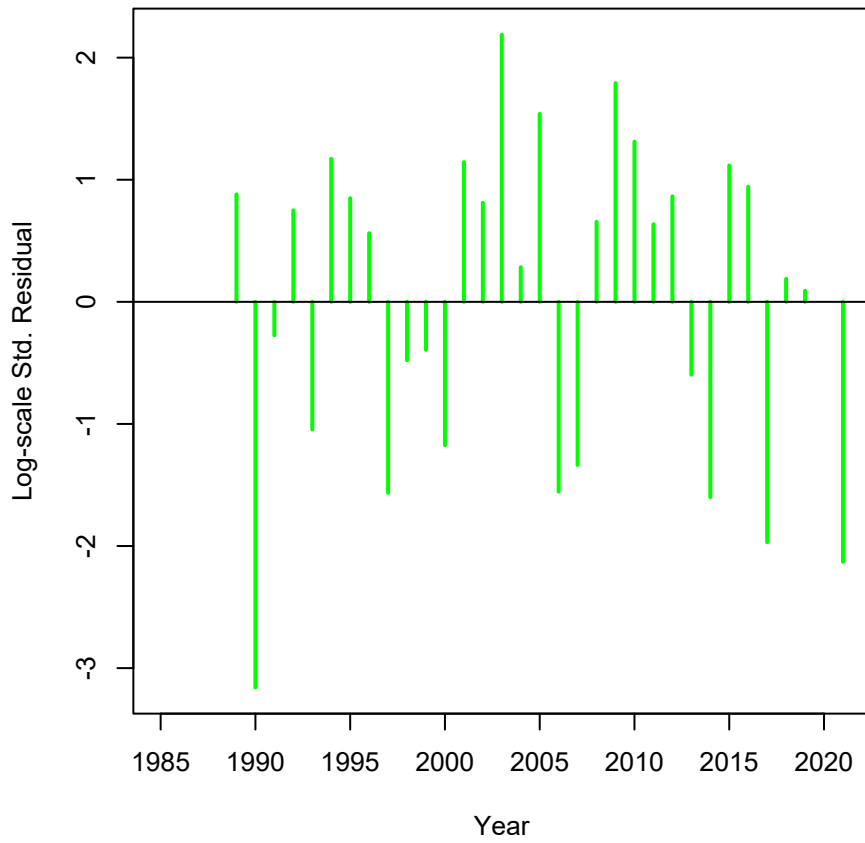
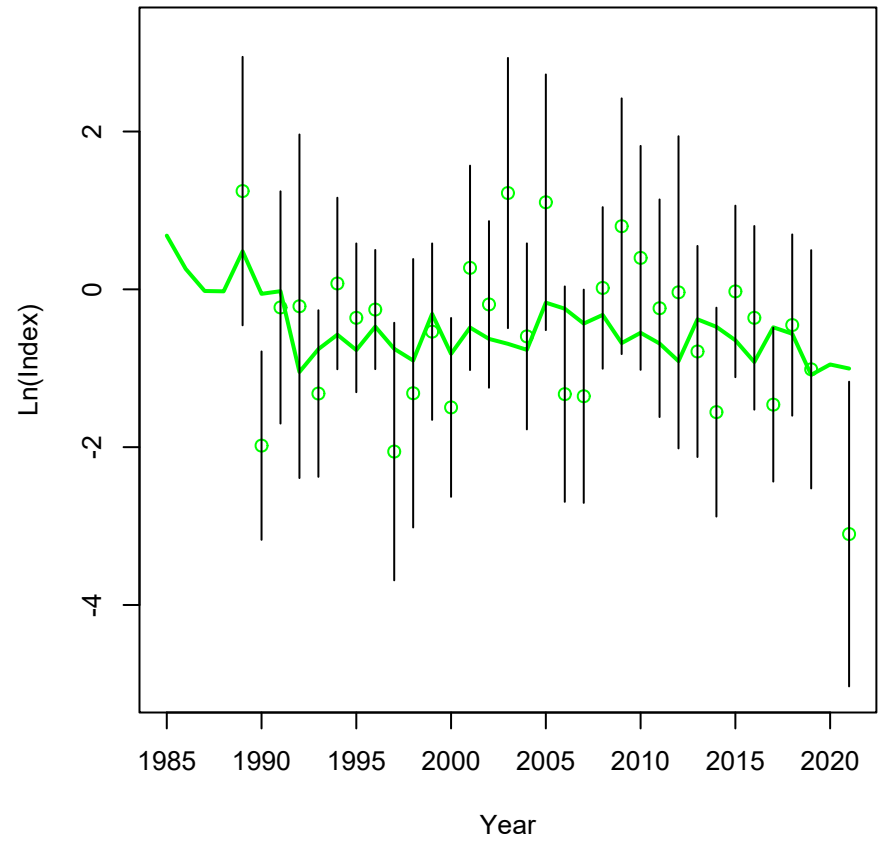
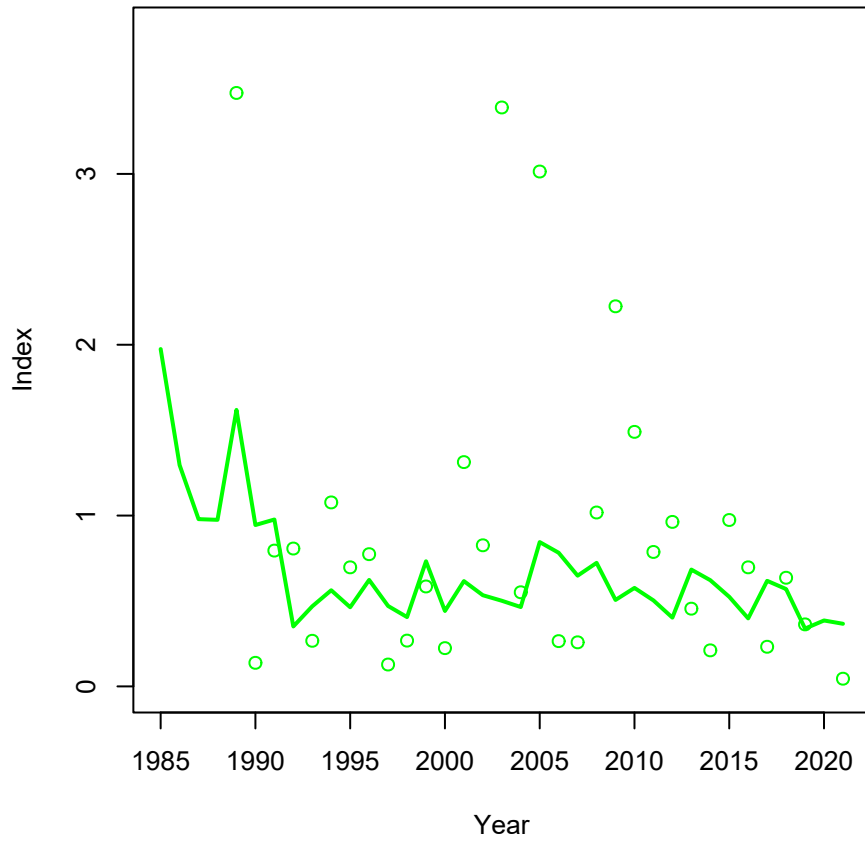
Index 3



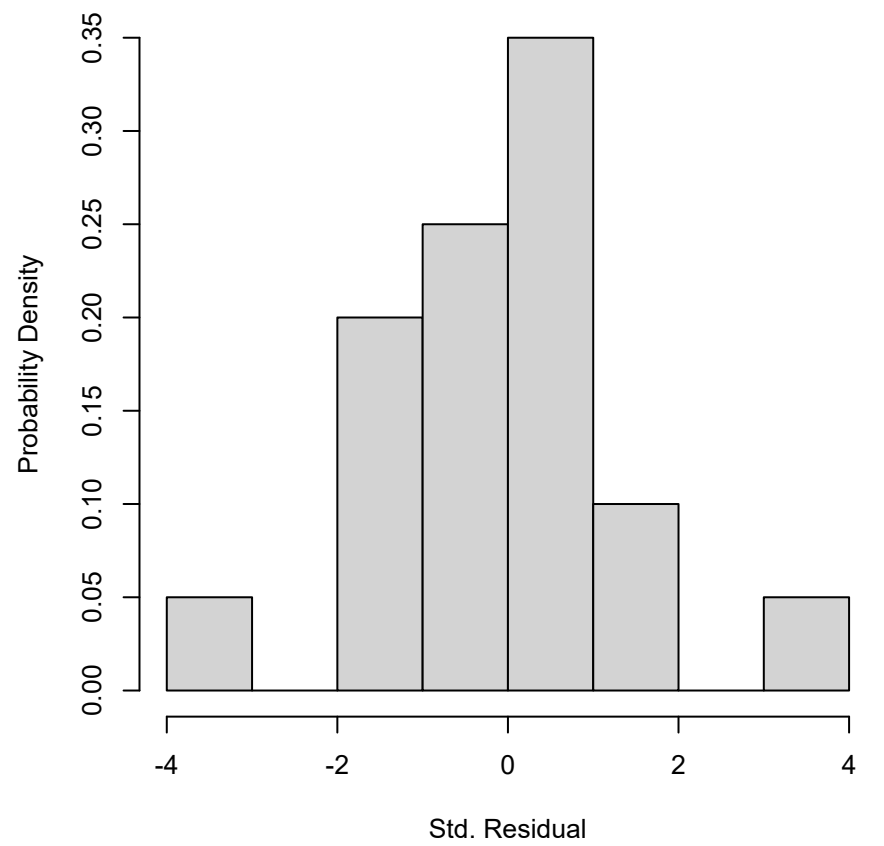
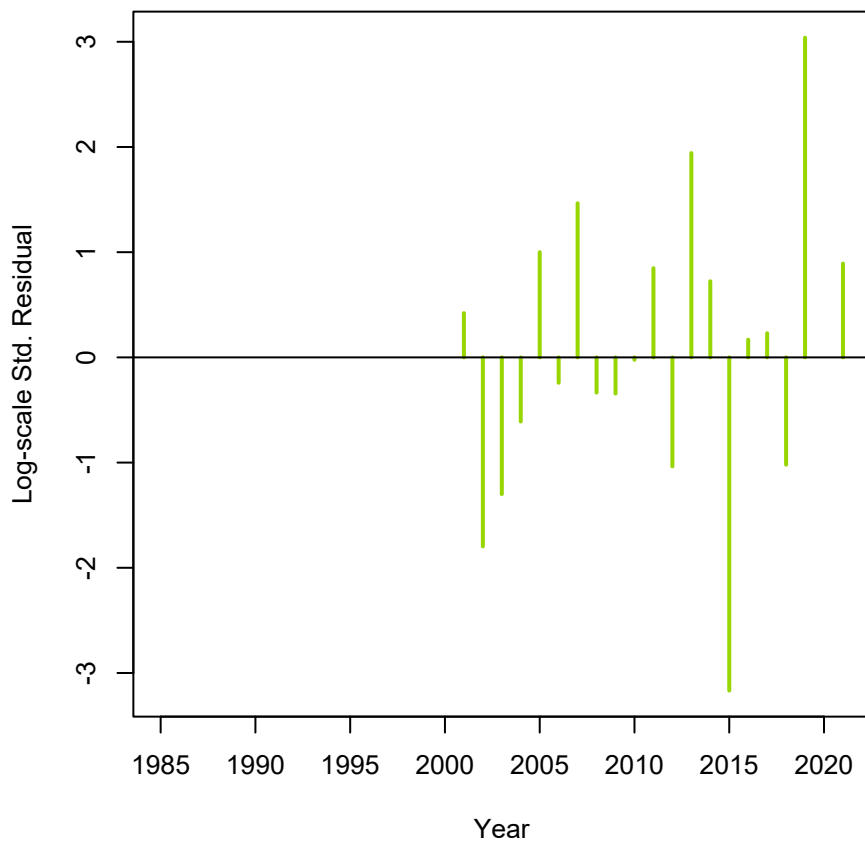
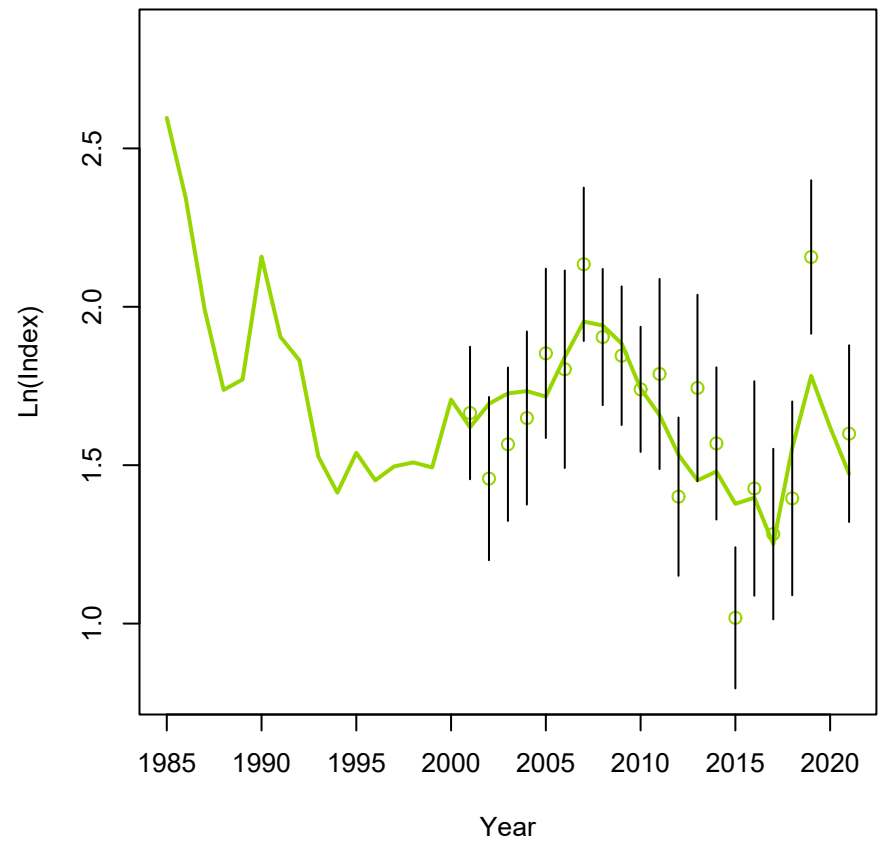
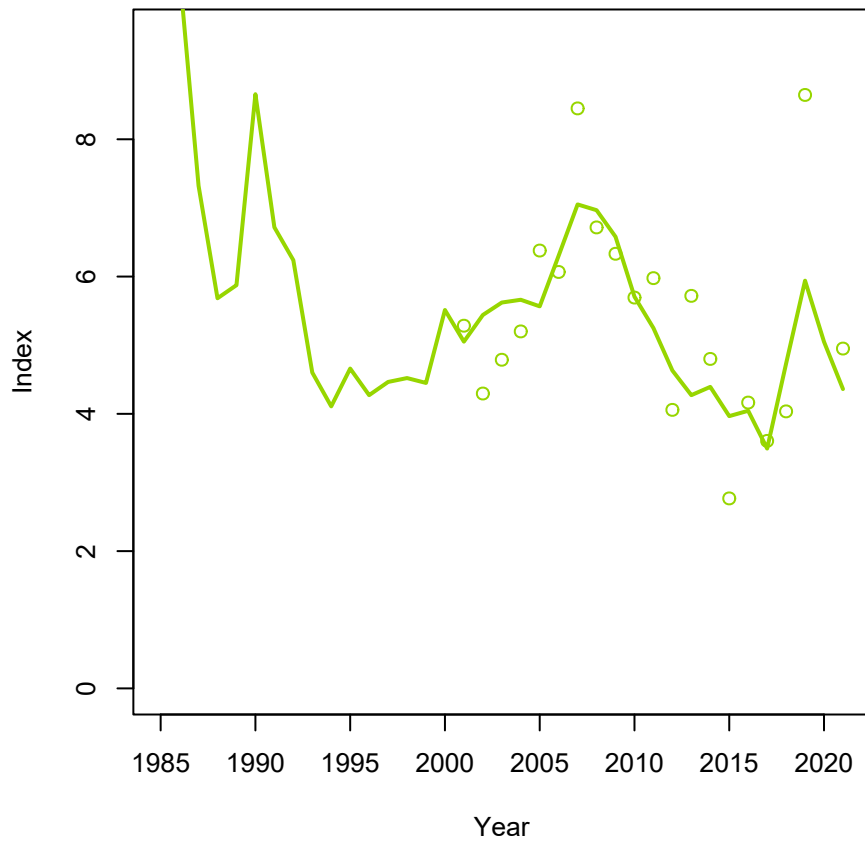
Index 4



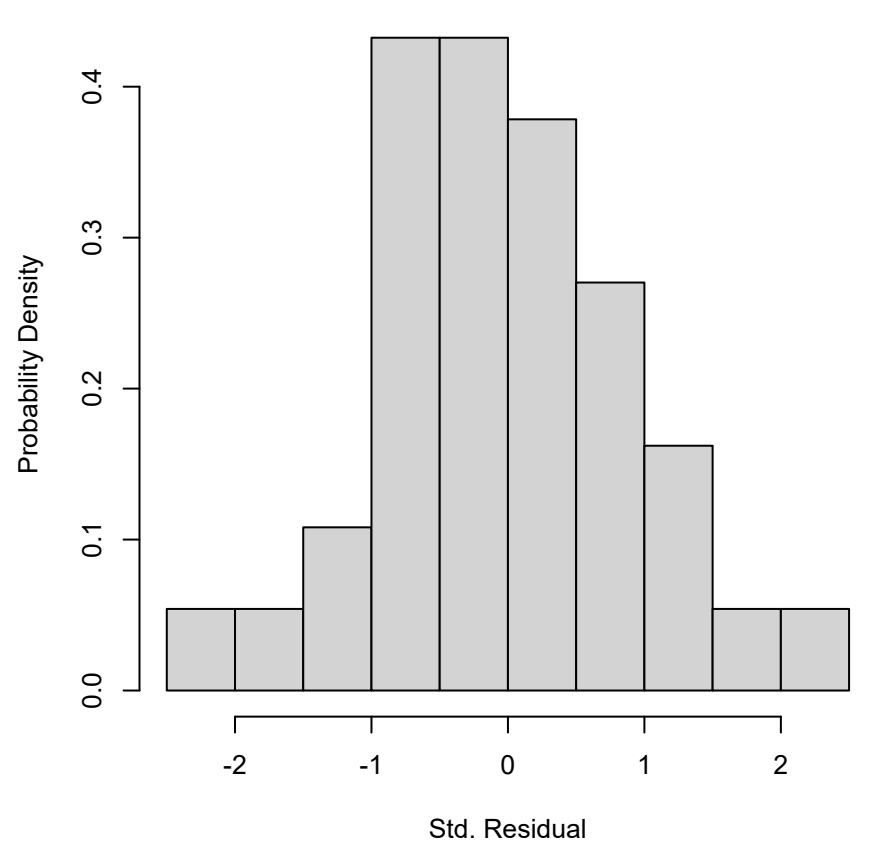
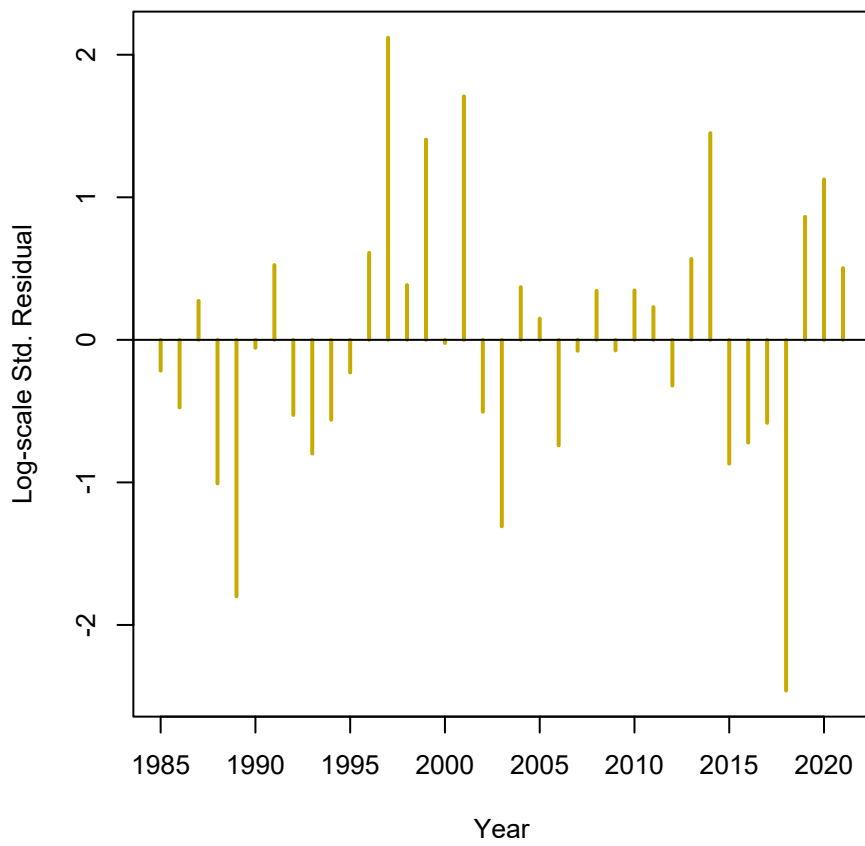
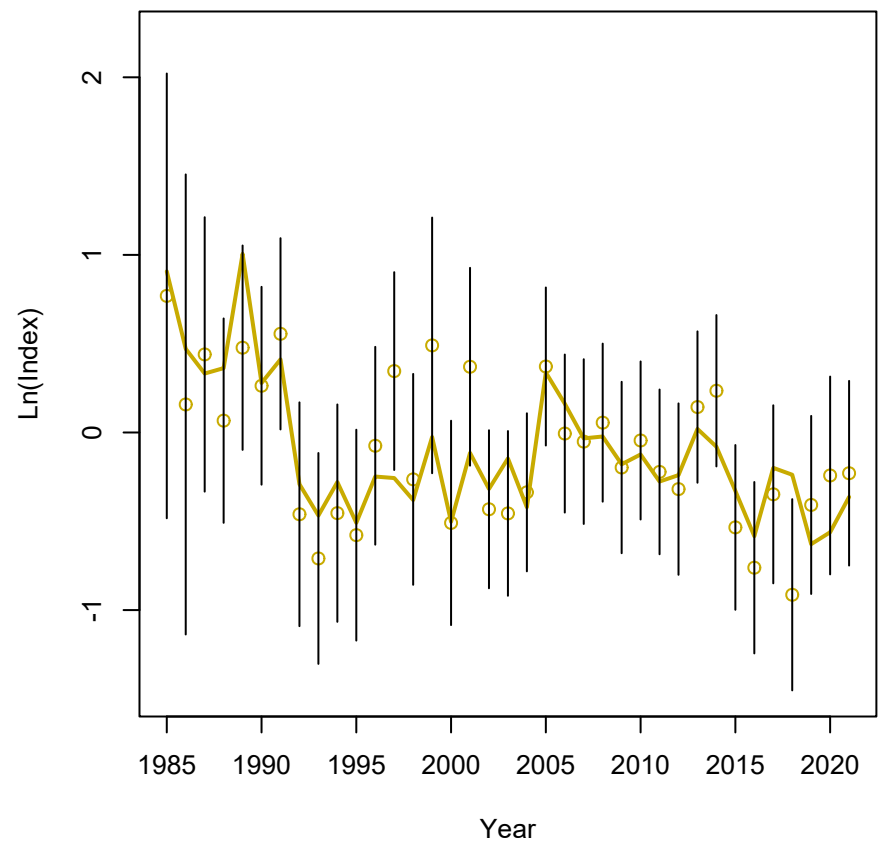
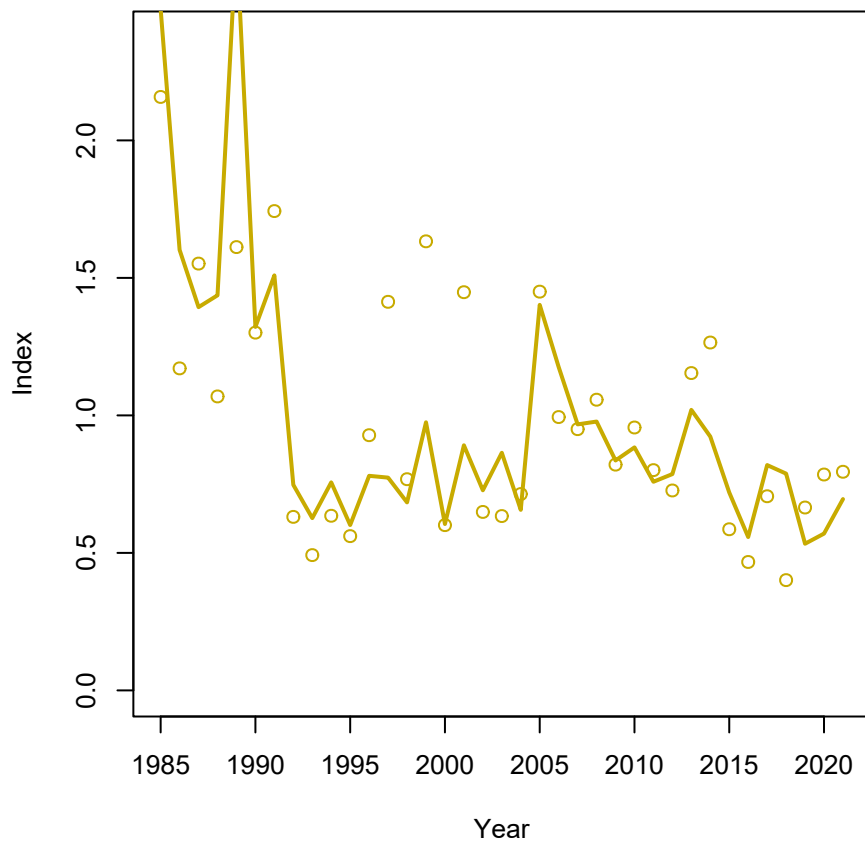
Index 5



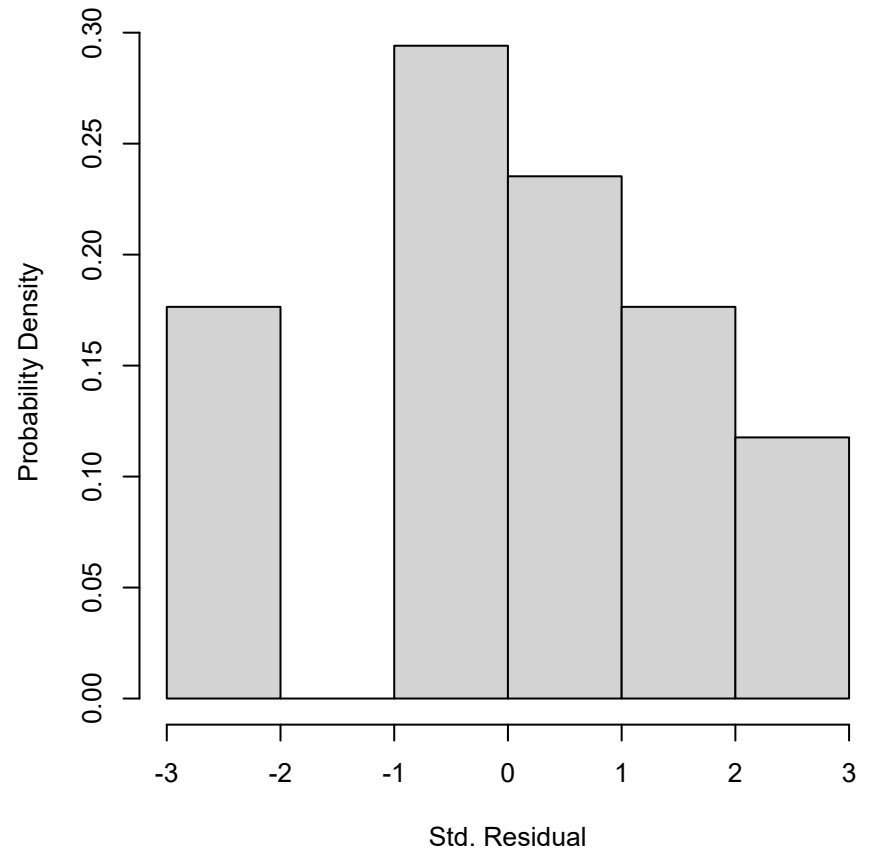
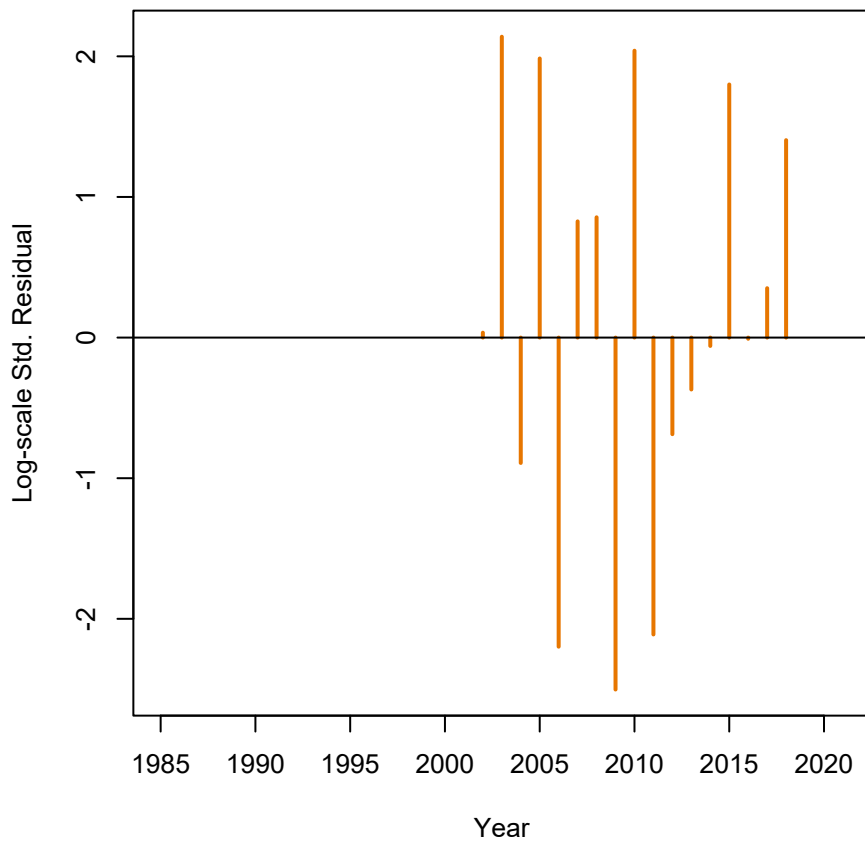
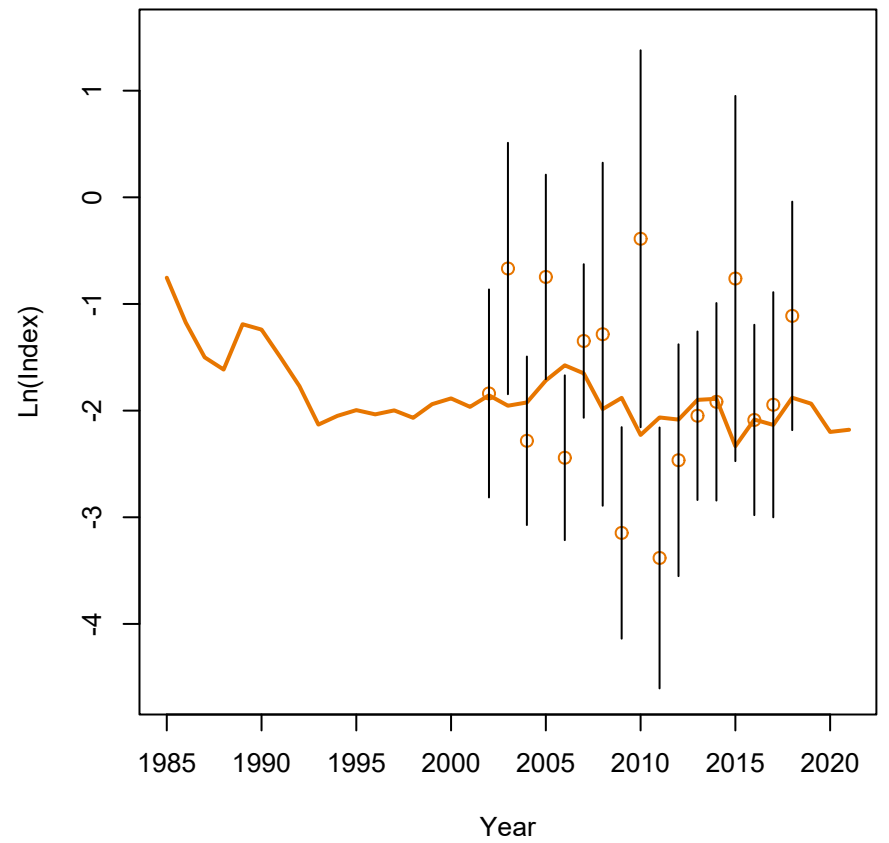
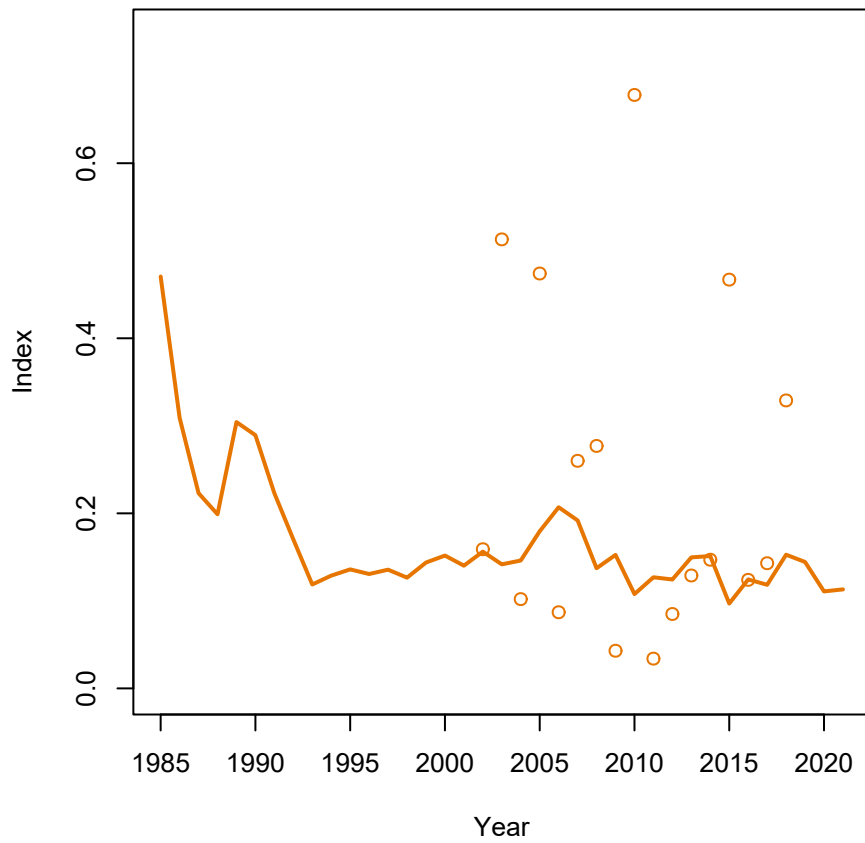
Index 6



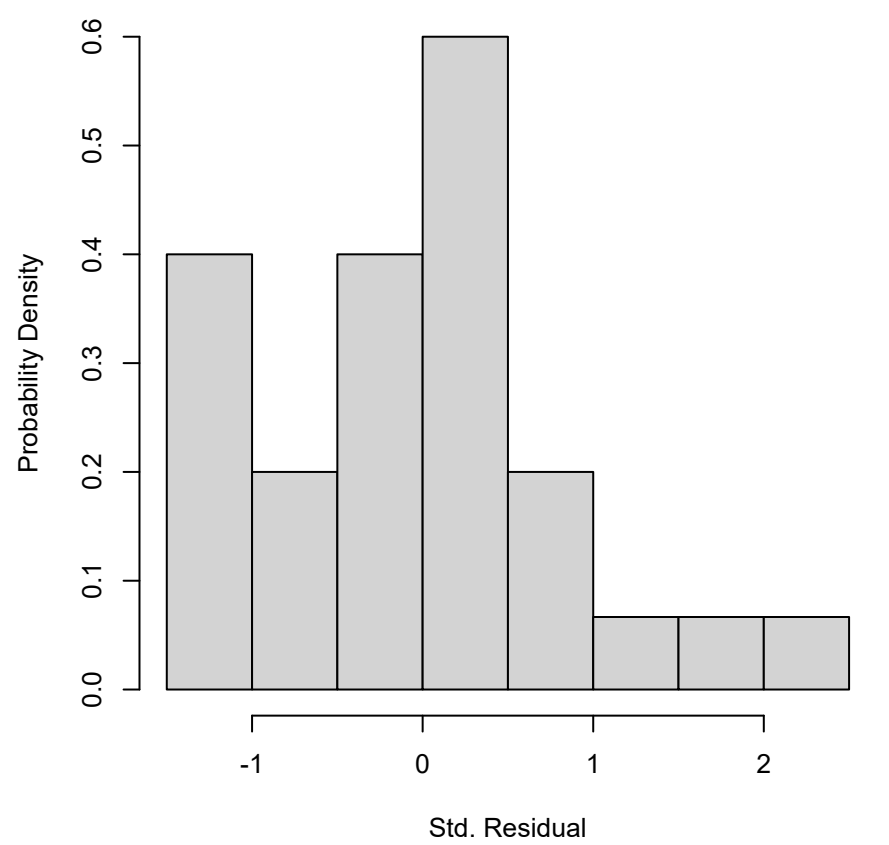
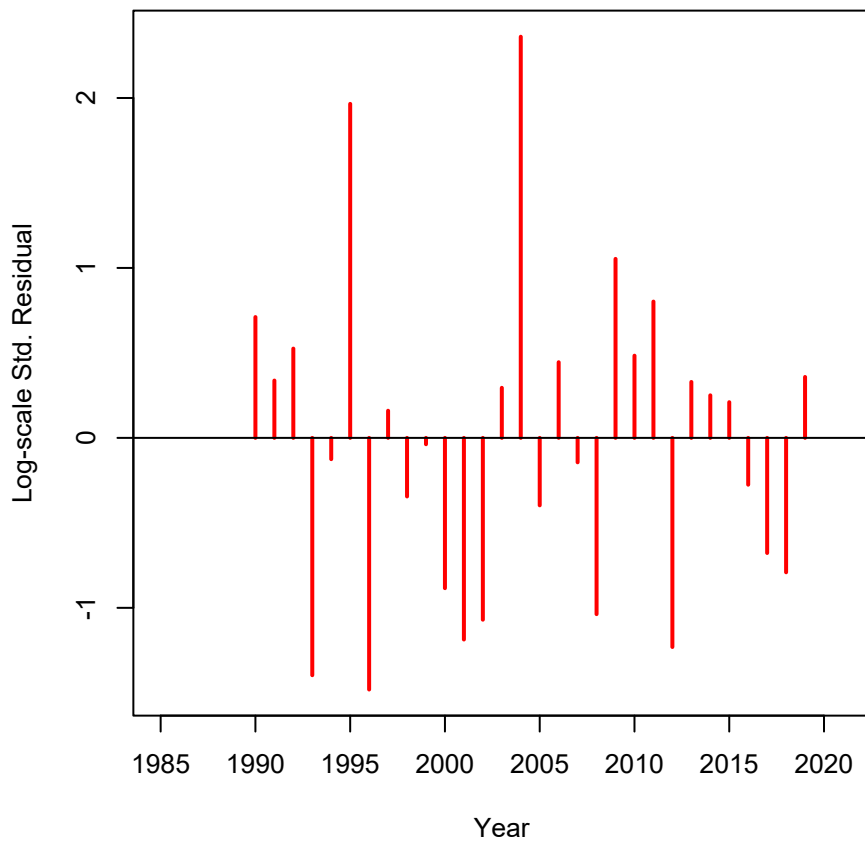
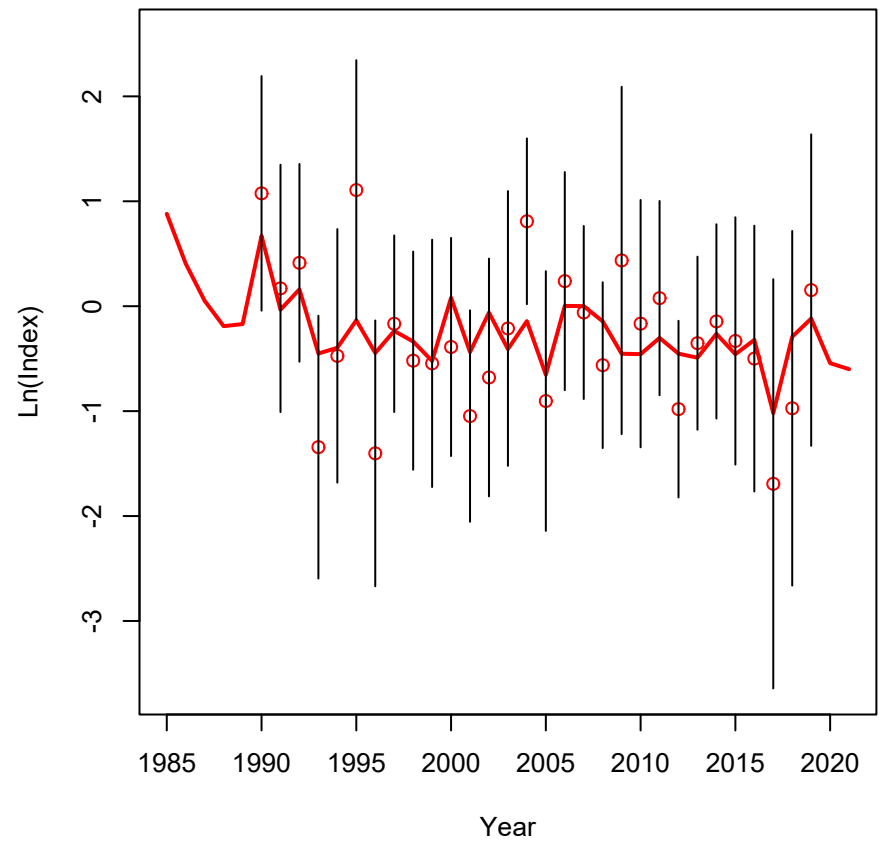
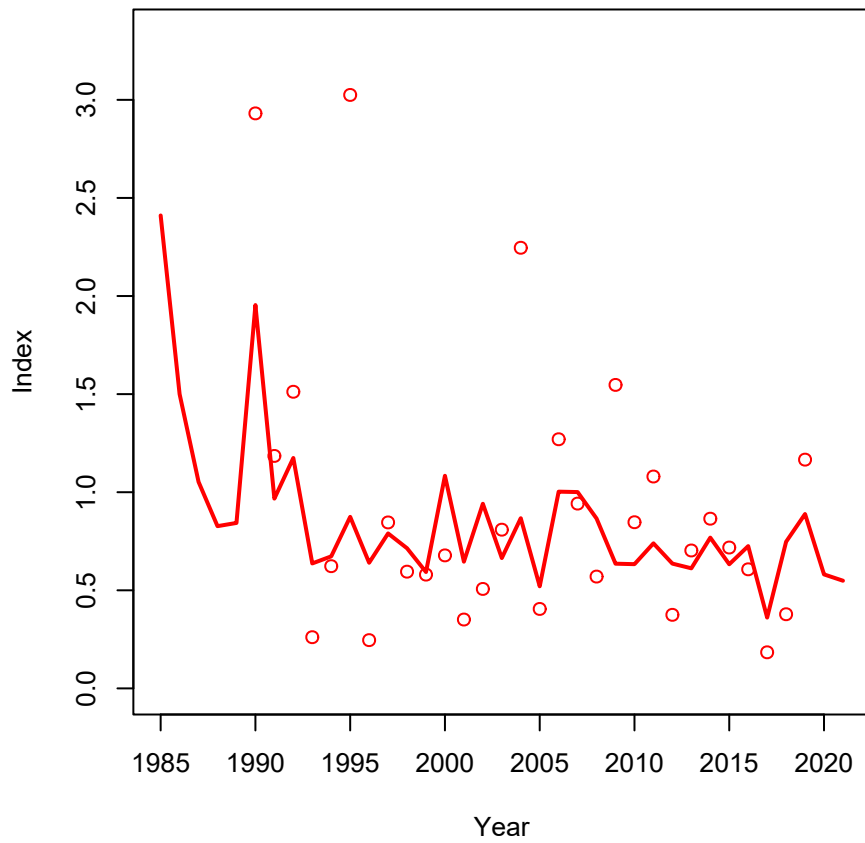
Index 7



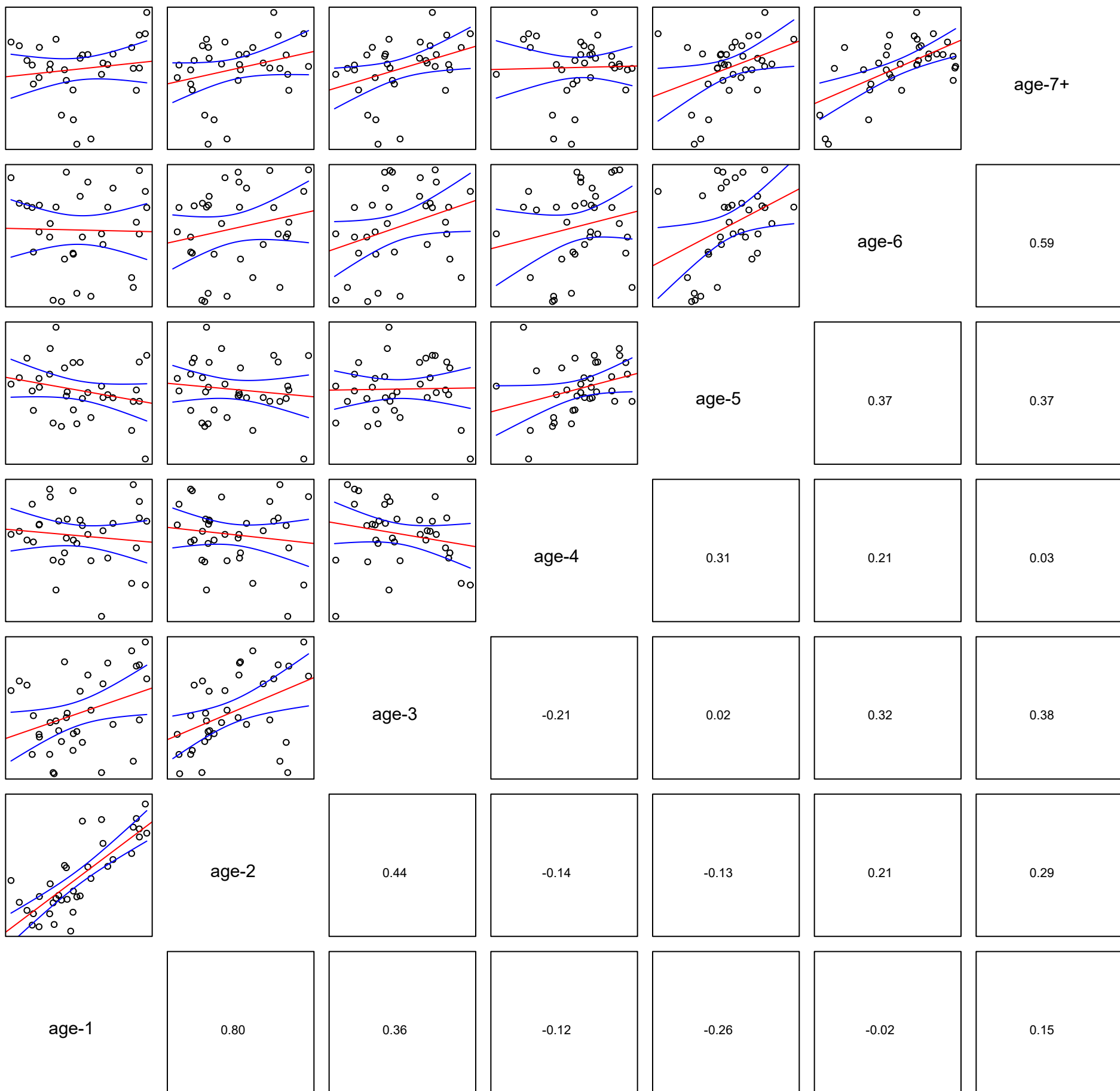
Index 8



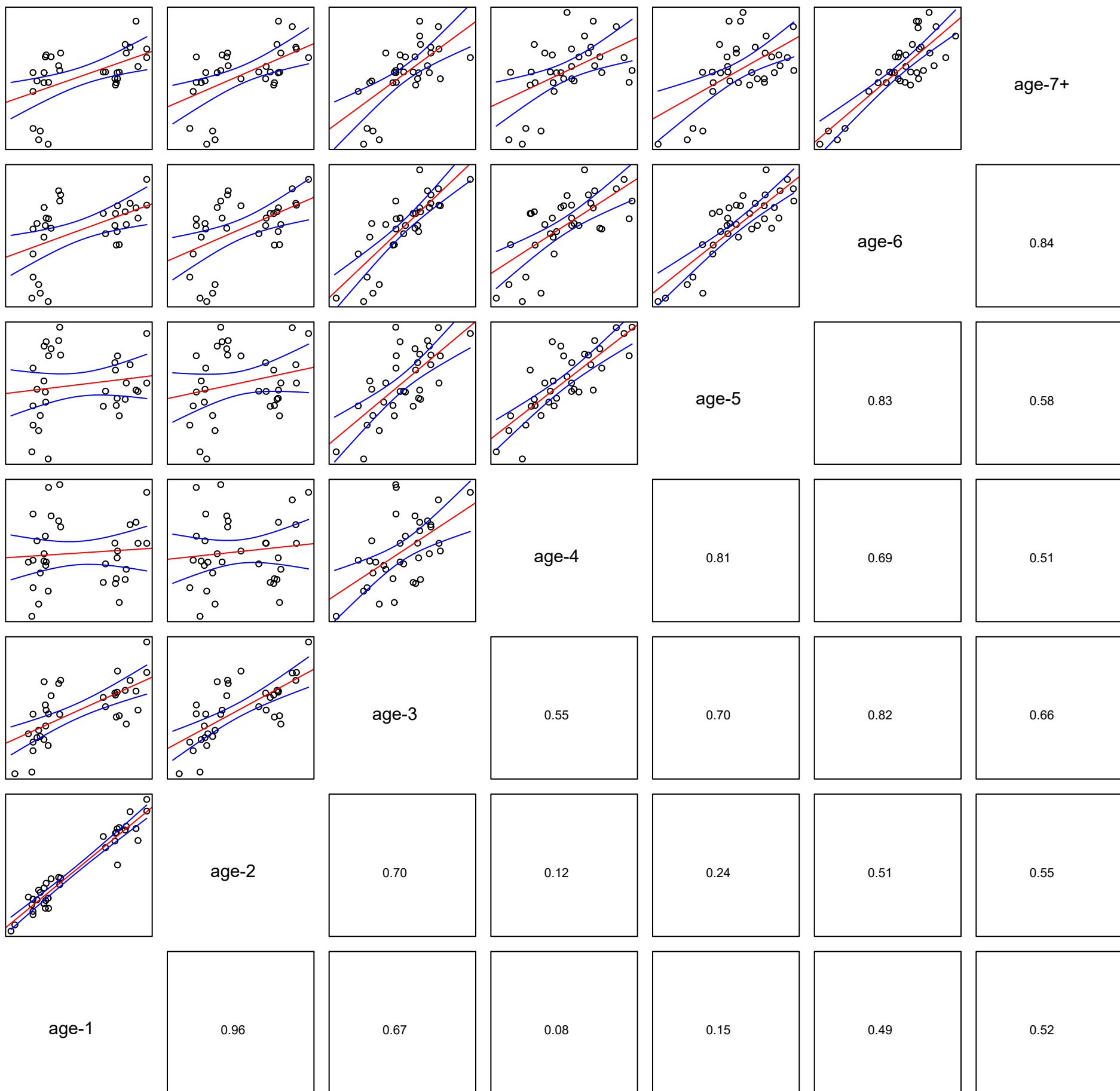
Index 9



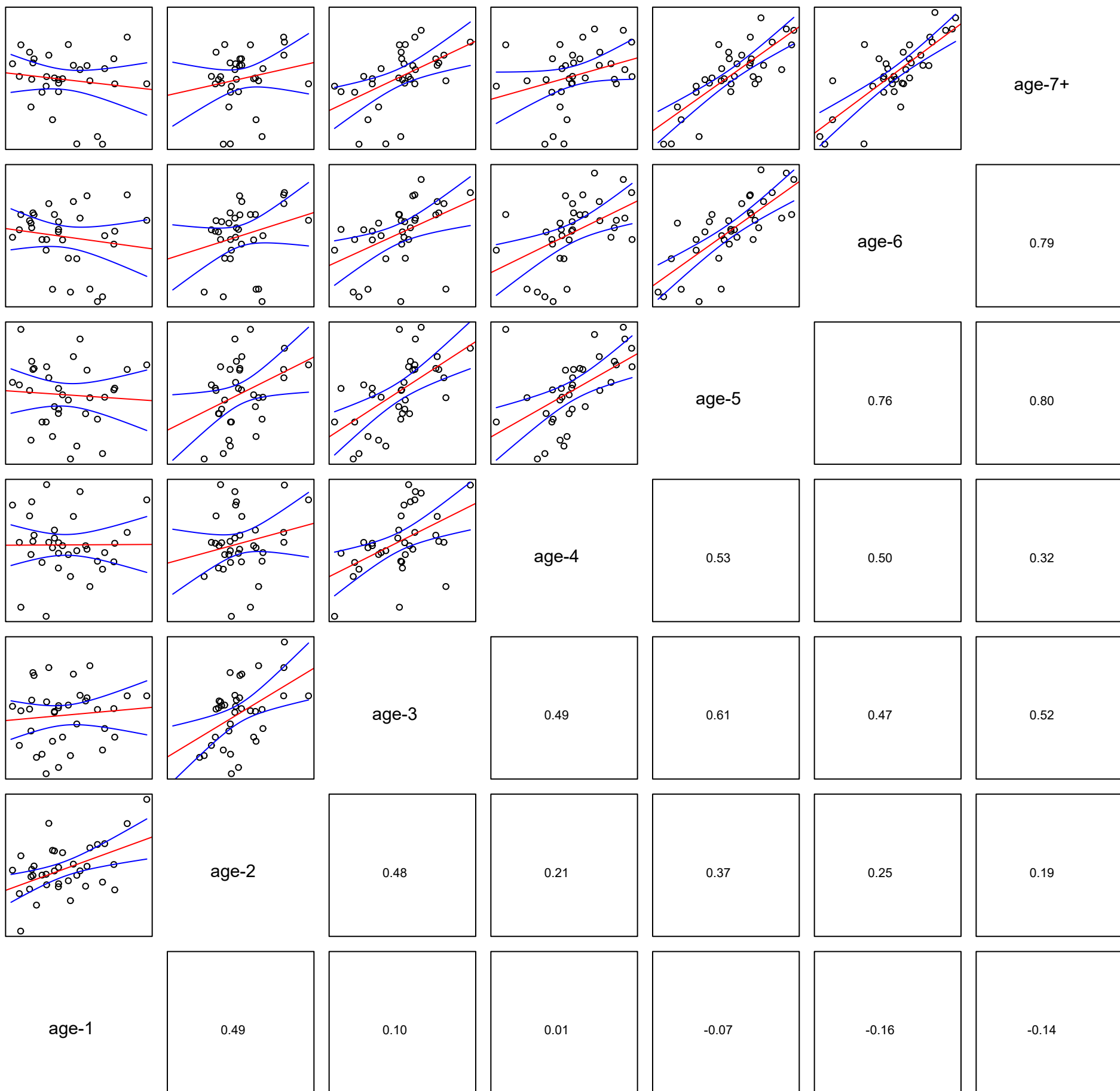
Catch for Fleet 1 Observed



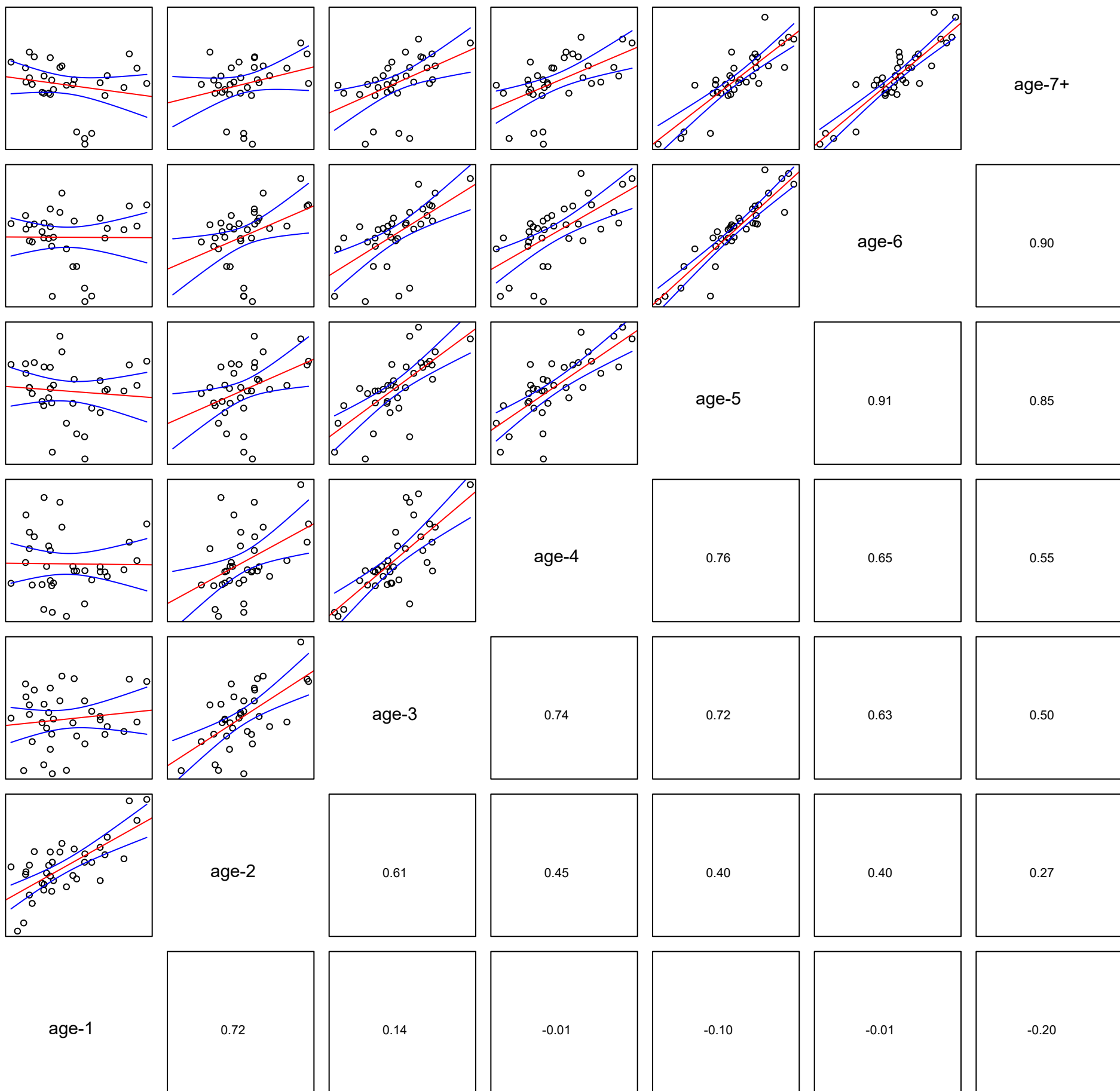
Catch for Fleet 1 Predicted



Catch for Fleet 2 Observed



Catch for Fleet 2 Predicted



Index 1 Observed

age-7+

0.24

age-5

0.62

0.27

age-4

0.26

0.19

0.36

age-3

0.54

0.35

0.15

0.15

age-2

0.51

0.68

0.30

0.13

0.16

age-1

0.45

0.13

0.29

-0.16

-0.12

0.07

Index 1 Predicted

age-7+

0.74

age-6

0.78

0.82

age-5

0.68

0.73

0.62

age-4

0.76

0.85

0.78

0.70

age-3

0.44

0.64

0.38

0.56

0.53

age-2

0.60

0.22

0.44

0.25

0.35

0.36

age-1

Index 2 Observed

age-7+

age-6

-0.52

age-5

0.55

-1.00

age-4

0.78

0.43

NA

age-3

0.77

0.85

0.21

NA

age-2

0.57

0.81

0.96

-0.74

NA

age-1

0.26

0.52

0.05

0.18

1.00

NA

Index 2 Predicted

age-7+

age-6

age-5

age-4

age-3

age-2

age-1

-0.01

0.12

0.29

0.02

-0.15

-0.02

0.94

1.00

0.98

1.00

0.98

0.99

0.98

0.96

0.93

0.95

0.81

0.58

0.70

0.42

0.25

Index 3 Observed

age-7+

age-6

age-5

age-4

age-3

age-2

age-1

0.68

0.12

0.01

-0.16

0.05

0.00

0.66

0.49

0.60

0.27

0.46

0.24

0.12

0.27

0.17

0.31

0.02

0.22

-0.03

-0.05

0.41

age-1

0.68

0.12

0.01

-0.16

0.05

0.00

0.66

0.49

0.60

0.27

0.46

0.24

0.12

0.27

0.17

0.31

0.02

0.22

-0.03

-0.05

0.41

age-1

Index 3 Predicted

age-7+

age-6

0.91

age-5

0.99

0.89

age-4

0.90

0.85

0.71

age-3

0.83

0.93

0.92

0.82

age-2

0.62

0.51

0.52

0.57

0.49

age-1

0.86

0.30

0.34

0.27

0.30

0.30

Index 4 Observed

age-7+

0.45

0.51

0.82

0.72

-0.21

0.75

age-6

0.32

0.58

0.72

0.07

-0.36

age-5

0.59

0.66

0.61

0.06

age-4

0.83

0.10

0.46

age-3

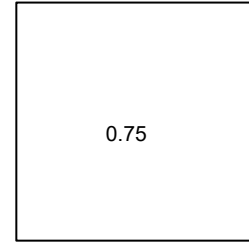
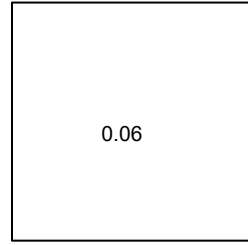
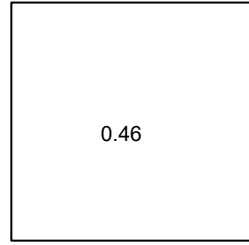
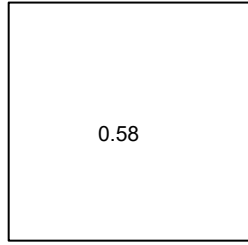
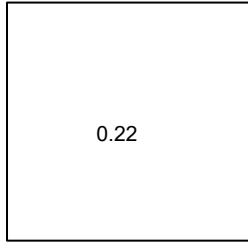
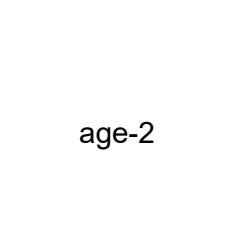
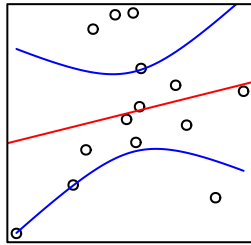
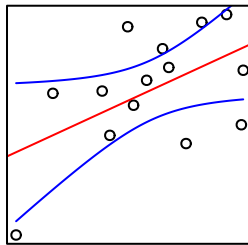
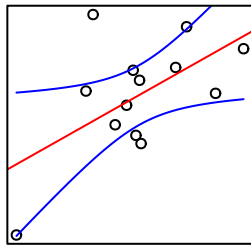
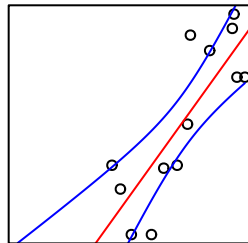
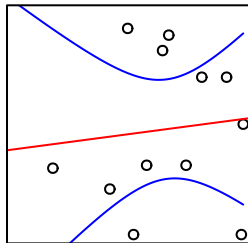
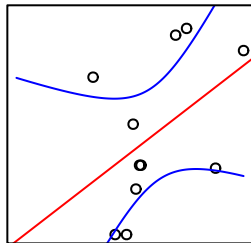
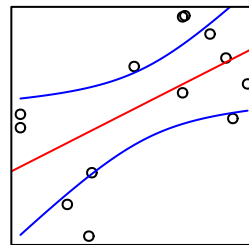
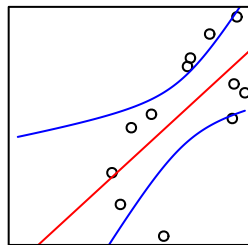
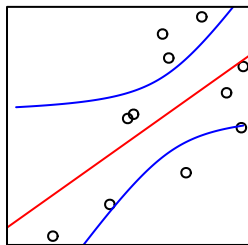
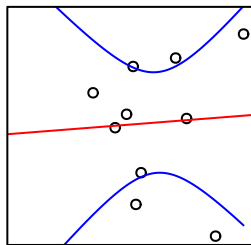
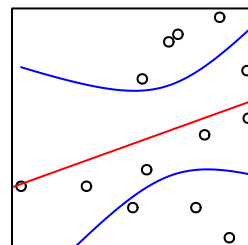
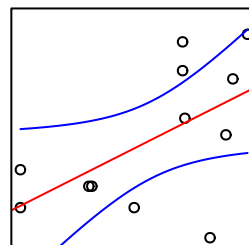
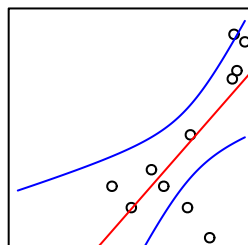
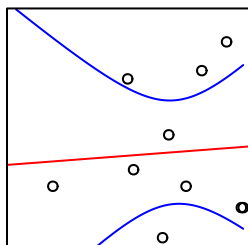
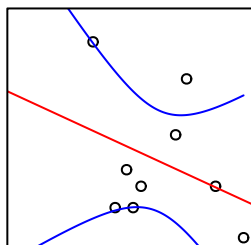
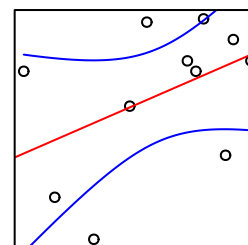
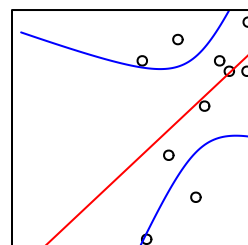
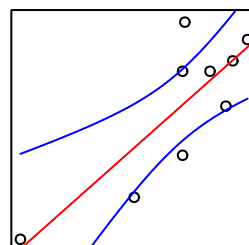
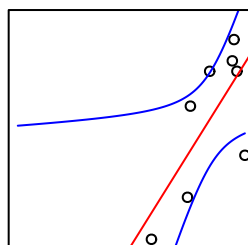
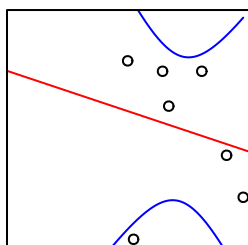
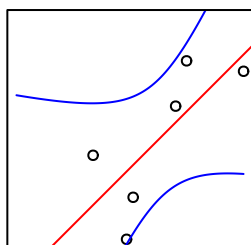
0.53

0.58

age-2

0.22

age-1



Index 4 Predicted

age-7+

age-6

age-5

age-4

age-3

age-2

age-1

0.59

0.35

0.39

0.33

0.27

0.24

0.94

0.99

0.93

0.98

0.96

0.89

0.95

0.97

0.95

0.97

0.86

0.71

0.73

0.71

0.64

Index 6 Observed

age-7+

0.30

0.14

-0.37

0.20

0.09

-0.45

age-6

0.30

0.23

0.30

0.36

-0.05

age-5

0.29

0.36

0.44

0.14

age-4

0.30

0.25

0.42

age-3

0.33

0.01

age-2

0.09

age-1

Index 6 Predicted

age-7+

age-6

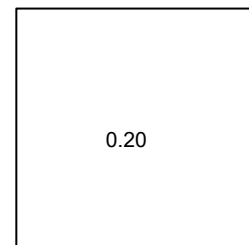
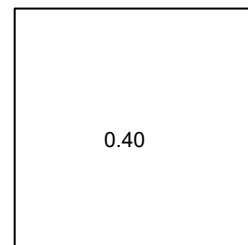
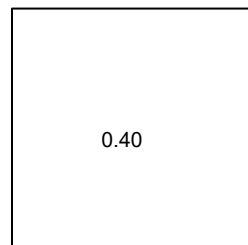
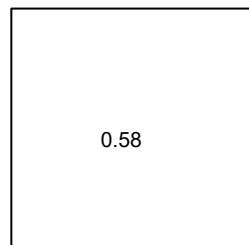
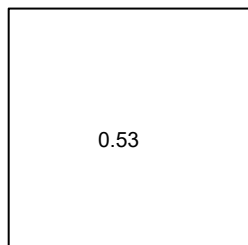
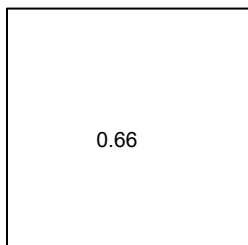
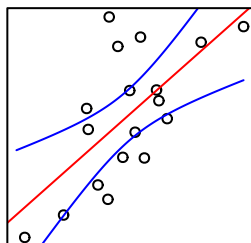
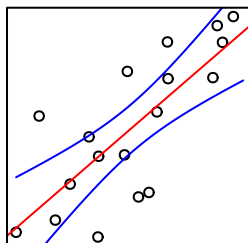
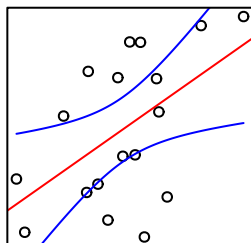
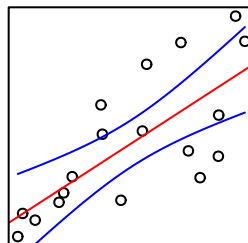
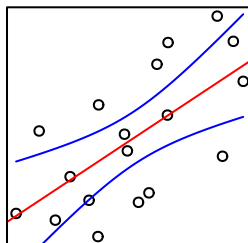
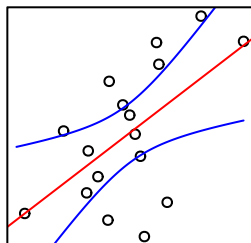
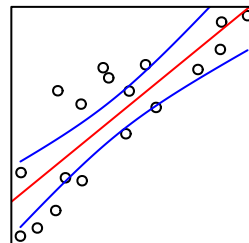
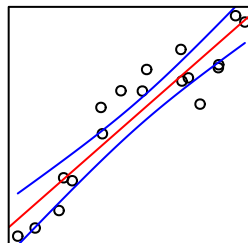
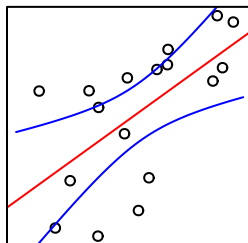
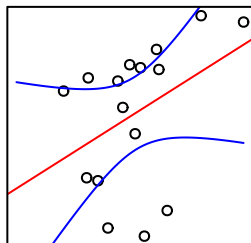
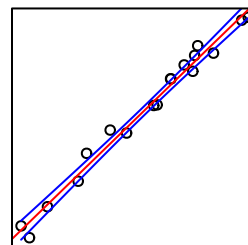
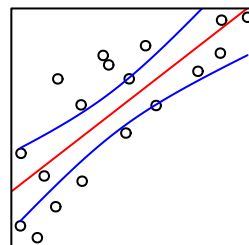
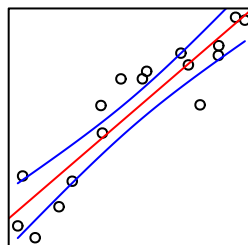
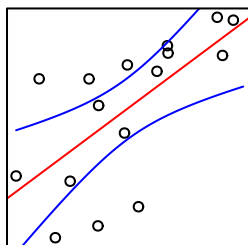
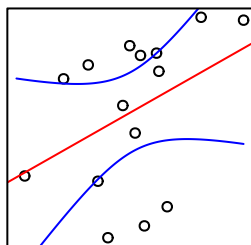
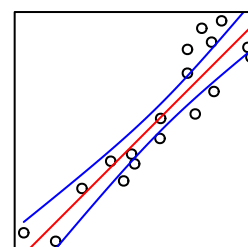
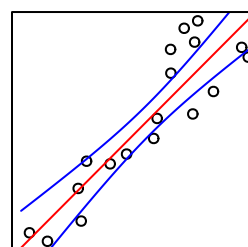
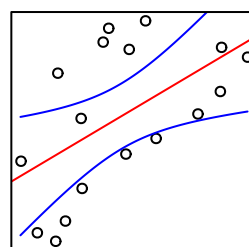
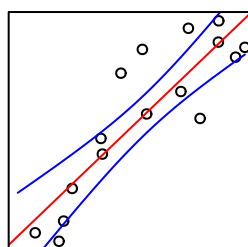
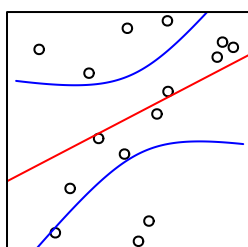
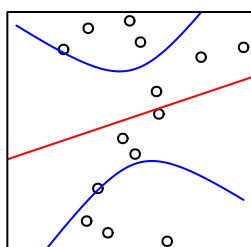
age-5

age-4

age-3

age-2

age-1



0.66

0.53

0.58

0.40

0.40

0.20

0.93

0.99

0.90

0.84

0.80

0.55

0.74

0.93

0.92

0.88

0.77

0.66

0.62

0.66

0.40

Index 8 Observed

age-7+

age-6

age-5

age-4

age-3

age-2

age-1

-0.14

0.20

0.01

NA

NA

NA

-0.53

NA

NA

NA

-0.20

0.46

NA

NA

NA

NA

NA

NA

NA

NA

NA

Index 8 Predicted

age-7+

age-6

age-5

age-4

age-3

age-2

age-1

0.51

0.45

0.44

NA

NA

NA

0.67

NA

NA

NA

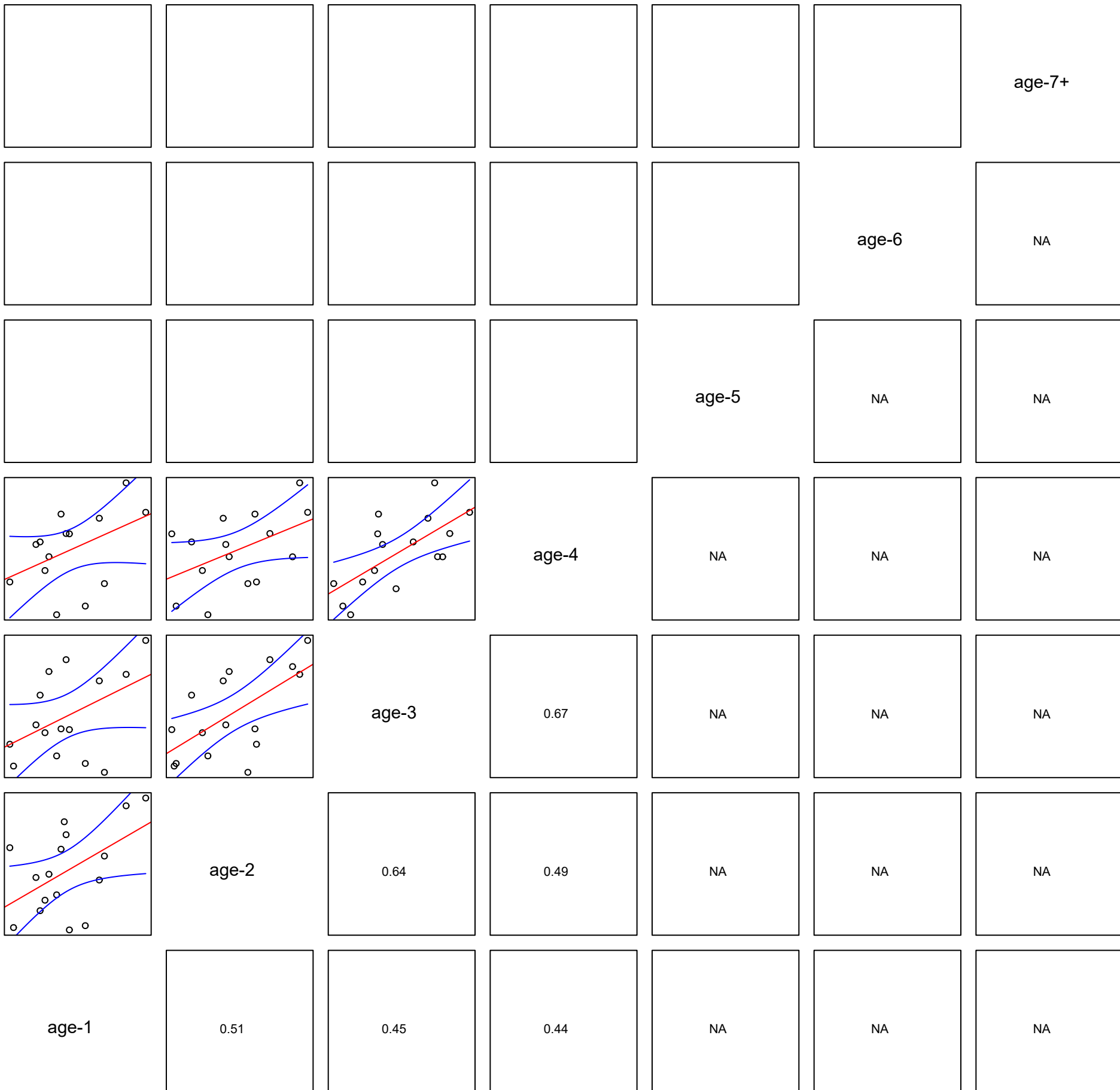
0.64

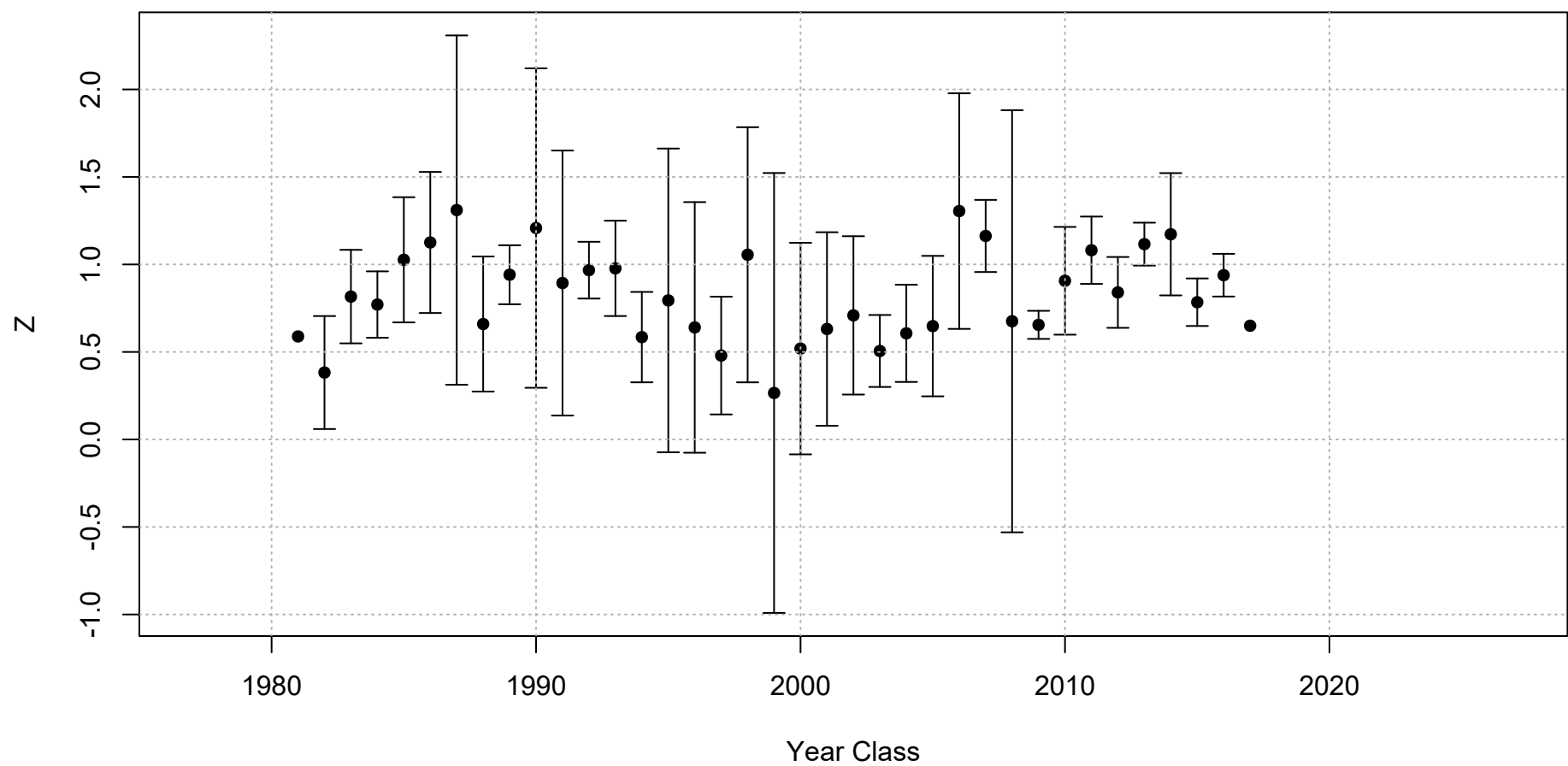
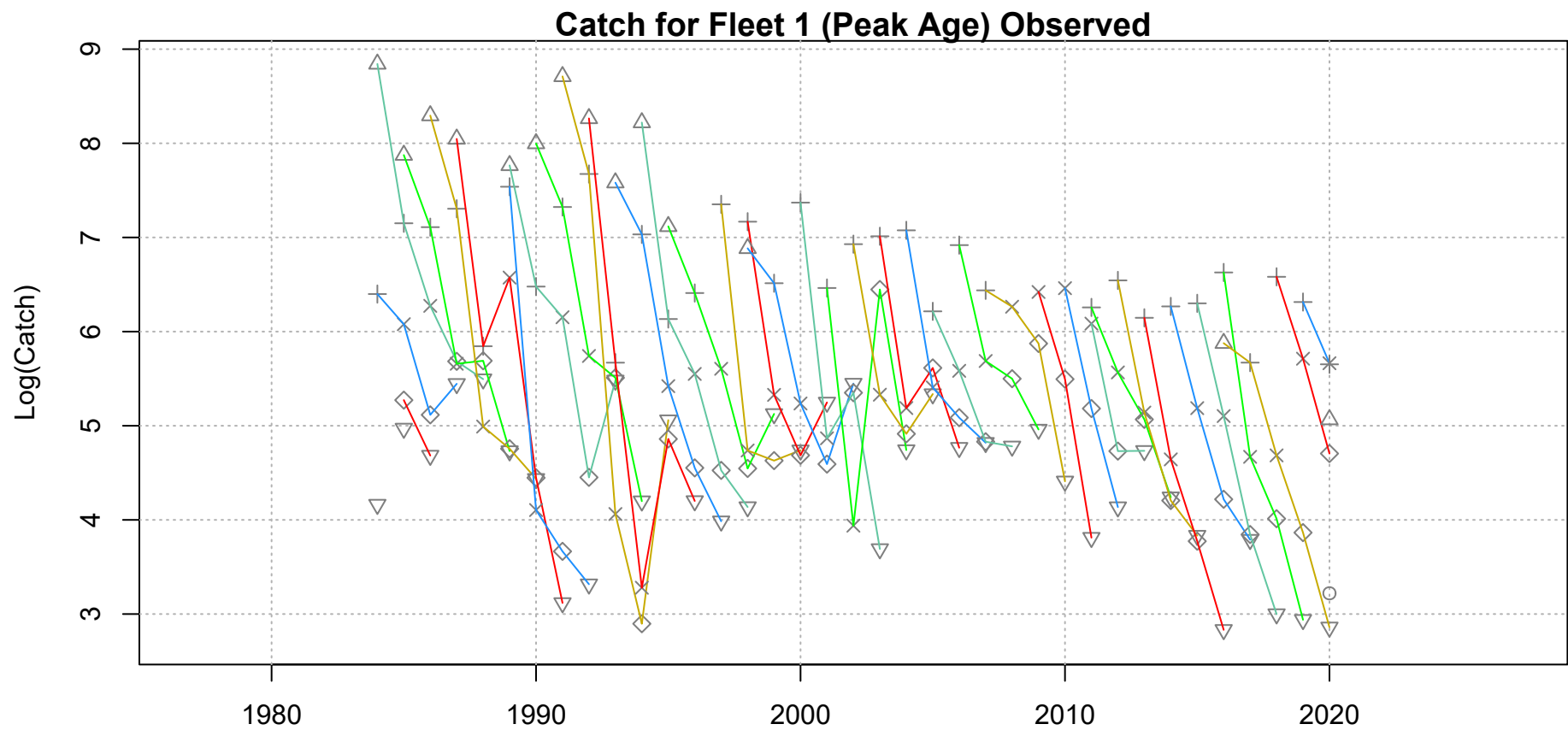
0.49

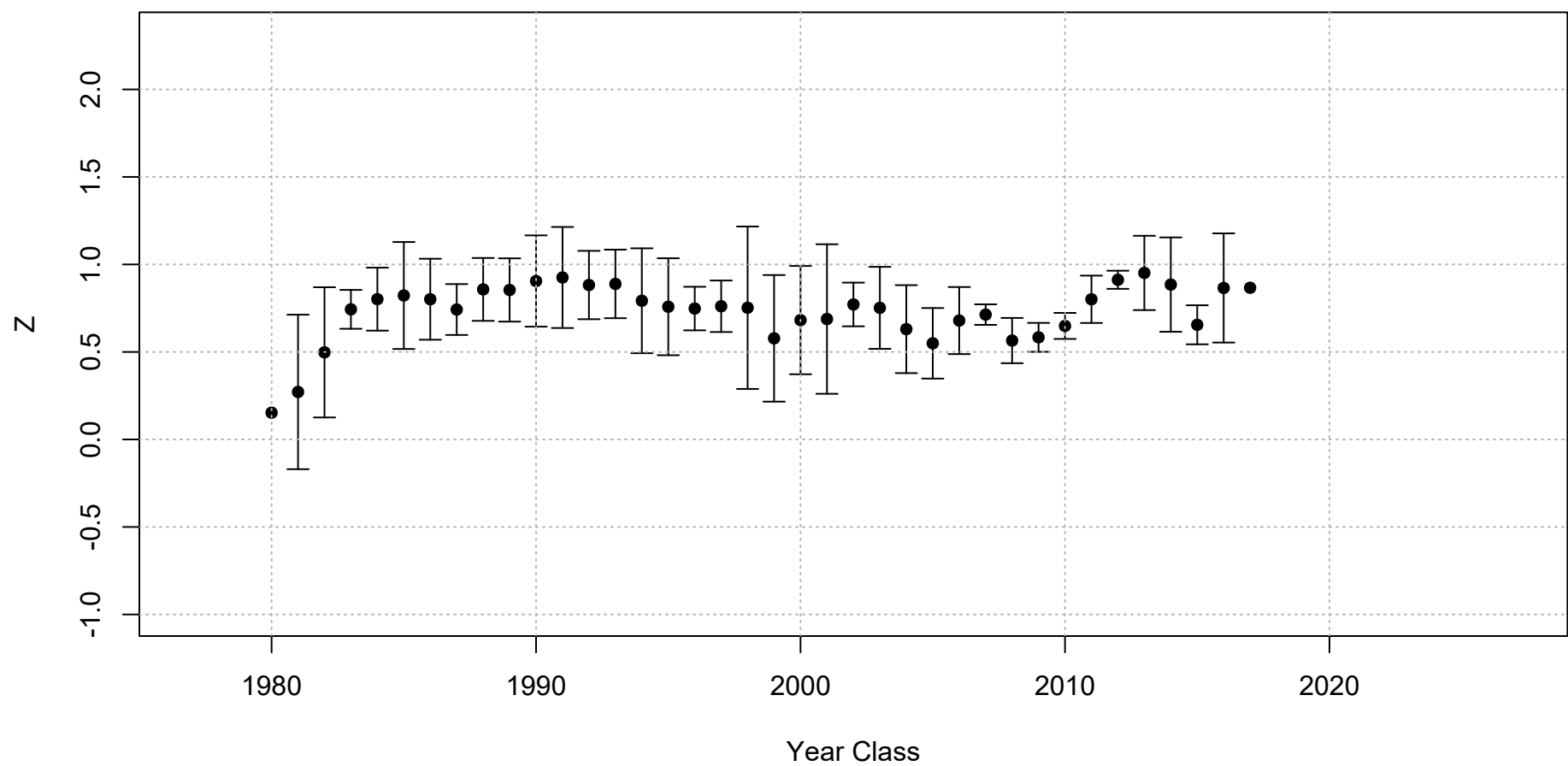
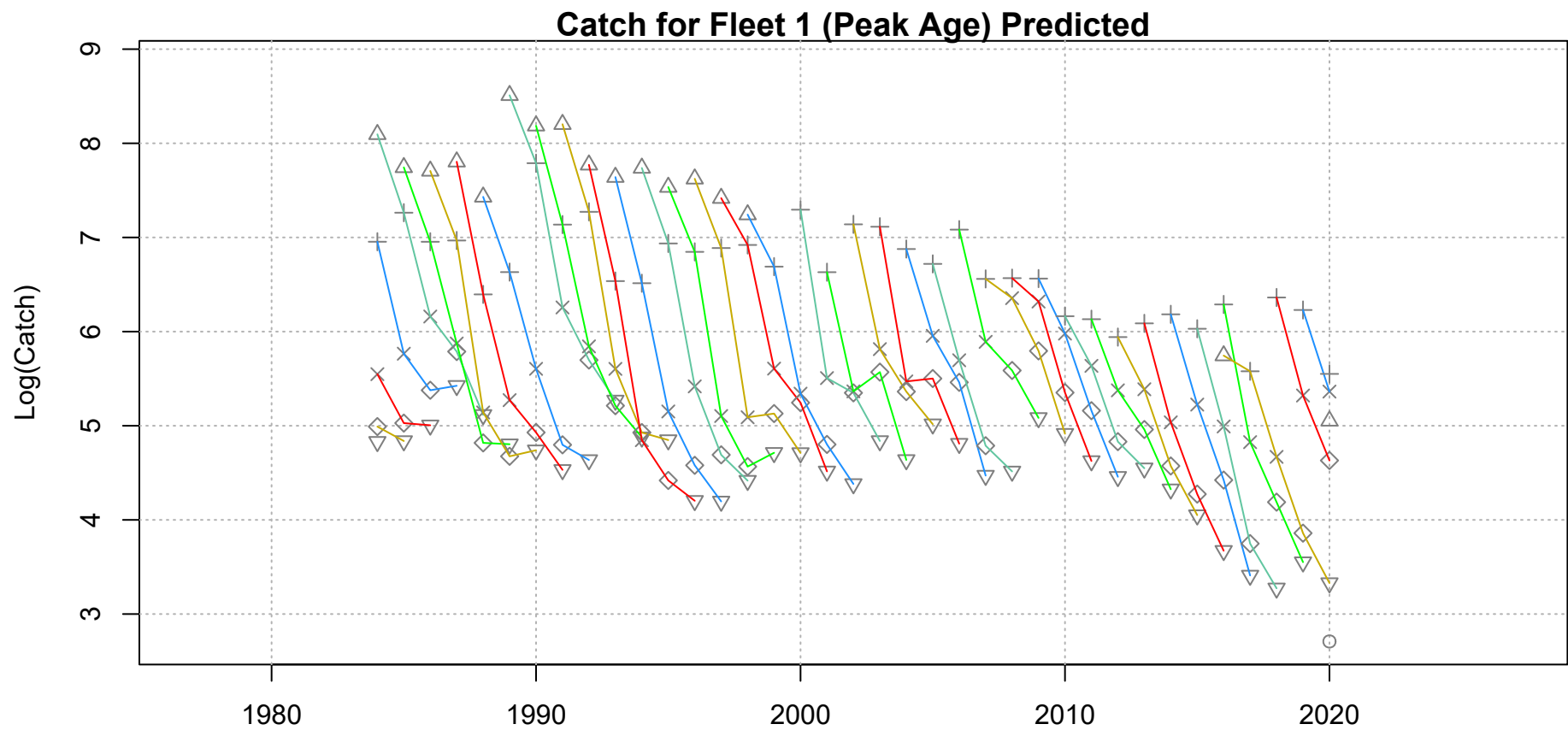
NA

NA

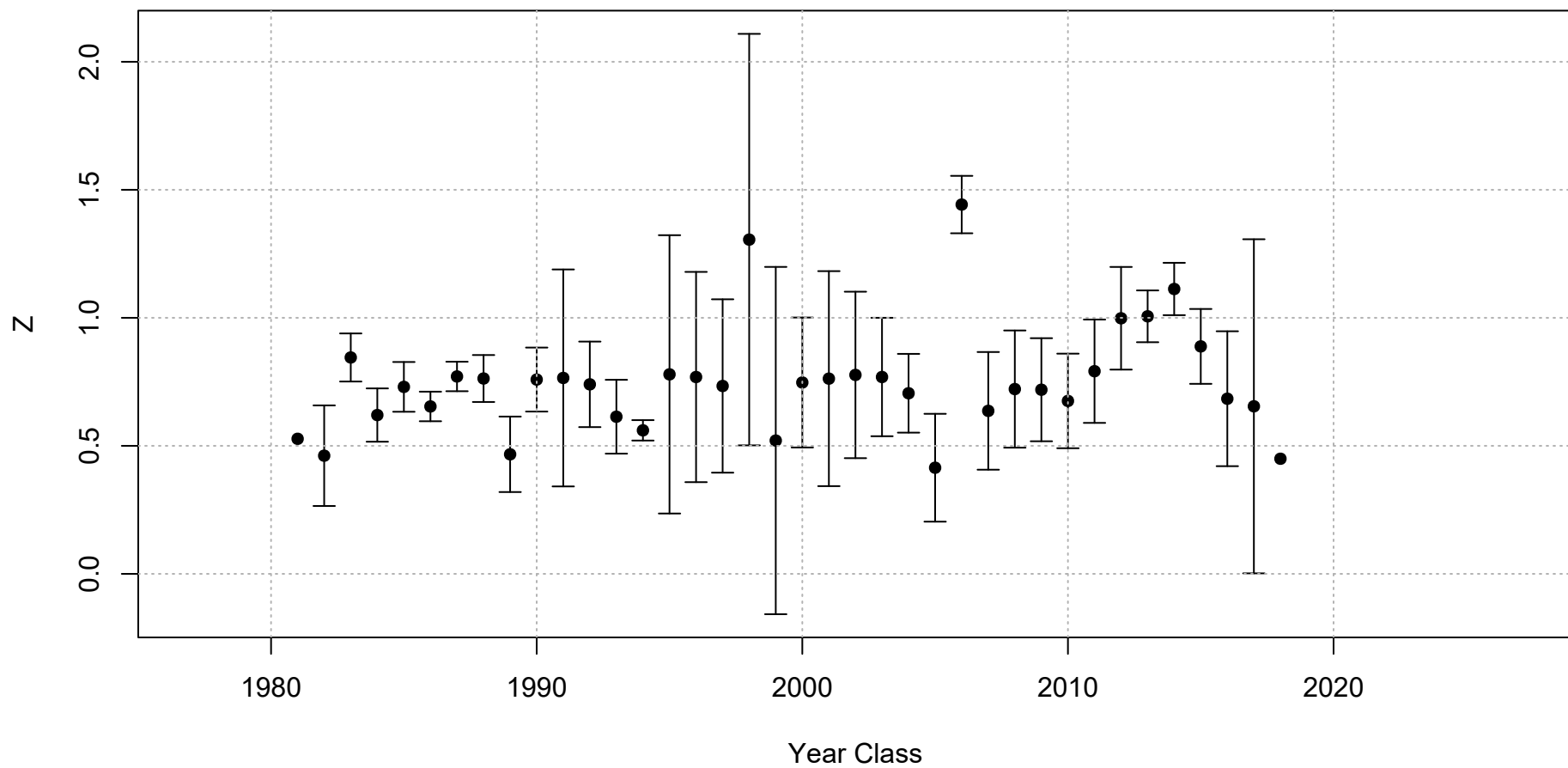
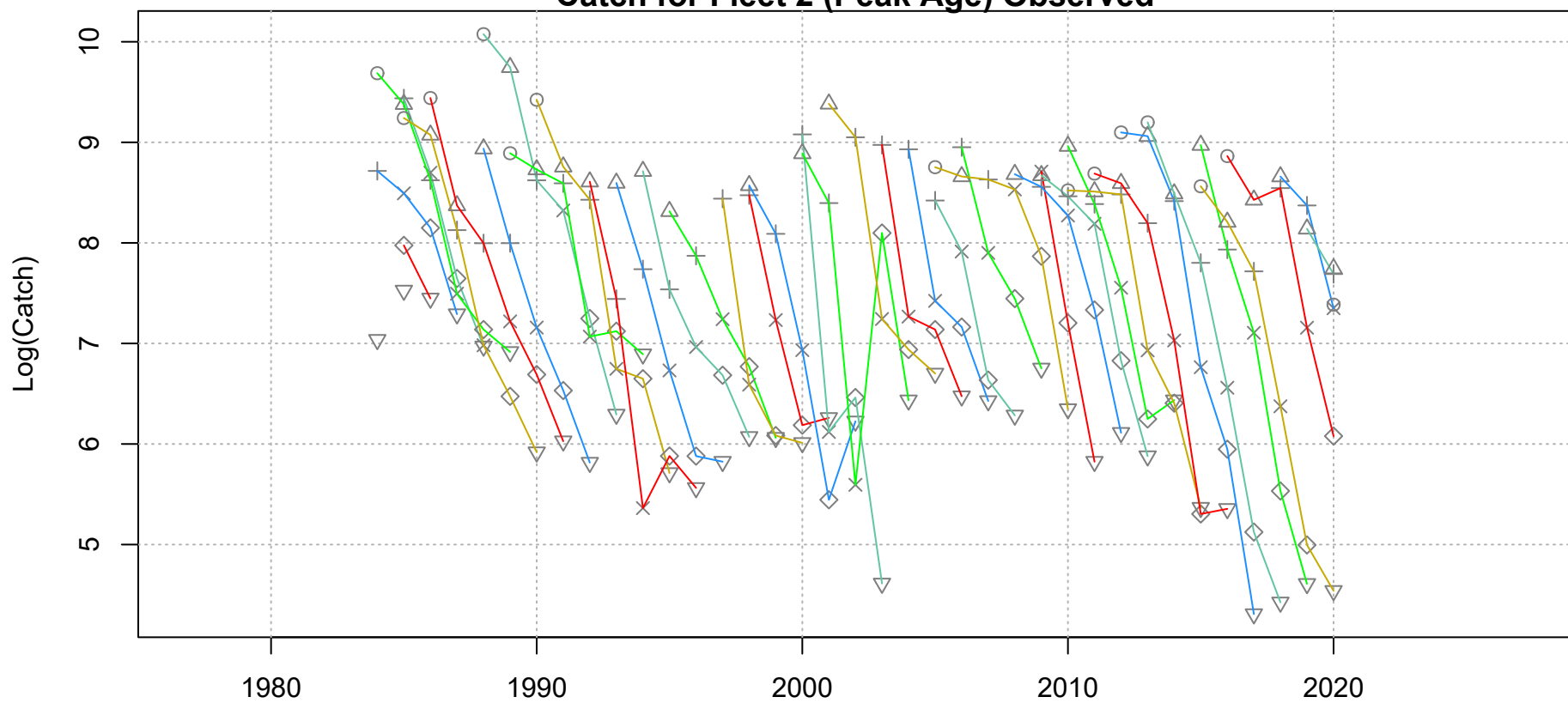
NA



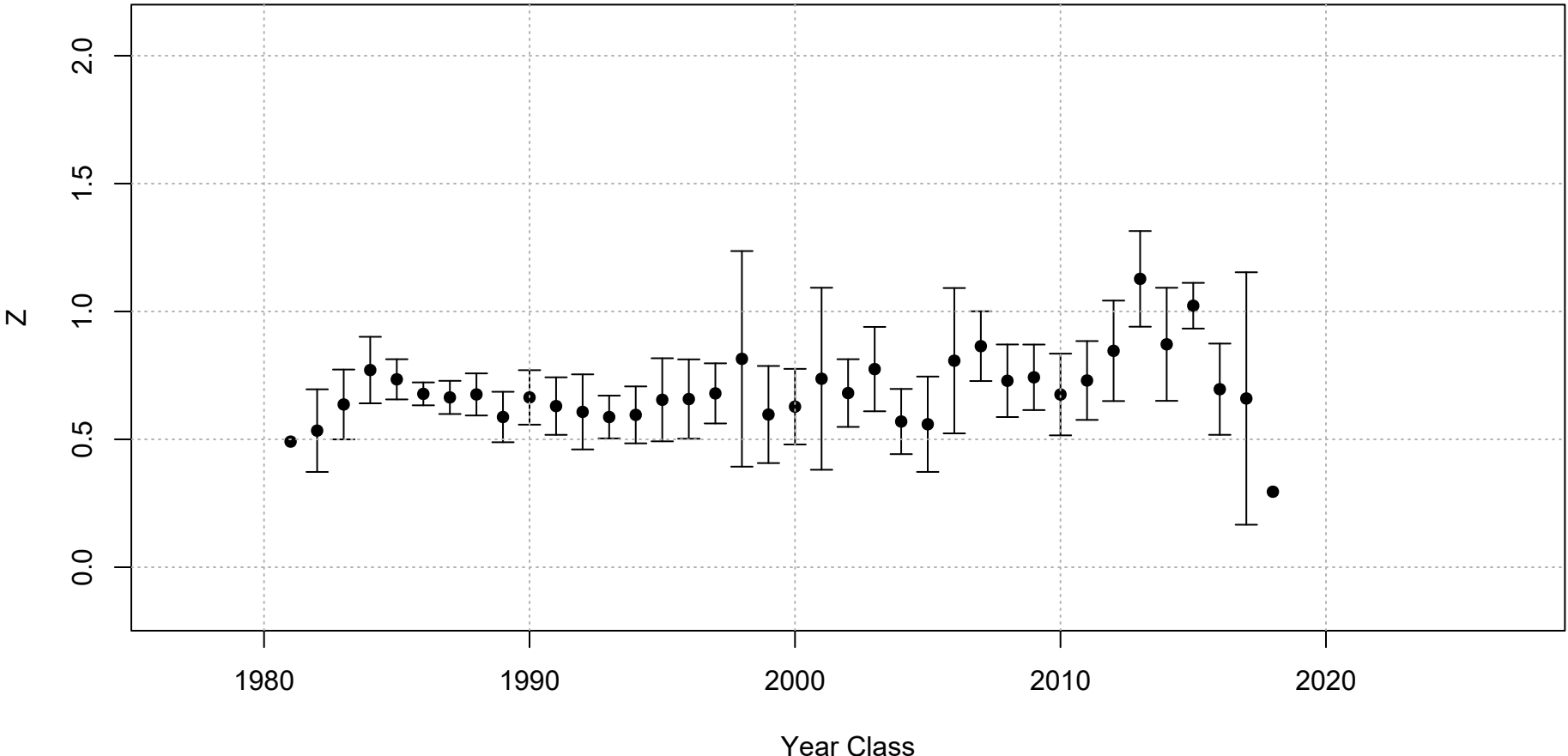
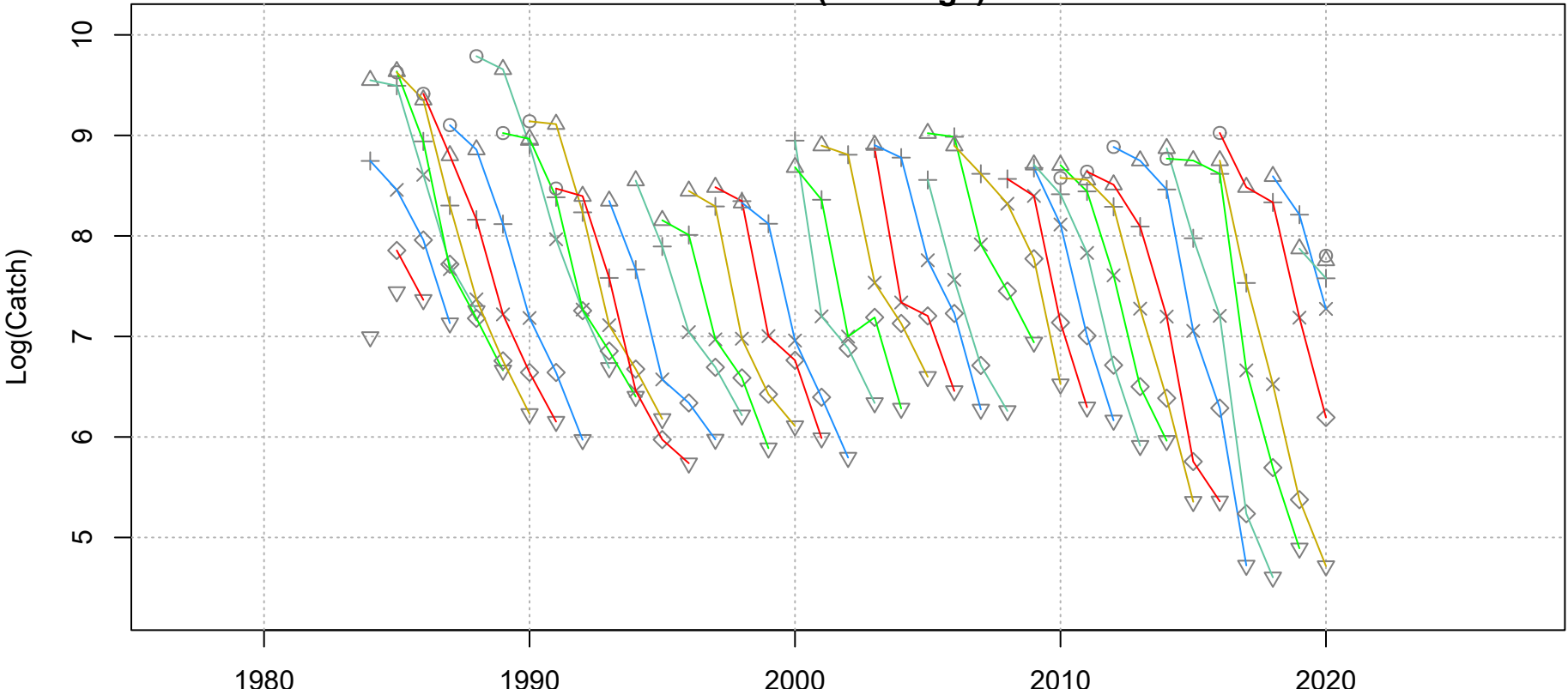


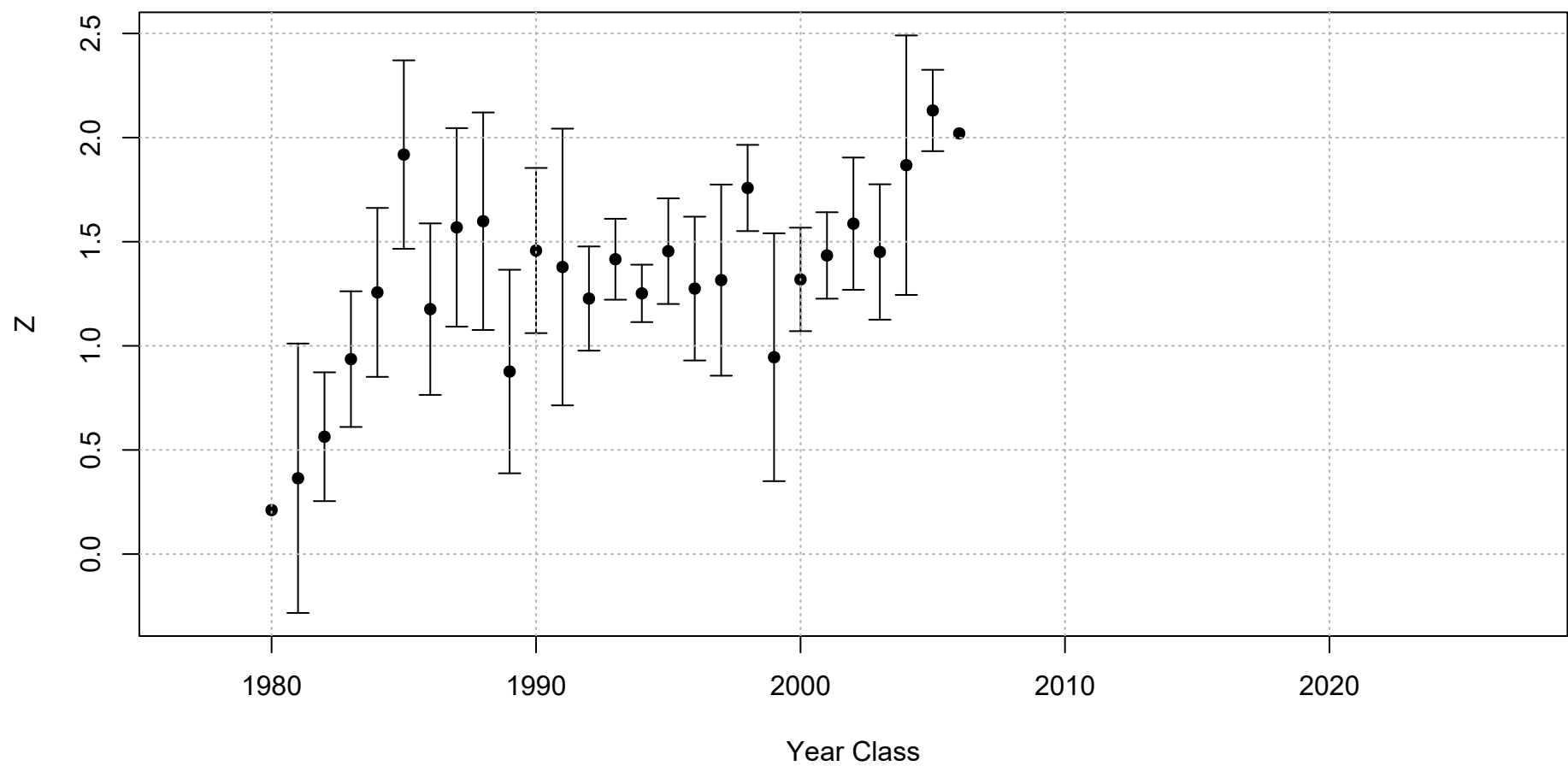
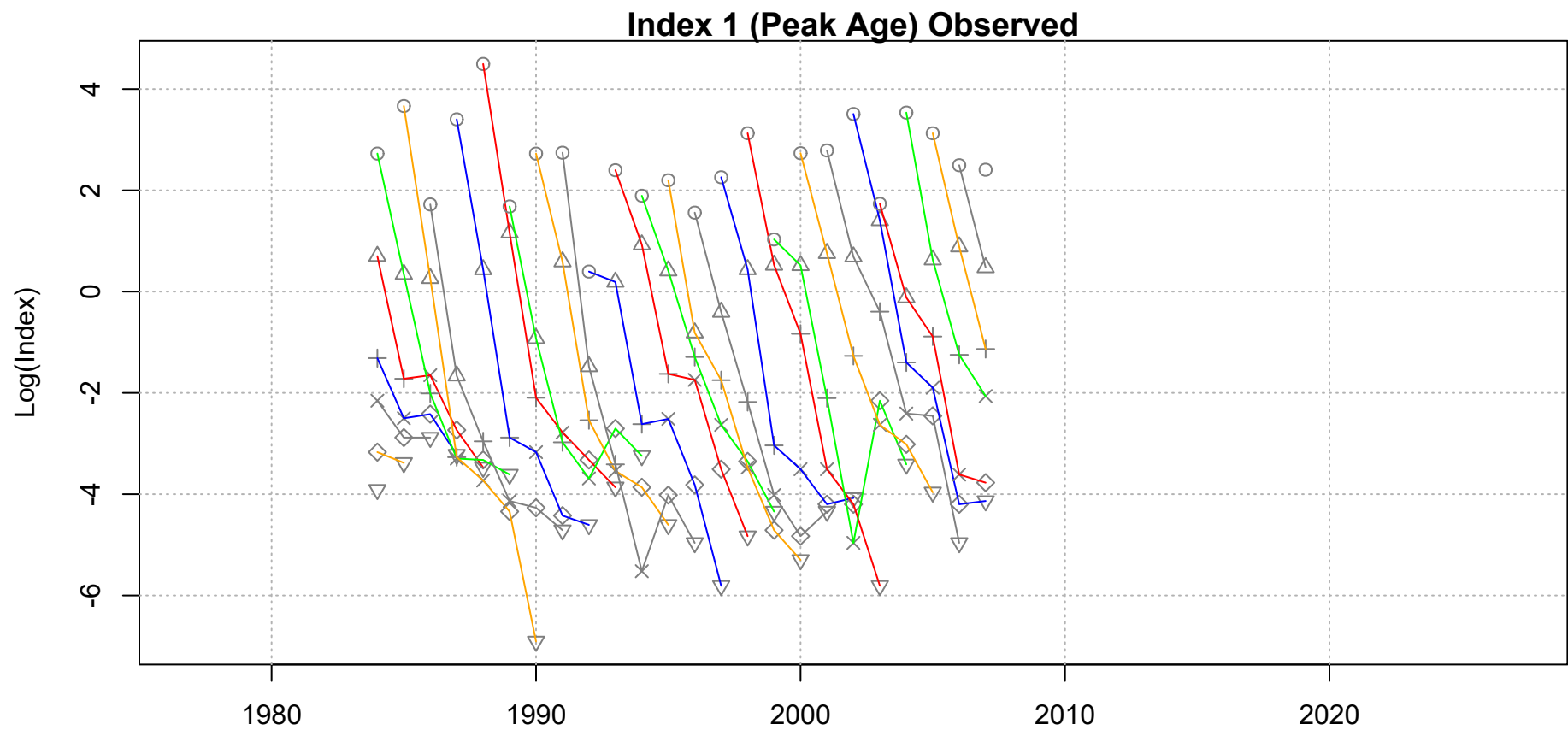


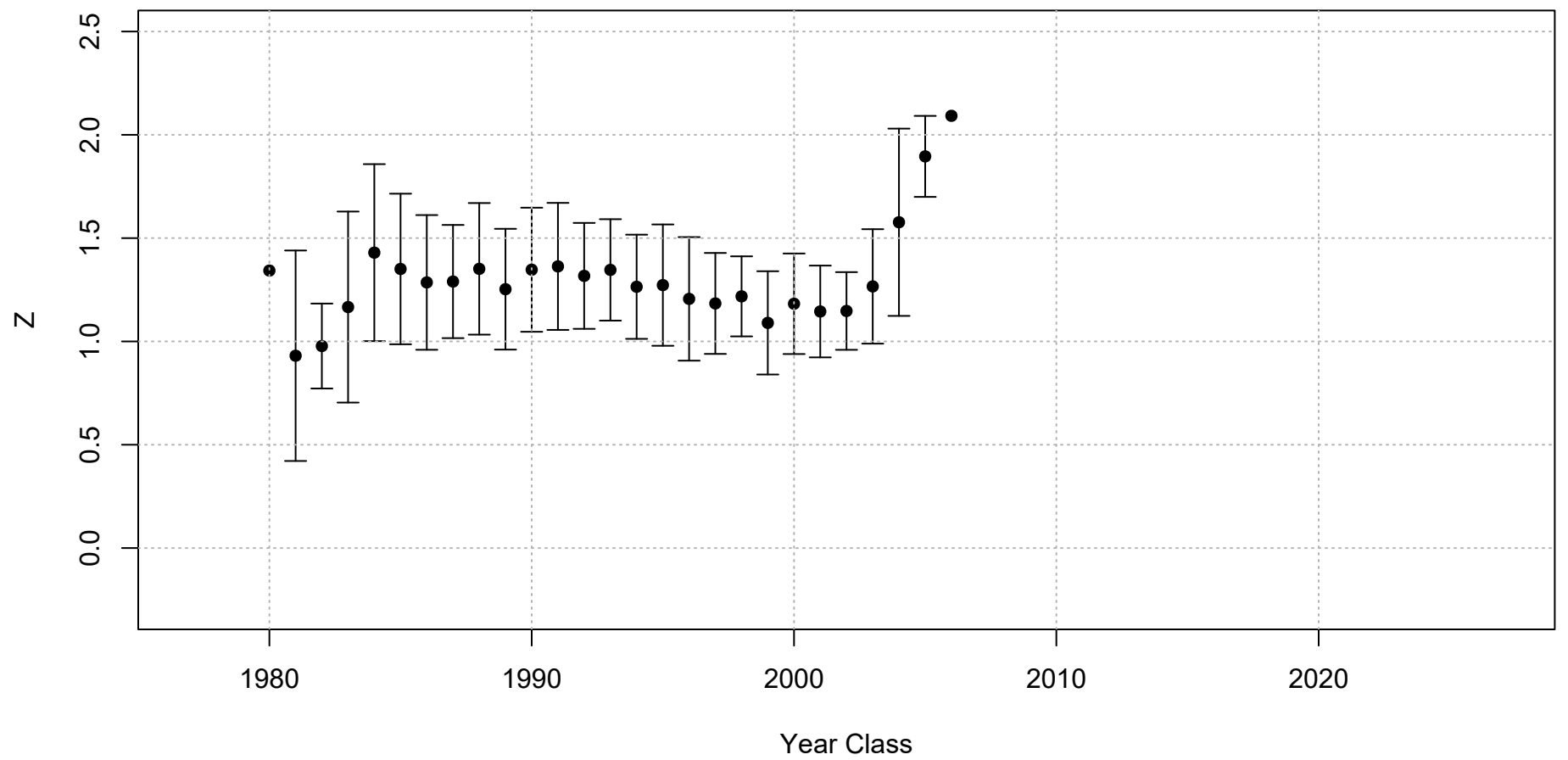
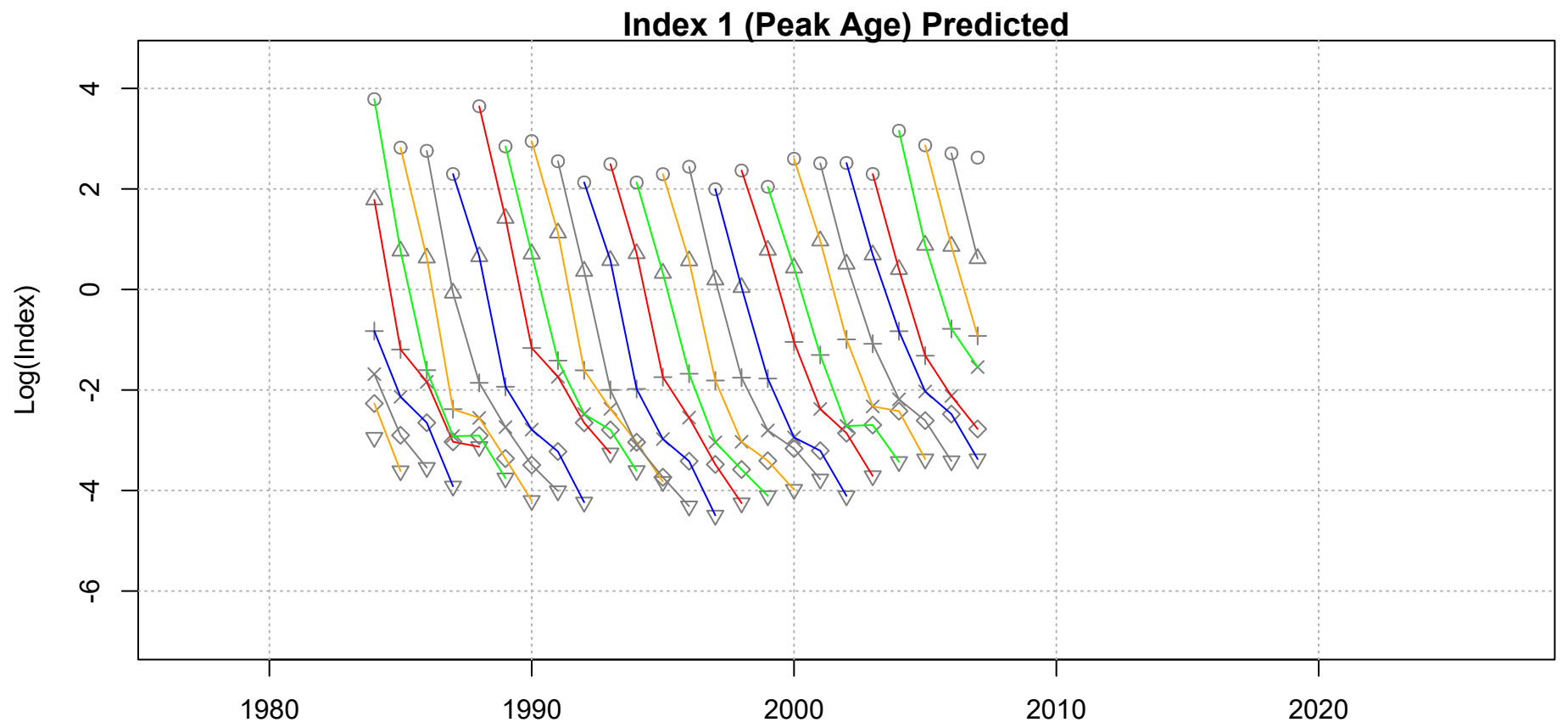
Catch for Fleet 2 (Peak Age) Observed

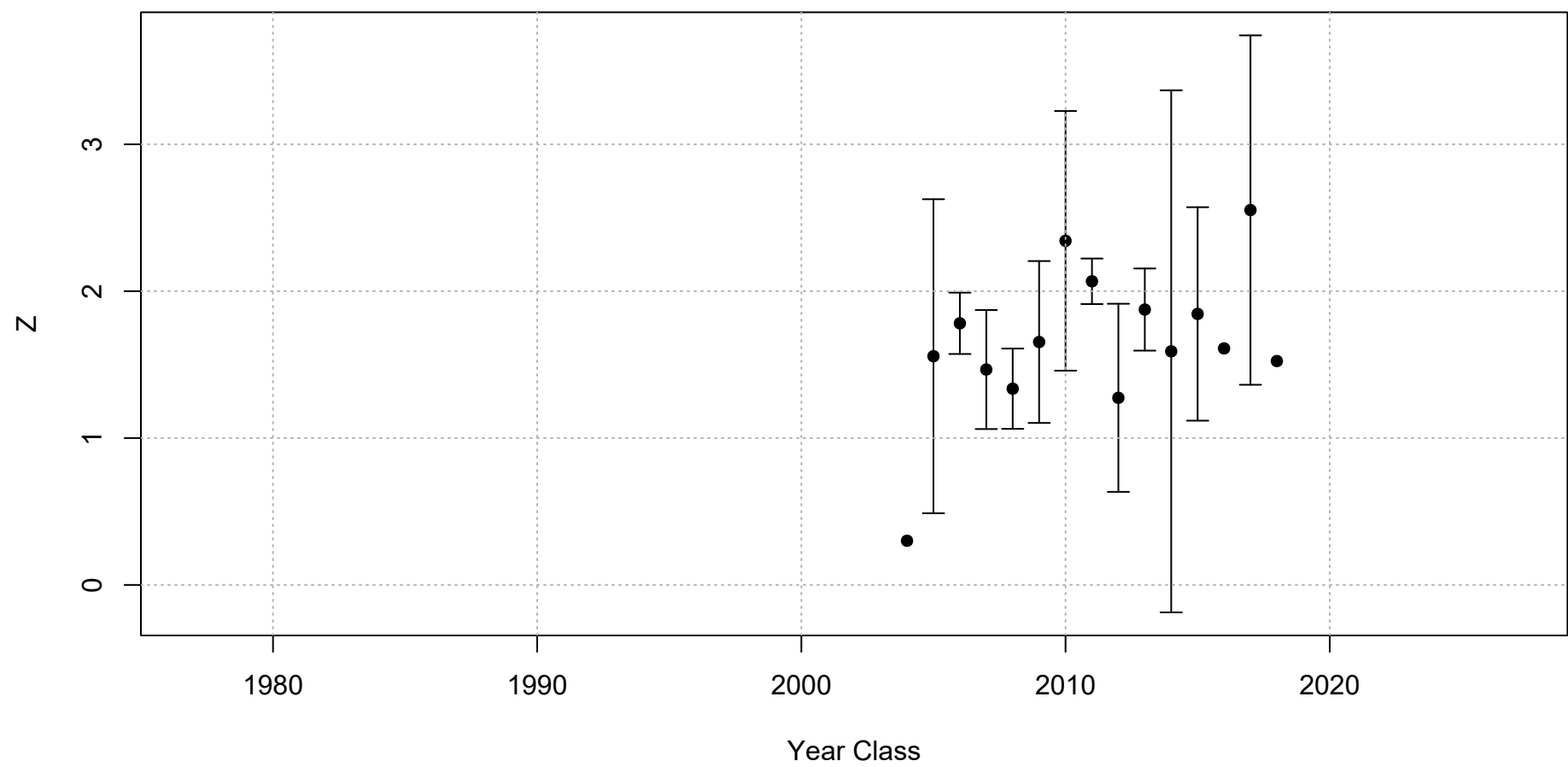
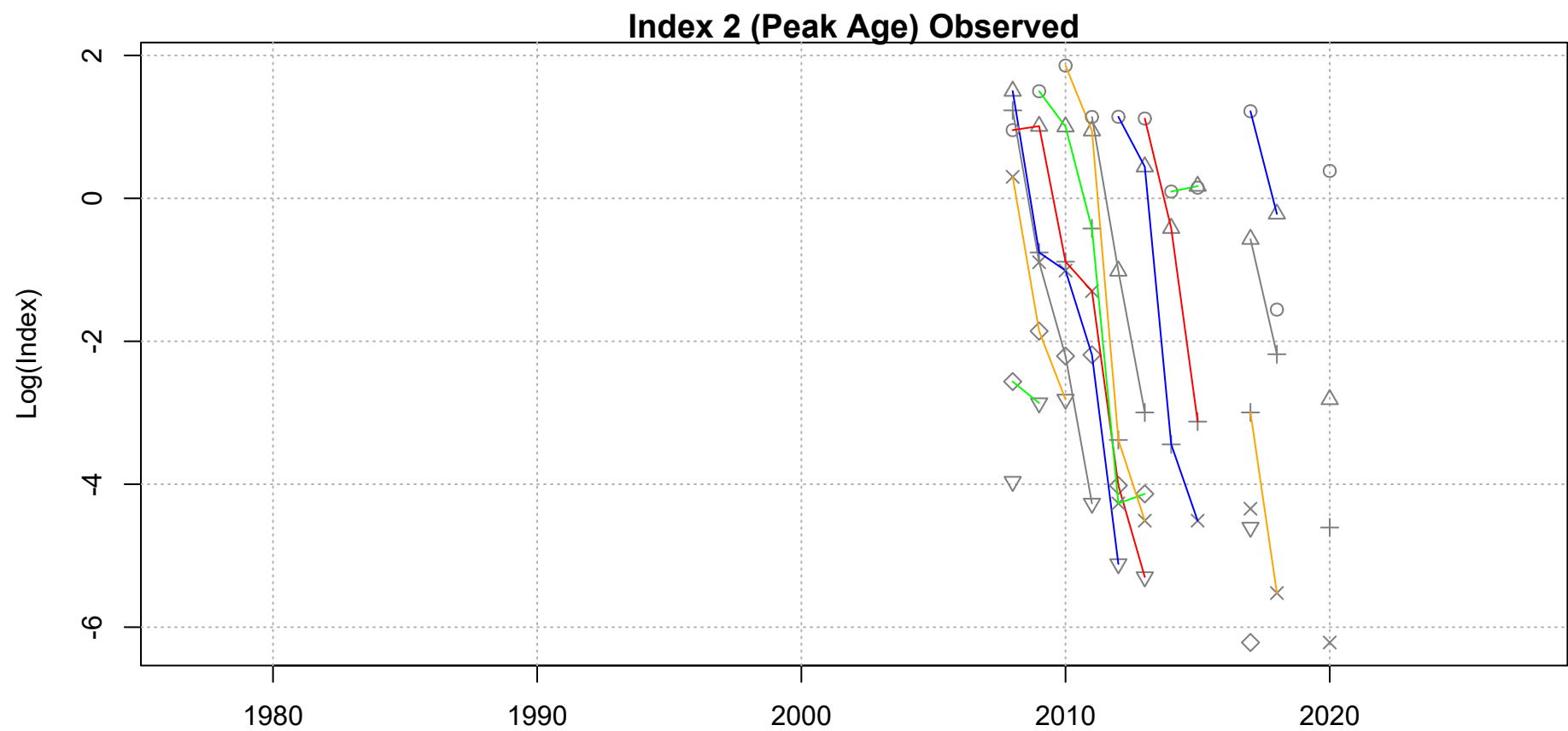


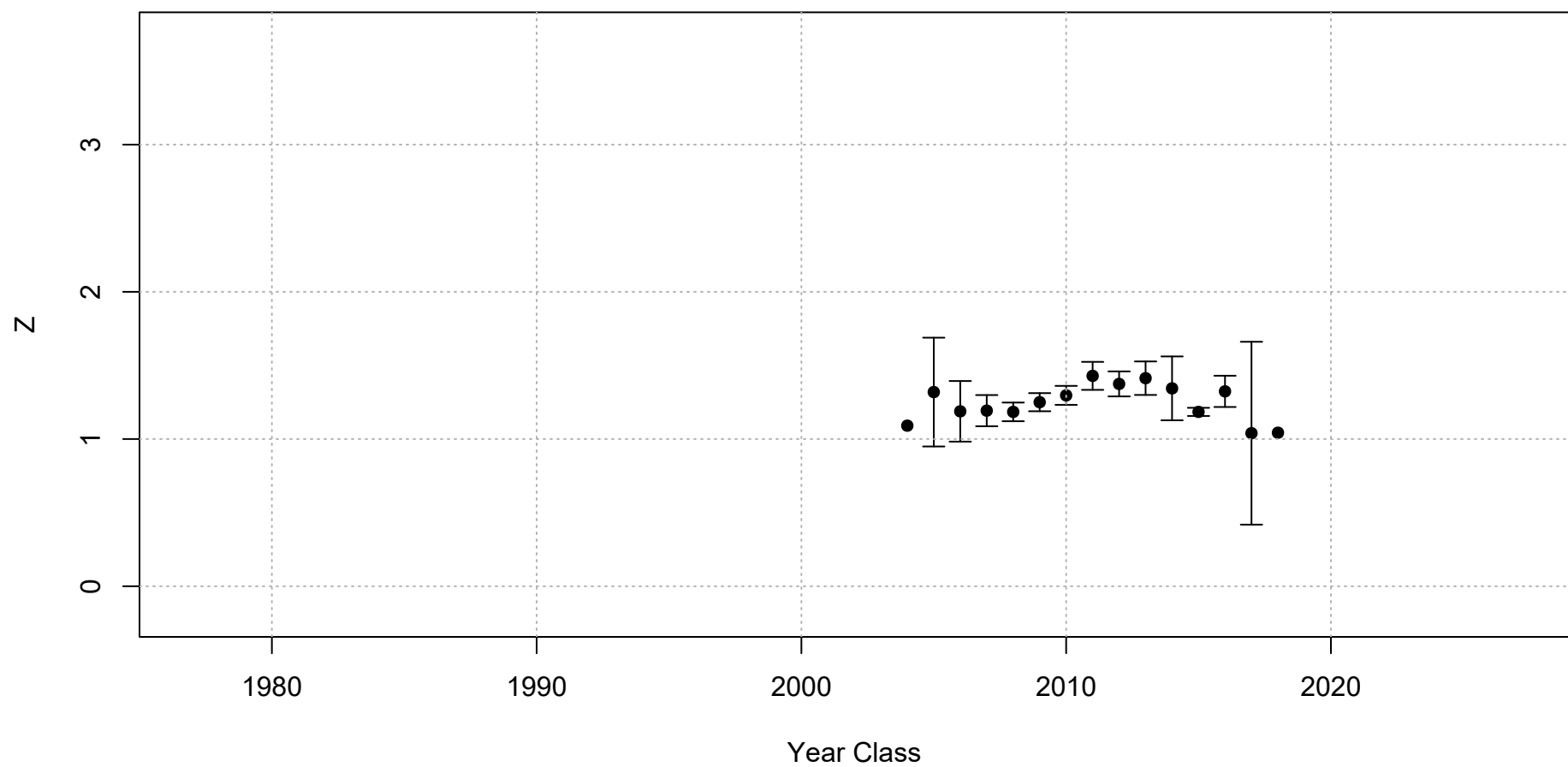
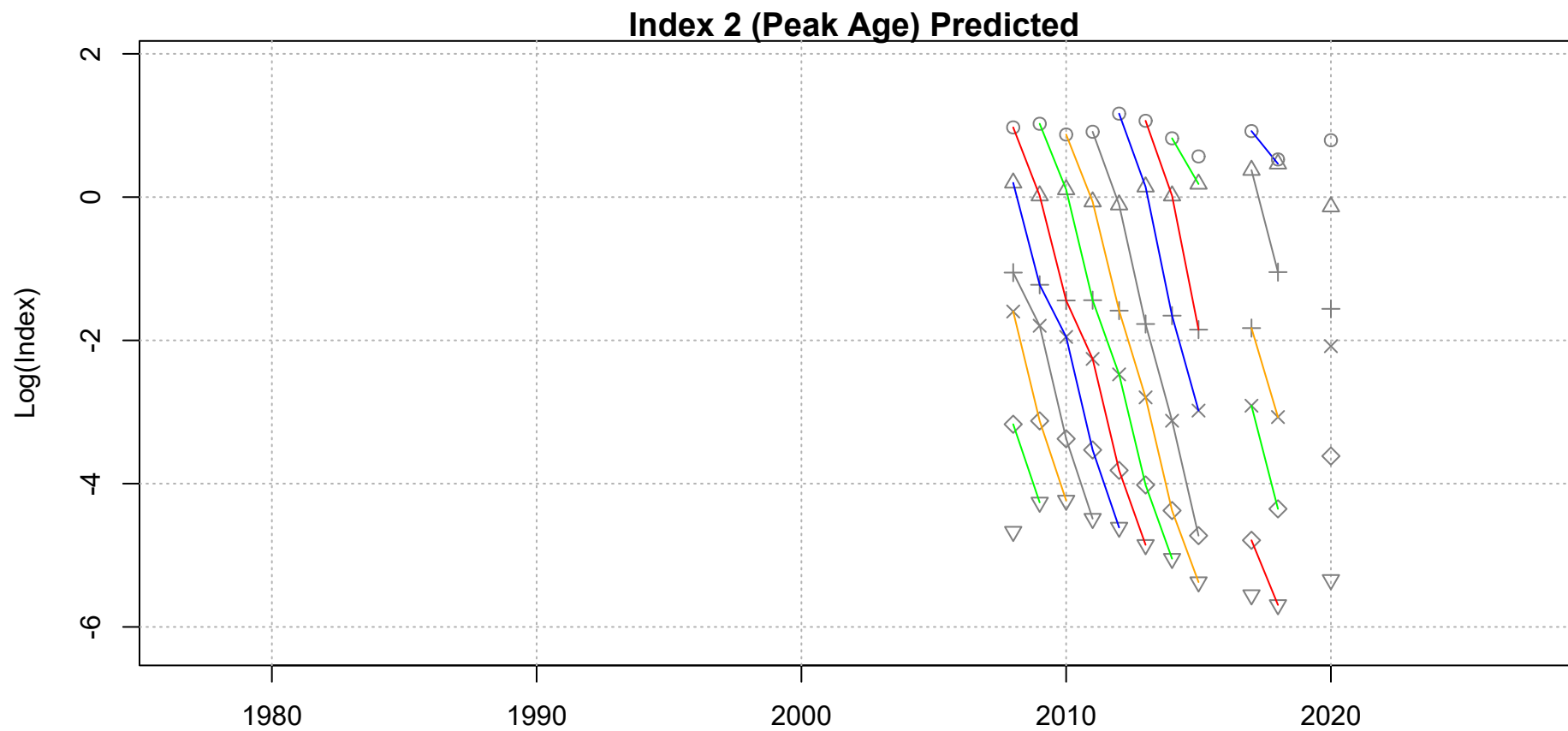
Catch for Fleet 2 (Peak Age) Predicted



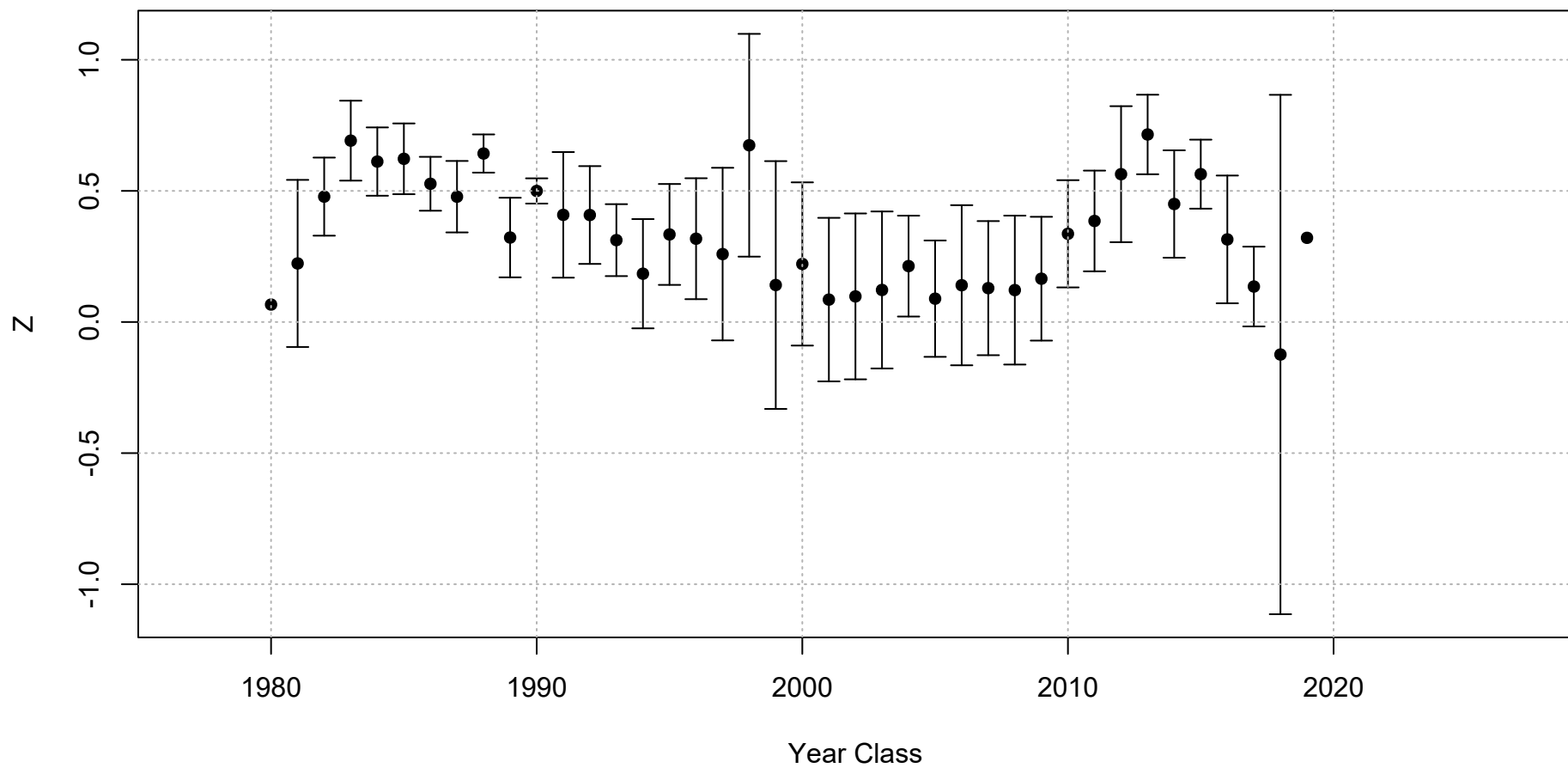
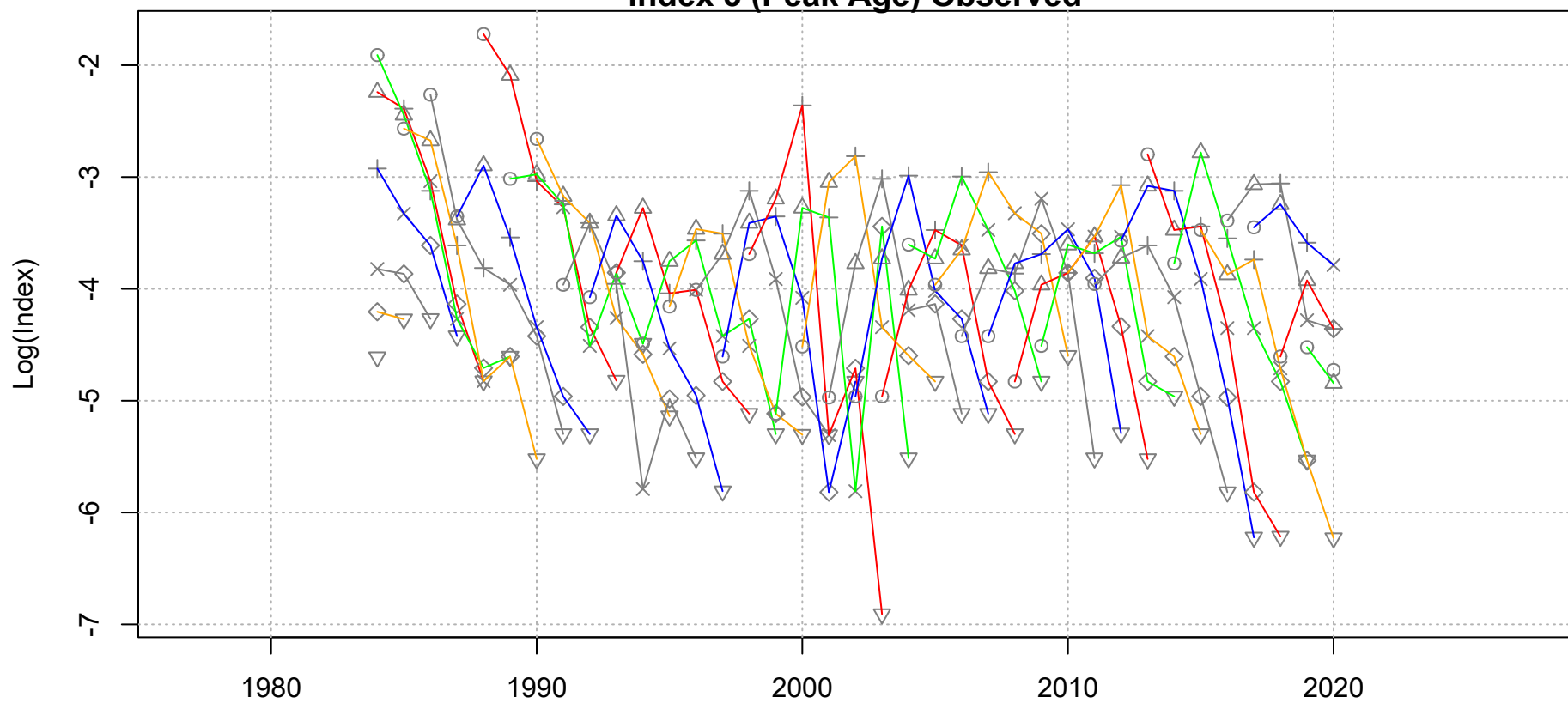




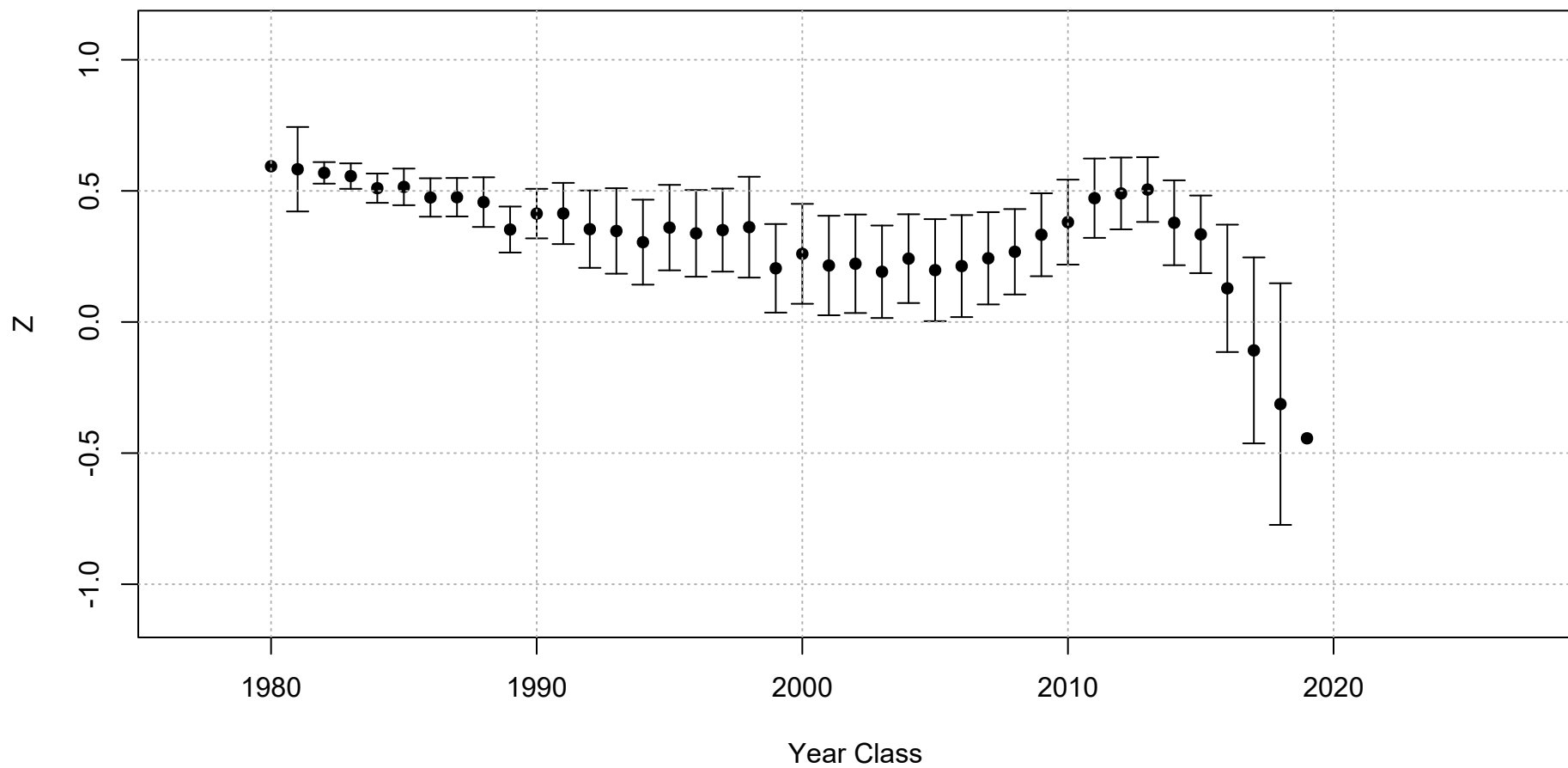
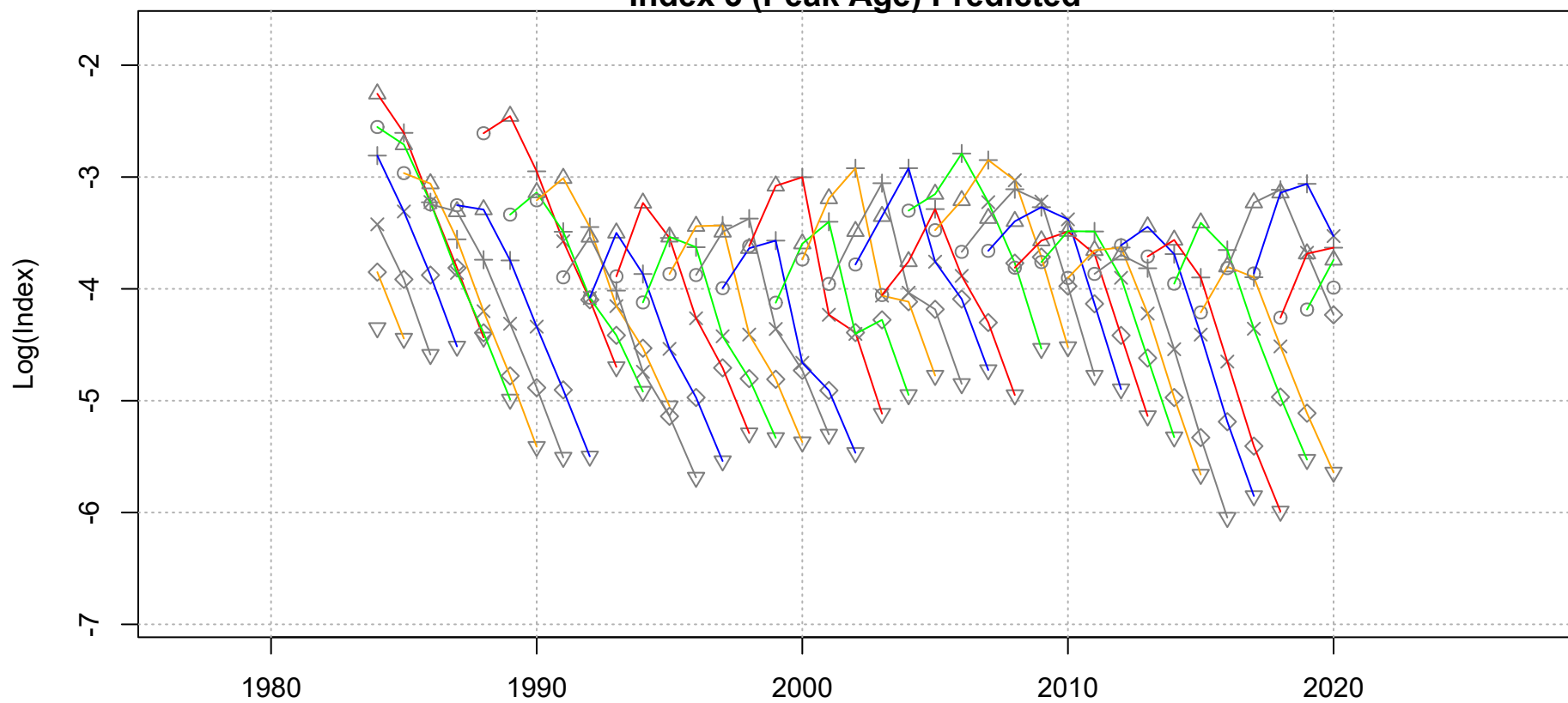


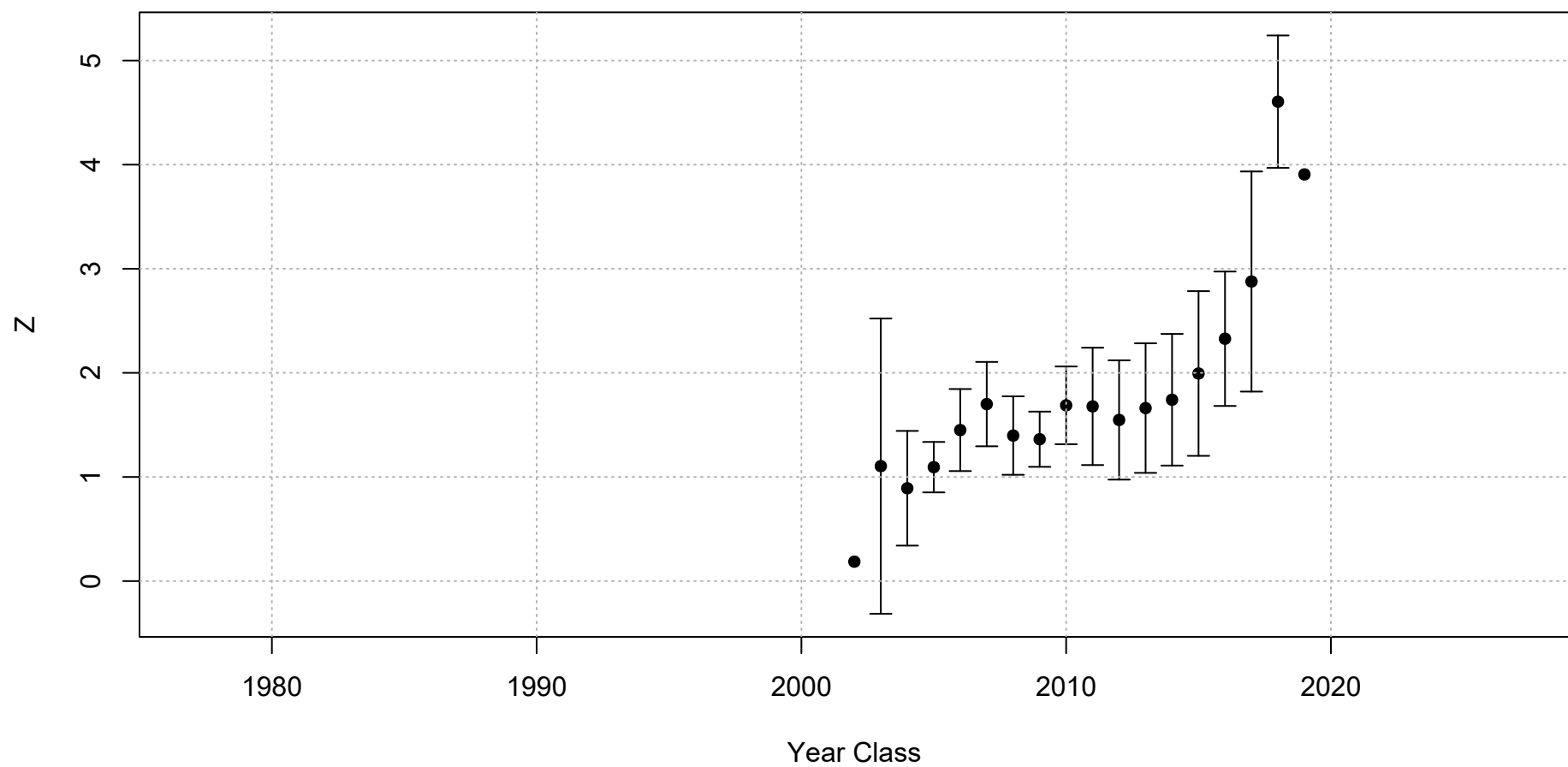
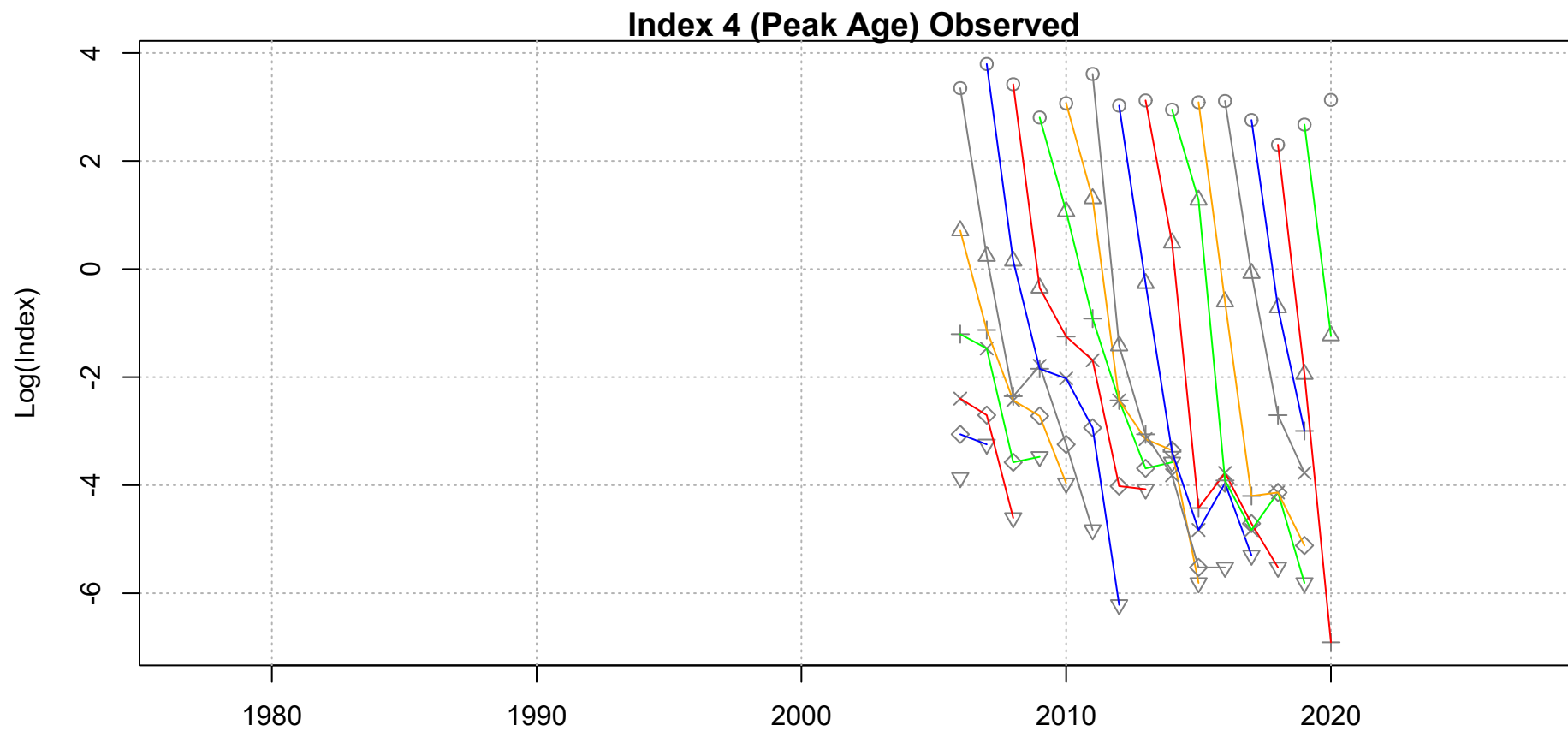


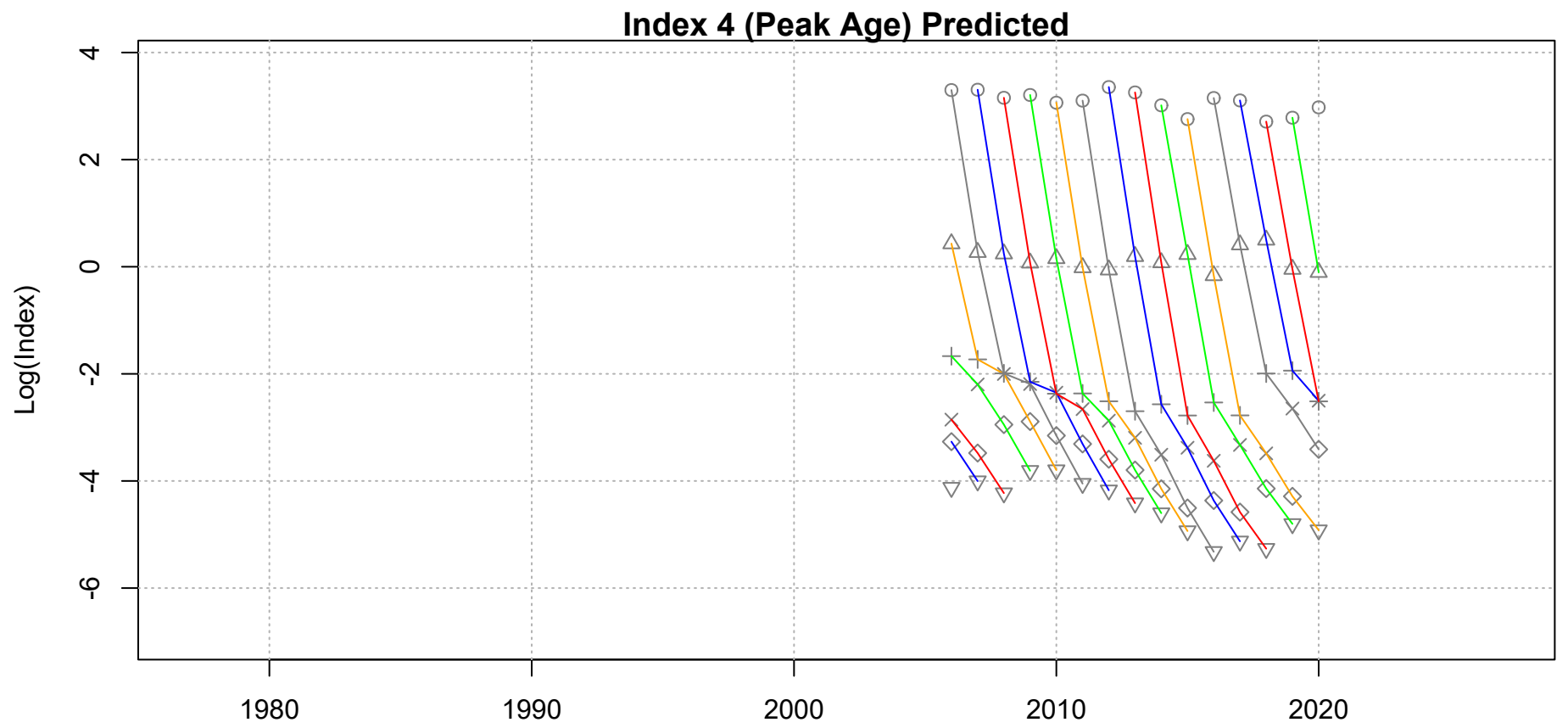
Index 3 (Peak Age) Observed



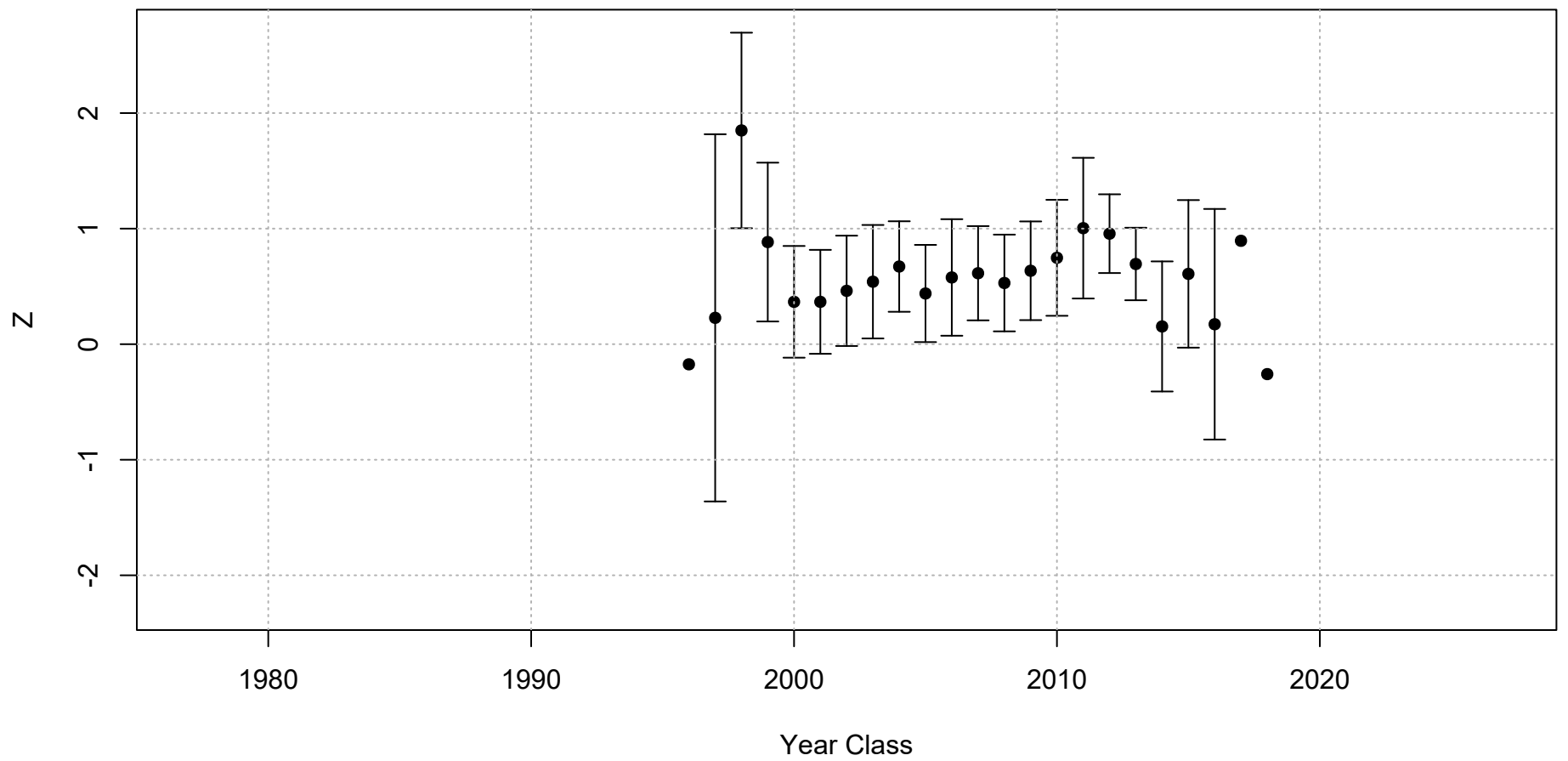
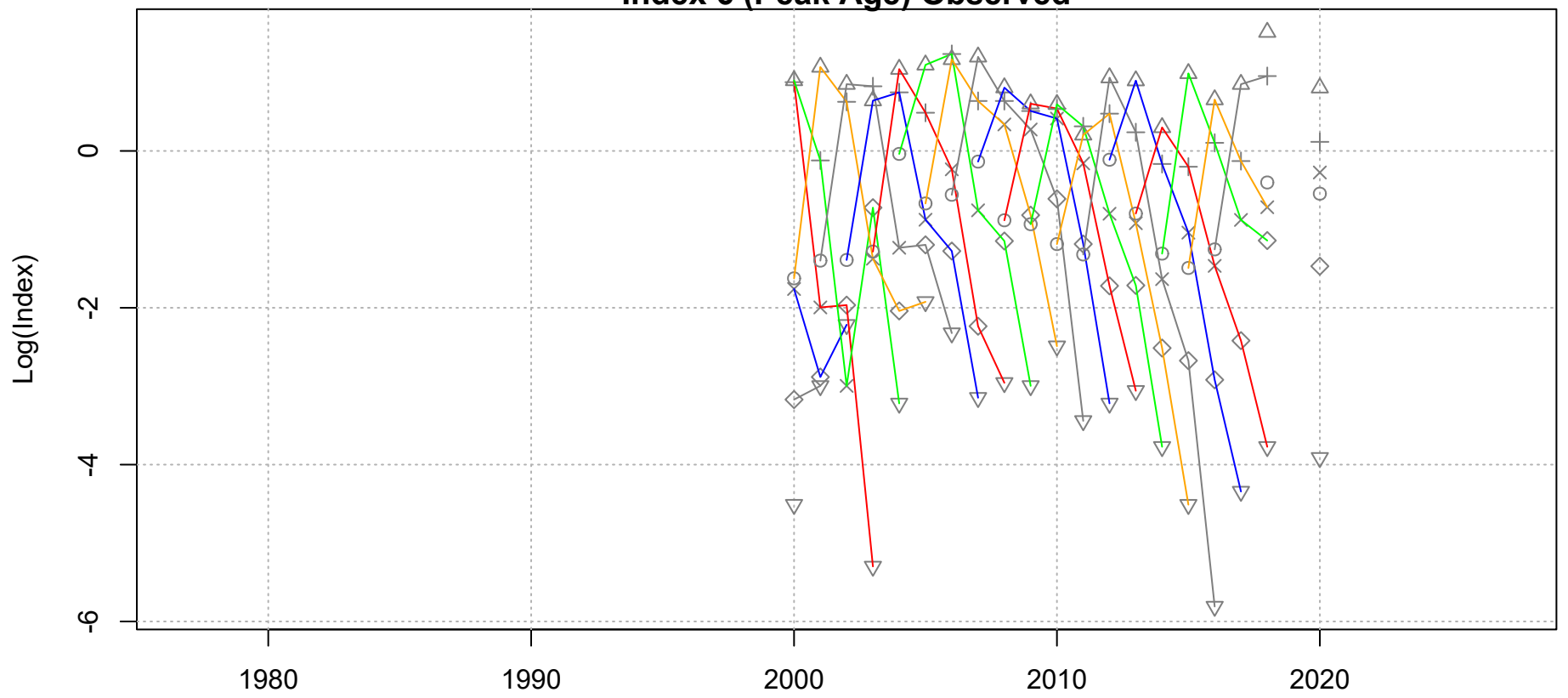
Index 3 (Peak Age) Predicted



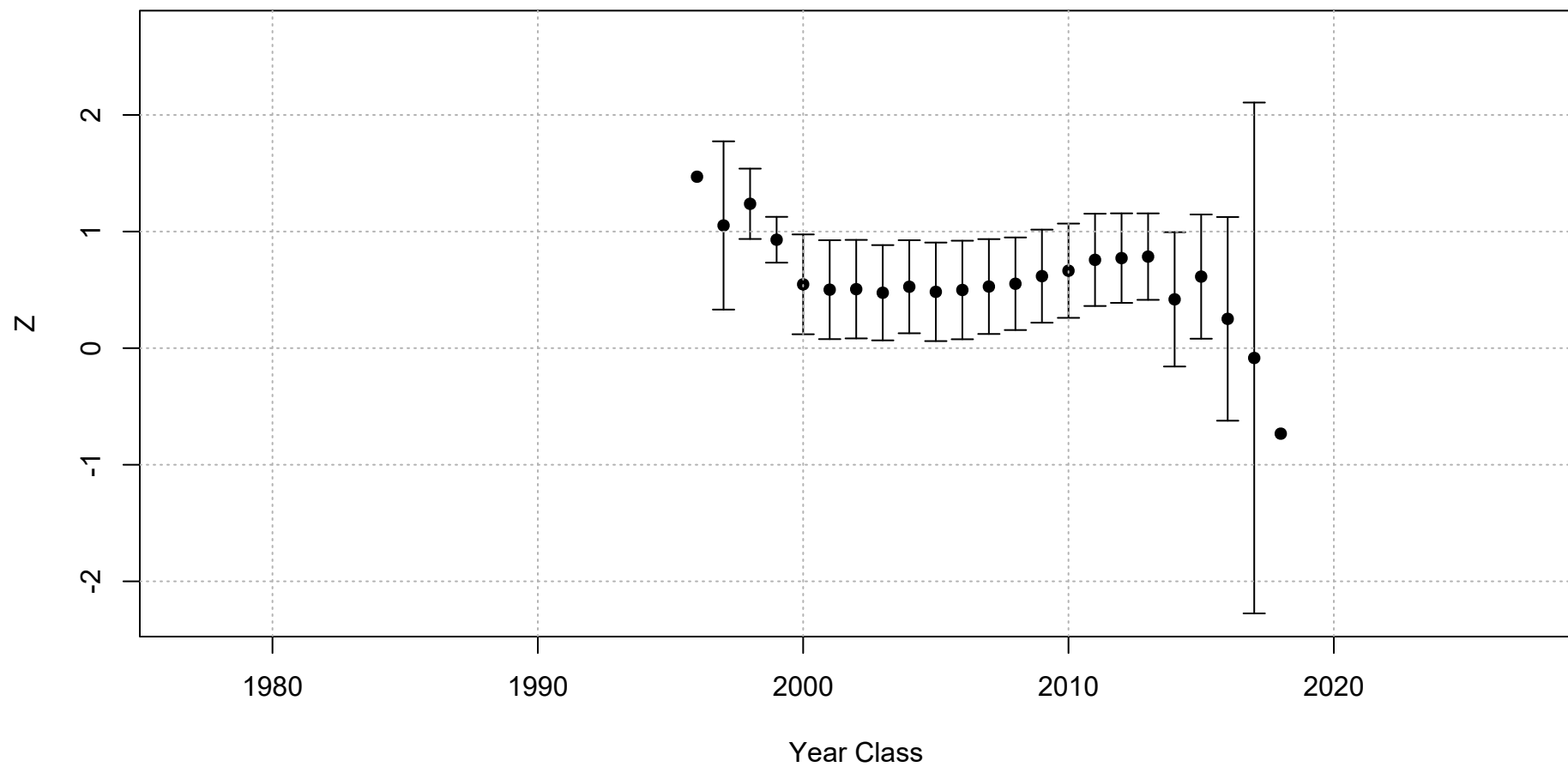
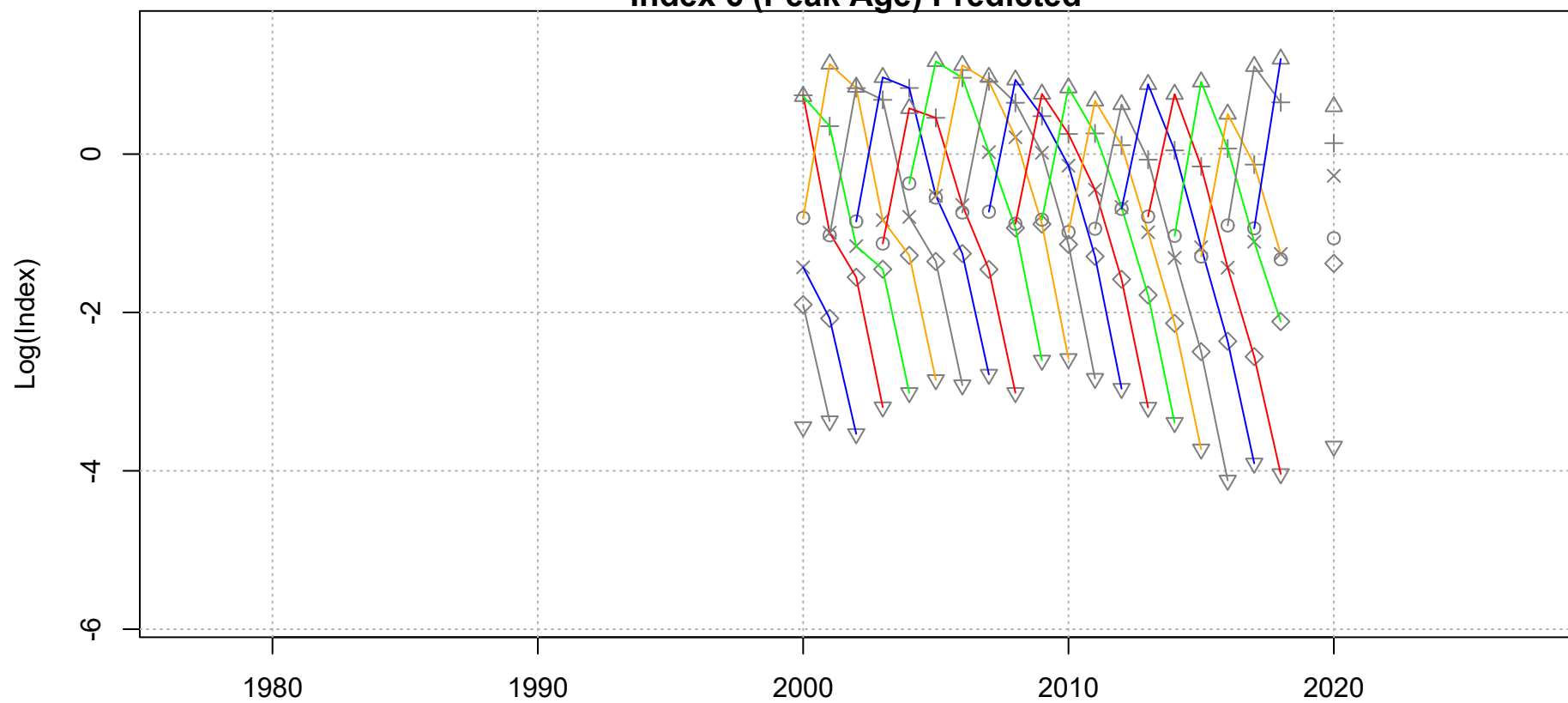




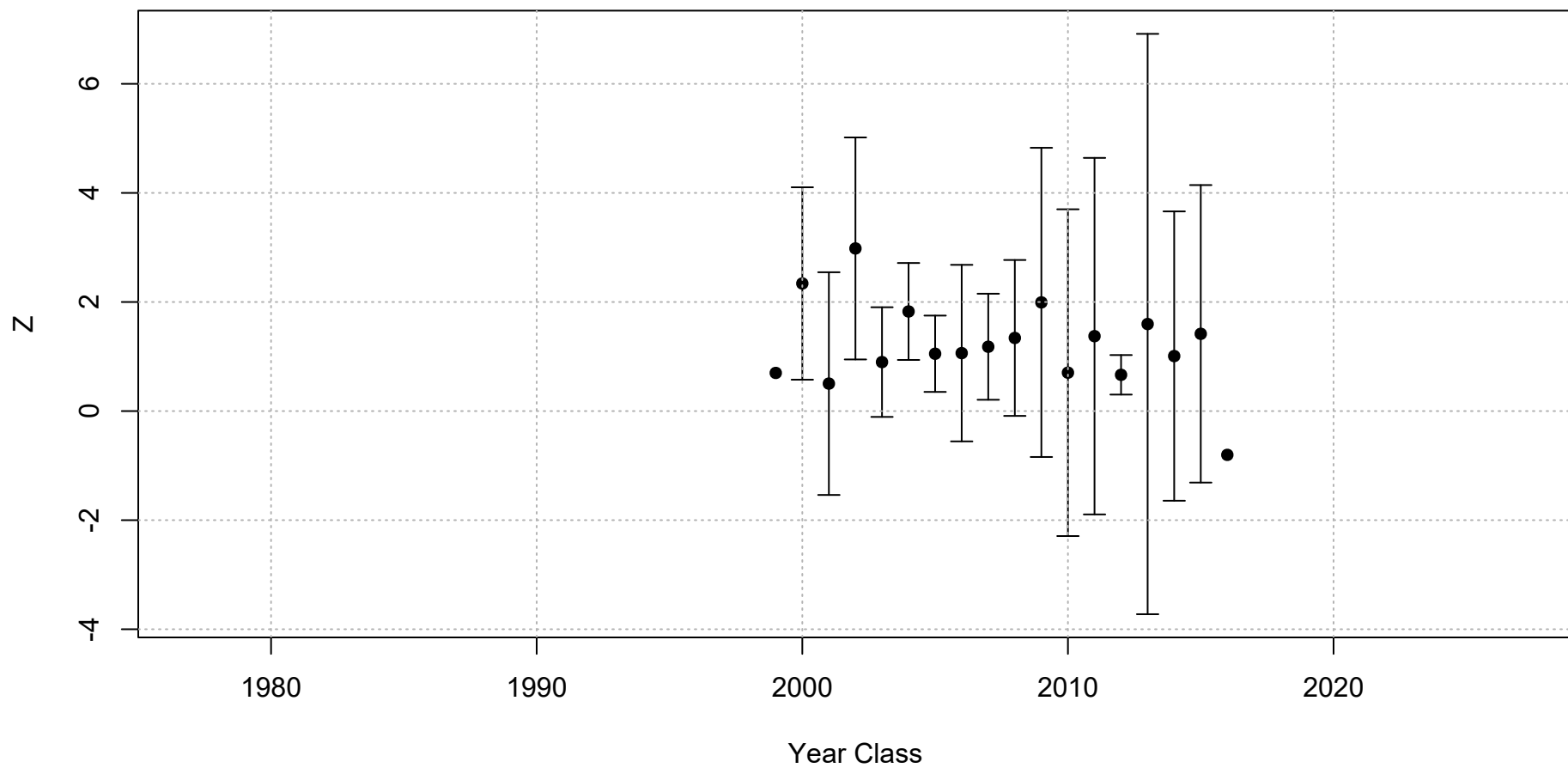
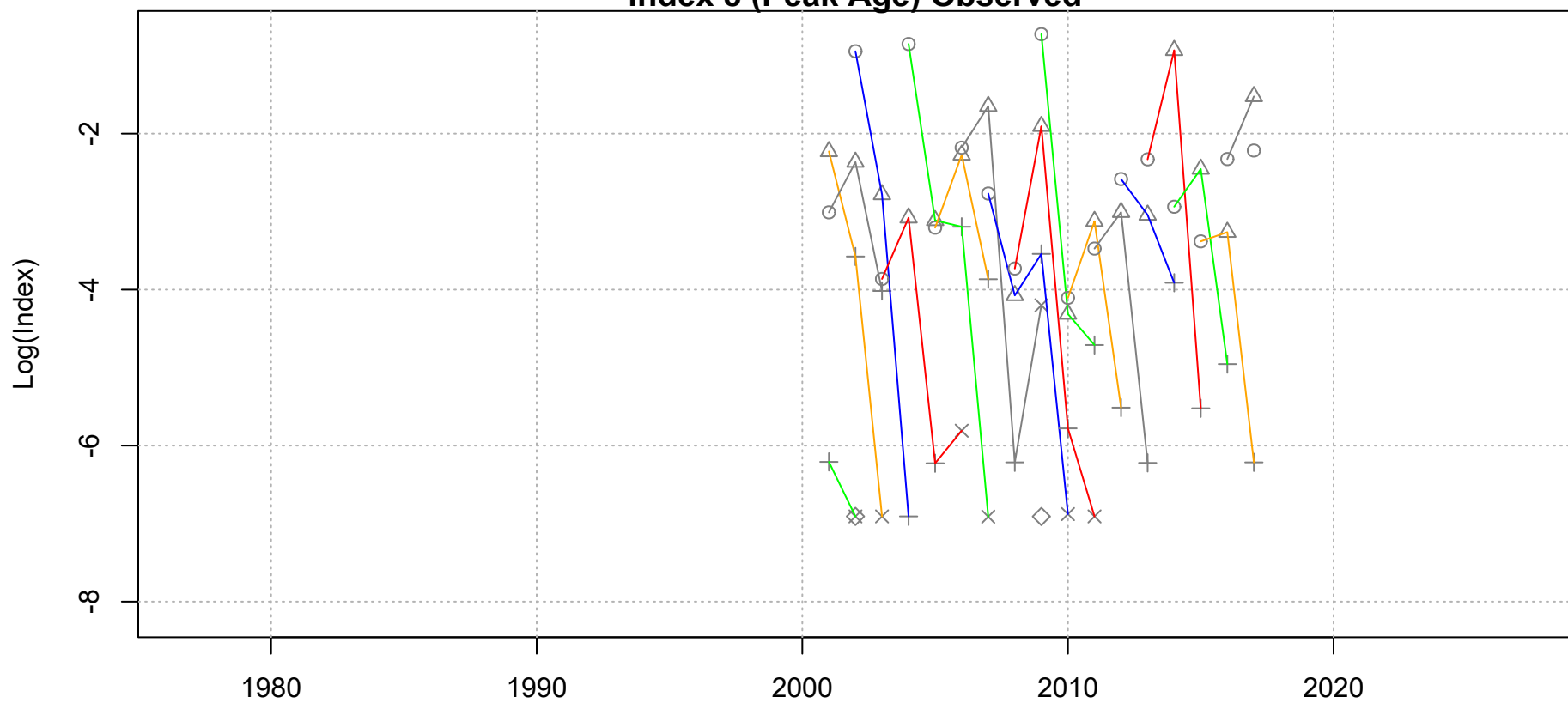
Index 6 (Peak Age) Observed

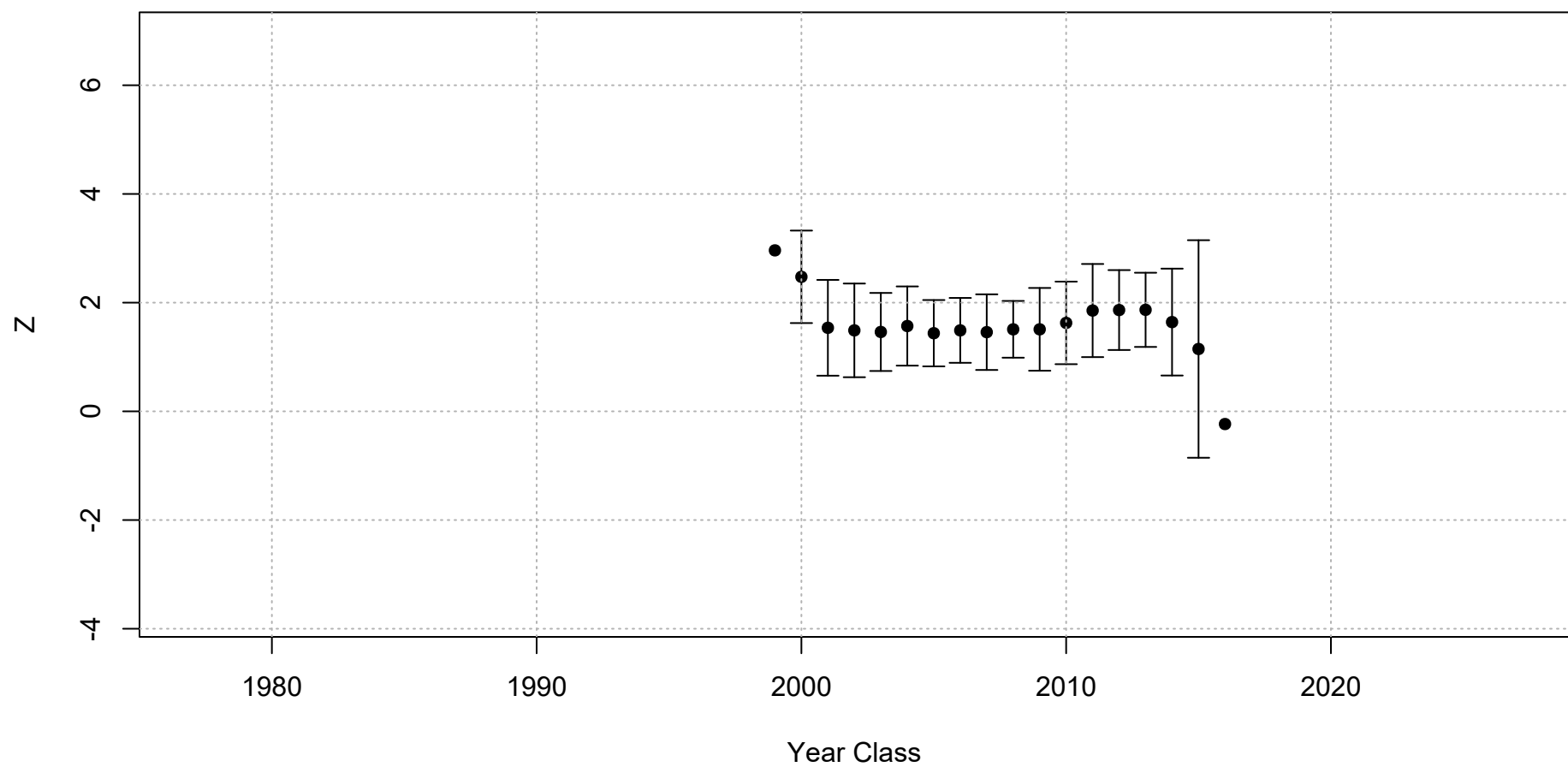
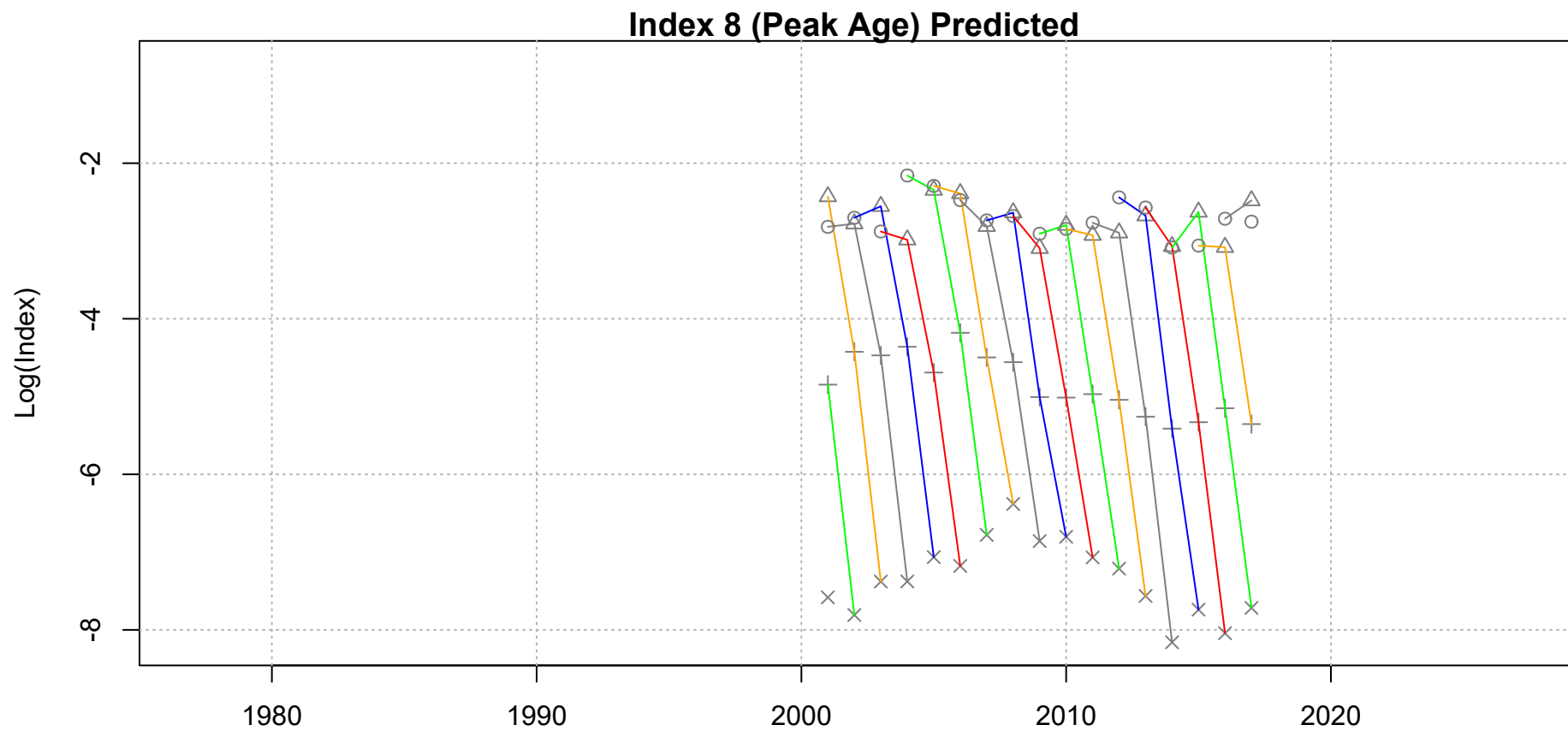


Index 6 (Peak Age) Predicted

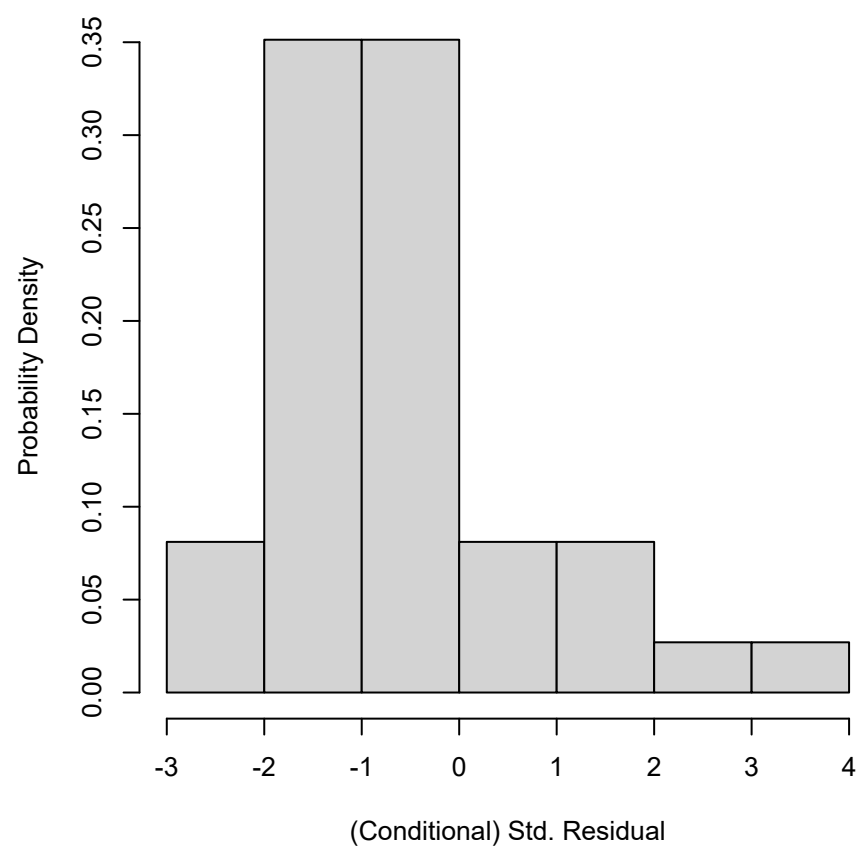
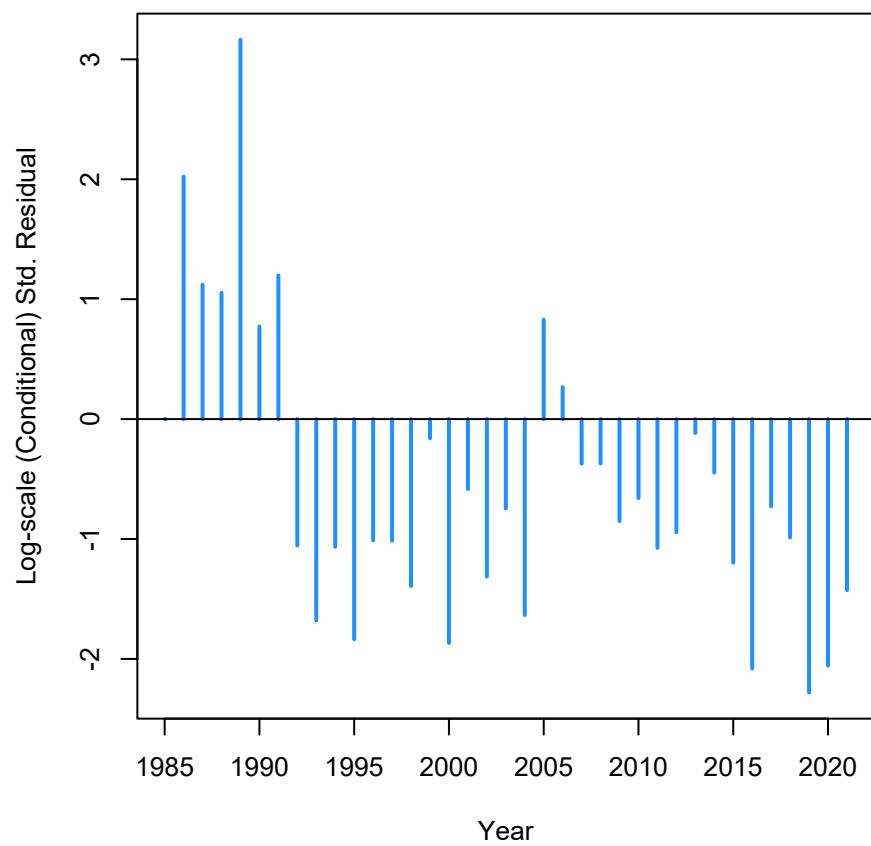
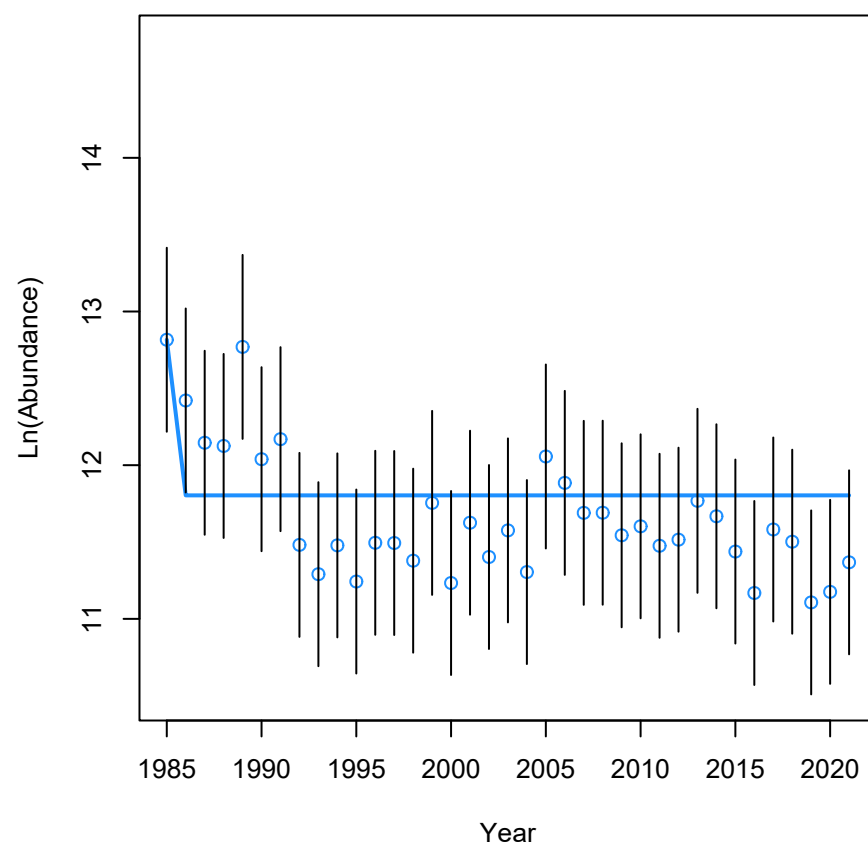
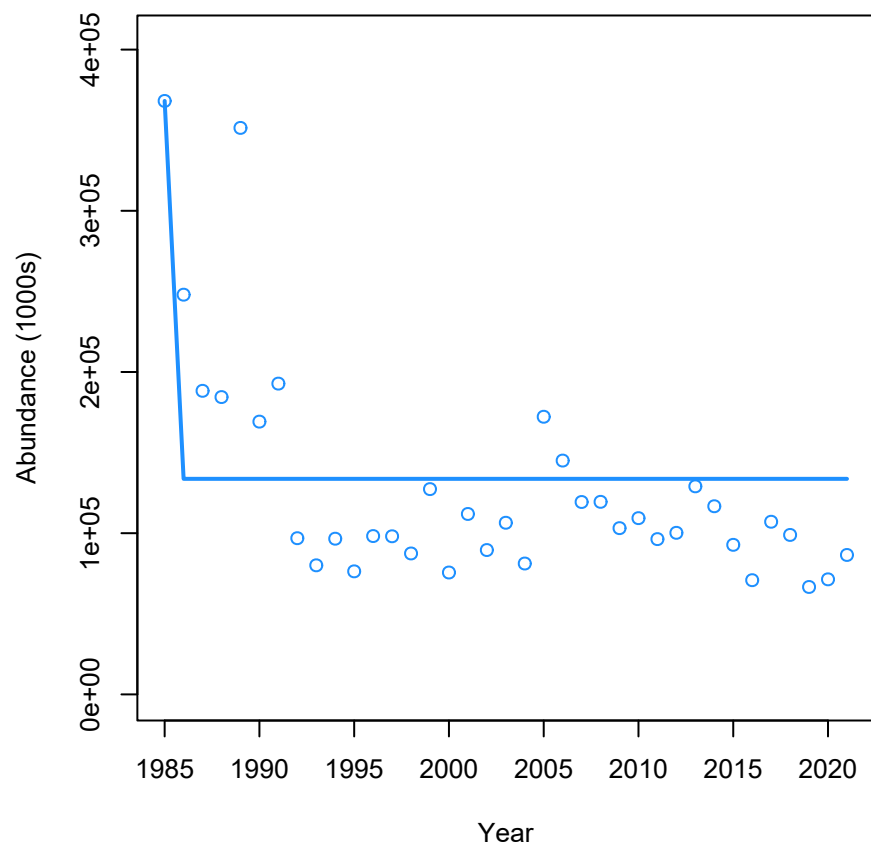


Index 8 (Peak Age) Observed

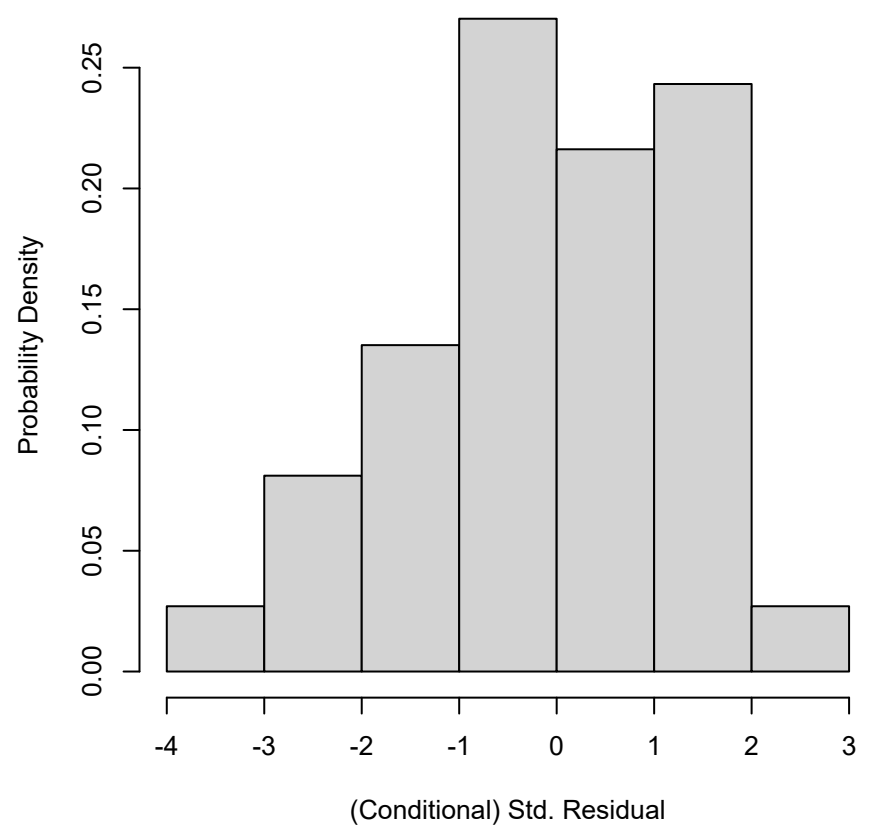
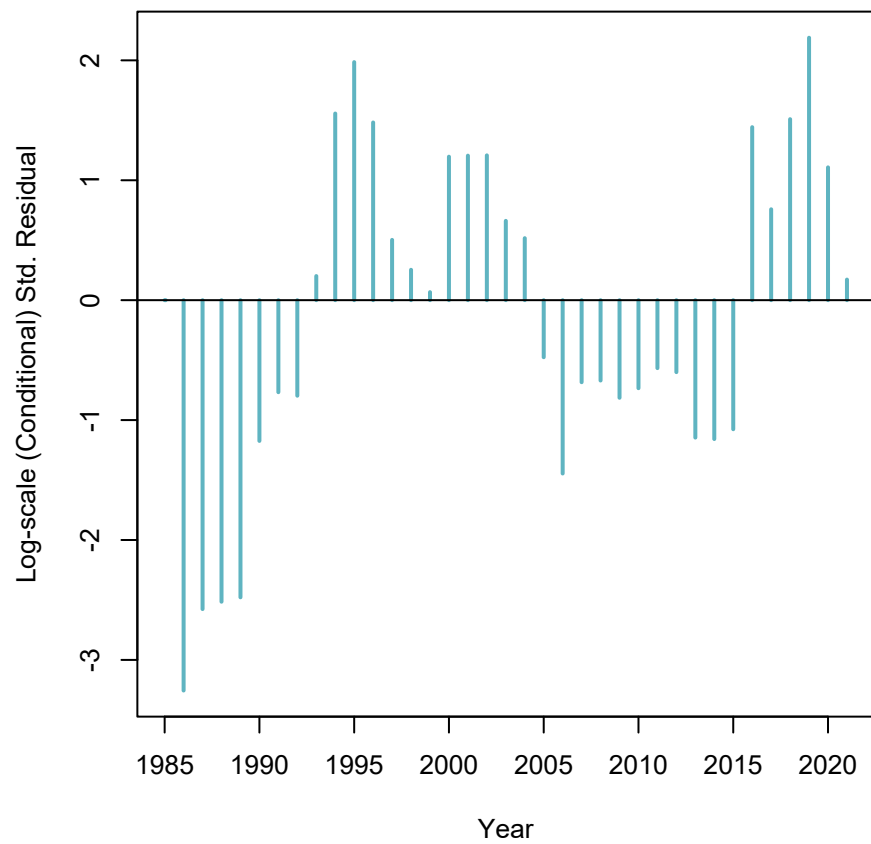
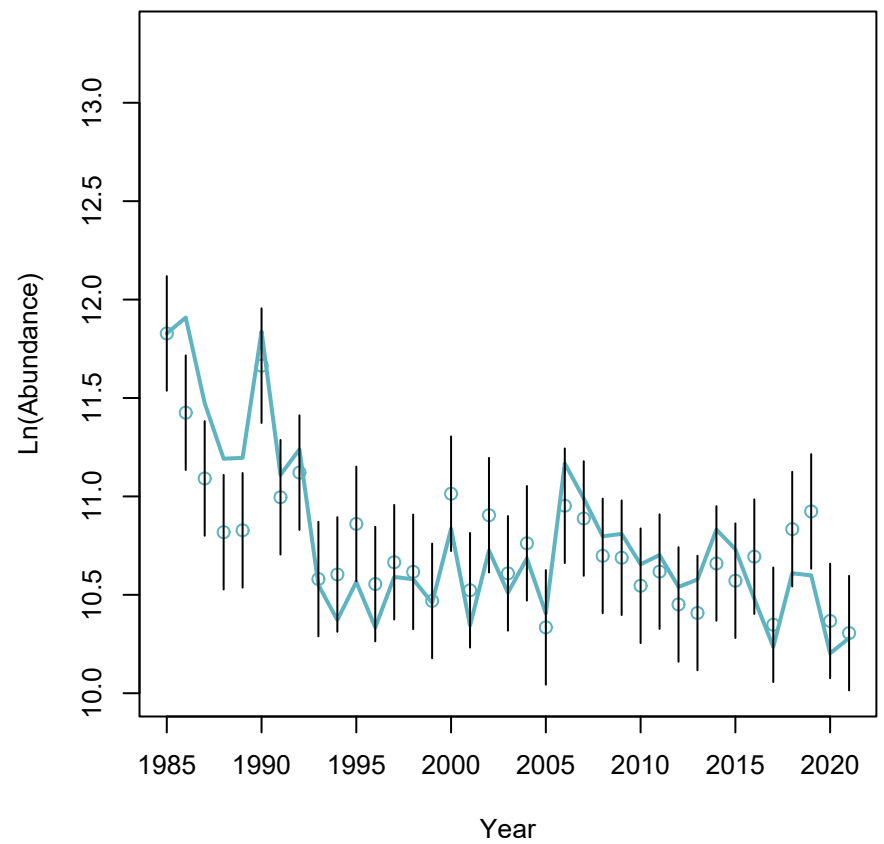
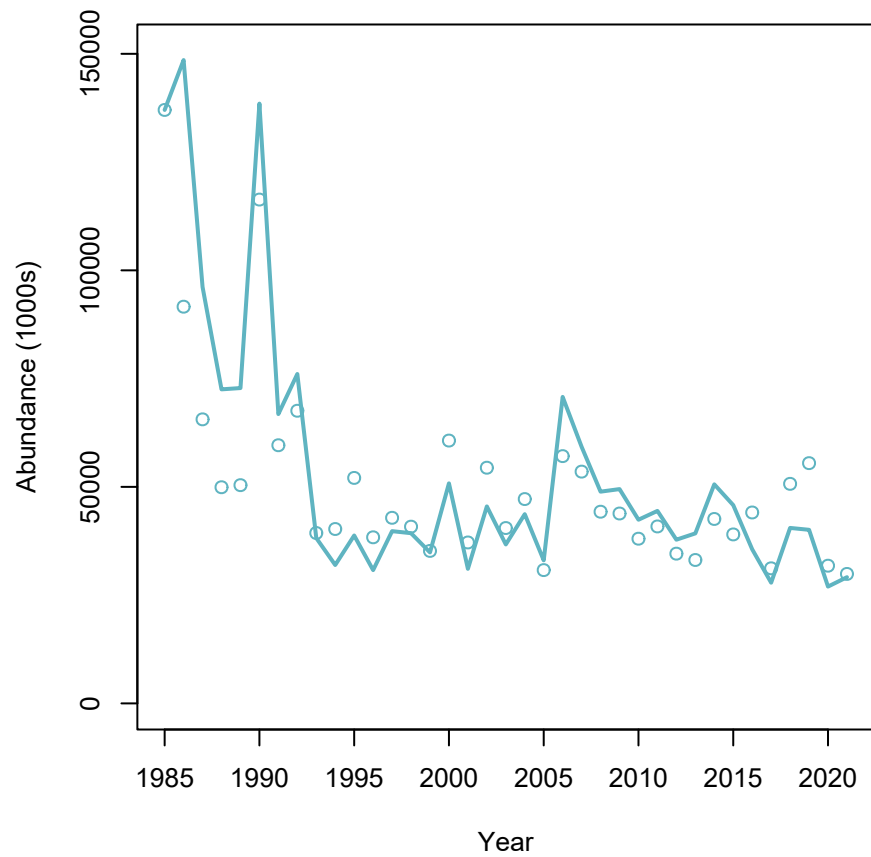




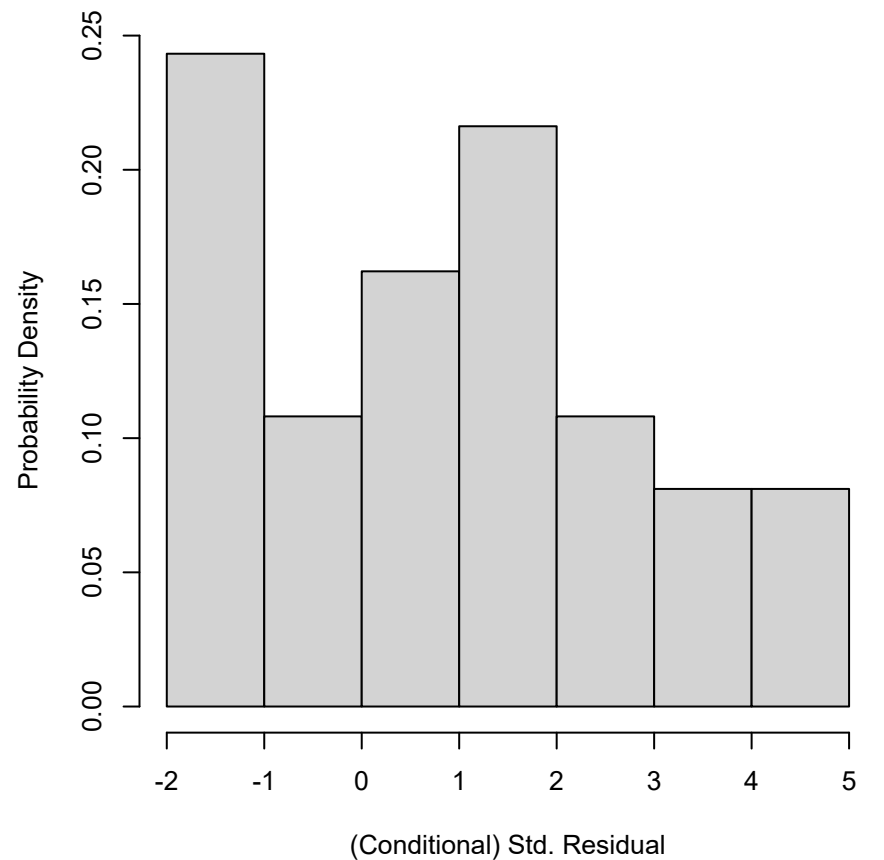
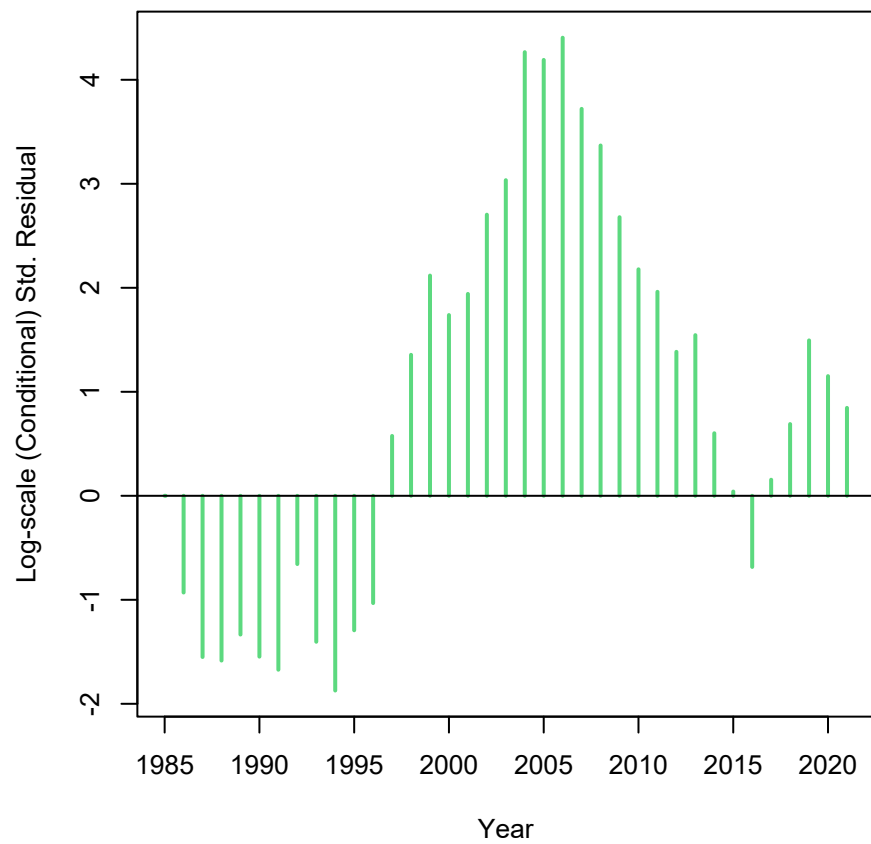
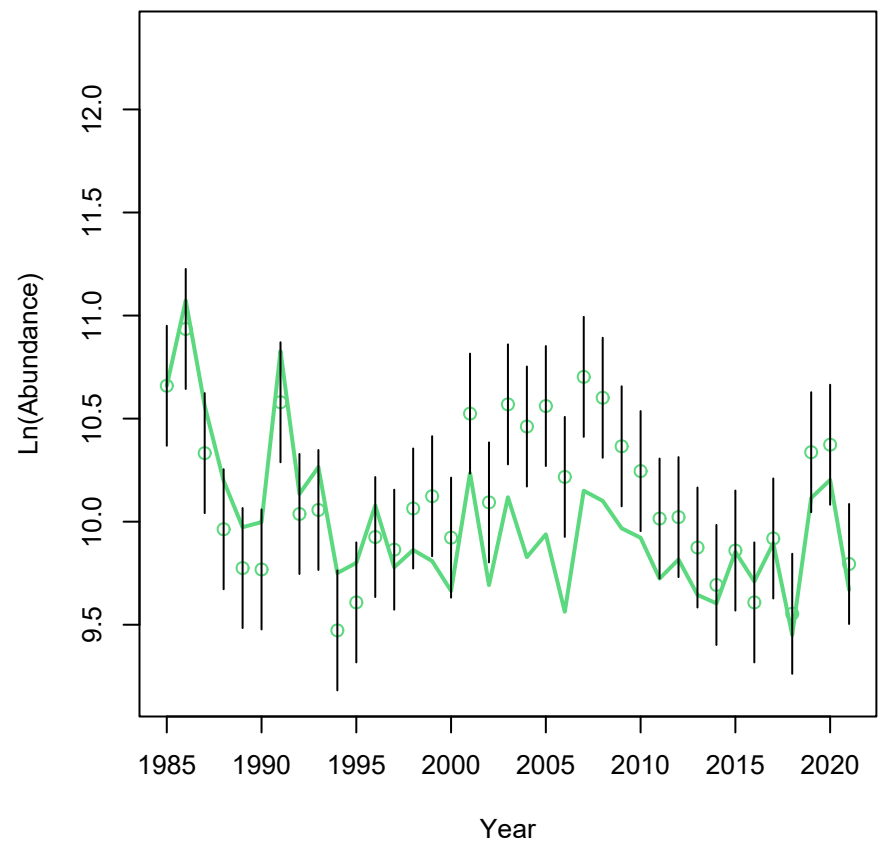
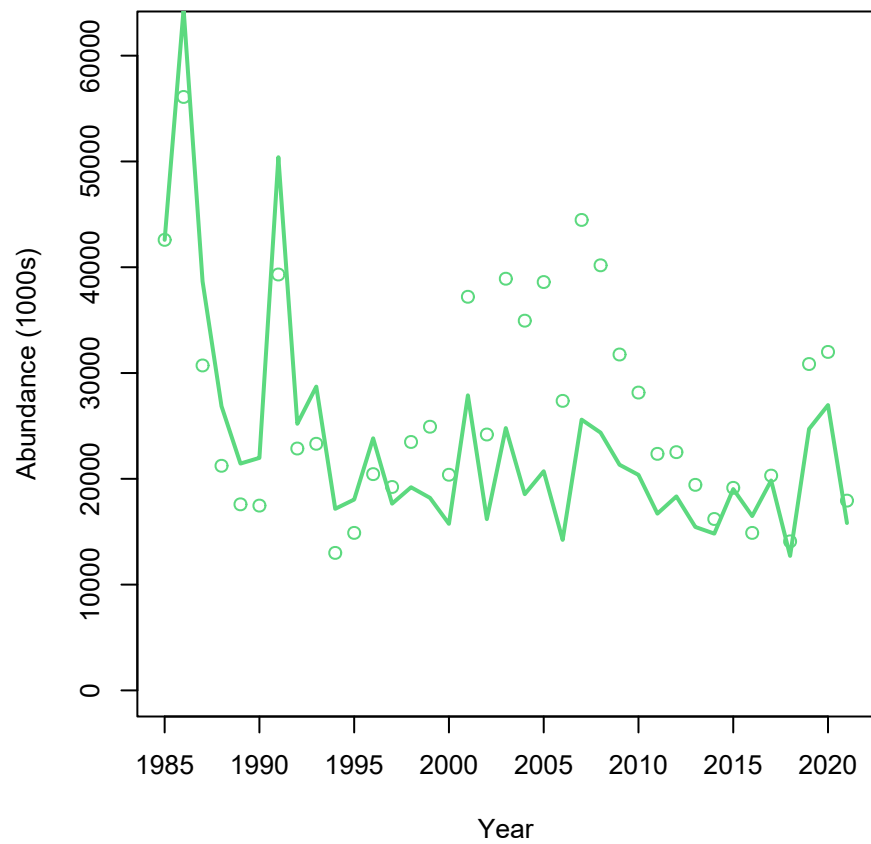
Conditional Expected and Posterior Estimates of Age 1 Abundance



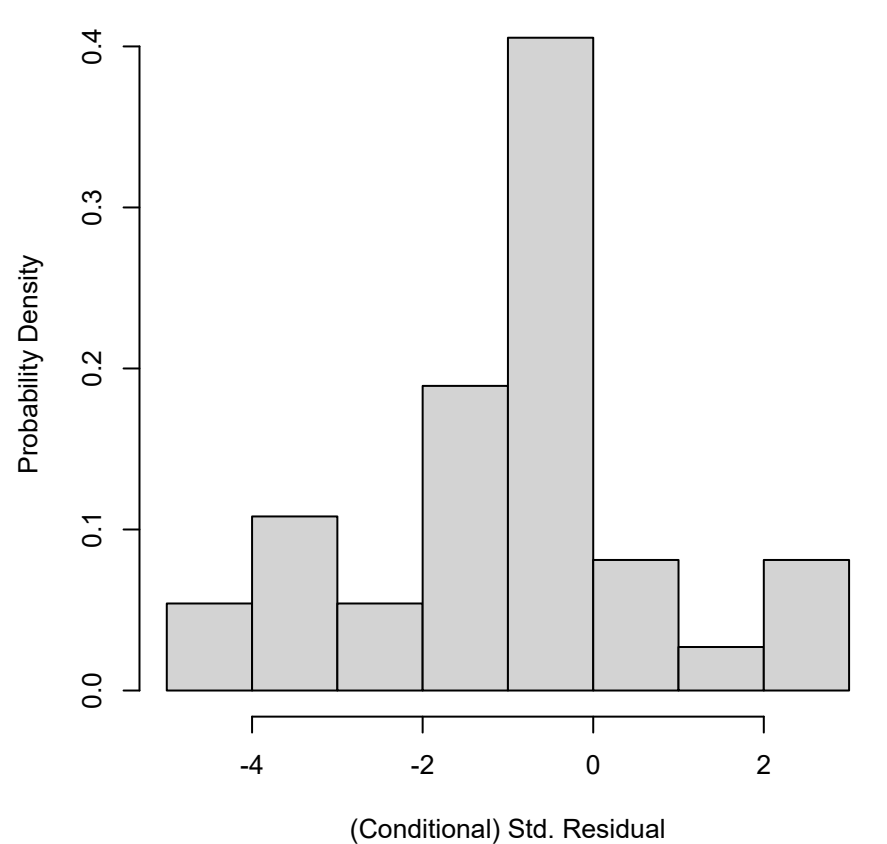
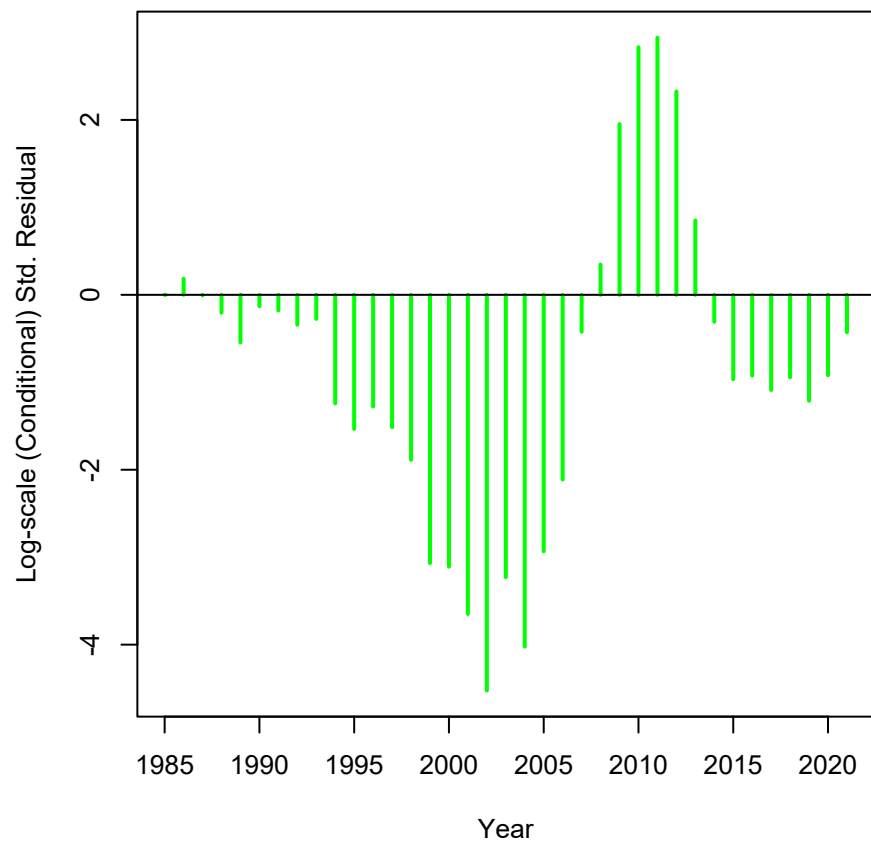
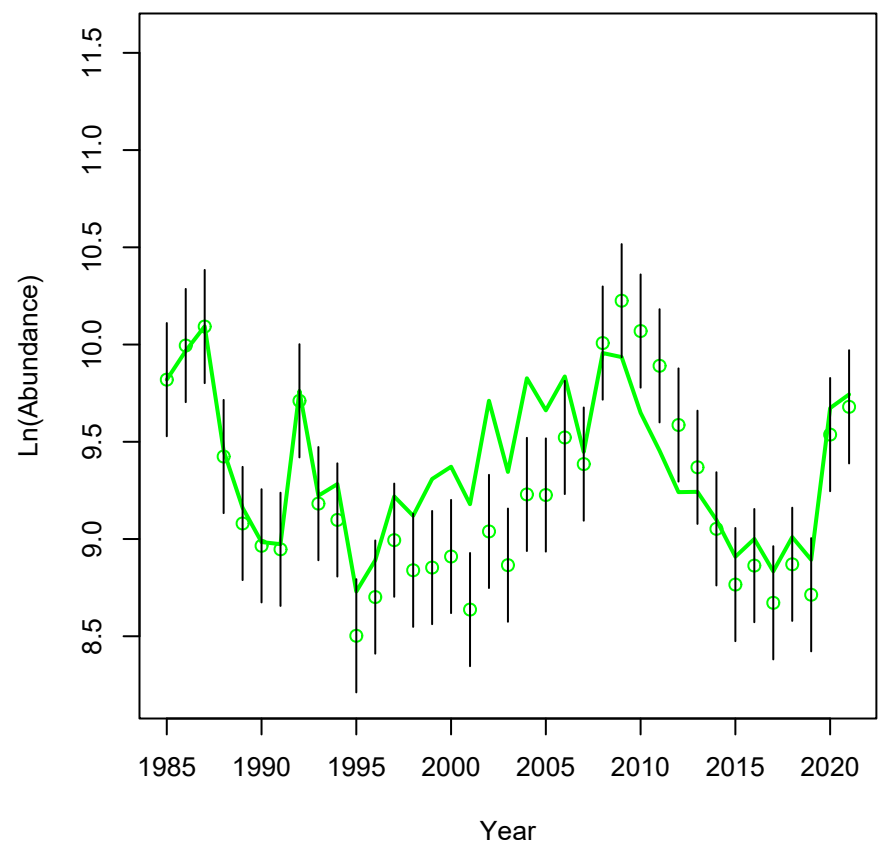
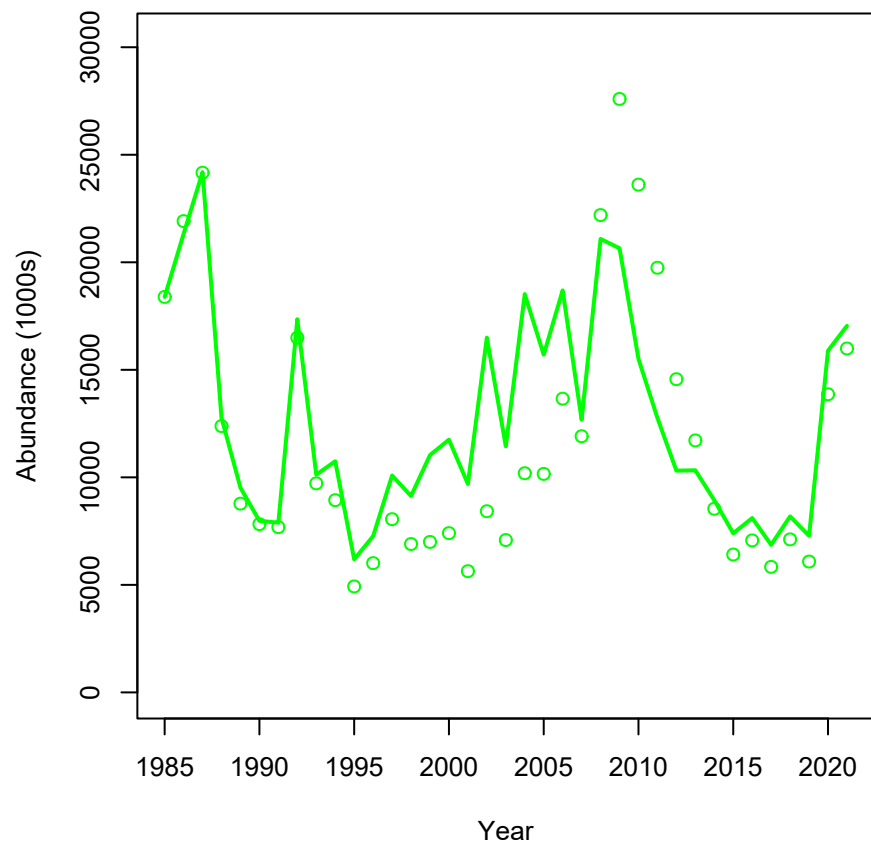
Conditional Expected and Posterior Estimates of Age 2 Abundance



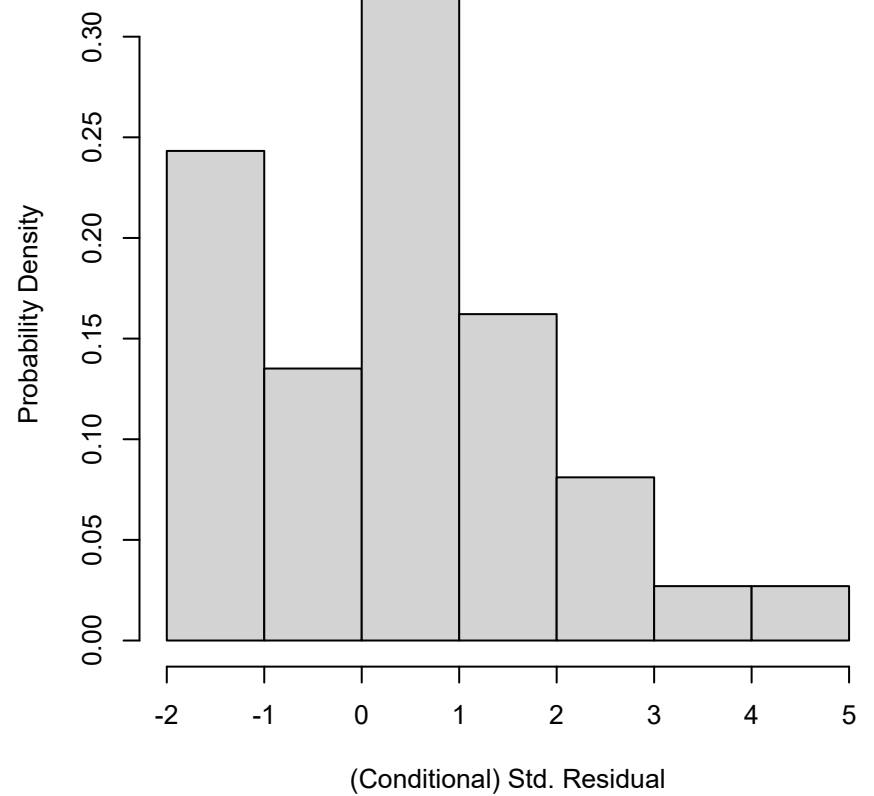
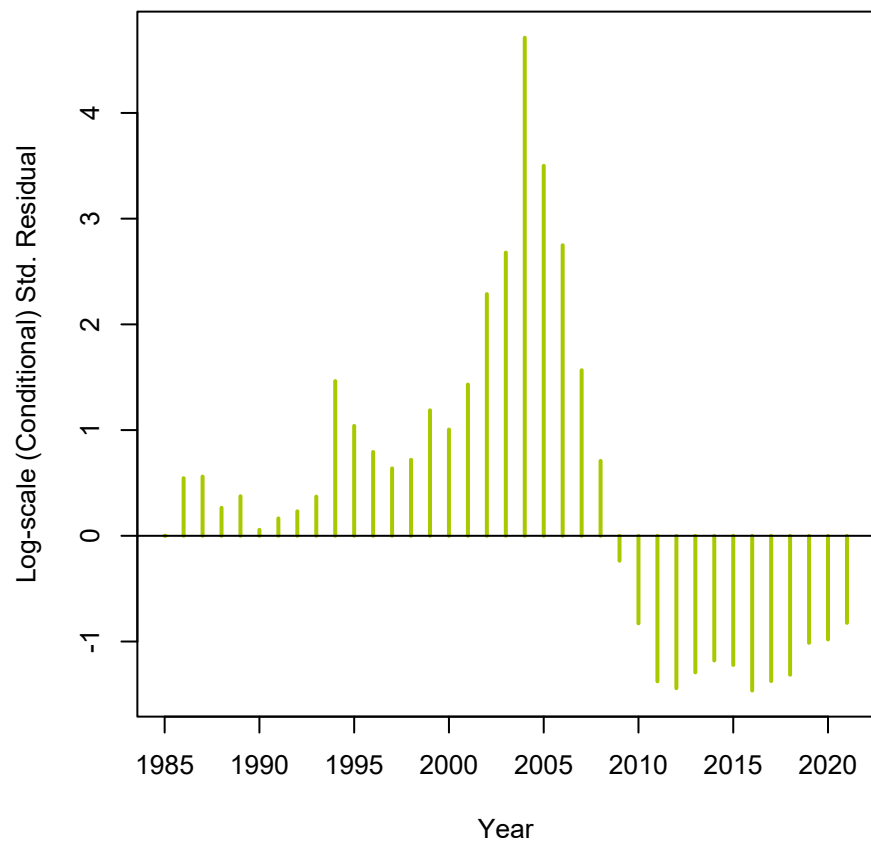
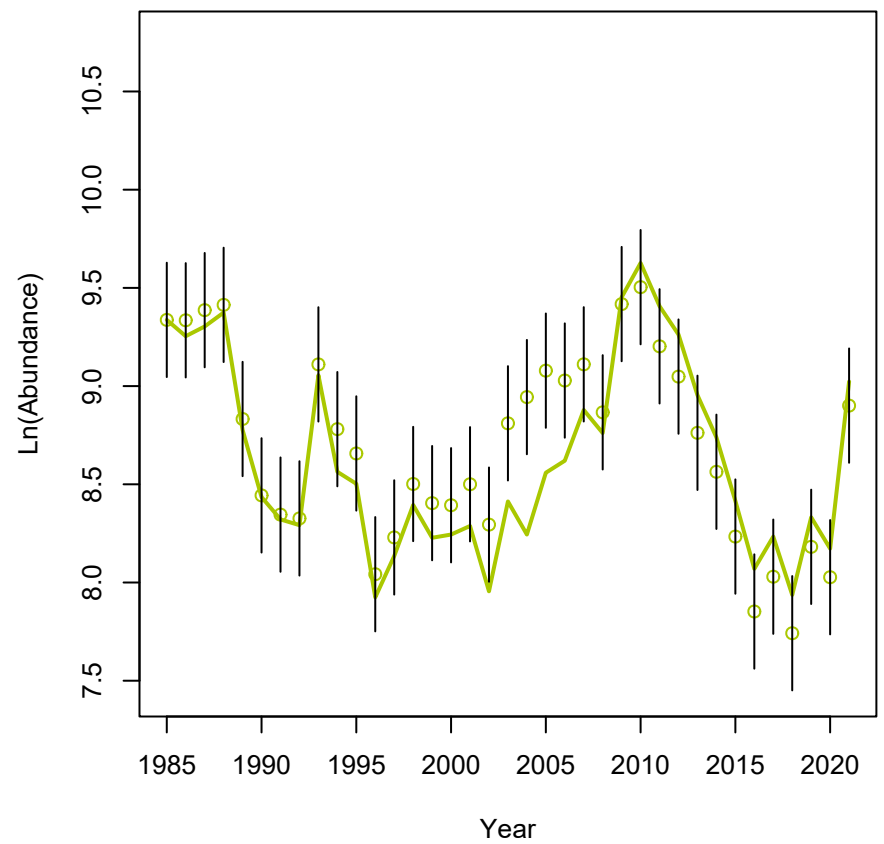
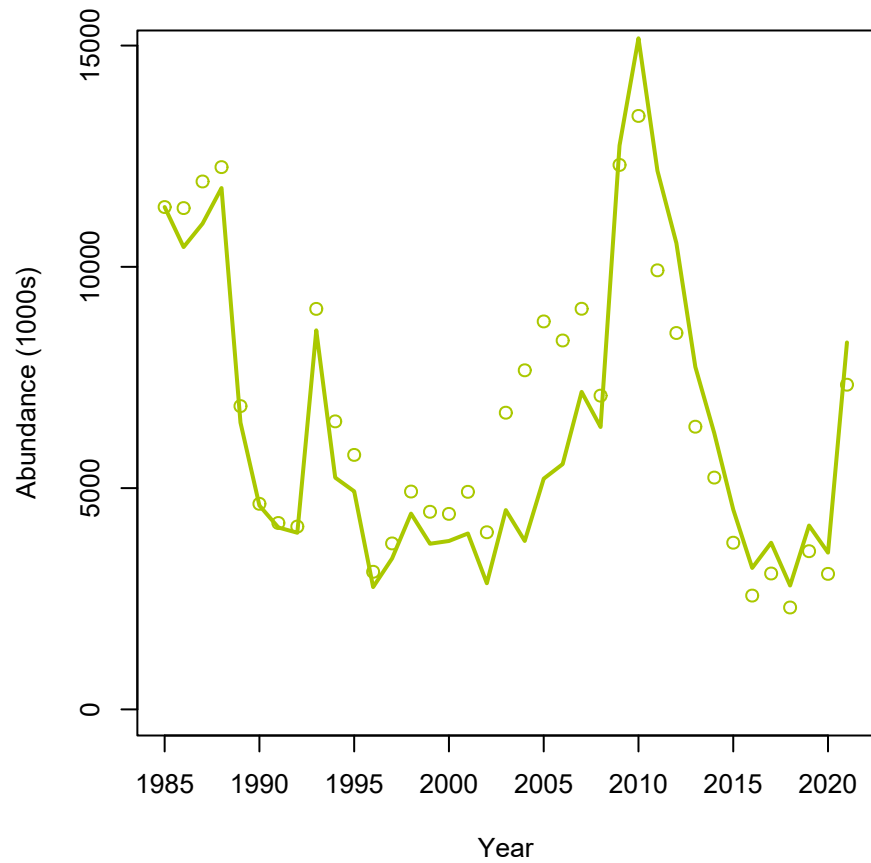
Conditional Expected and Posterior Estimates of Age 3 Abundance



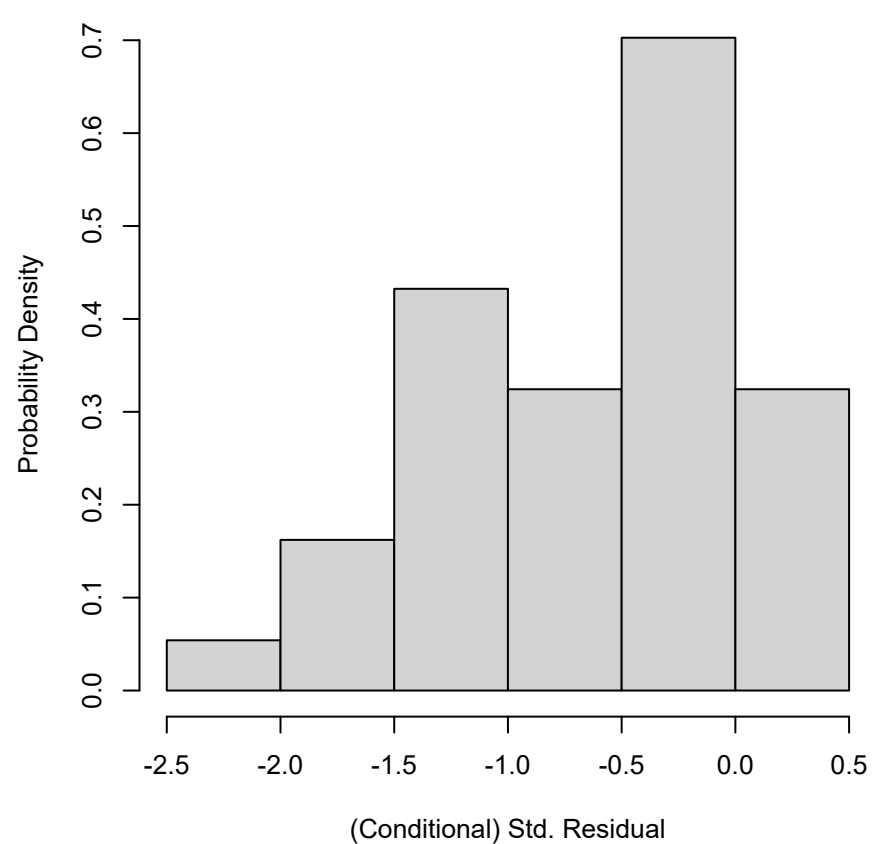
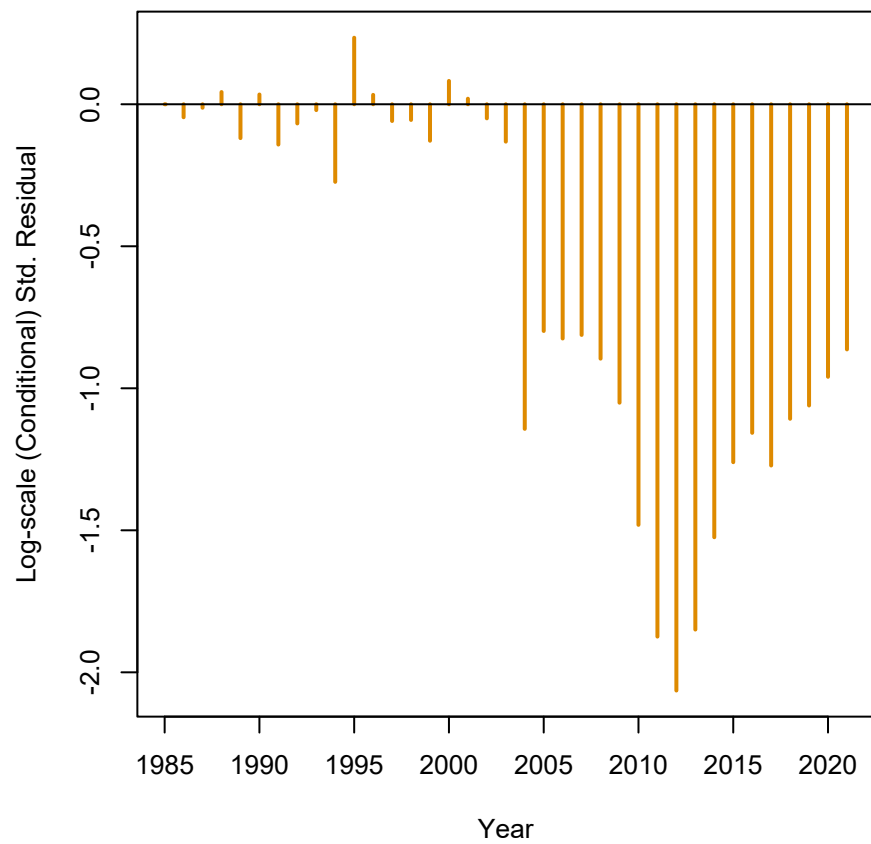
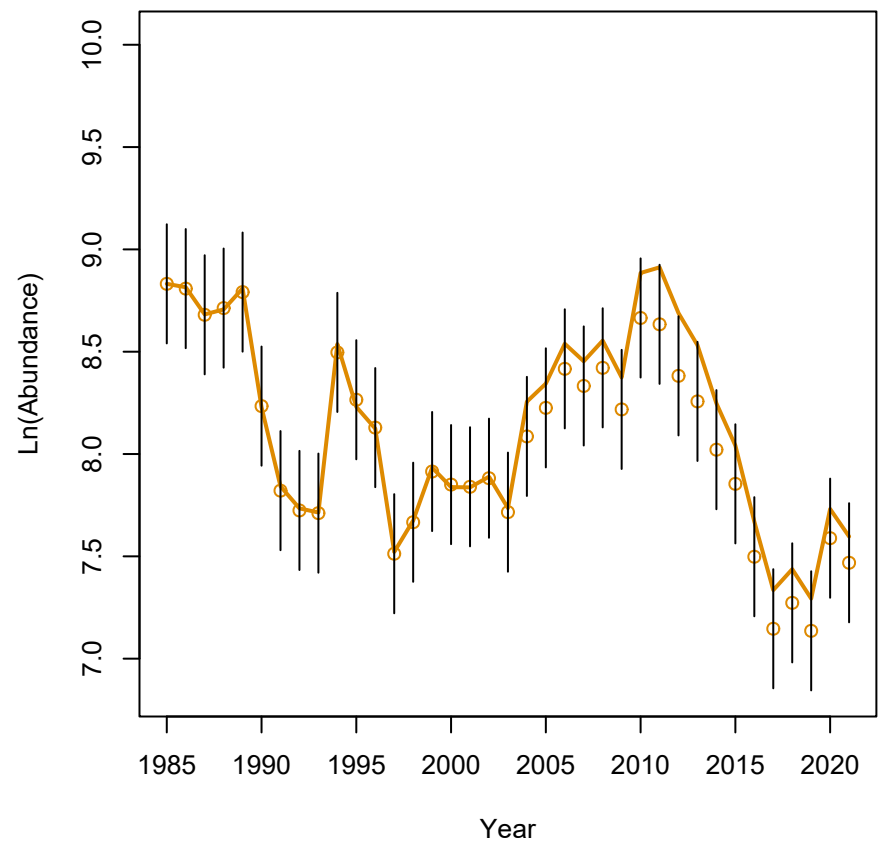
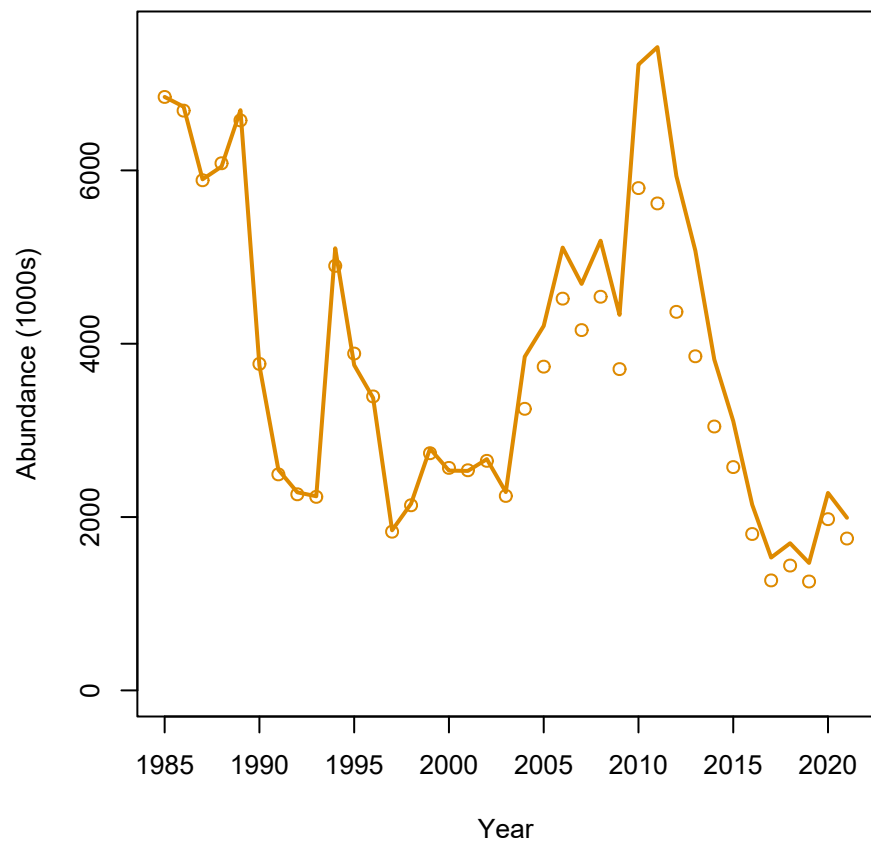
Conditional Expected and Posterior Estimates of Age 4 Abundance



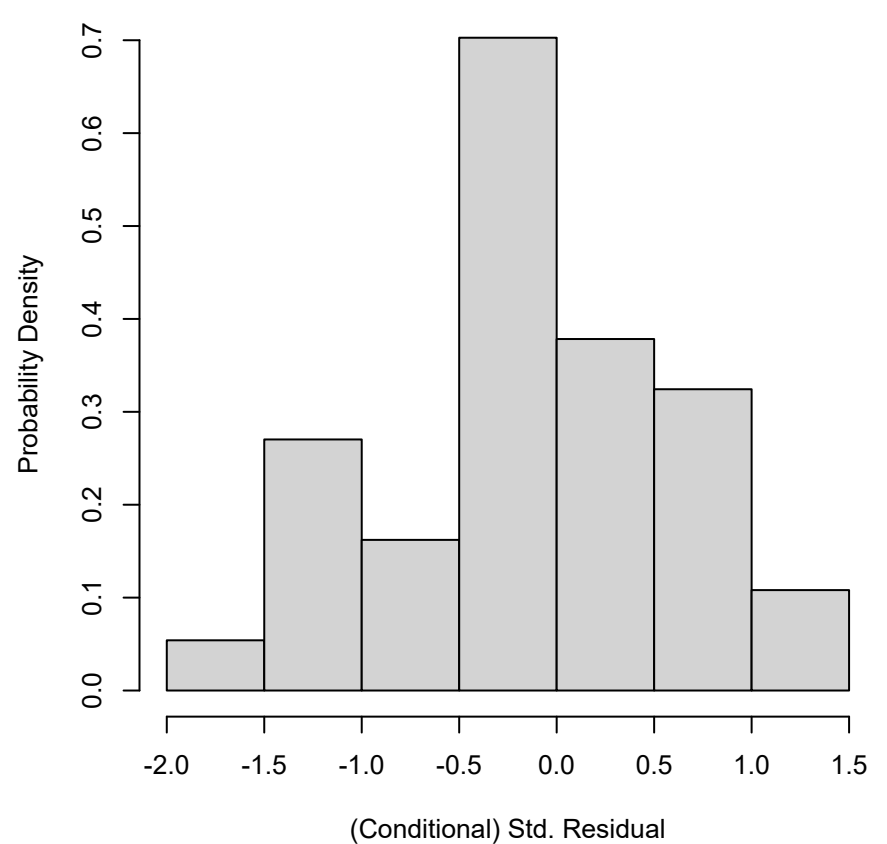
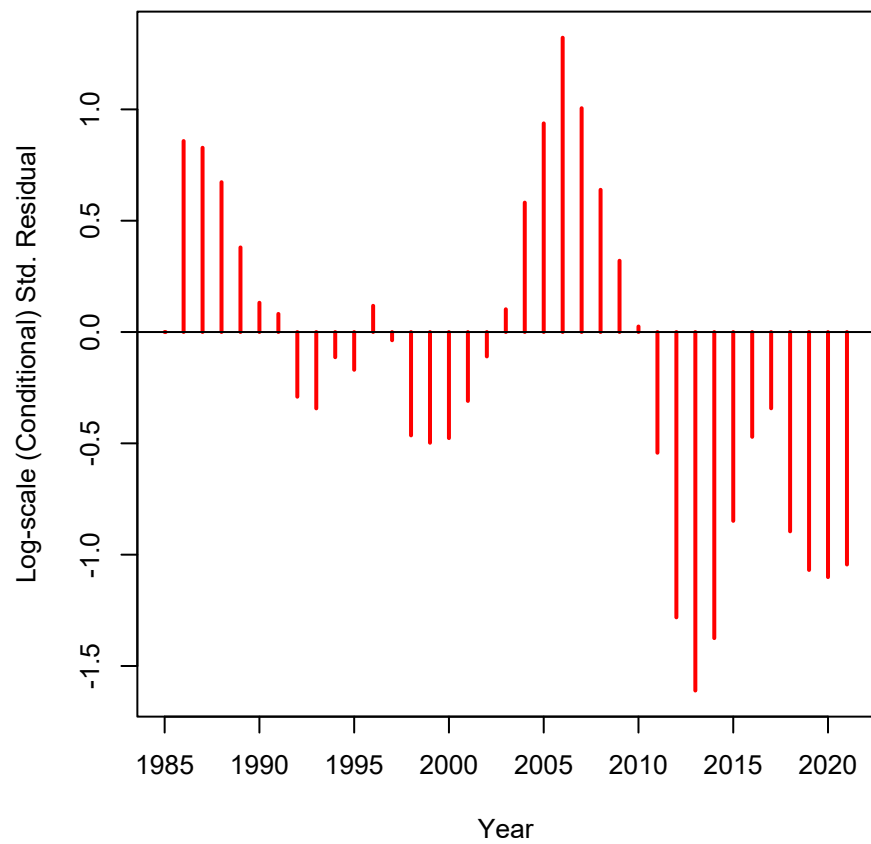
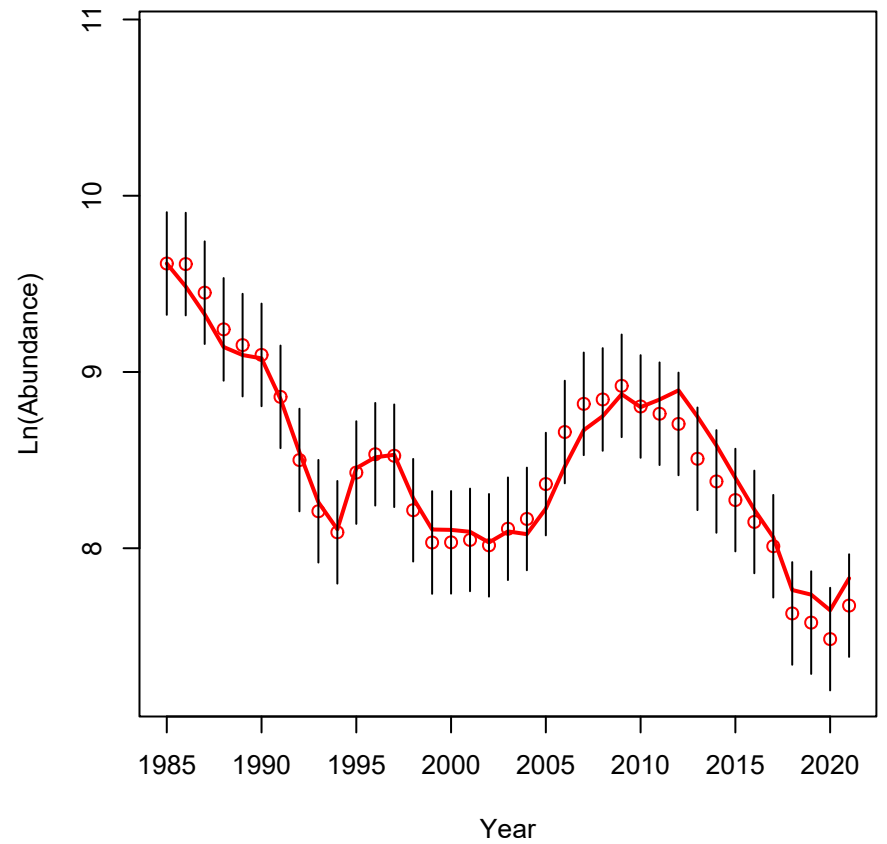
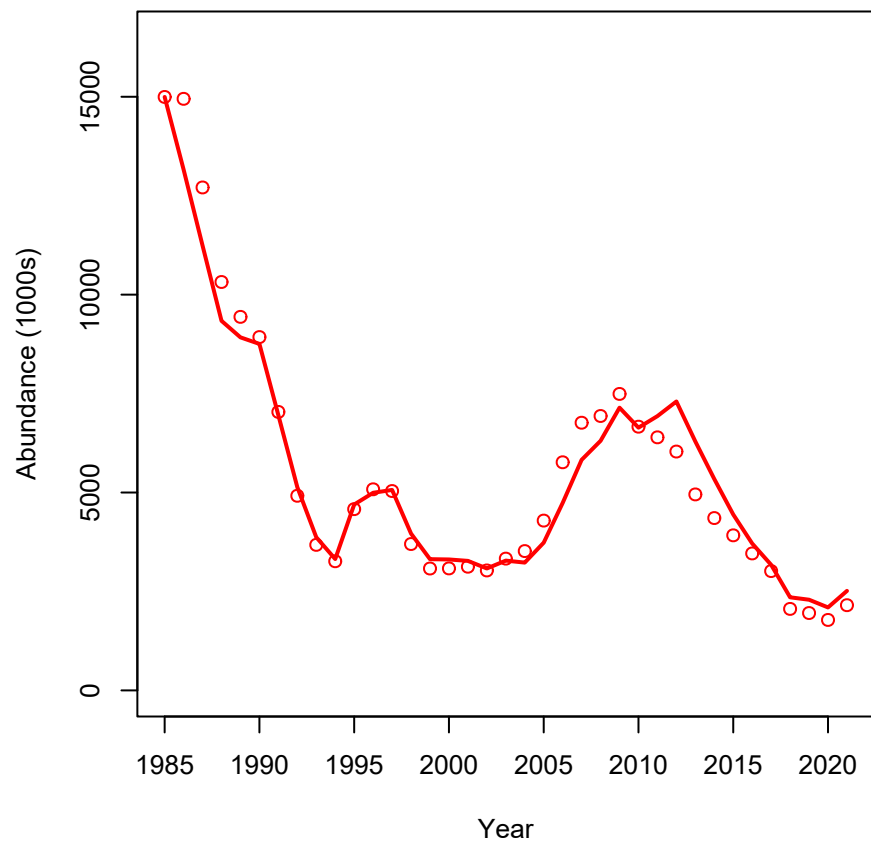
Conditional Expected and Posterior Estimates of Age 5 Abundance



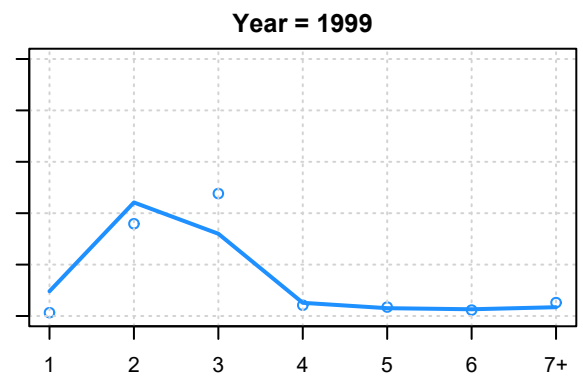
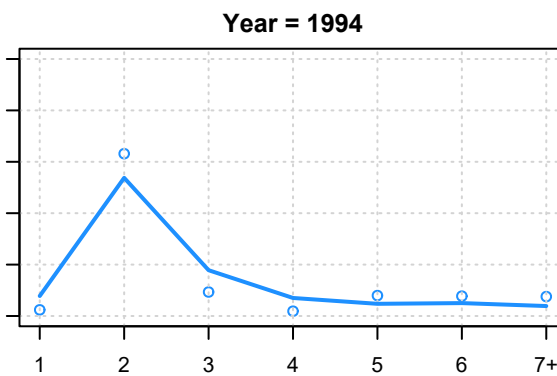
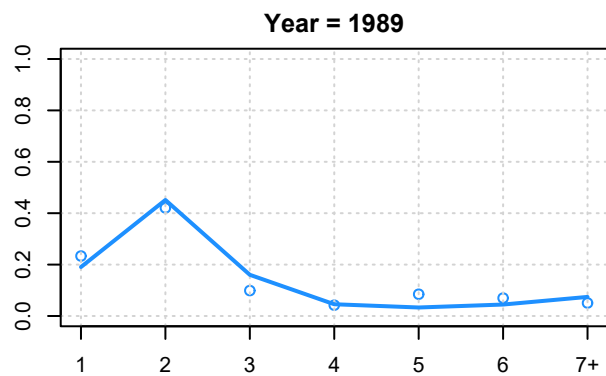
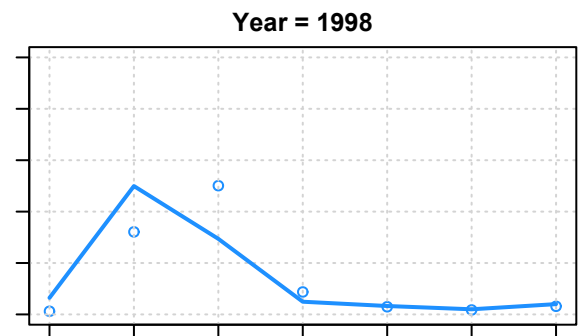
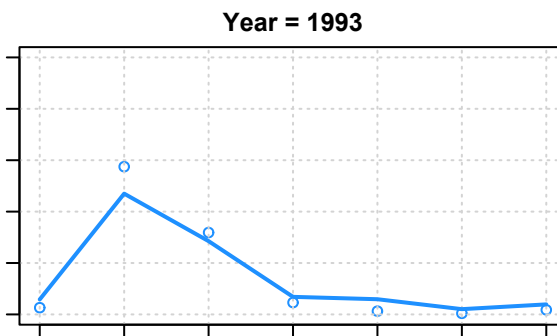
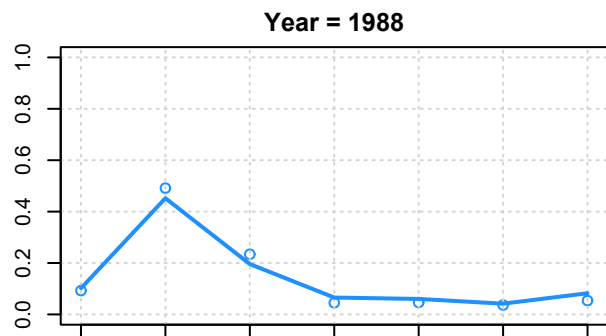
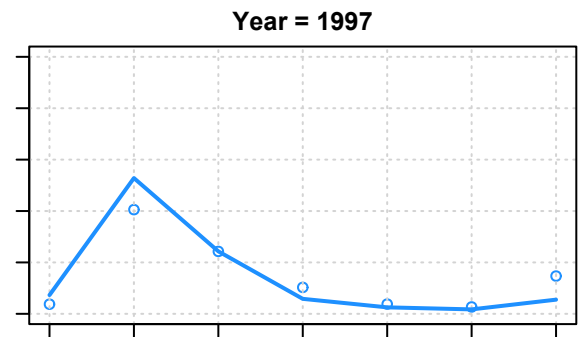
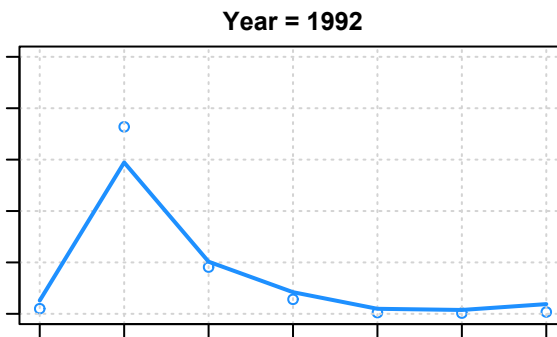
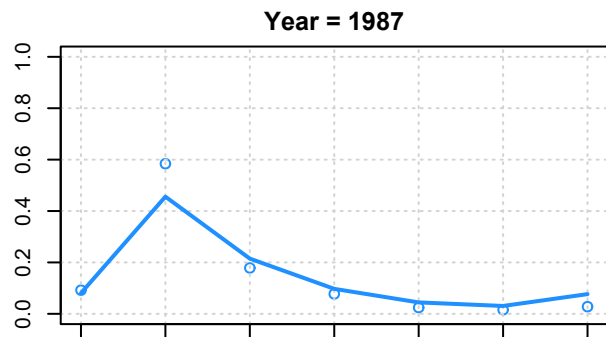
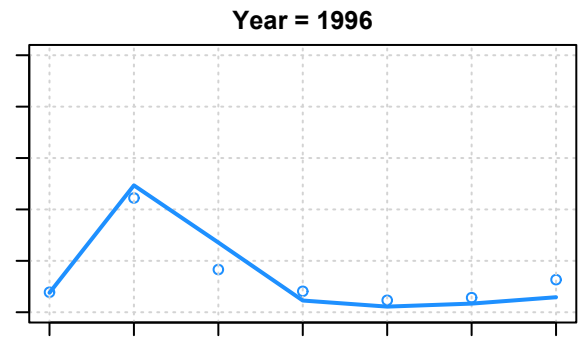
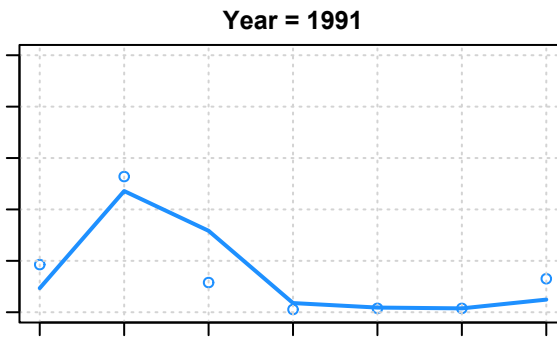
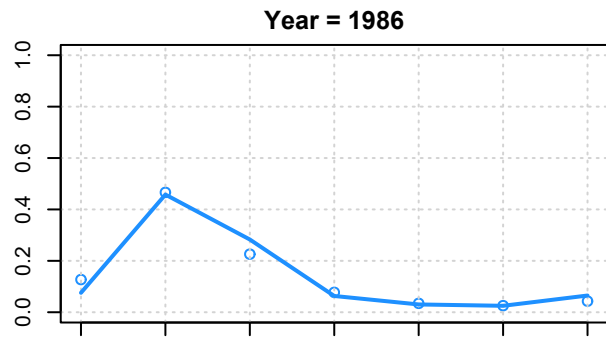
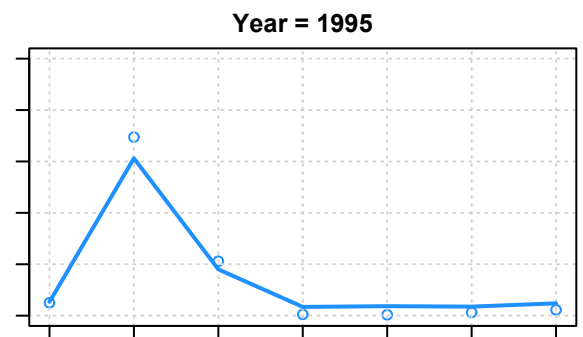
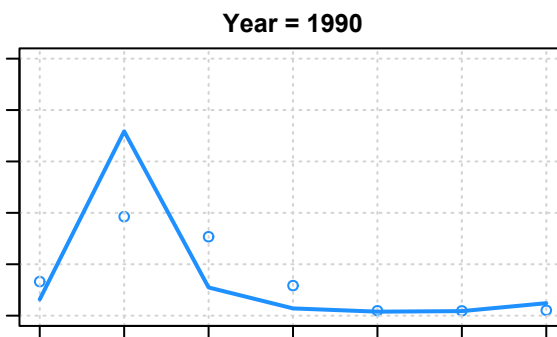
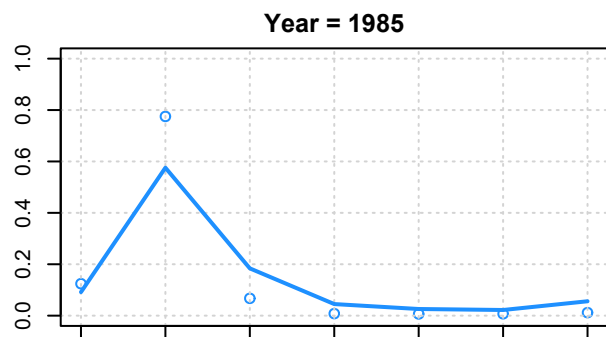
Conditional Expected and Posterior Estimates of Age 6 Abundance



Conditional Expected and Posterior Estimates of Age 7 Abundance

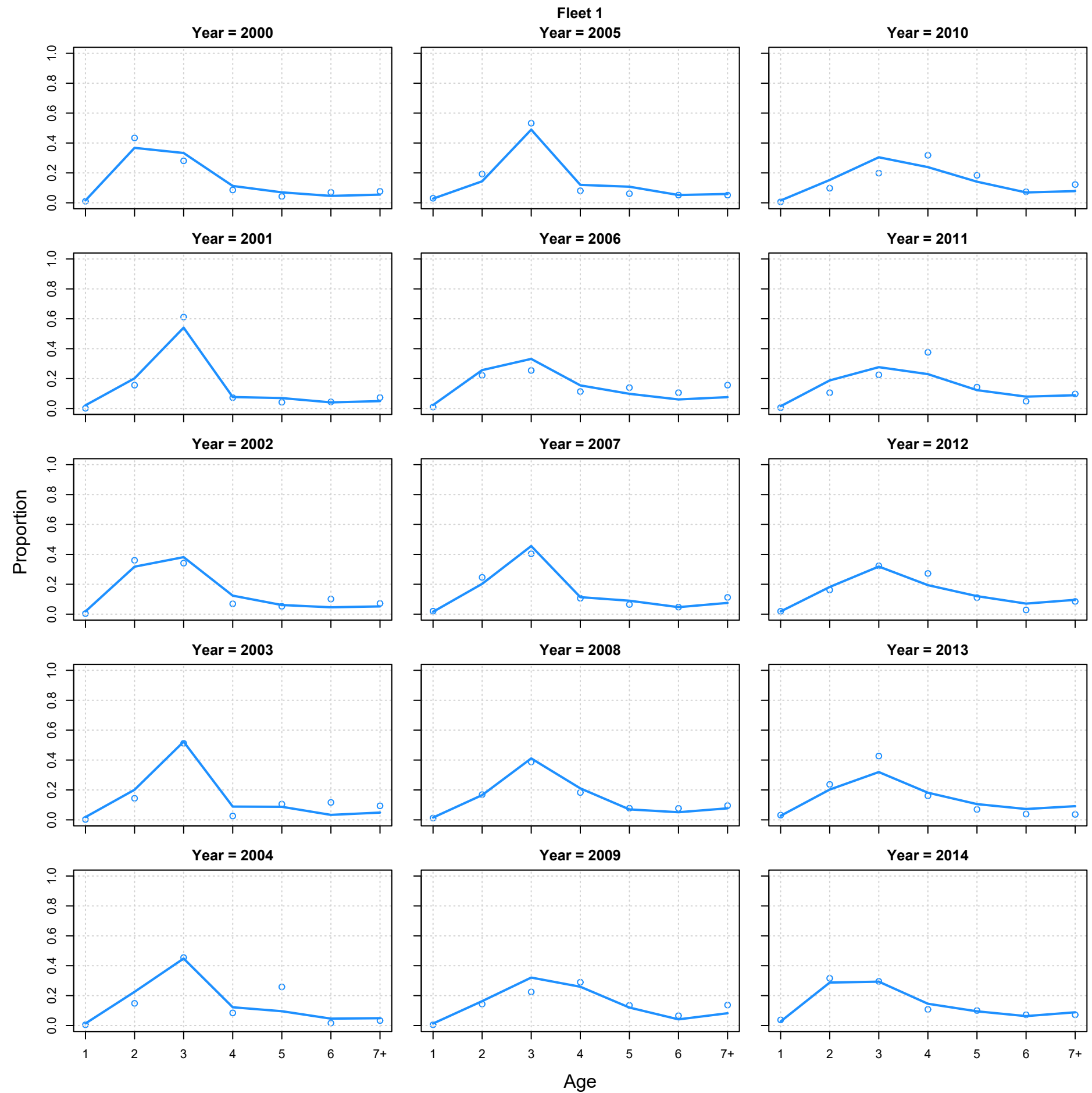


Fleet 1
Year = 1990

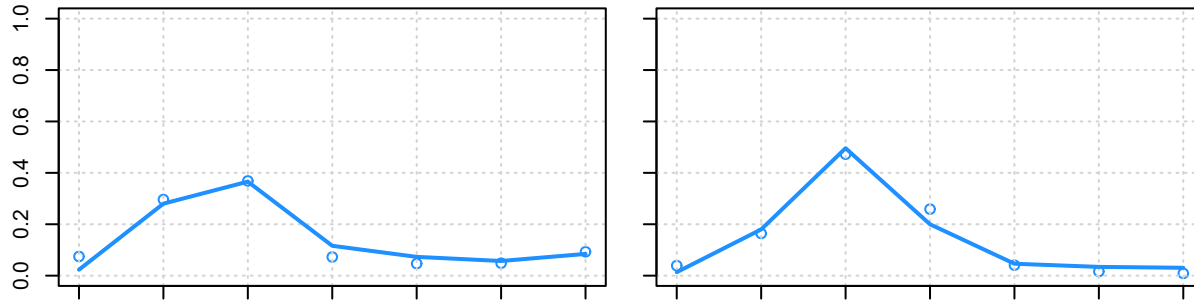


Proportion

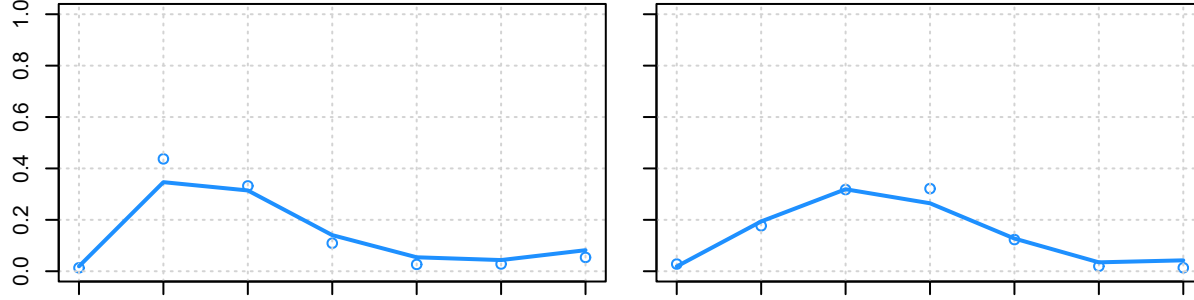
Age



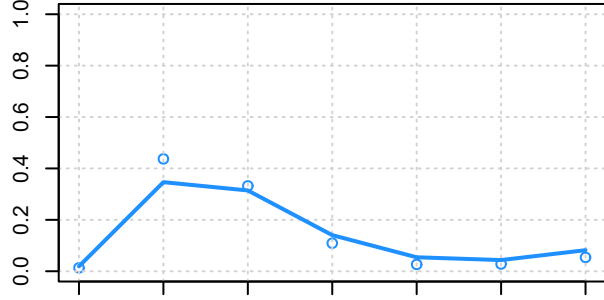
Fleet 1
Year = 2020



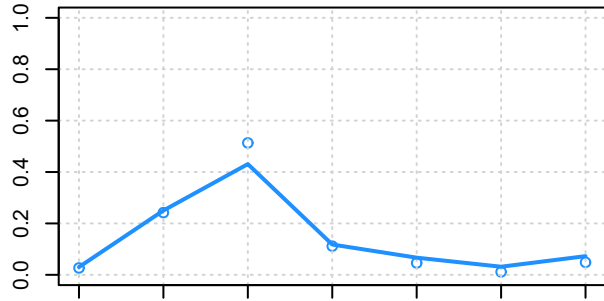
Year = 2021



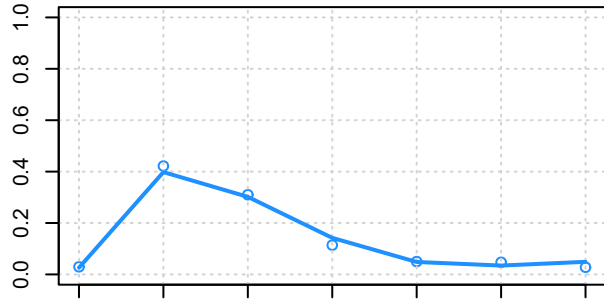
Year = 2016



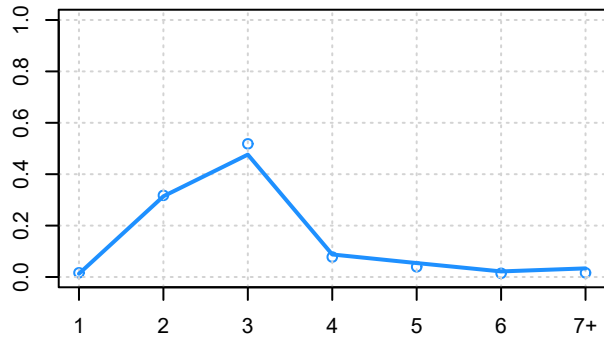
Year = 2017



Year = 2018



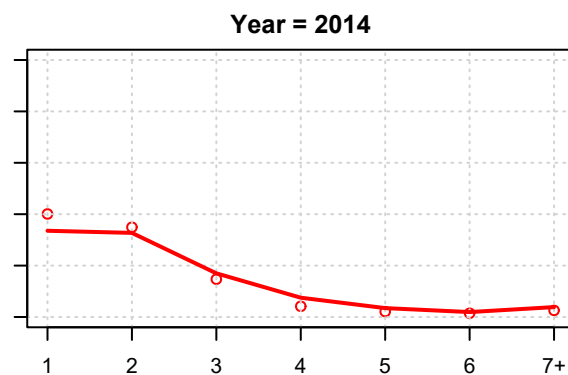
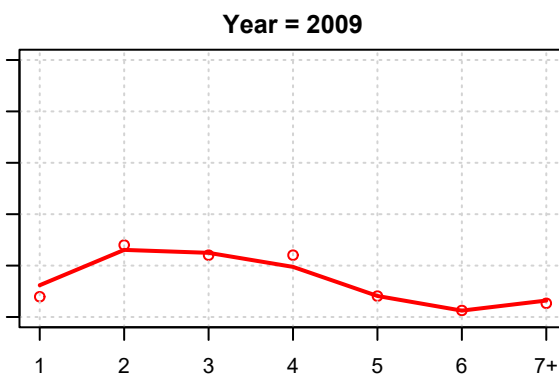
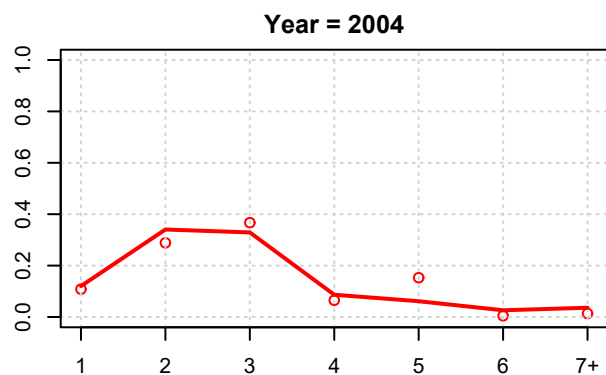
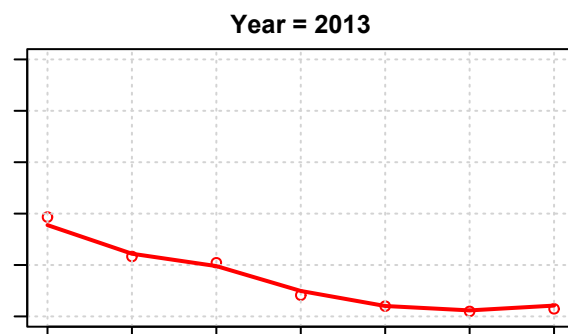
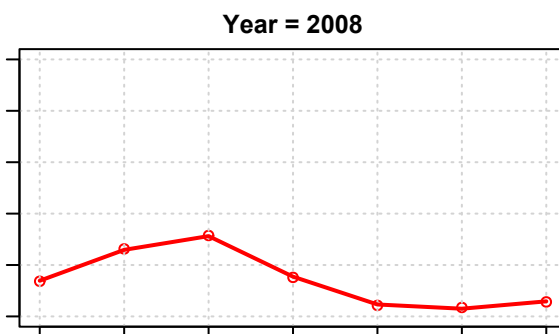
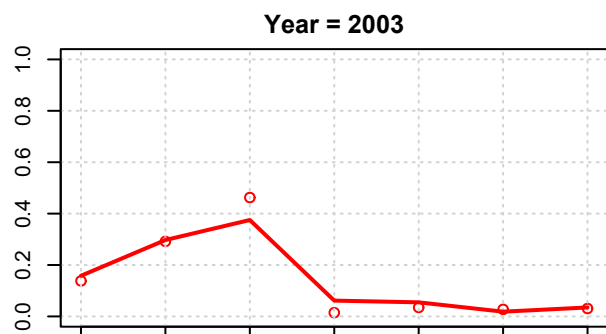
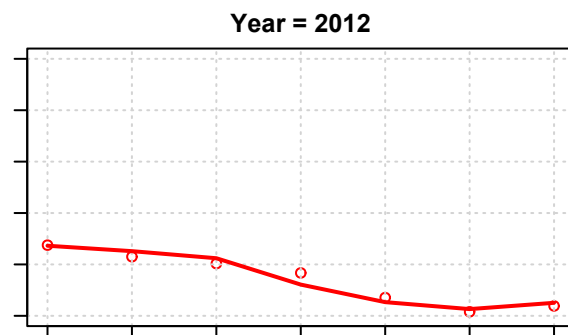
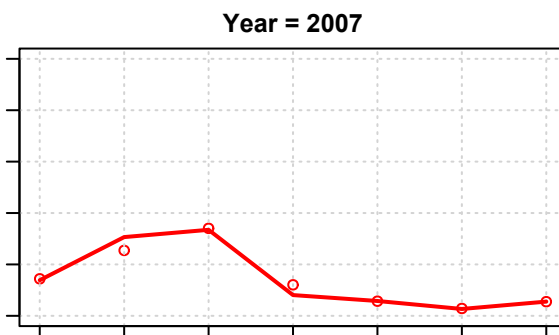
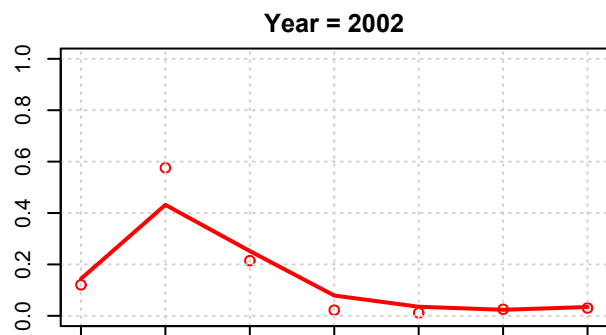
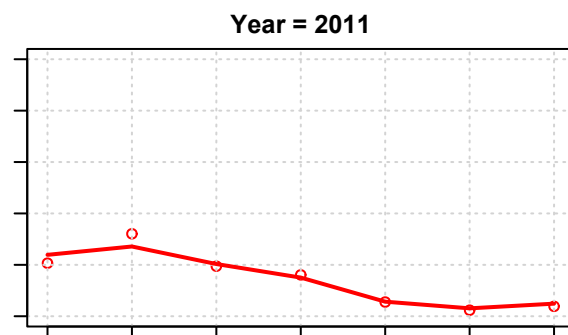
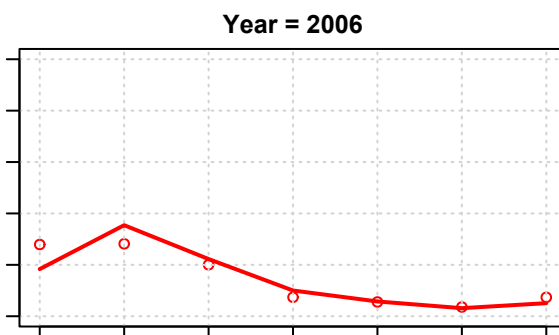
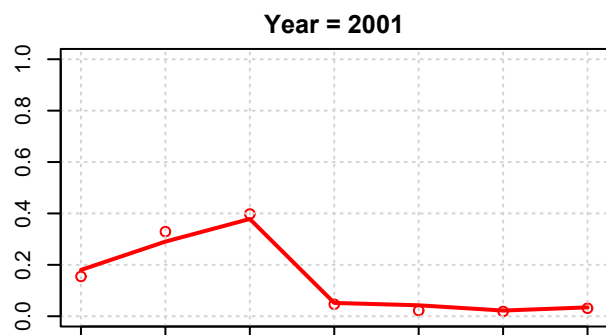
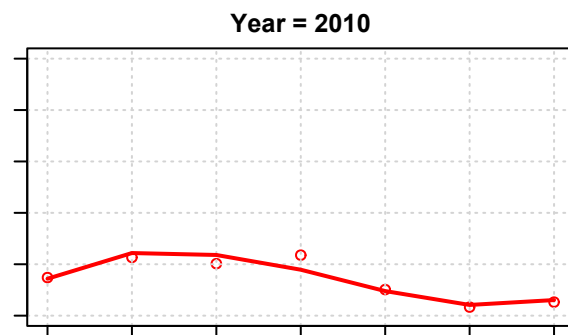
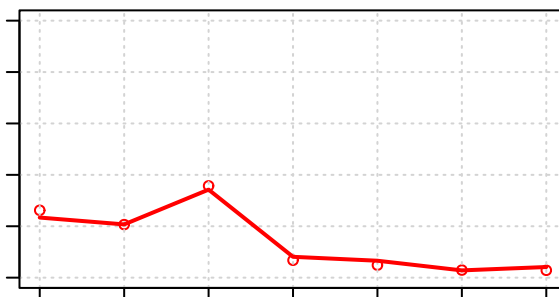
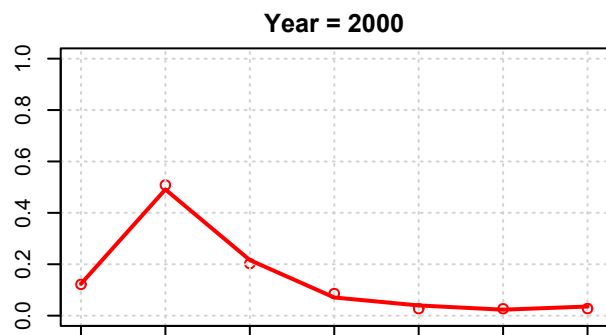
Year = 2019



Age

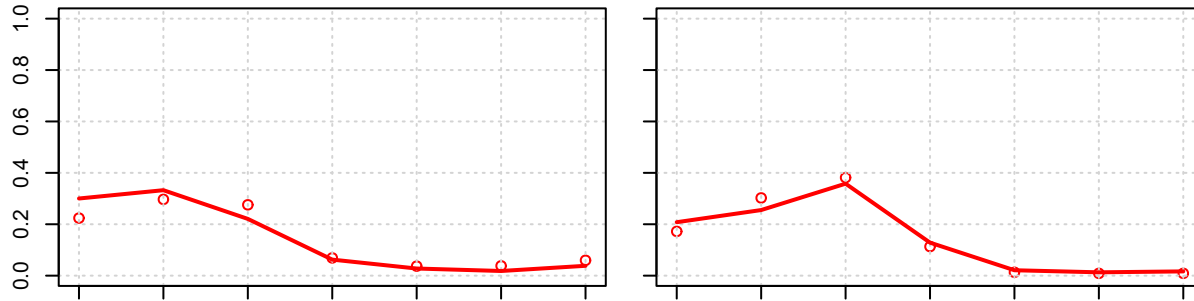
Proportion

Fleet 2
Year = 2005

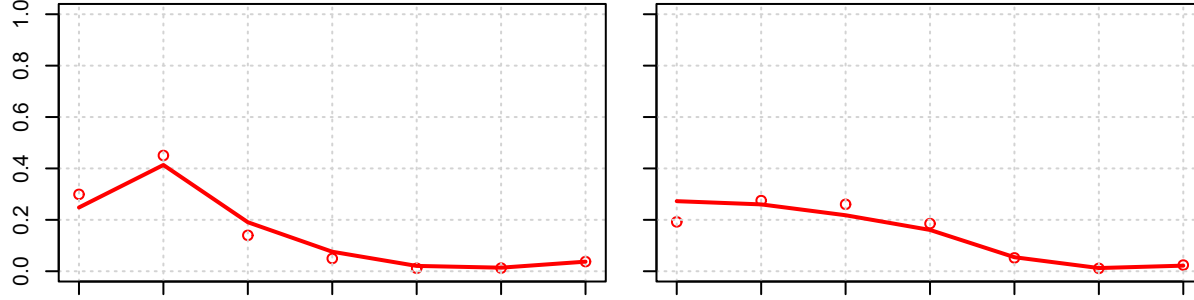


Age

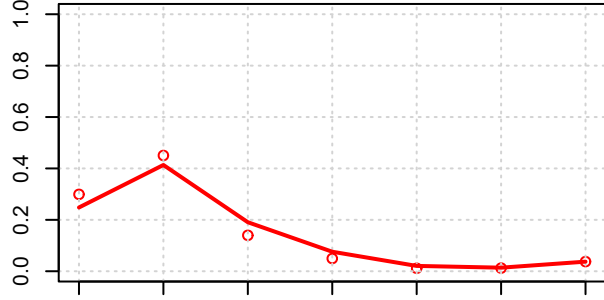
Fleet 2
Year = 2020



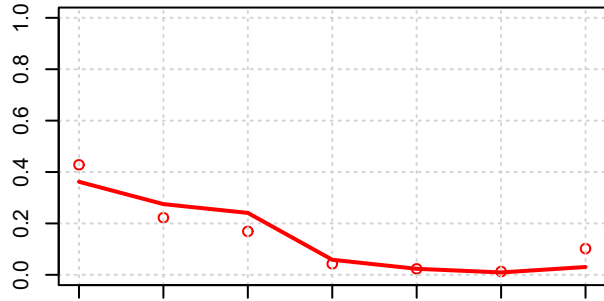
Year = 2021



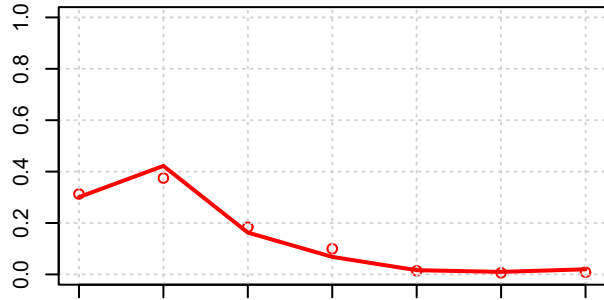
Year = 2016



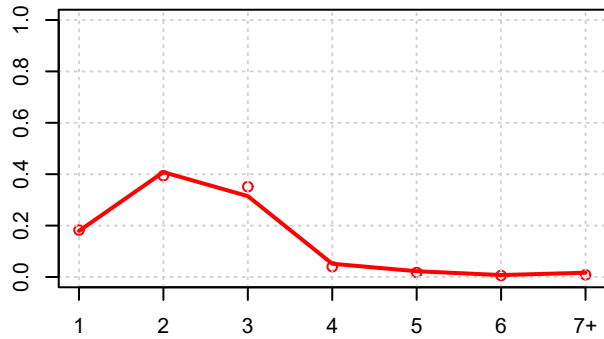
Year = 2017



Year = 2018



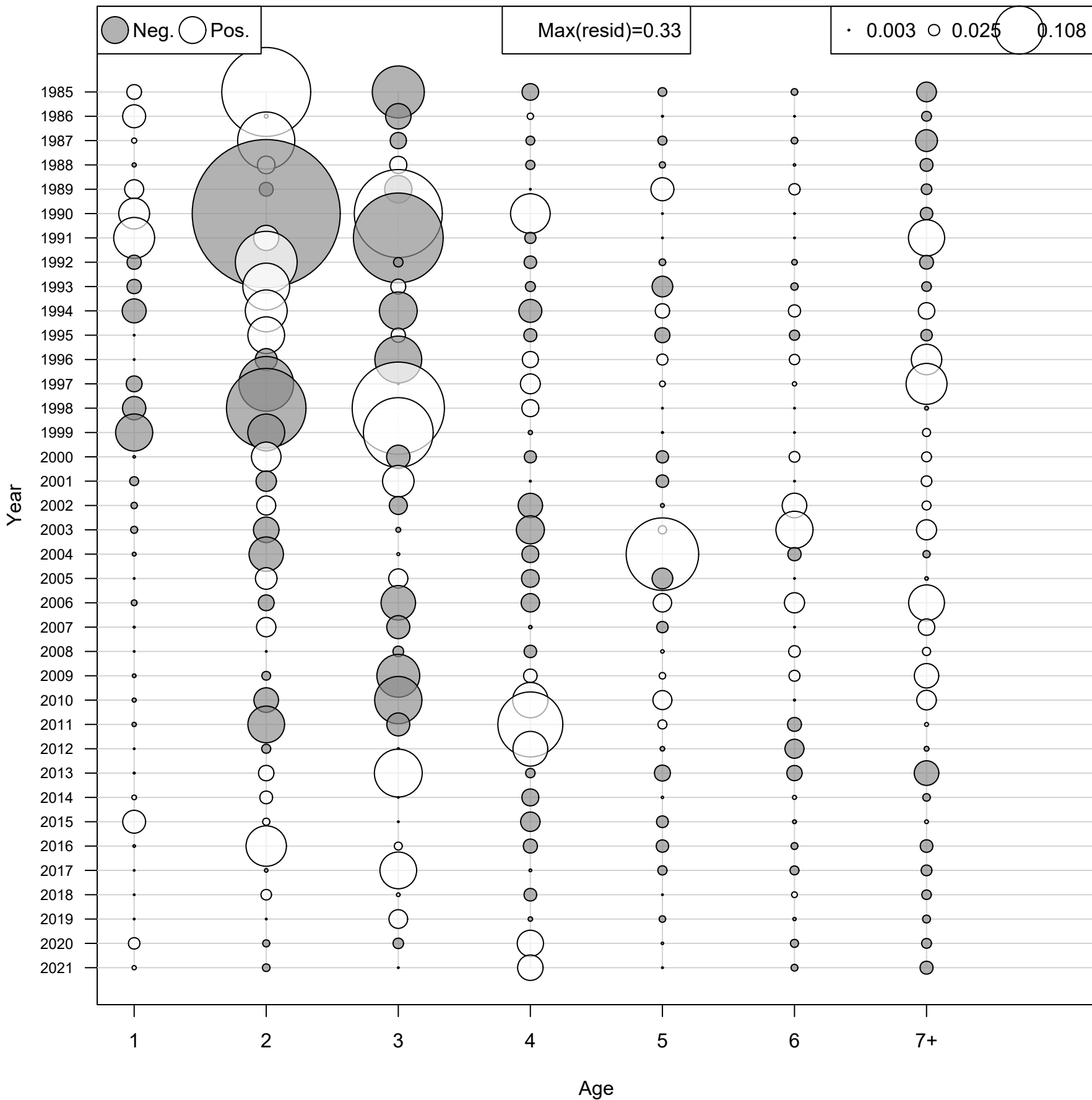
Year = 2019



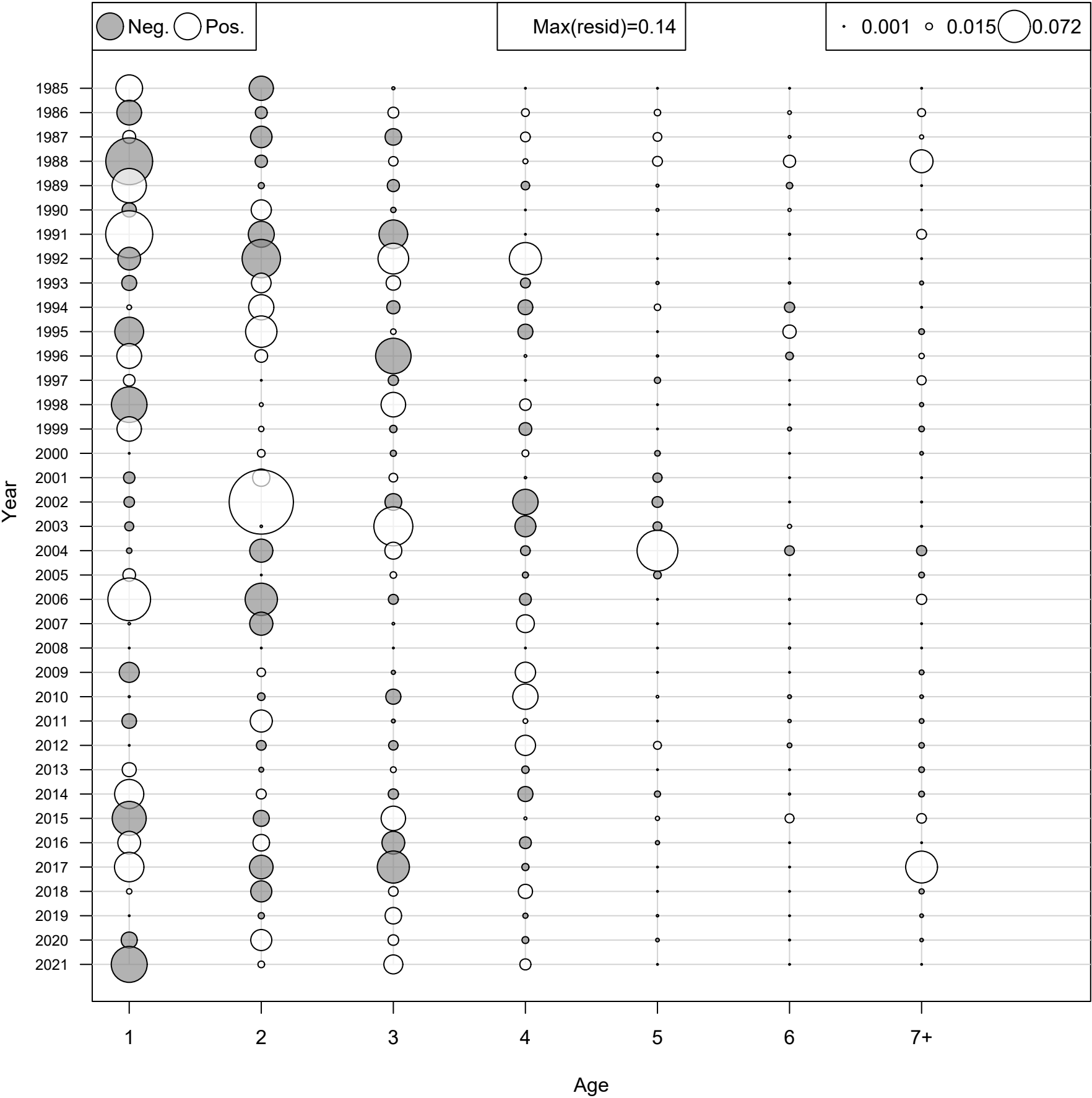
Age

Proportion

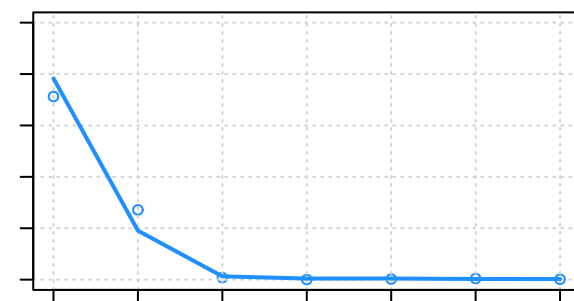
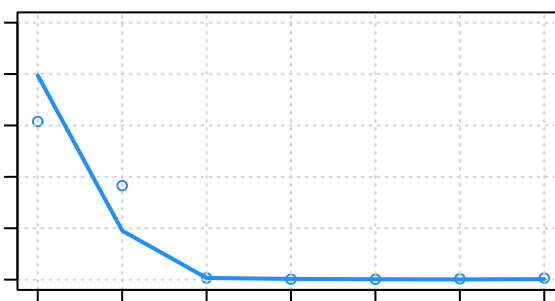
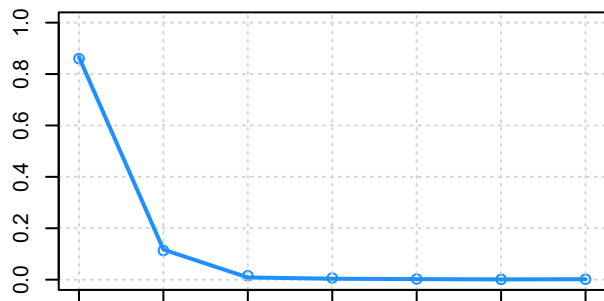
Age Comp Residuals (Observed-Predicted) for Fleet 1



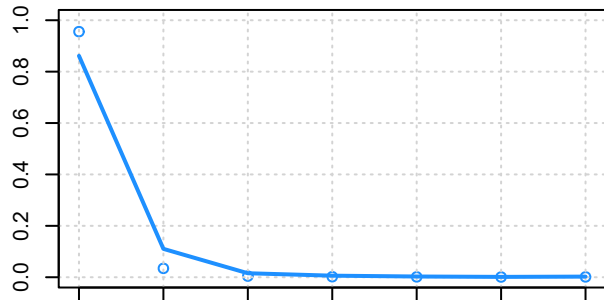
Age Comp Residuals (Observed-Predicted) for Fleet 2



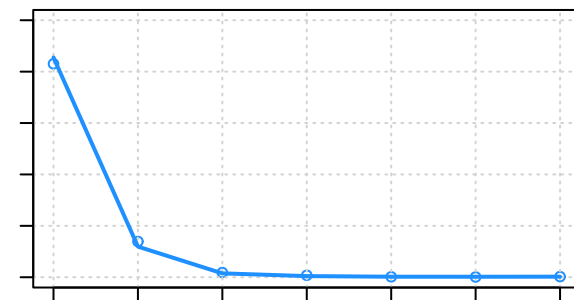
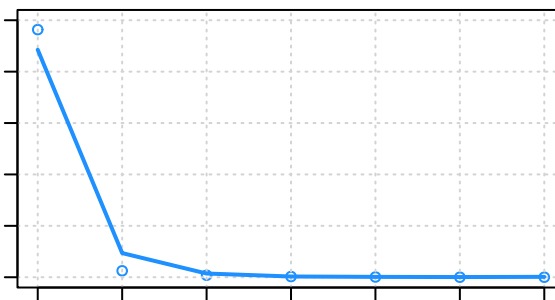
Index 1
Year = 1990



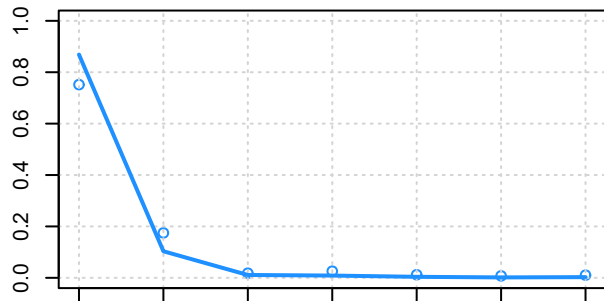
Year = 1986



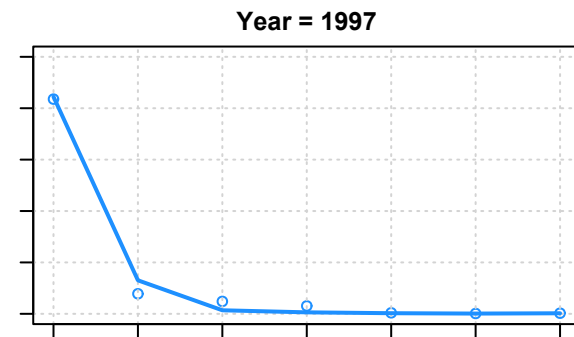
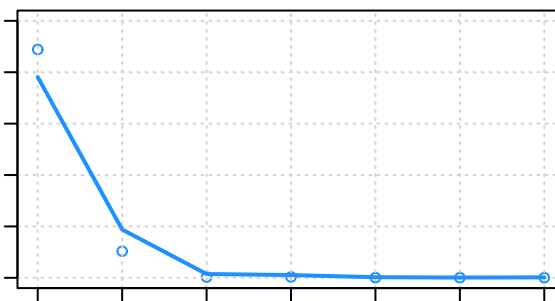
Year = 1991



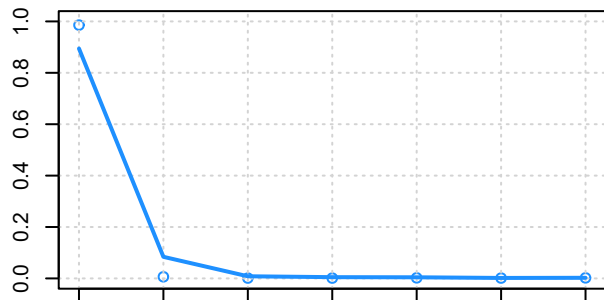
Year = 1987



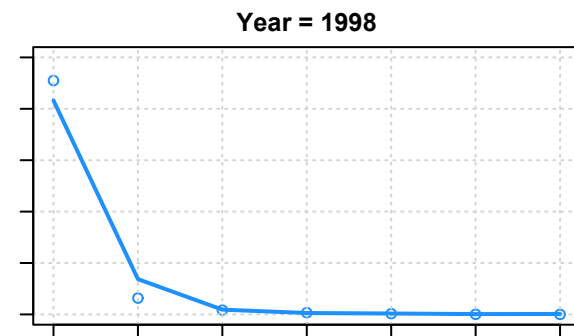
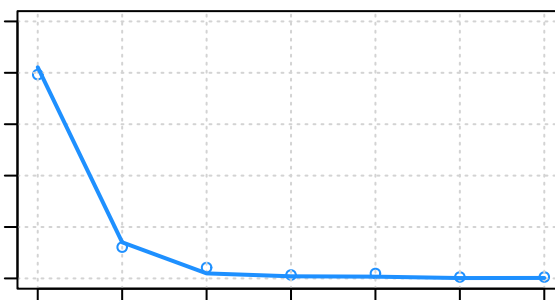
Year = 1992



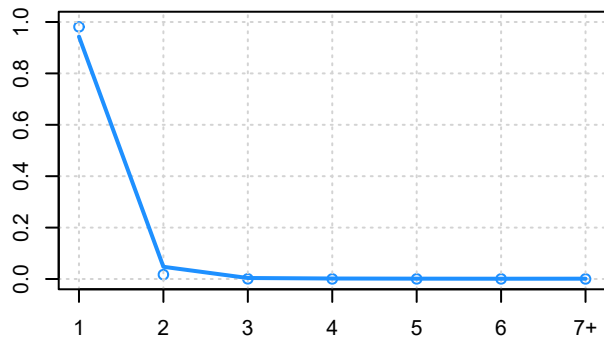
Year = 1988



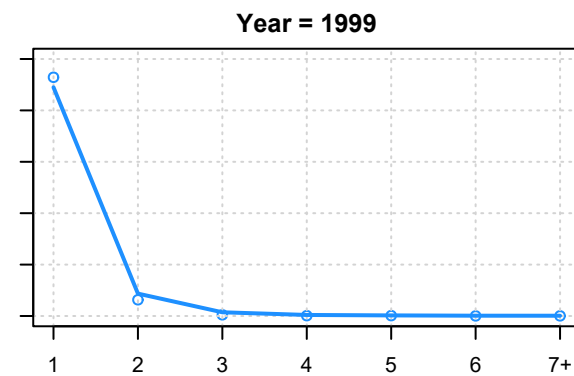
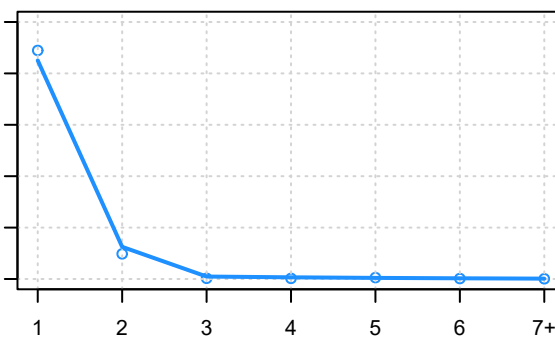
Year = 1993



Year = 1989

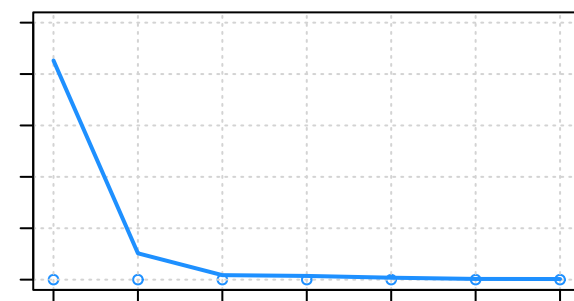
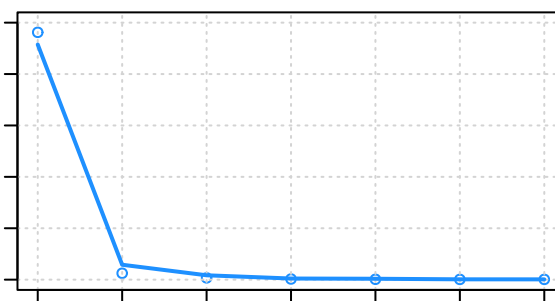
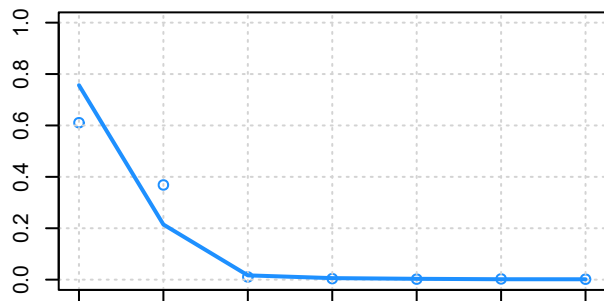


Year = 1994

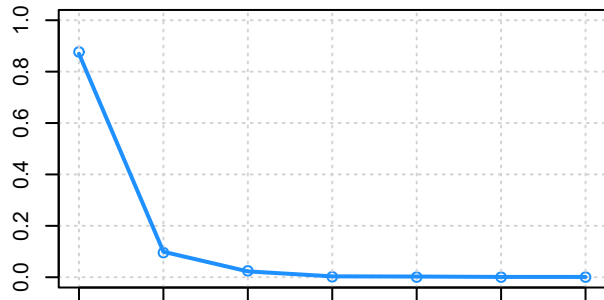


Age

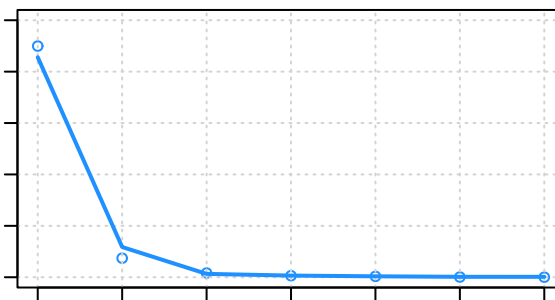
Index 1
Year = 2005



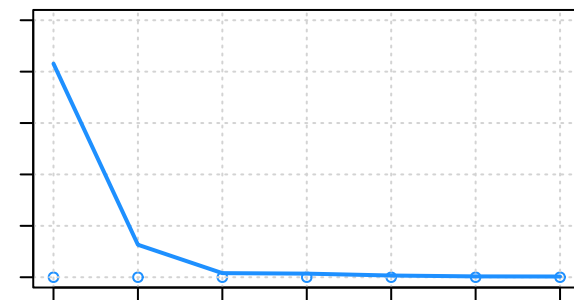
Year = 2001



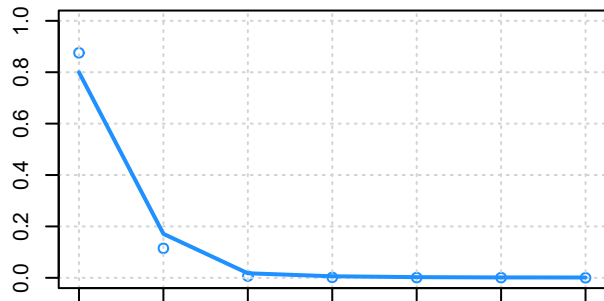
Year = 2006



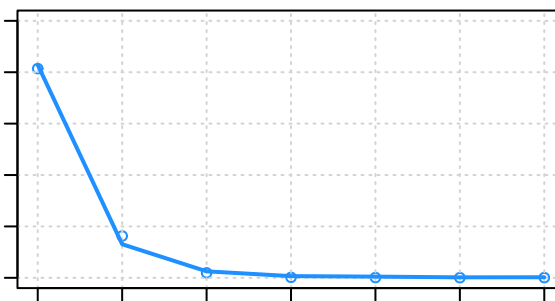
Year = 2011



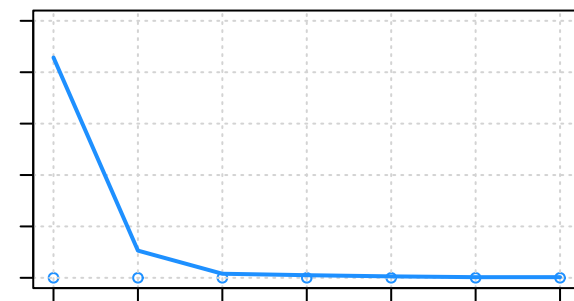
Year = 2002



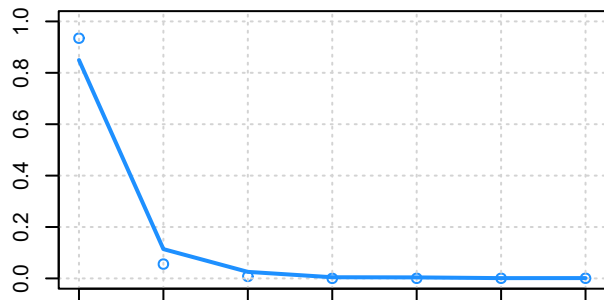
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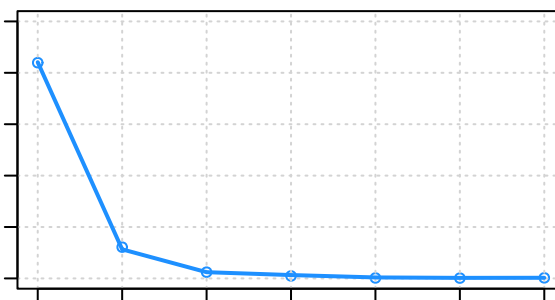
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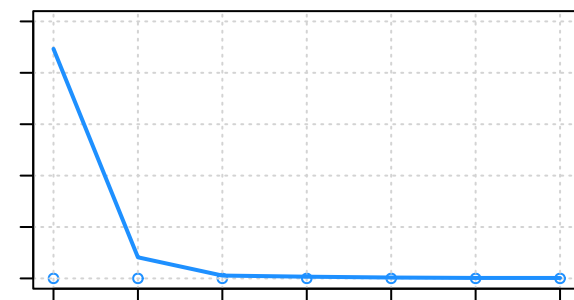
Year = 2003



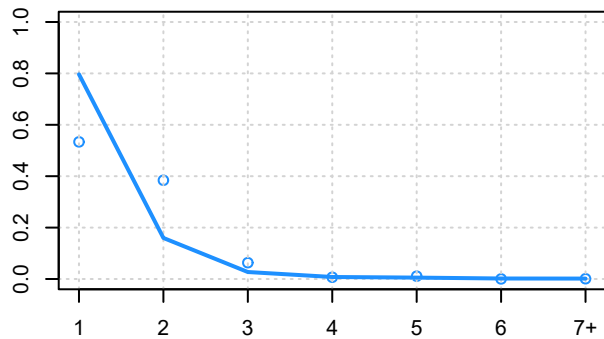
Year = 2008



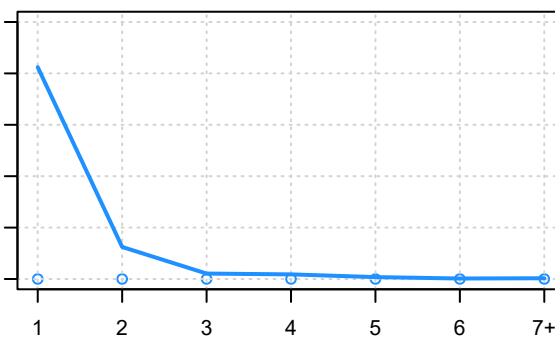
Year = 2013



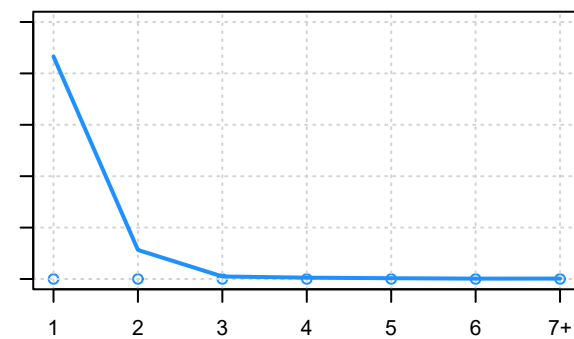
Year = 2004



Year = 2009

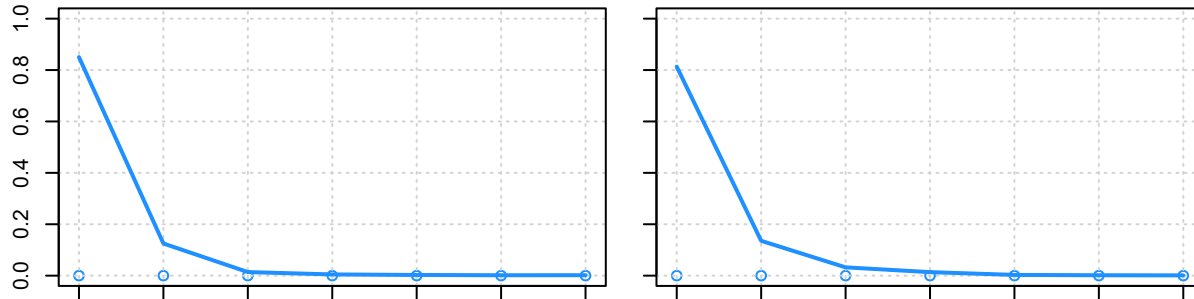


Year = 2014

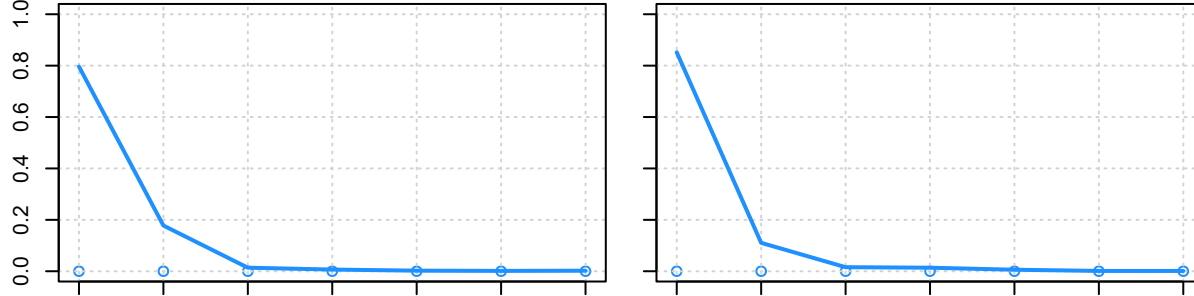


Age

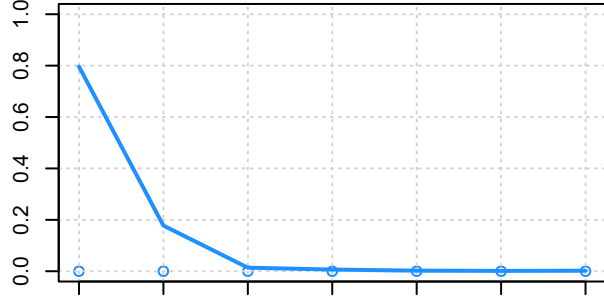
Index 1
Year = 2020



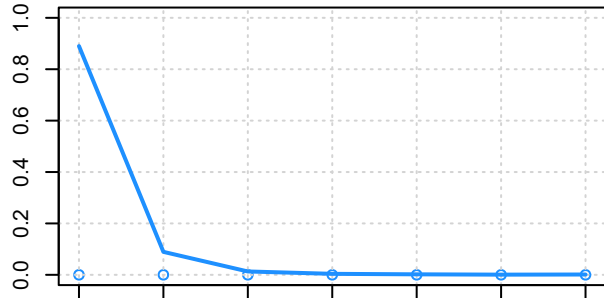
Year = 2021



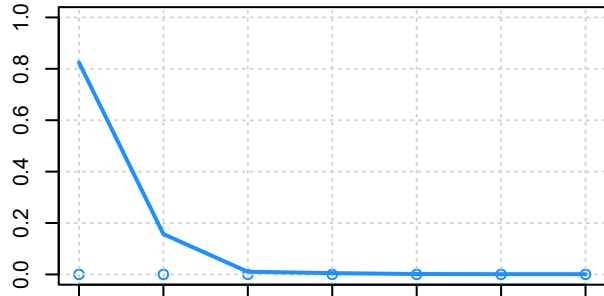
Year = 2016



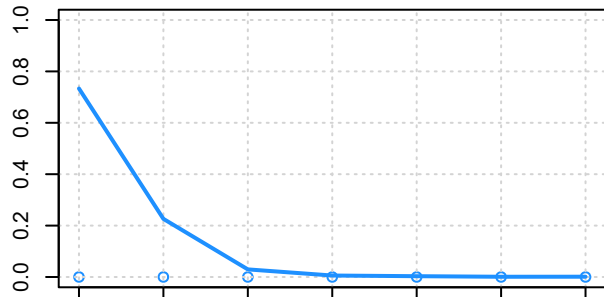
Year = 2017



Year = 2018



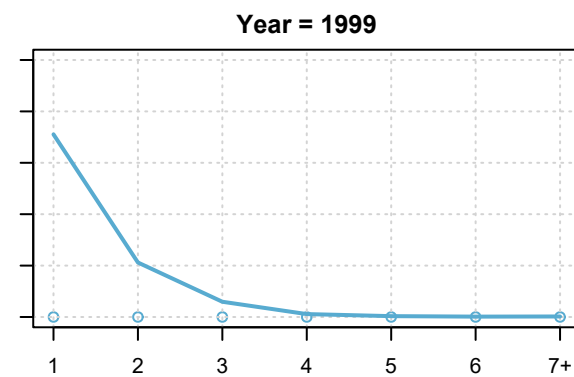
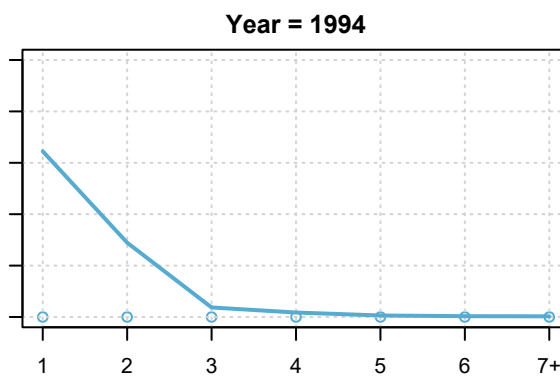
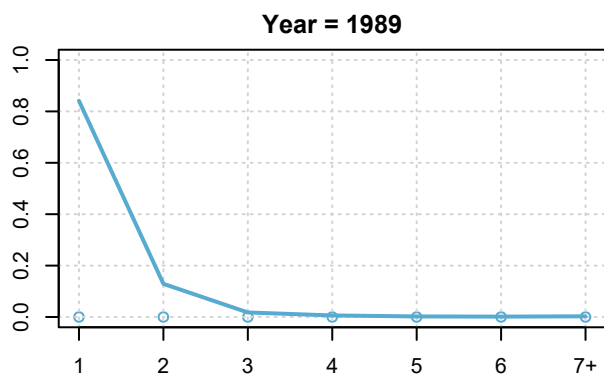
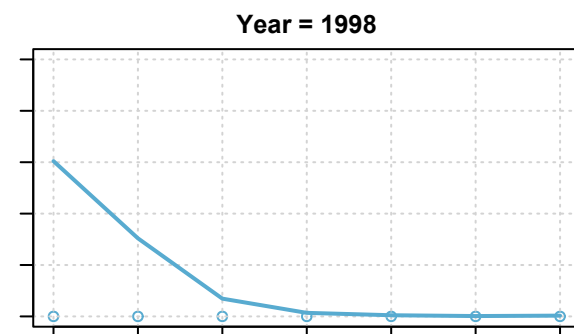
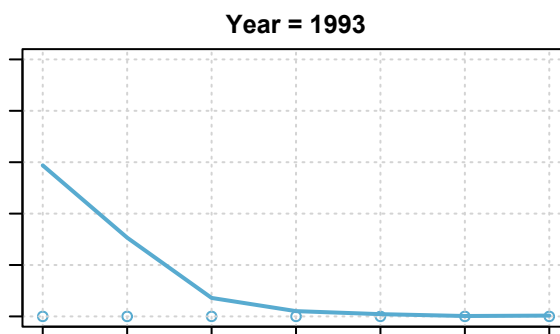
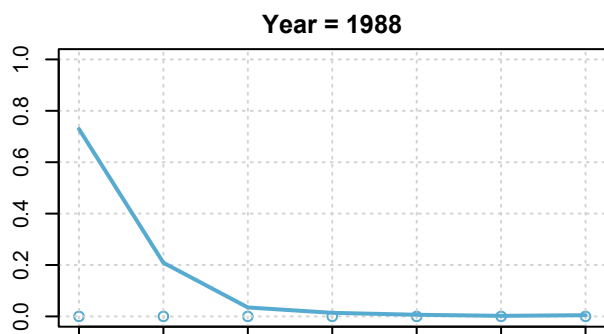
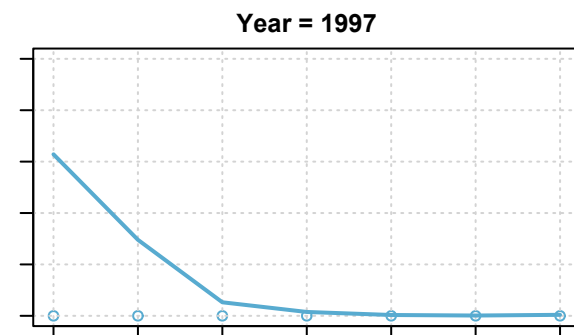
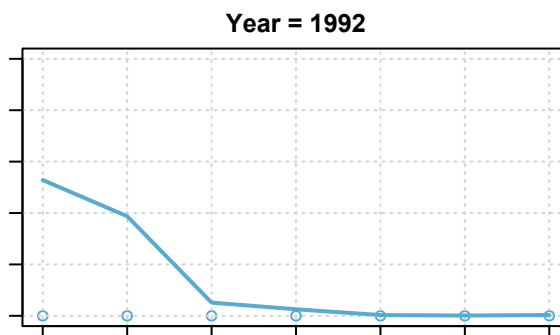
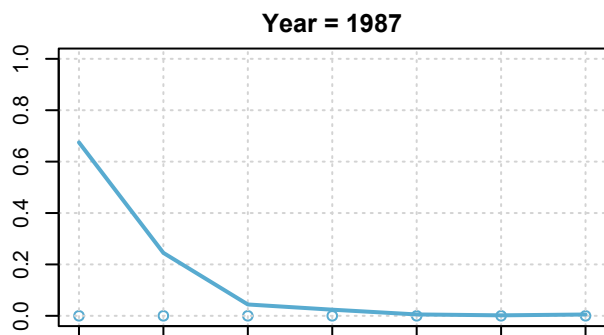
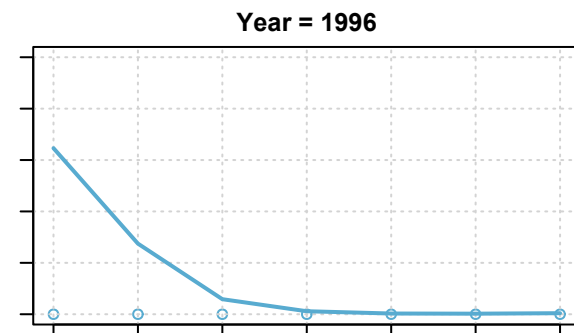
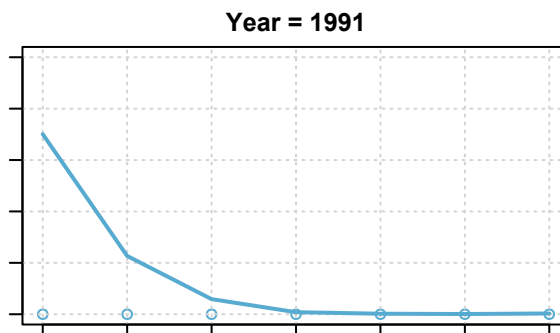
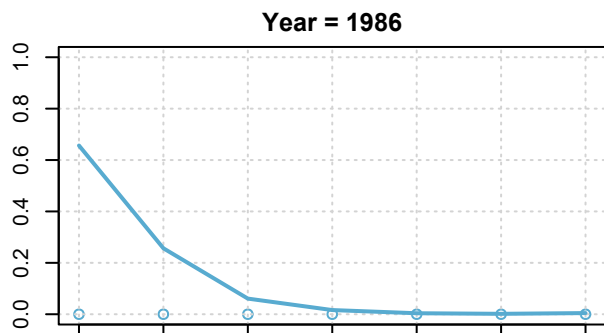
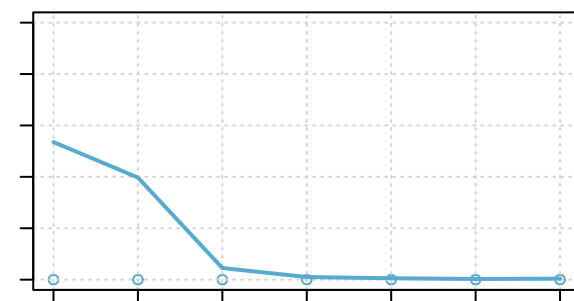
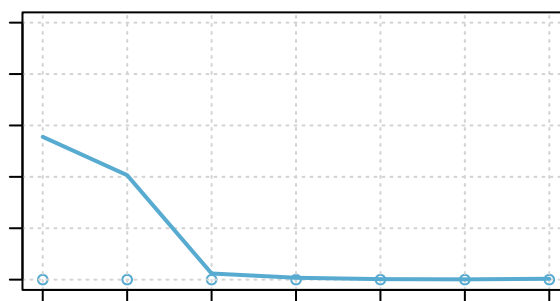
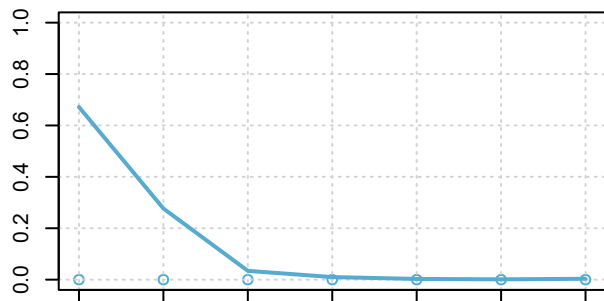
Year = 2019



Age

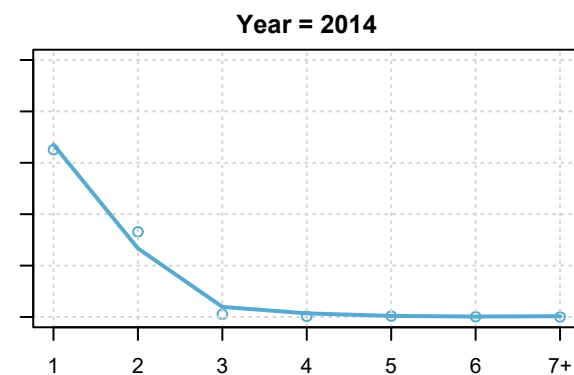
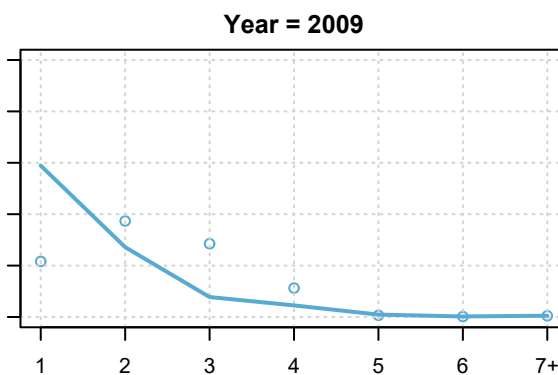
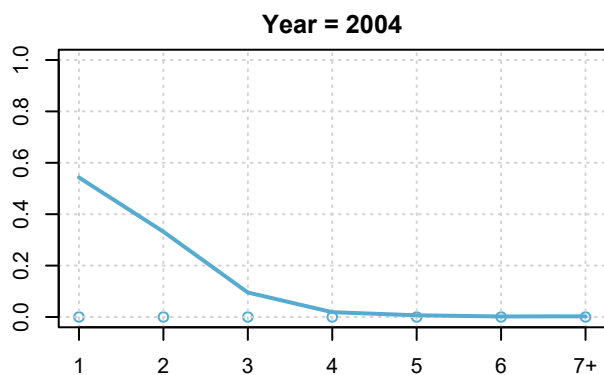
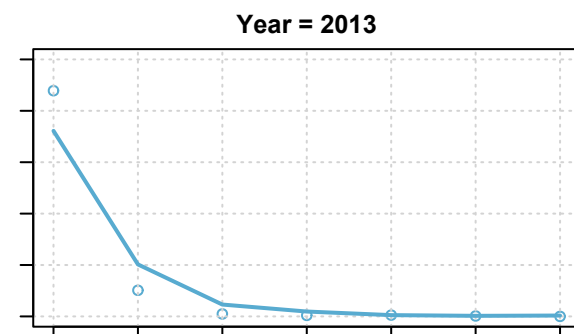
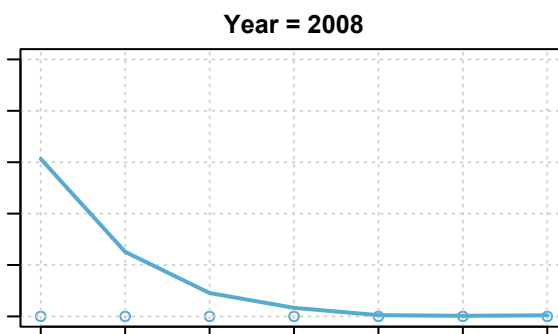
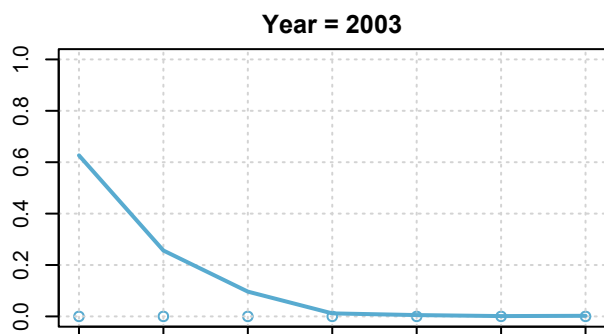
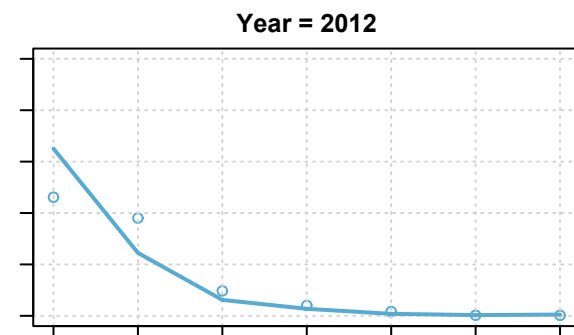
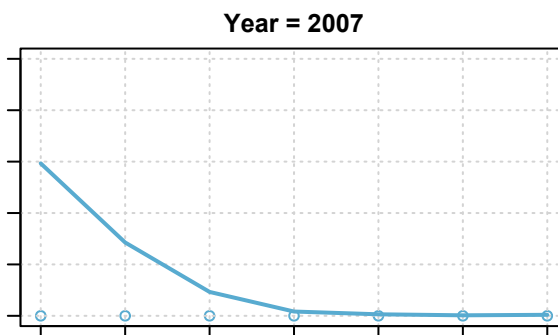
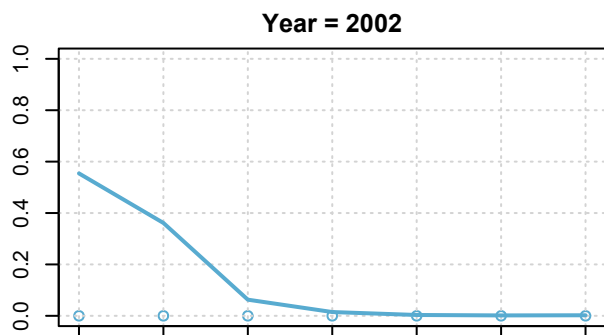
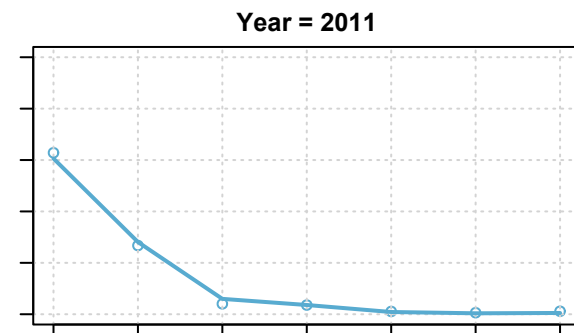
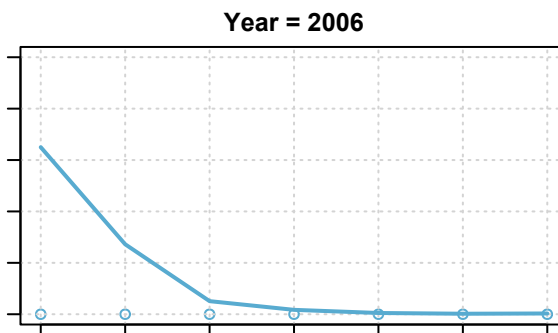
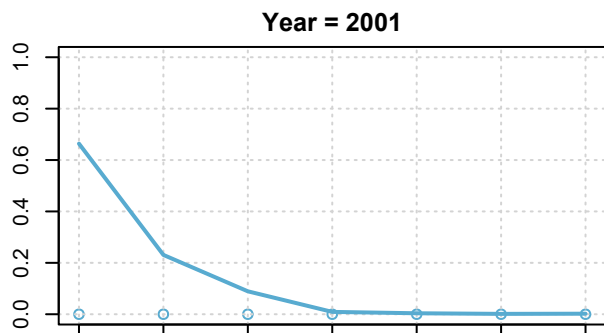
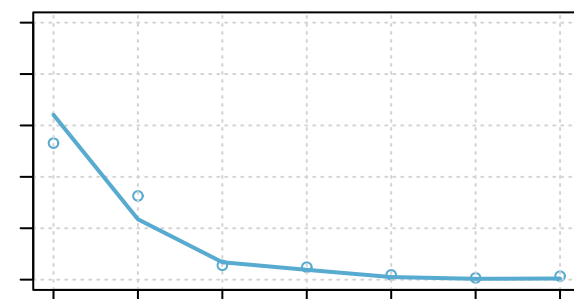
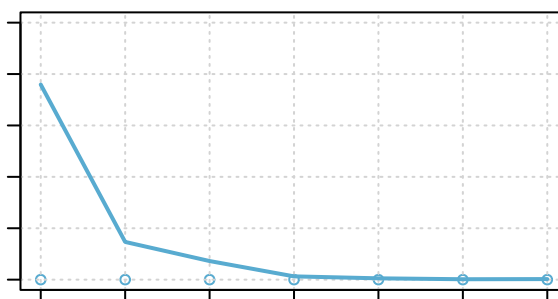
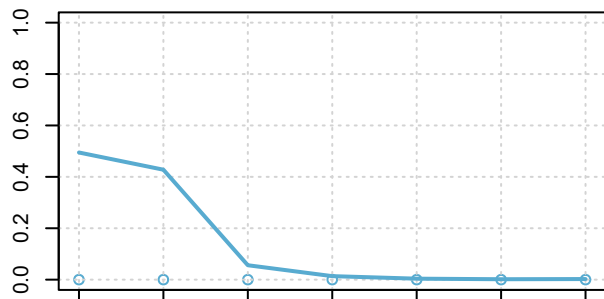
Proportion

Index 2
Year = 1990



Age

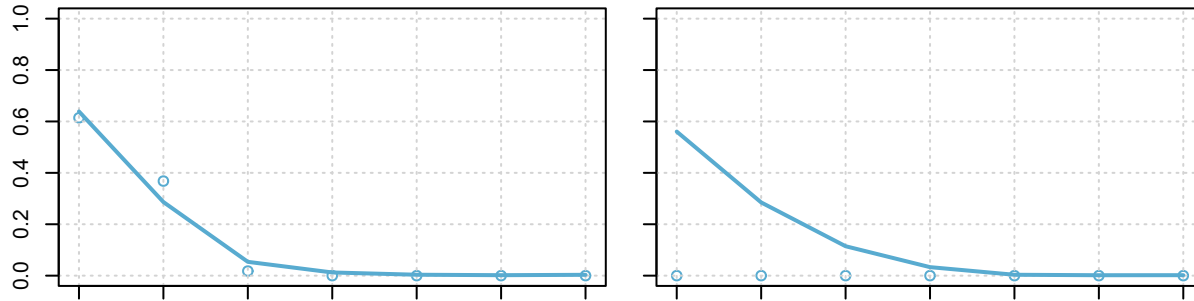
Index 2
Year = 2005



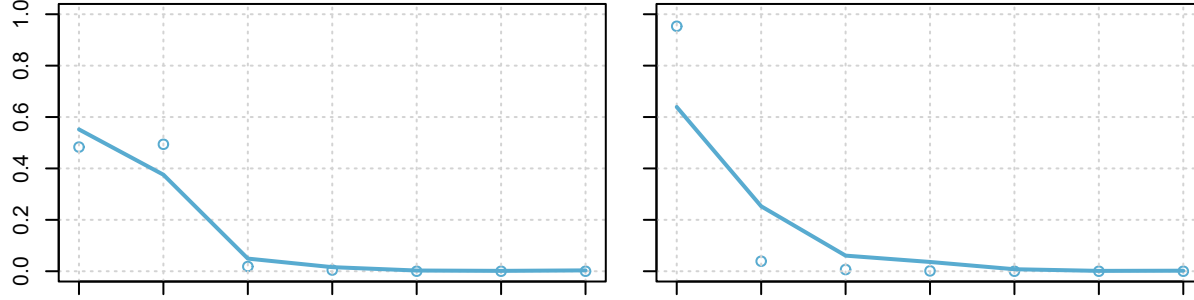
Proportion

Age

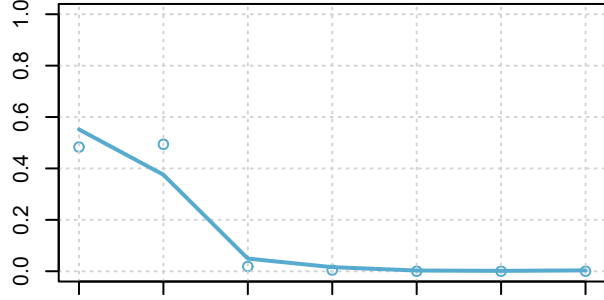
Index 2
Year = 2020



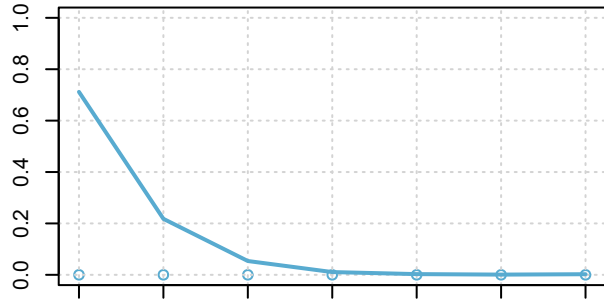
Year = 2021



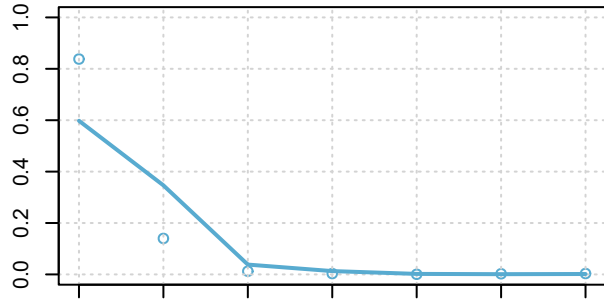
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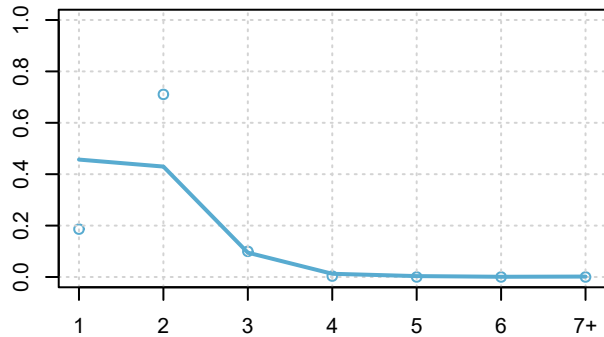
Year = 2017



Year = 2018



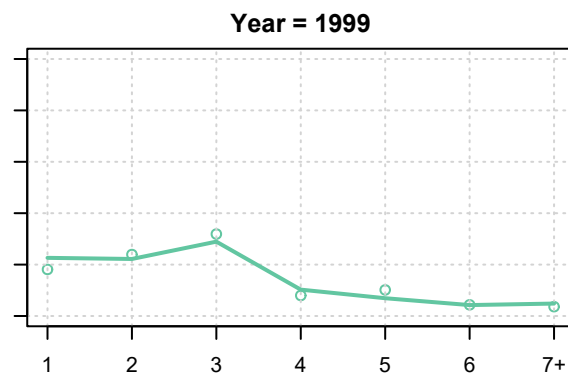
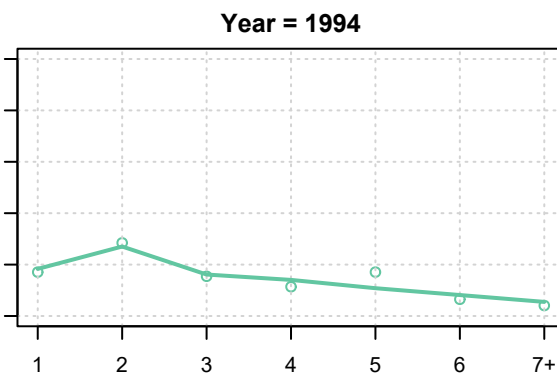
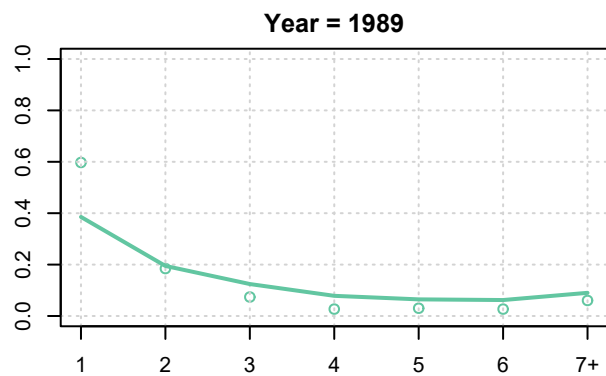
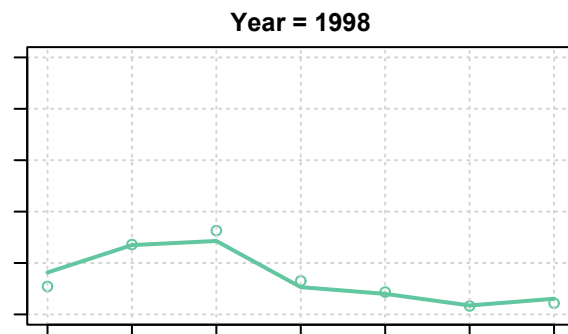
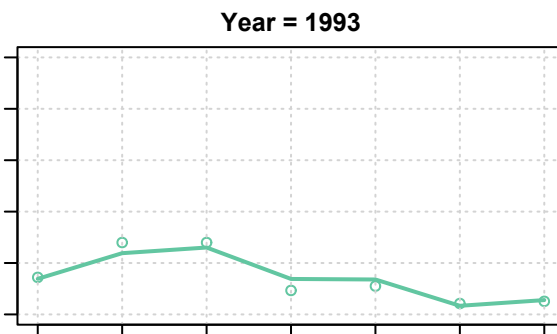
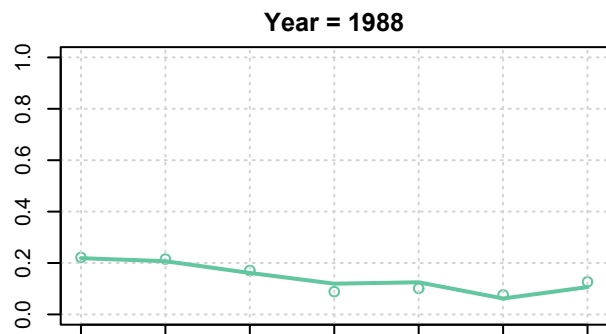
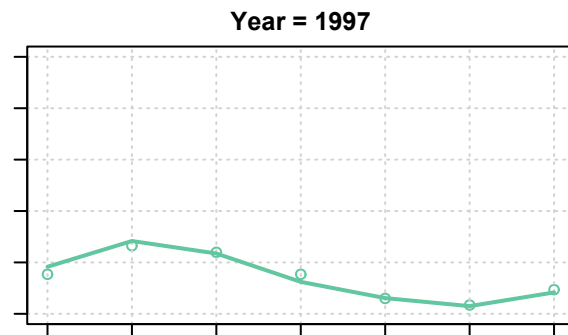
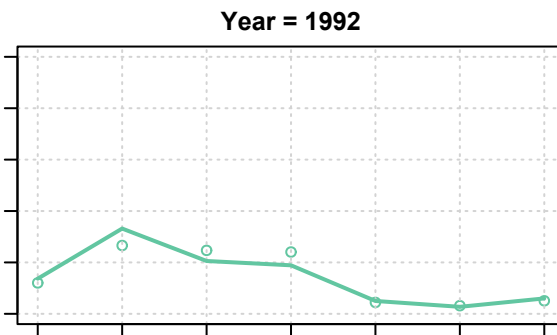
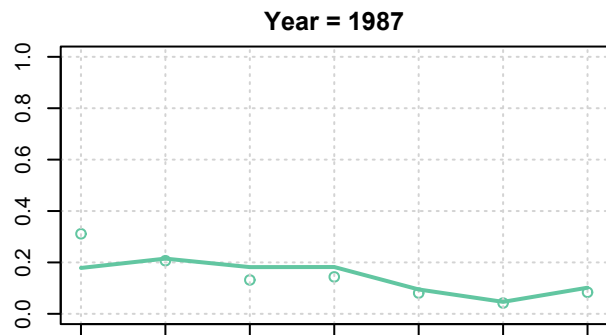
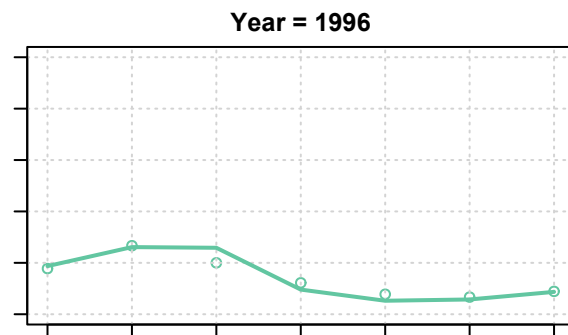
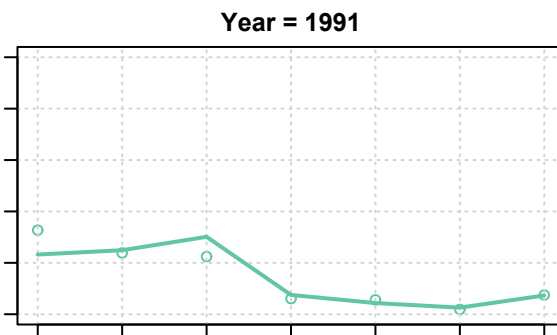
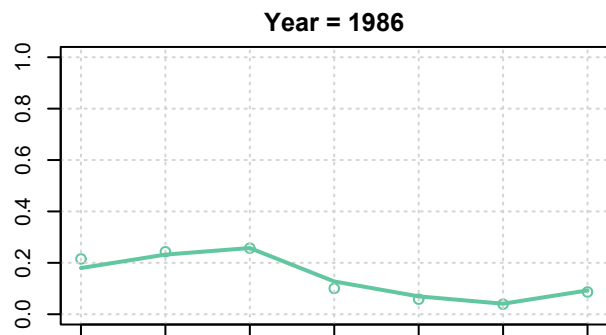
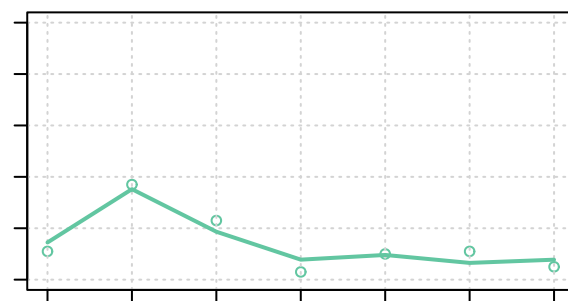
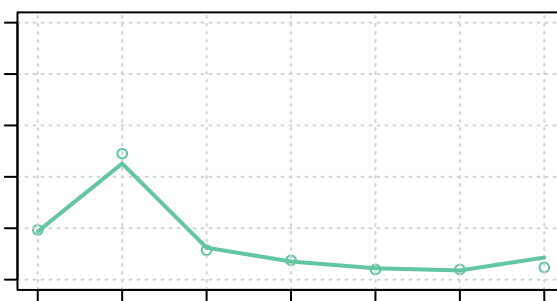
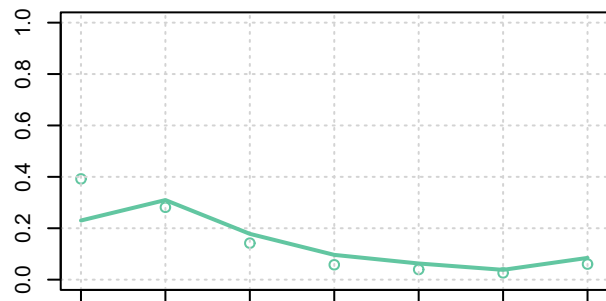
Year = 2019



Age

Proportion

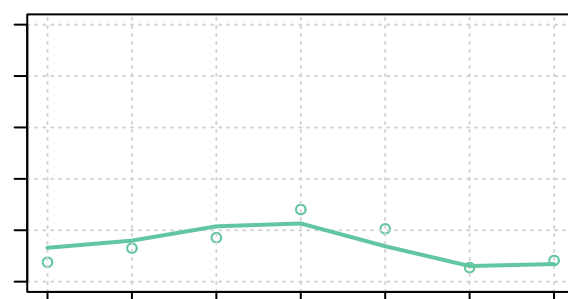
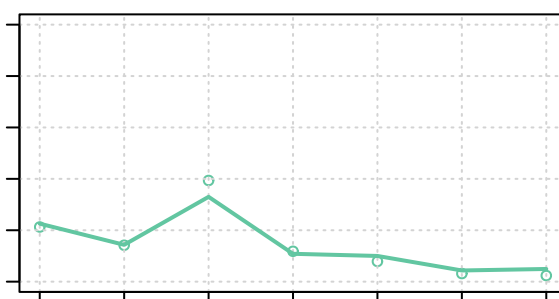
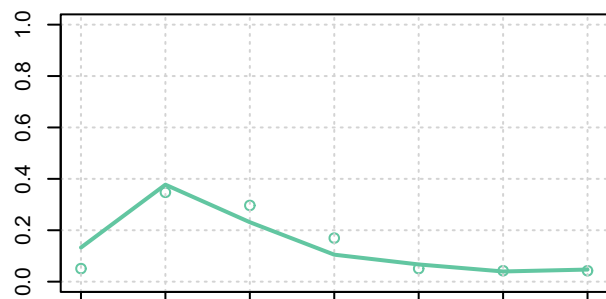
Index 3
Year = 1990



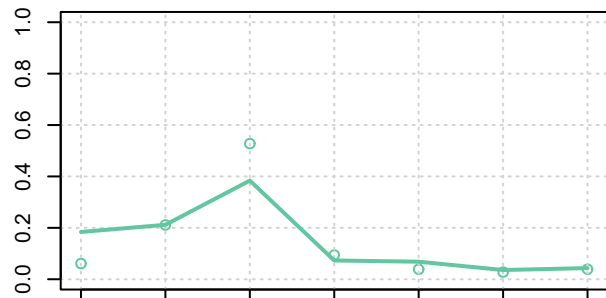
Proportion

Age

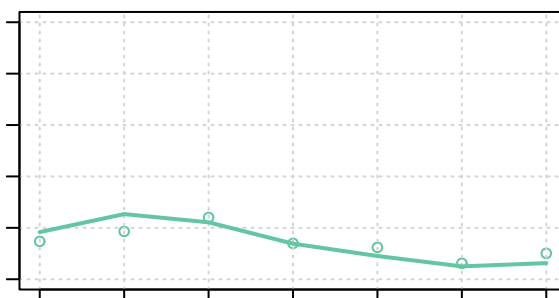
Index 3
Year = 2005



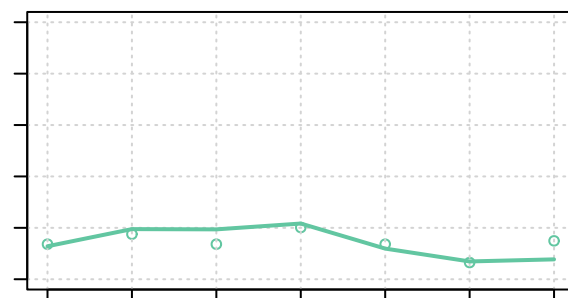
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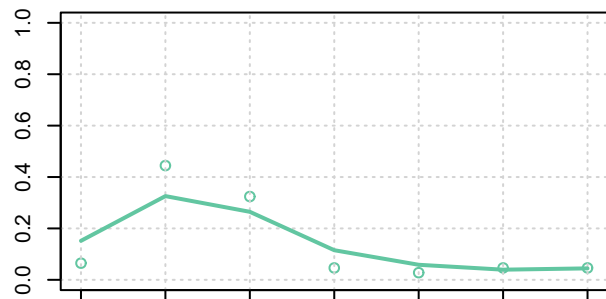
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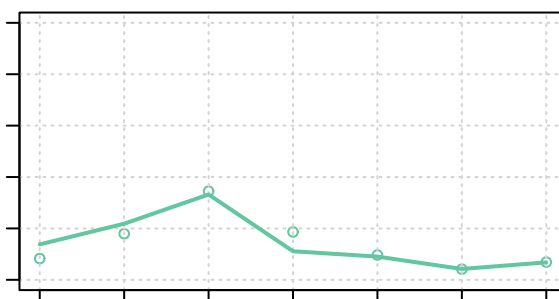
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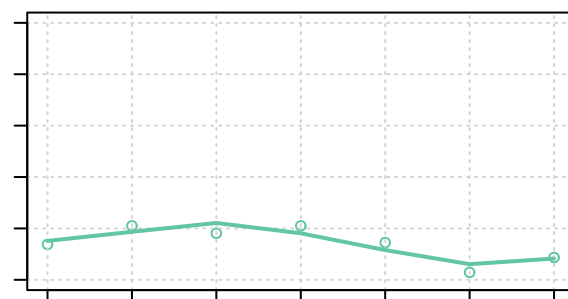
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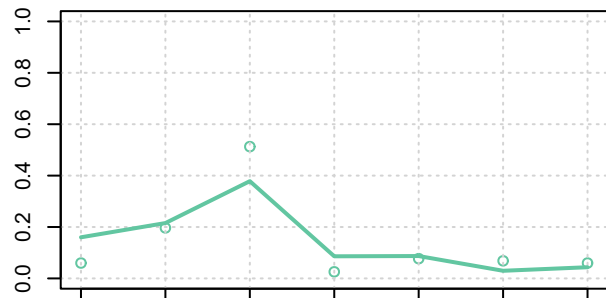
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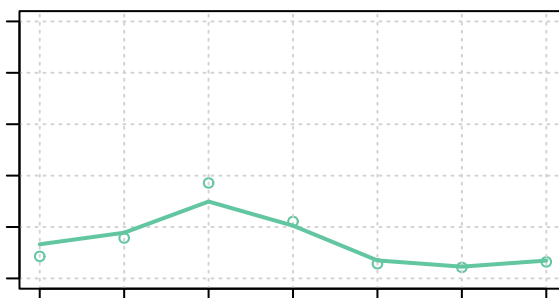
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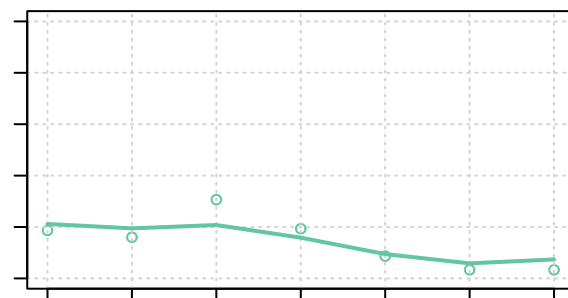
Year = 2003



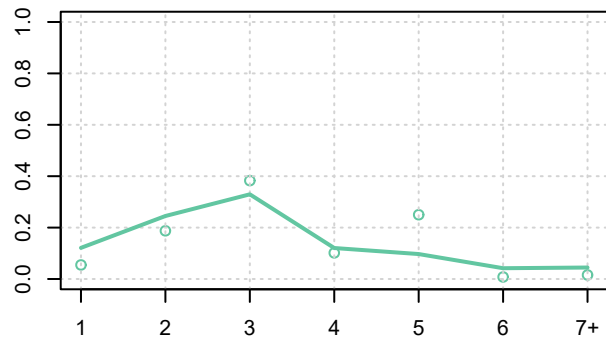
Year = 2008



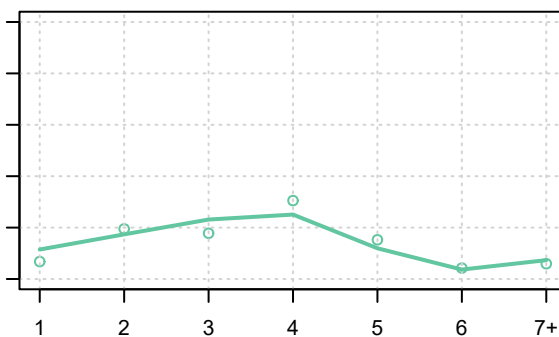
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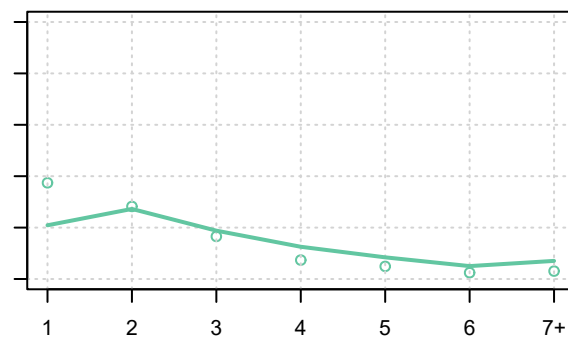
Year = 2004



Year = 2009

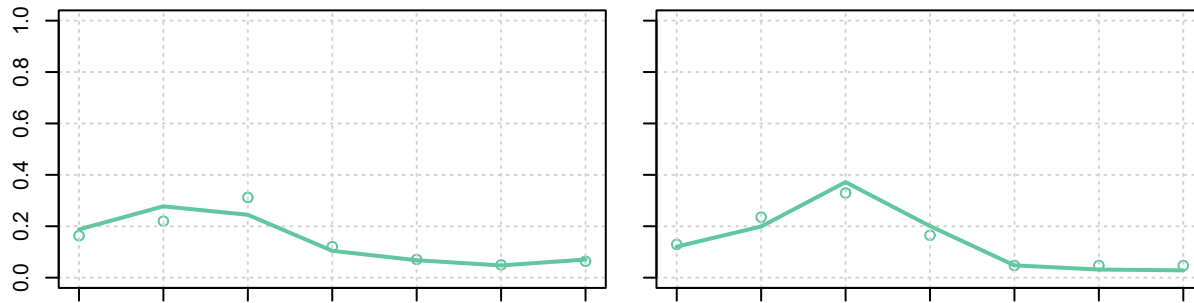


Year = 2014

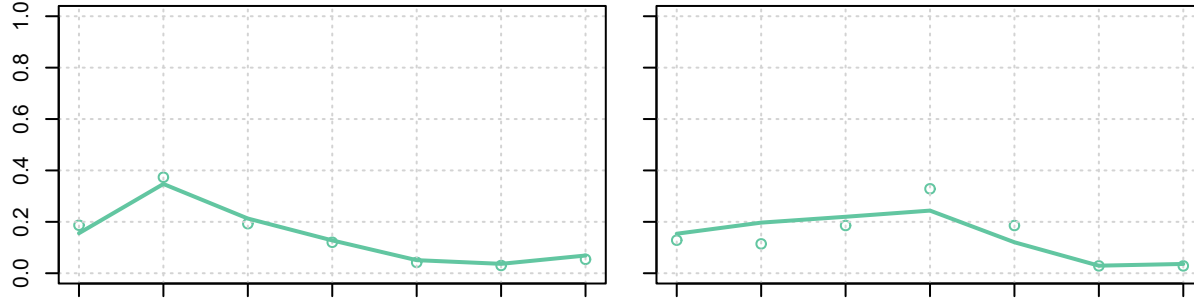


Age

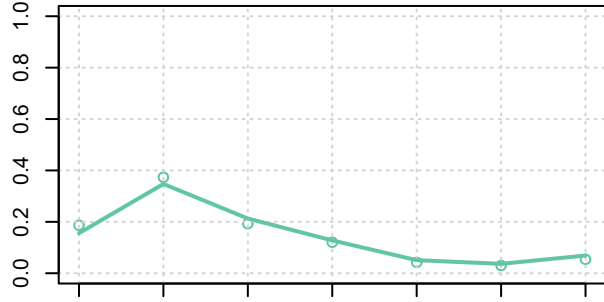
Index 3
Year = 2020



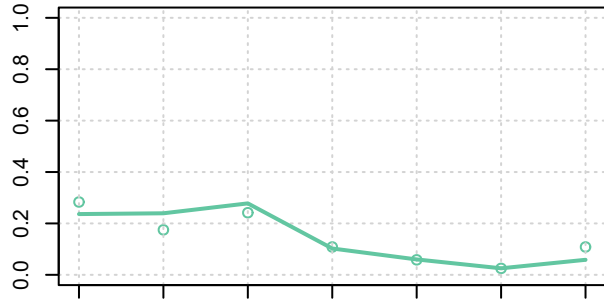
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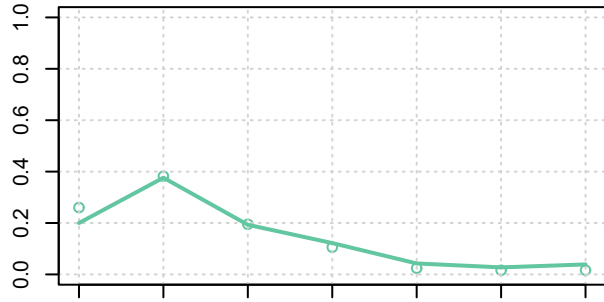
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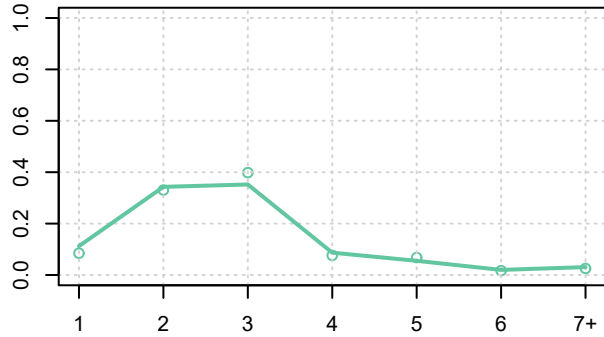
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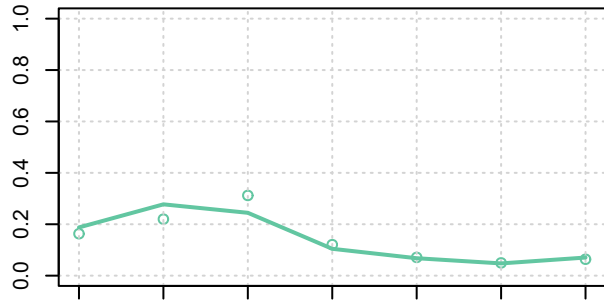
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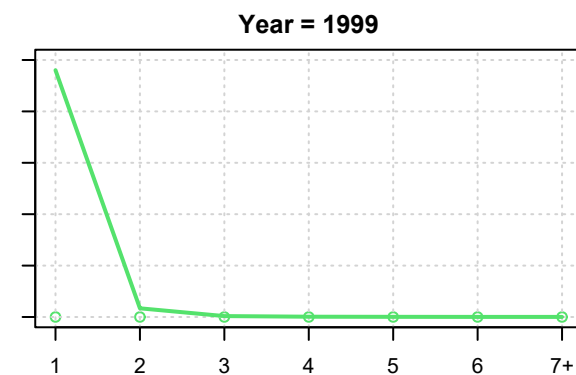
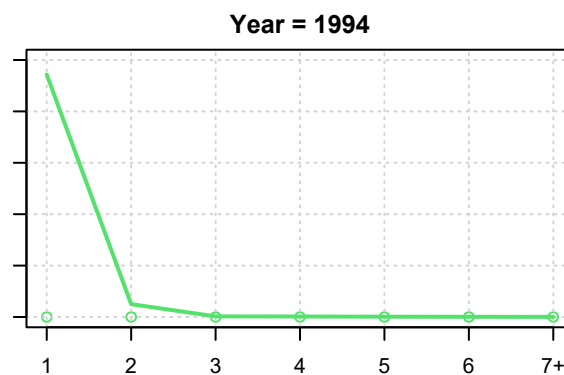
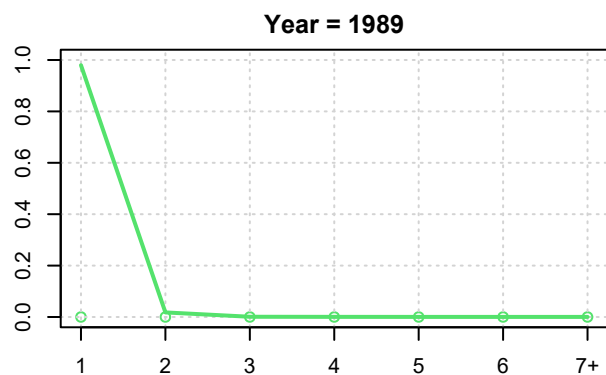
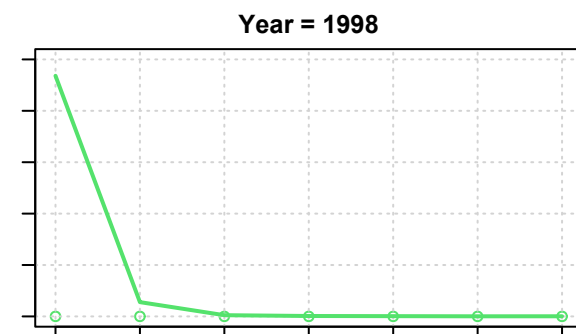
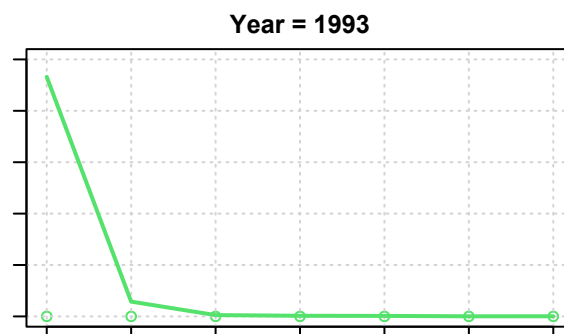
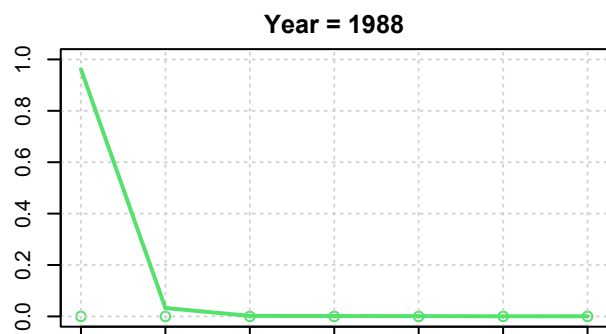
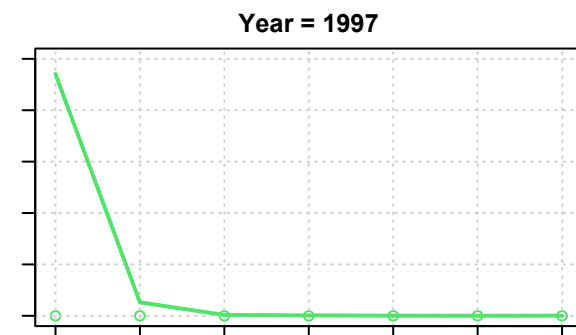
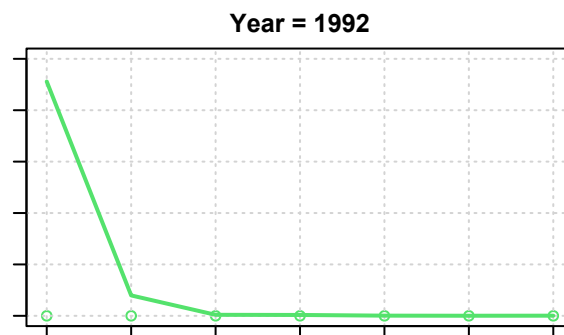
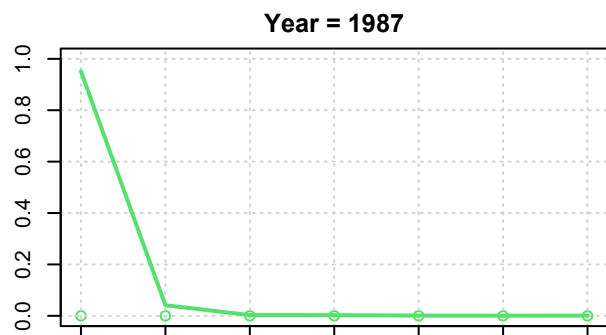
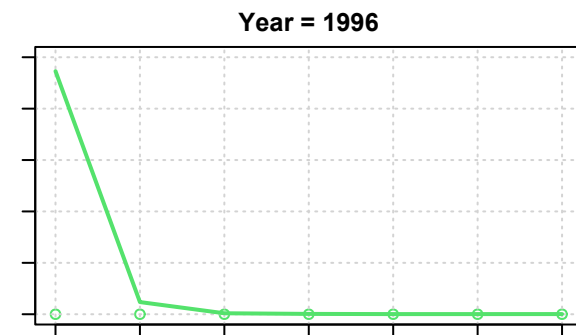
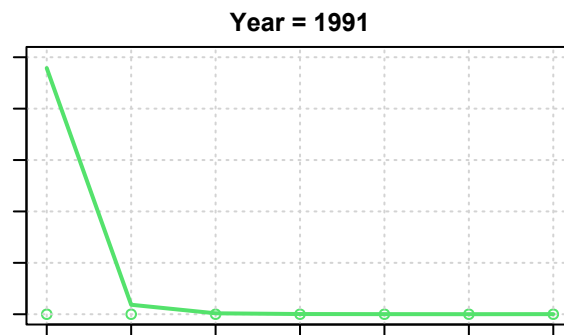
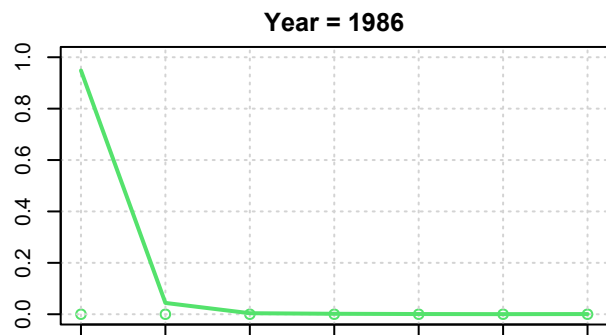
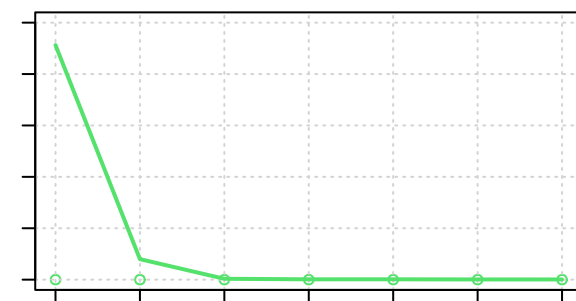
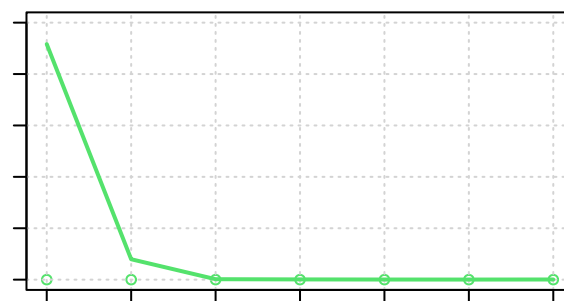
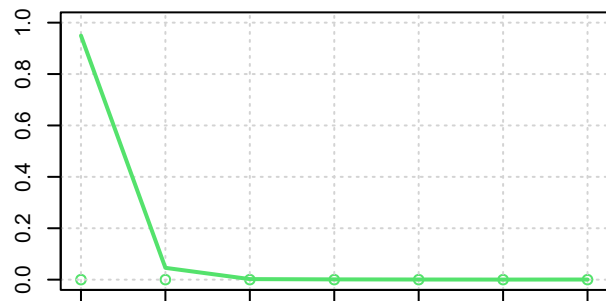
Year = 2019



Year = 2015



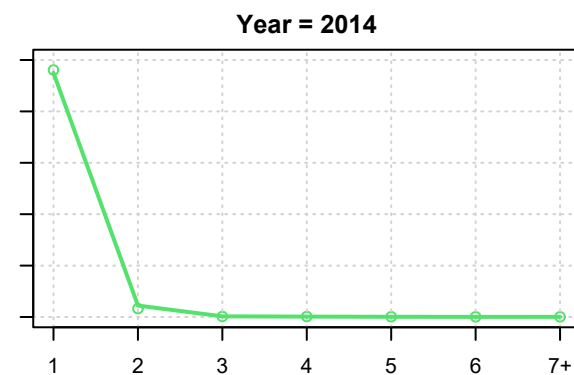
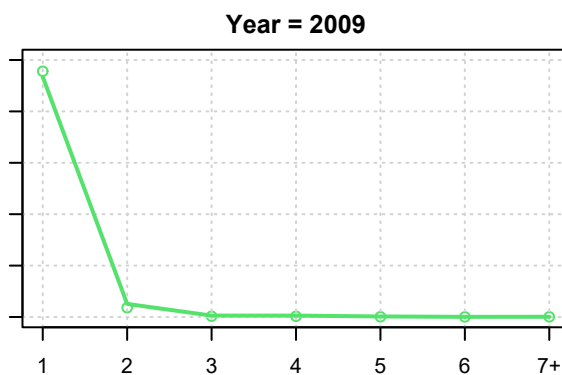
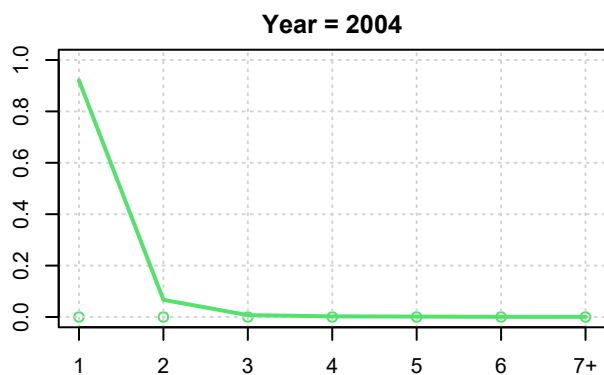
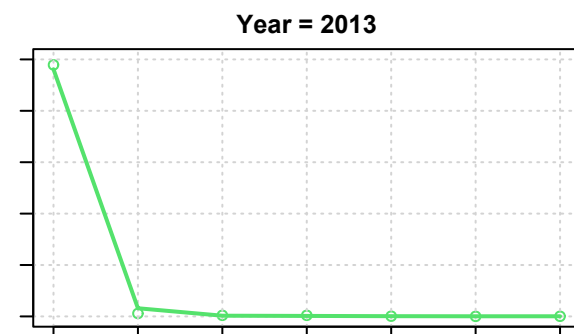
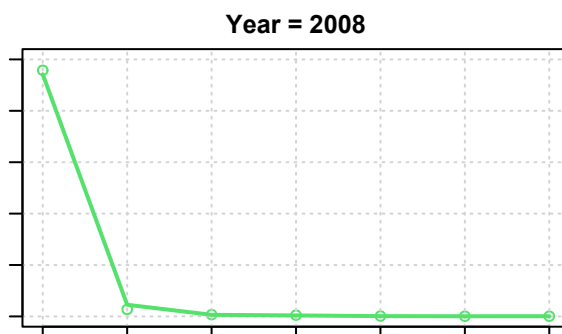
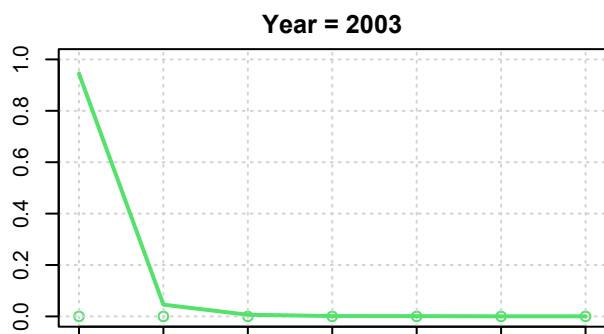
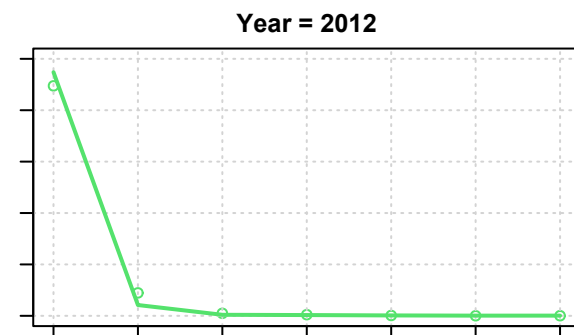
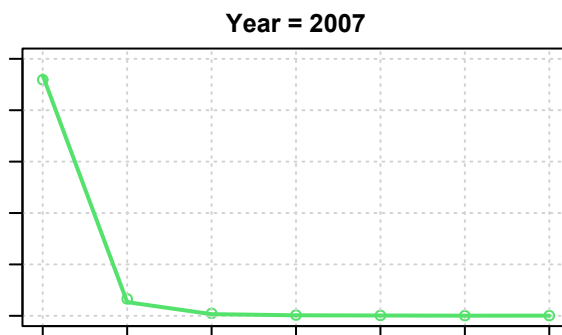
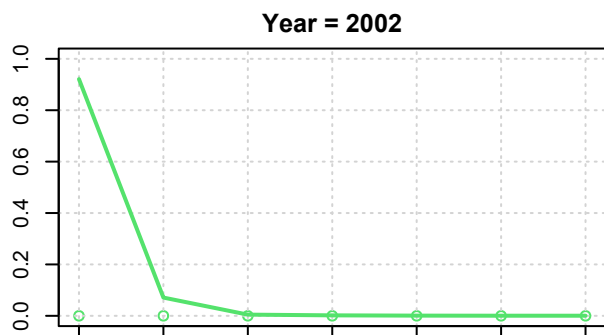
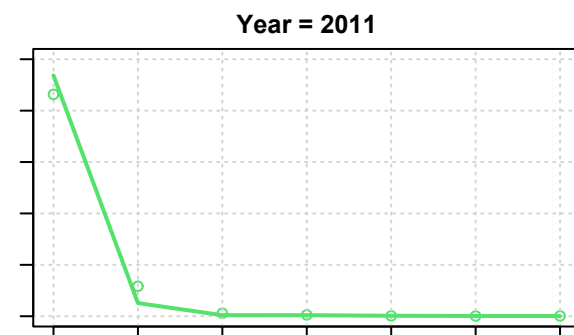
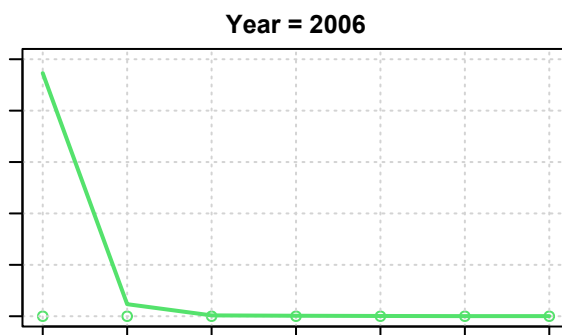
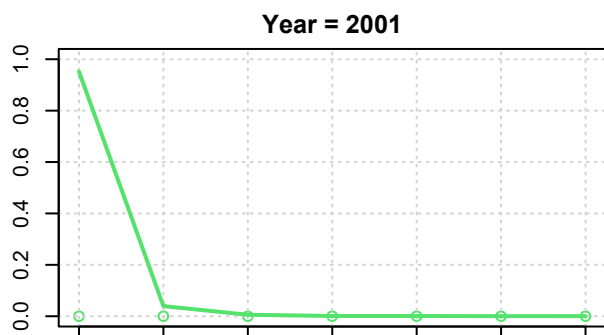
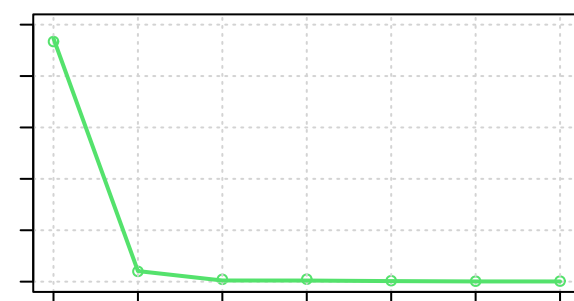
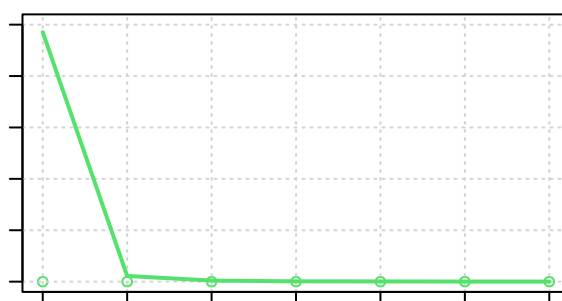
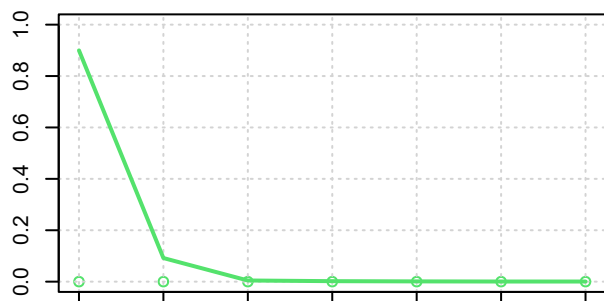
Index 4
Year = 1990



Proportion

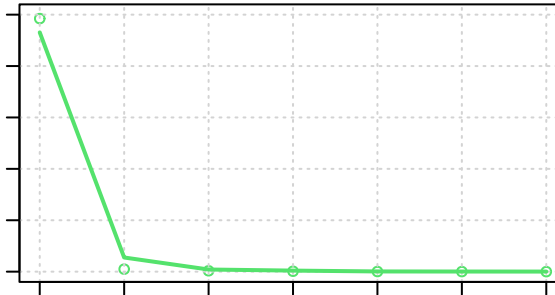
Age

Index 4
Year = 2005

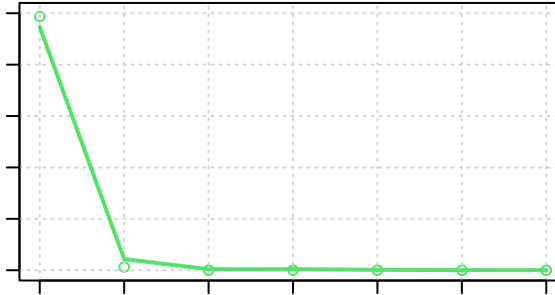


Age

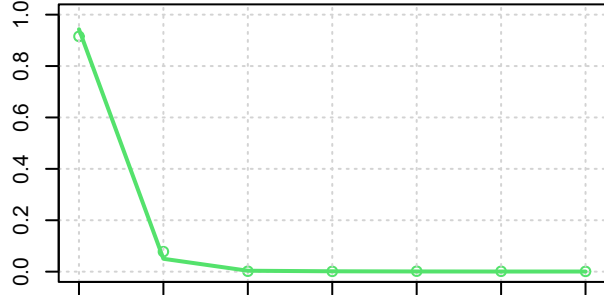
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Year = 2020



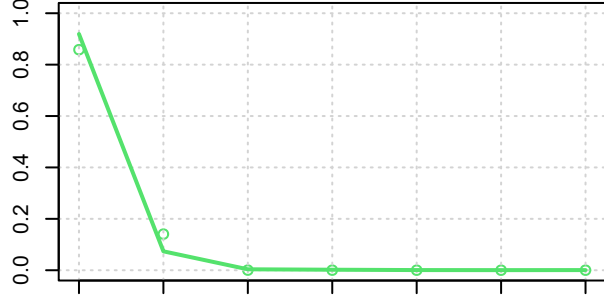
Year = 2021



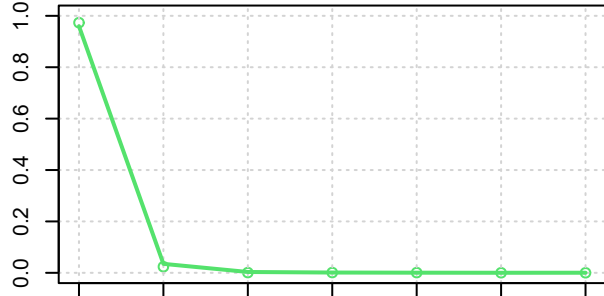
Year = 2015



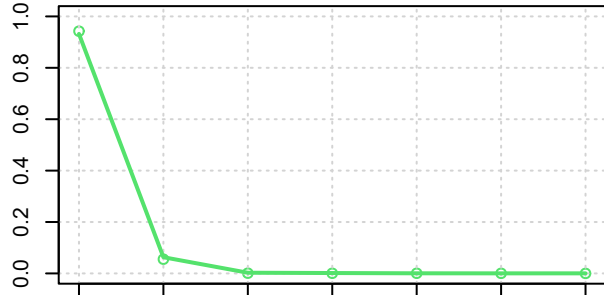
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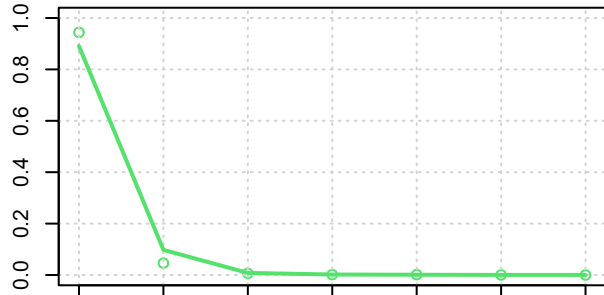
Year = 2017



Year = 2018



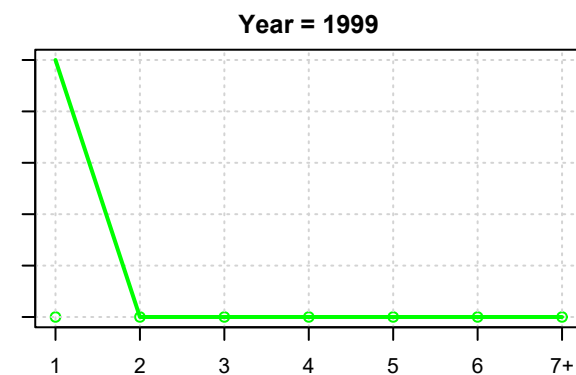
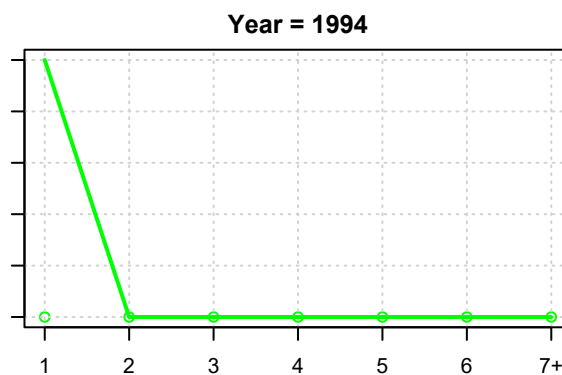
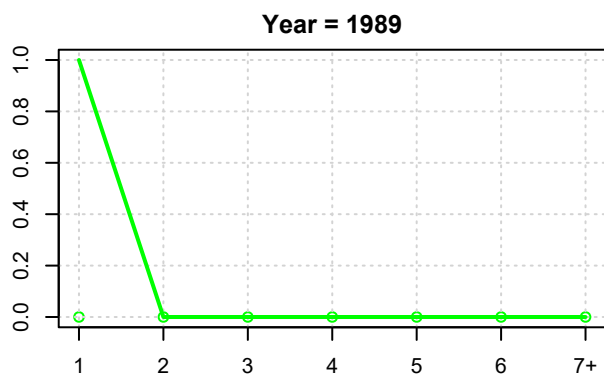
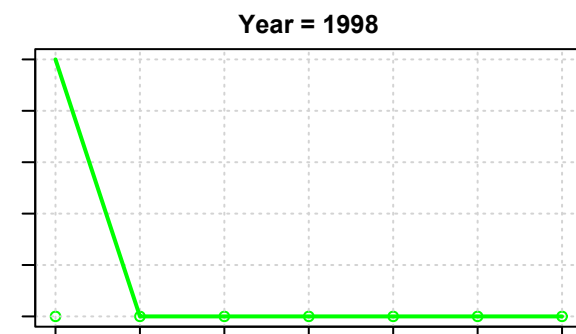
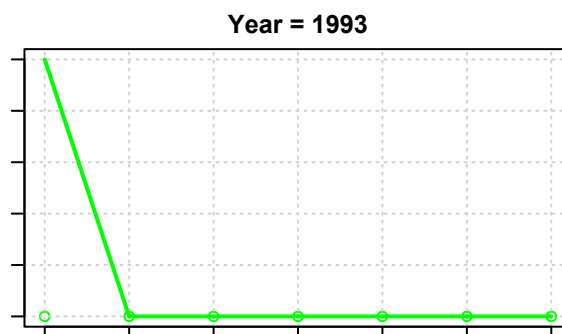
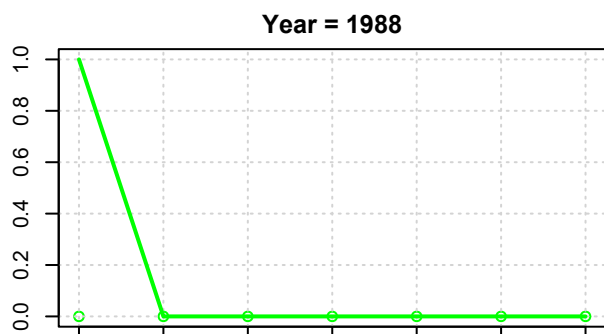
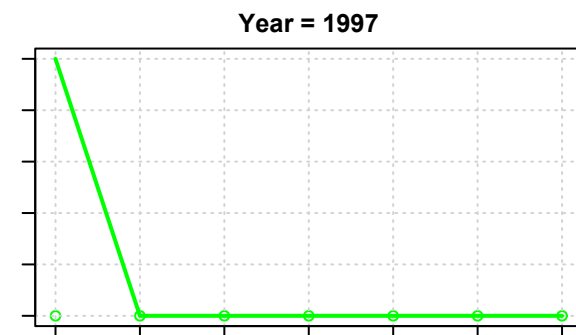
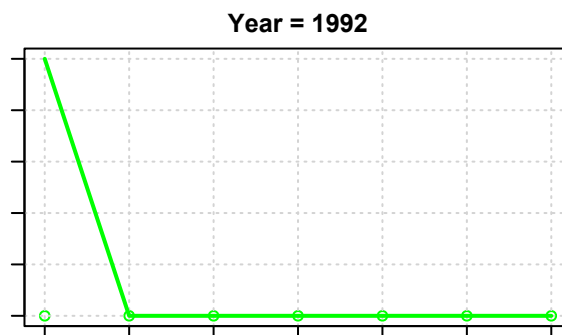
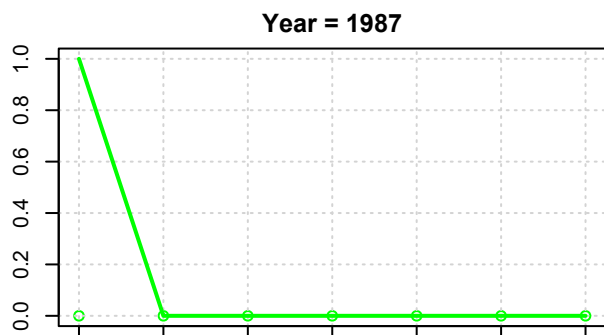
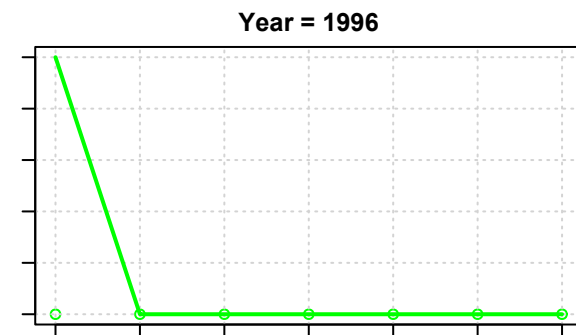
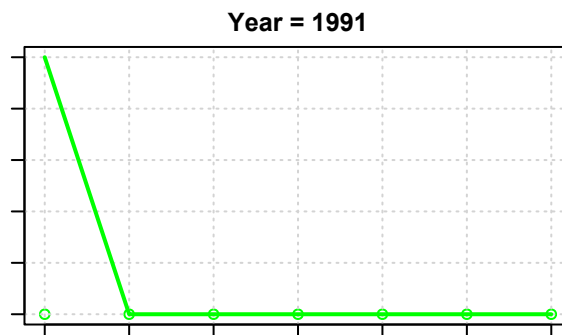
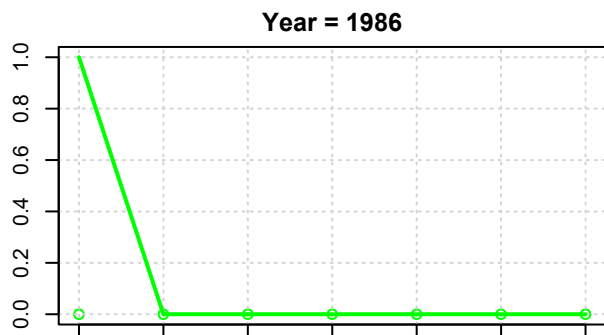
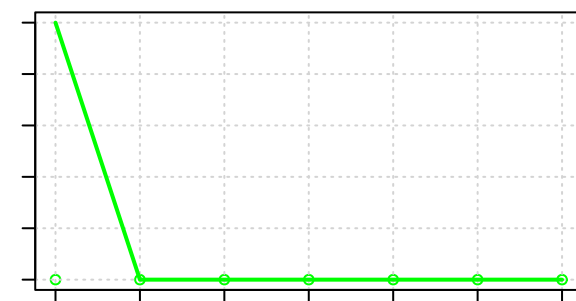
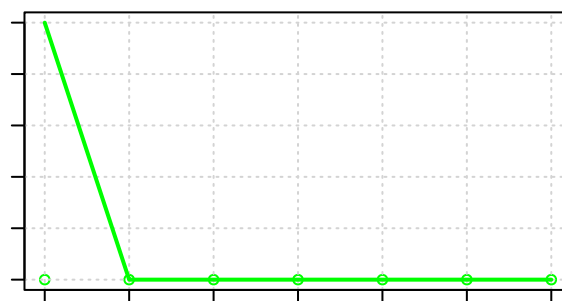
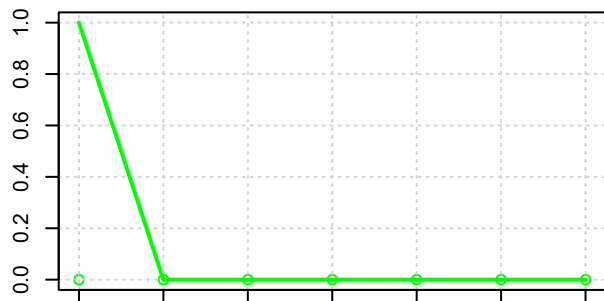
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Age

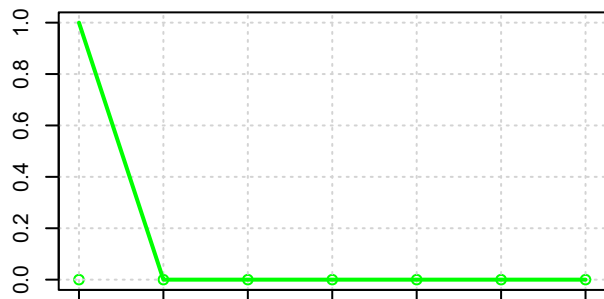
Proportion

Index 5
Year = 1990

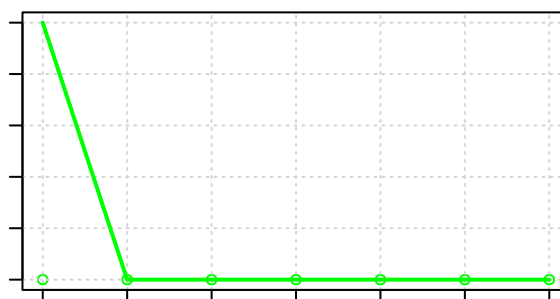


Age

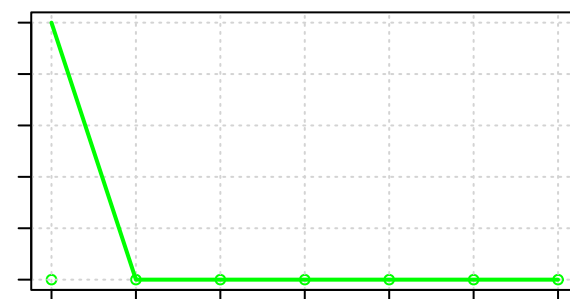
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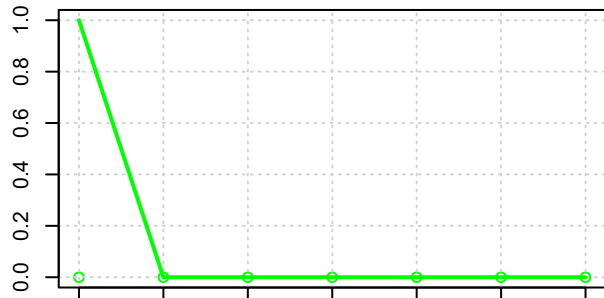
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Year = 2005



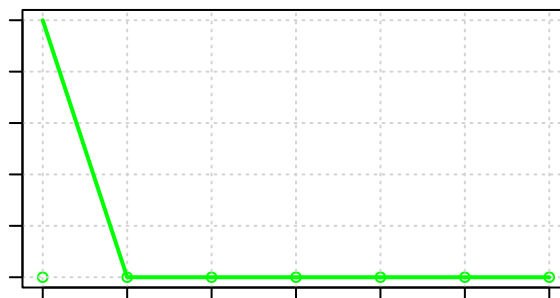
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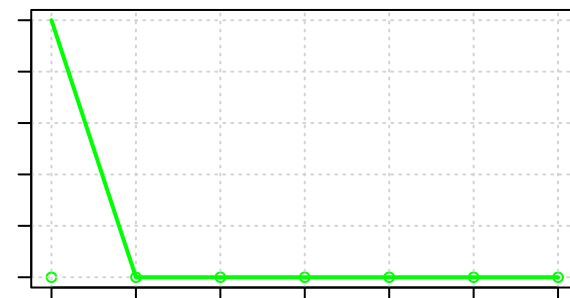
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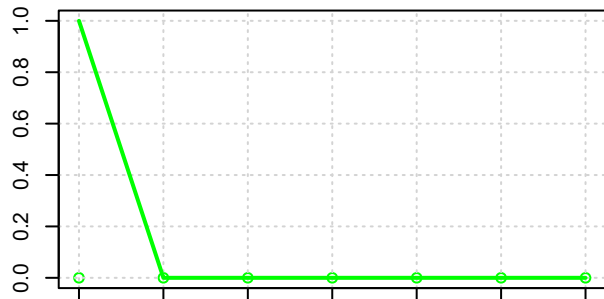
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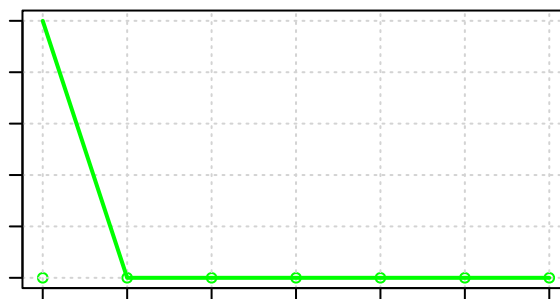
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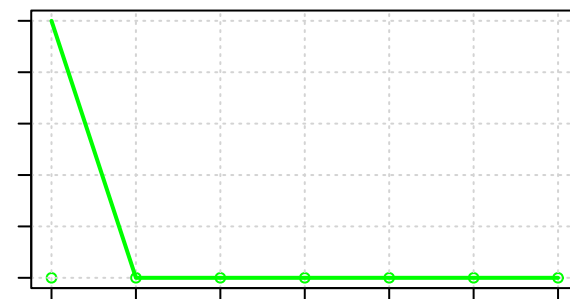
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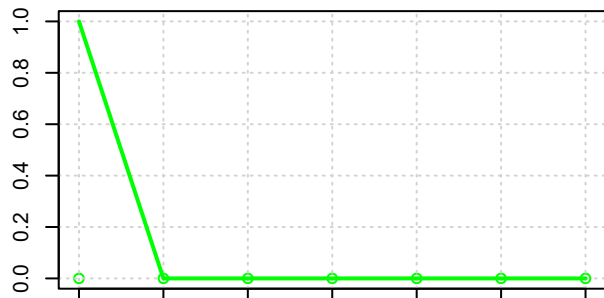
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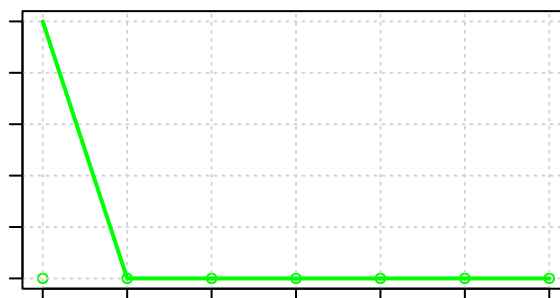
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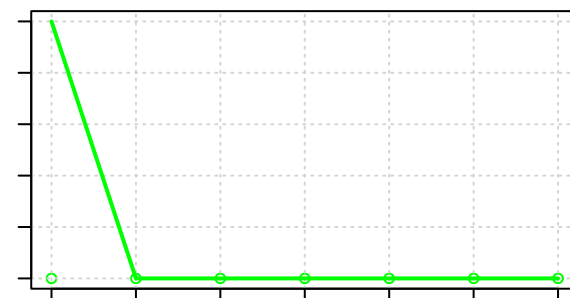
Year = 2003



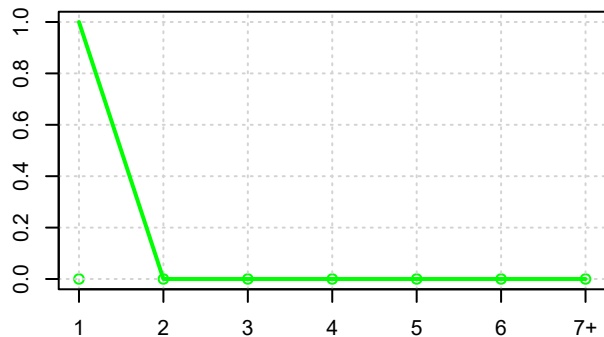
Year = 2008



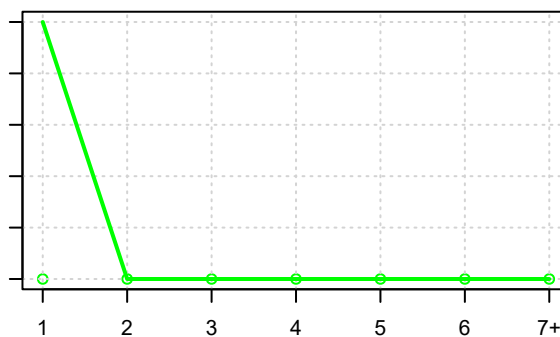
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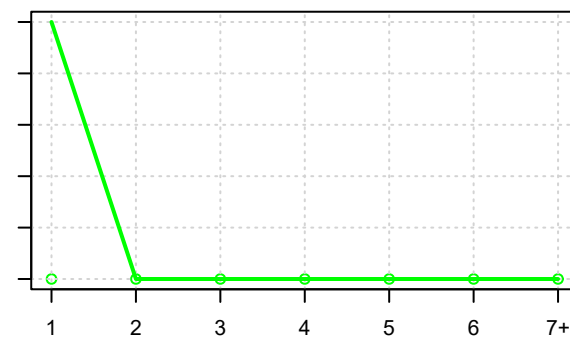
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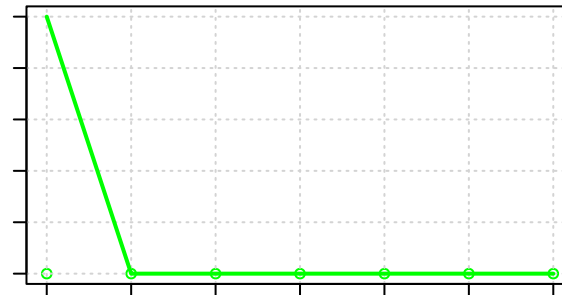
Year = 2009



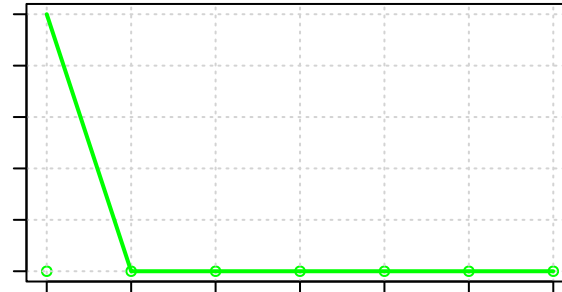
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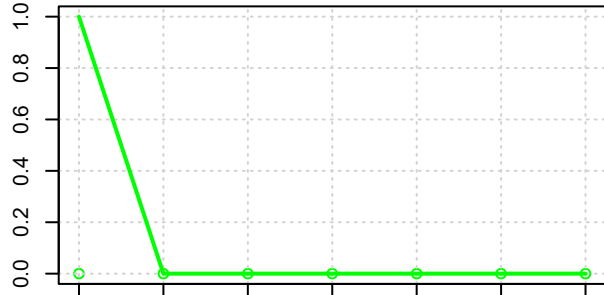
Index 5
Year = 2020



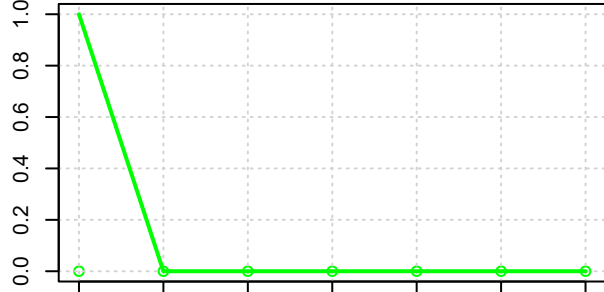
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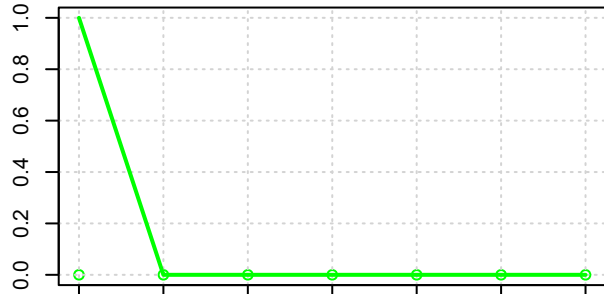
Year = 2015



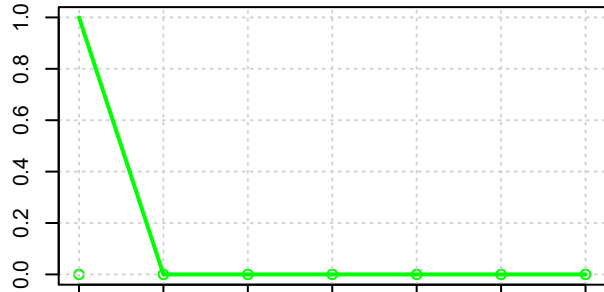
Year = 2016



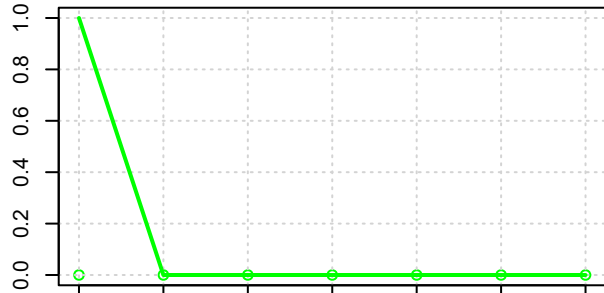
Year = 2017



Year = 2018



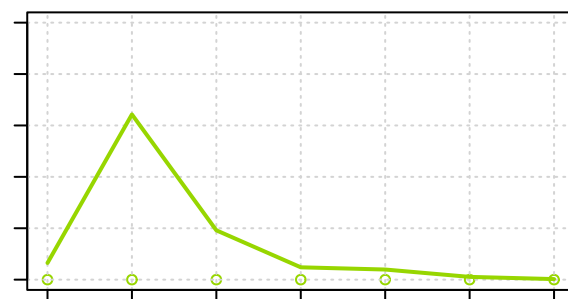
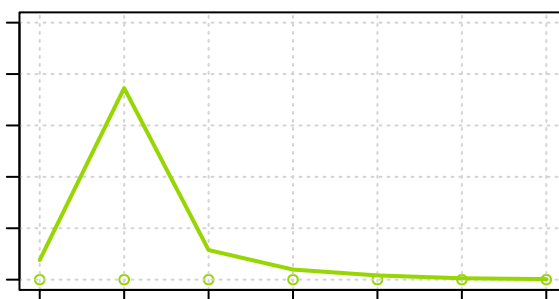
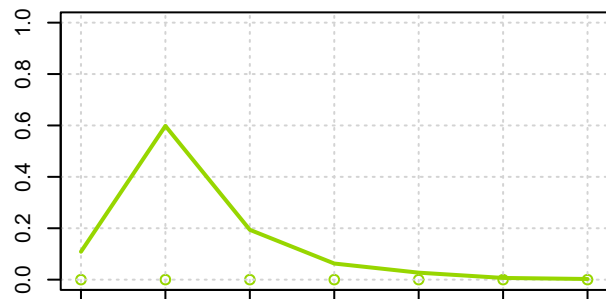
Year = 2019



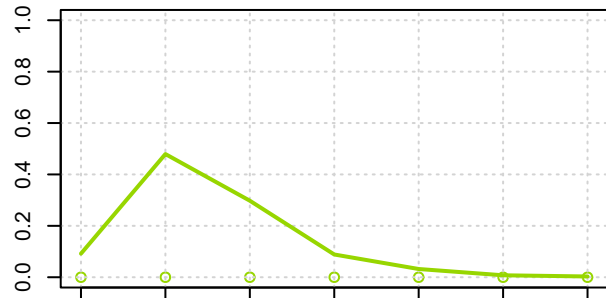
Age

Proportion

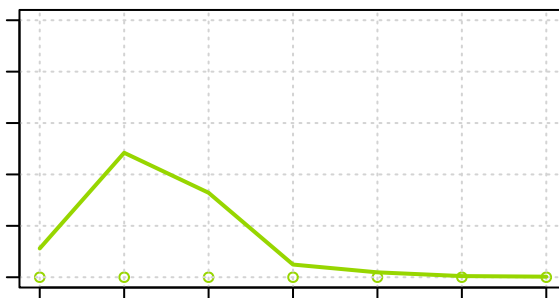
Index 6
Year = 1990



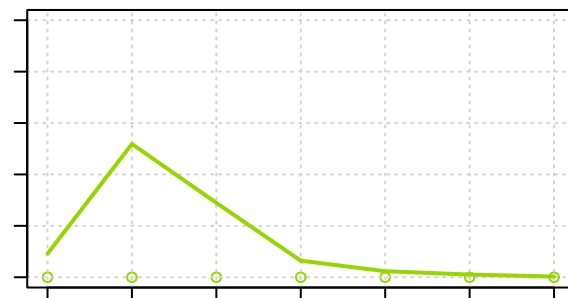
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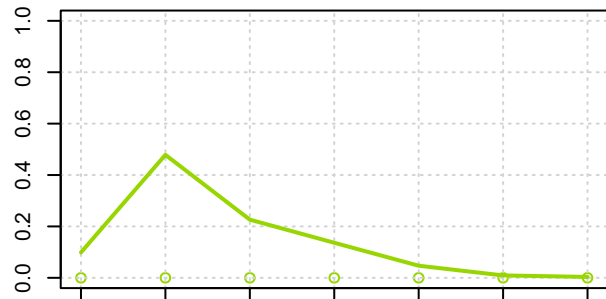
Year = 1991



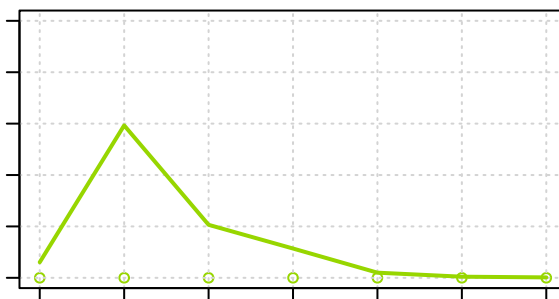
Year = 1996



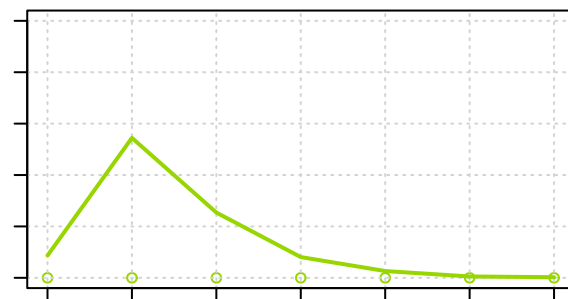
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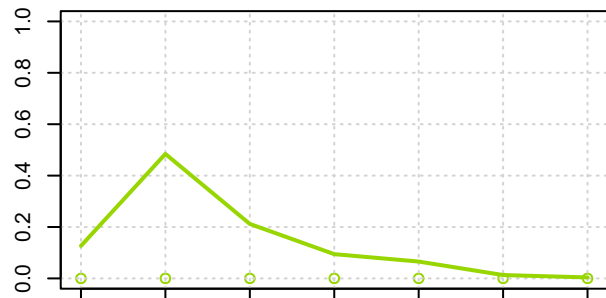
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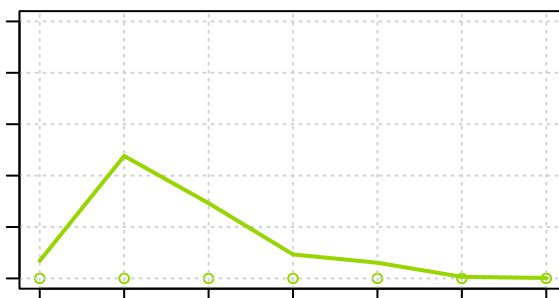
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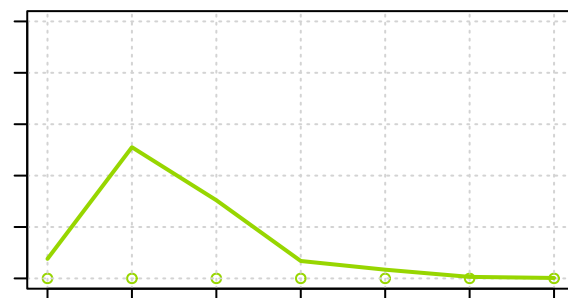
Year = 1988



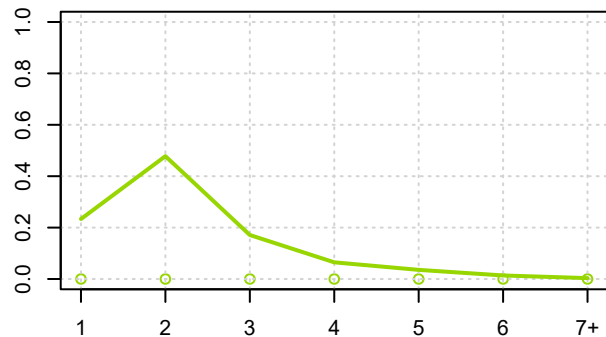
Year = 1993



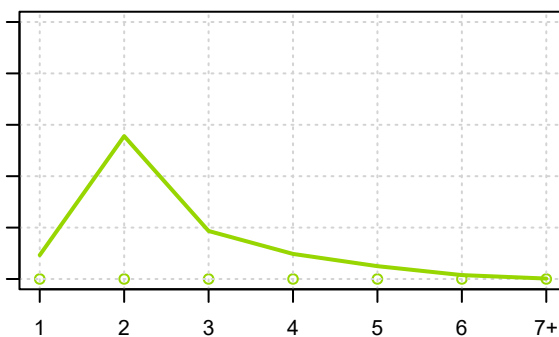
Year = 1998



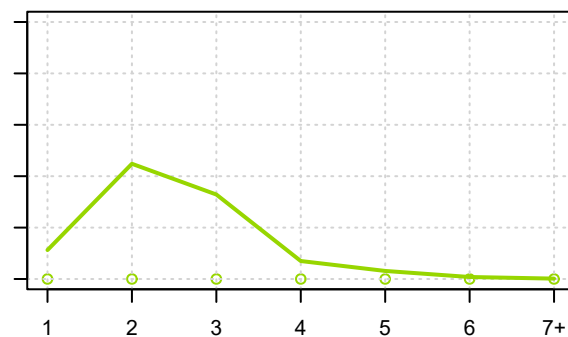
Year = 1989



Year = 1994

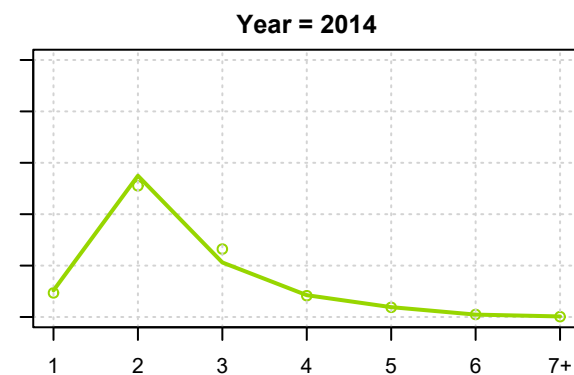
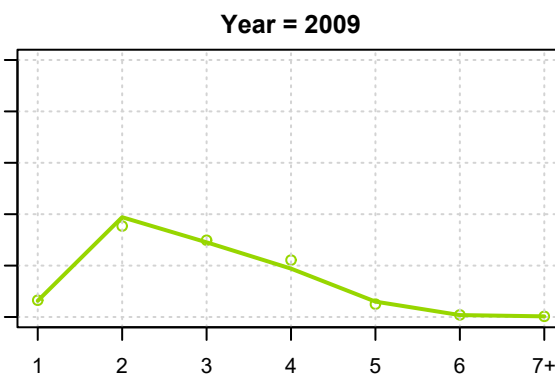
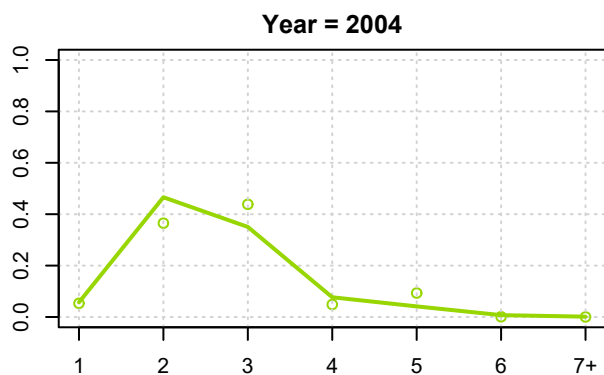
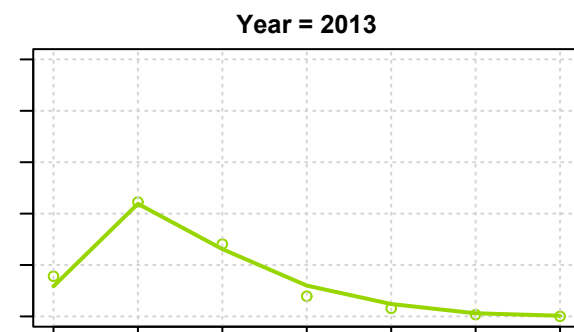
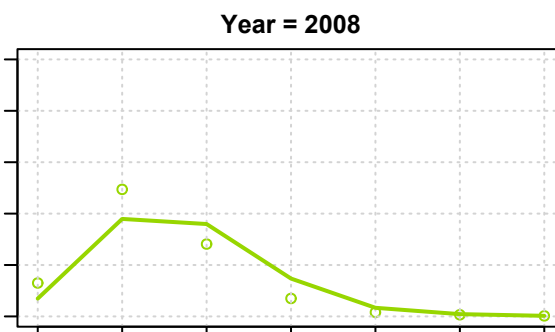
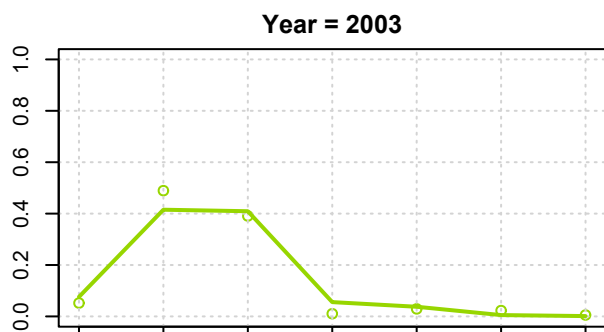
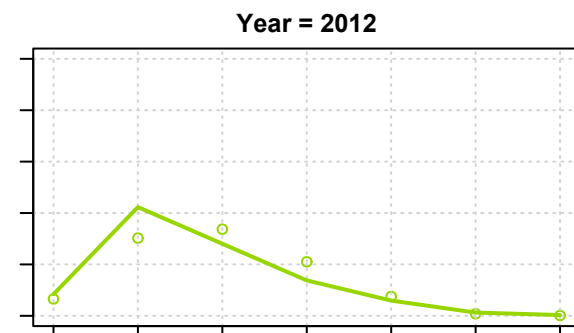
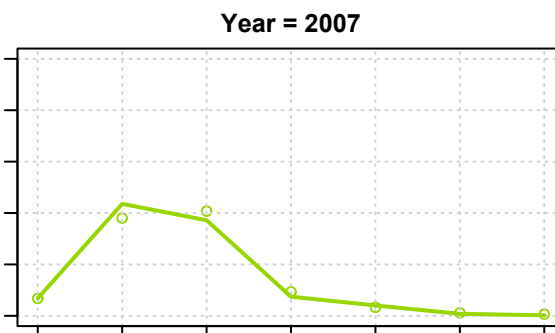
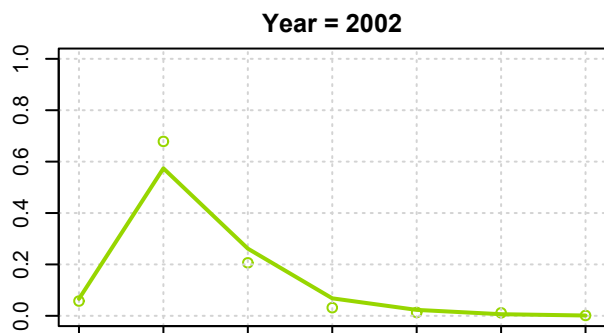
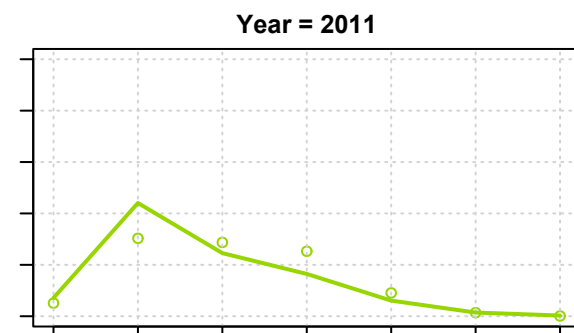
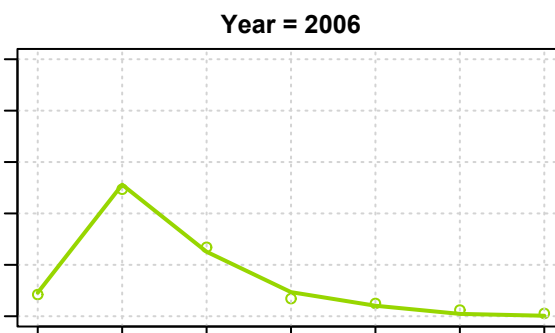
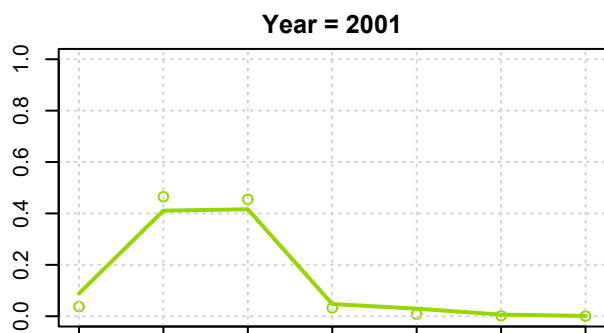
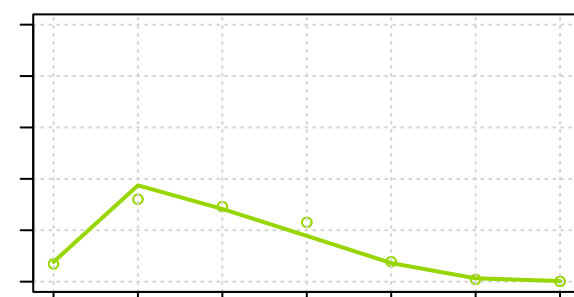
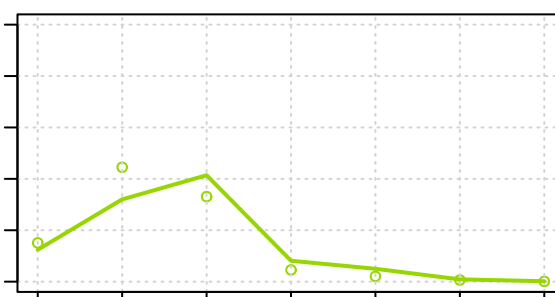
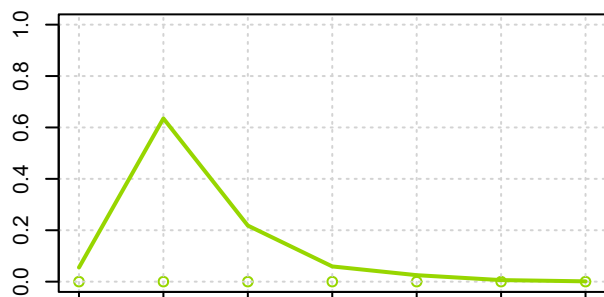


Year = 1999



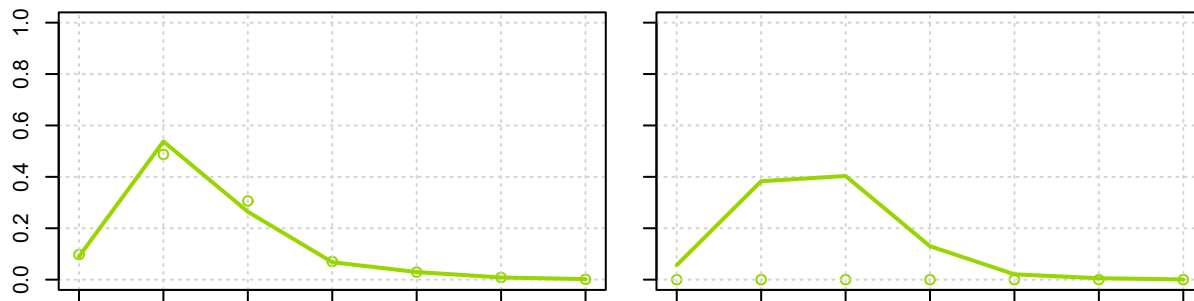
Age

Index 6
Year = 2005

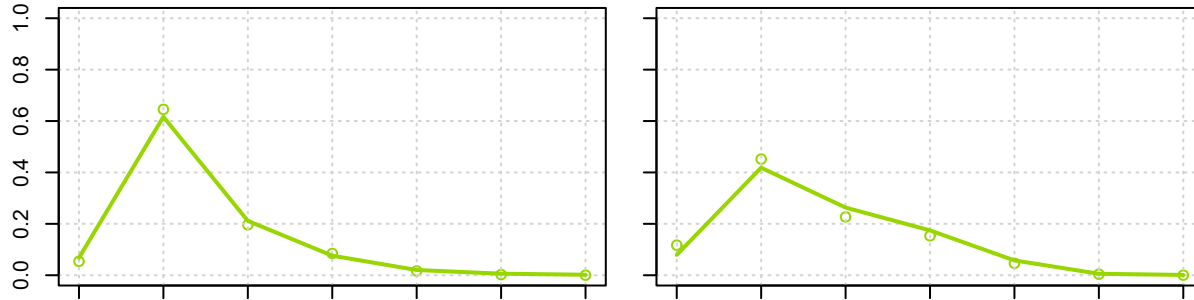


Age

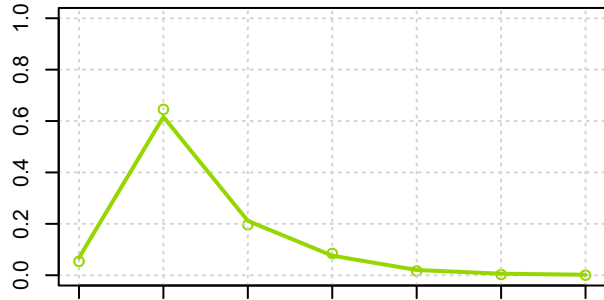
Index 6
Year = 2020



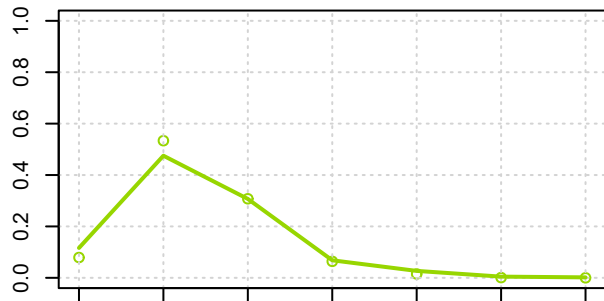
Year = 2021



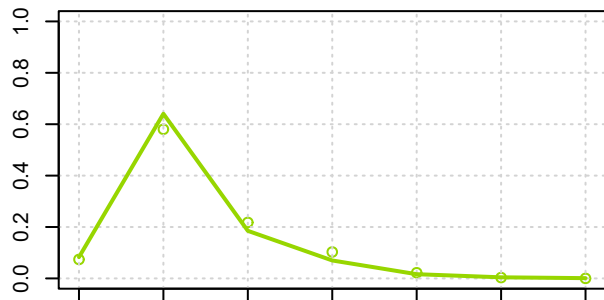
Year = 2016



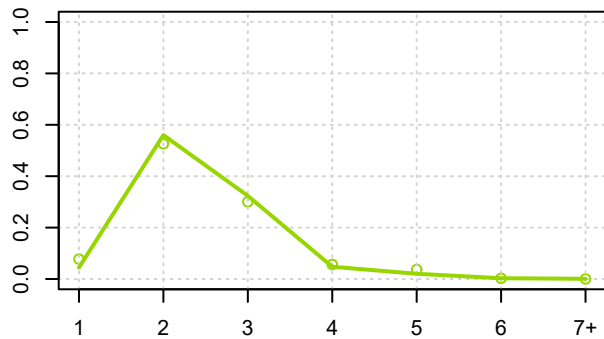
Year = 2017



Year = 2018



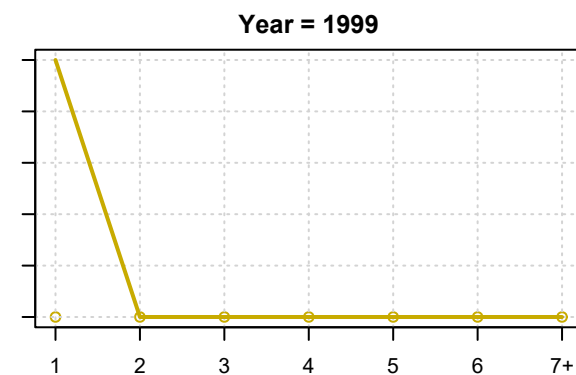
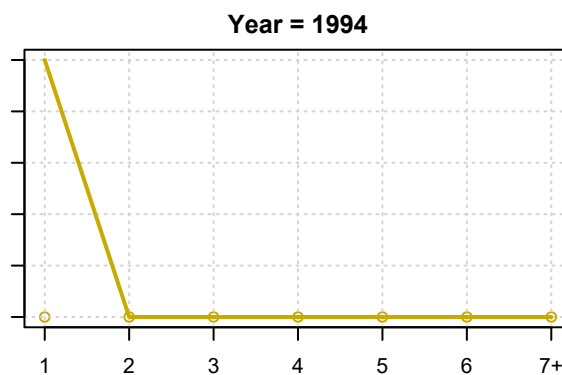
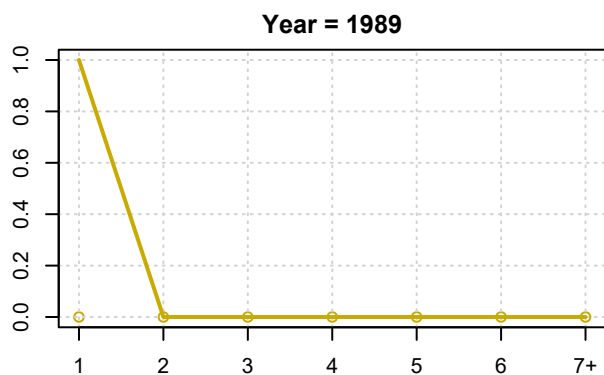
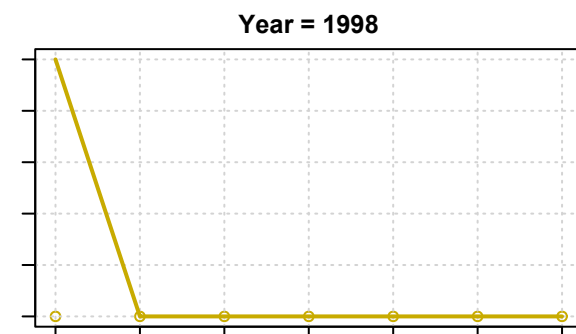
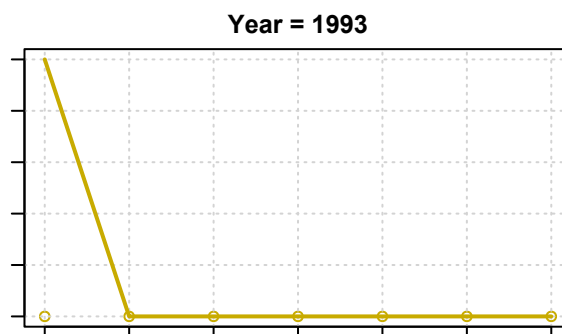
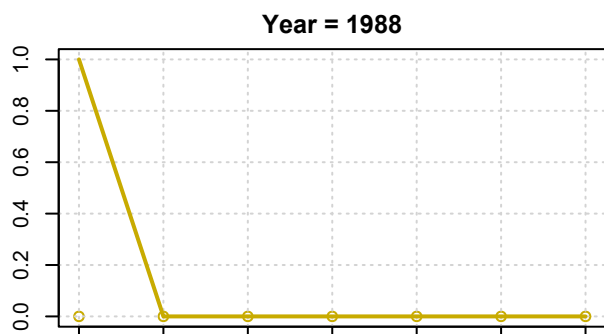
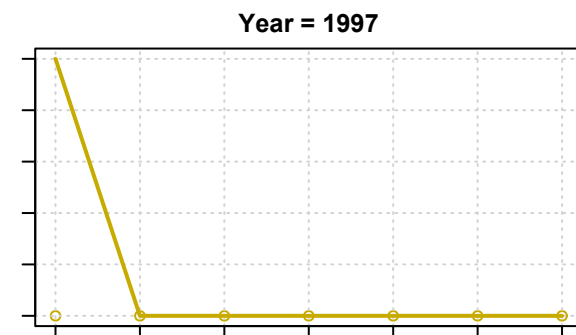
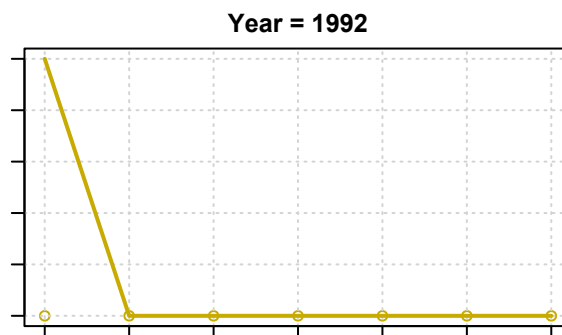
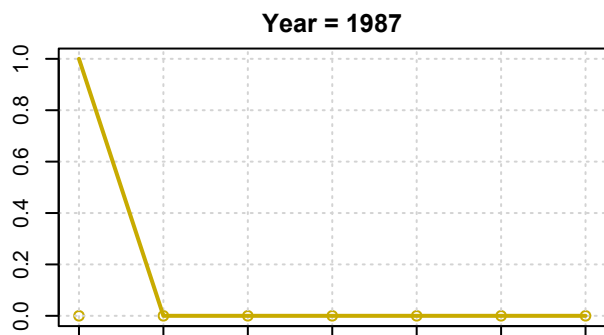
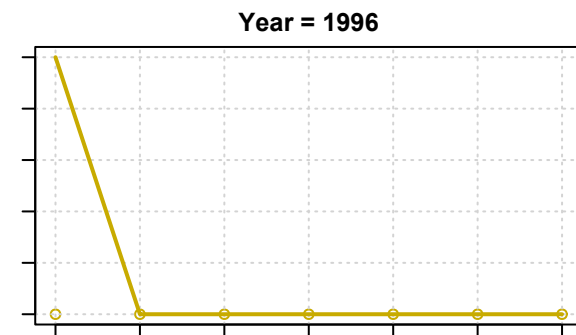
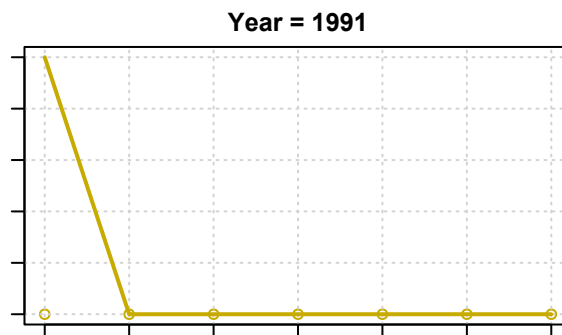
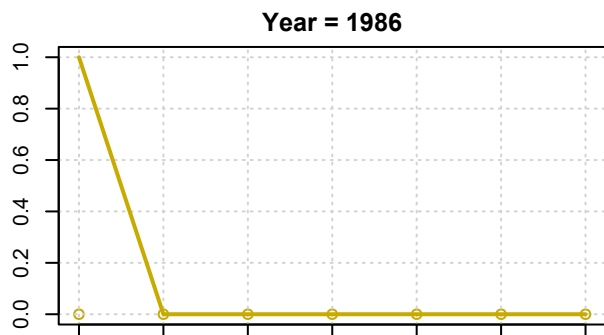
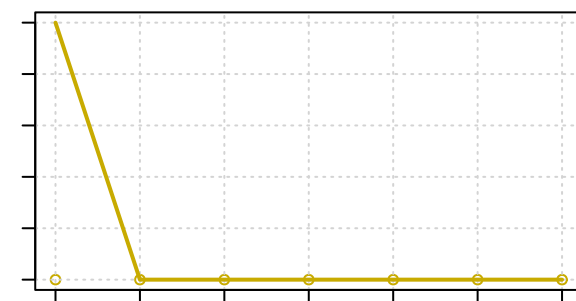
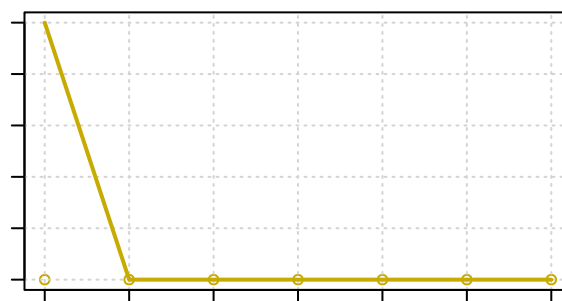
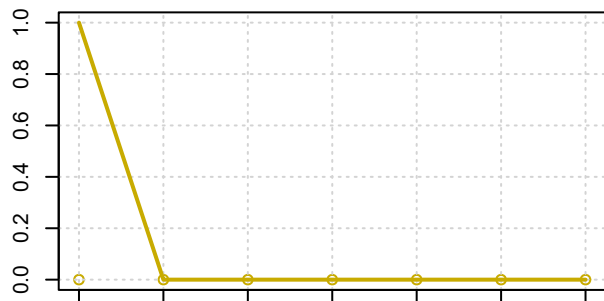
Year = 2019



Age

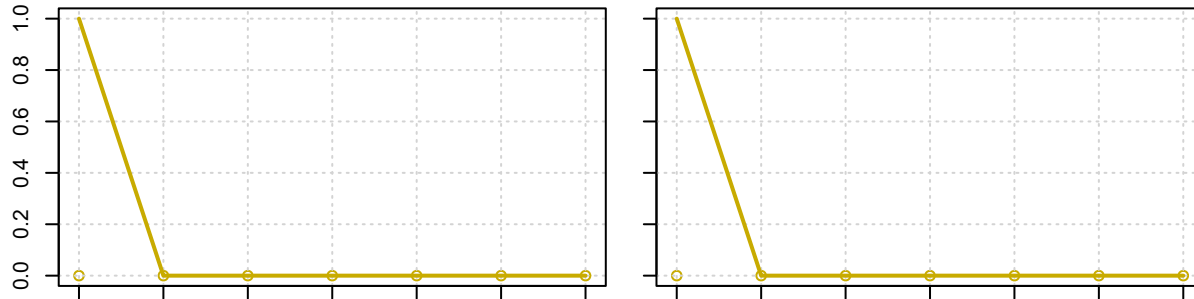
Proportion

Index 7
Year = 1990

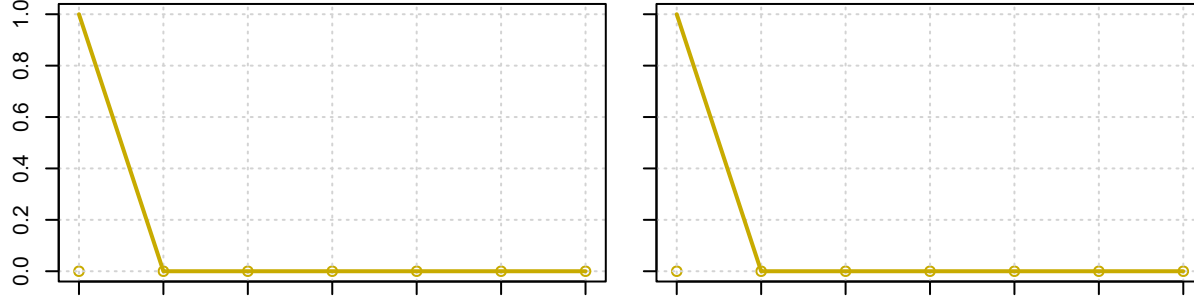


Age

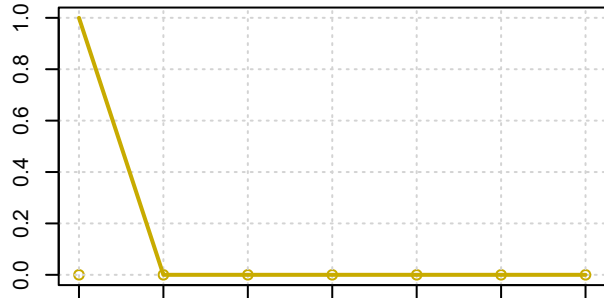
Index 7
Year = 2020



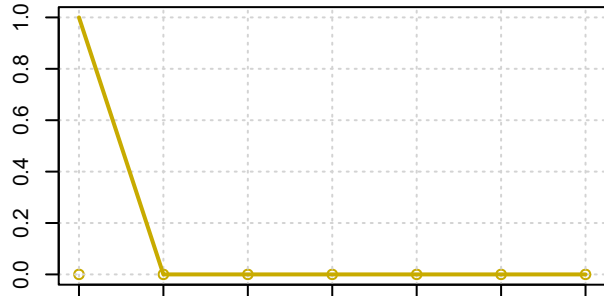
Year = 2021



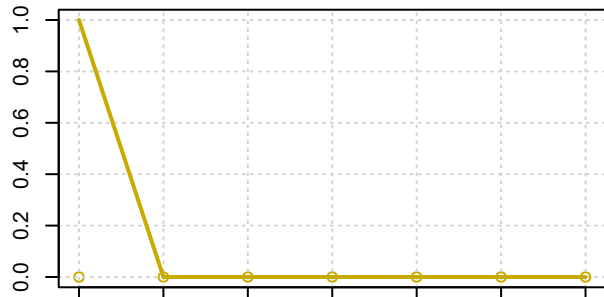
Year = 2017



Year = 2018

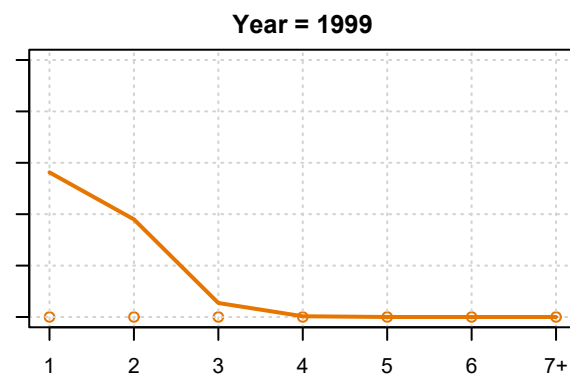
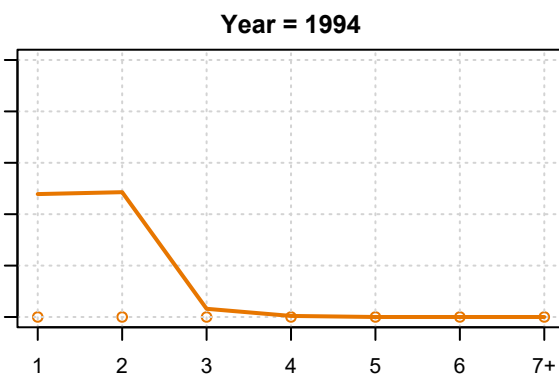
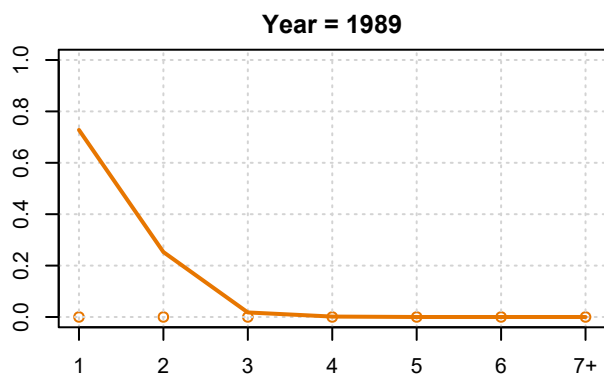
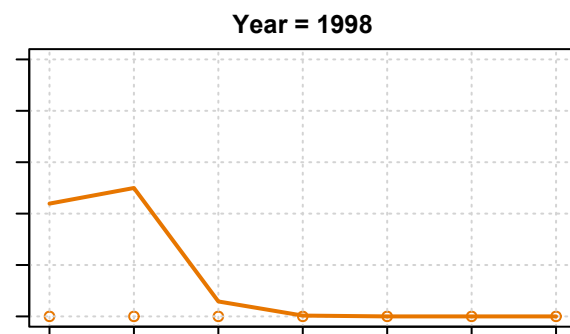
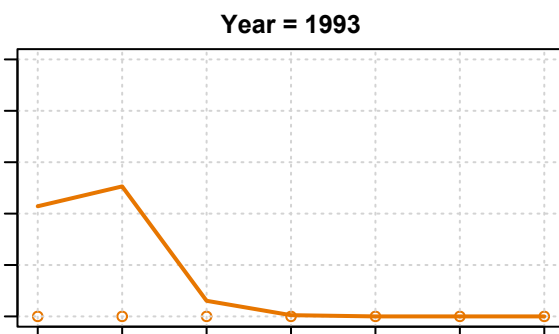
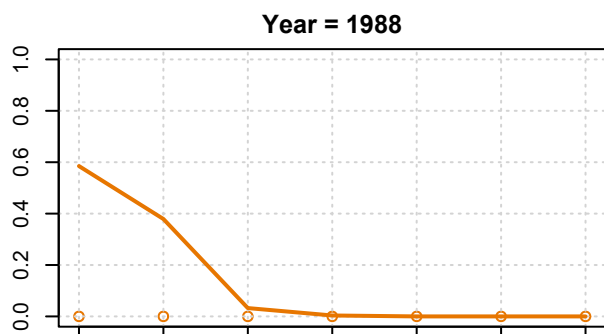
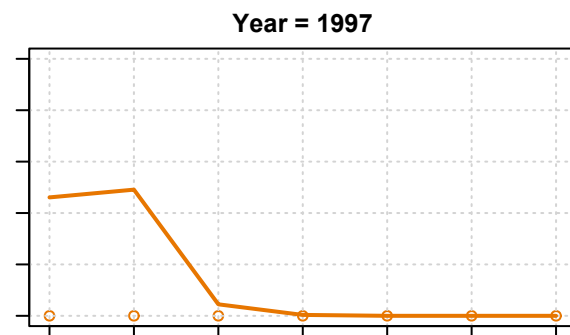
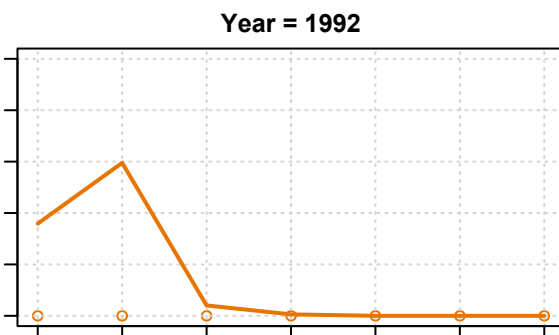
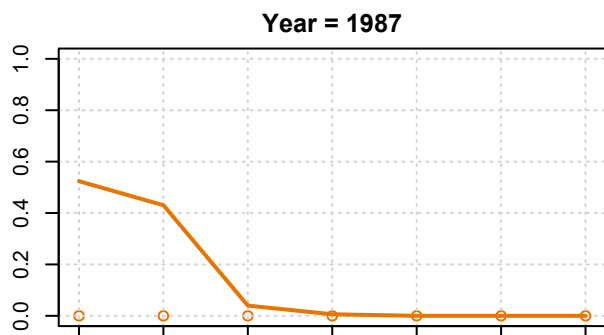
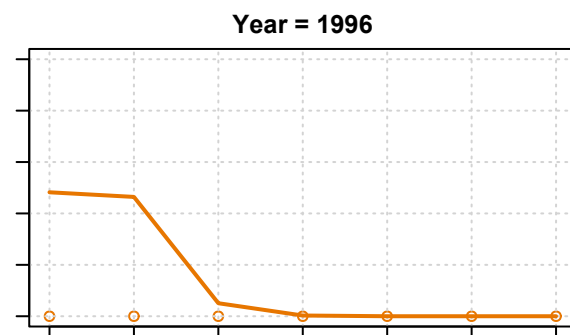
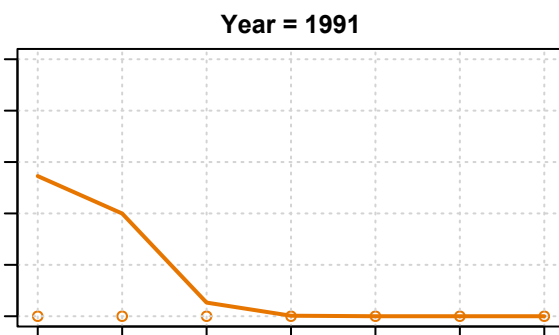
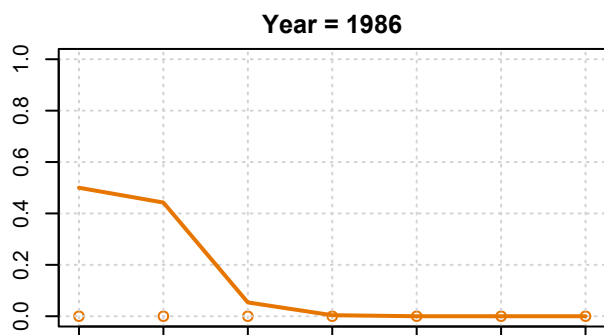
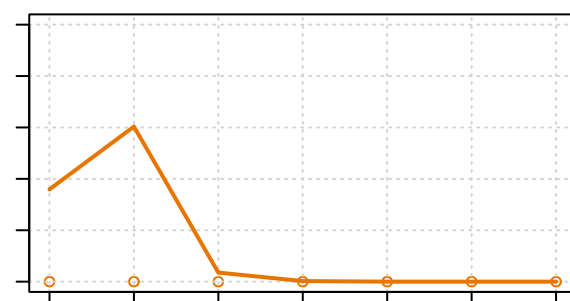
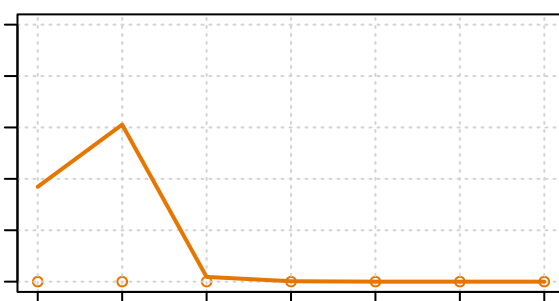
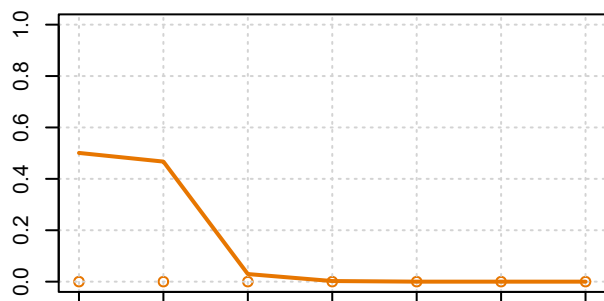


Year = 2019



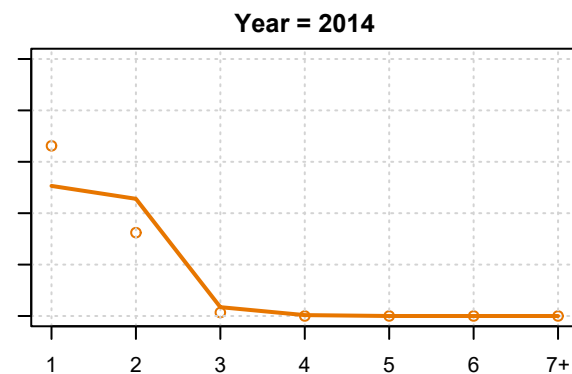
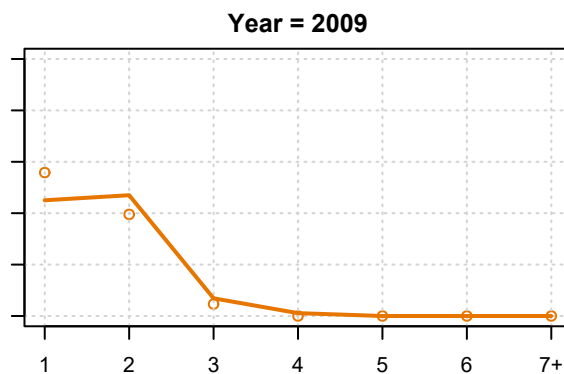
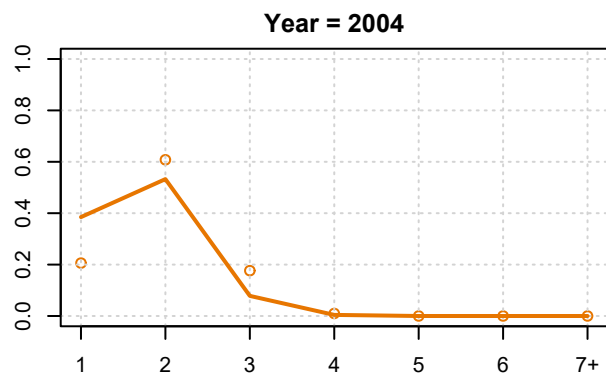
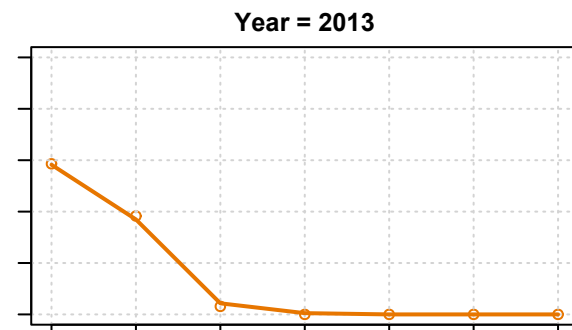
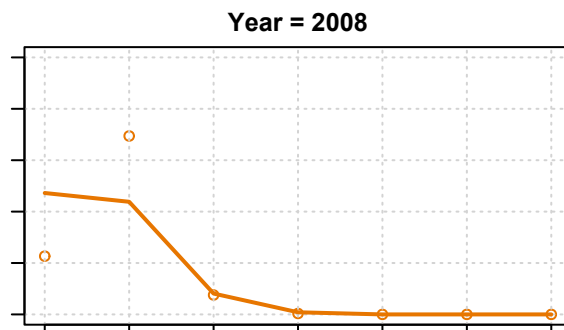
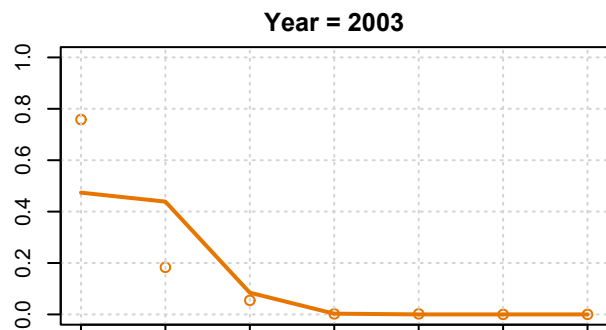
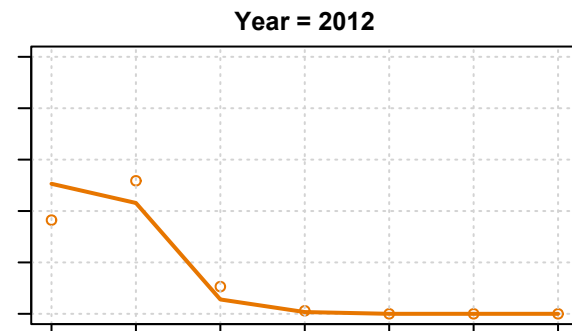
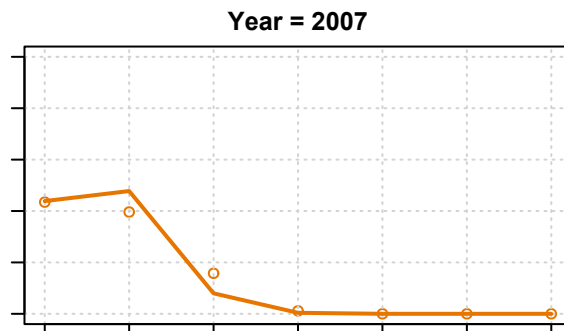
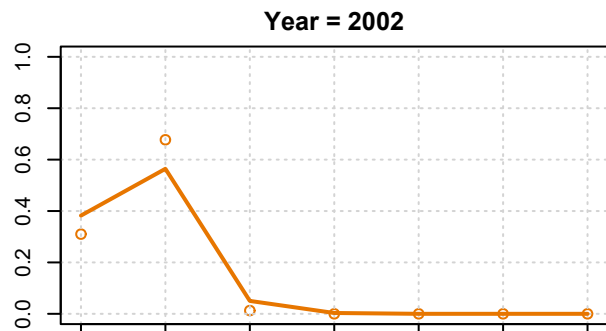
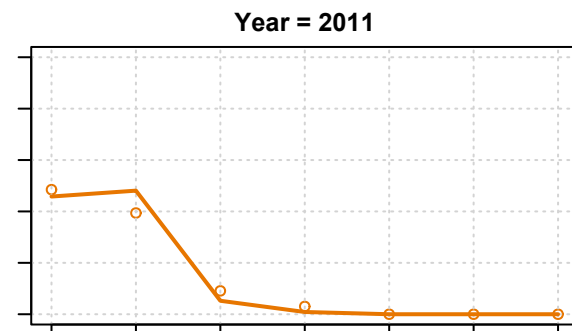
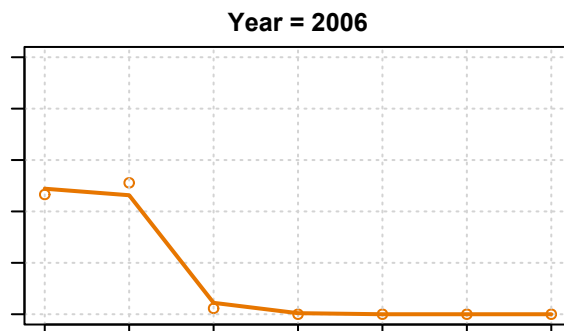
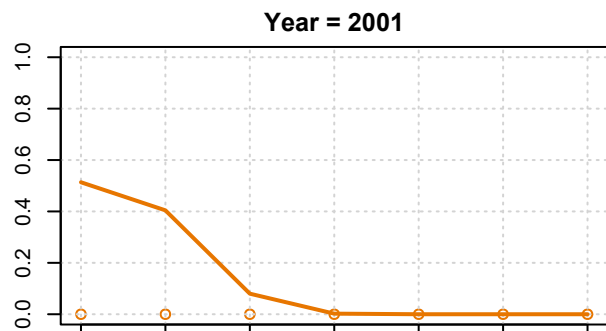
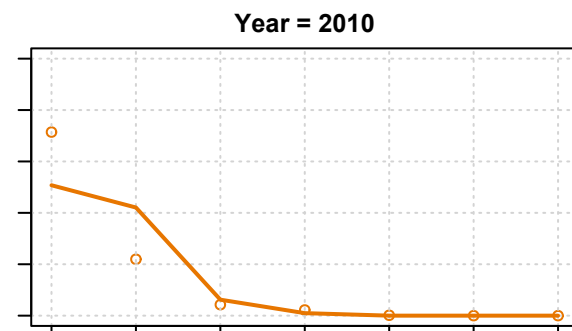
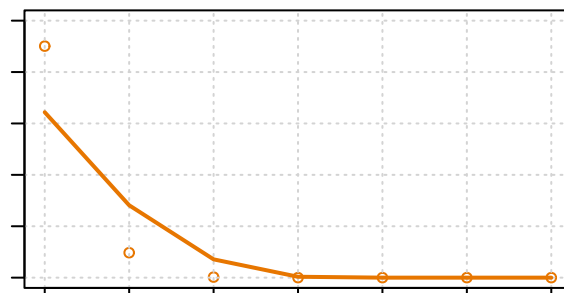
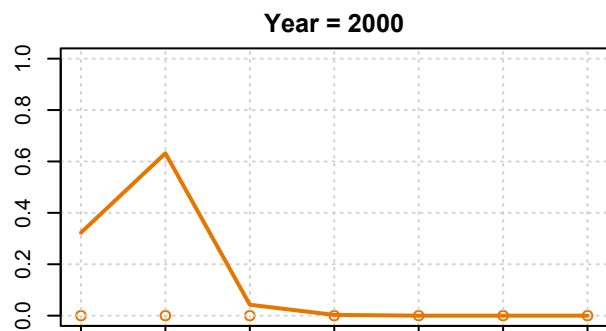
Age

Index 8
Year = 1990



Age

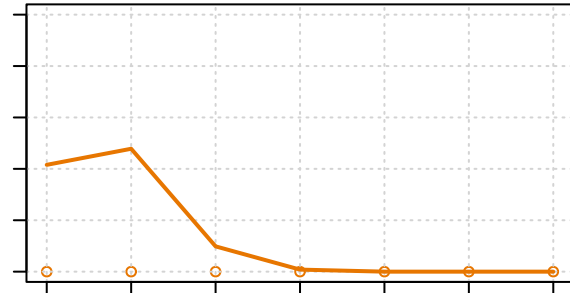
Index 8
Year = 2005



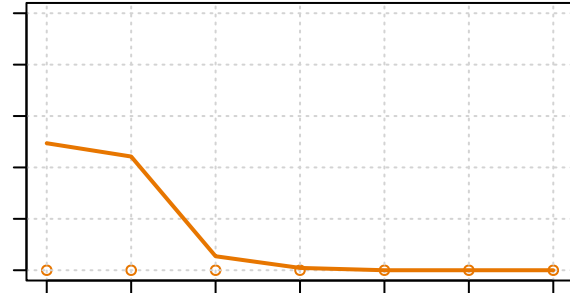
Proportion

Age

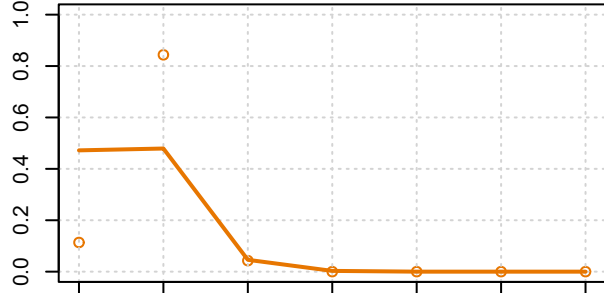
Index 8
Year = 2020



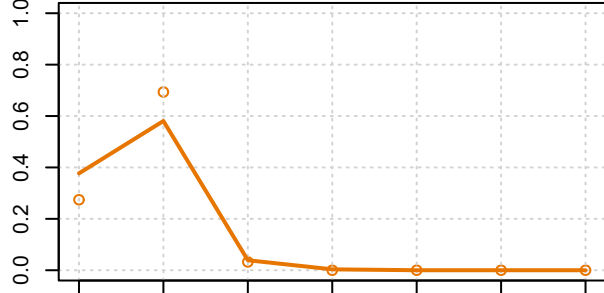
Year = 2021



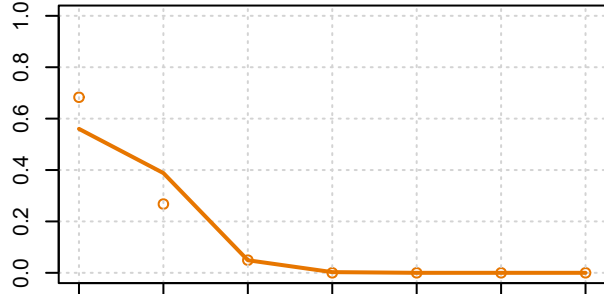
Year = 2015



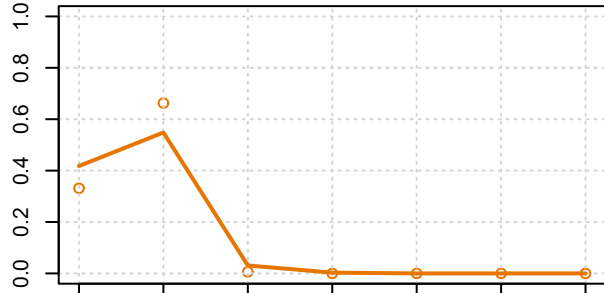
Year = 2016



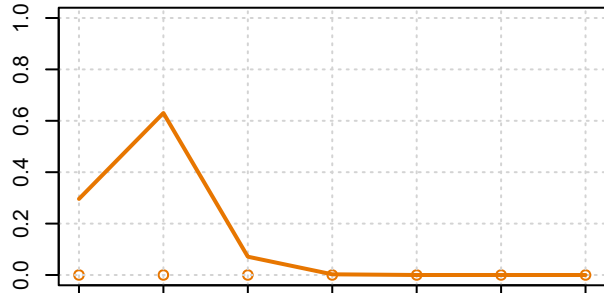
Year = 2017



Year = 2018



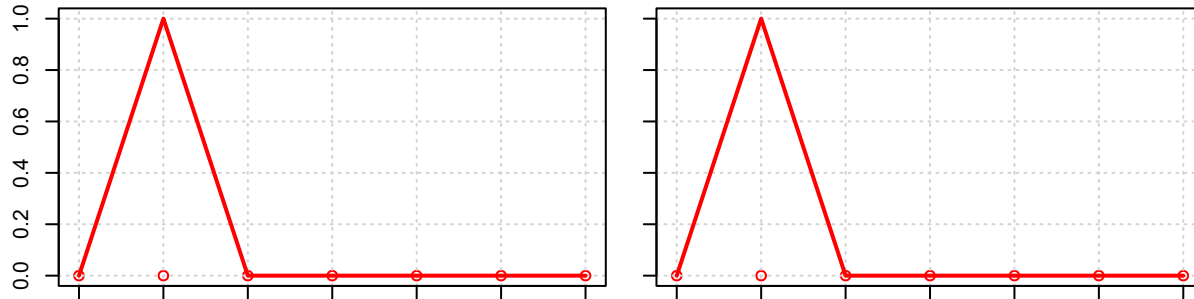
Year = 2019



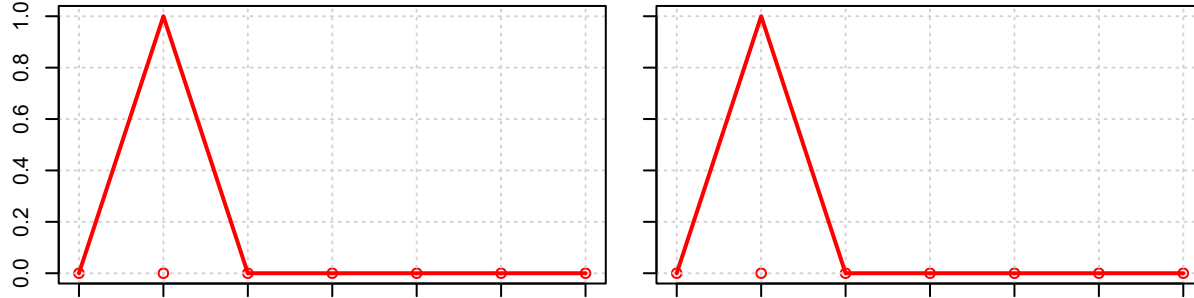
Age

Proportion

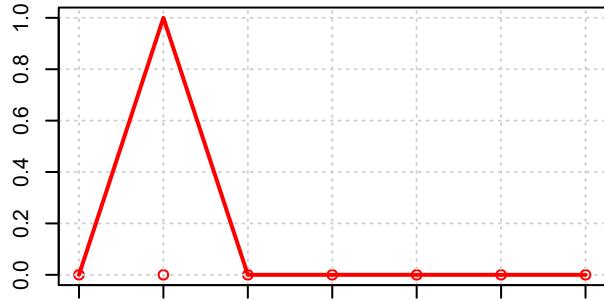
Index 9
Year = 2020



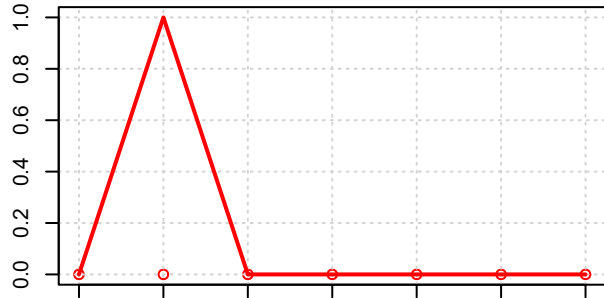
Year = 2021



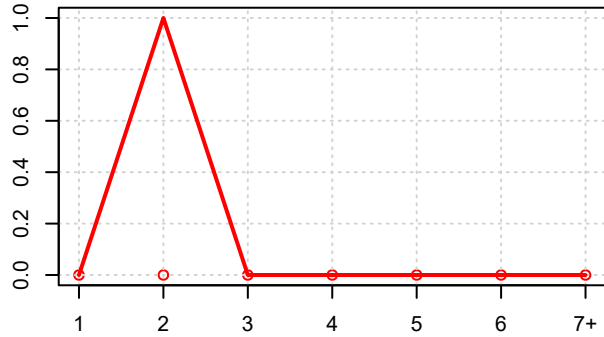
Year = 2017



Year = 2018

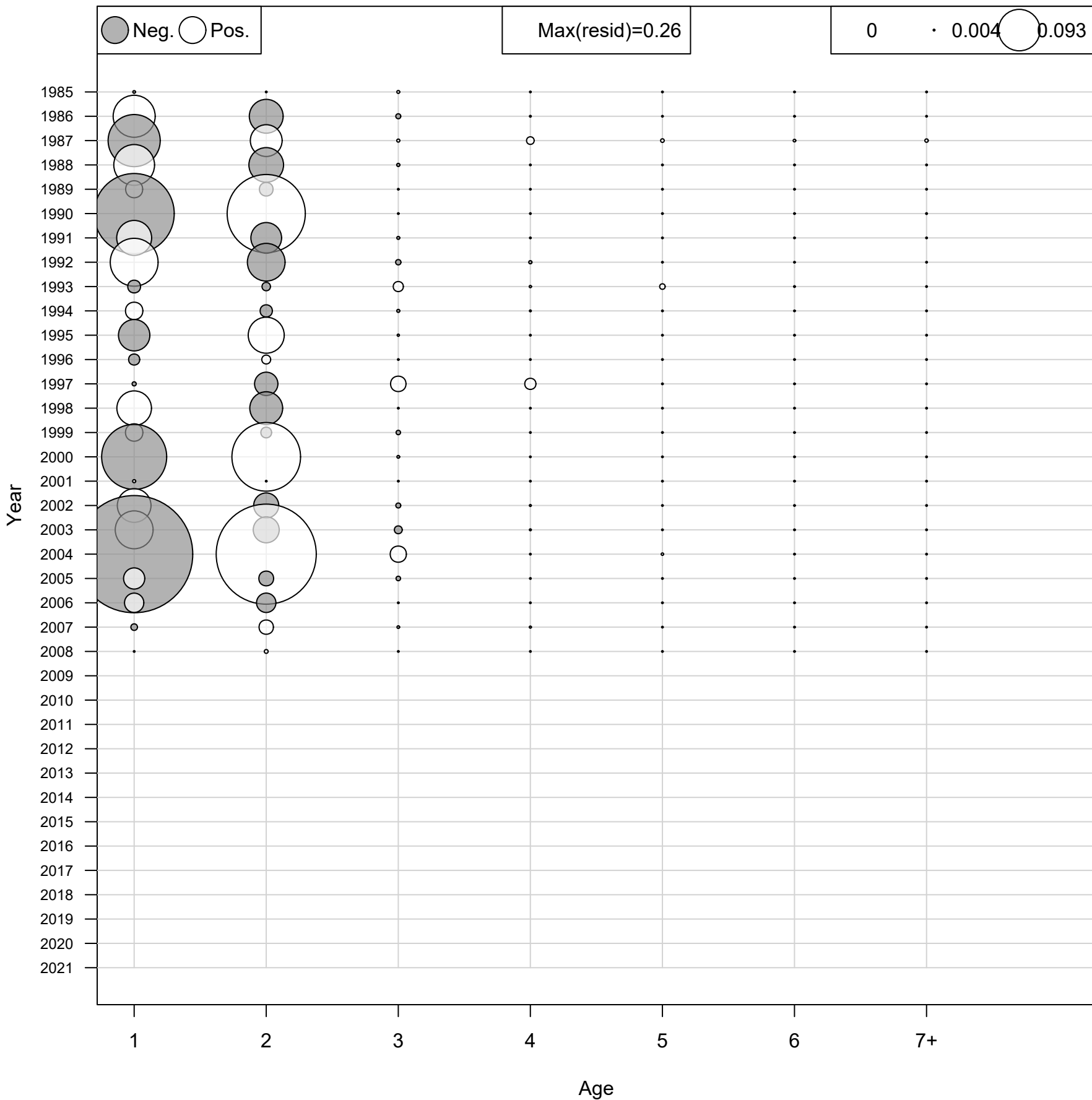


Year = 2019

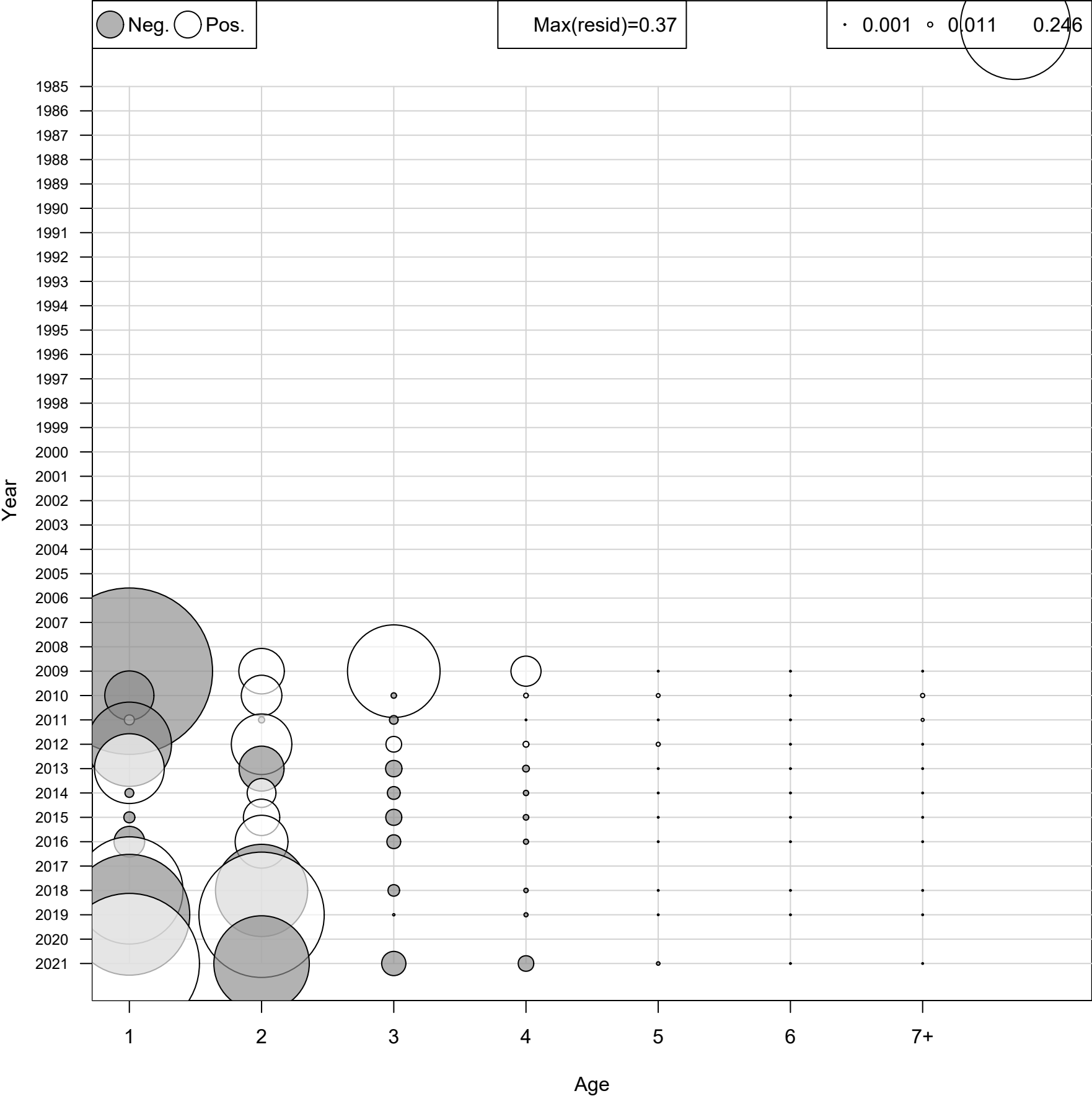


Age

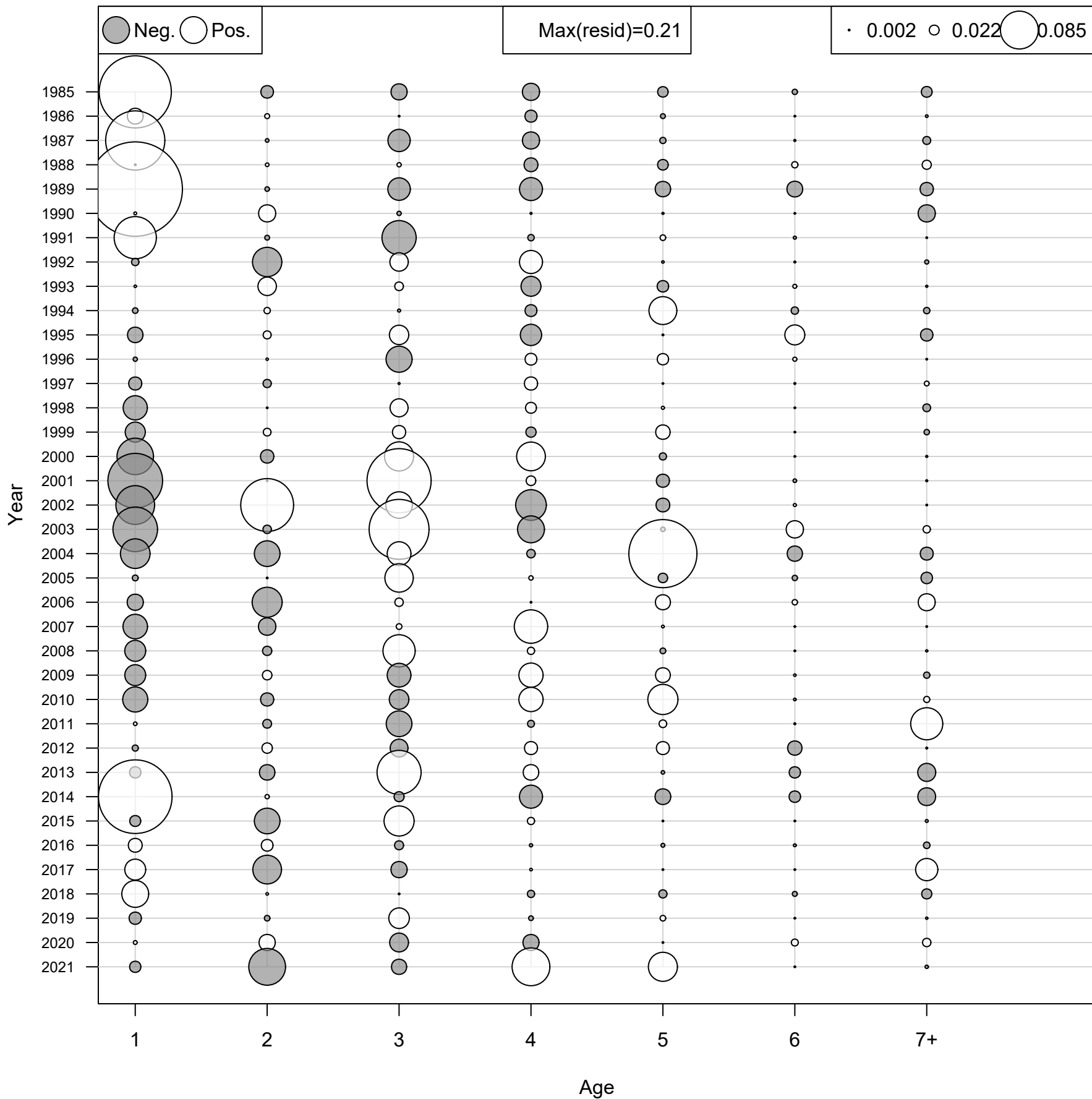
Age Comp Residuals (Observed-Predicted) for Index 1



Age Comp Residuals (Observed-Predicted) for Index 2



Age Comp Residuals (Observed-Predicted) for Index 3

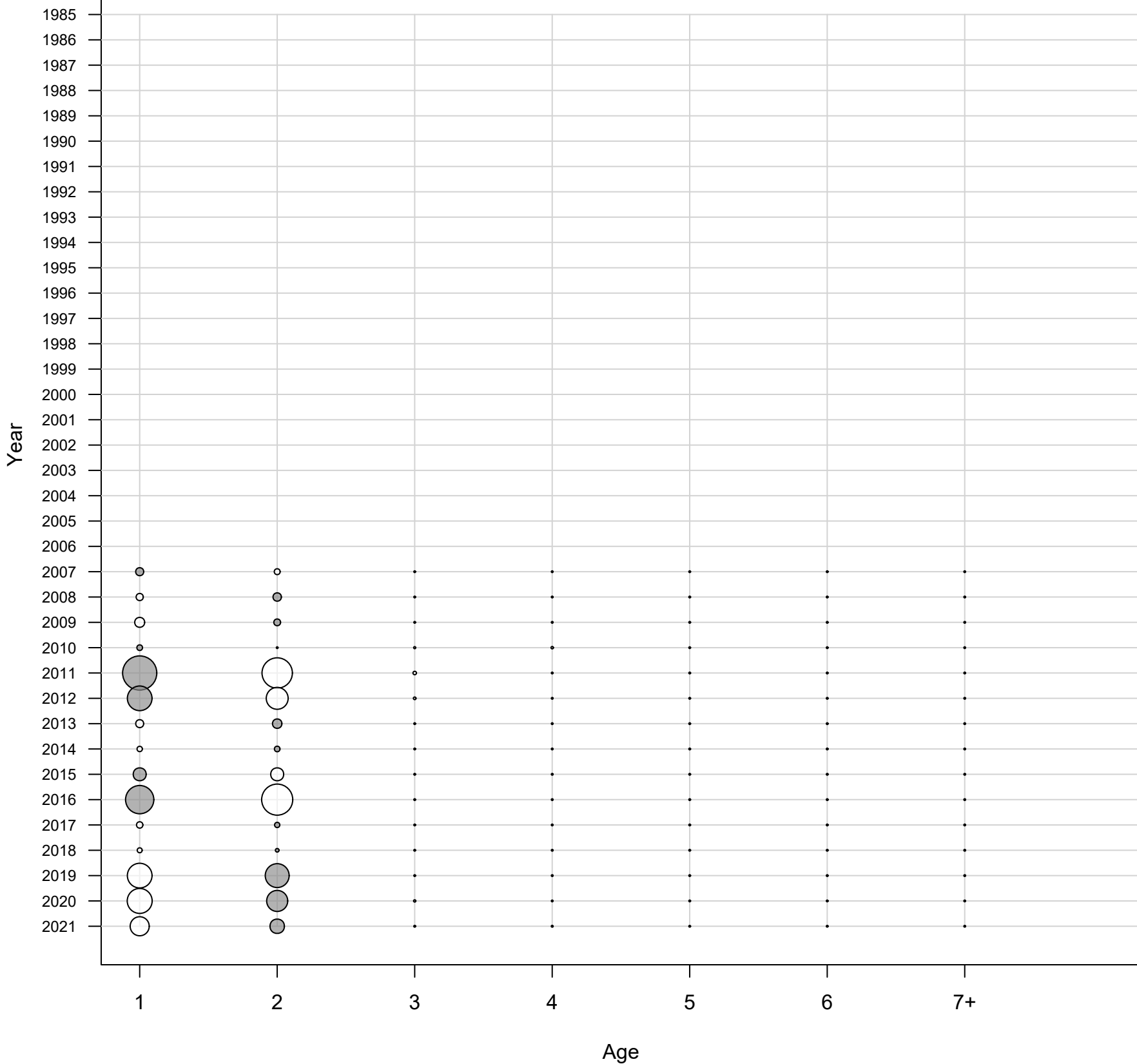


Age Comp Residuals (Observed-Predicted) for Index 4

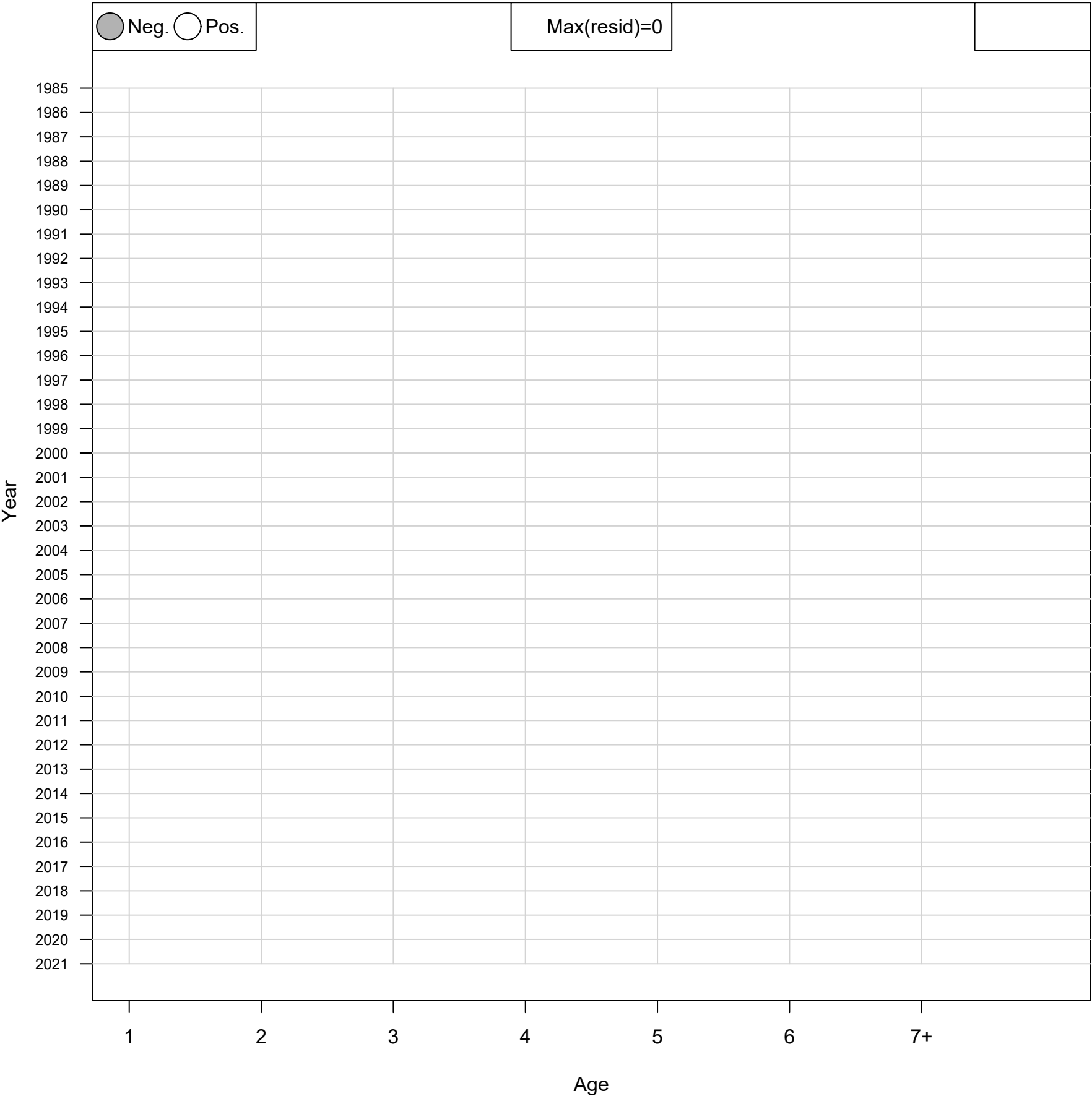
Neg. Pos.

Max(resid)=0.07

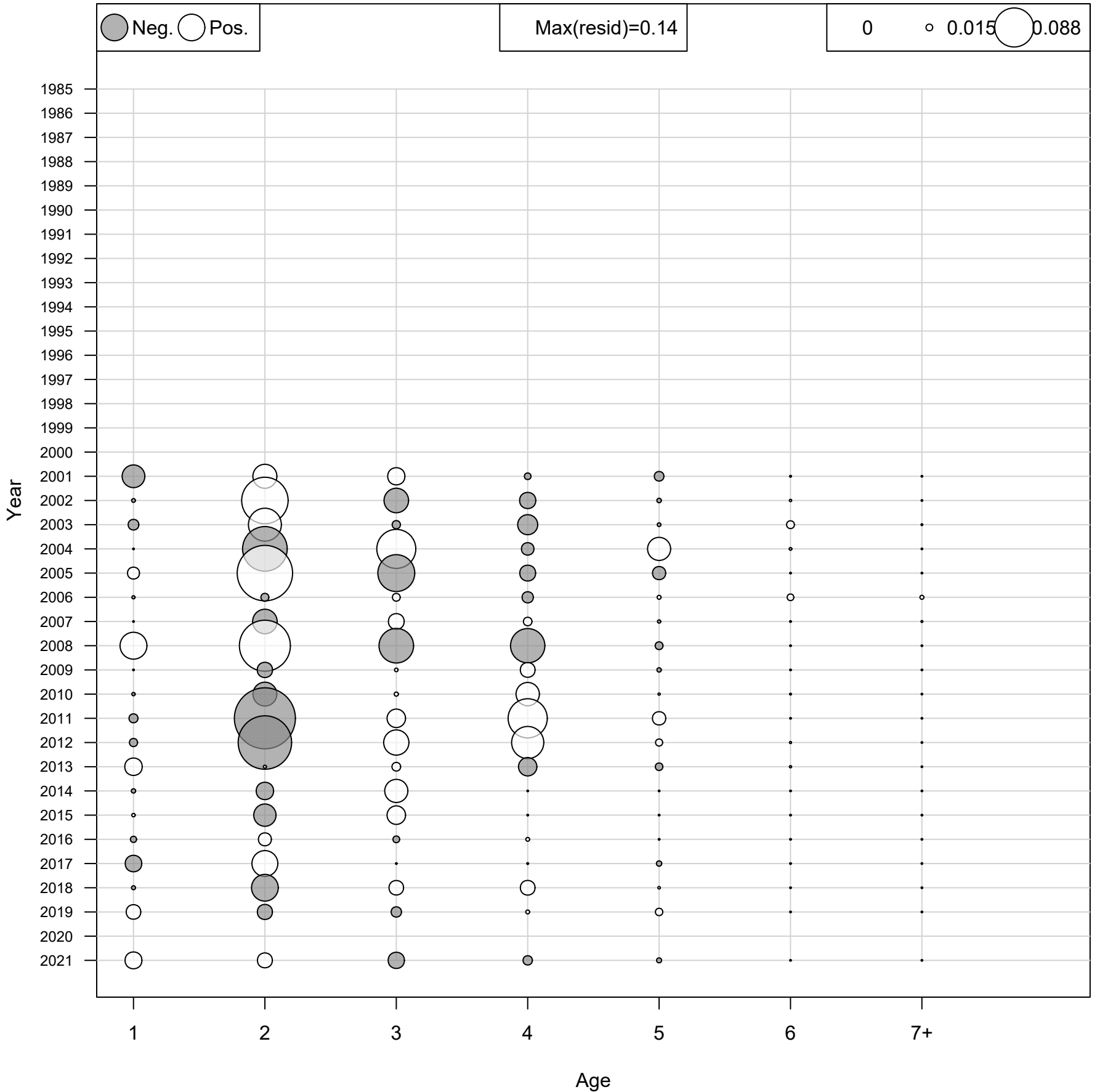
0 · 0.001 ○ 0.053



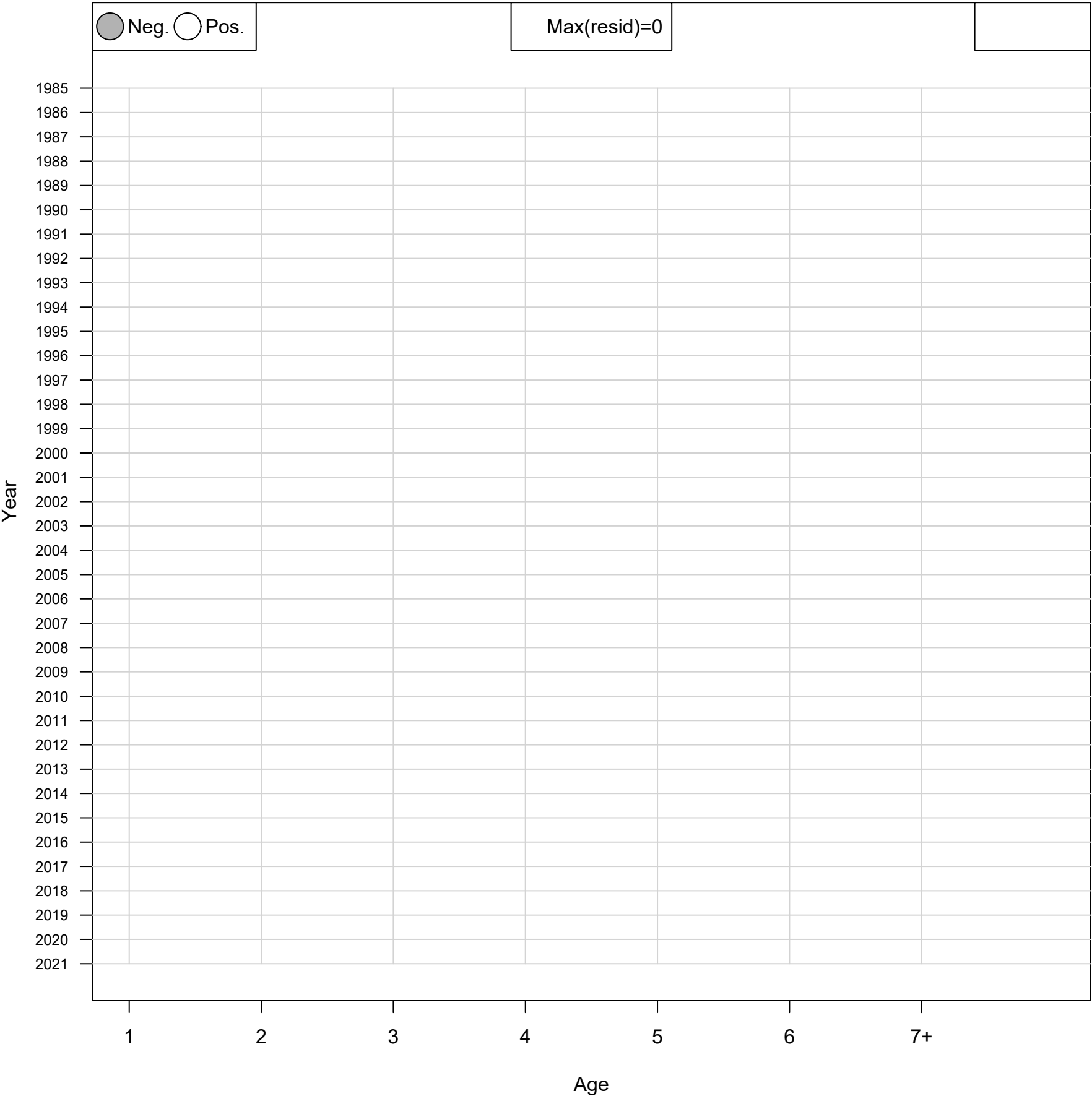
Age Comp Residuals (Observed-Predicted) for Index 5



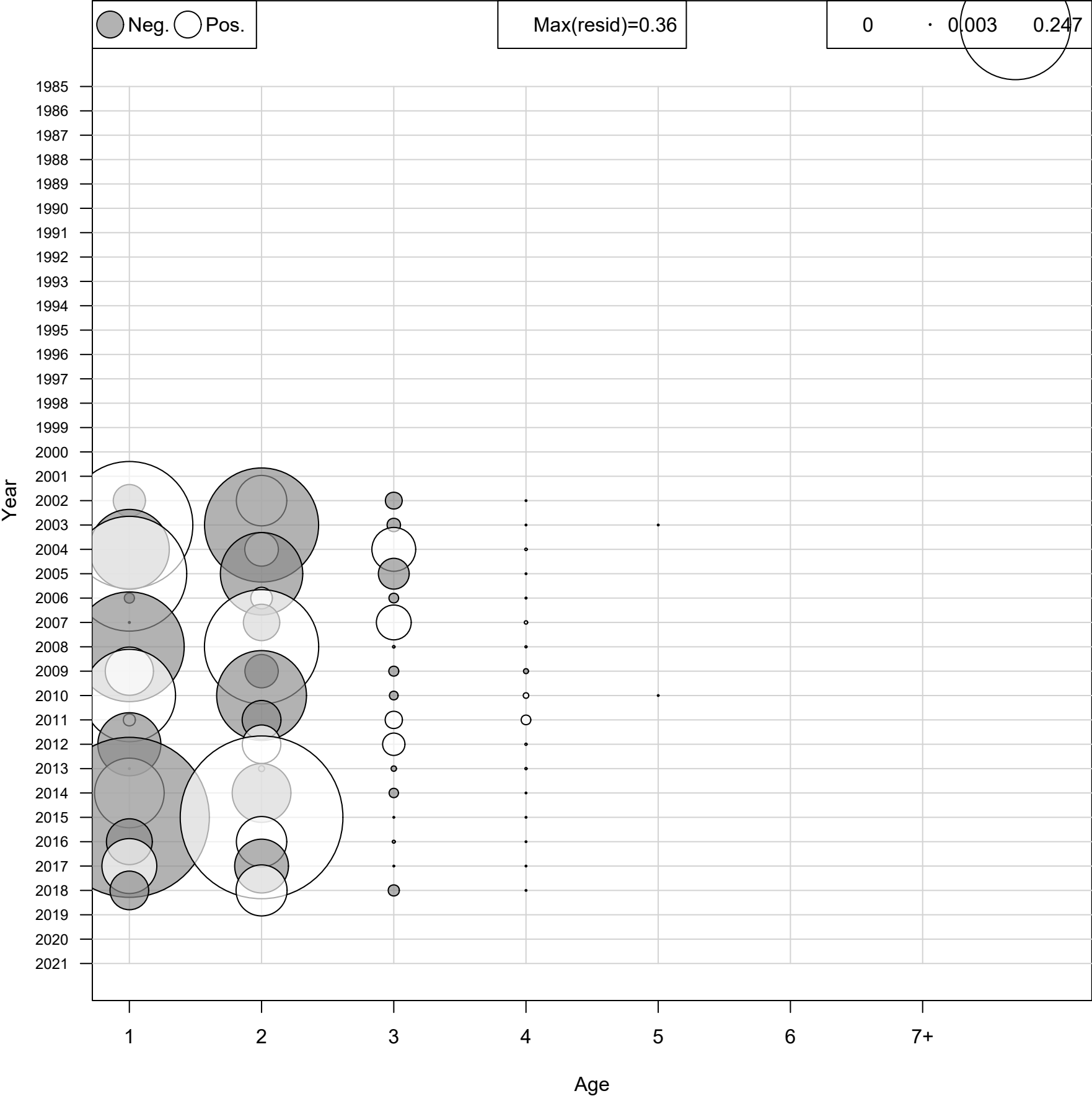
Age Comp Residuals (Observed-Predicted) for Index 6



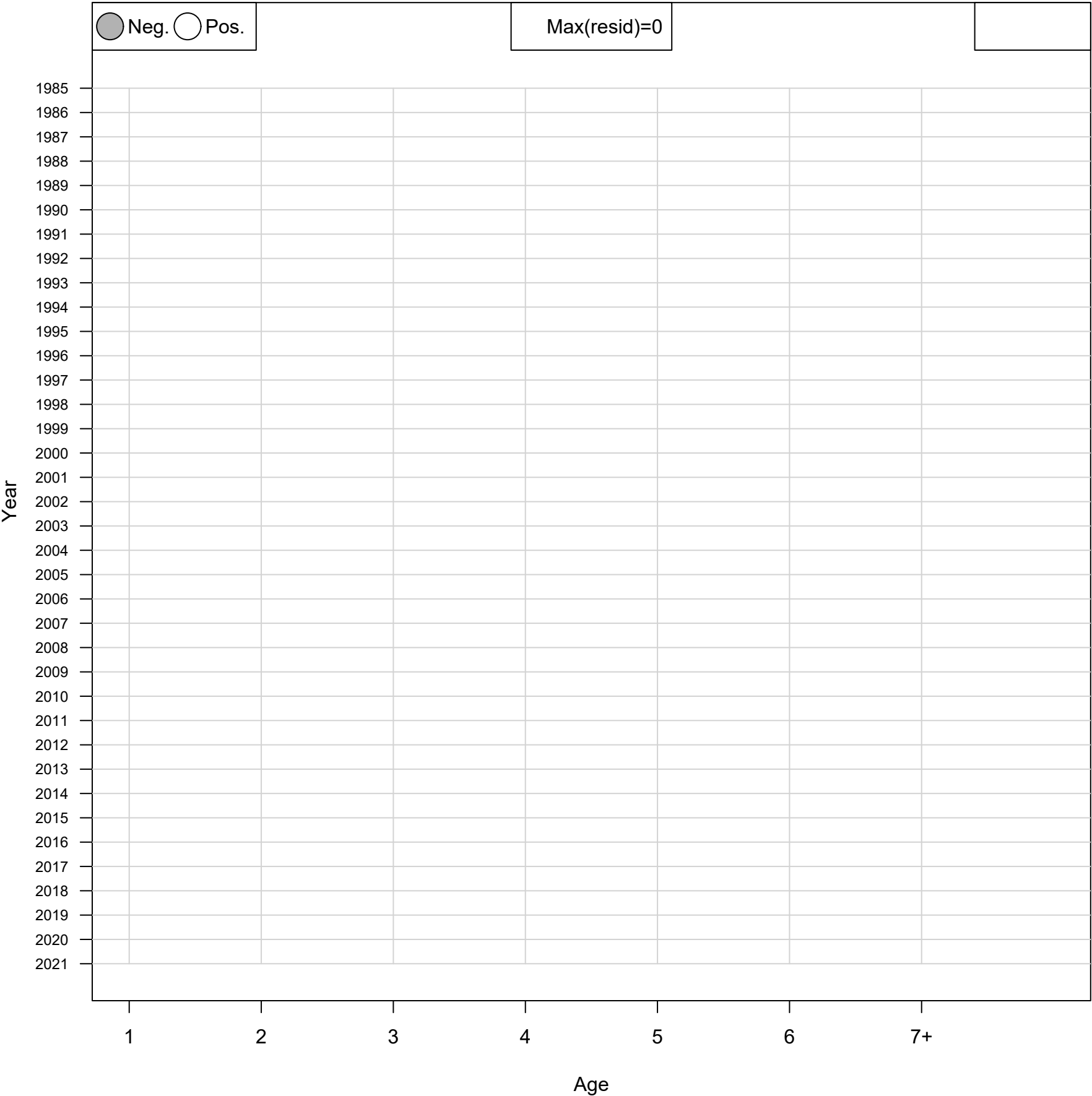
Age Comp Residuals (Observed-Predicted) for Index 7

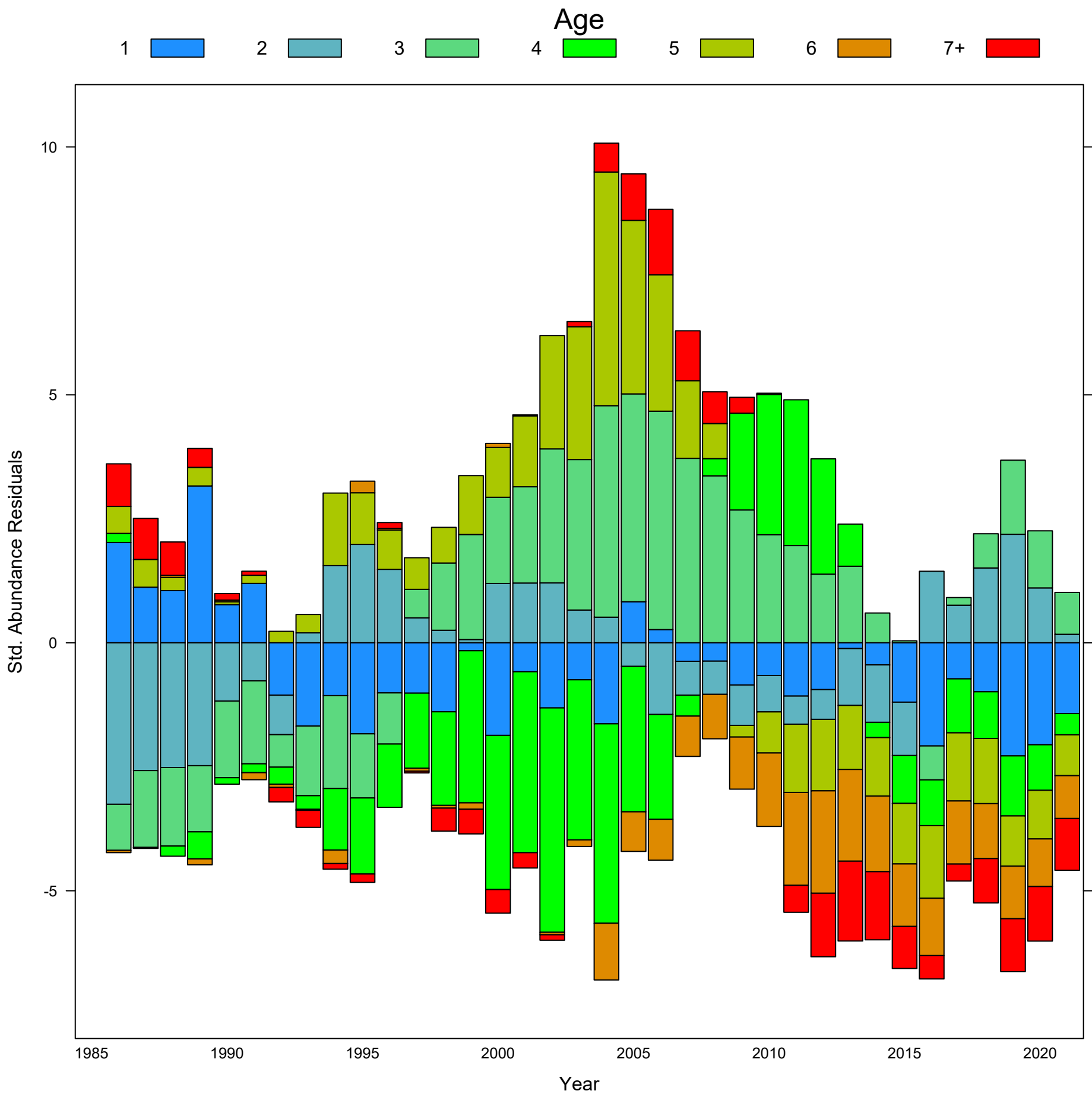


Age Comp Residuals (Observed-Predicted) for Index 8

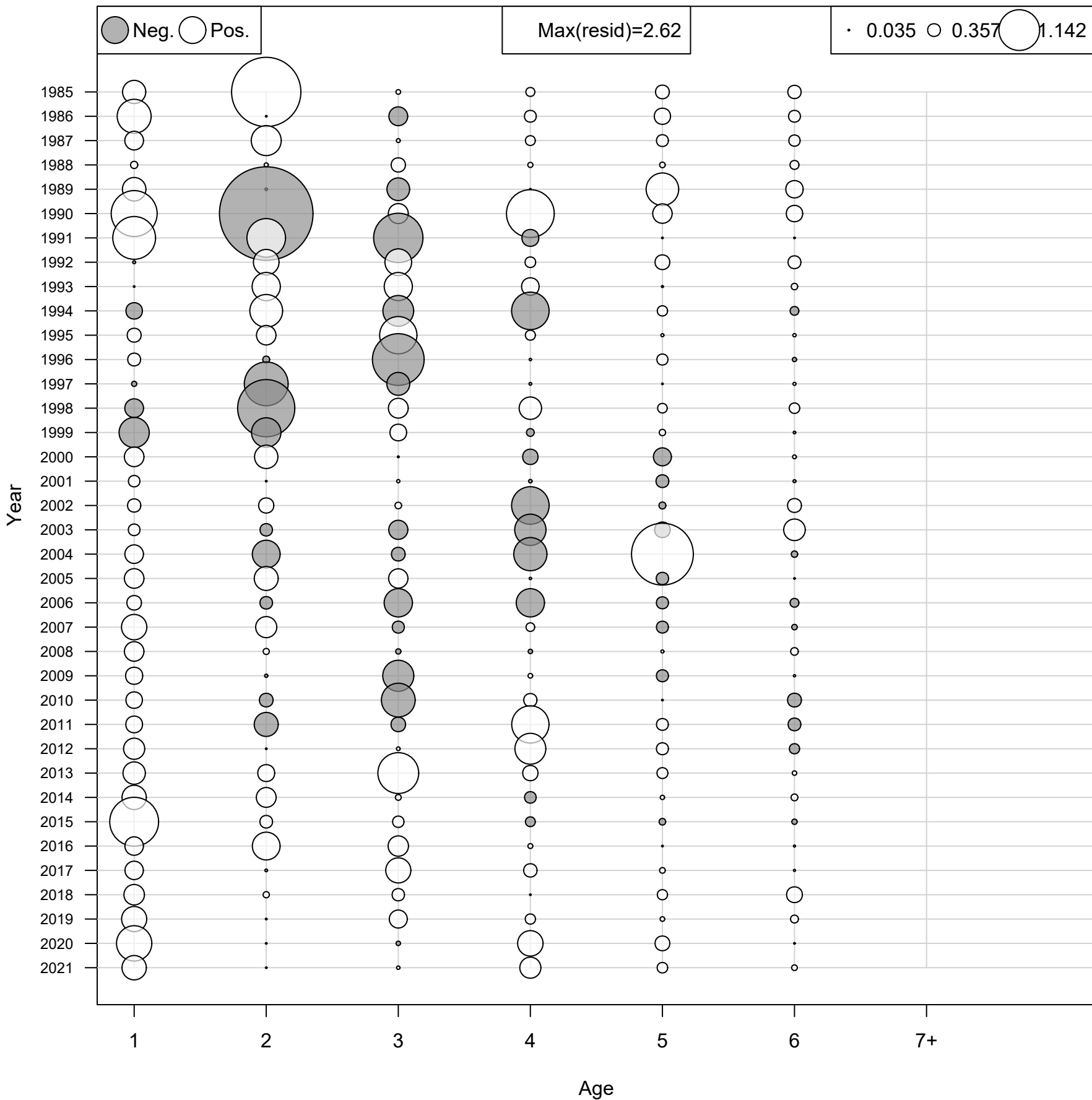


Age Comp Residuals (Observed-Predicted) for Index 9

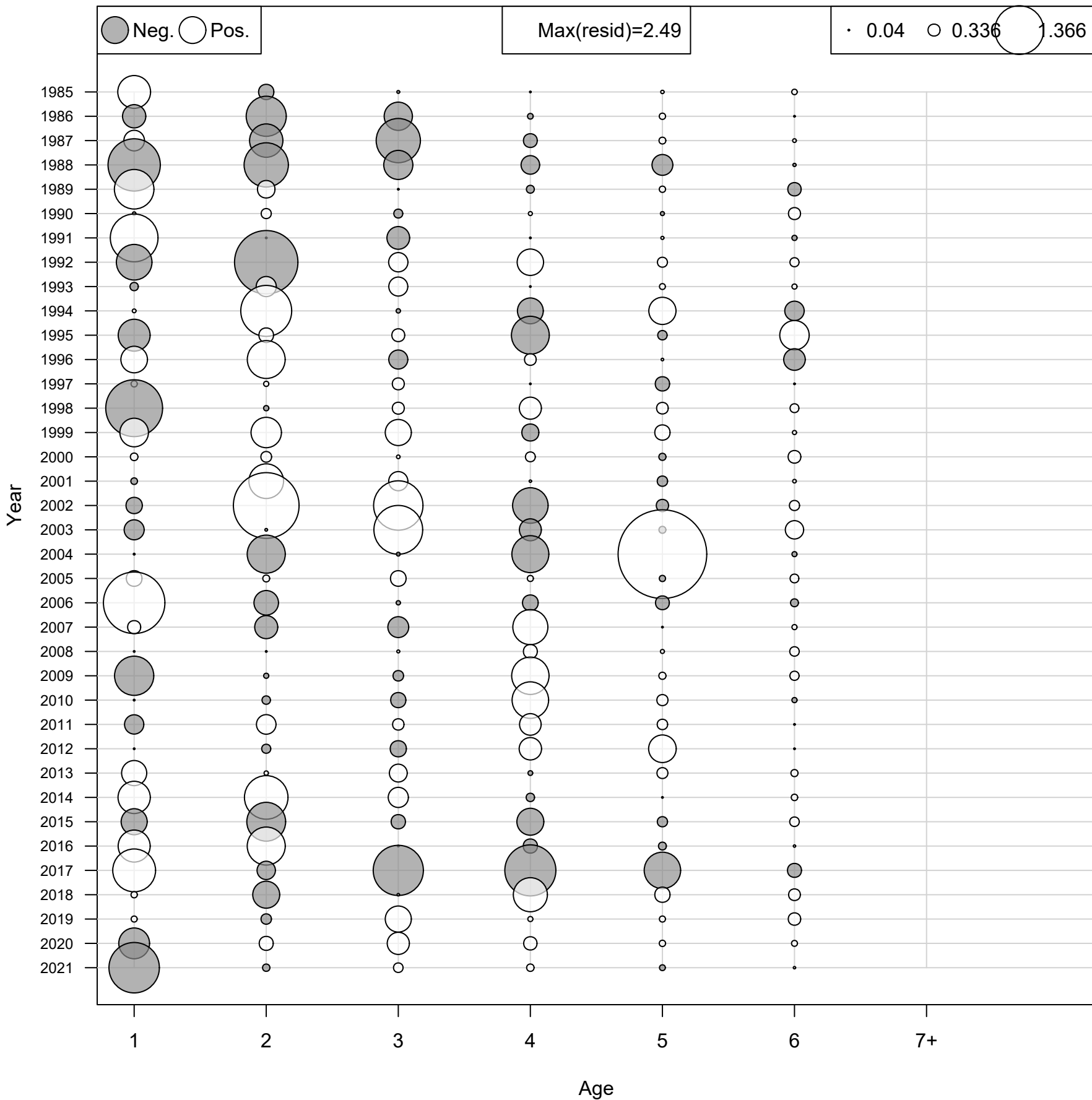




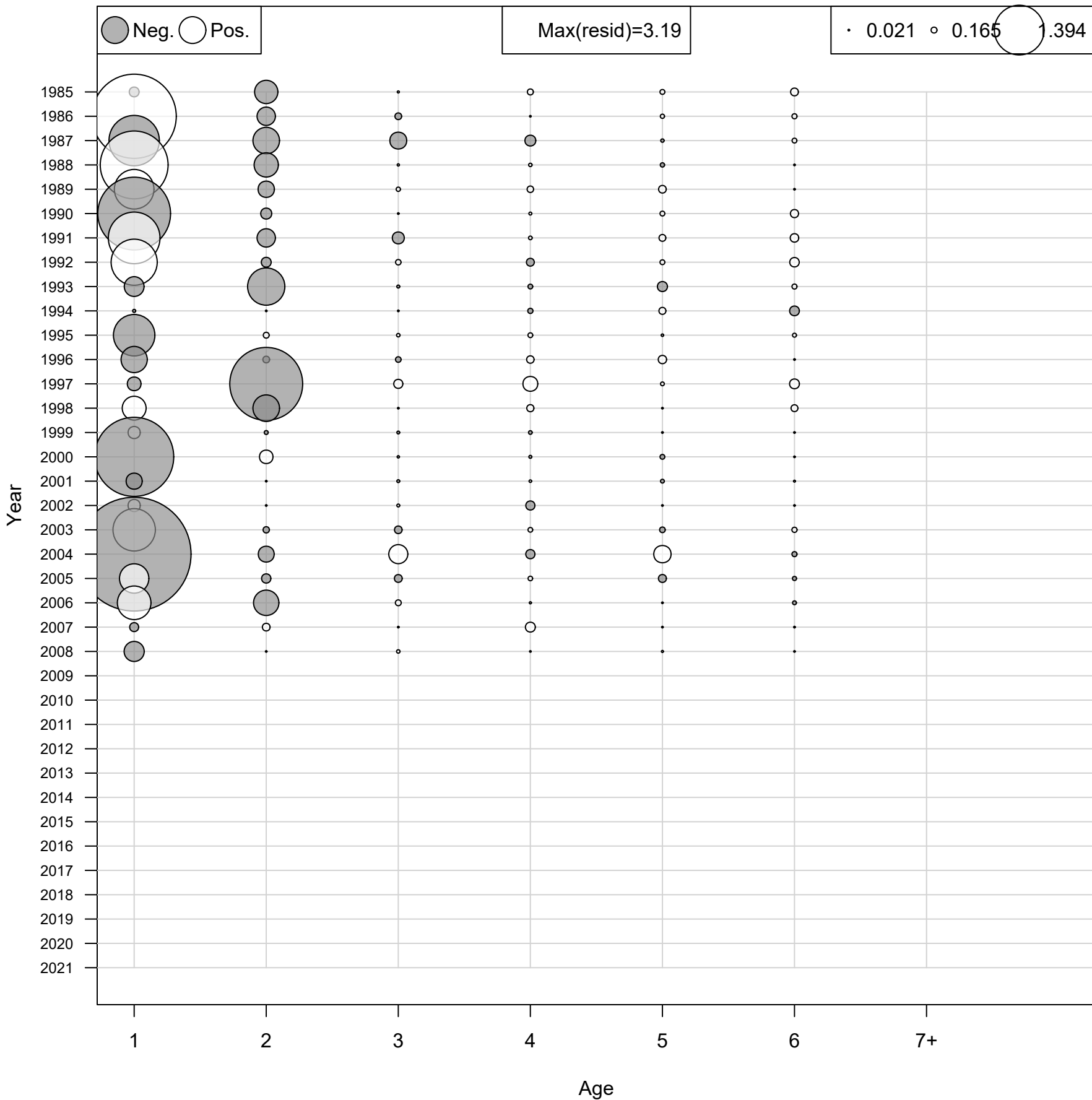
Age Comp OSA Quantile Residuals for Fleet 1



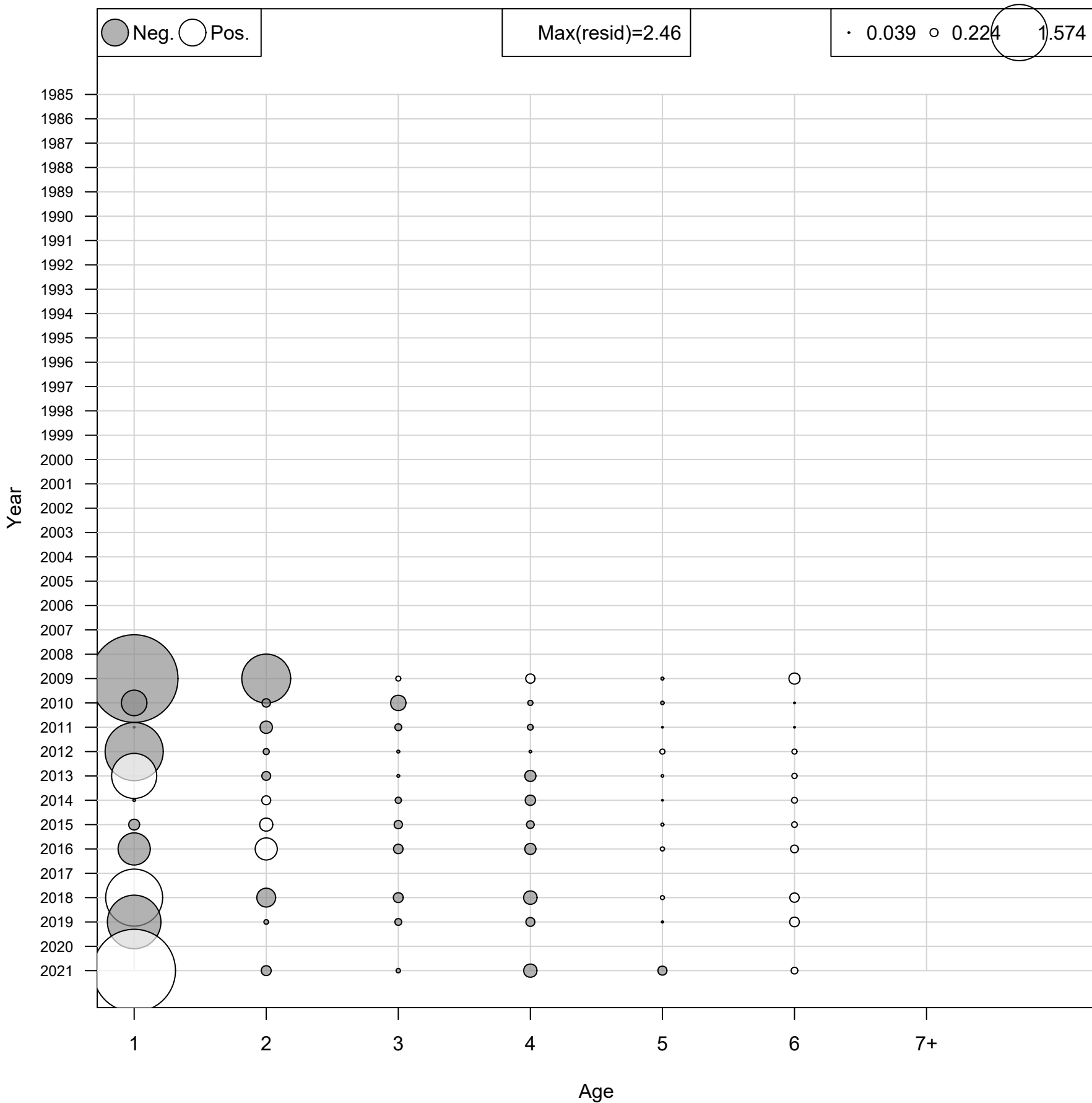
Age Comp OSA Quantile Residuals for Fleet 2



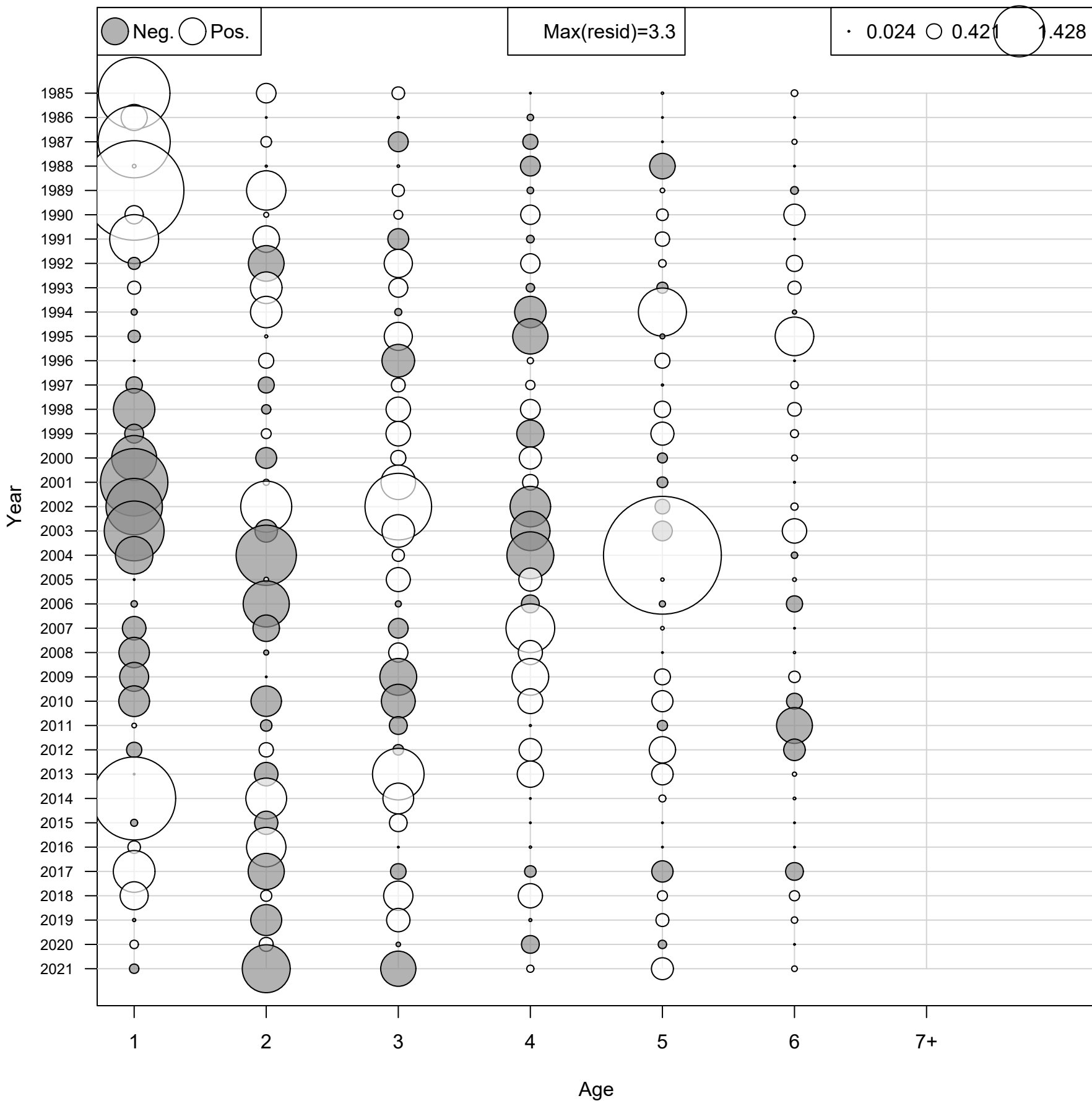
Age Comp OSA Quantile Residuals for Index 1



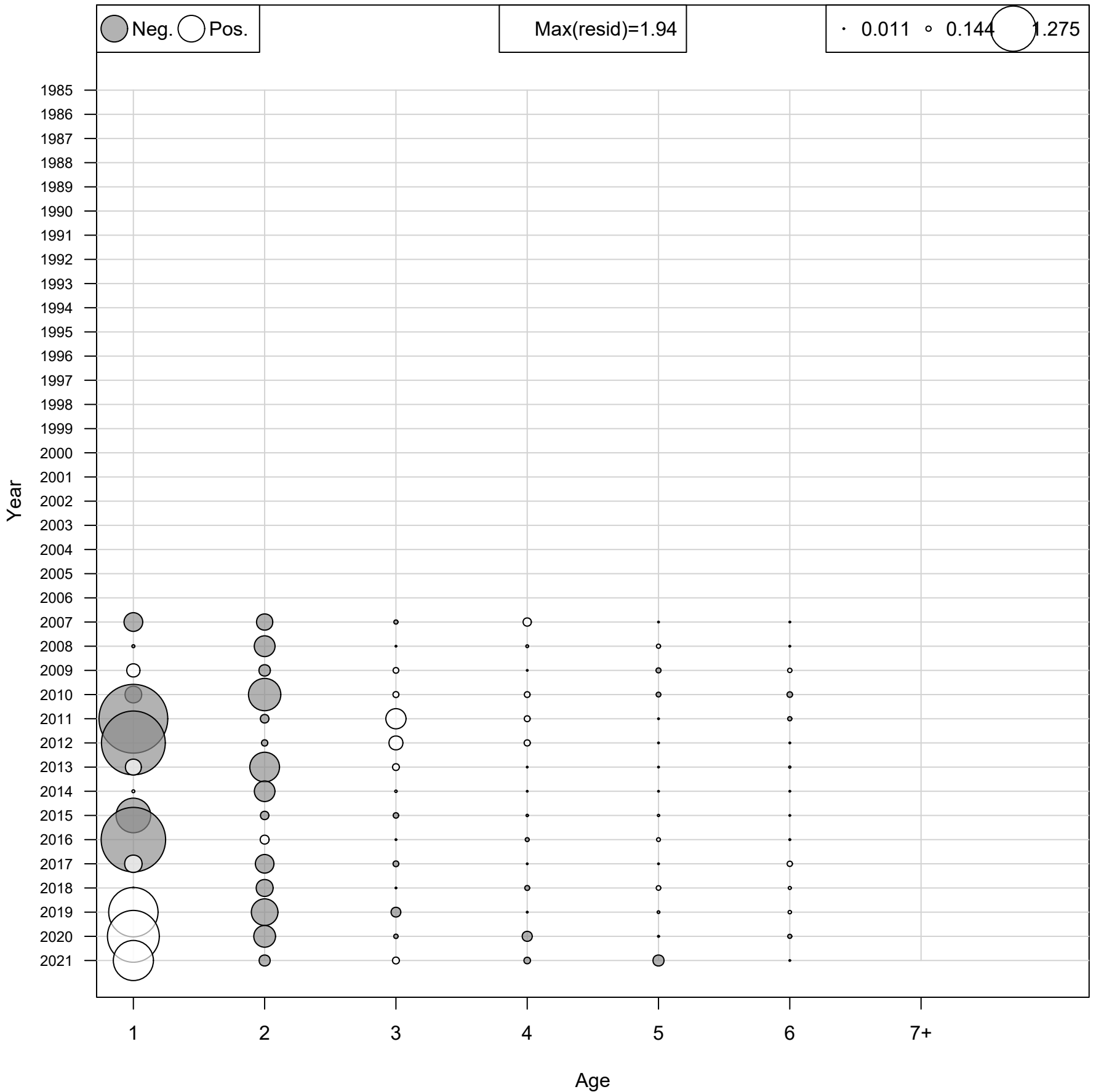
Age Comp OSA Quantile Residuals for Index 2



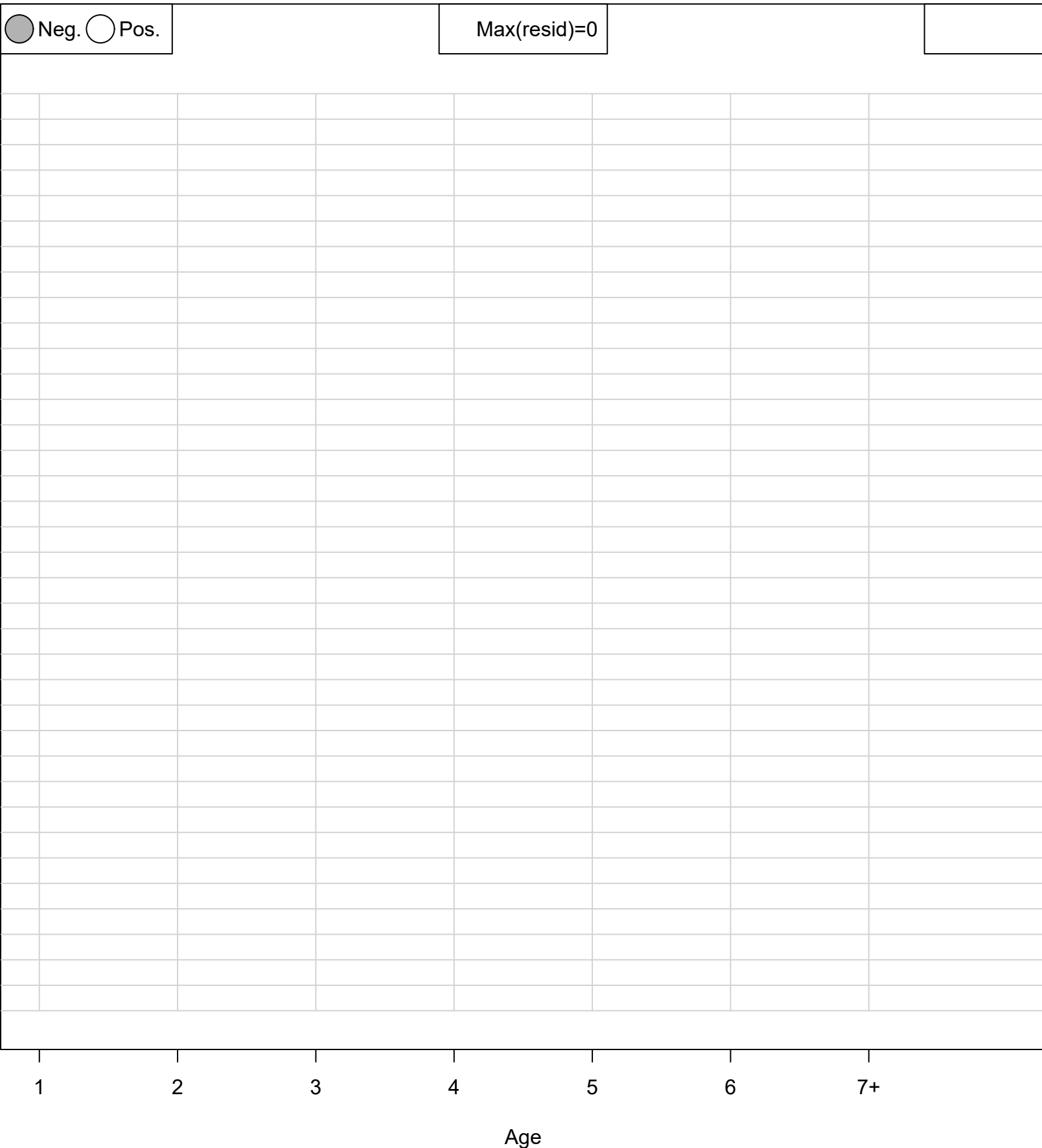
Age Comp OSA Quantile Residuals for Index 3



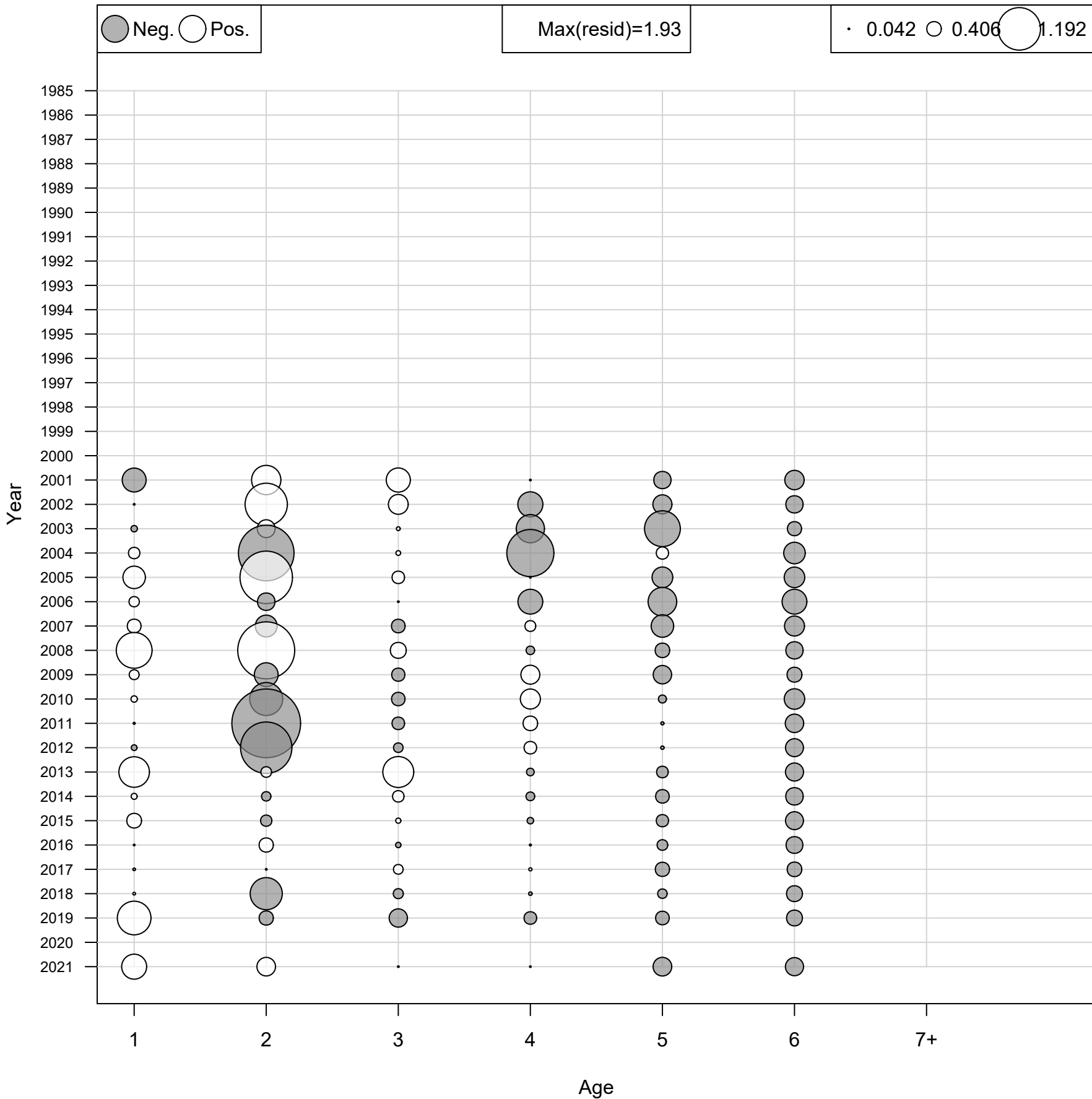
Age Comp OSA Quantile Residuals for Index 4



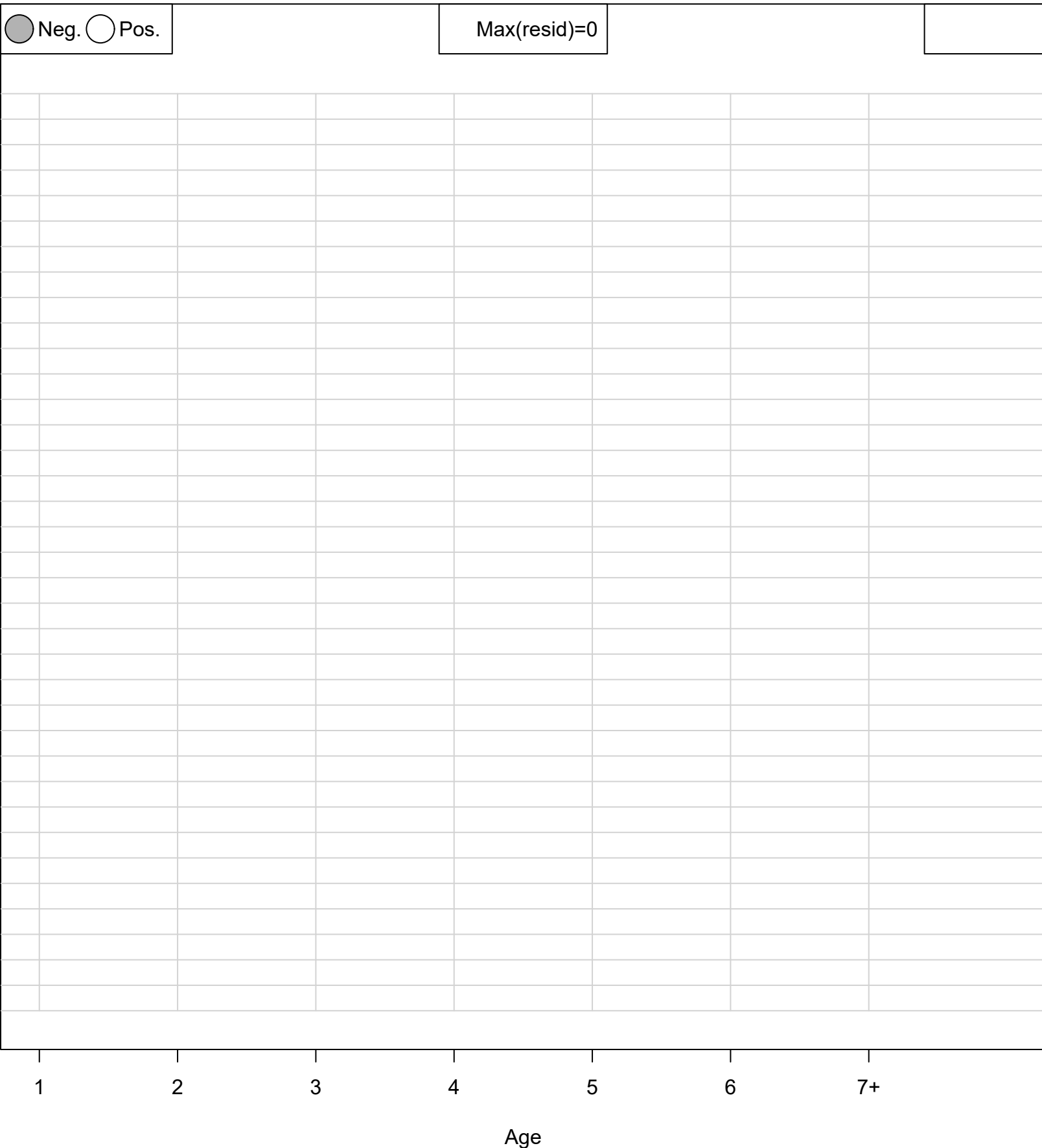
Age Comp OSA Quantile Residuals for Index 5



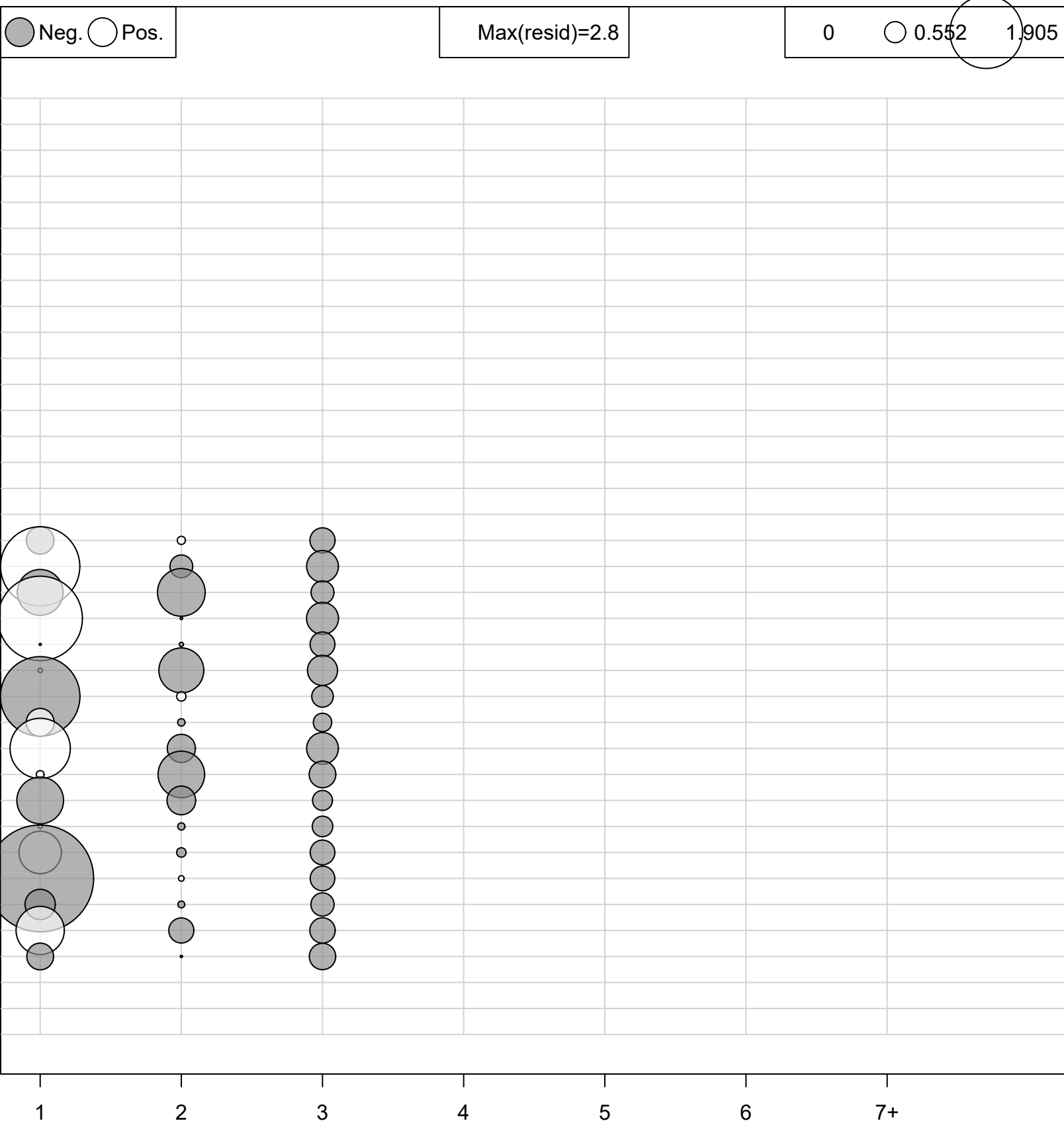
Age Comp OSA Quantile Residuals for Index 6



Age Comp OSA Quantile Residuals for Index 7



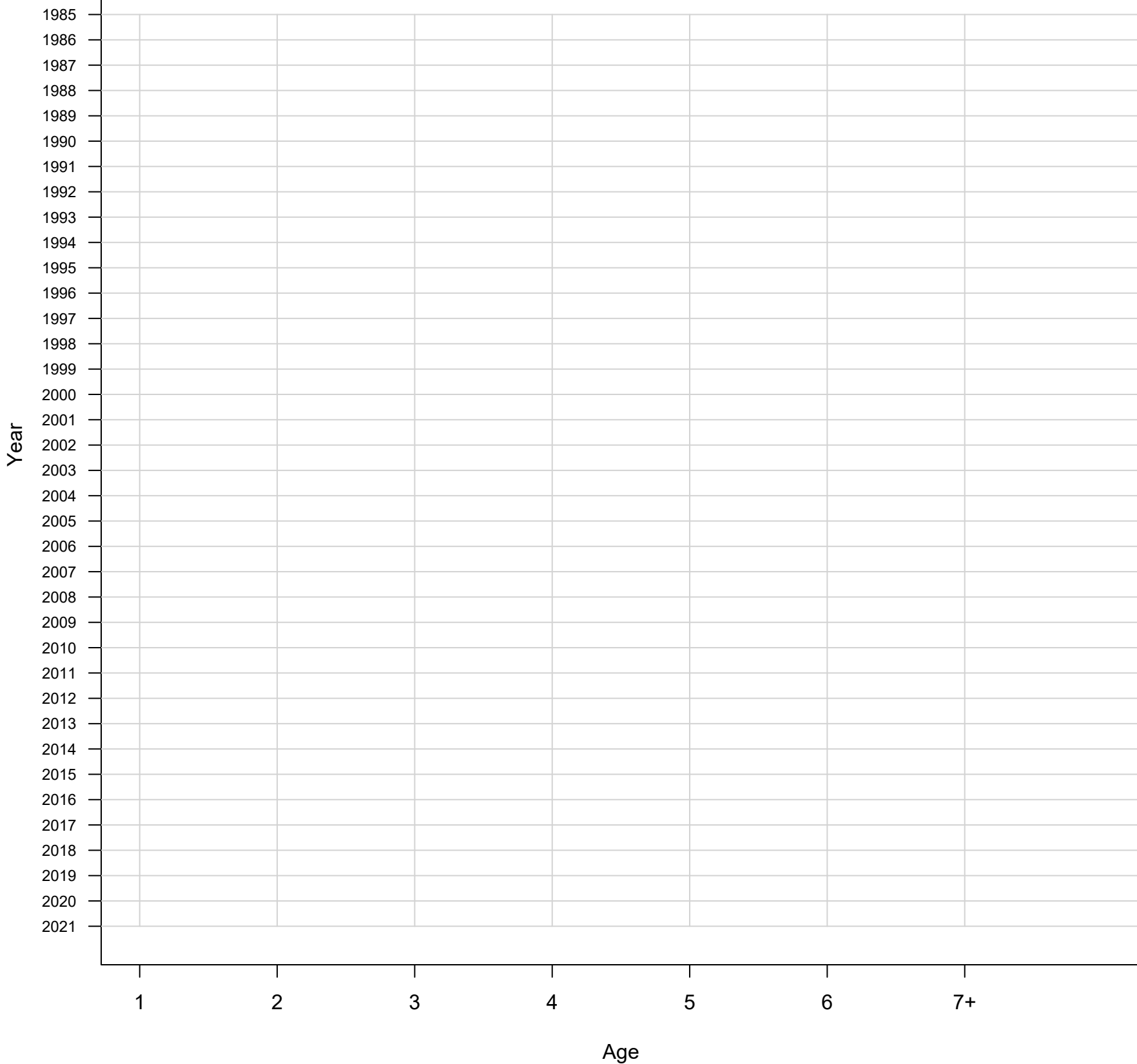
Age Comp OSA Quantile Residuals for Index 8



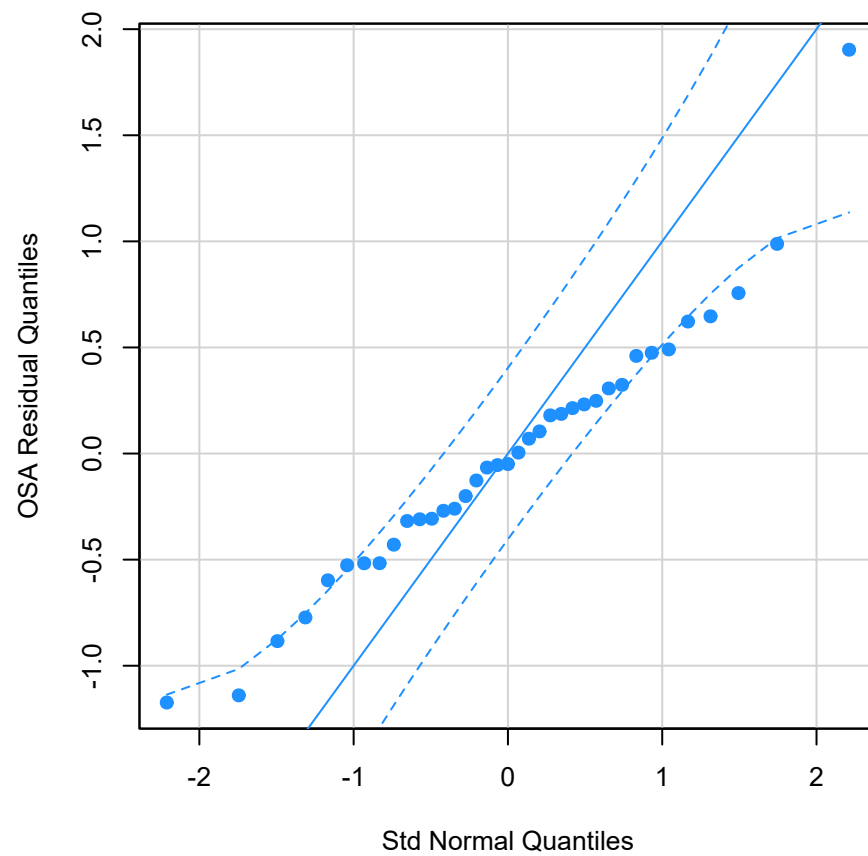
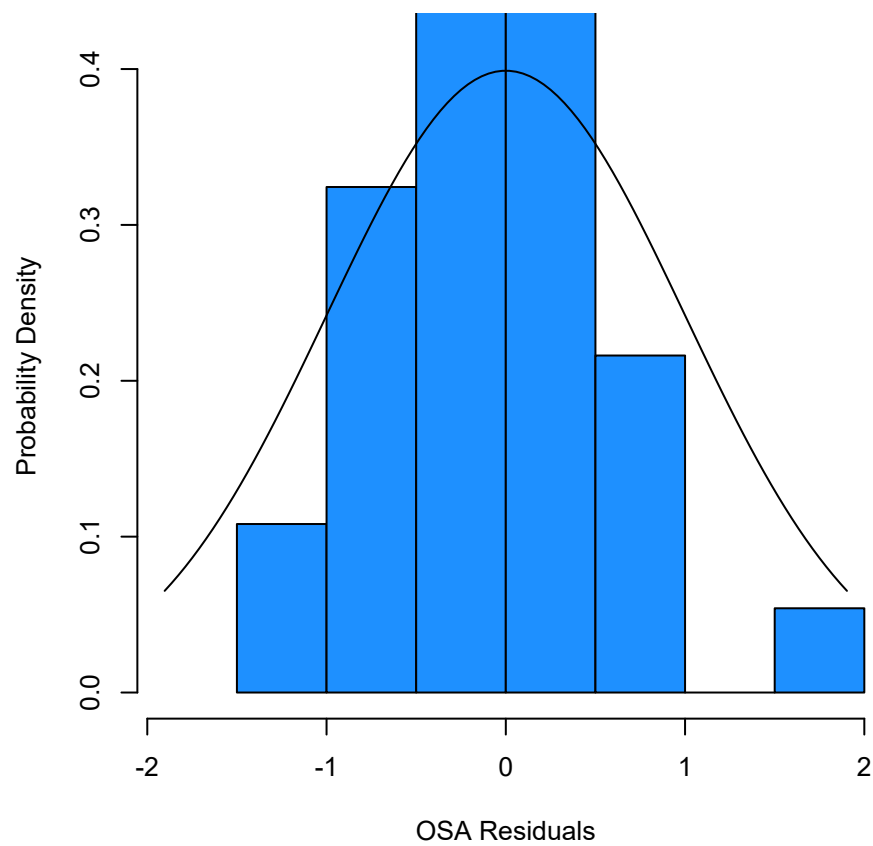
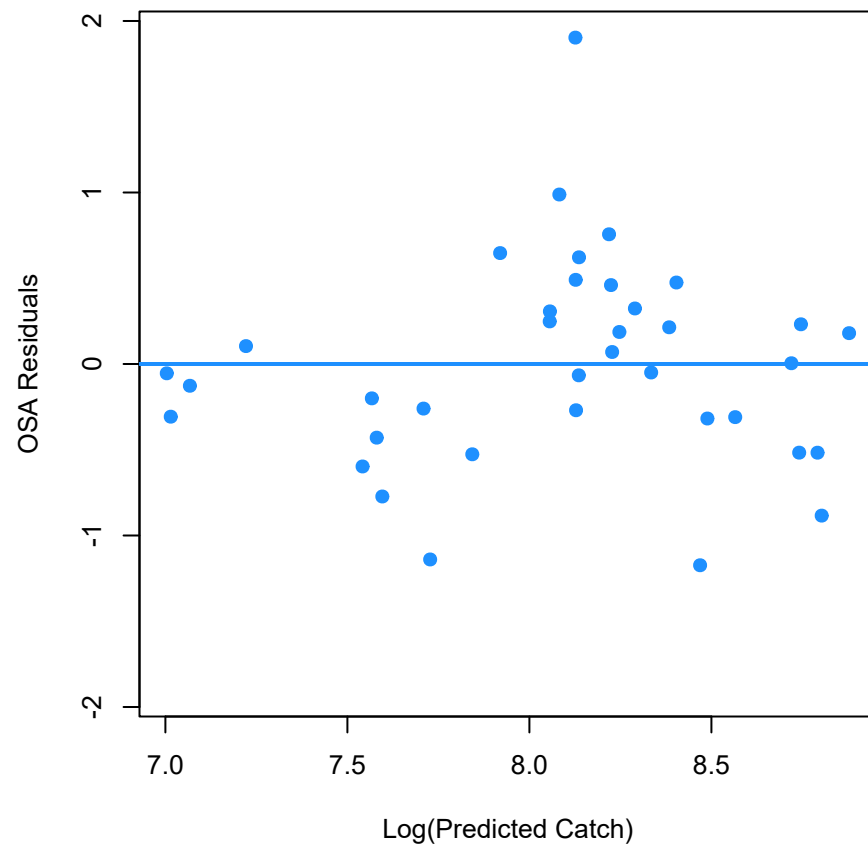
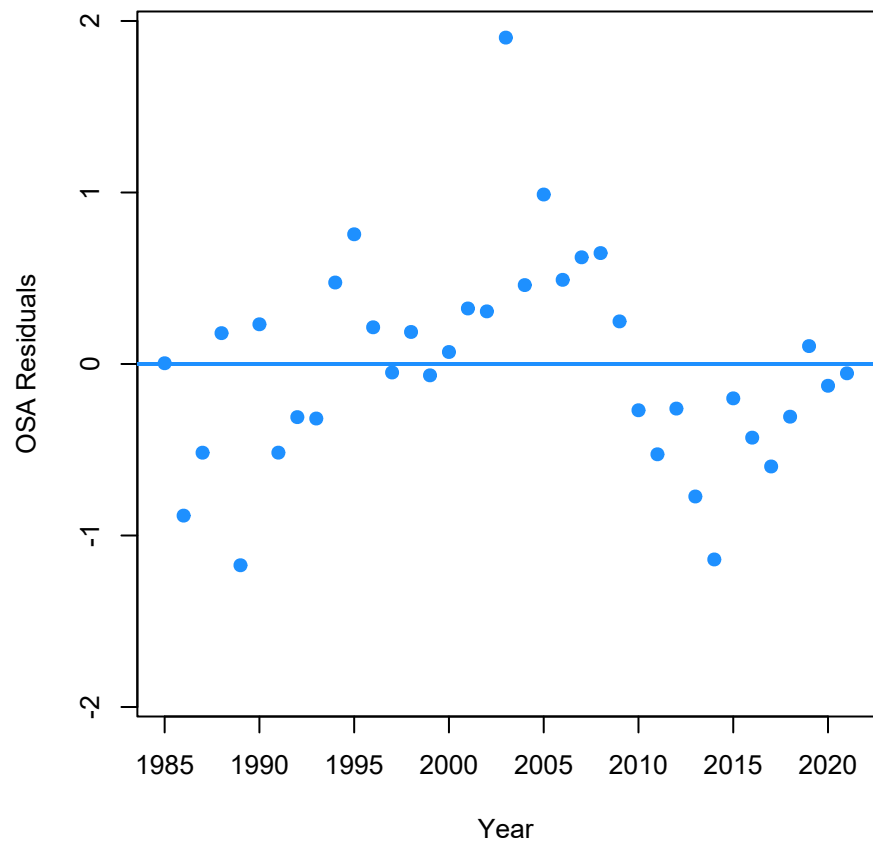
Age Comp OSA Quantile Residuals for Index 9

● Neg. ○ Pos.

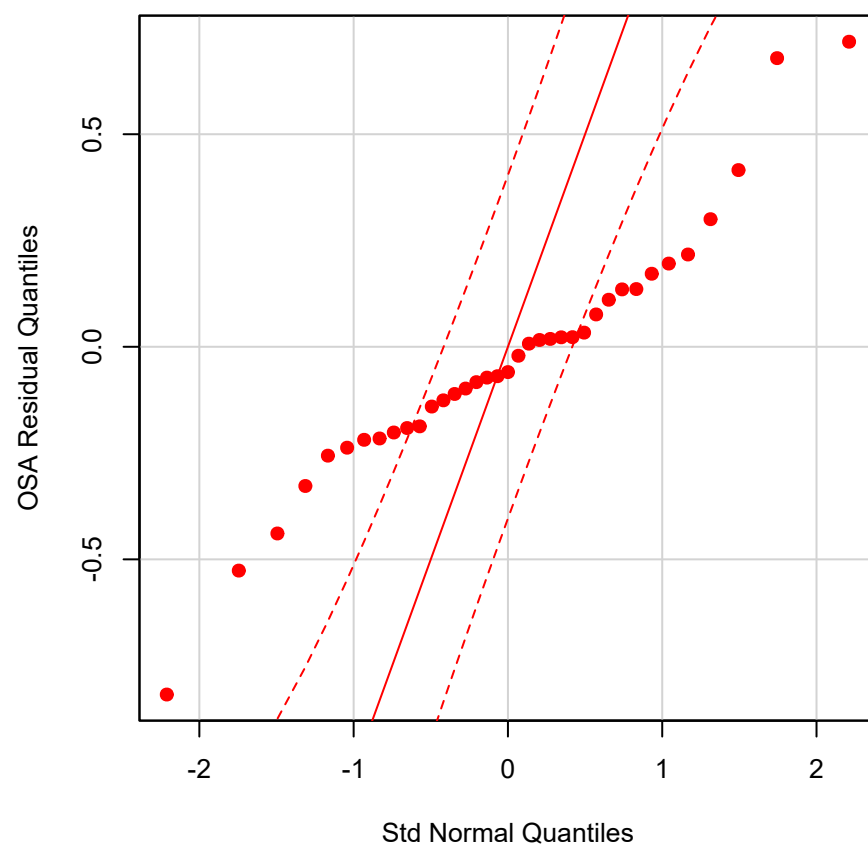
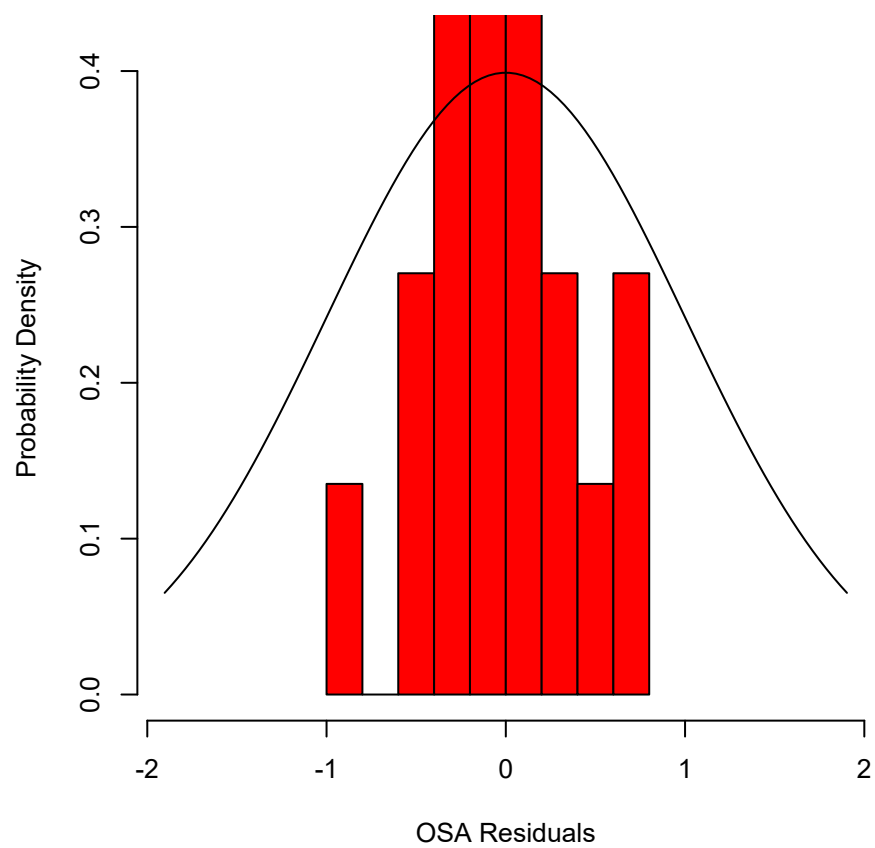
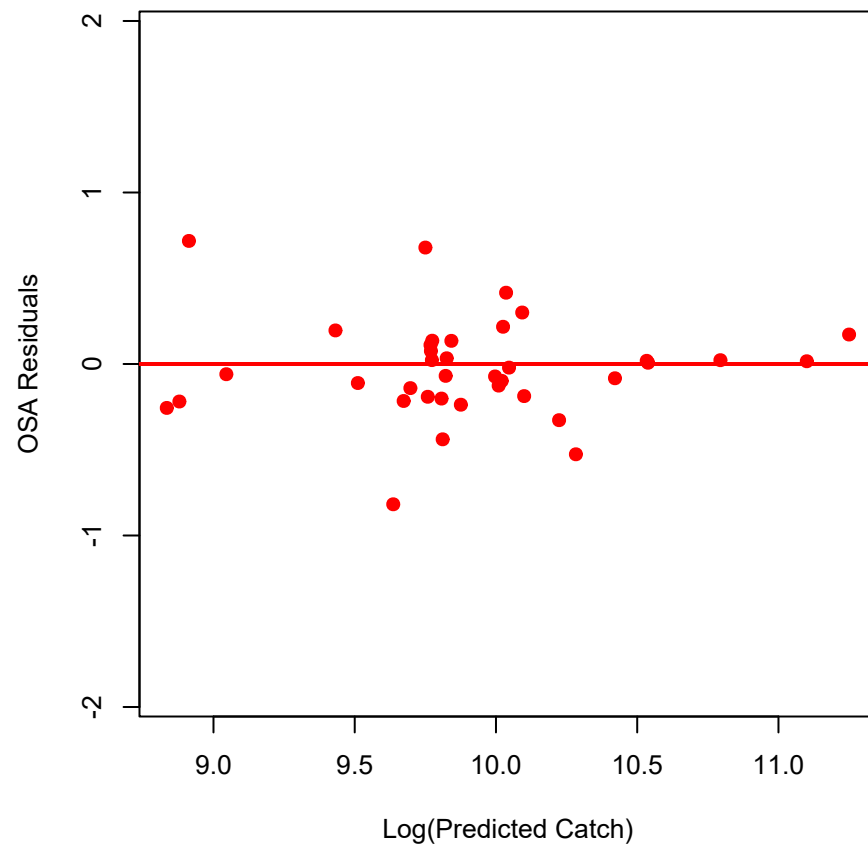
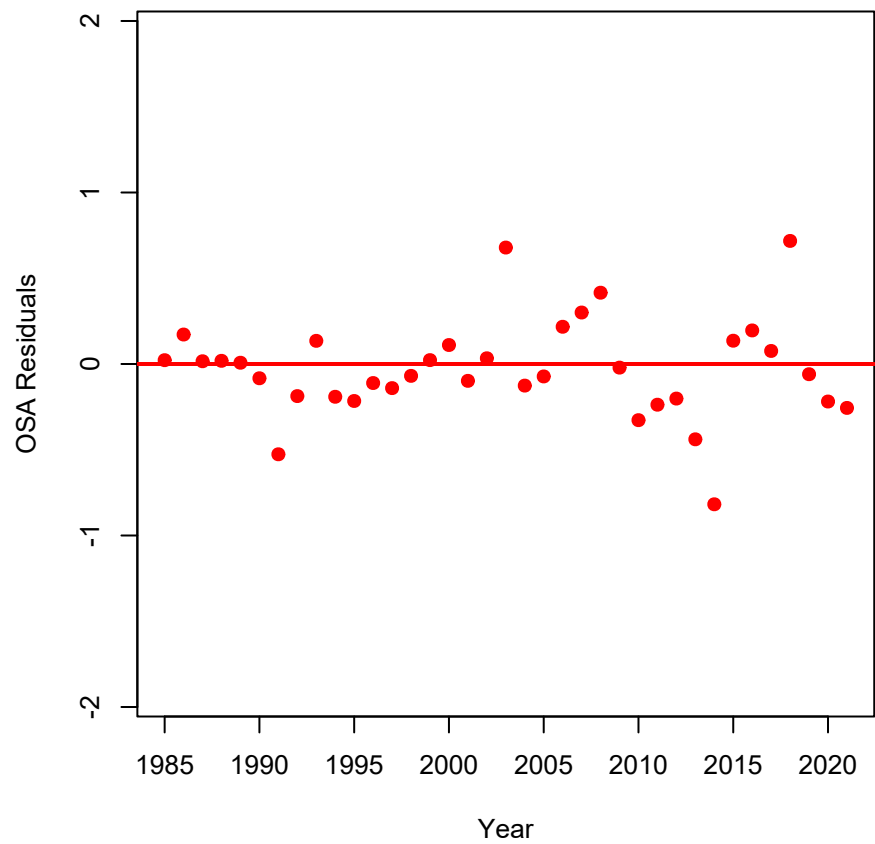
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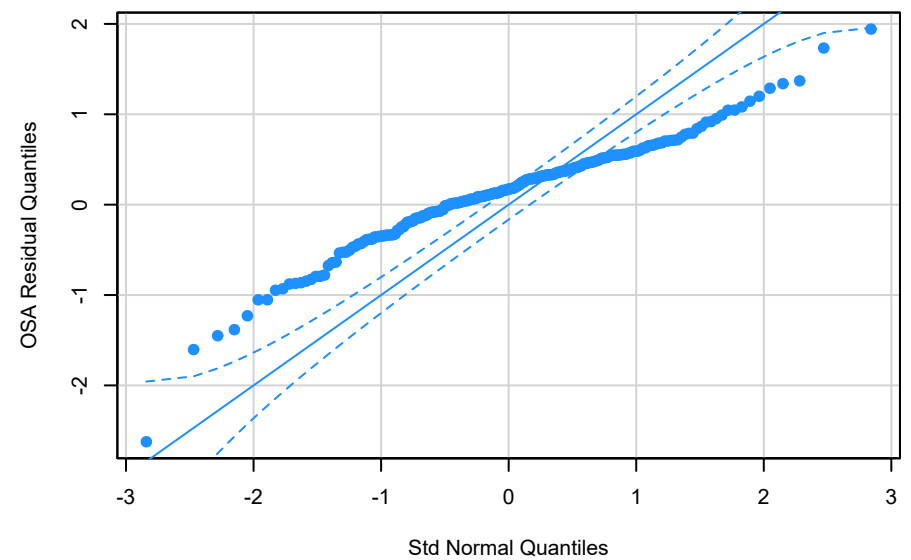
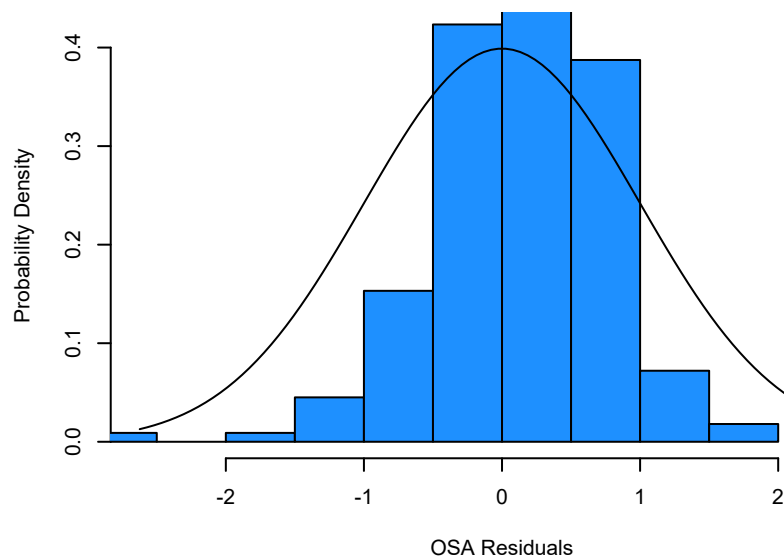
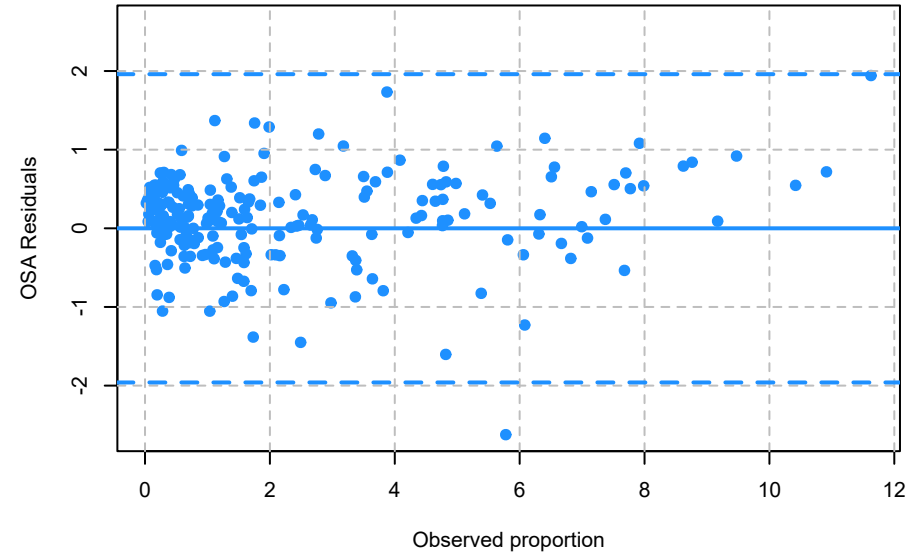
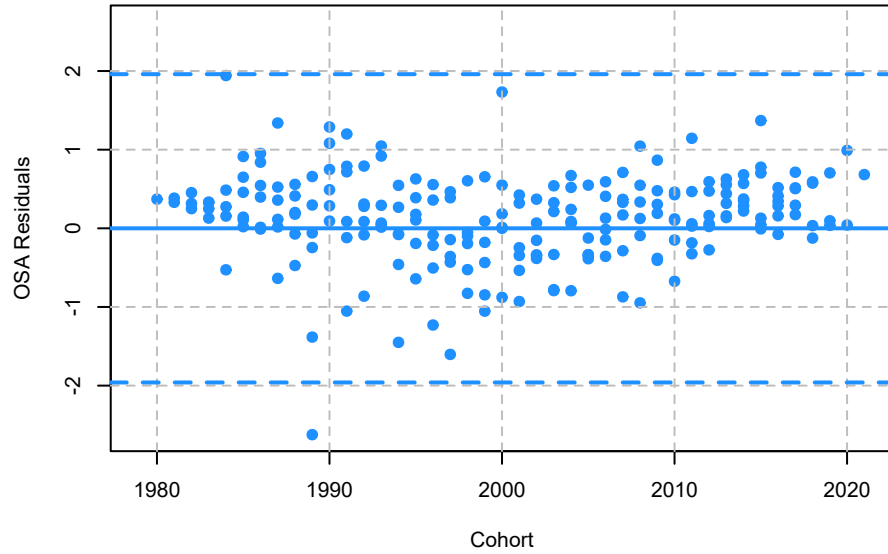
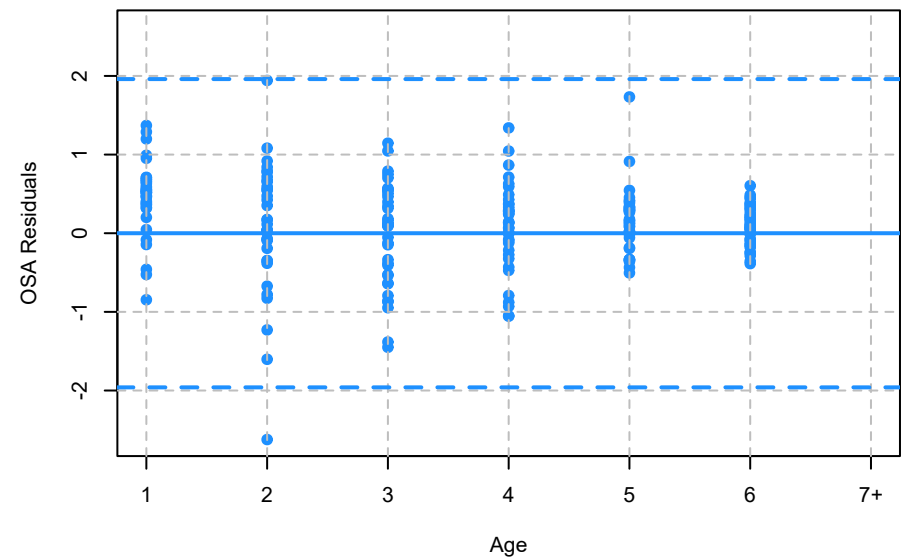
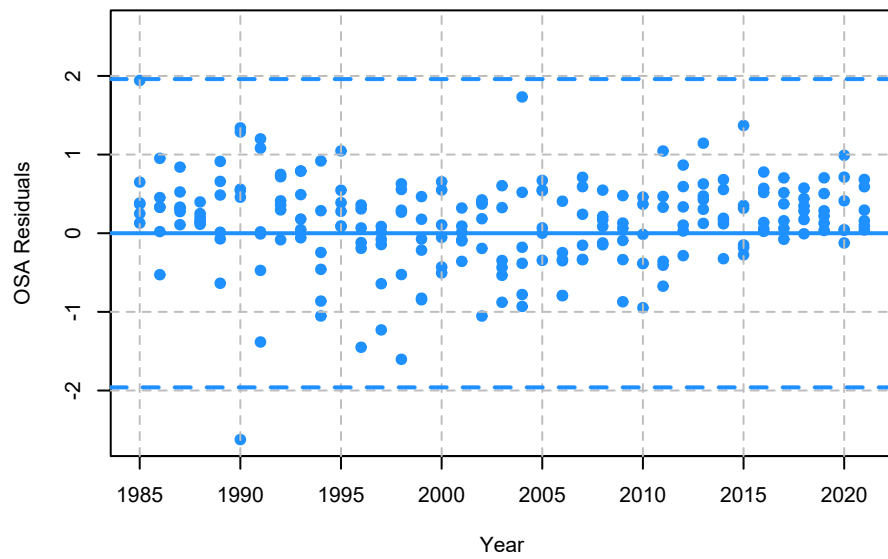
OSA residual diagnostics: Fleet 1



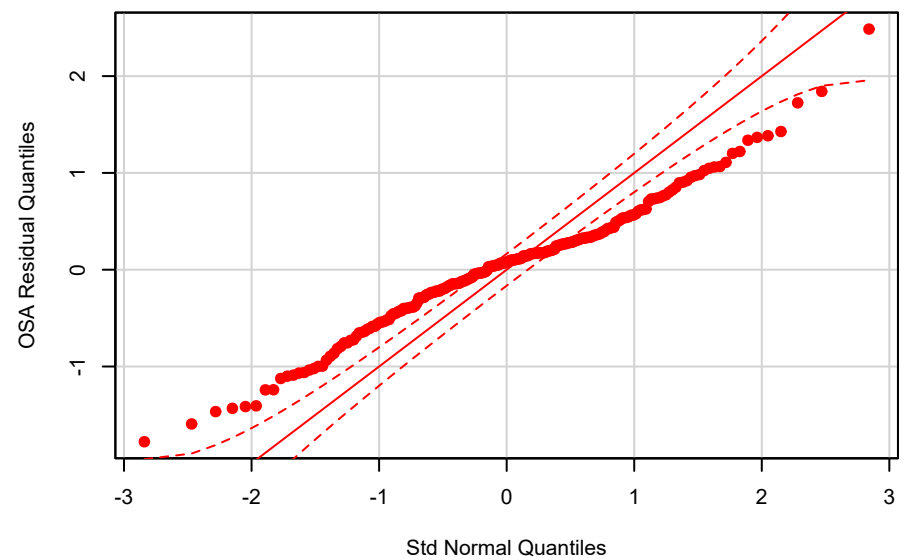
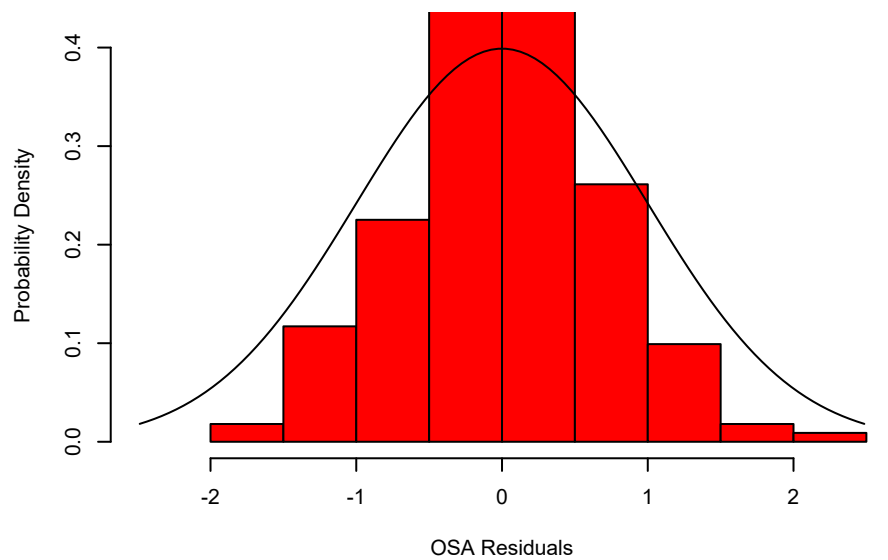
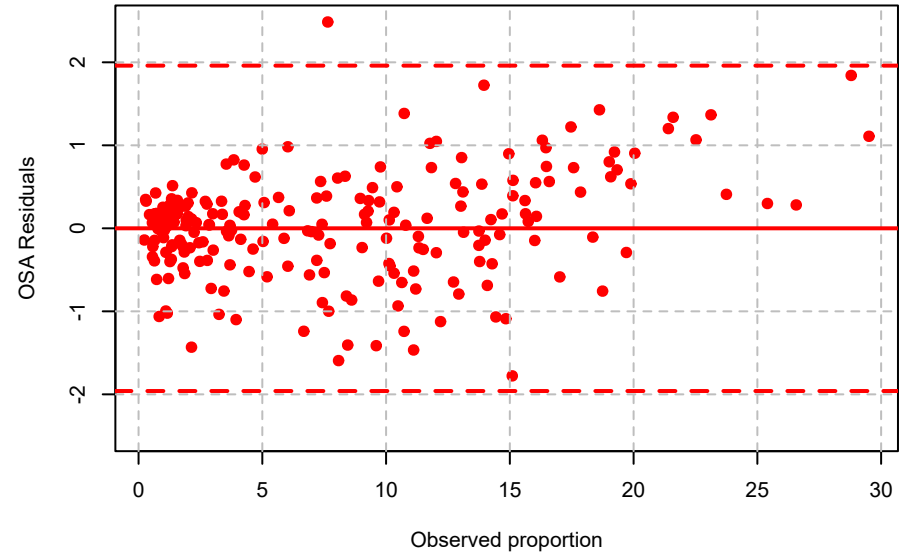
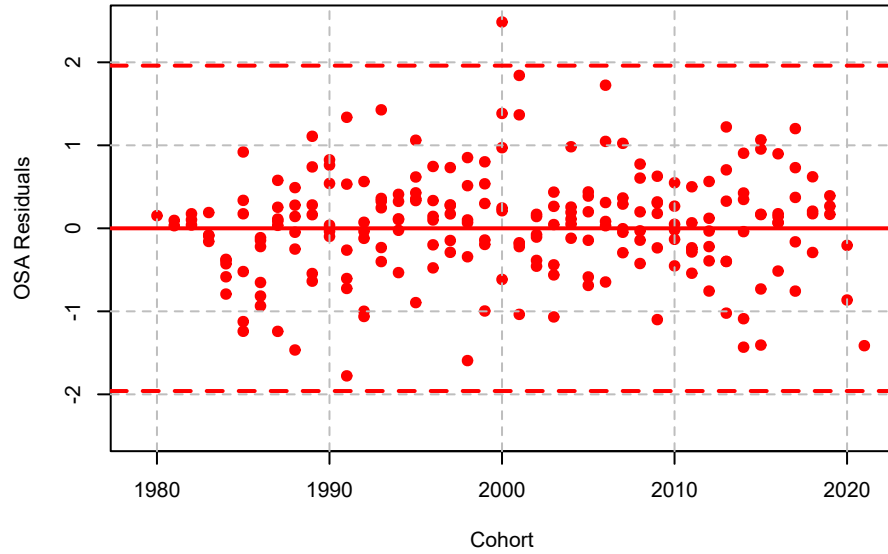
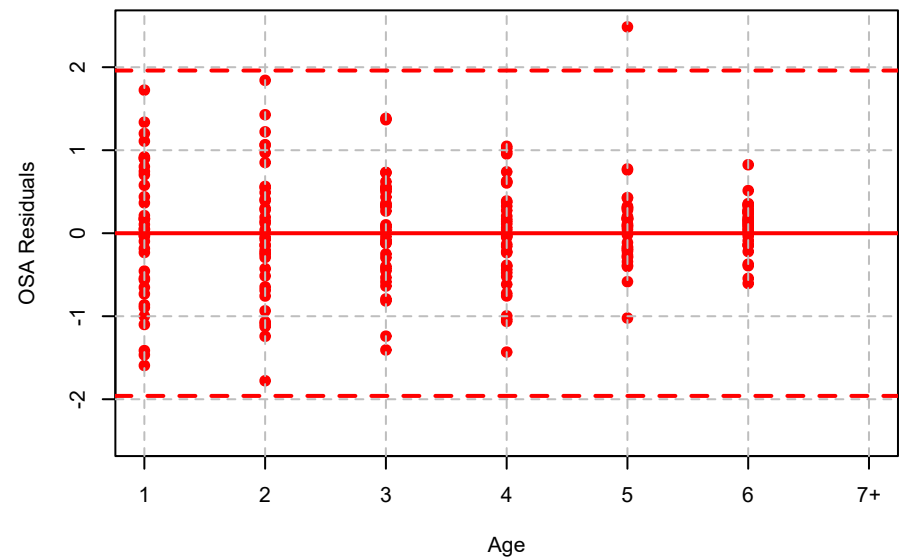
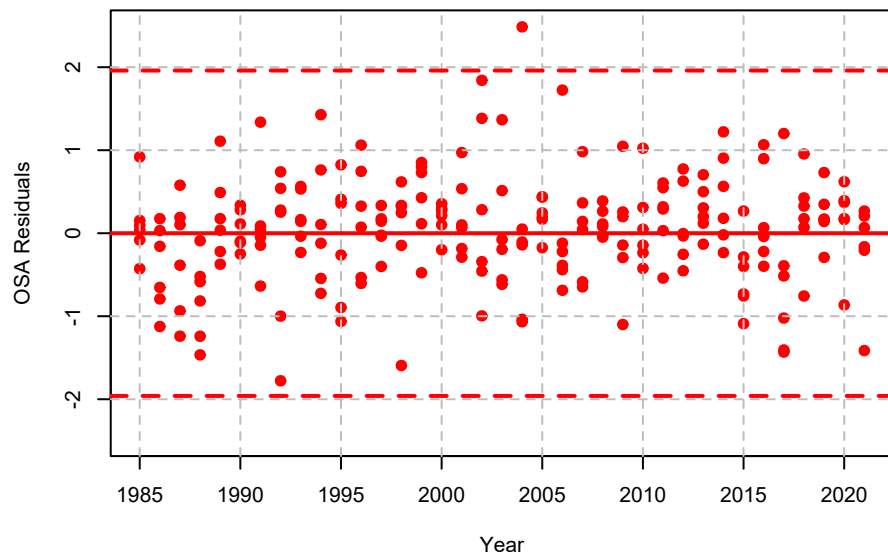
OSA residual diagnostics: Fleet 2



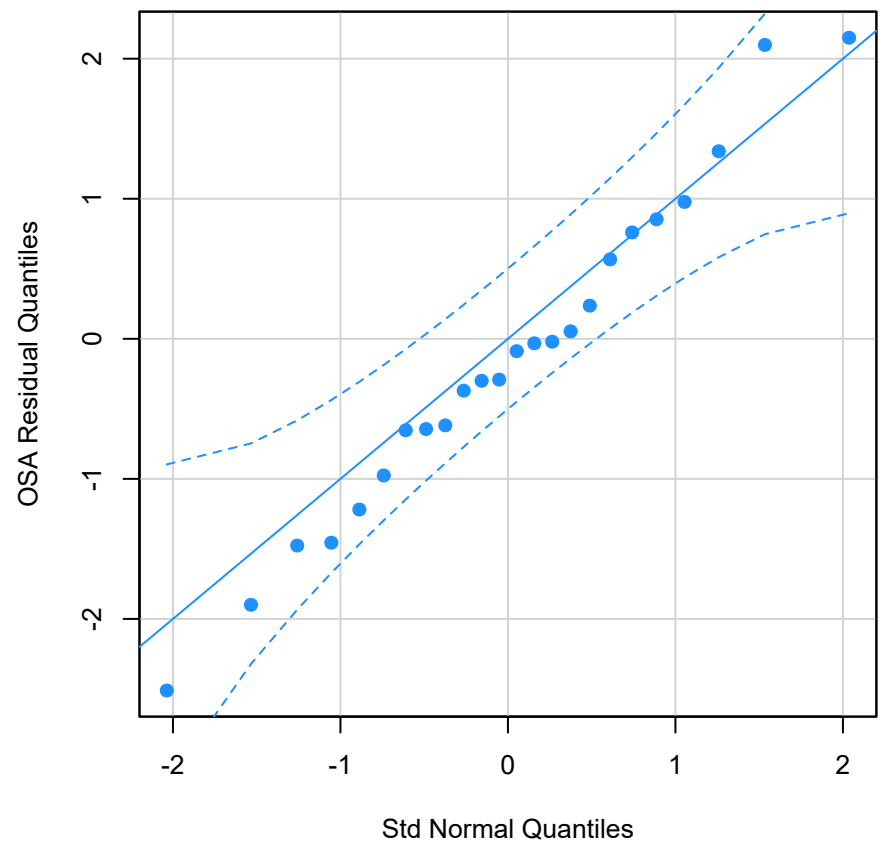
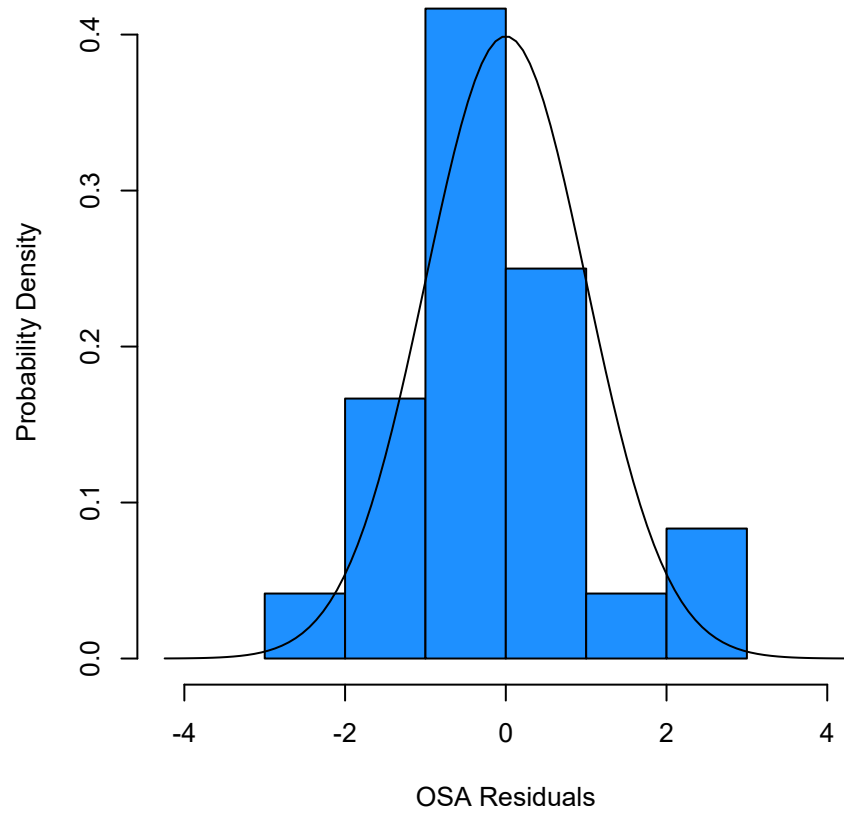
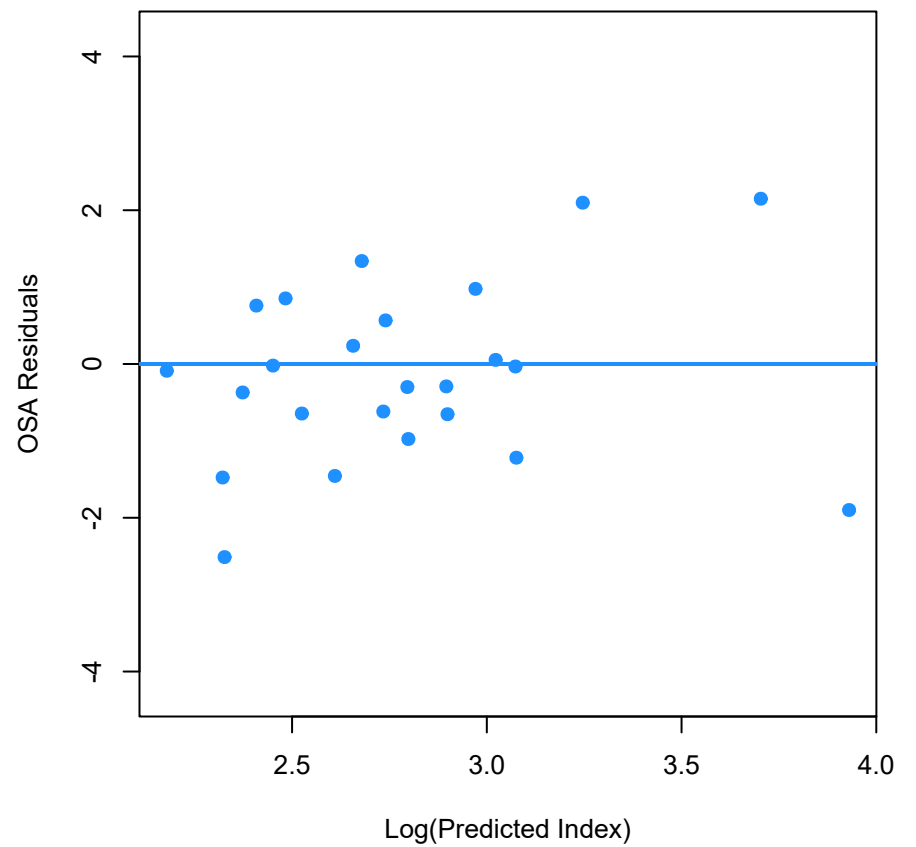
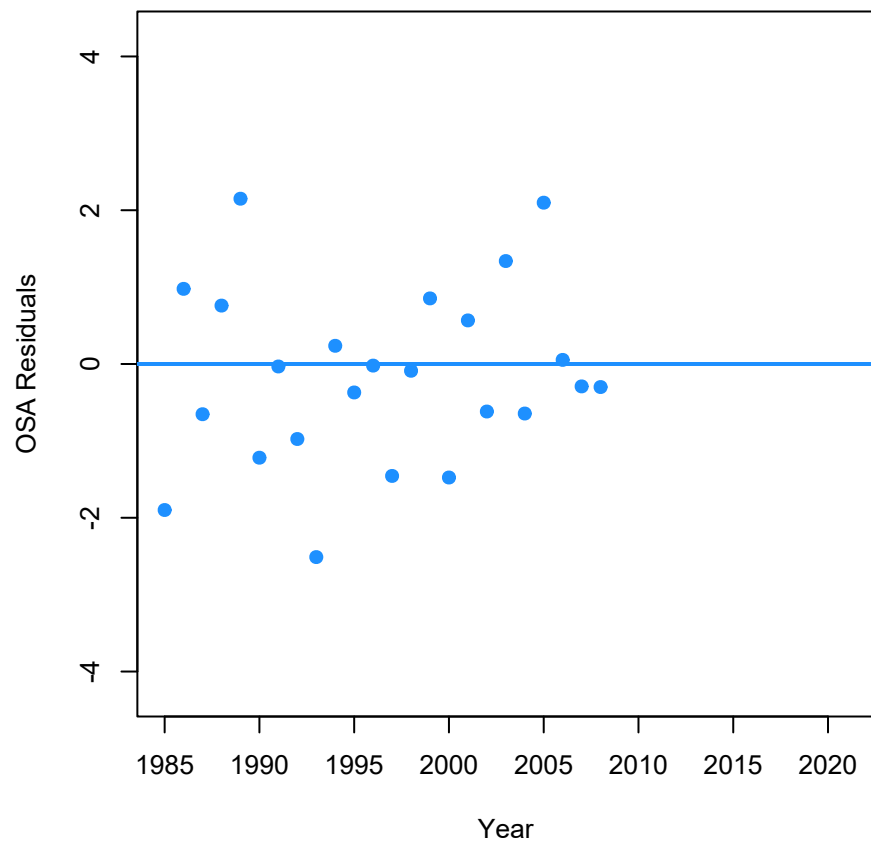
age composition OSA residual diagnostics: Fleet 1



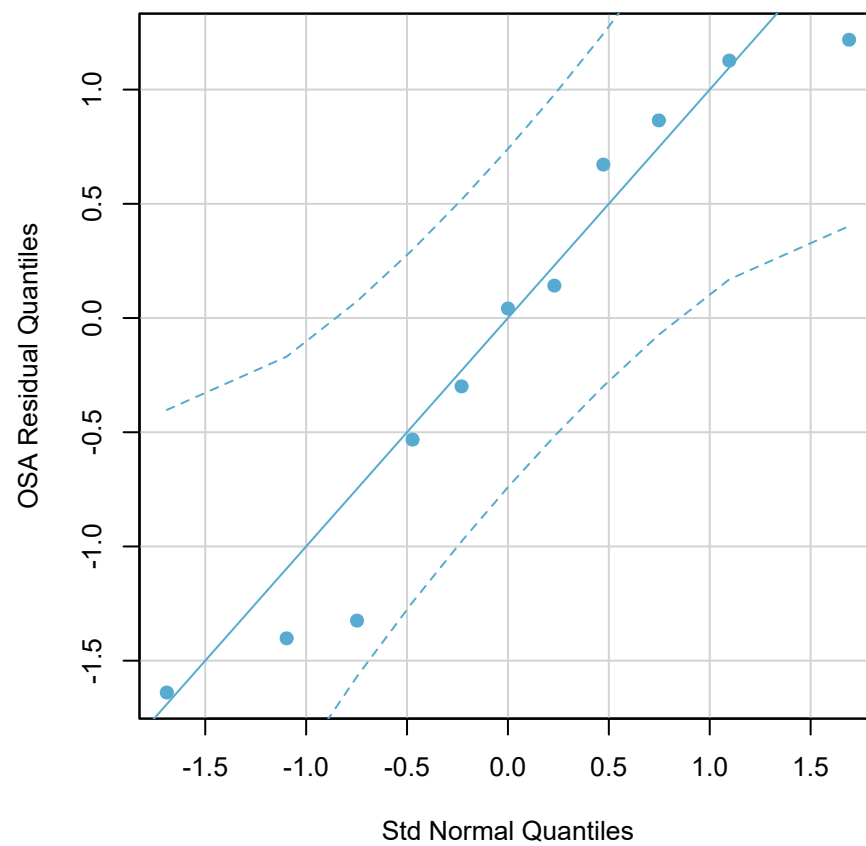
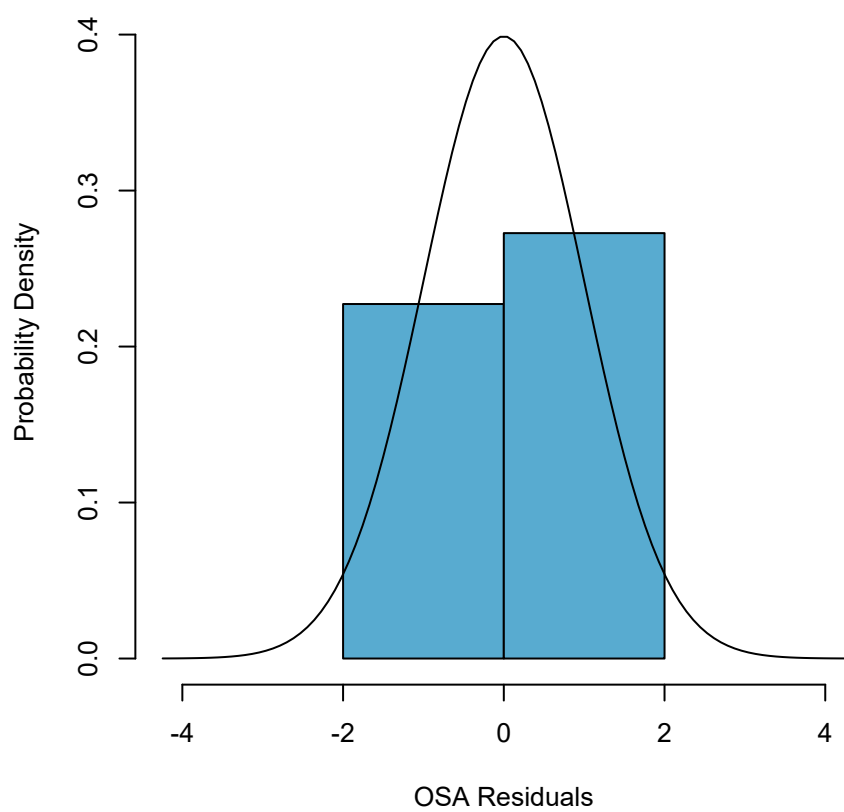
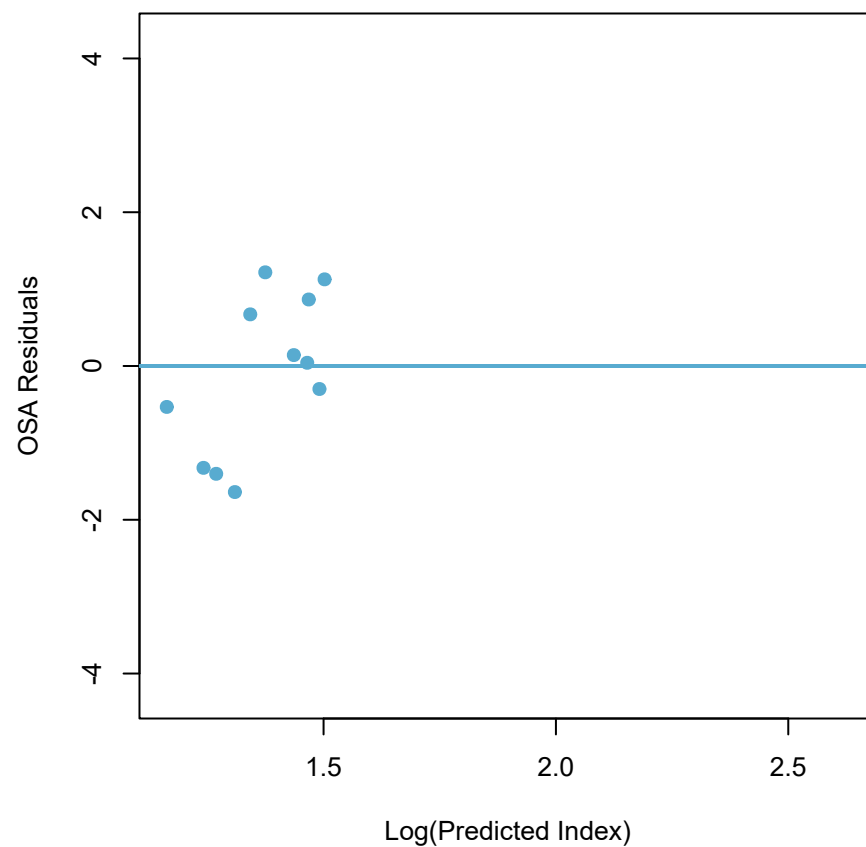
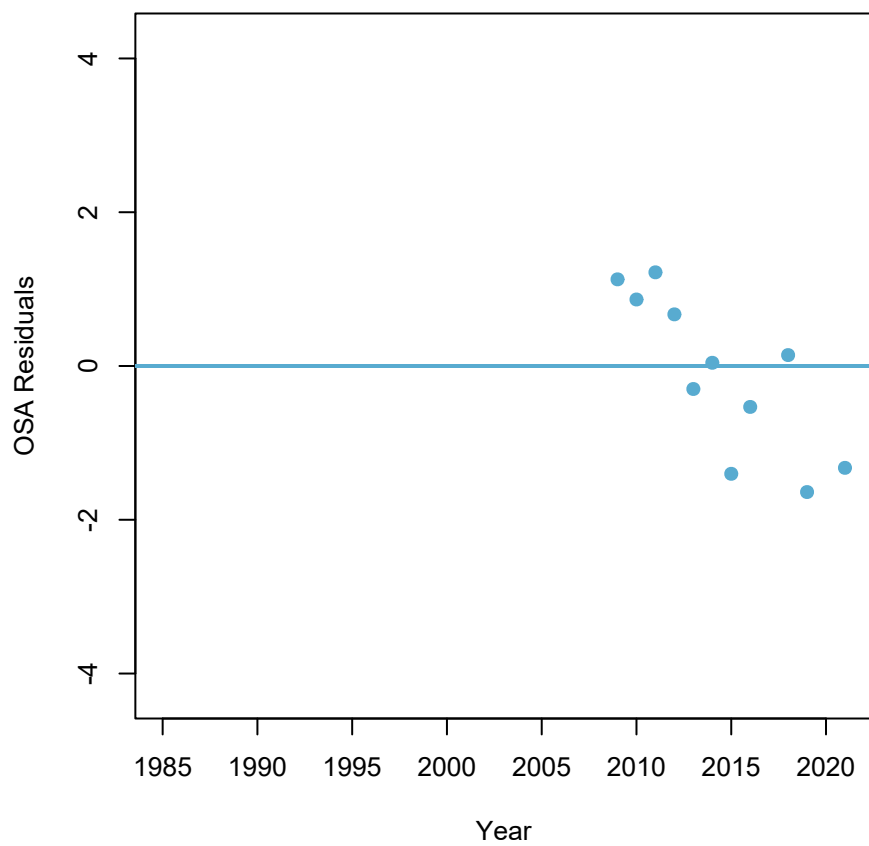
age composition OSA residual diagnostics: Fleet 2



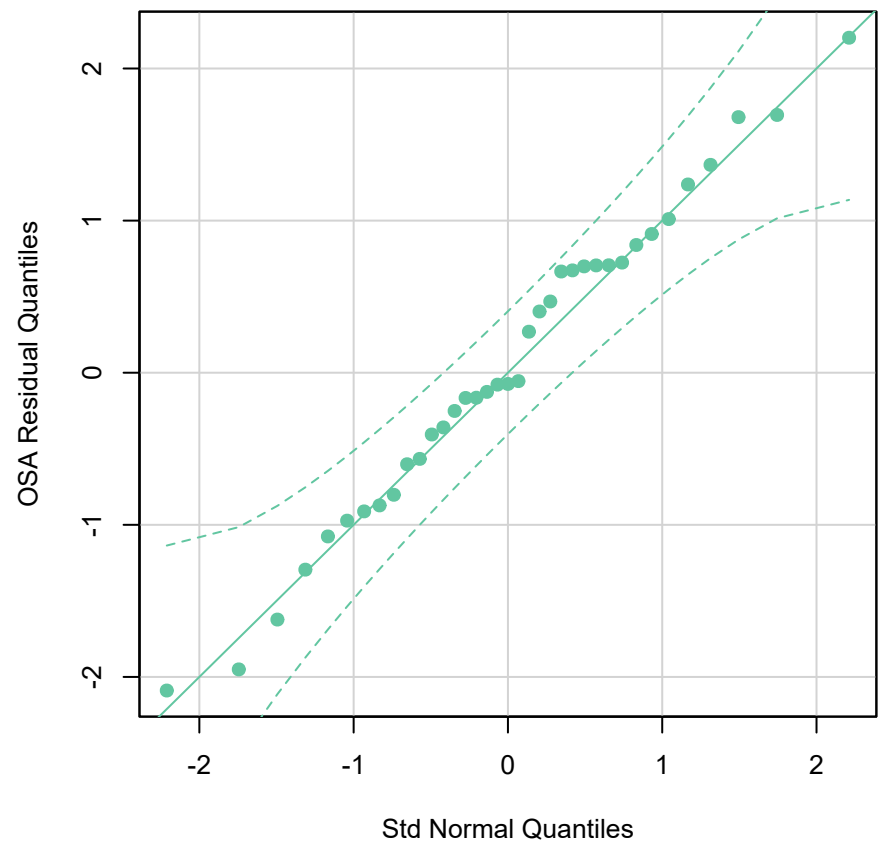
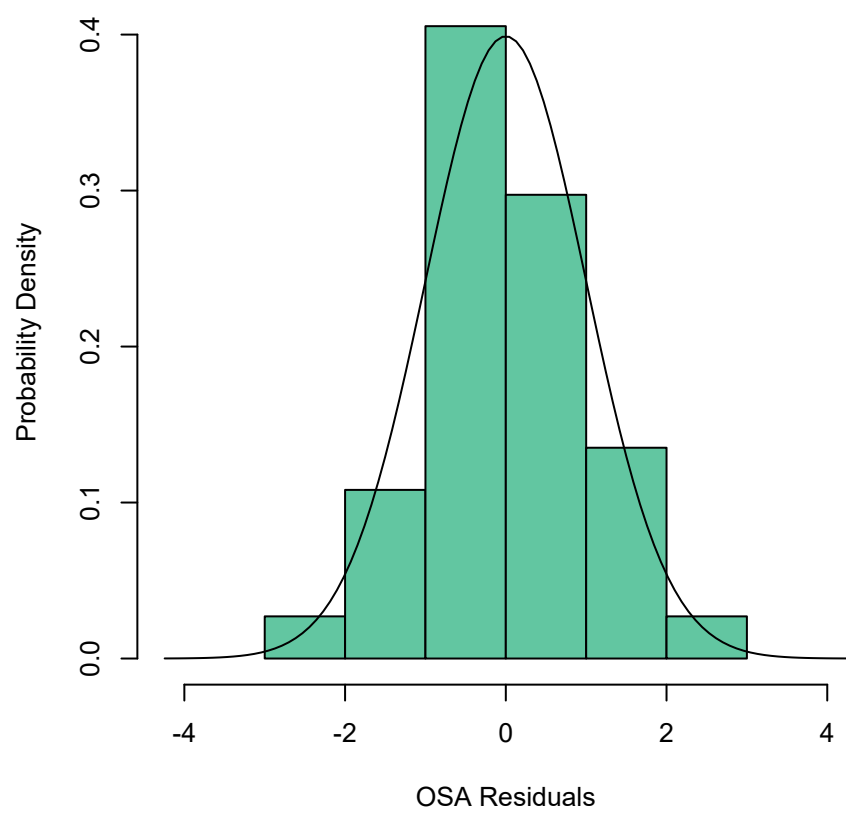
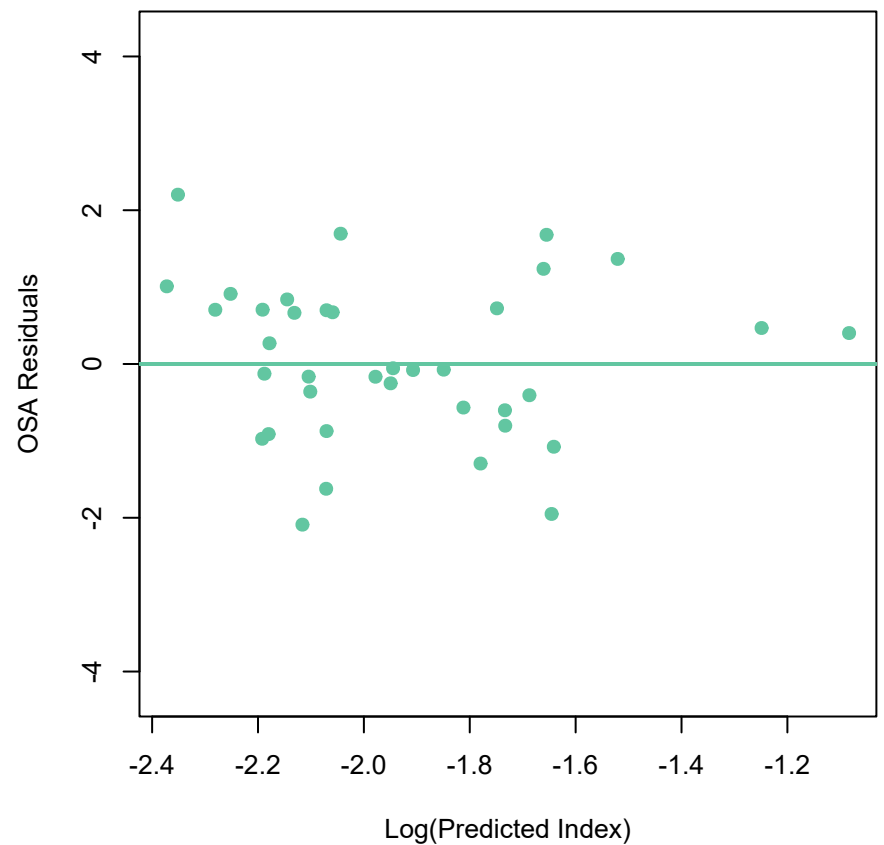
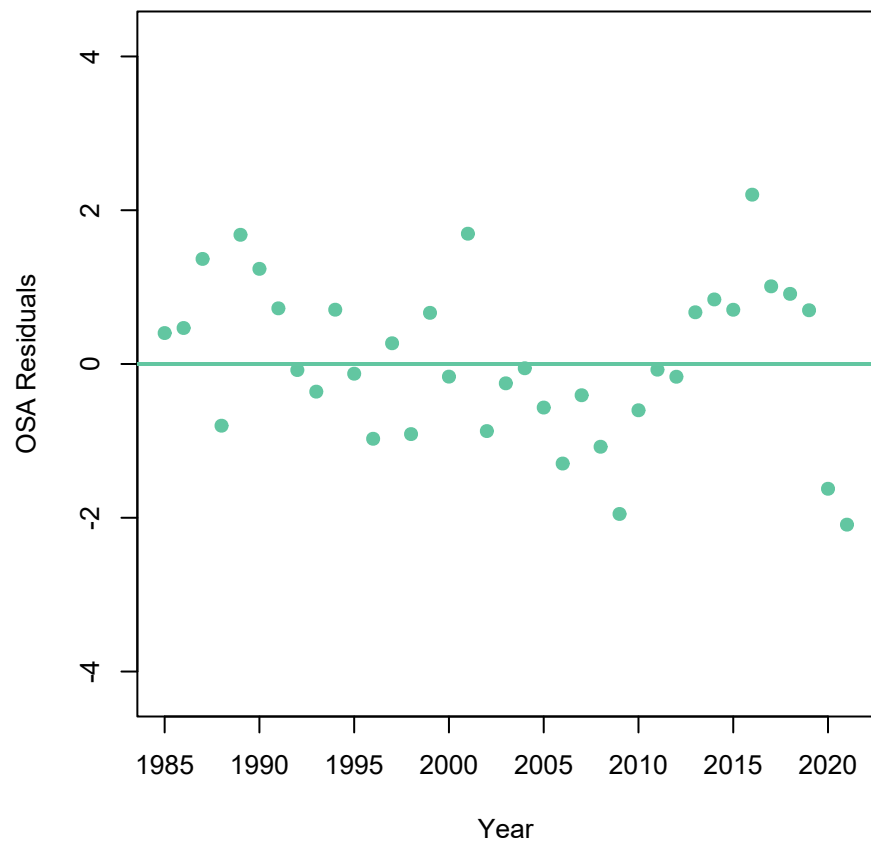
OSA residual diagnostics: Index 1



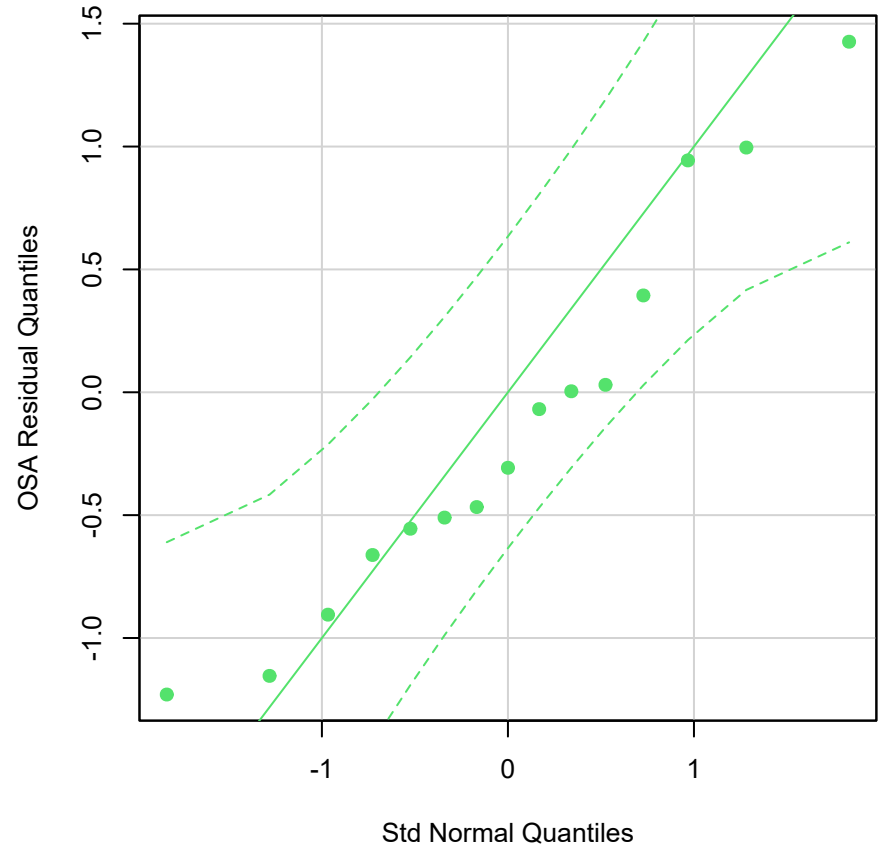
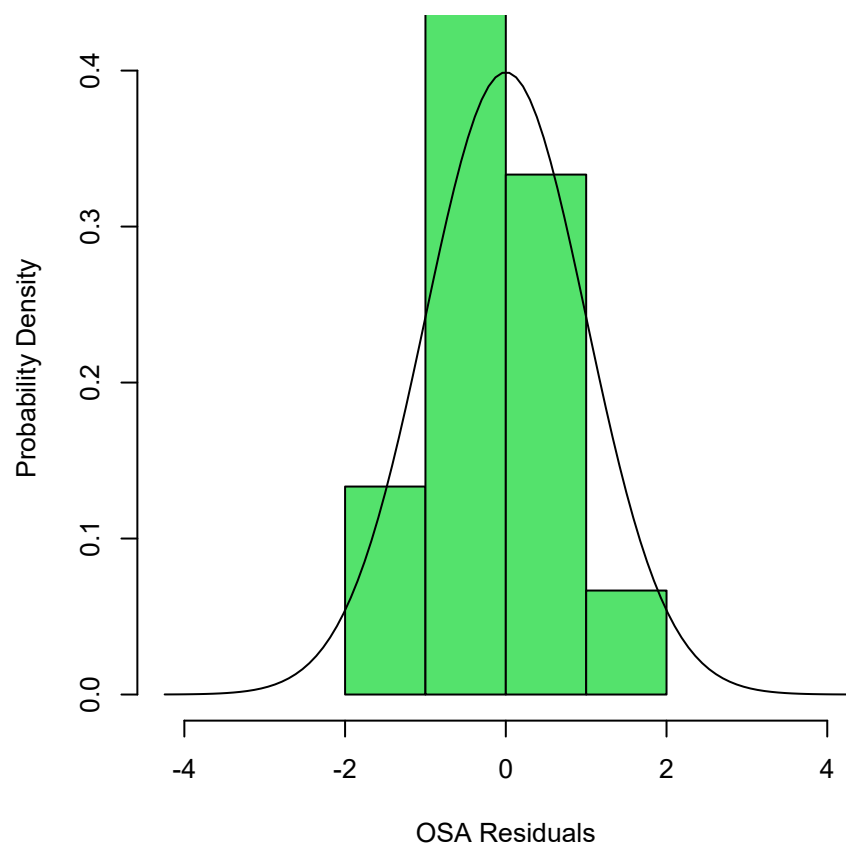
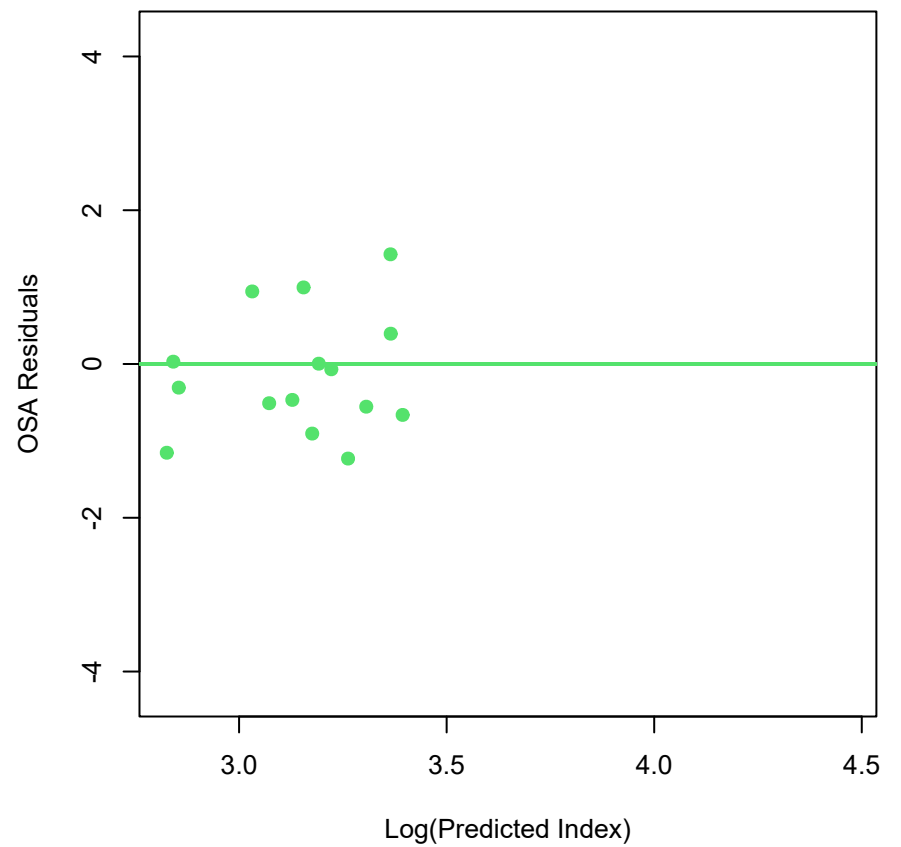
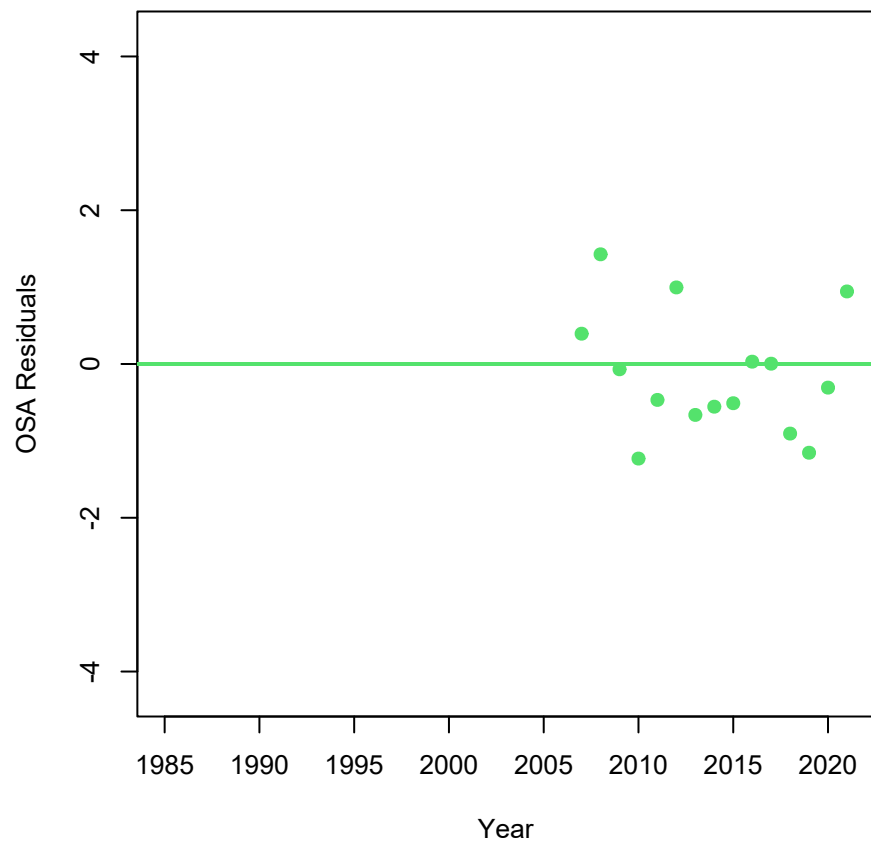
OSA residual diagnostics: Index 2



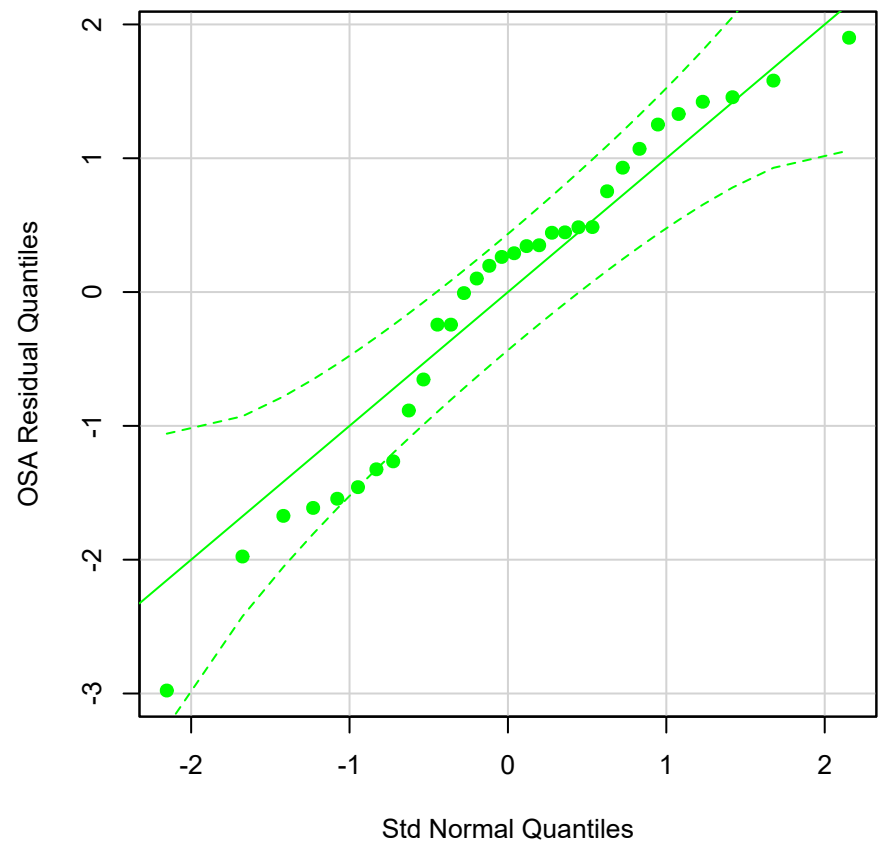
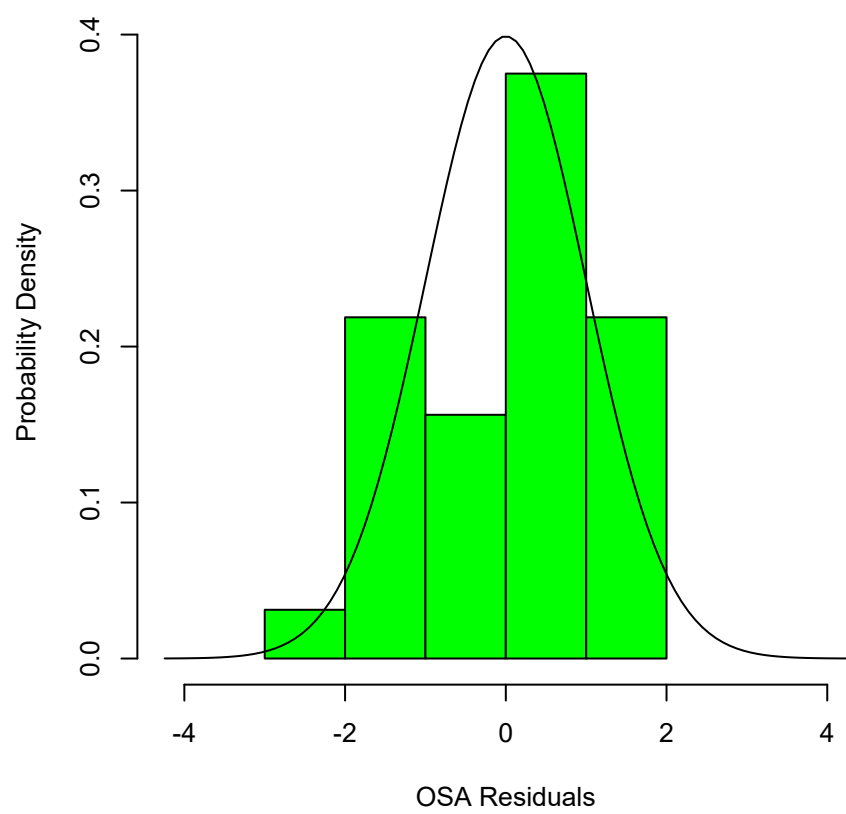
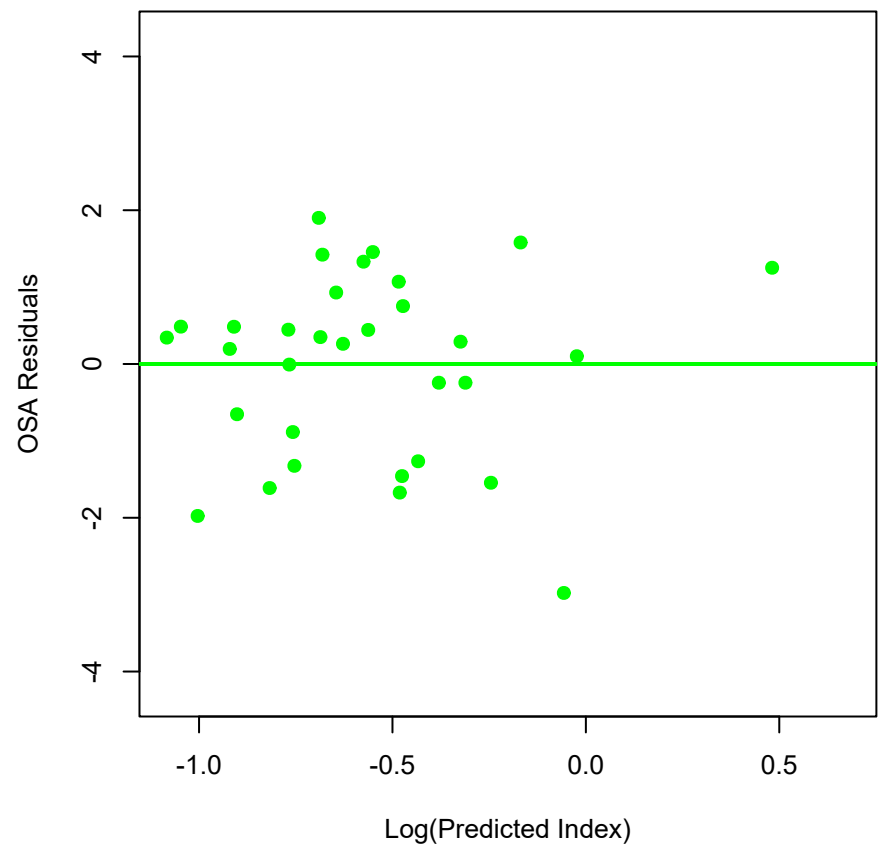
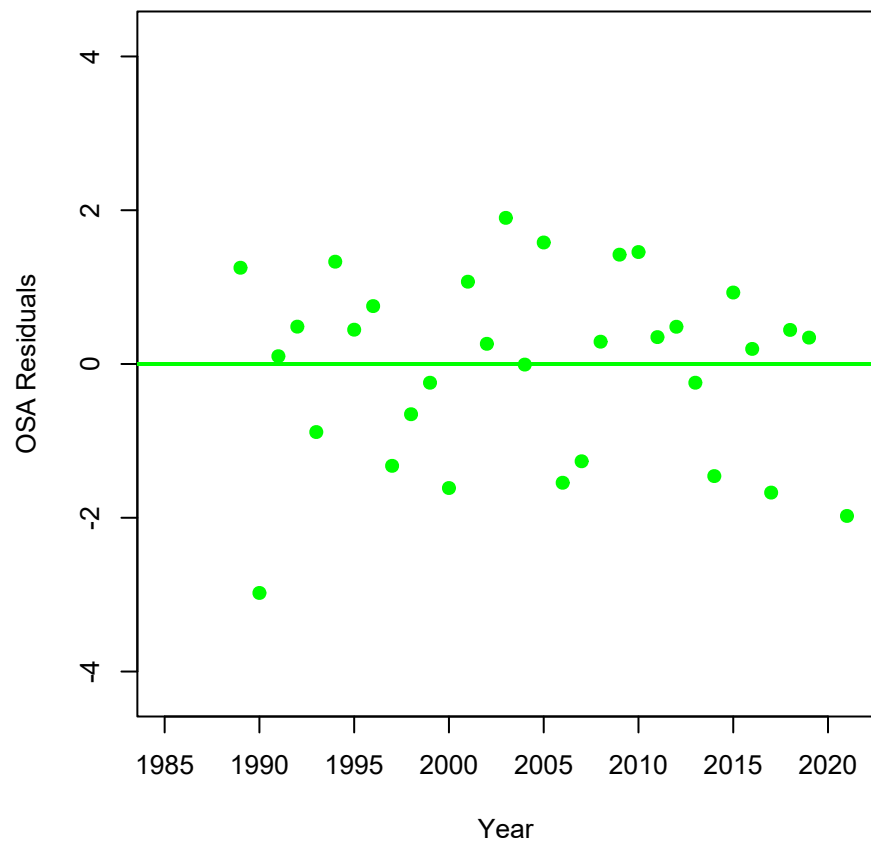
OSA residual diagnostics: Index 3



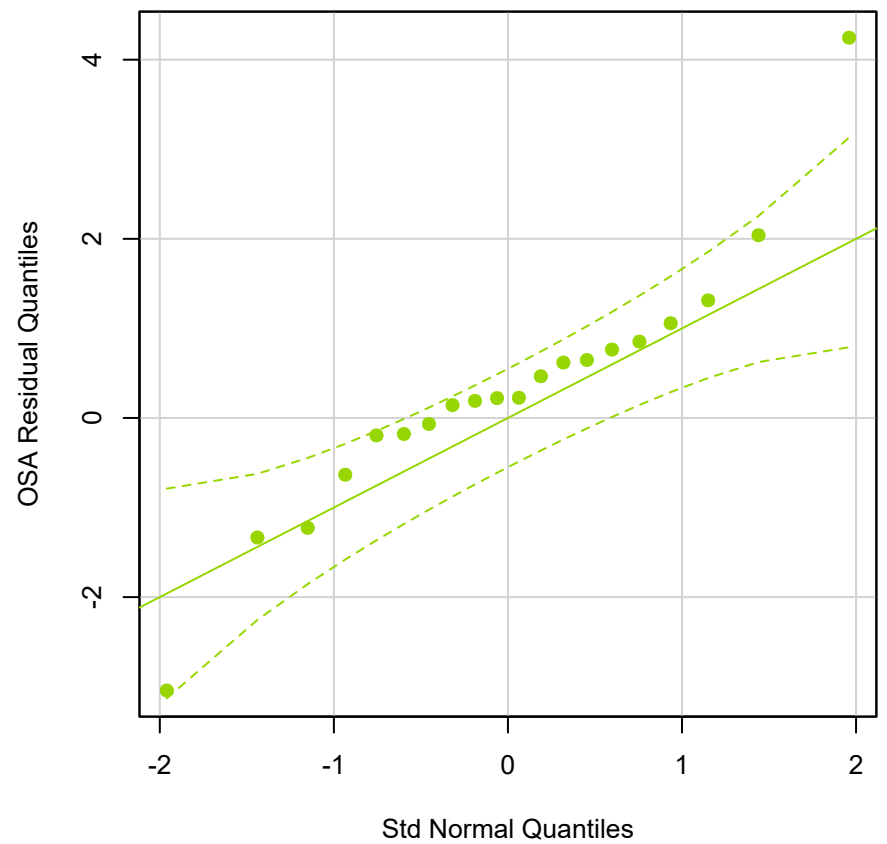
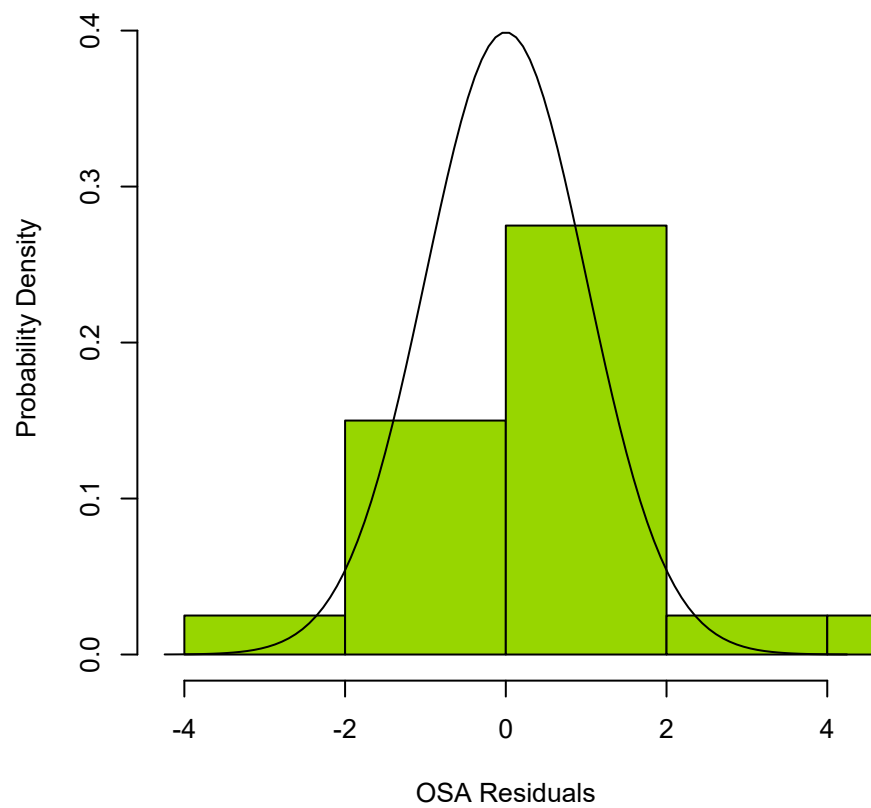
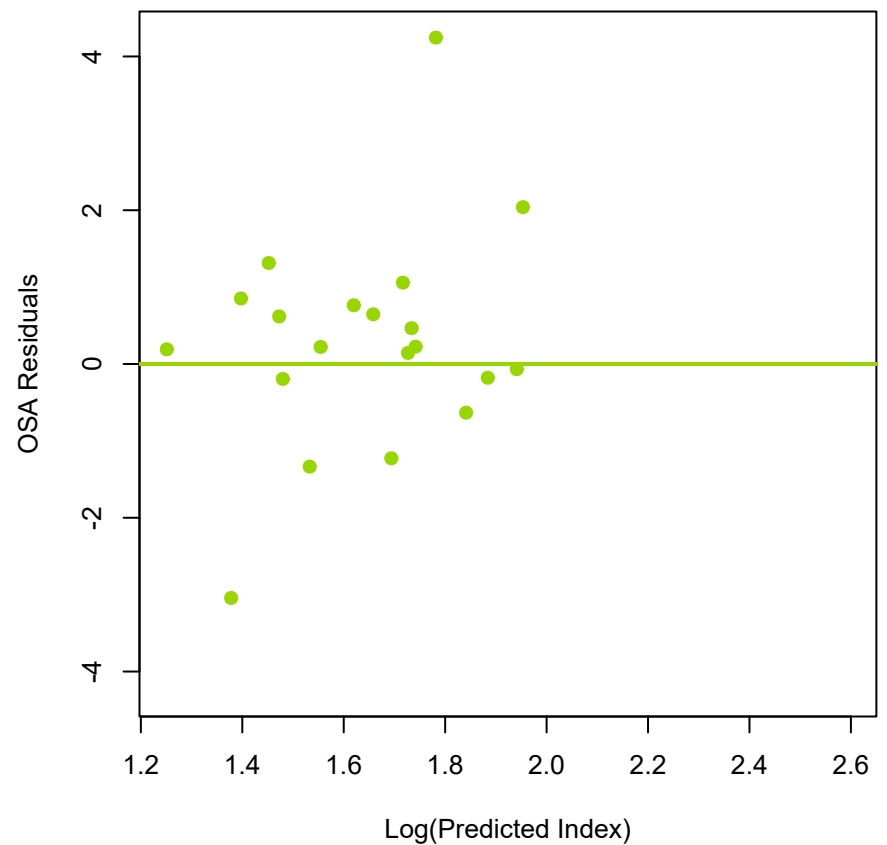
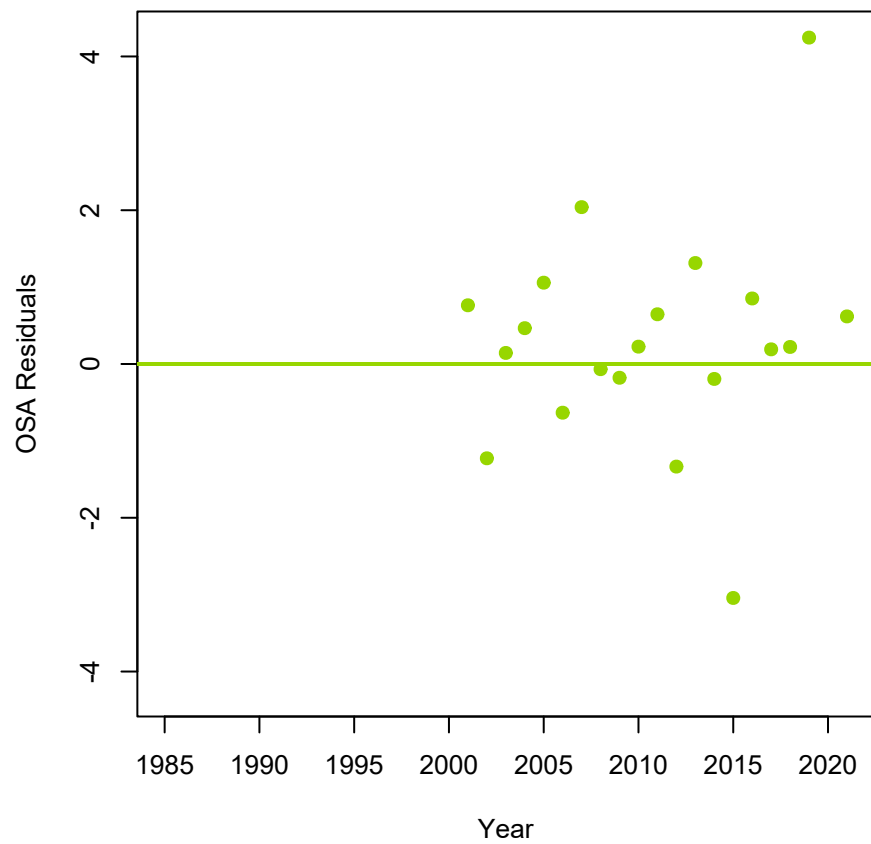
OSA residual diagnostics: Index 4



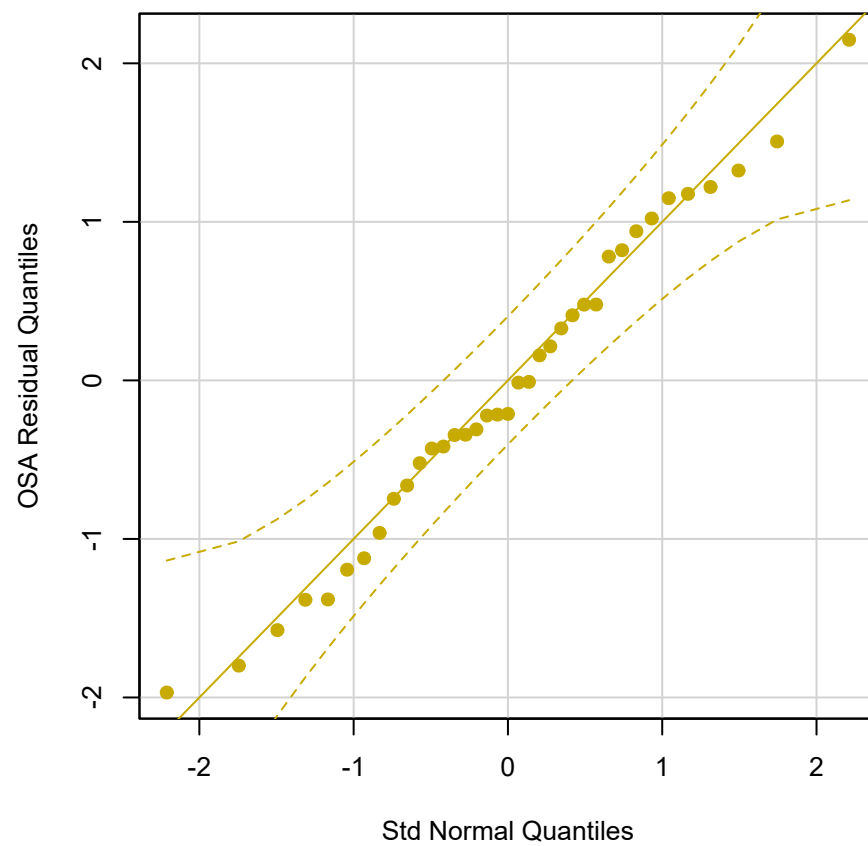
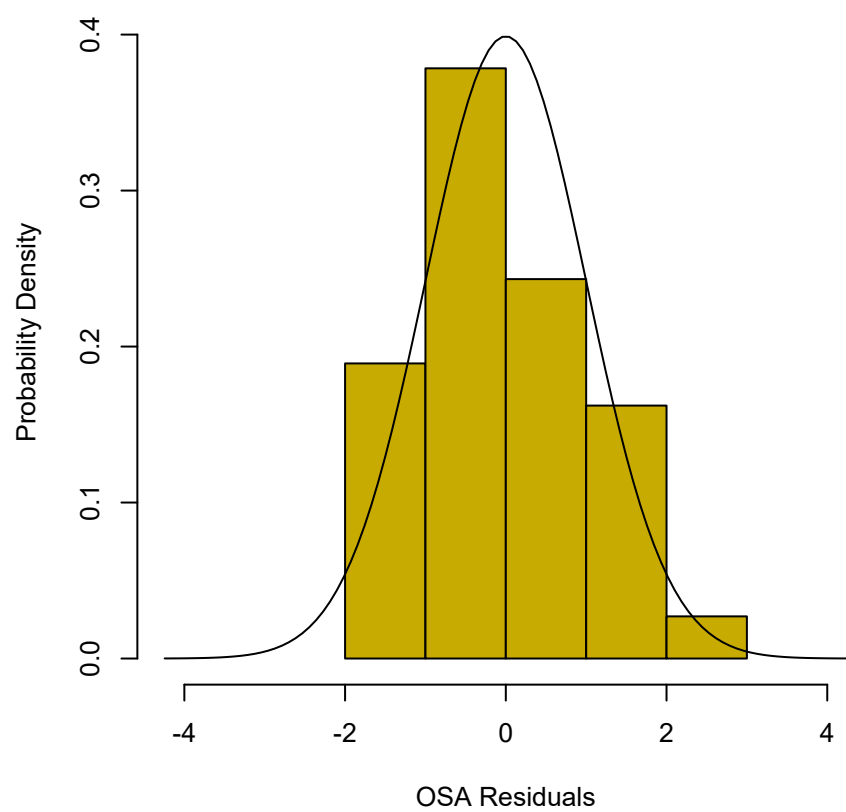
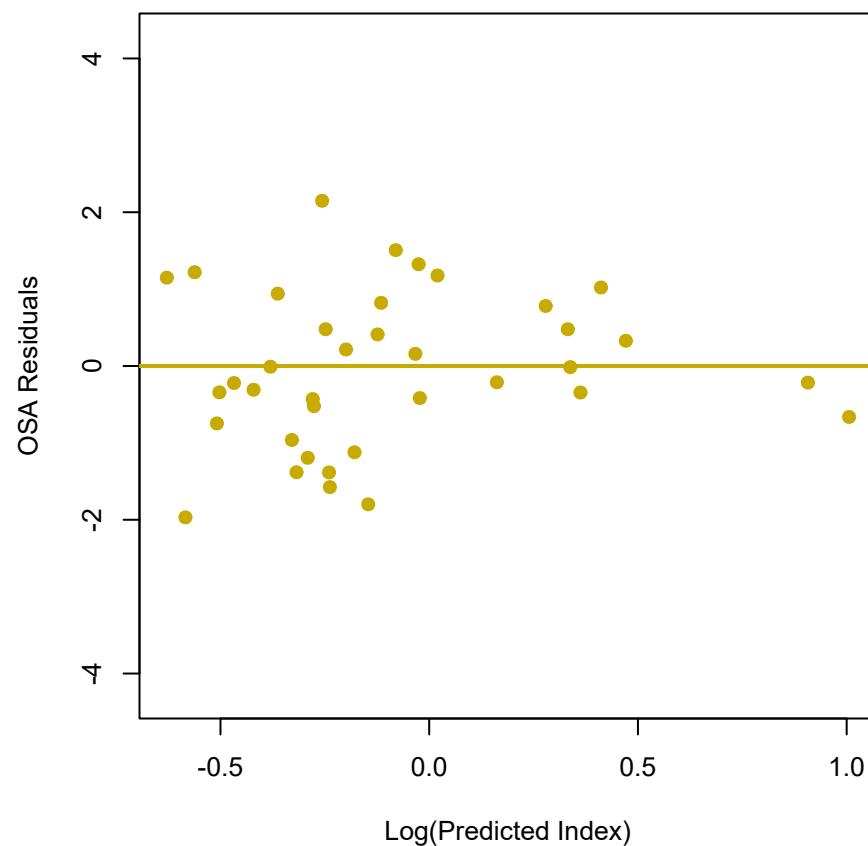
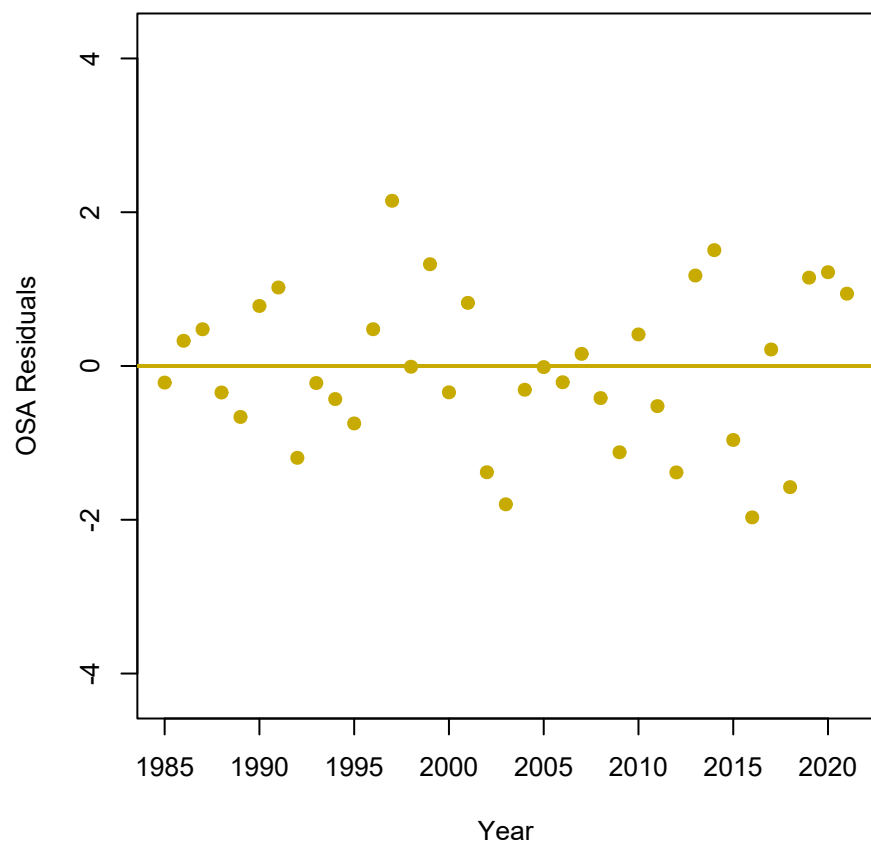
OSA residual diagnostics: Index 5



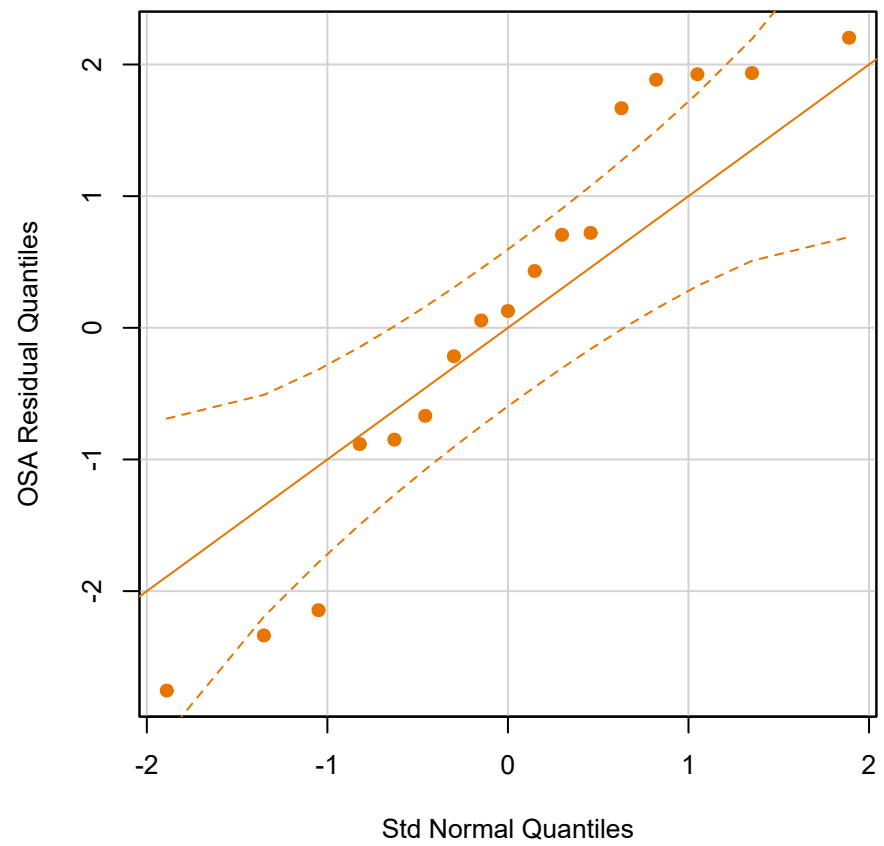
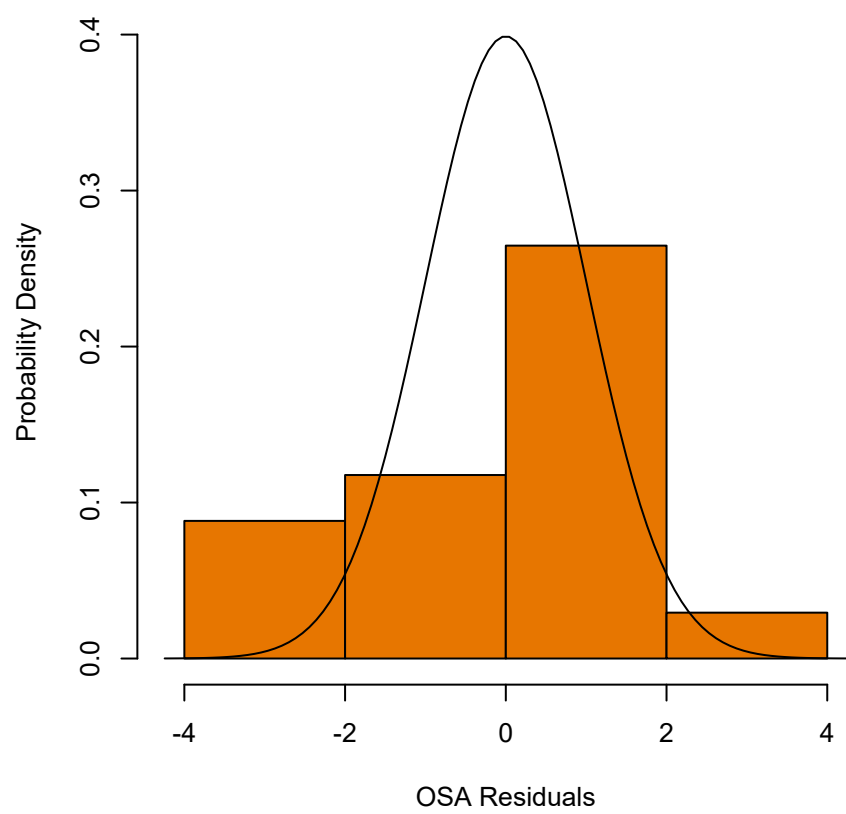
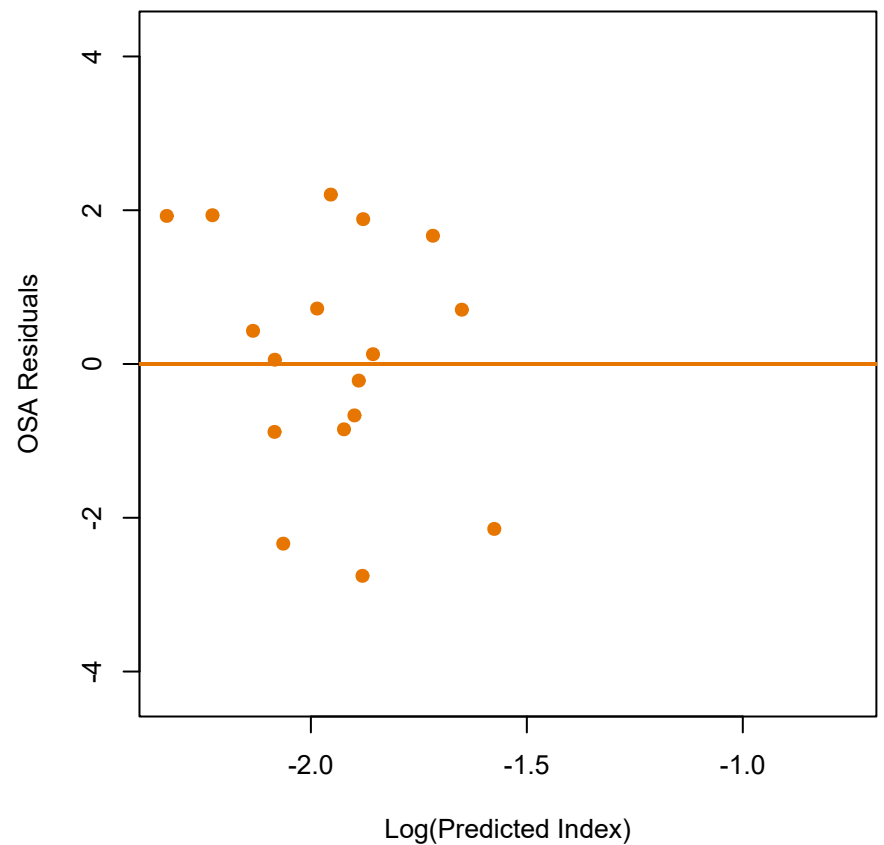
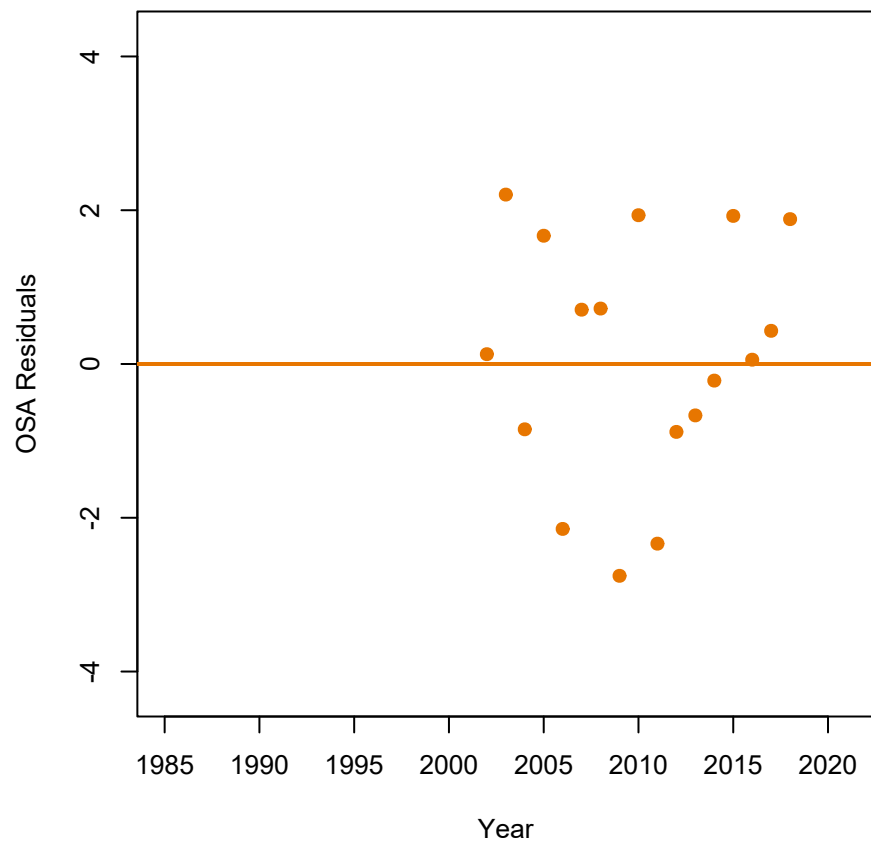
OSA residual diagnostics: Index 6



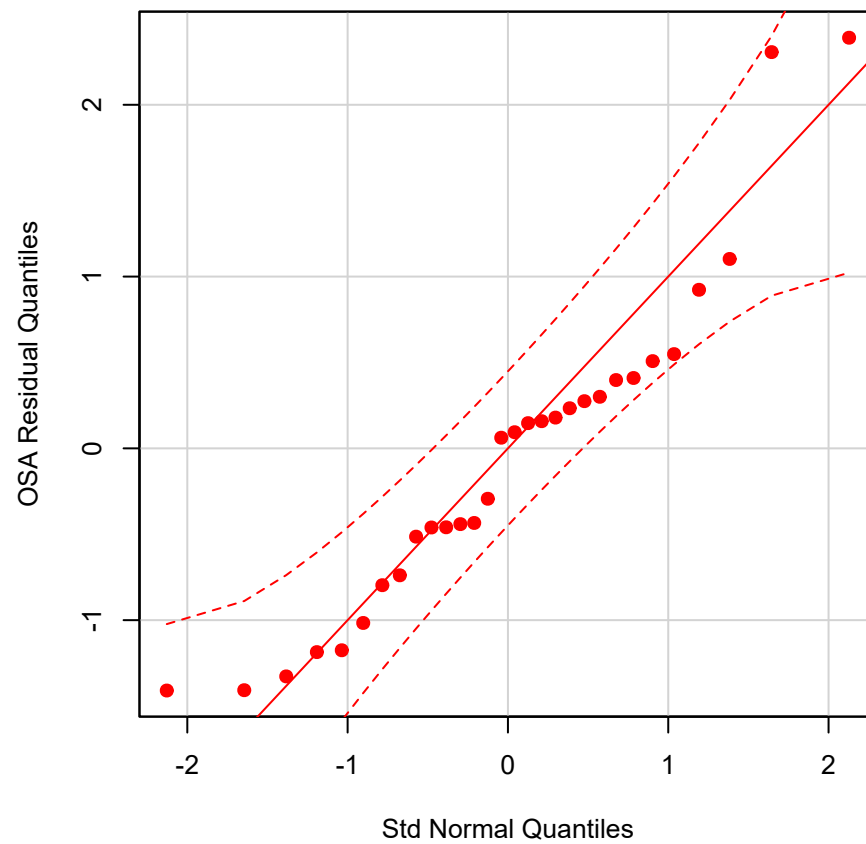
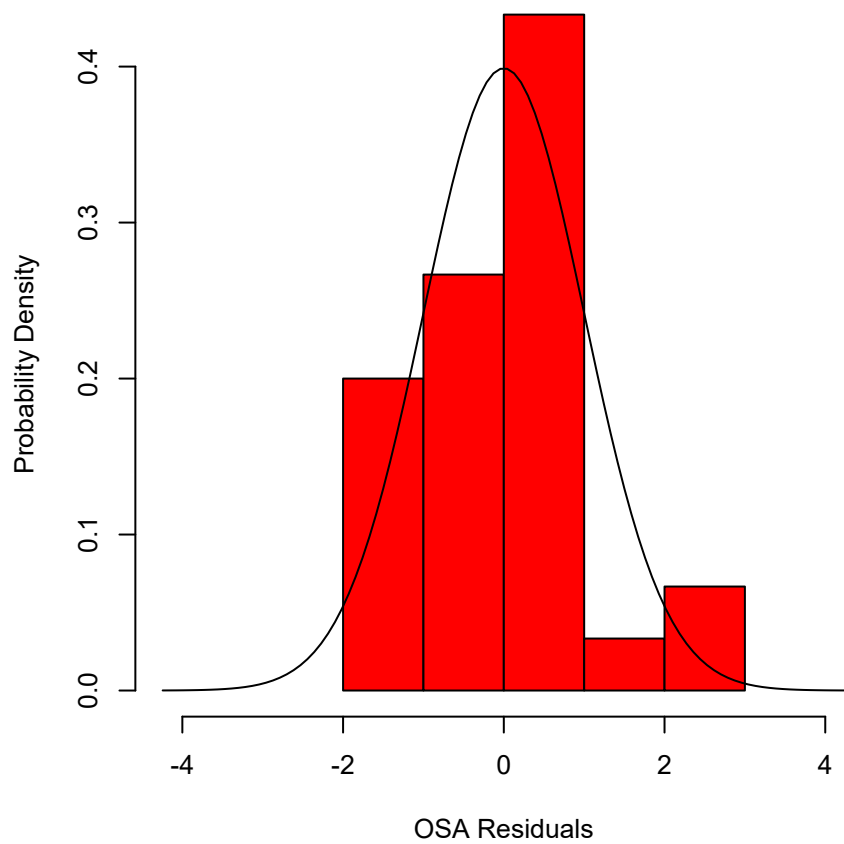
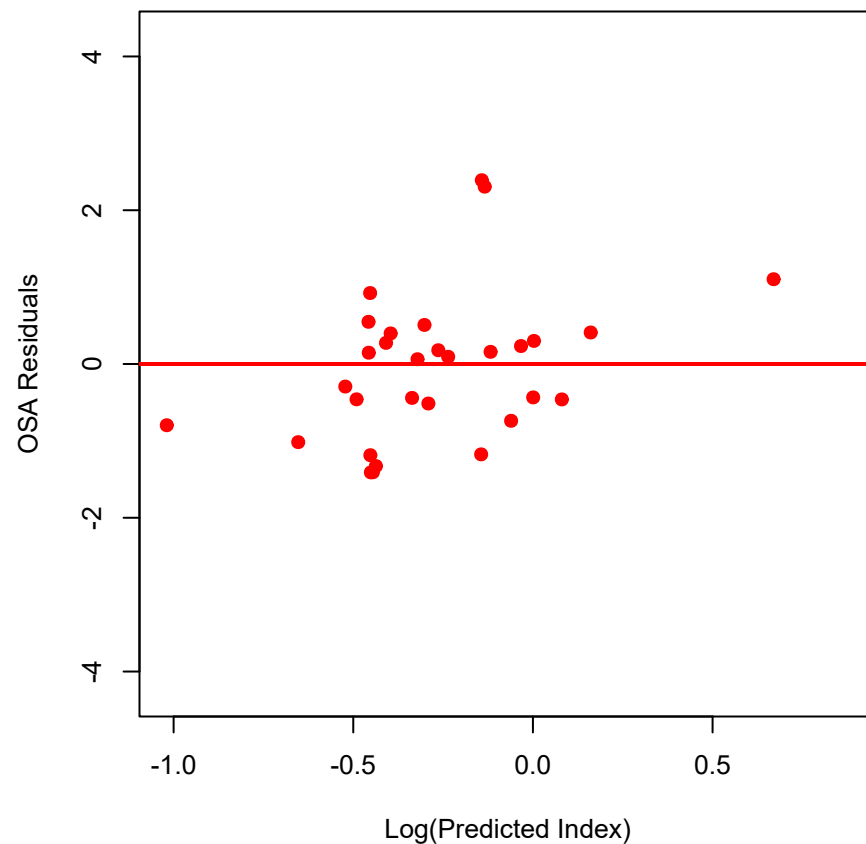
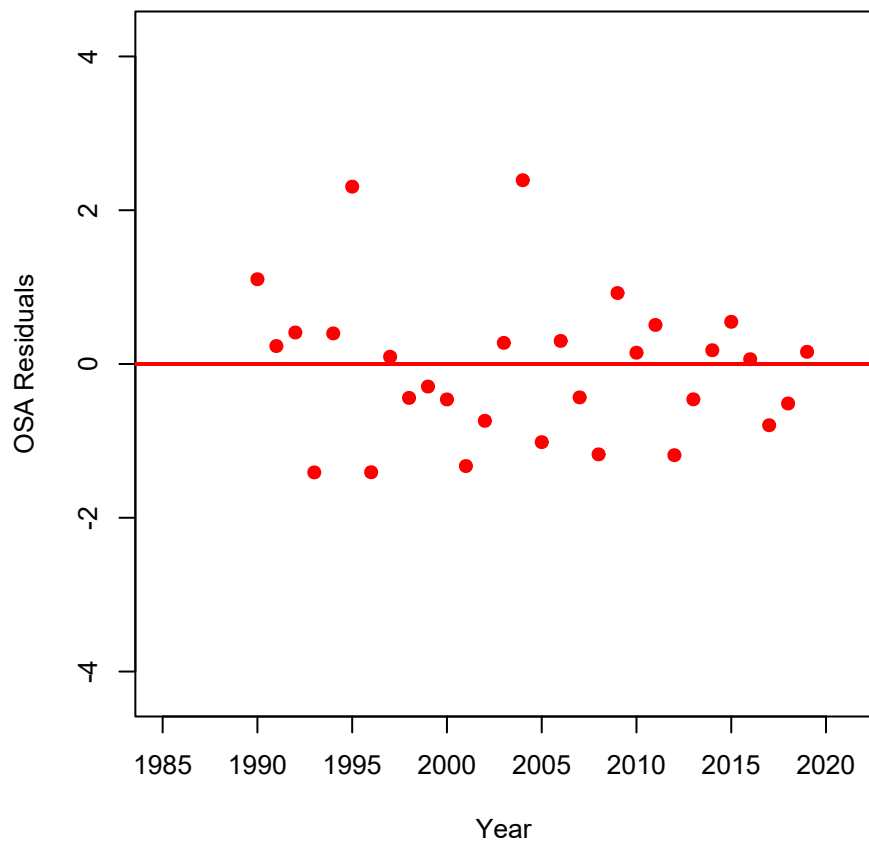
OSA residual diagnostics: Index 7



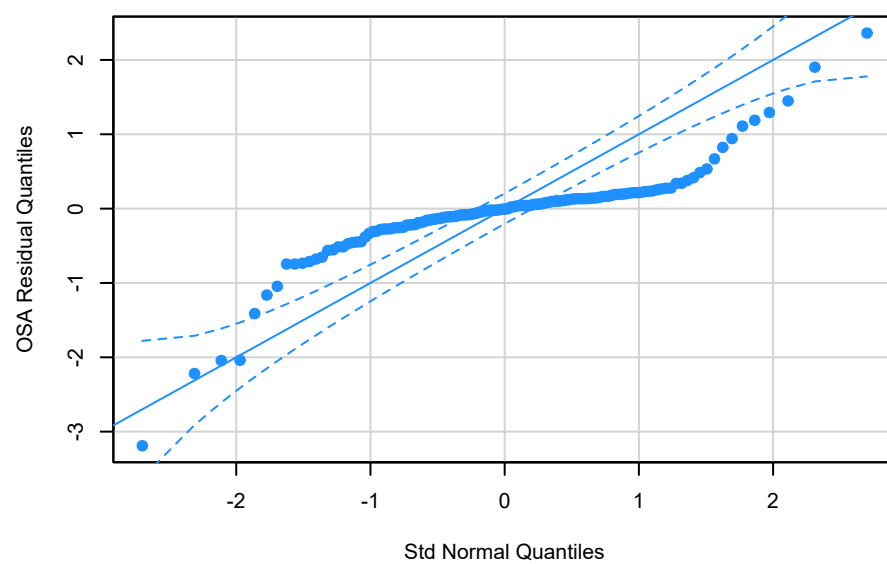
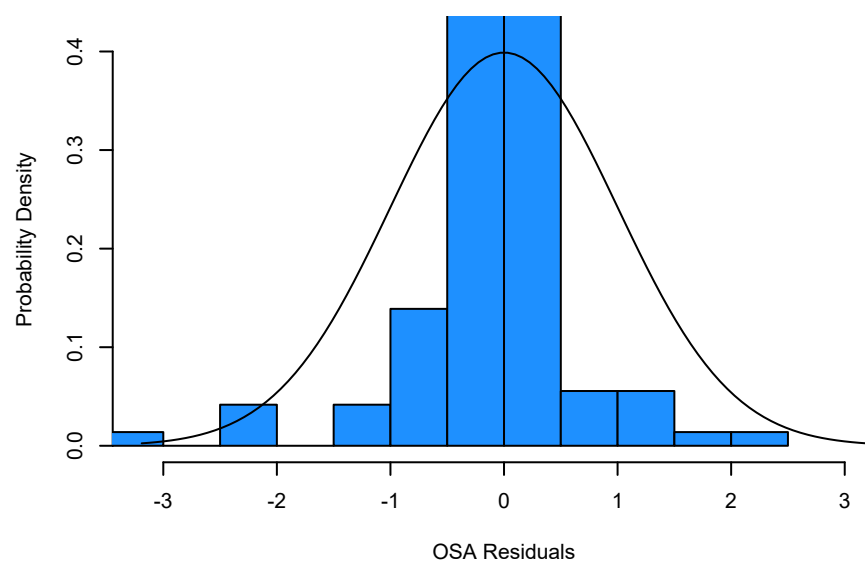
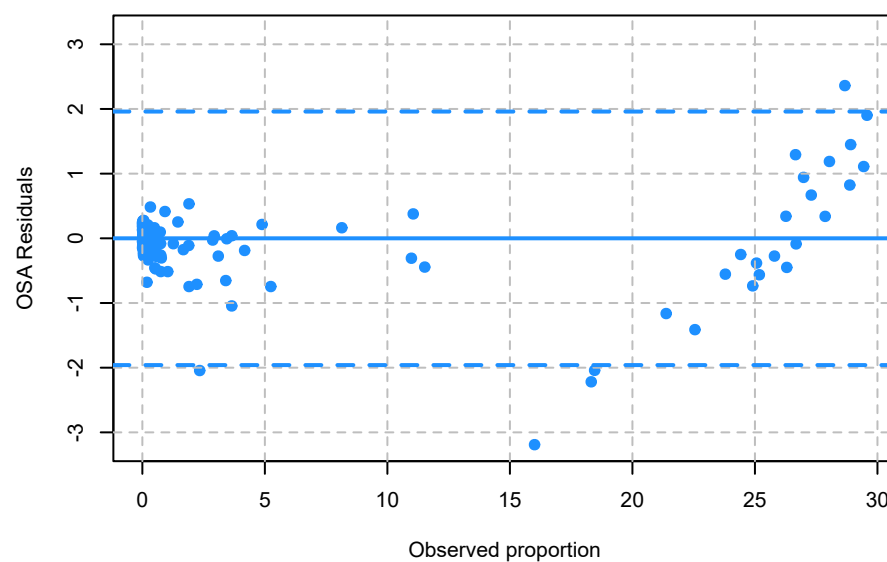
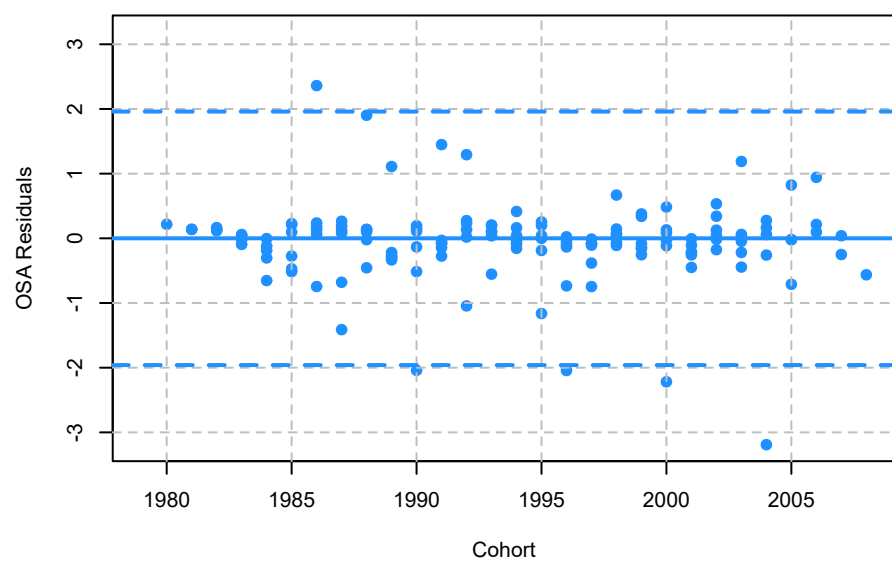
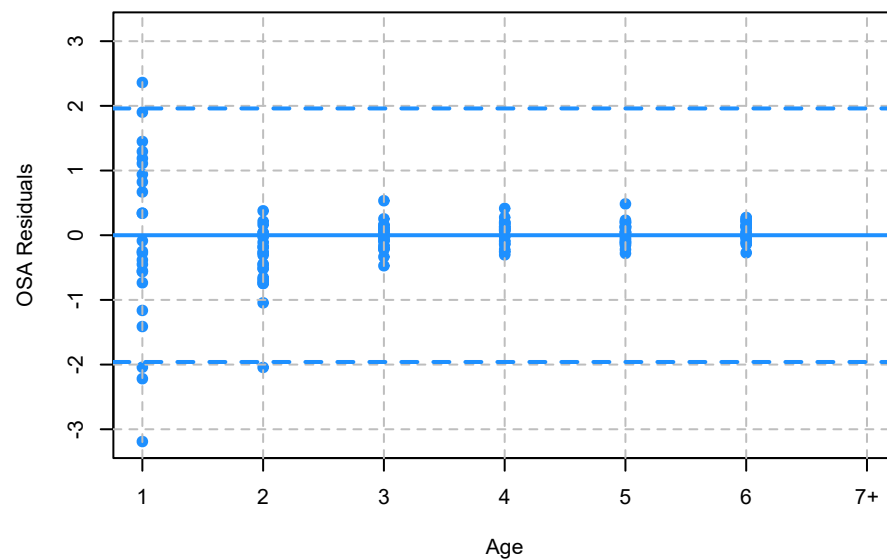
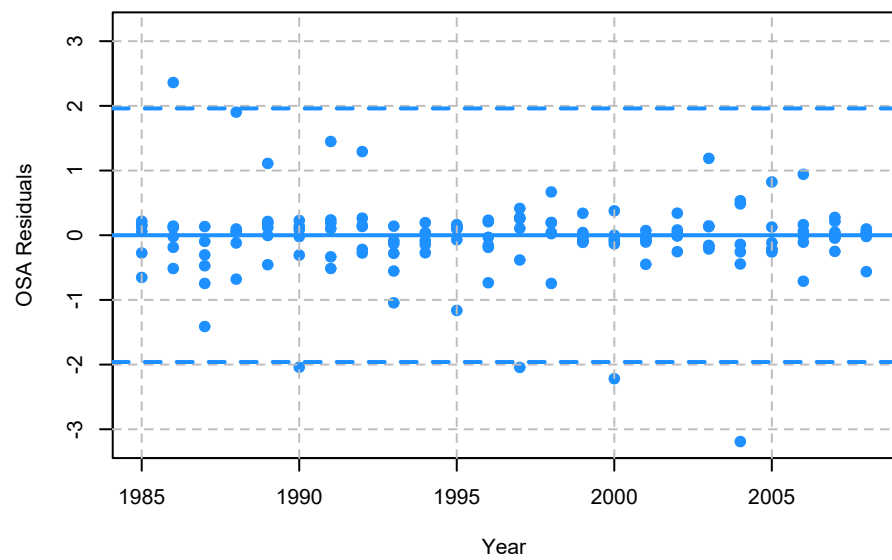
OSA residual diagnostics: Index 8



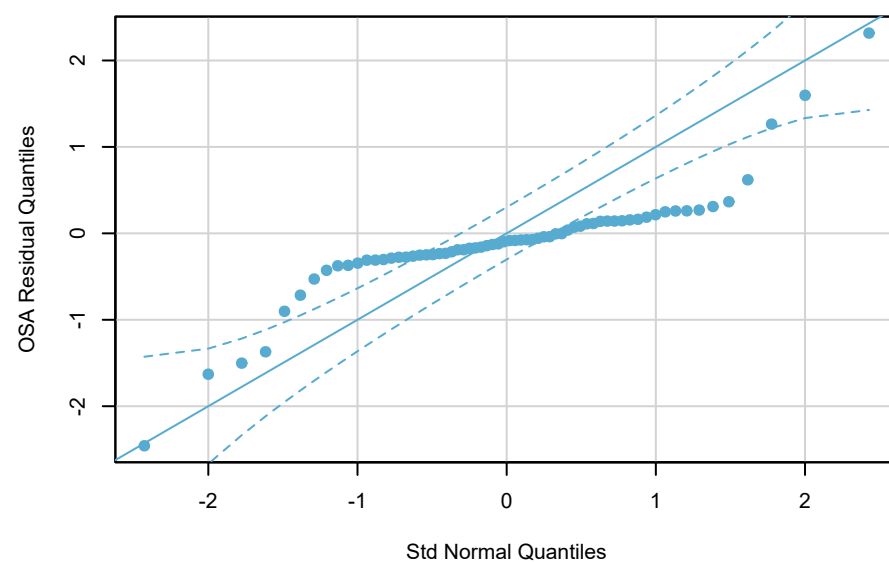
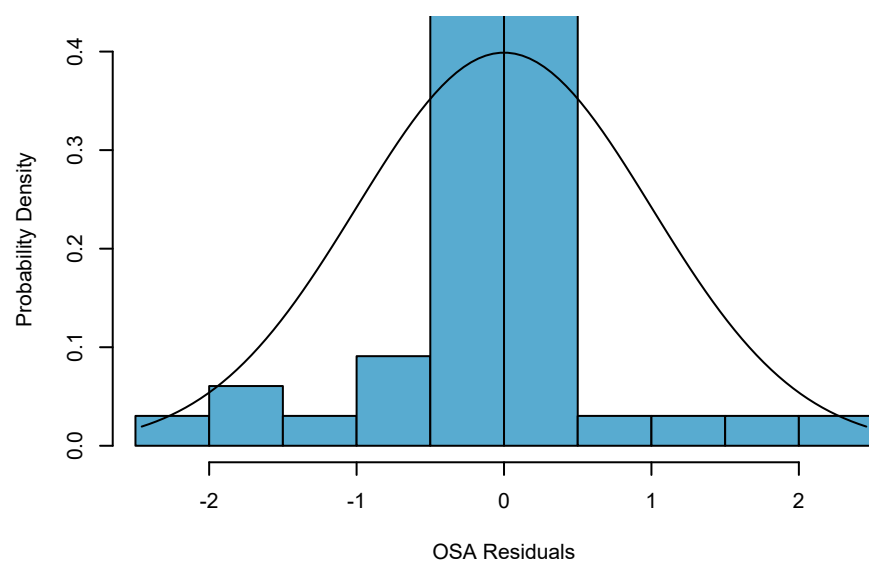
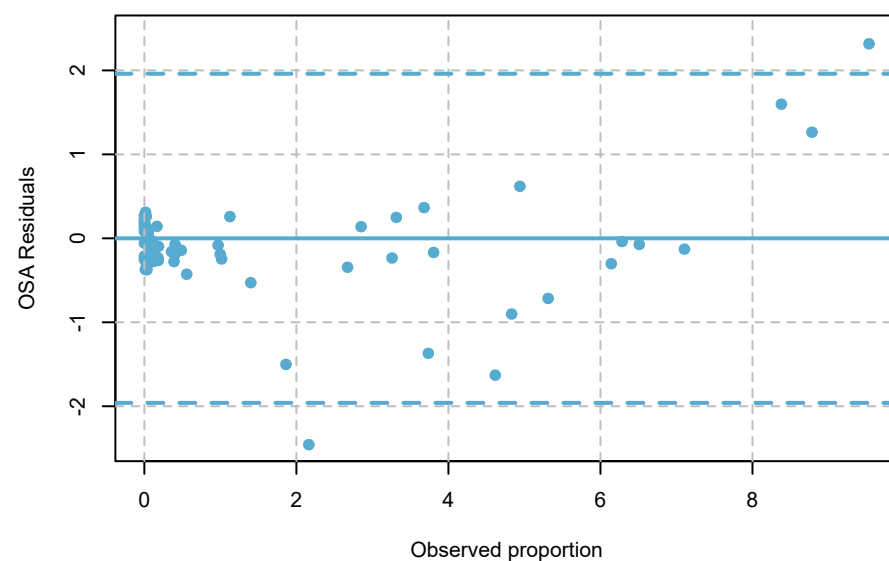
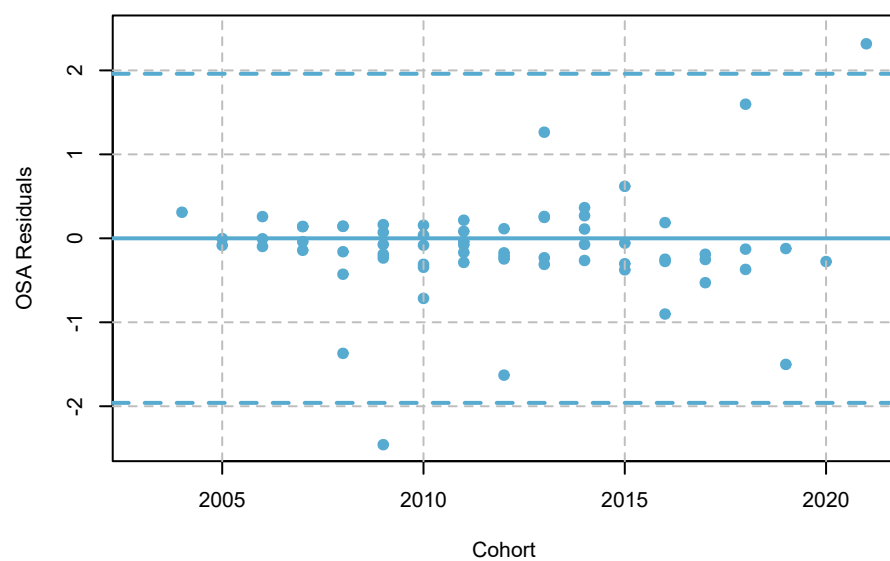
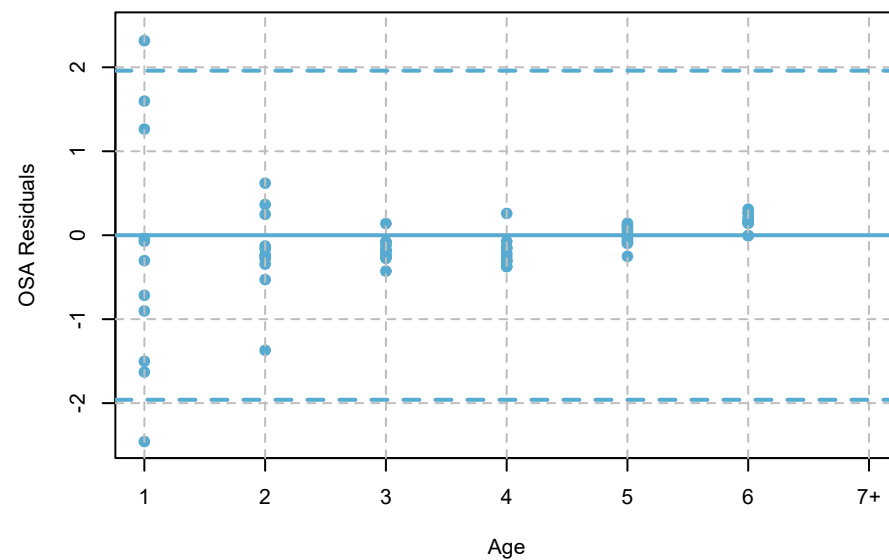
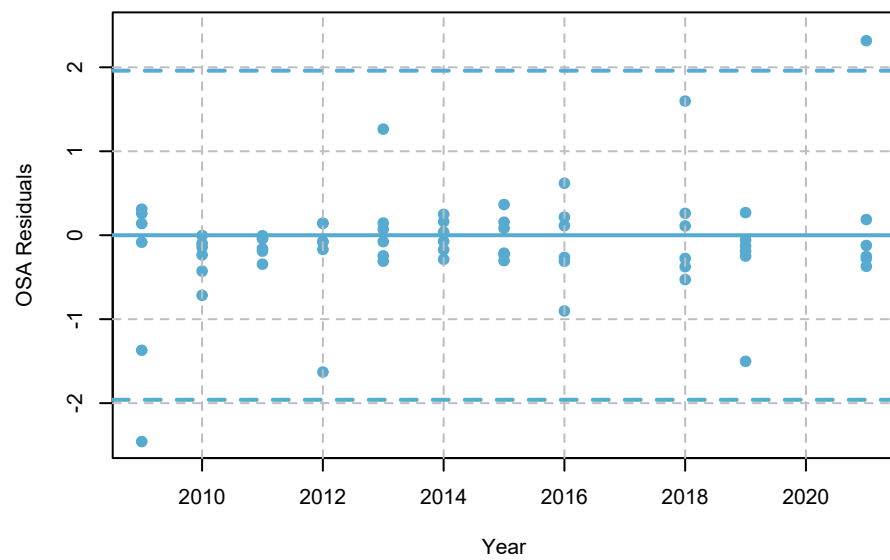
OSA residual diagnostics: Index 9



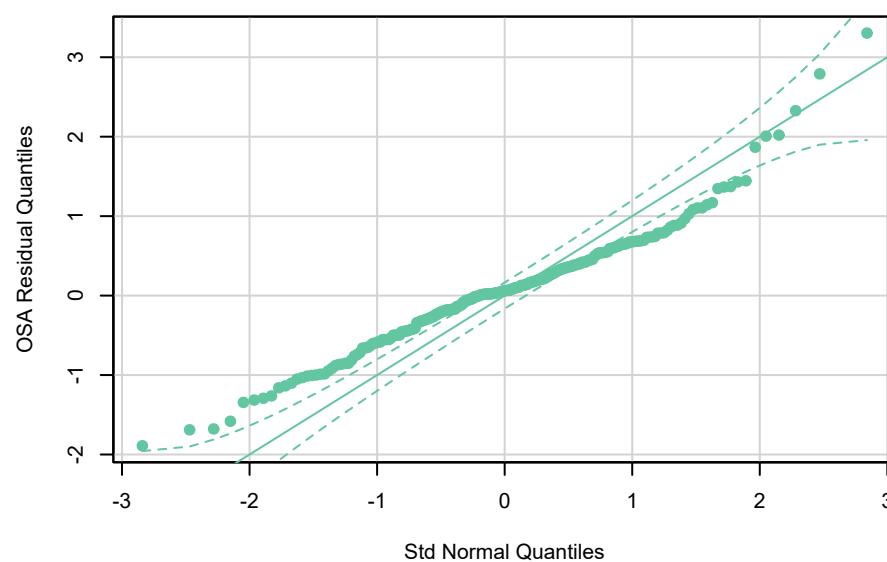
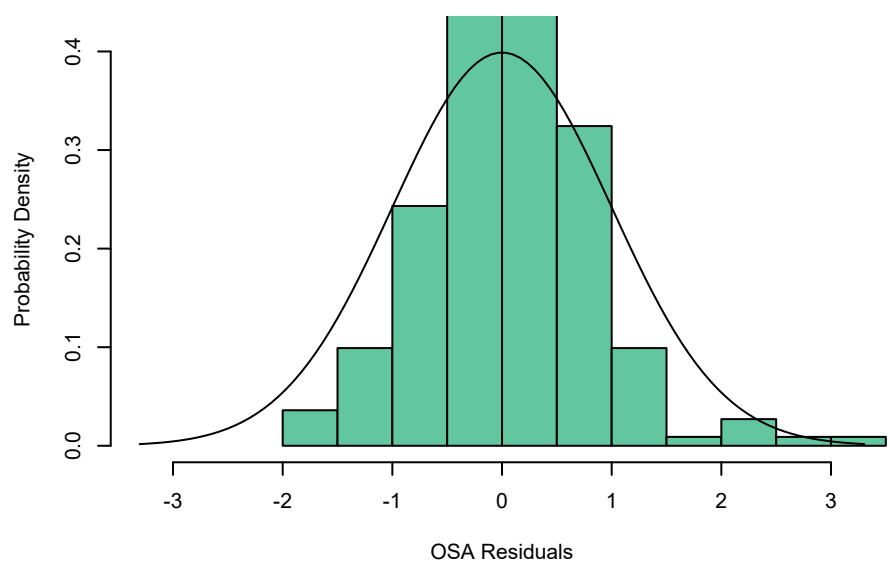
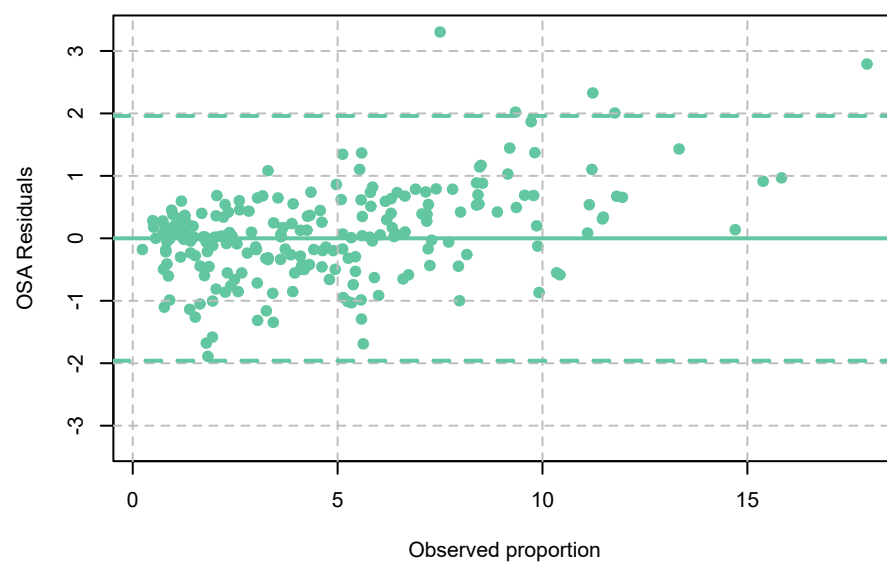
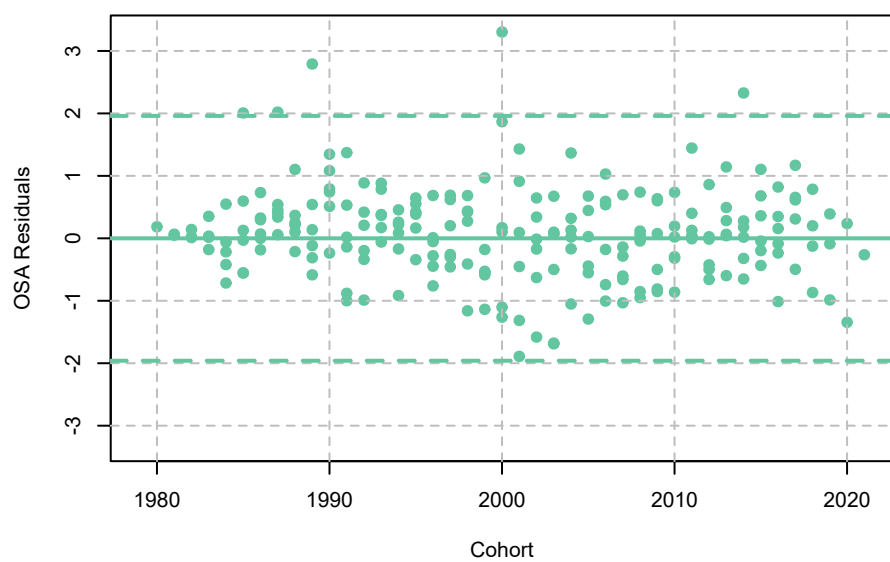
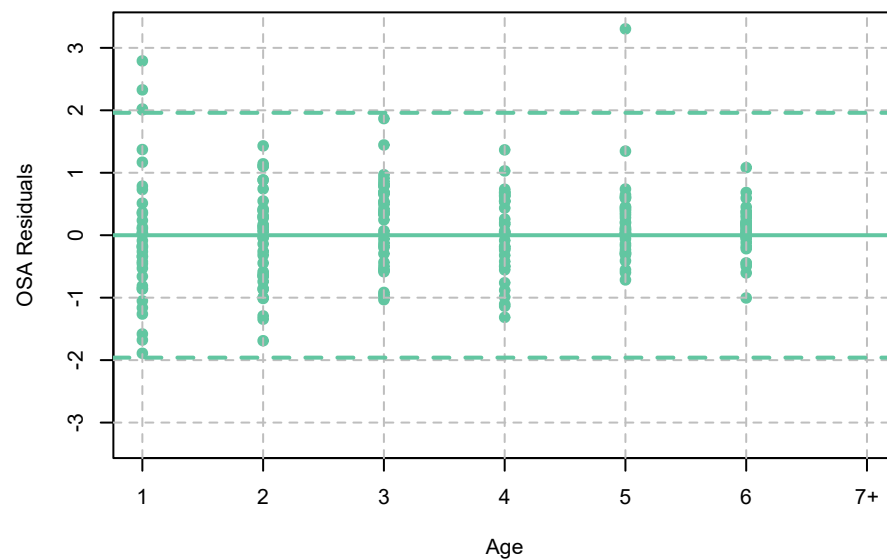
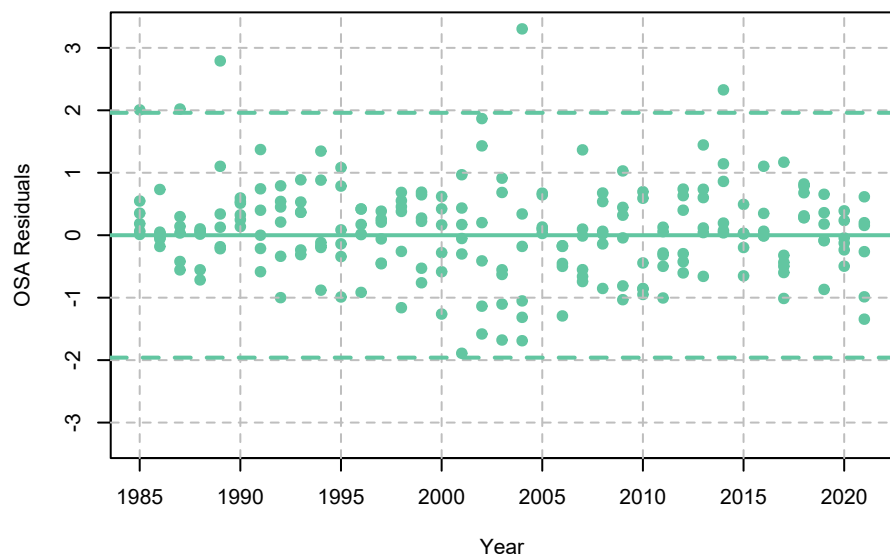
age composition OSA residual diagnostics: Index 1



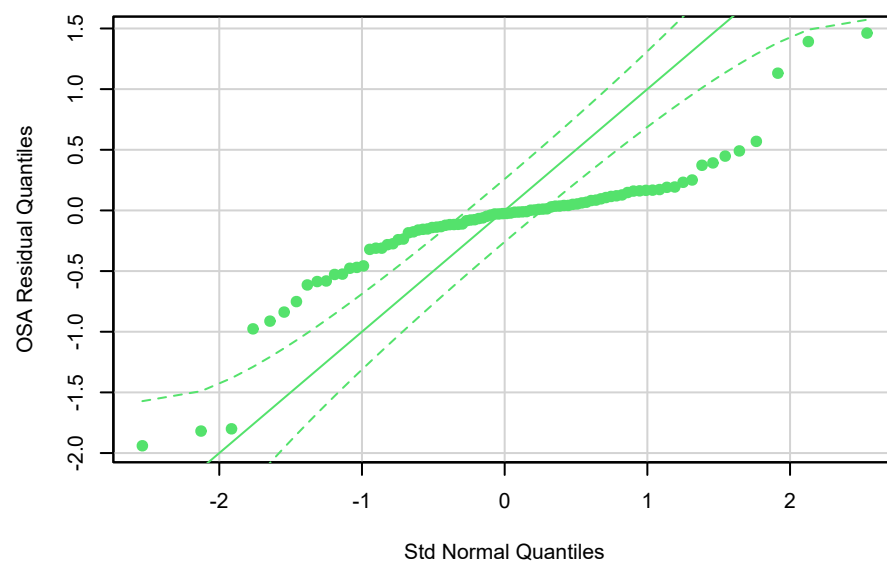
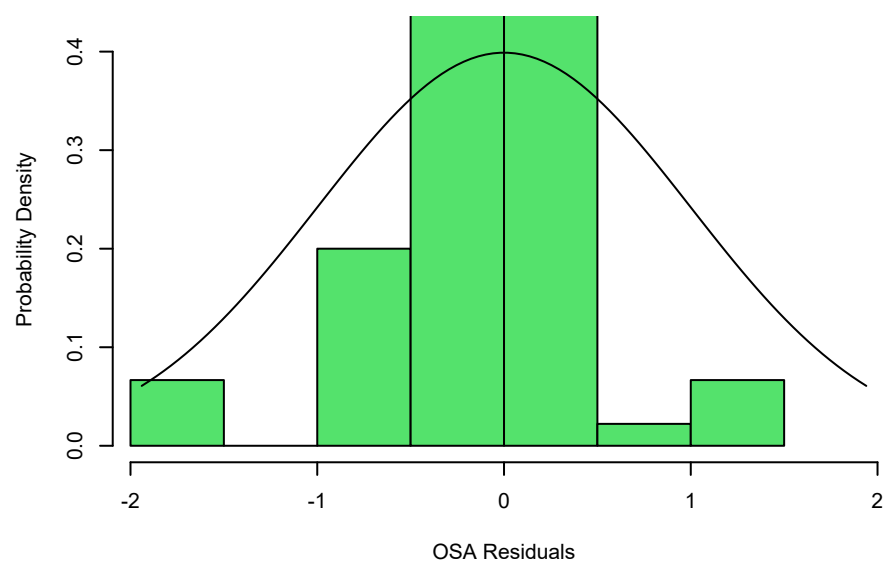
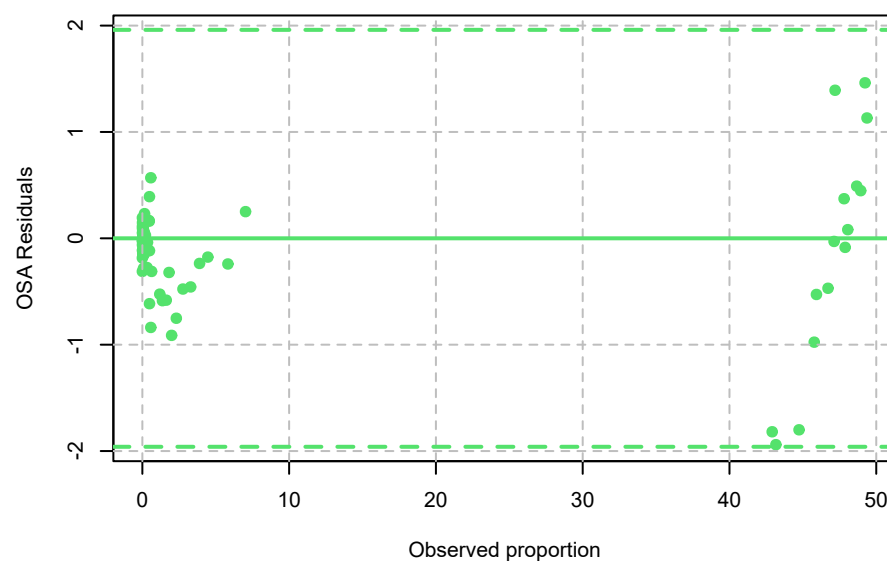
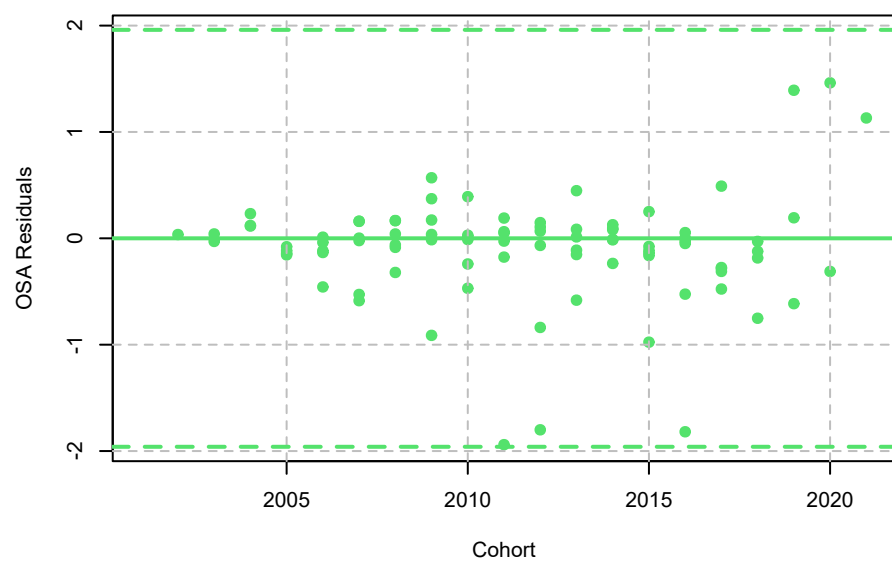
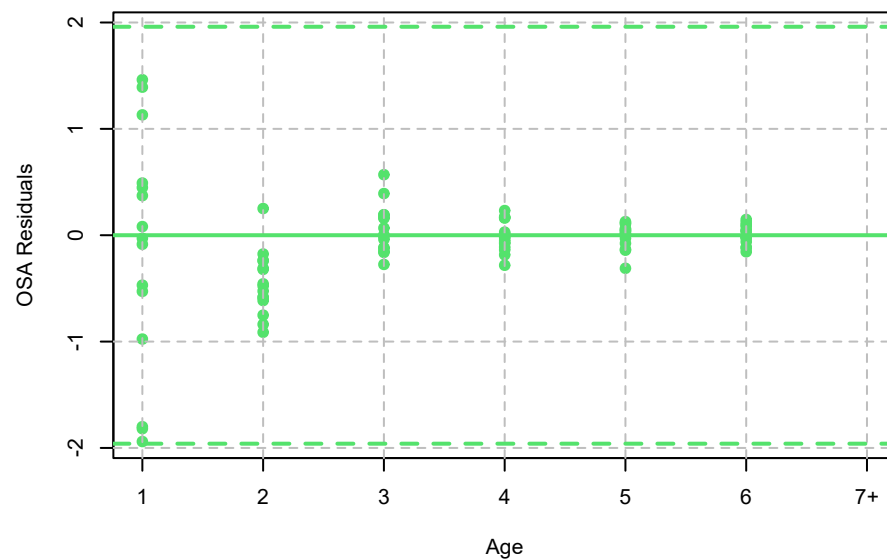
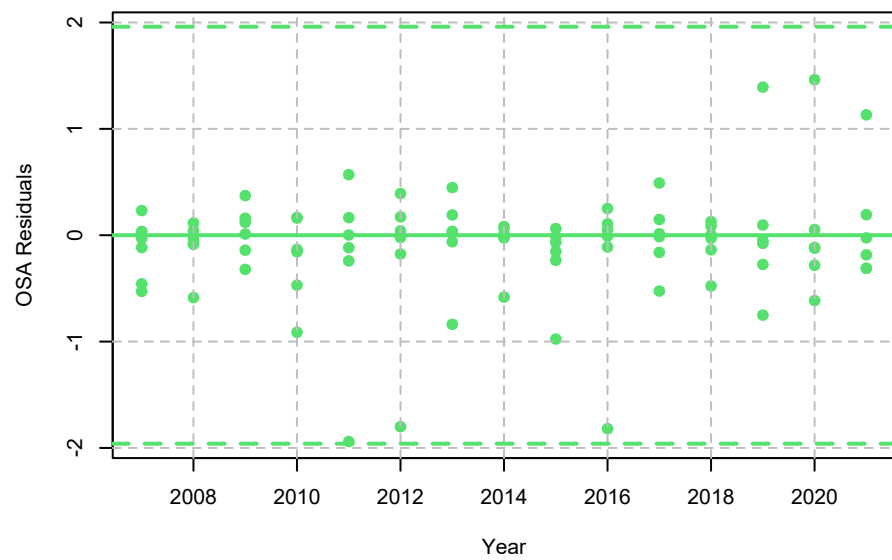
age composition OSA residual diagnostics: Index 2



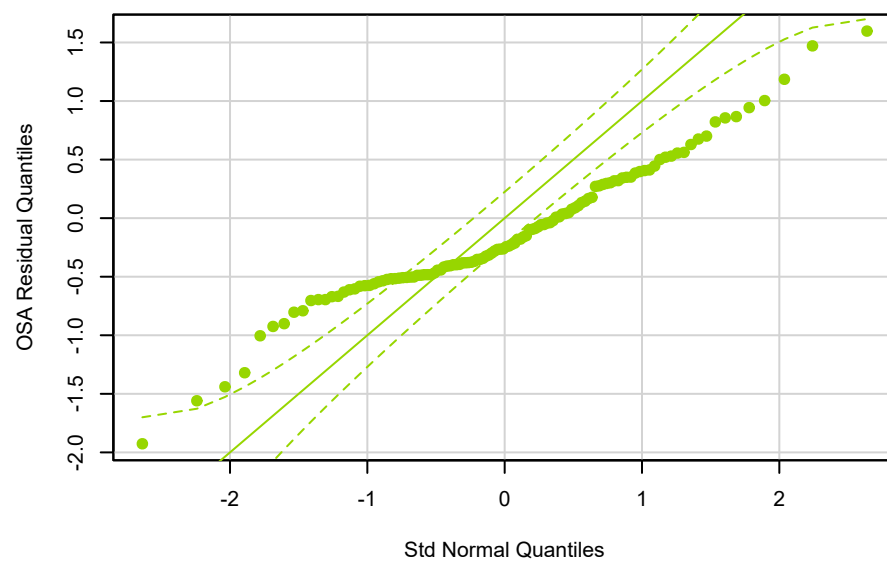
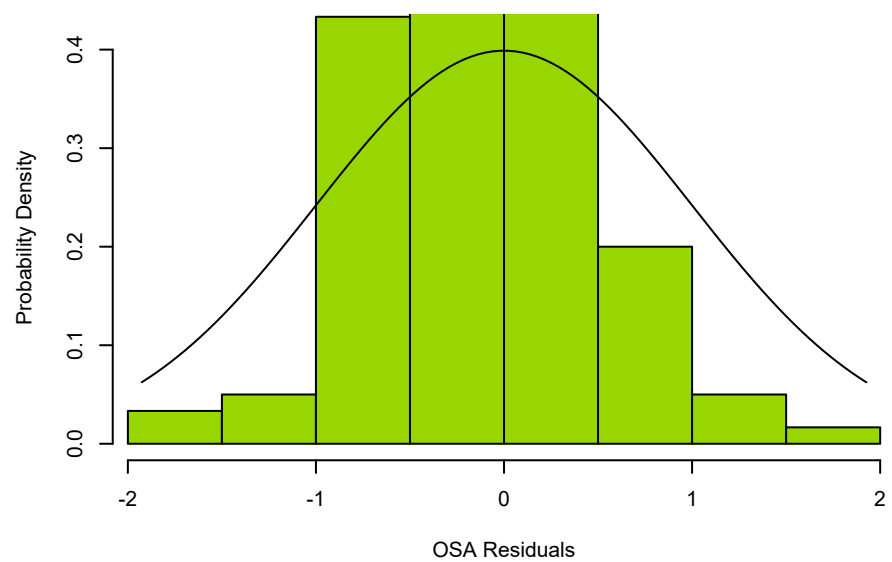
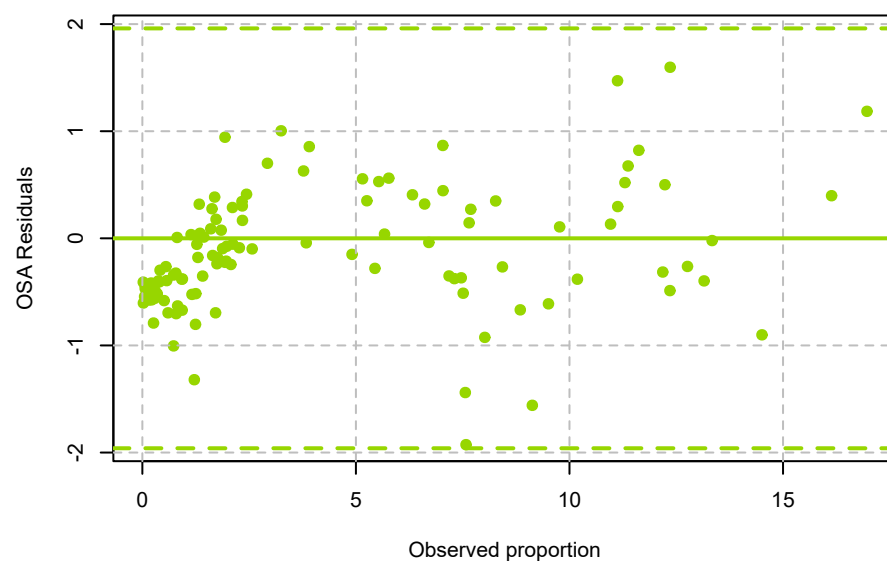
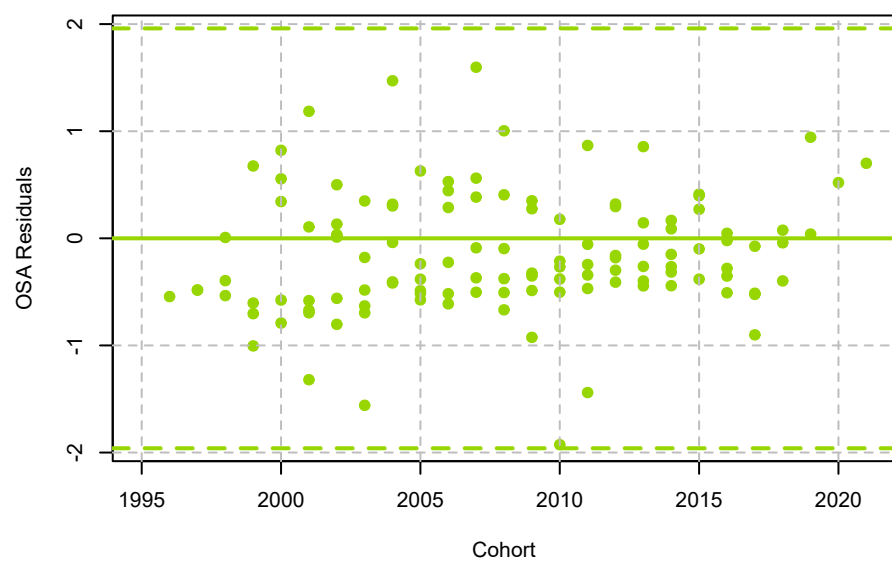
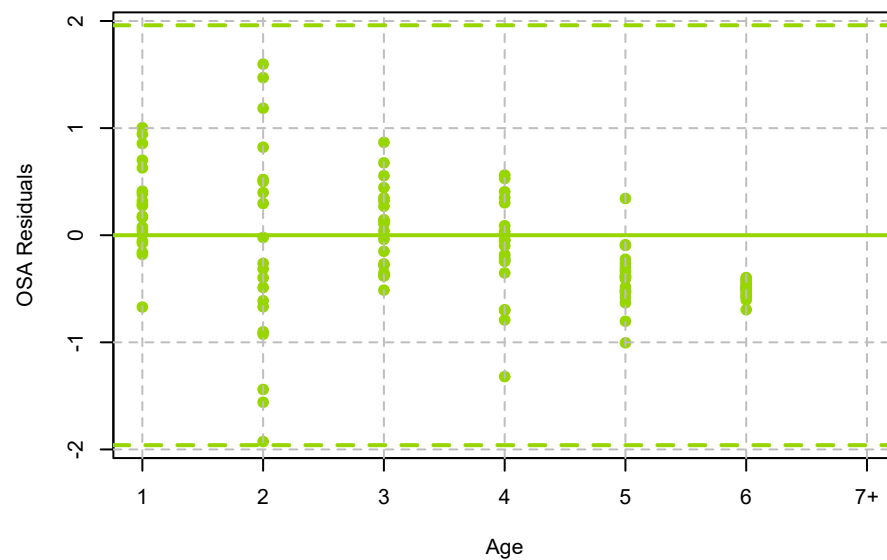
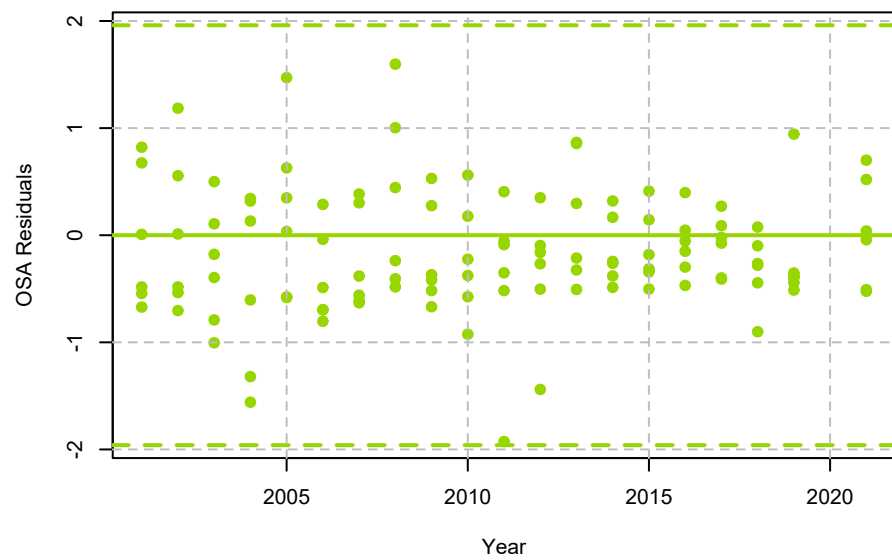
age composition OSA residual diagnostics: Index 3



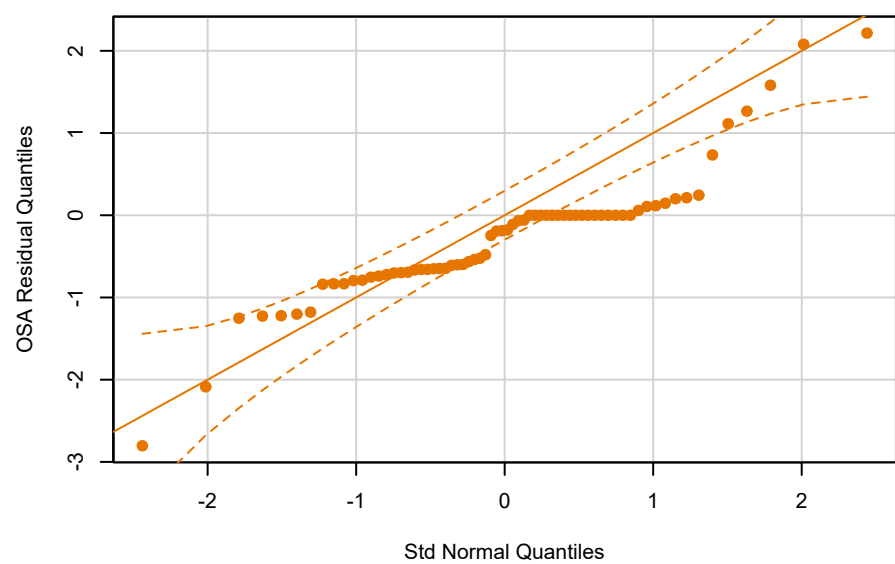
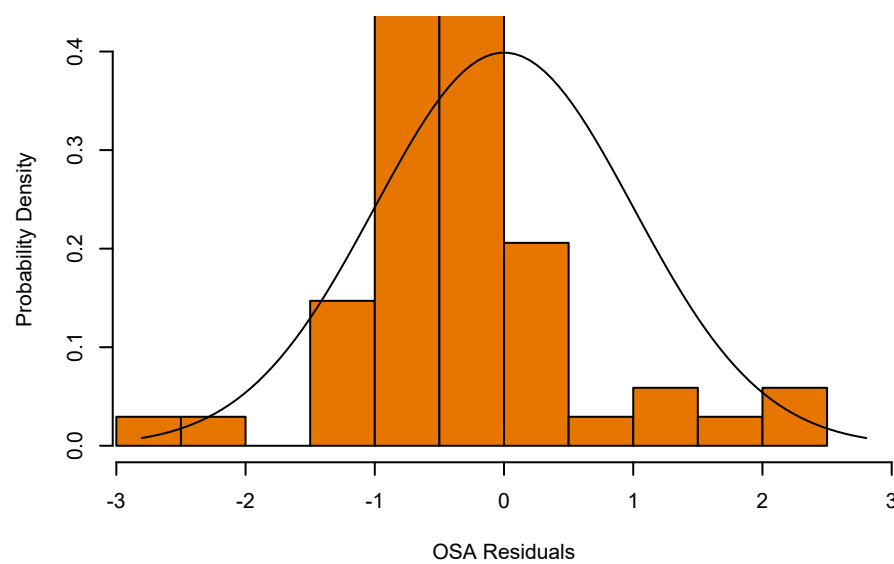
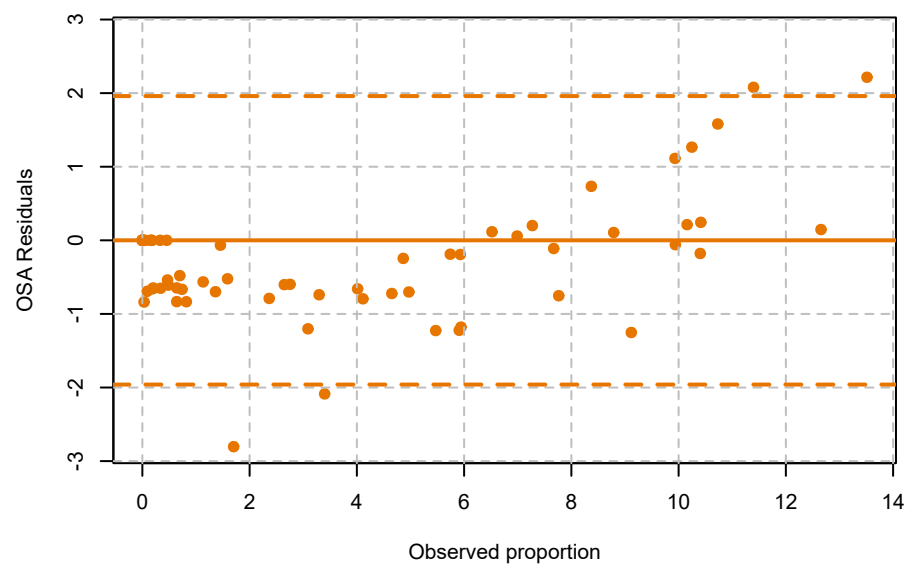
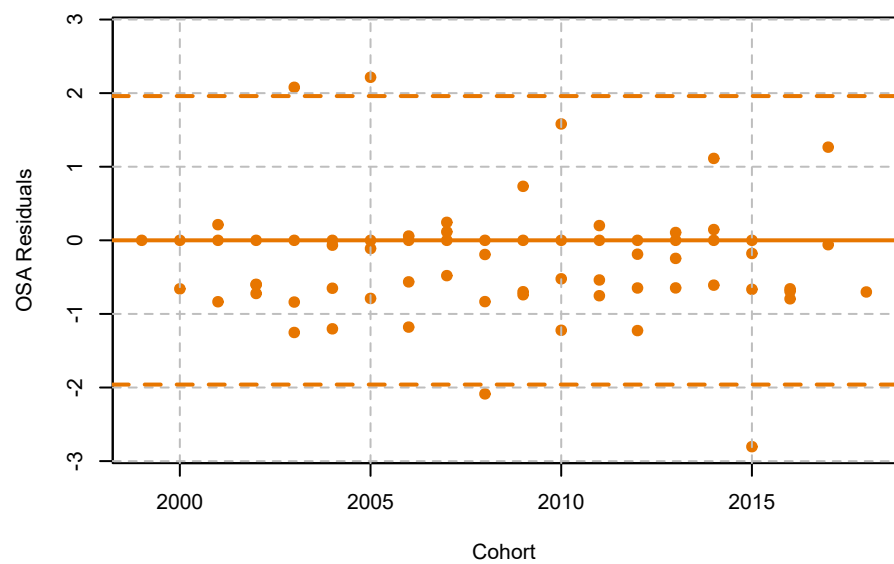
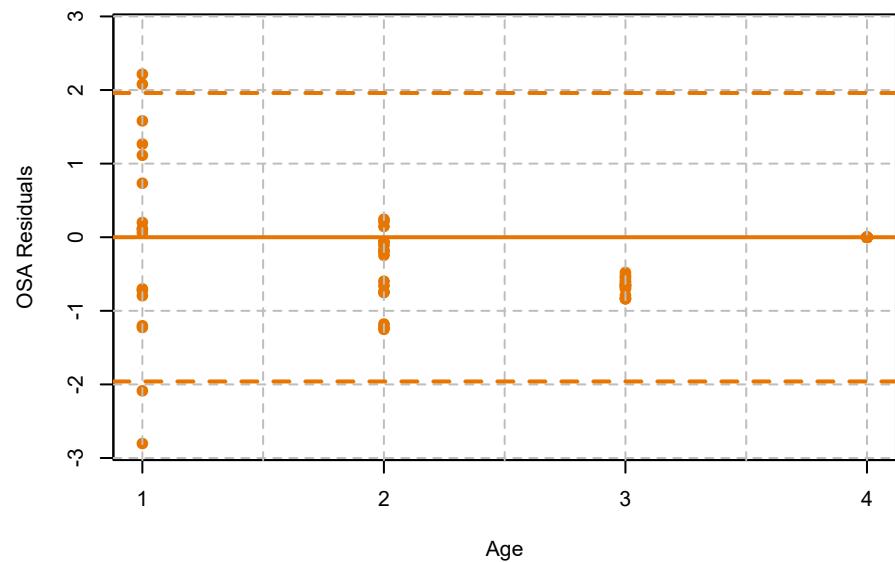
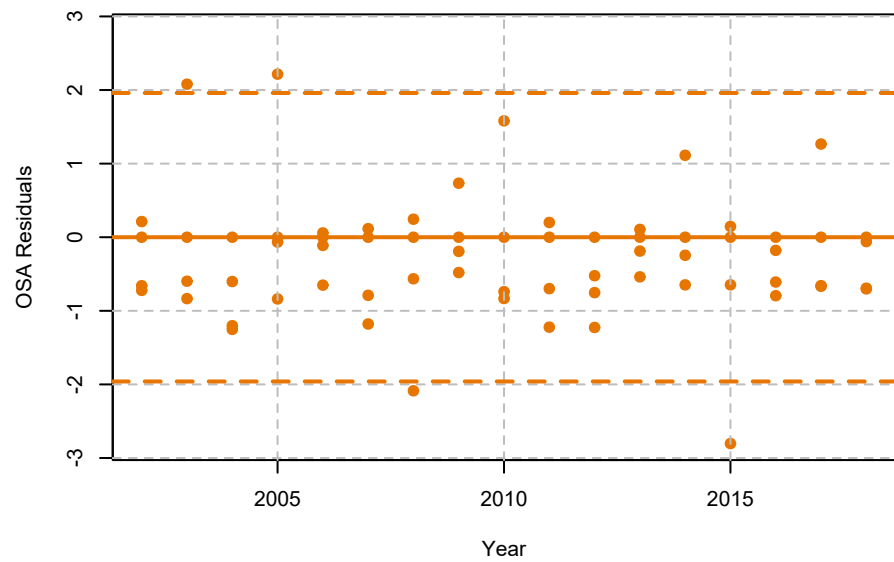
age composition OSA residual diagnostics: Index 4

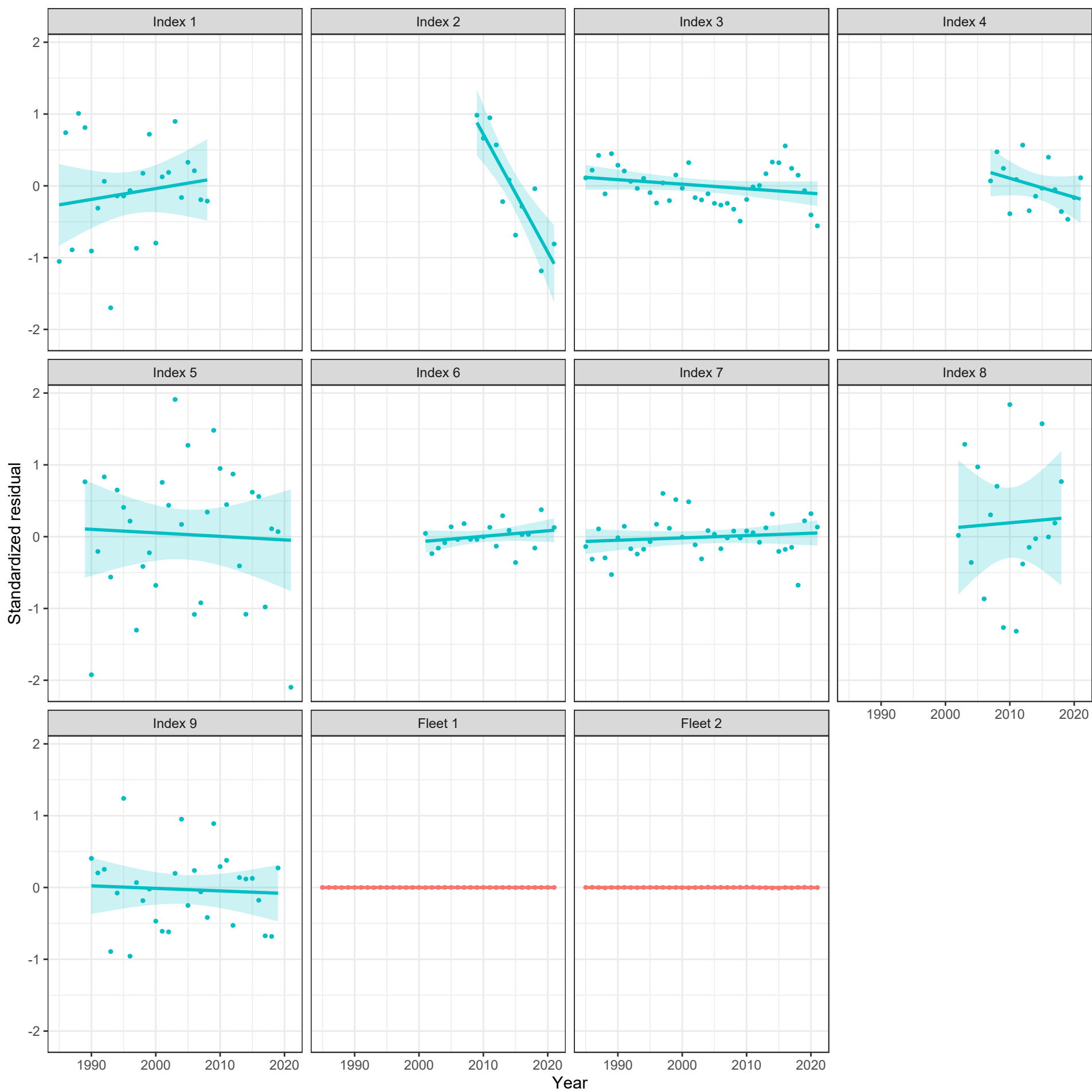


age composition OSA residual diagnostics: Index 6



age composition OSA residual diagnostics: Index 8



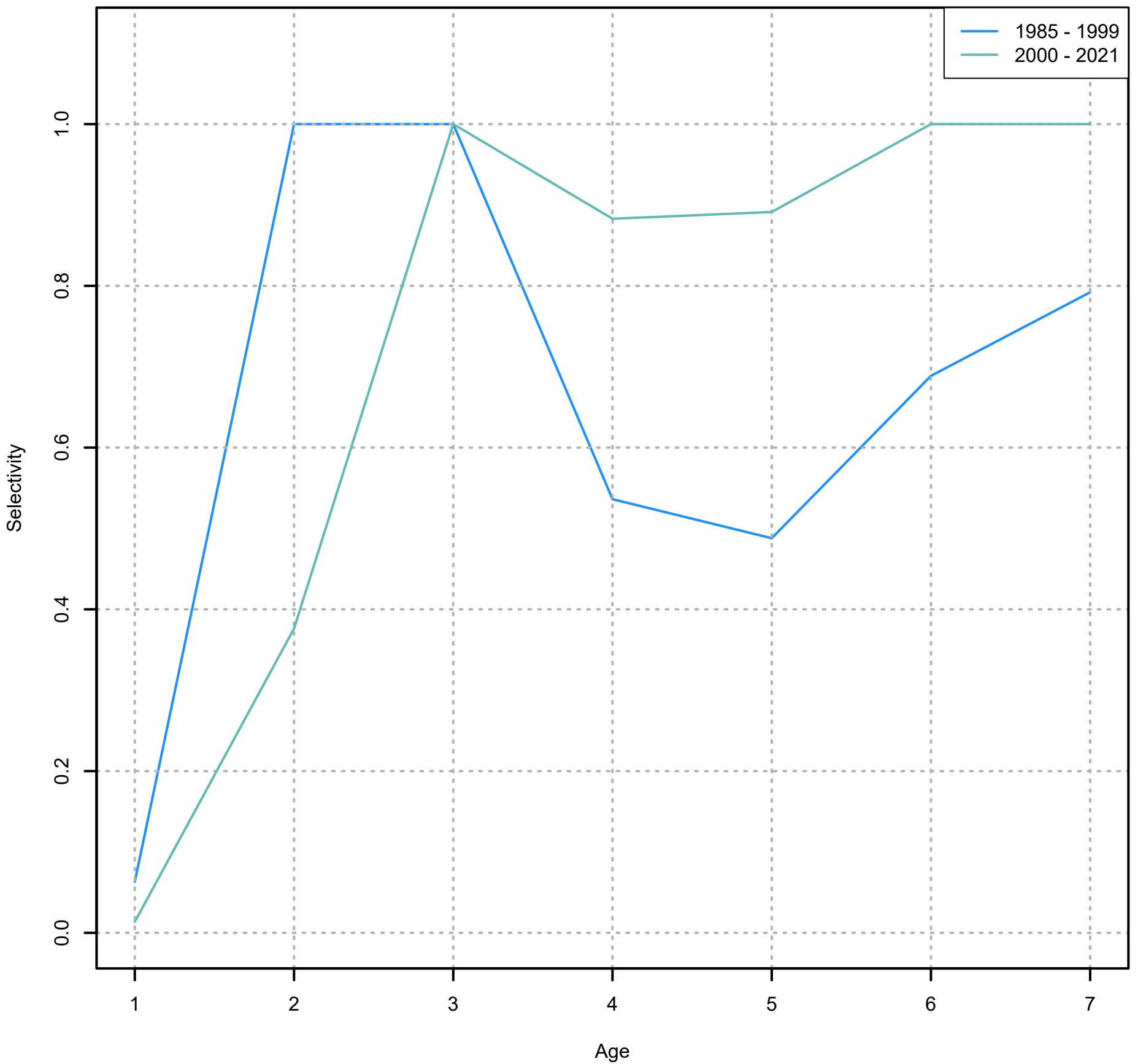


BF28W_M7: FINAL MODEL

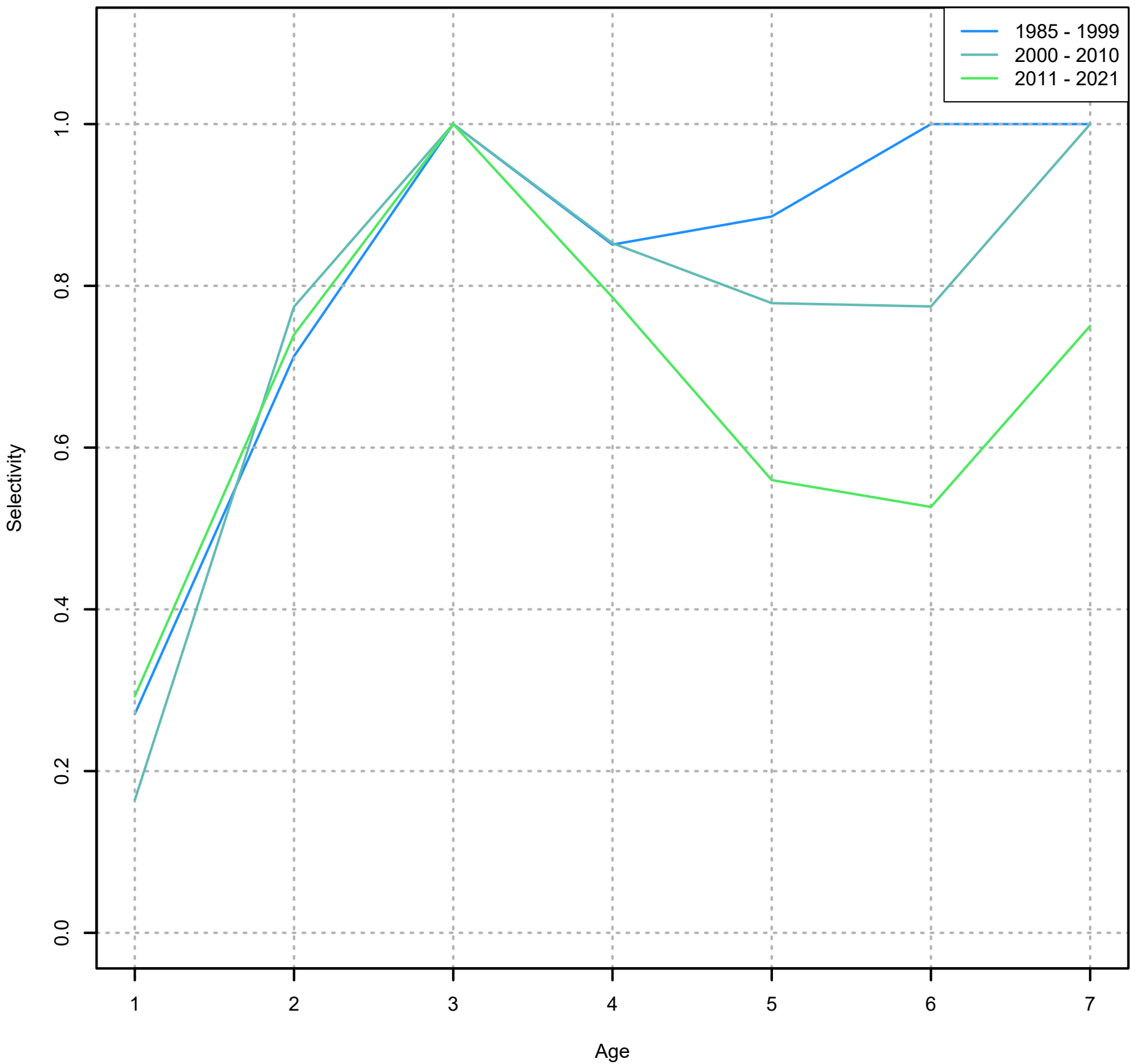
Final bluefish model with NAA transitions modeled as
random effects correlated by age and year

RESULTS PLOTS

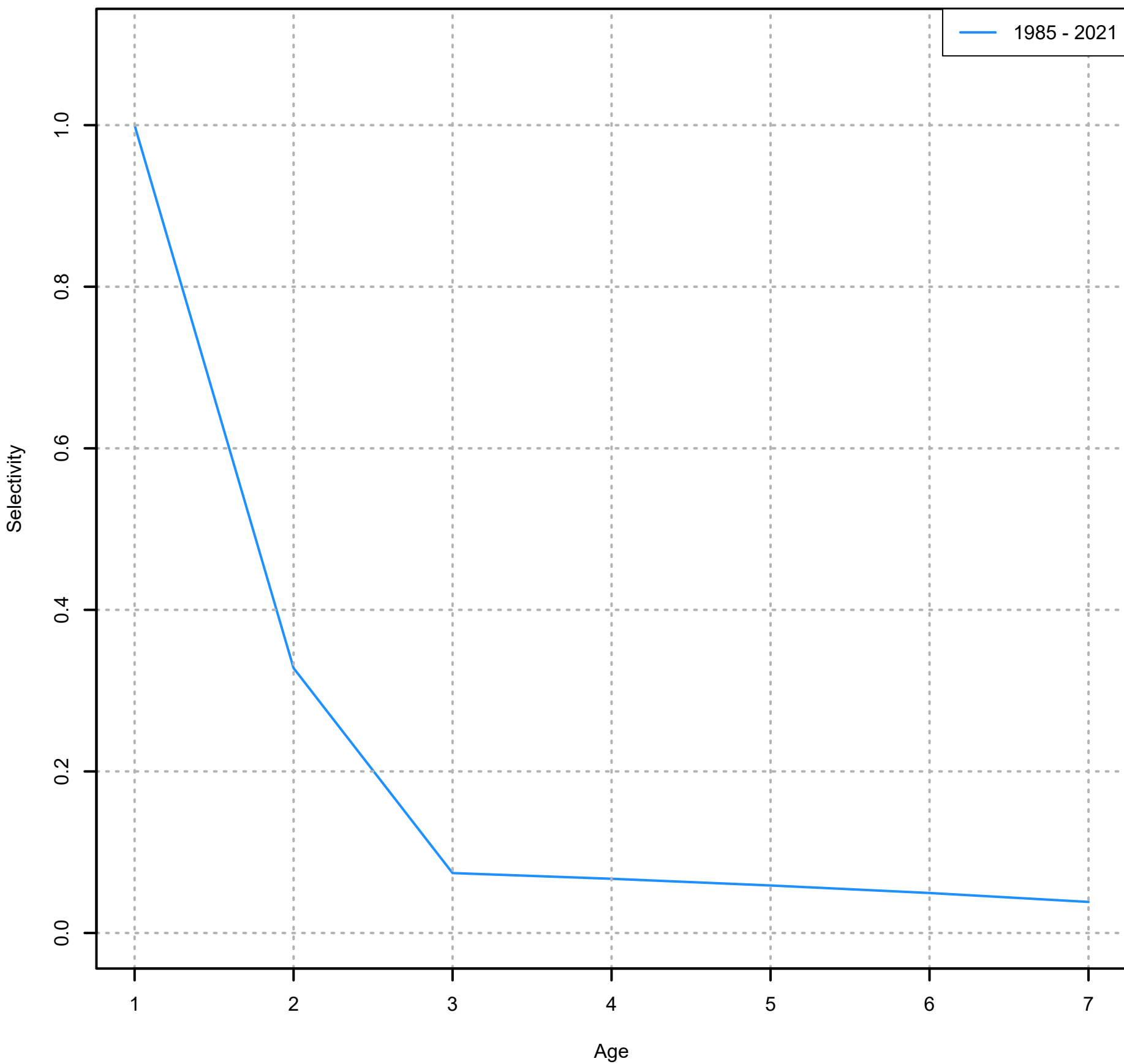
Fleet 1



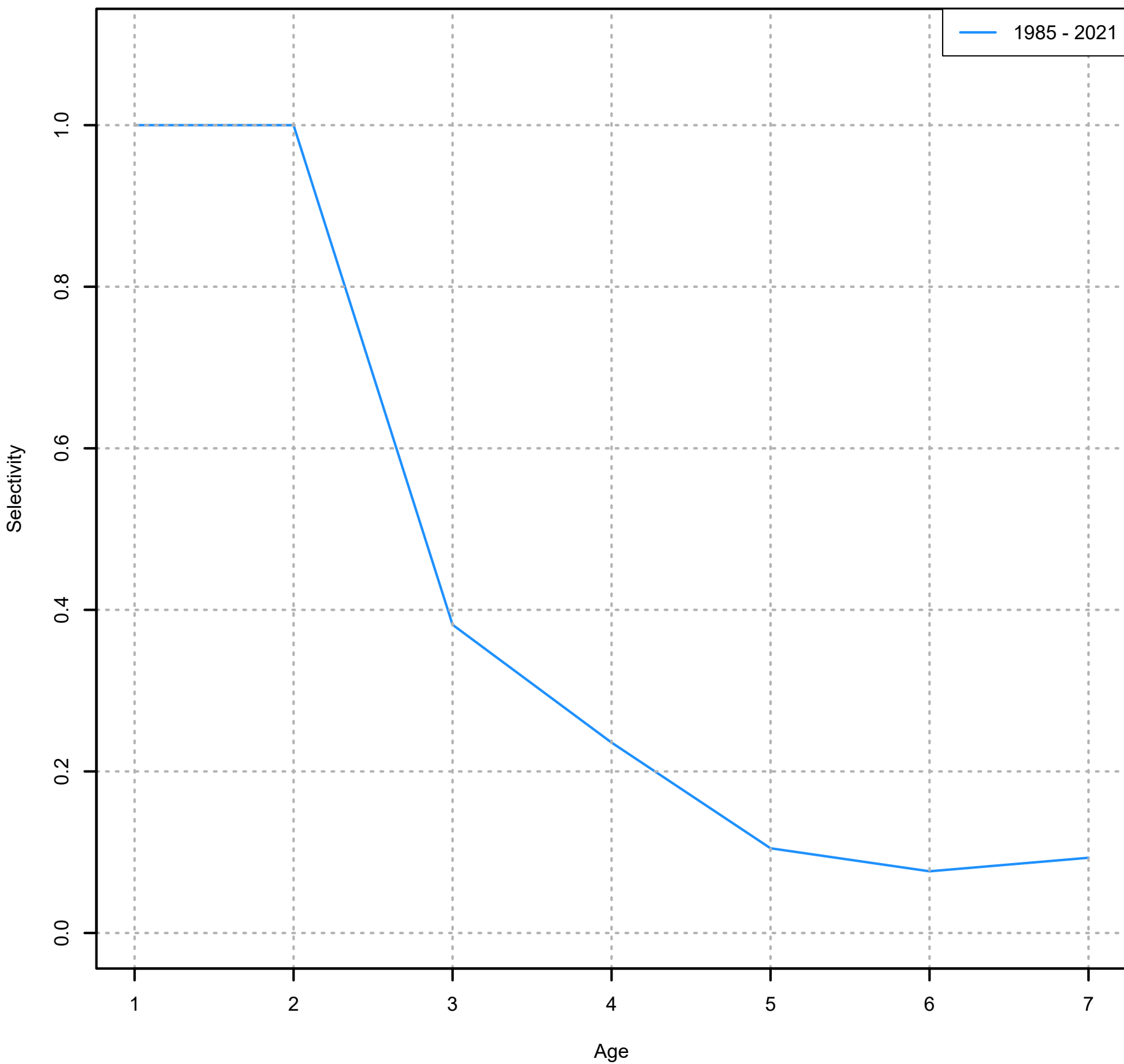
Fleet 2



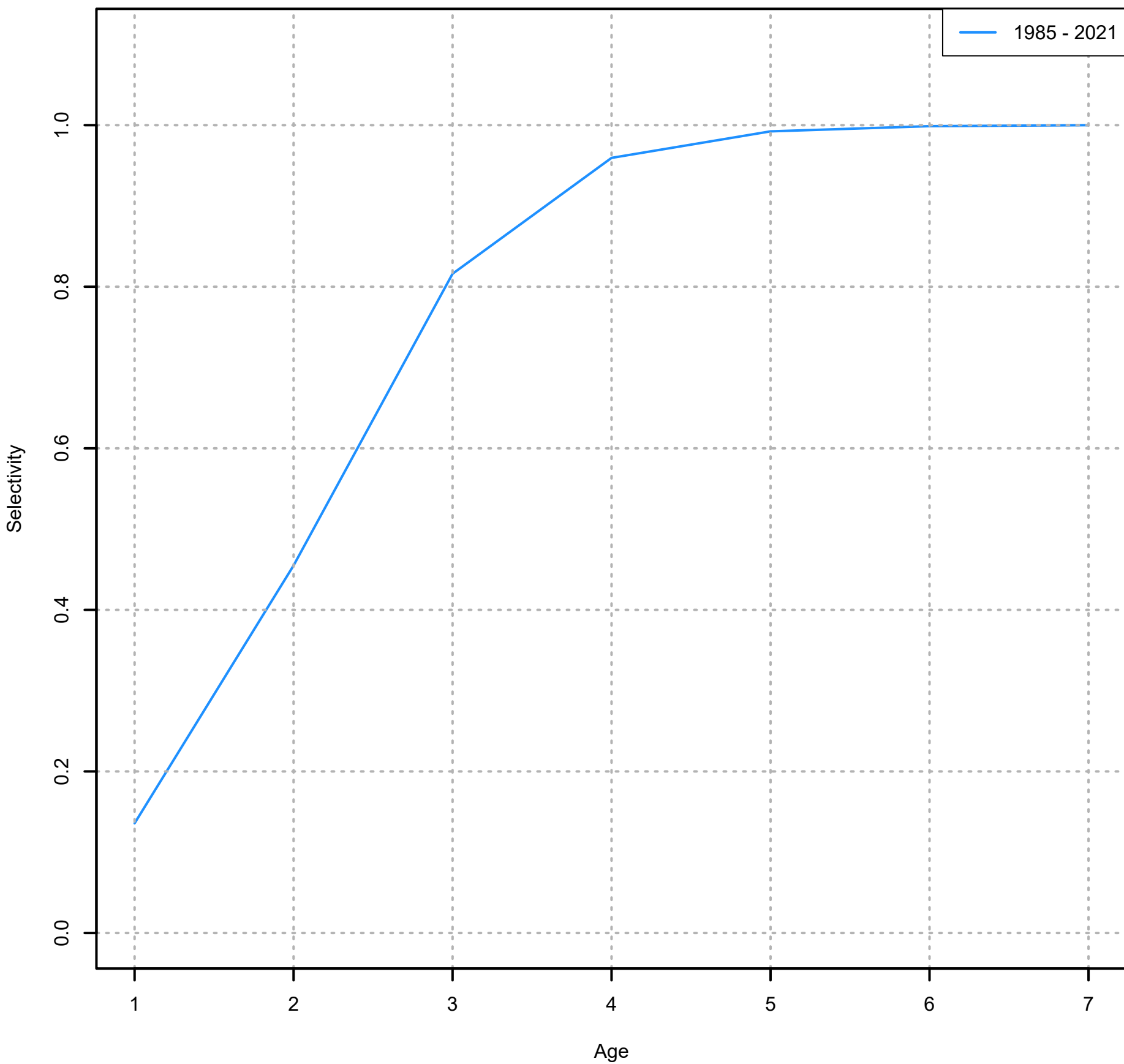
Index 1



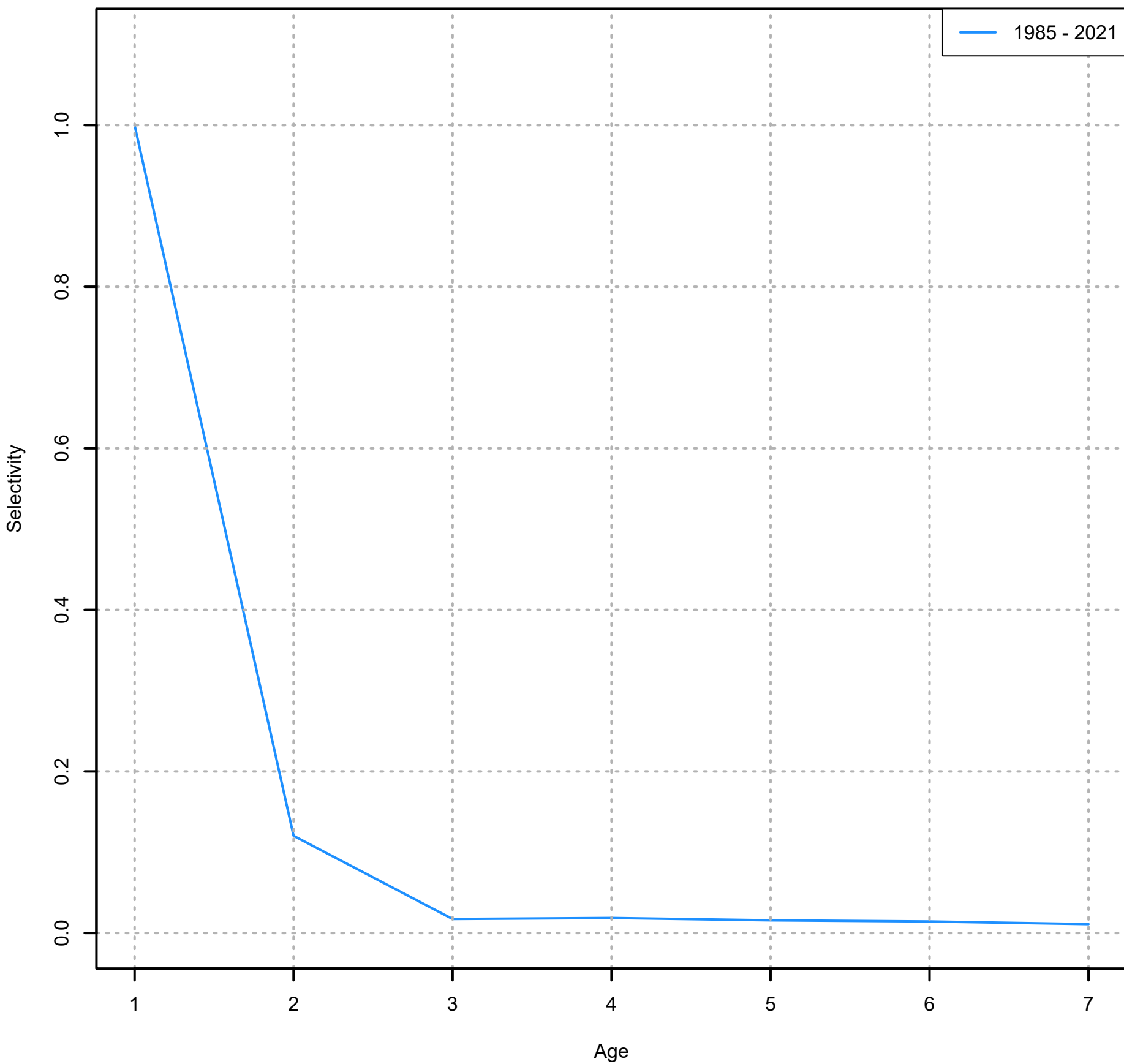
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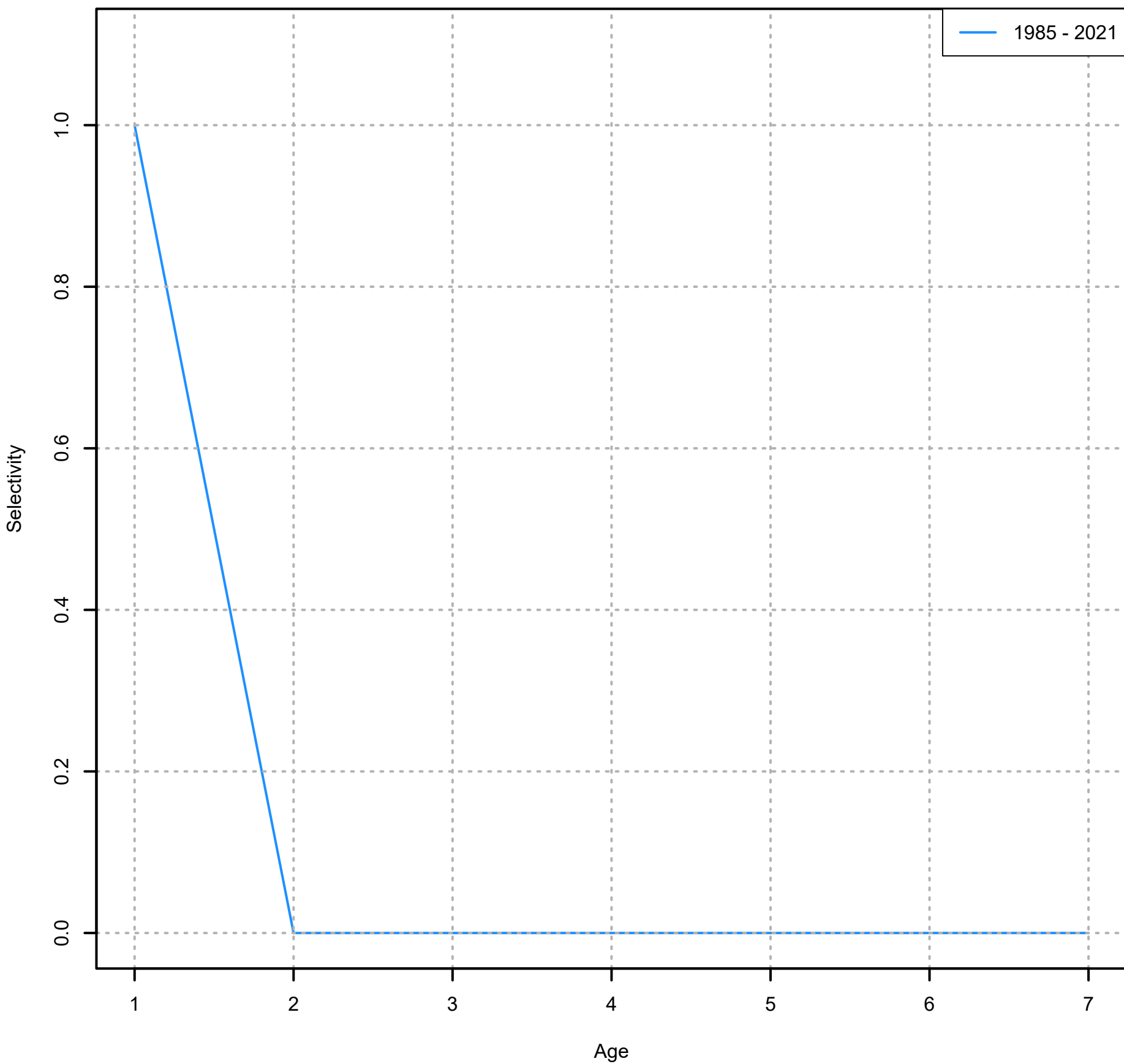
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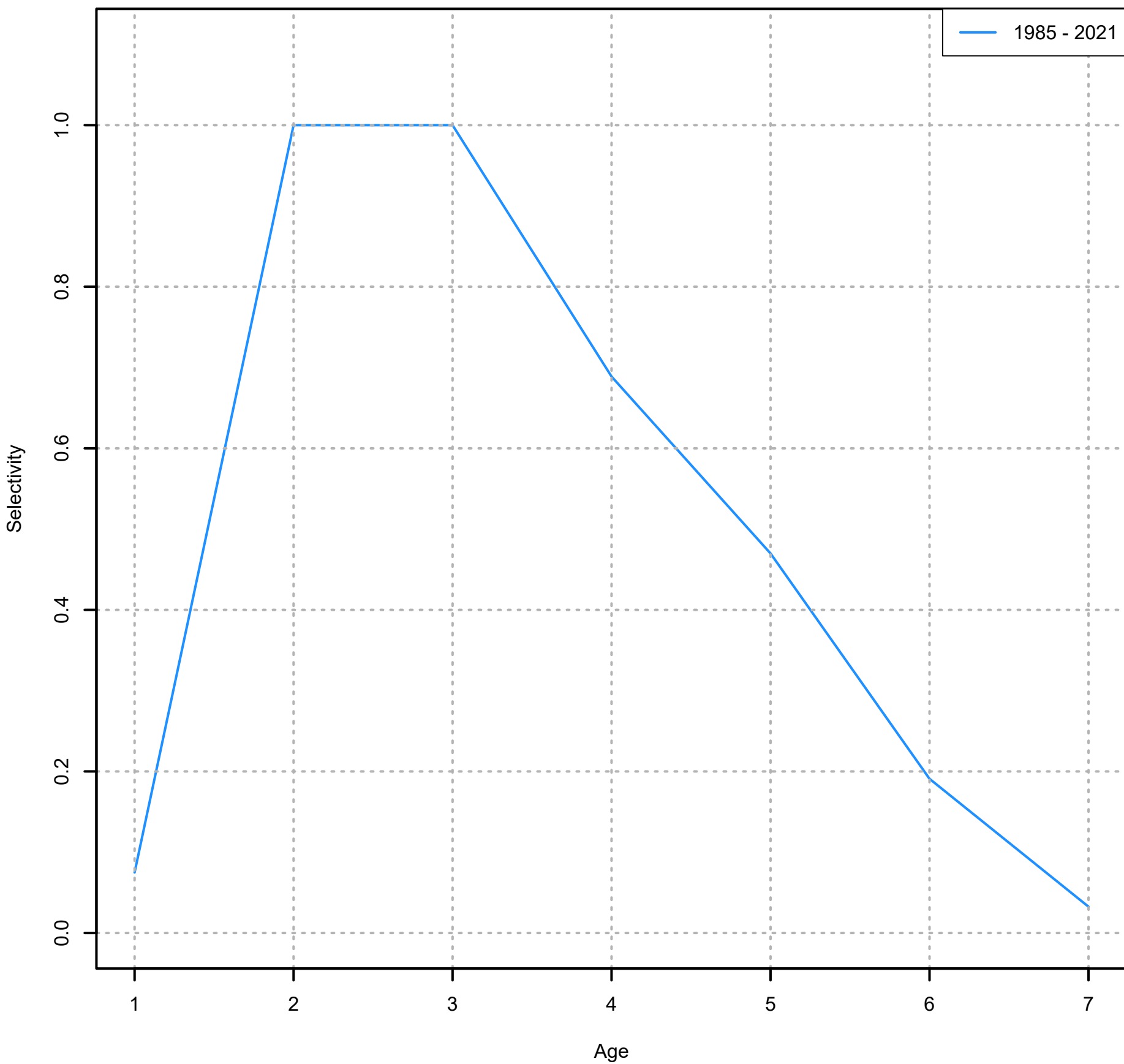
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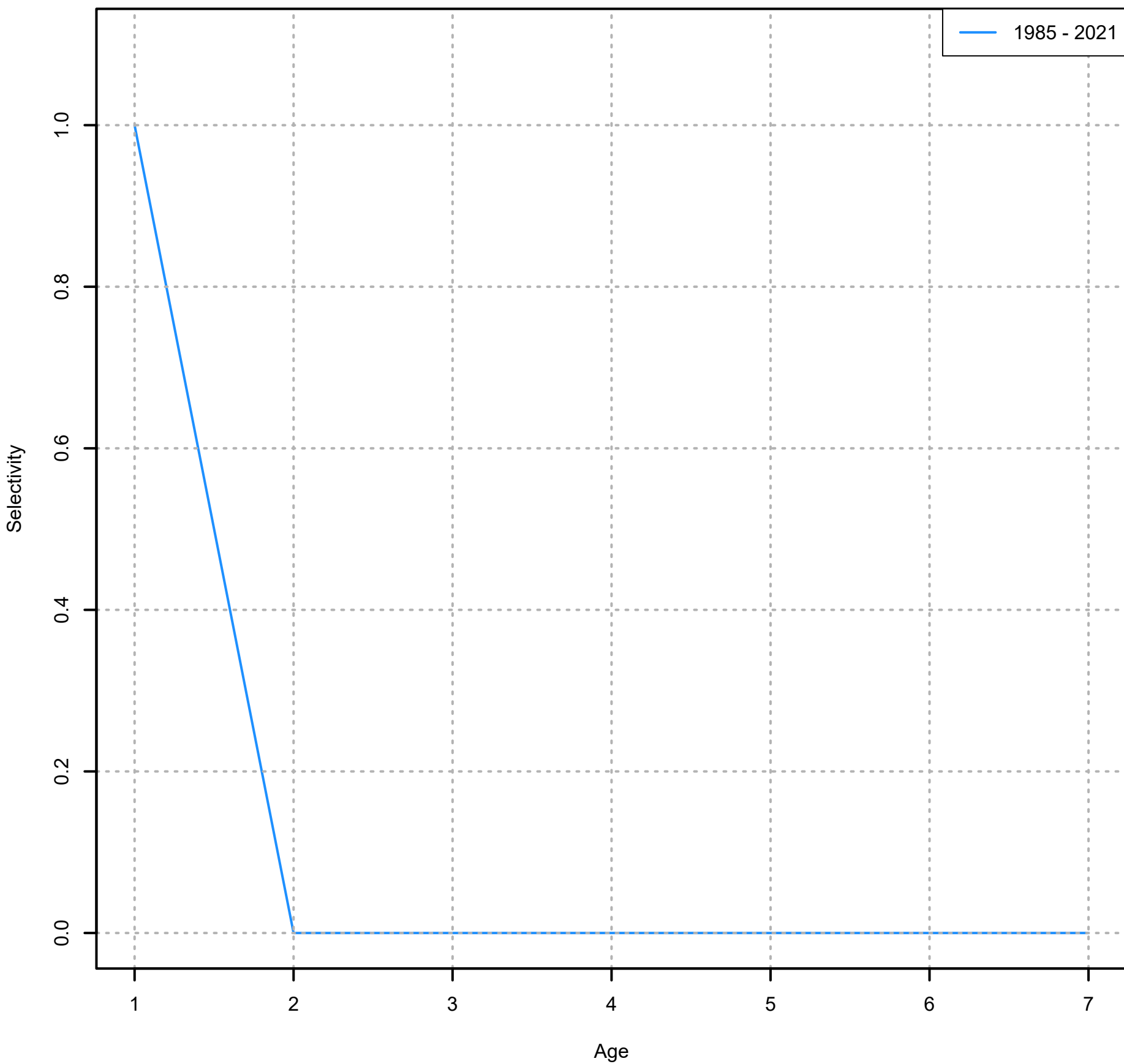
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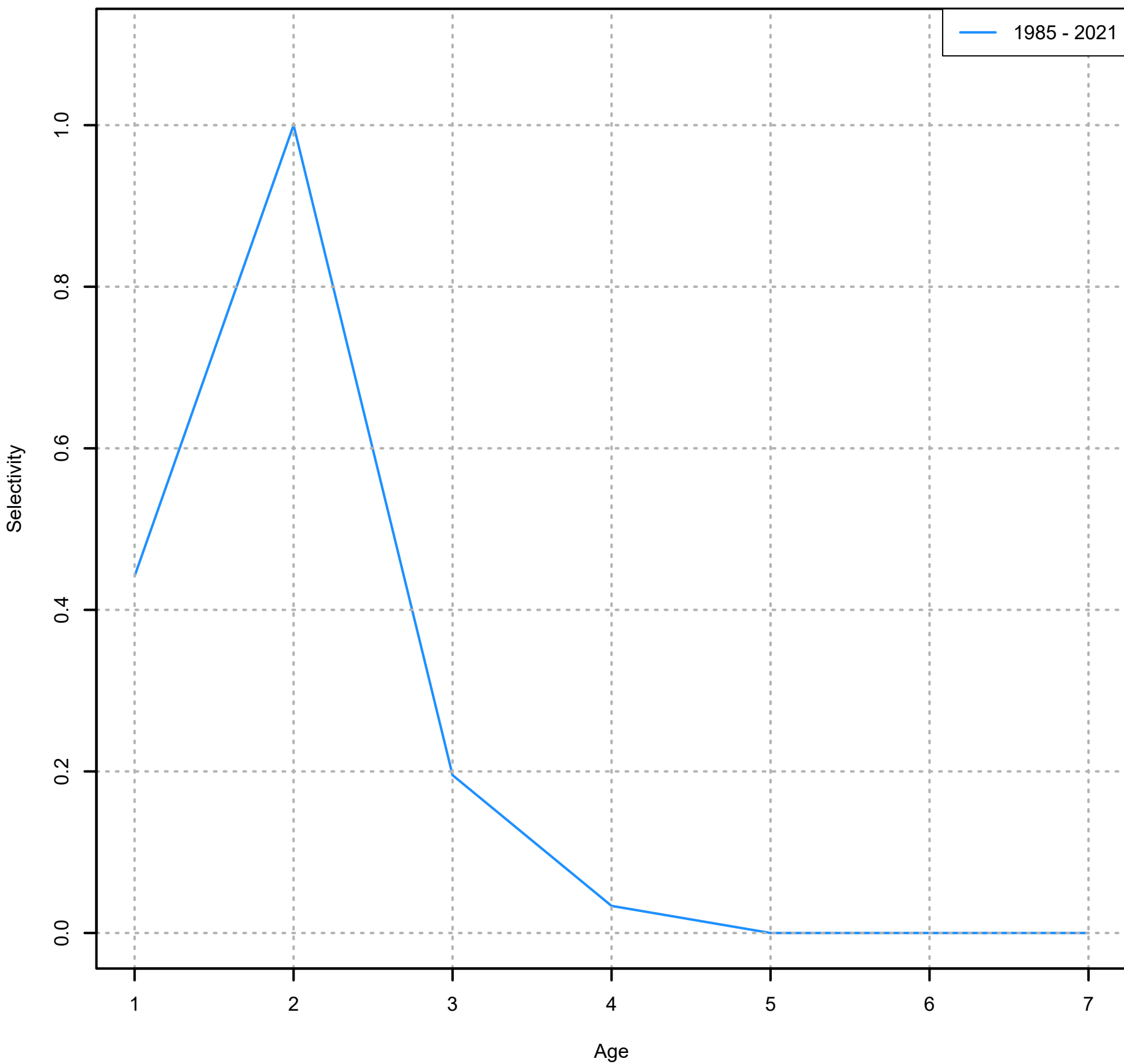
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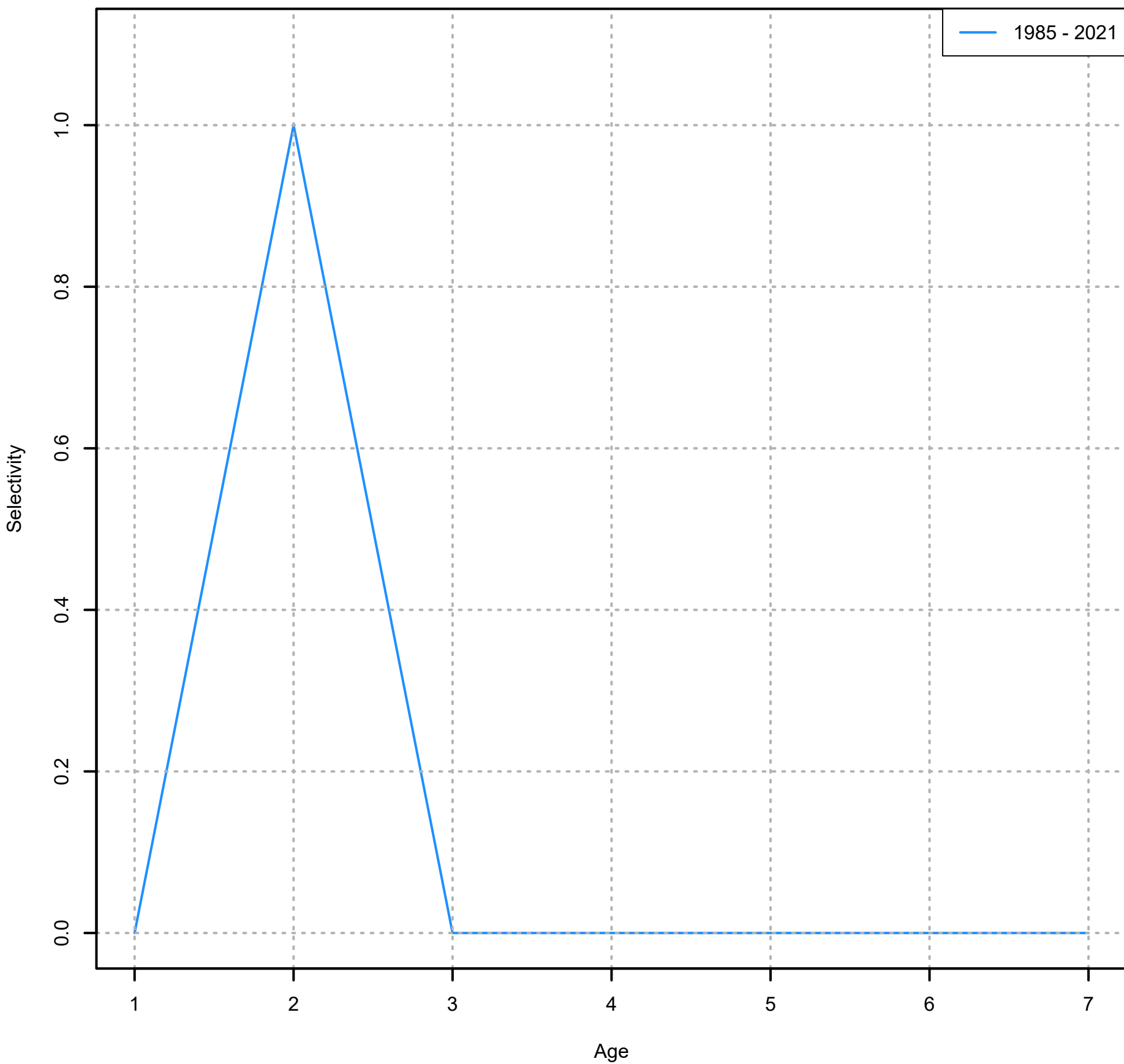
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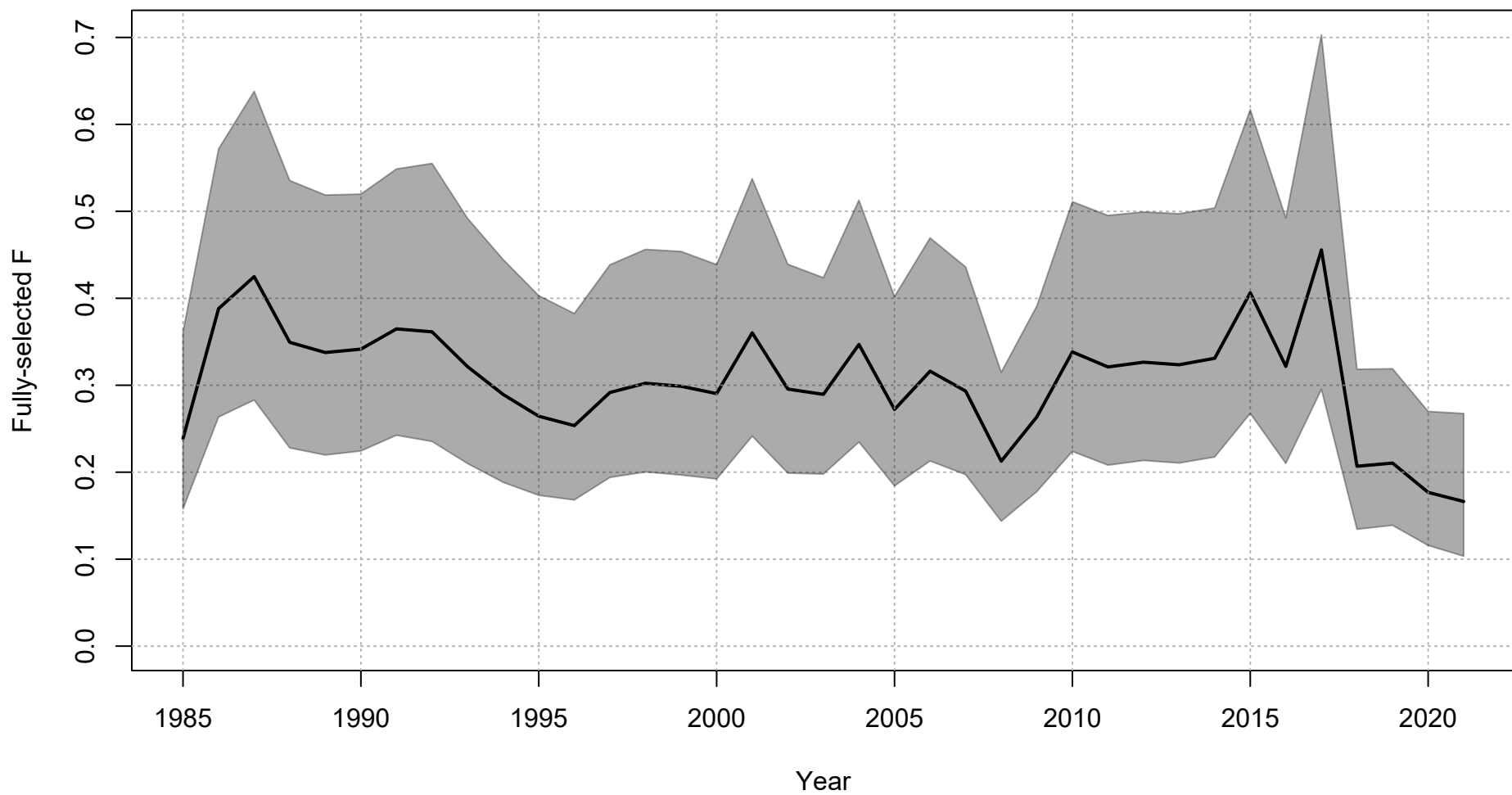
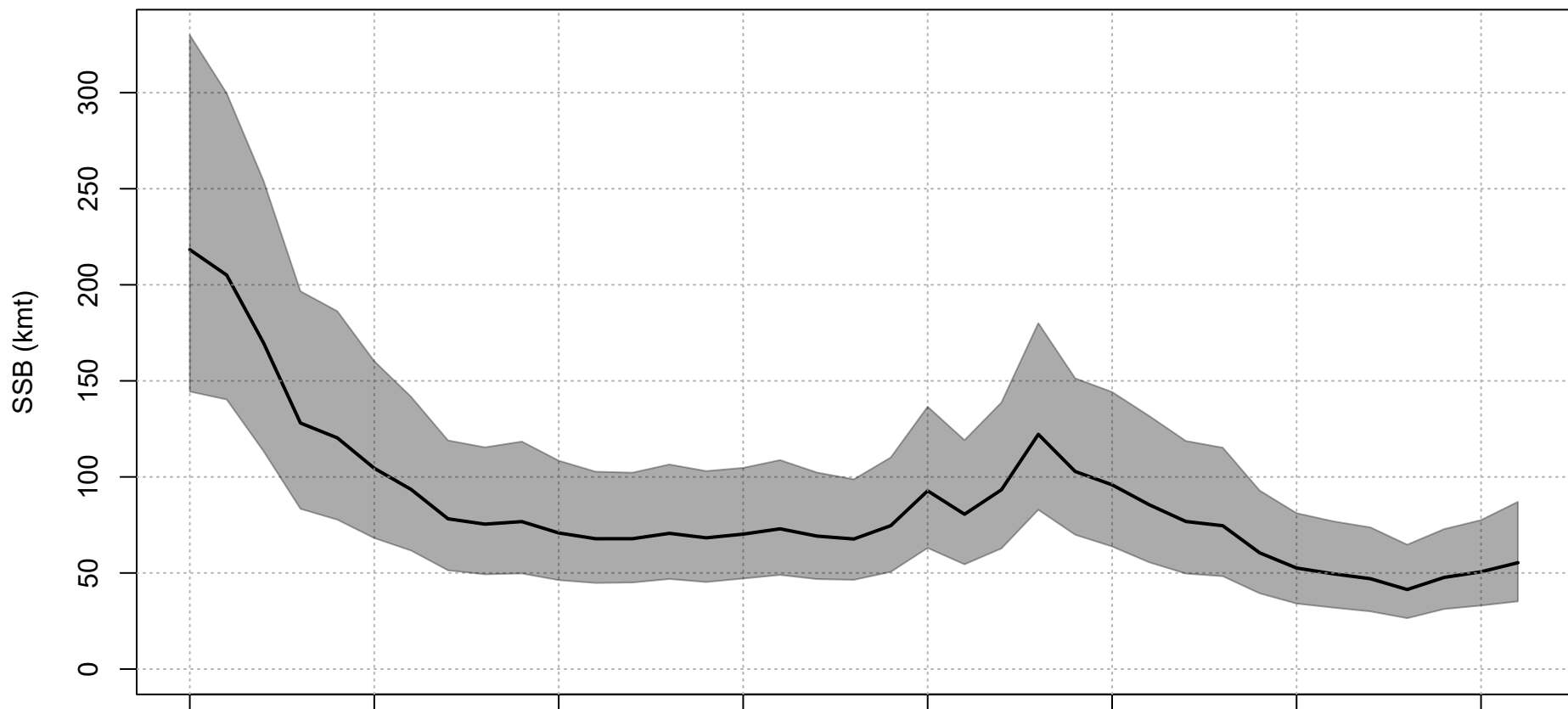


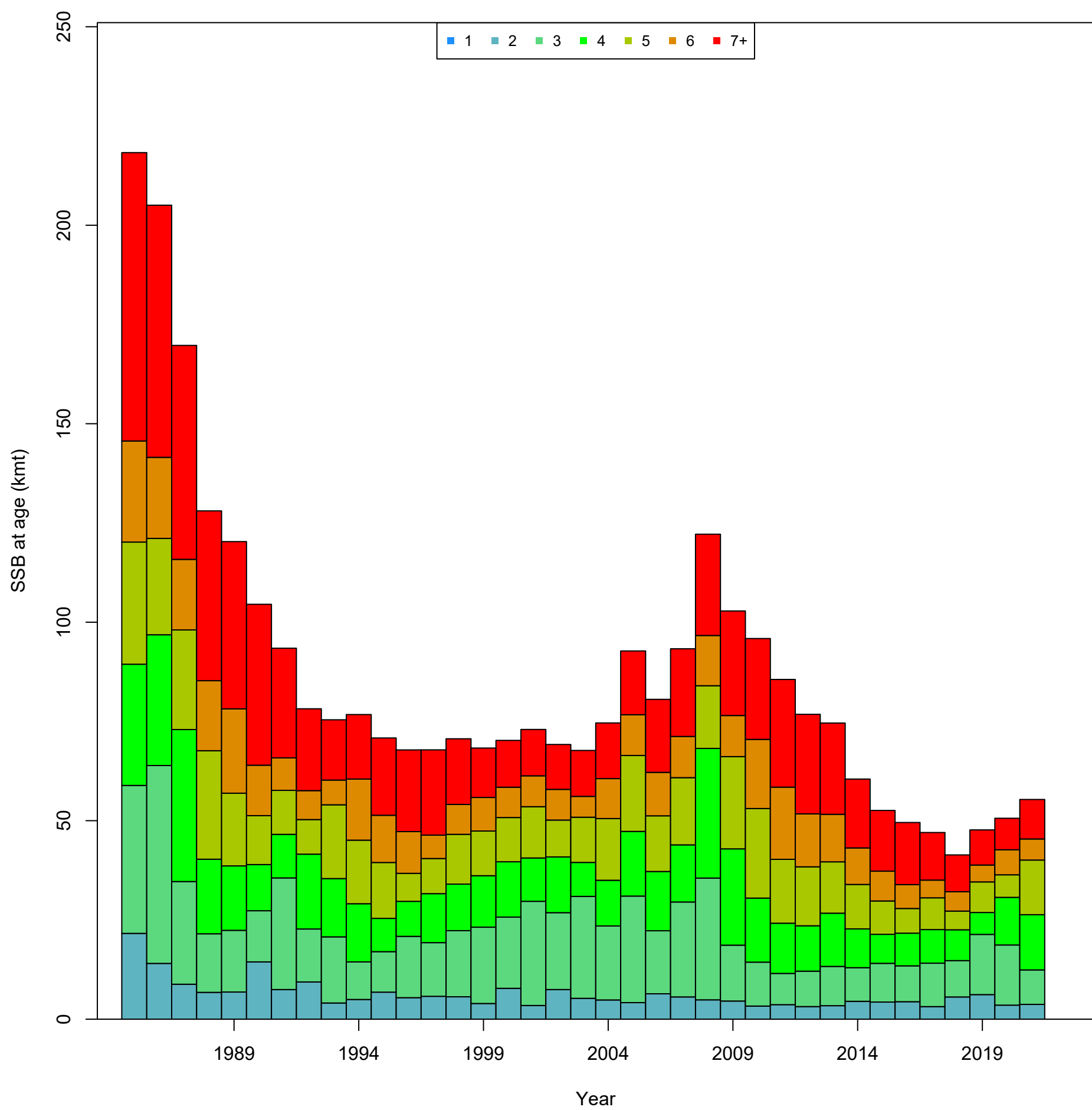
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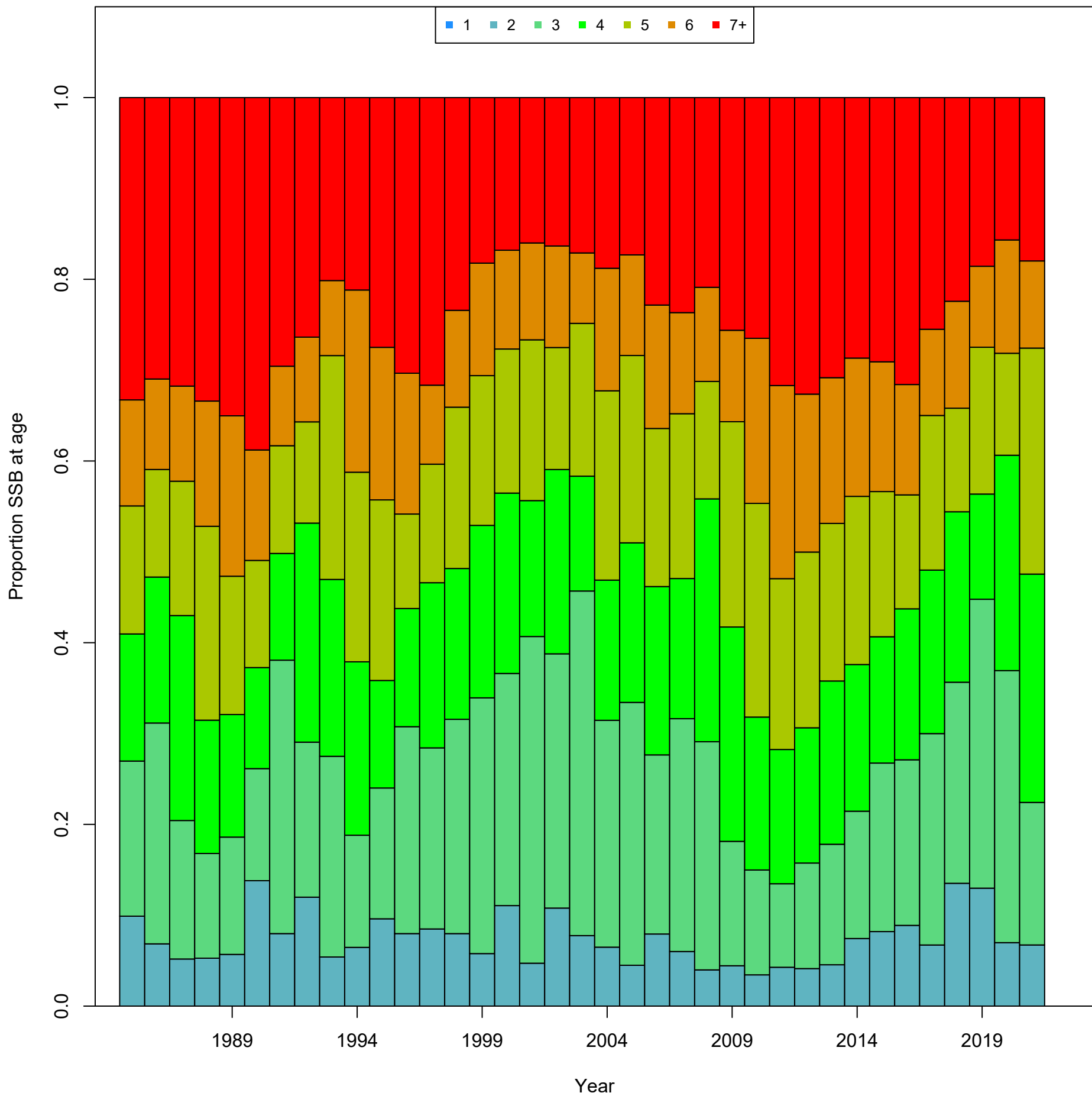


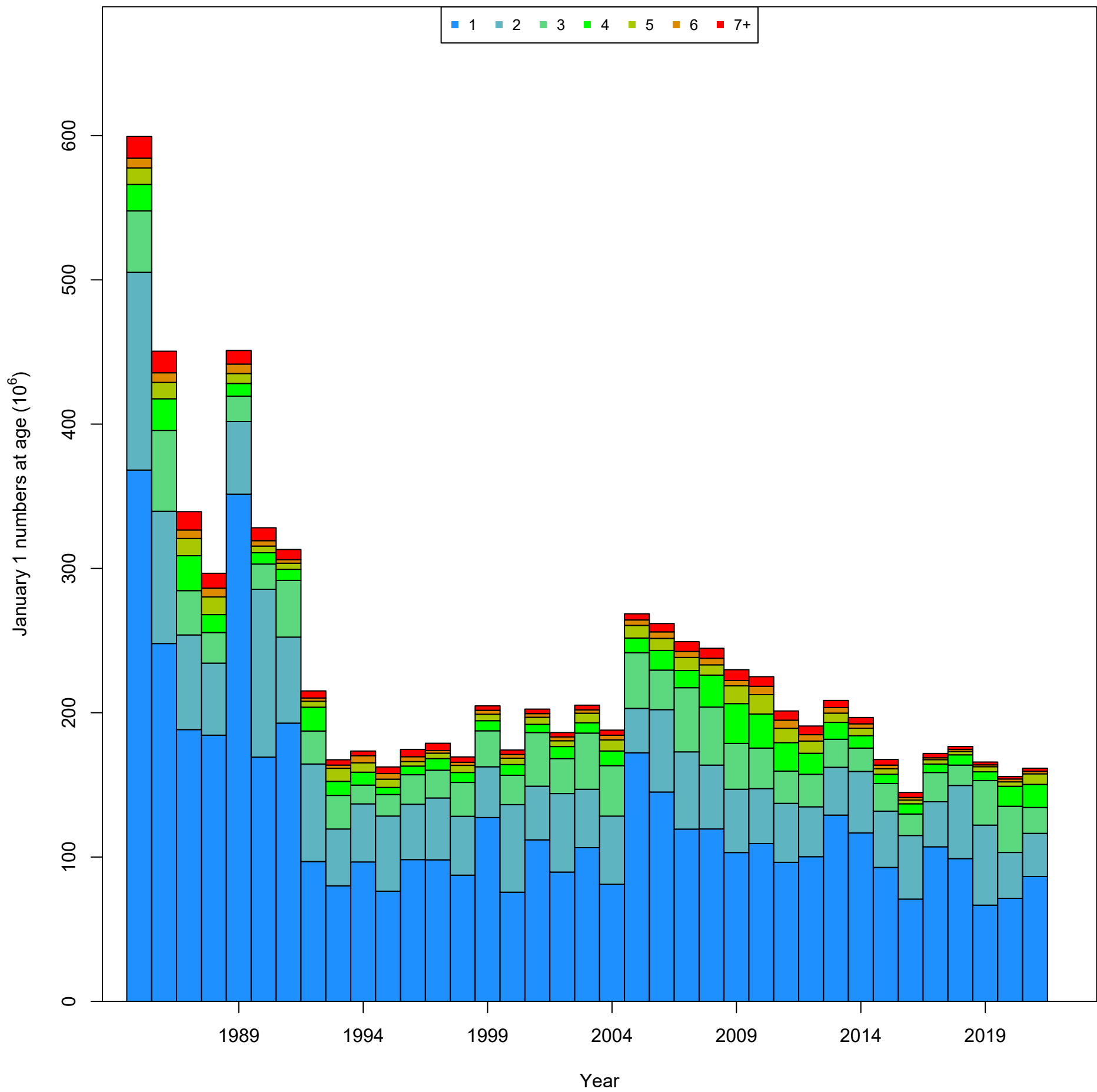
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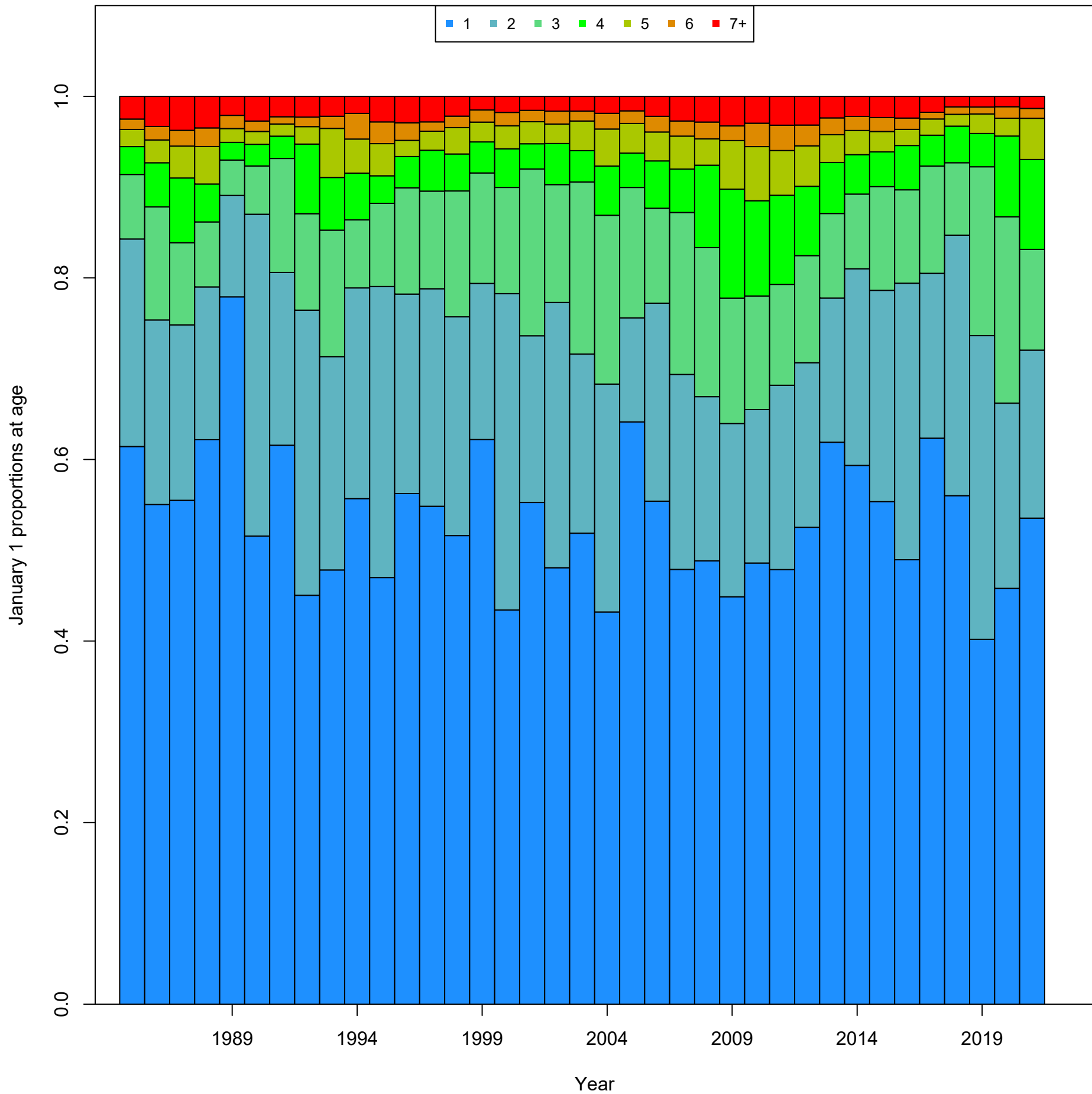


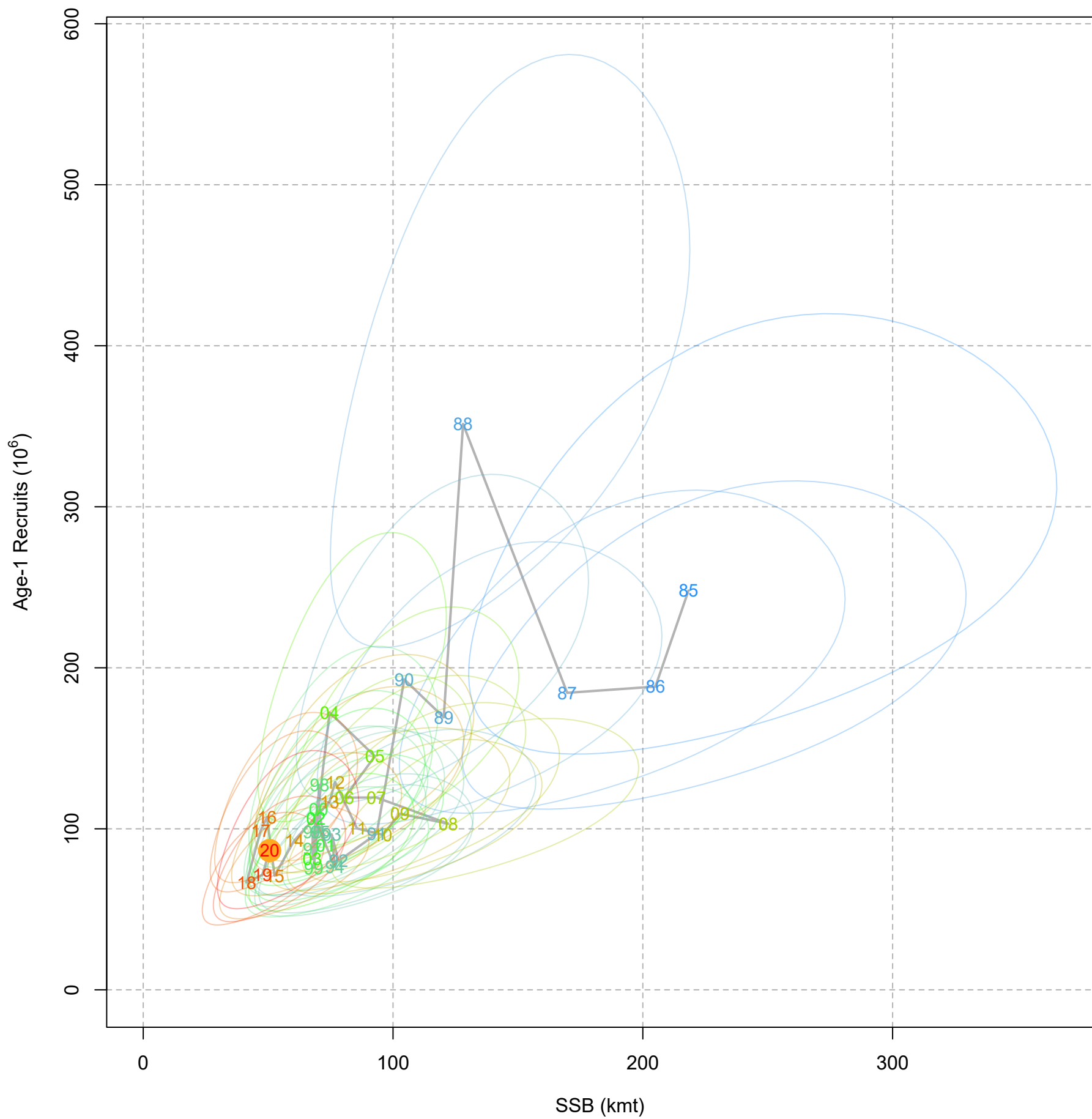


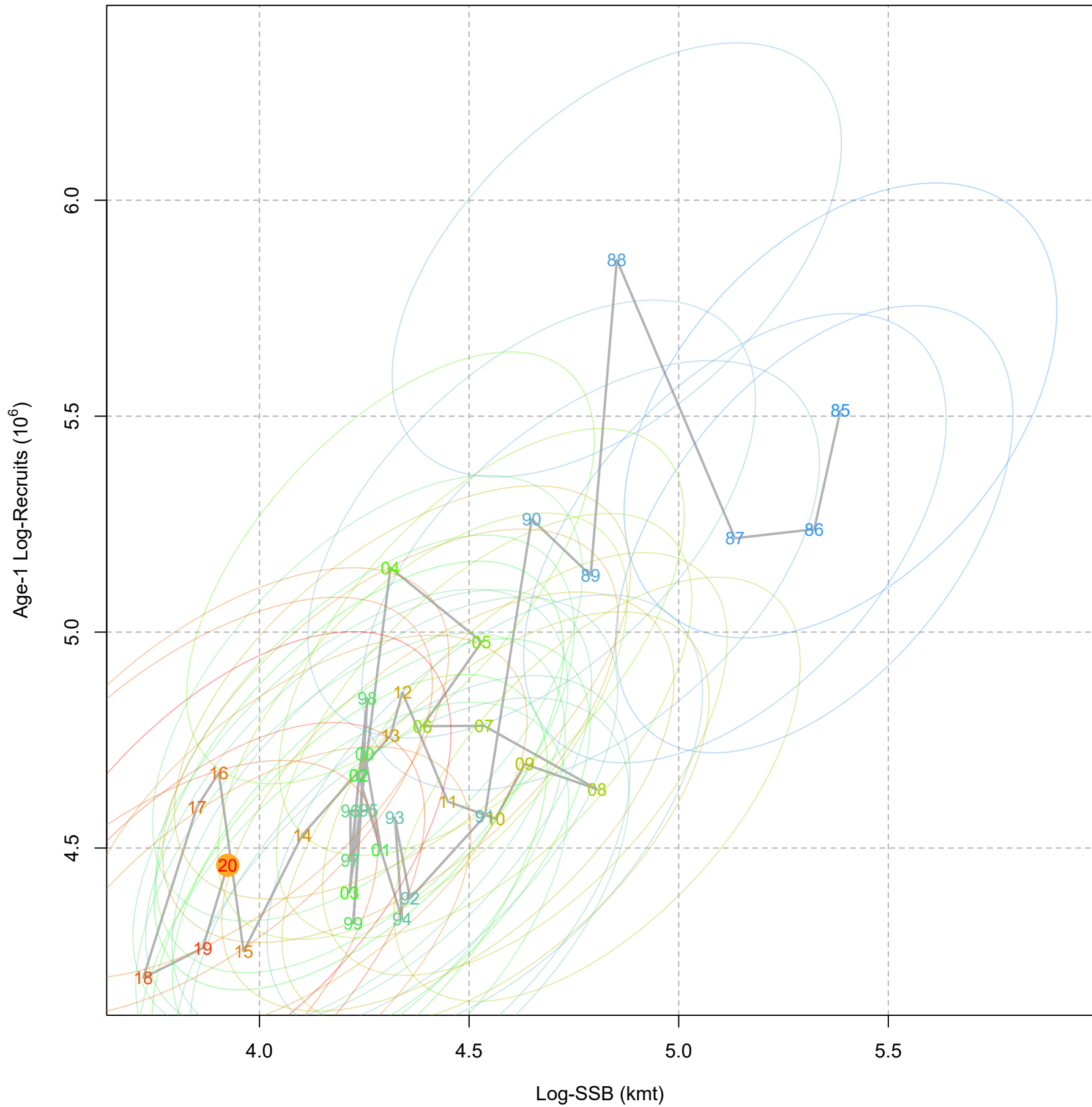


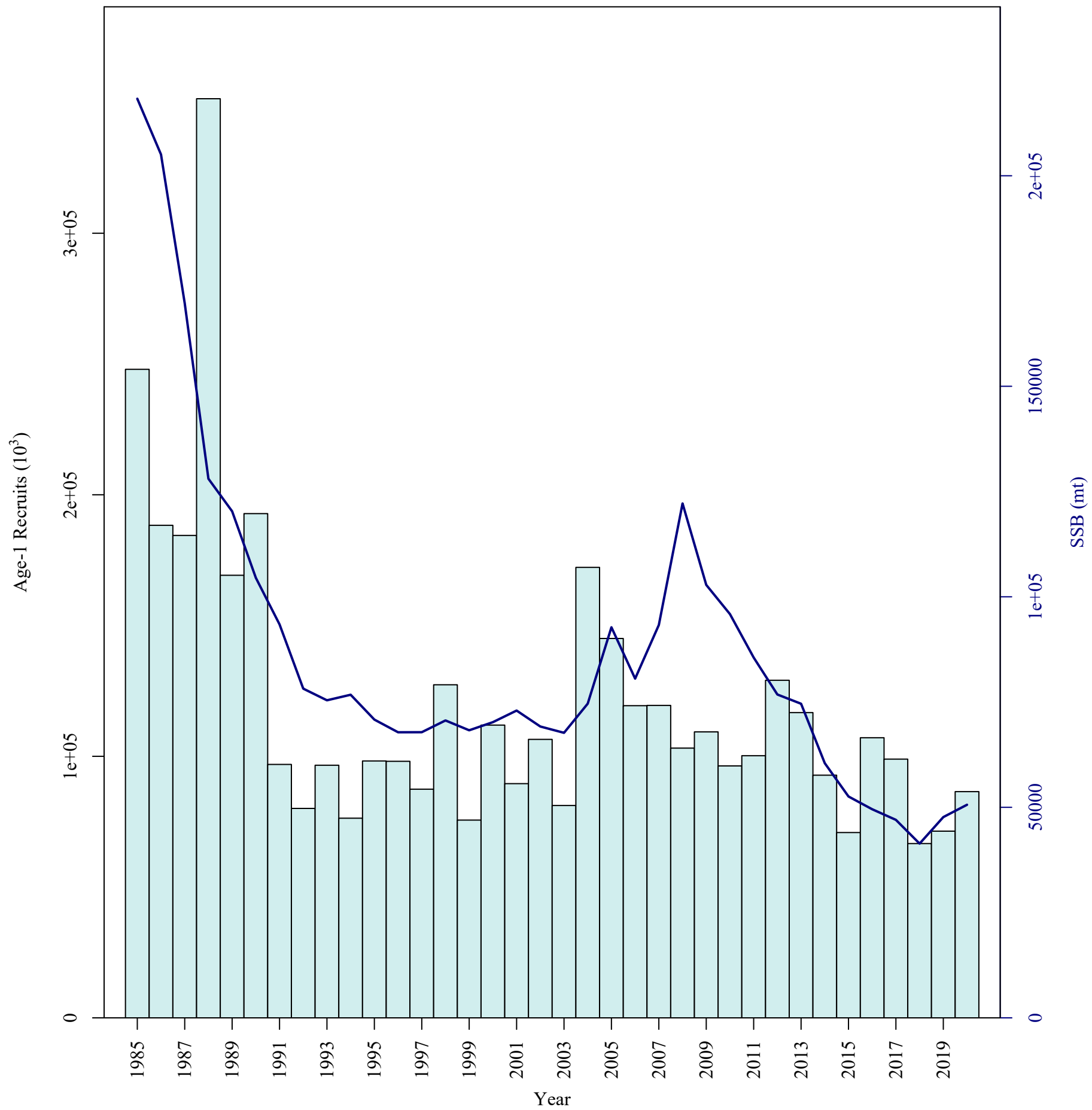


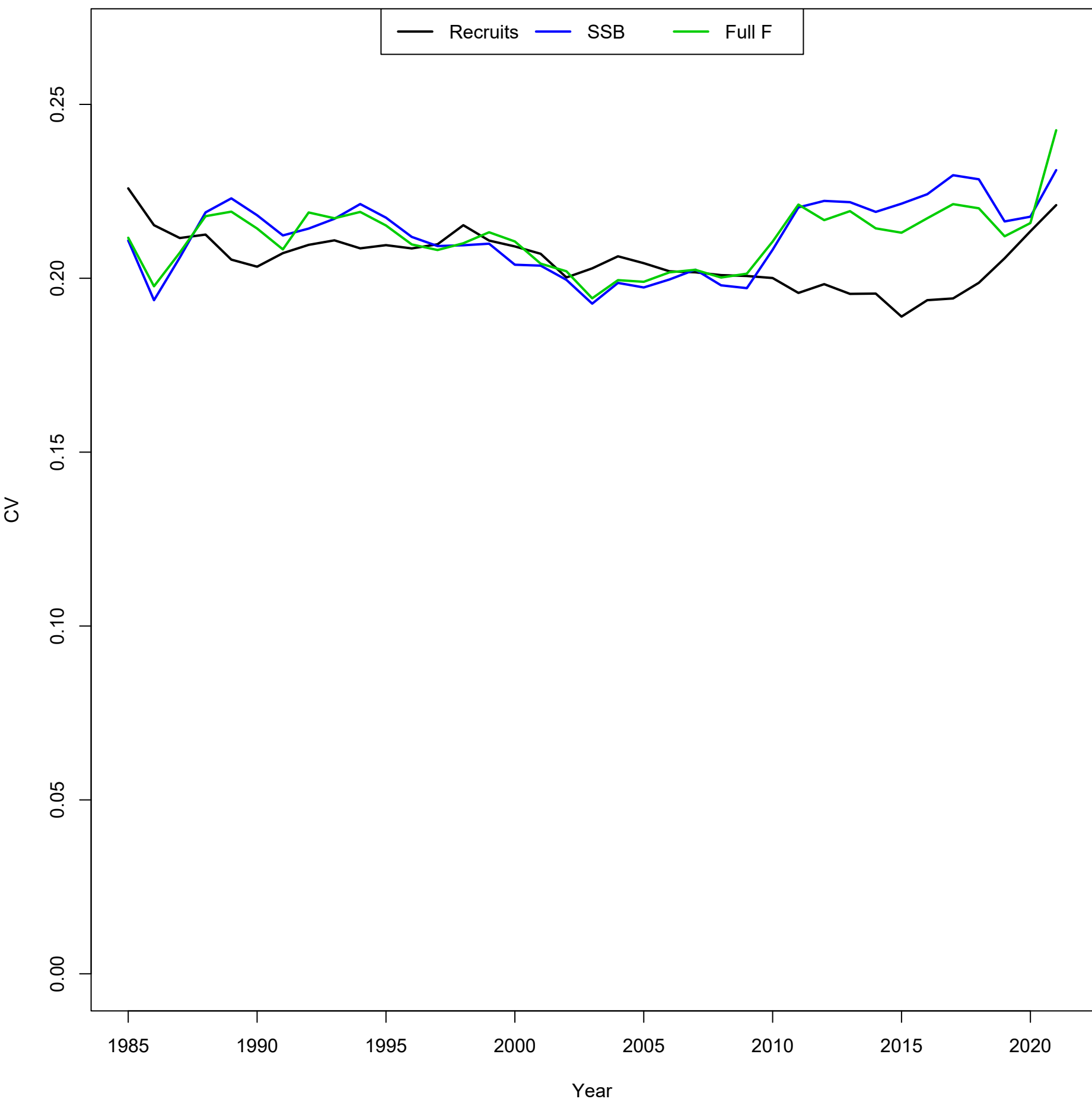


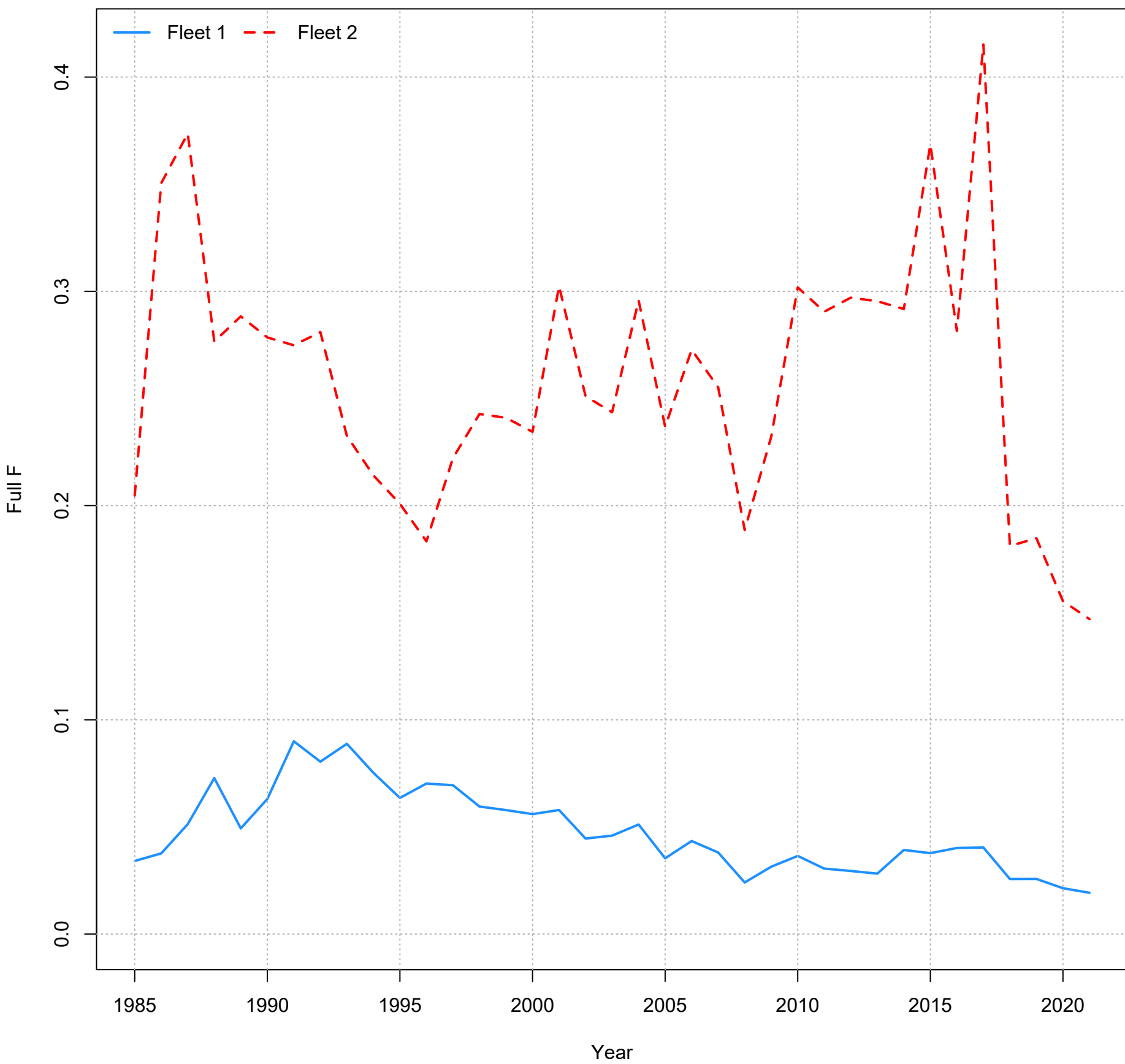


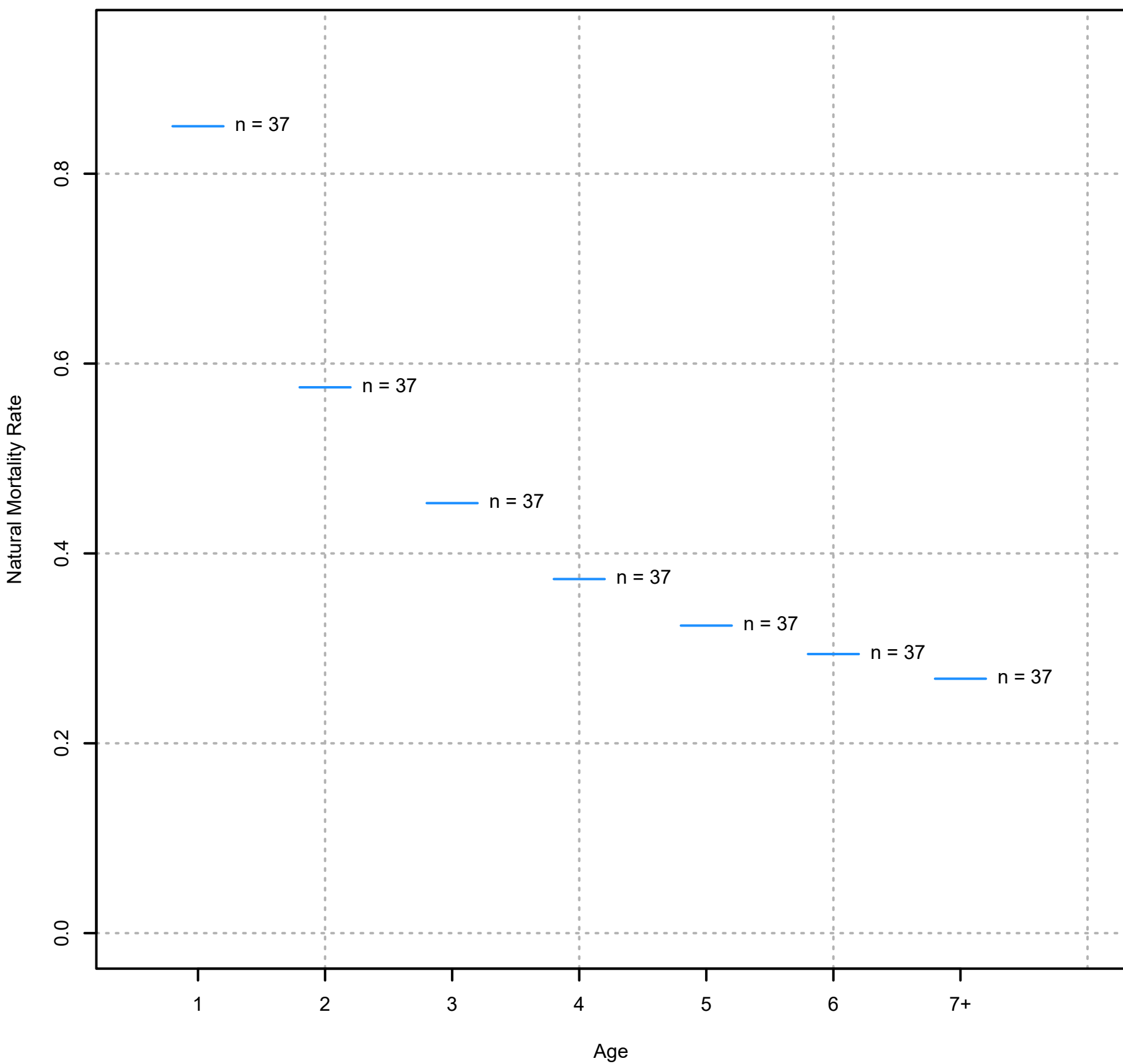


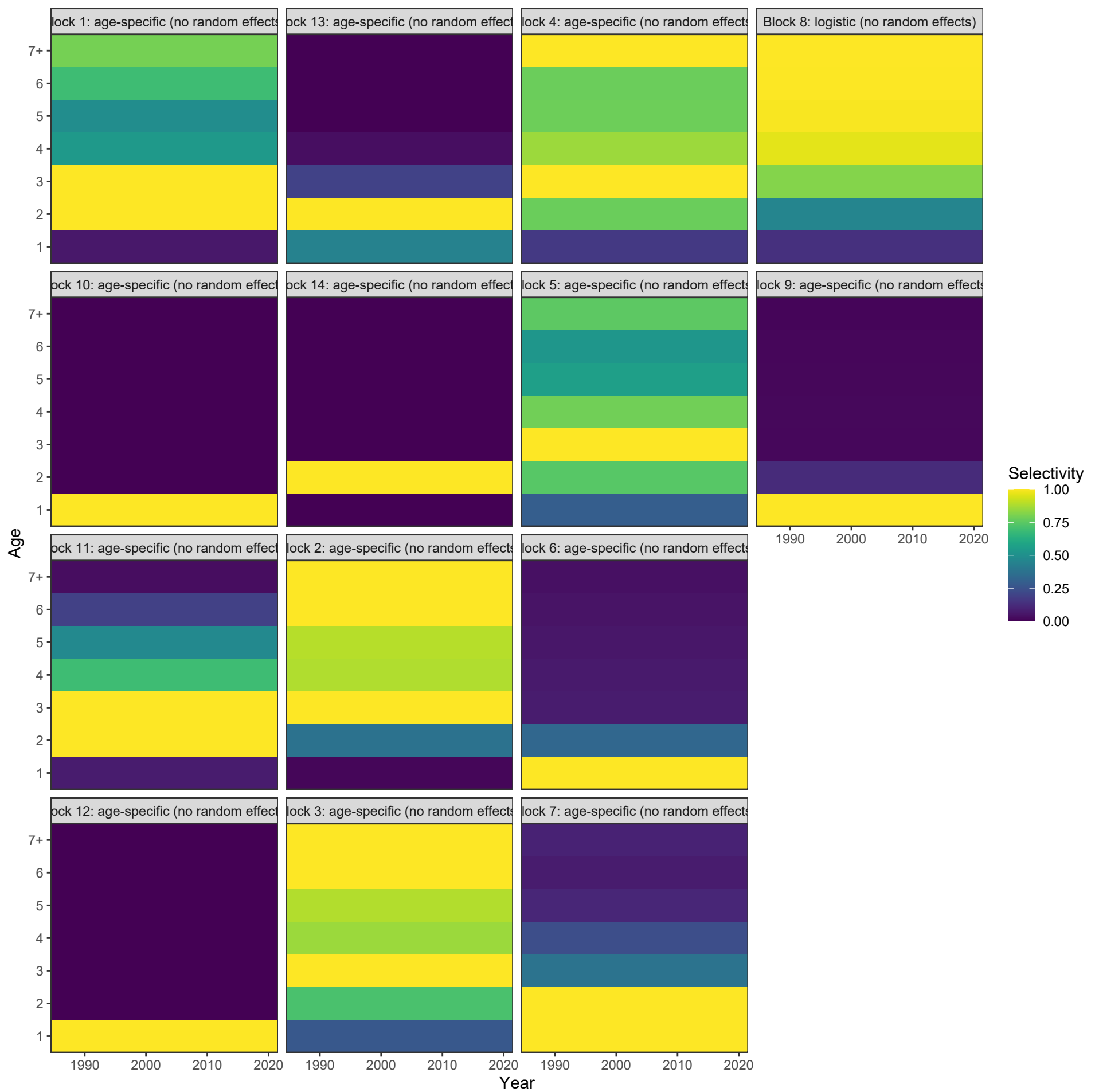


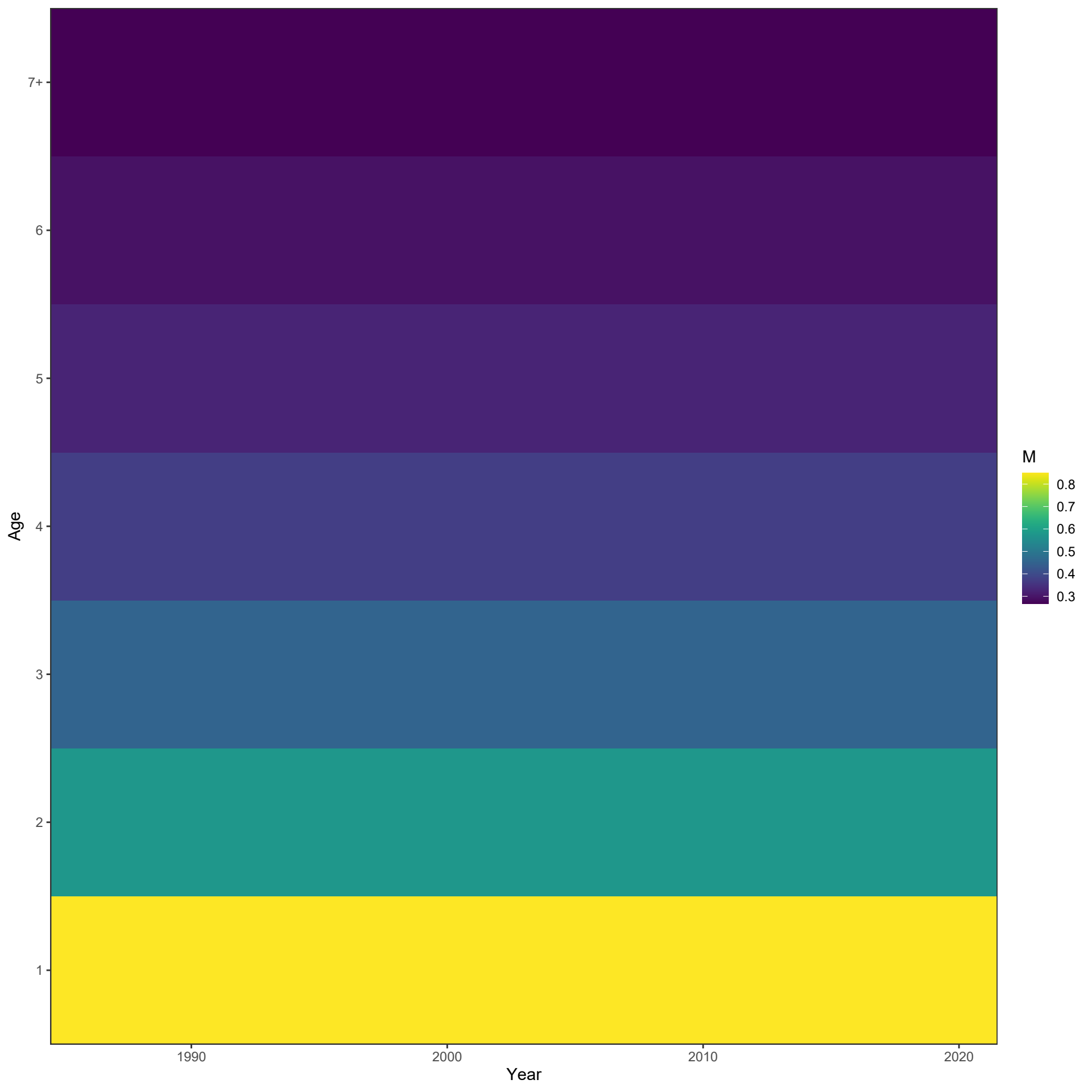


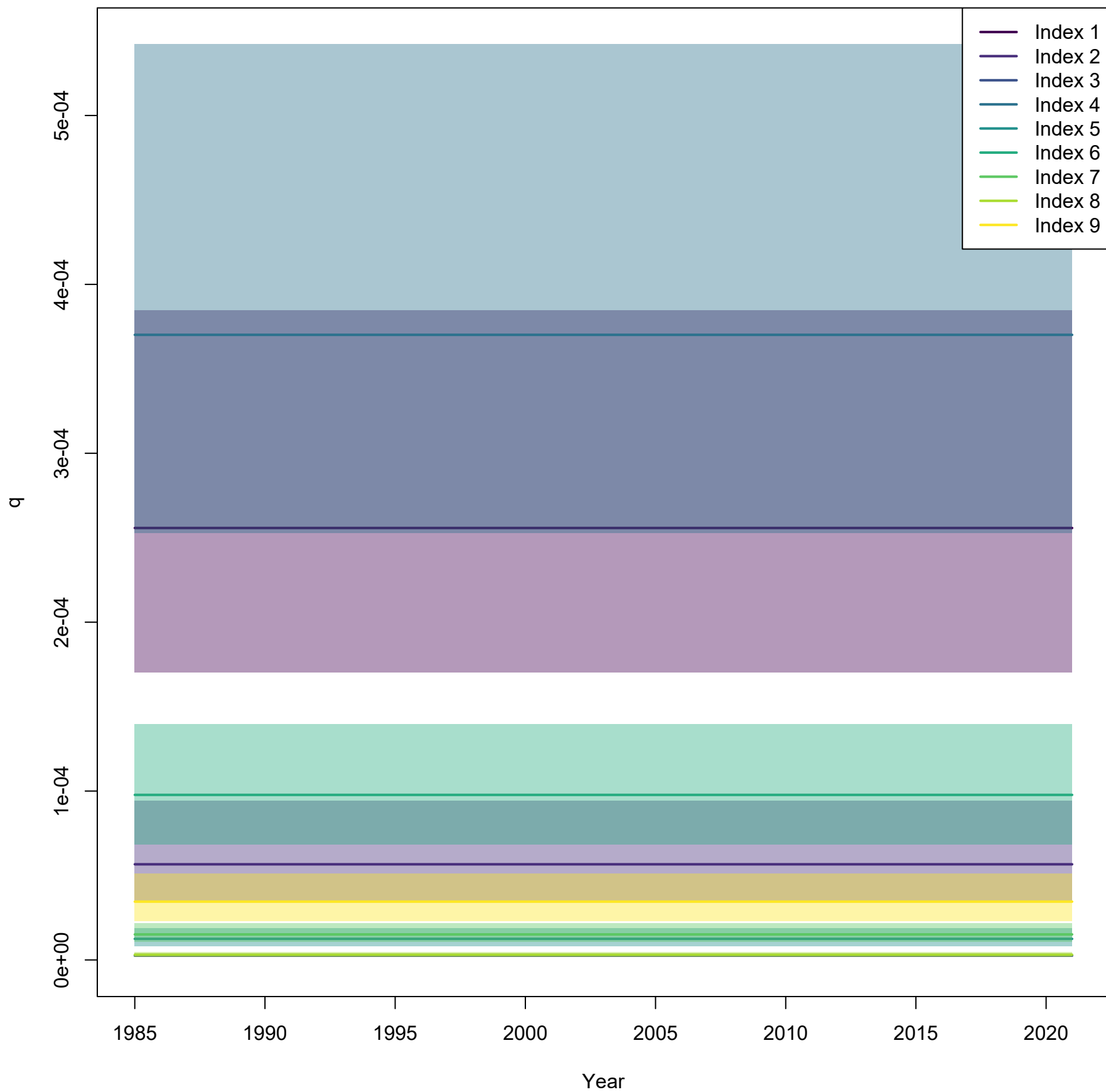




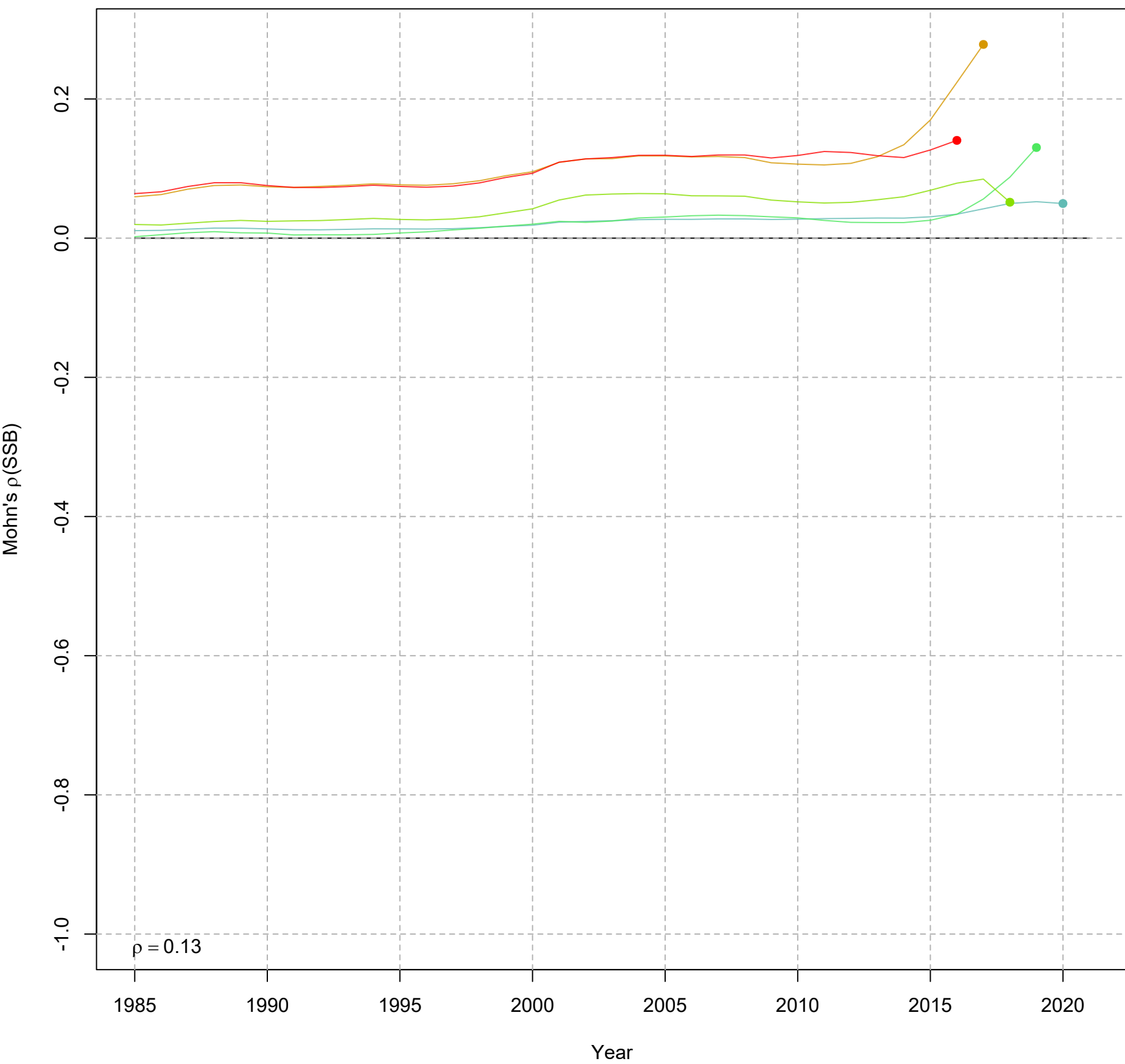


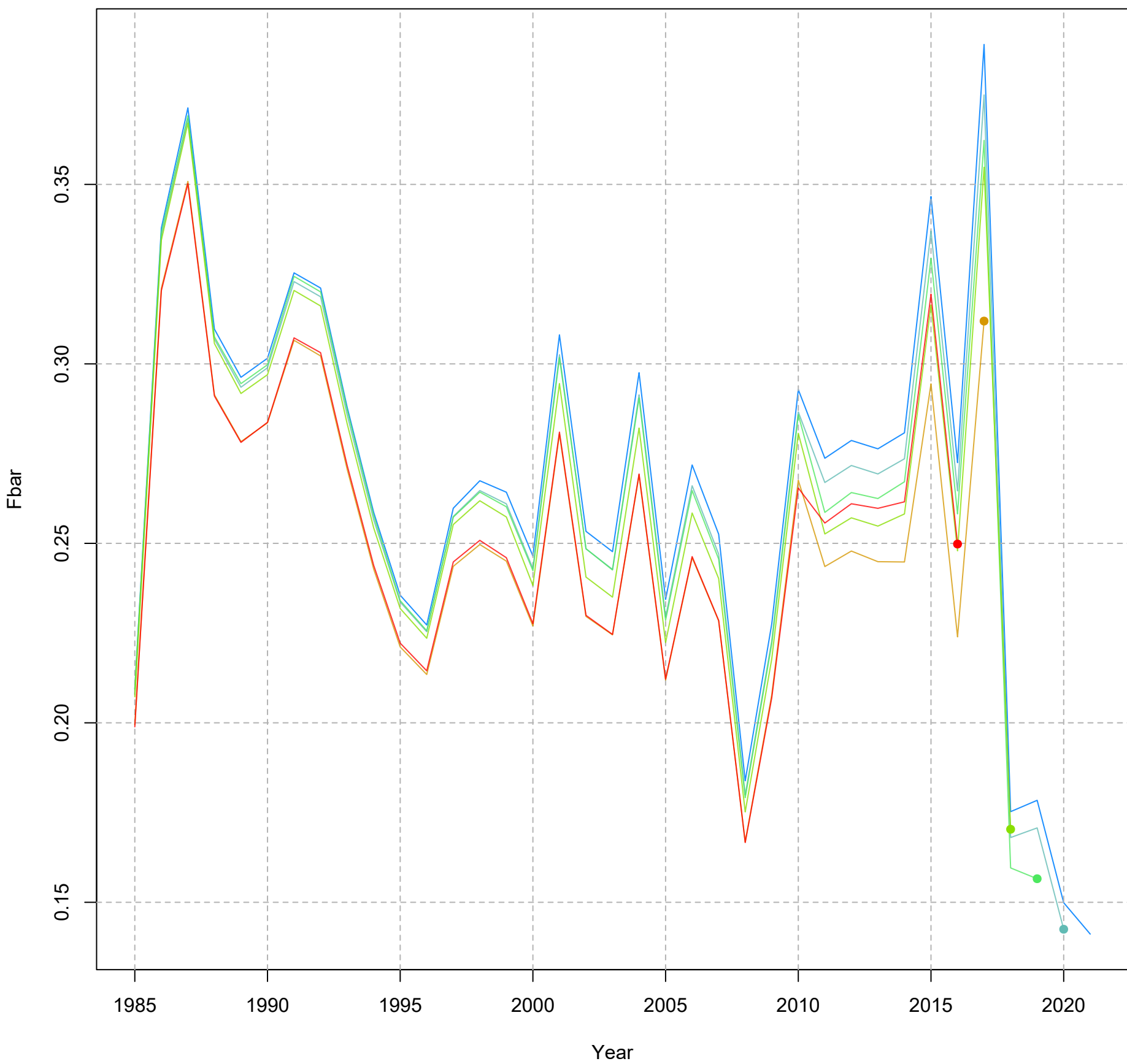




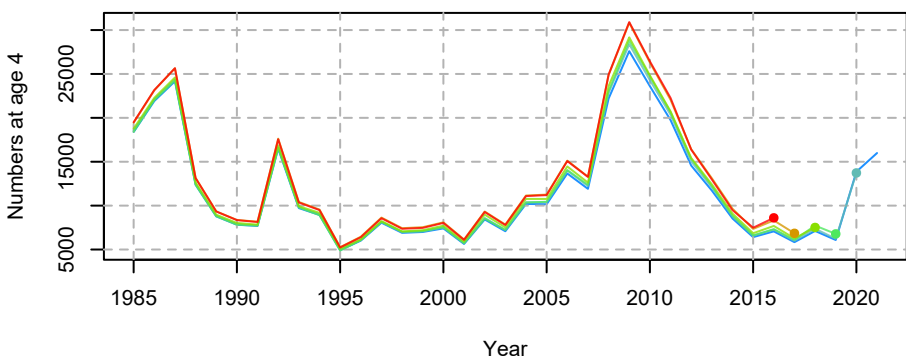
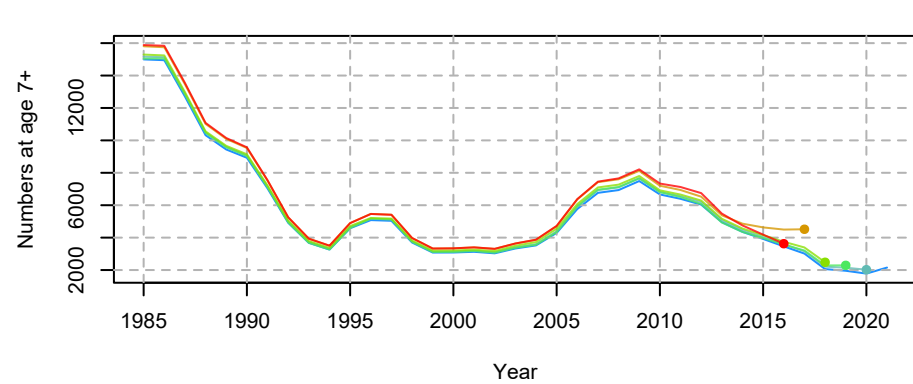
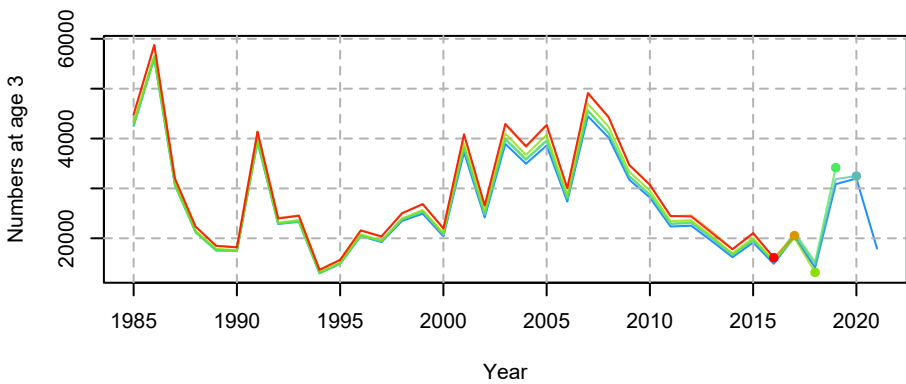
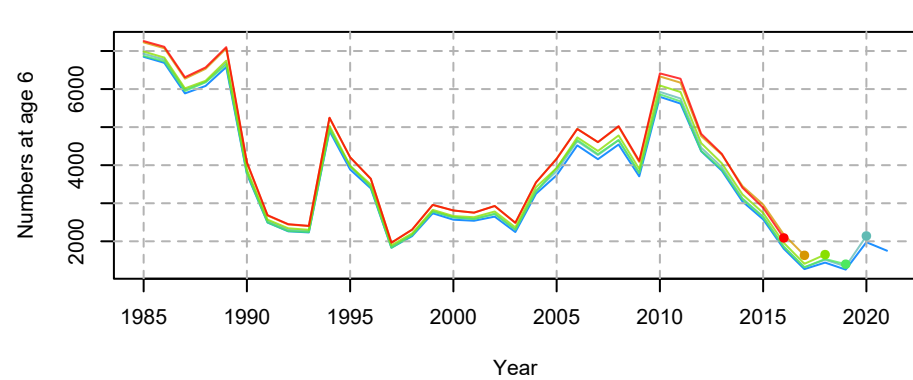
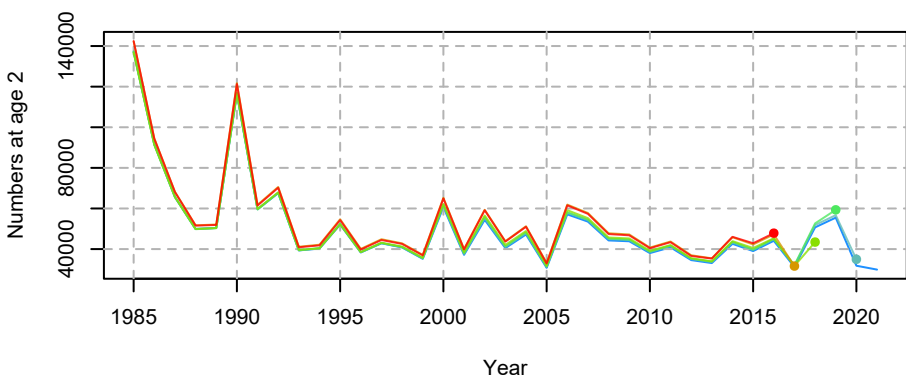
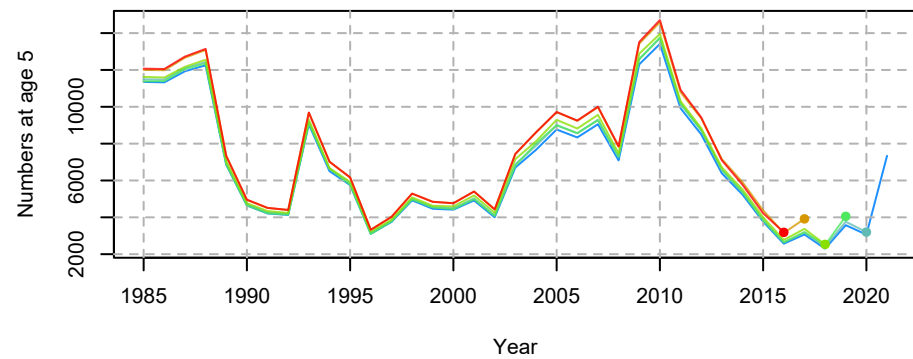
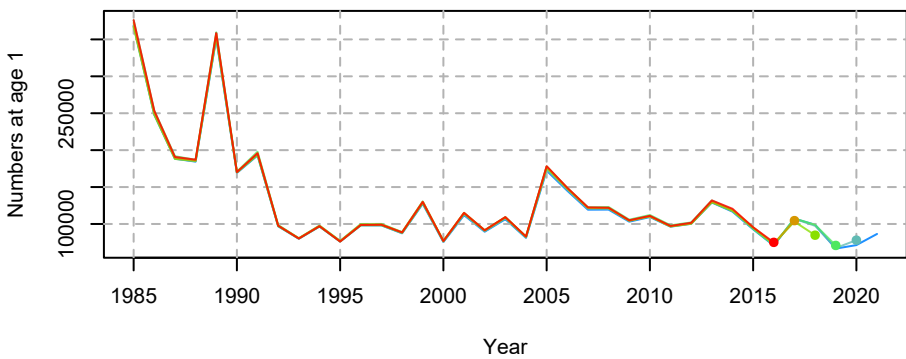


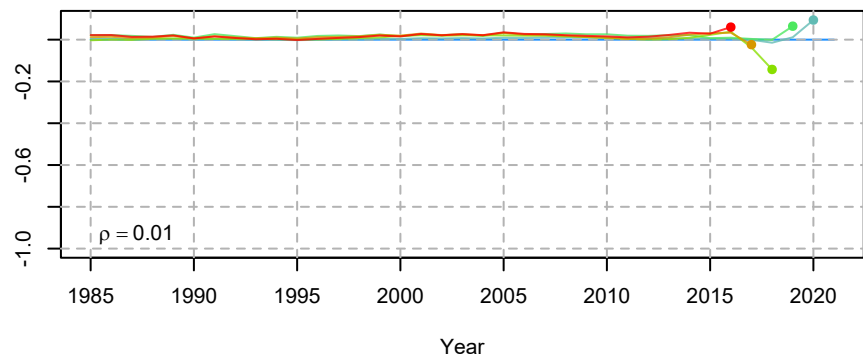
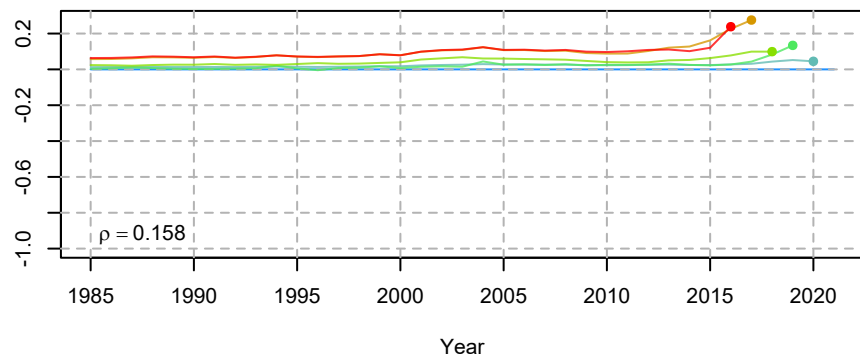
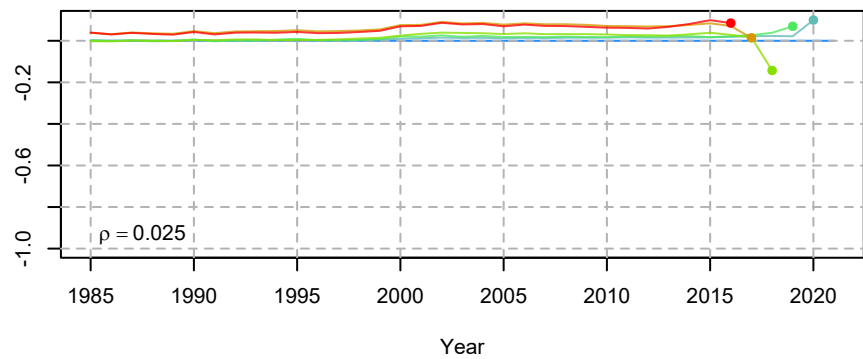
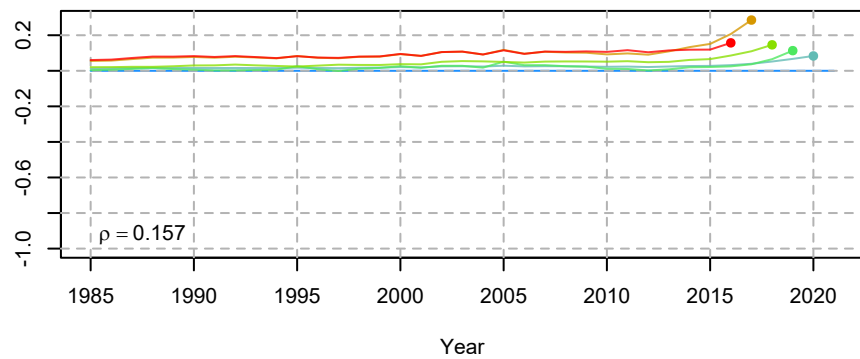
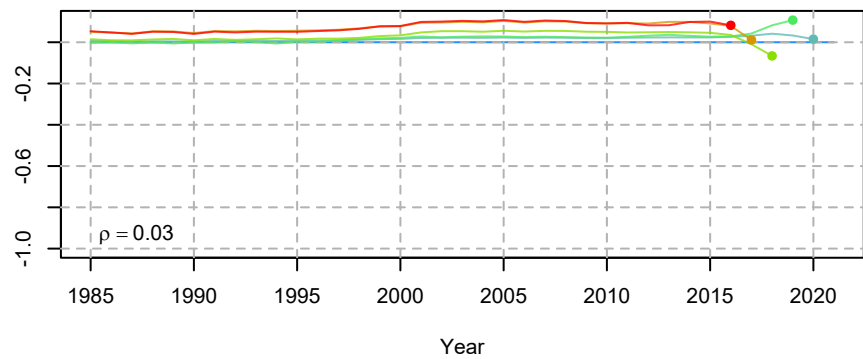
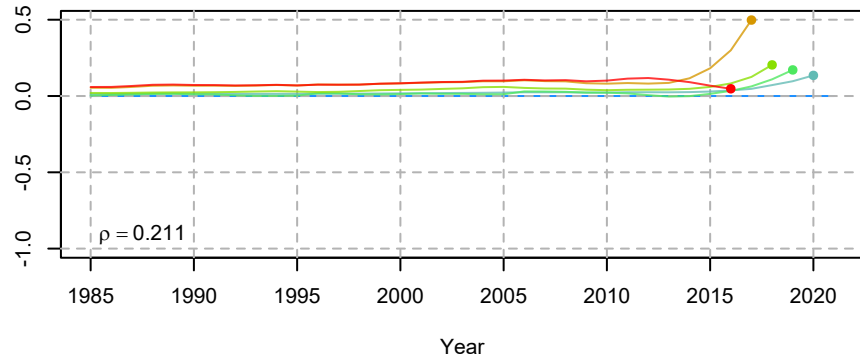
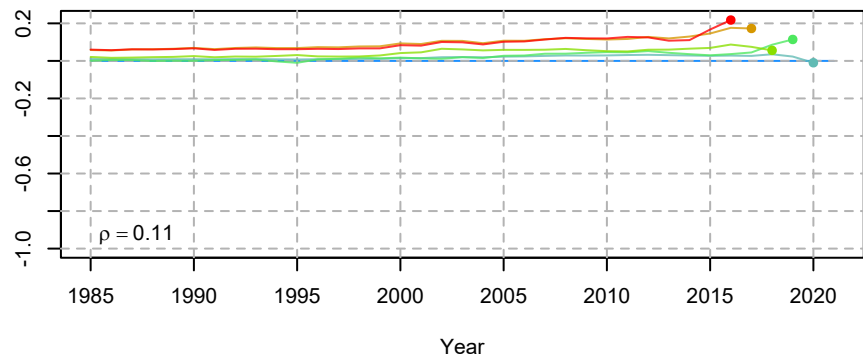


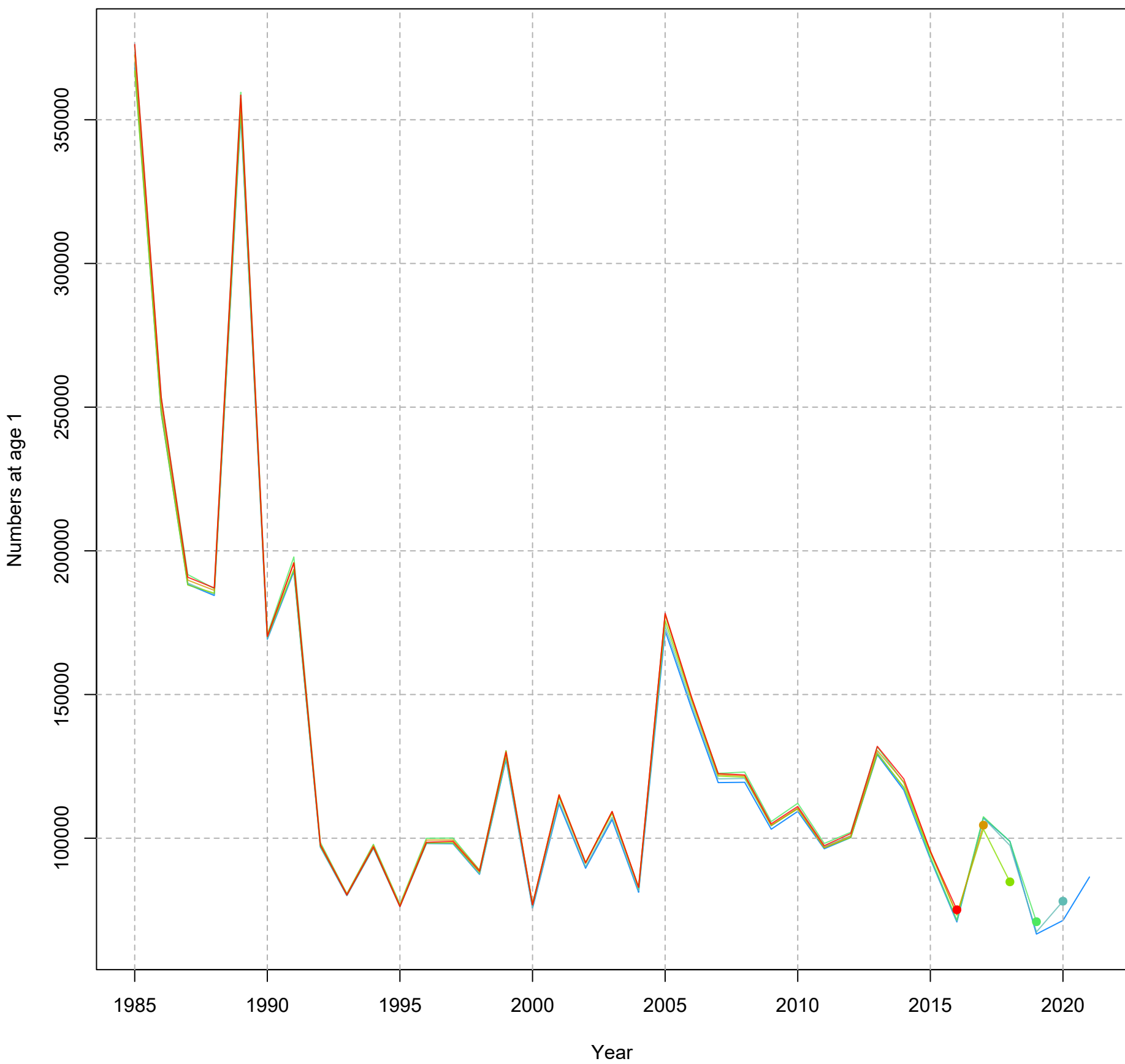


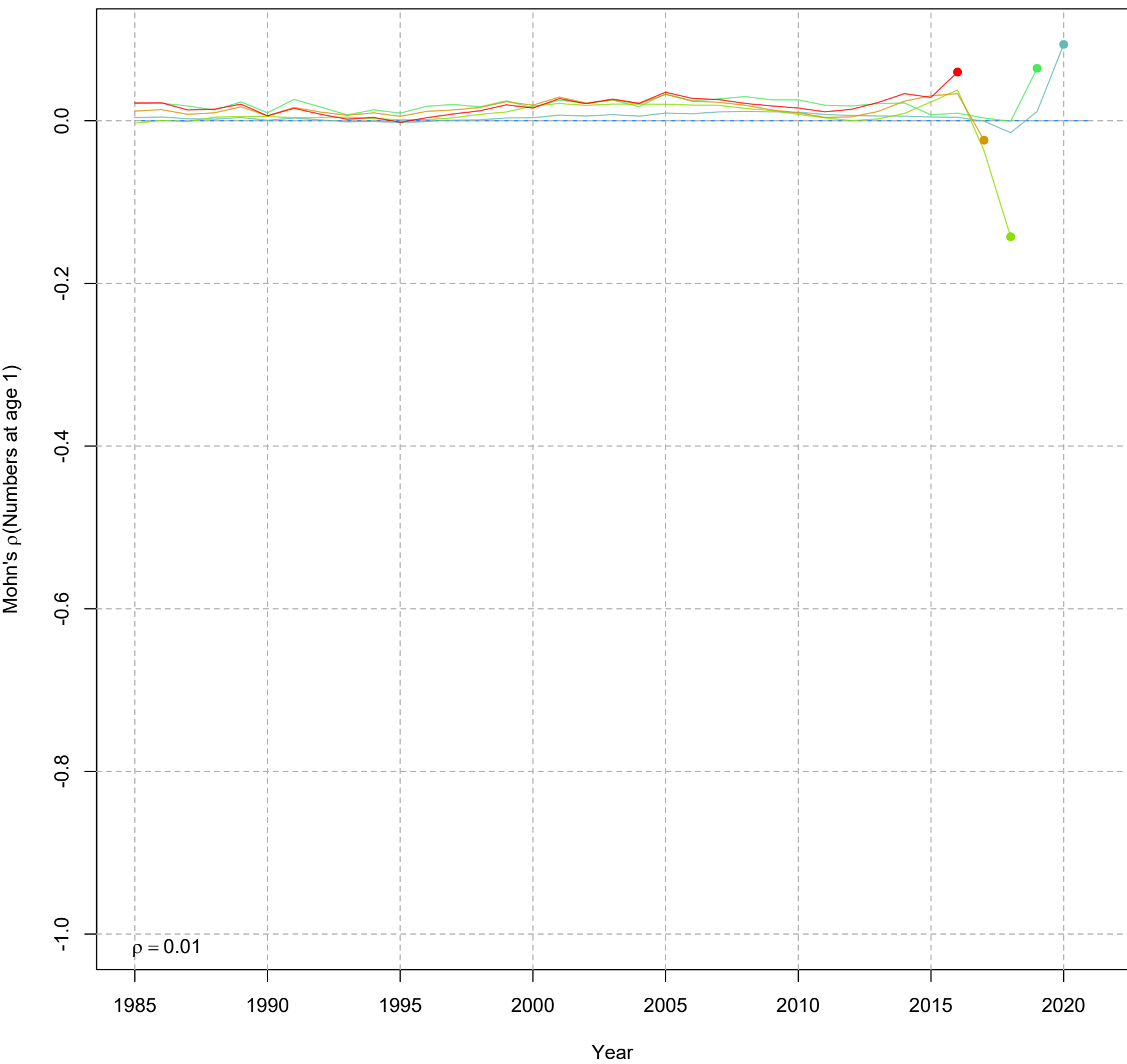






Mohn's ρ (Numbers at age 1)Mohn's ρ (Numbers at age 5)Mohn's ρ (Numbers at age 2)Mohn's ρ (Numbers at age 6)Mohn's ρ (Numbers at age 3)Mohn's ρ (Numbers at age 7+)Mohn's ρ (Numbers at age 4)



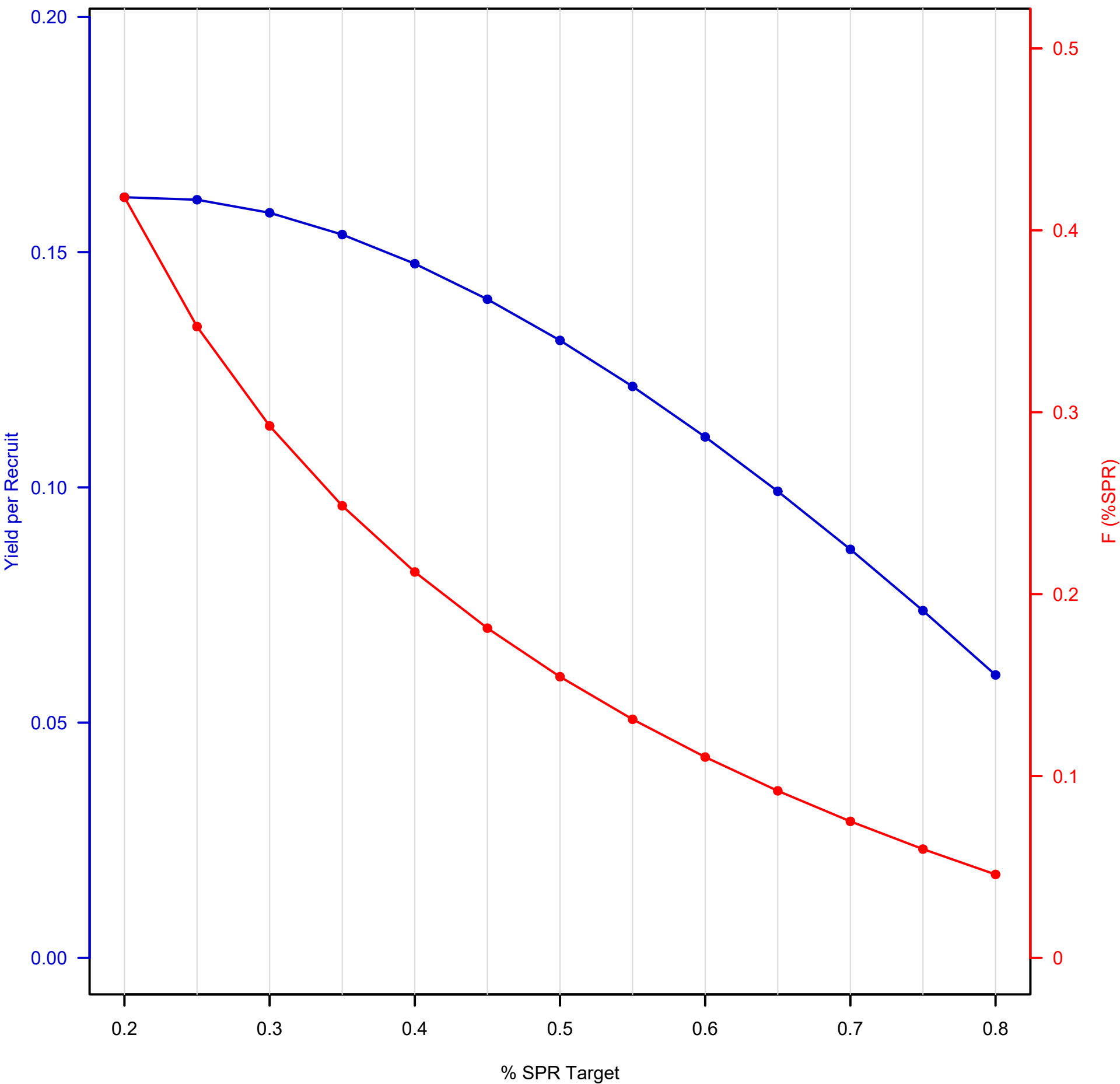


BF28W_M7: FINAL MODEL

Final bluefish model with NAA transitions modeled as random effects correlated by age and year

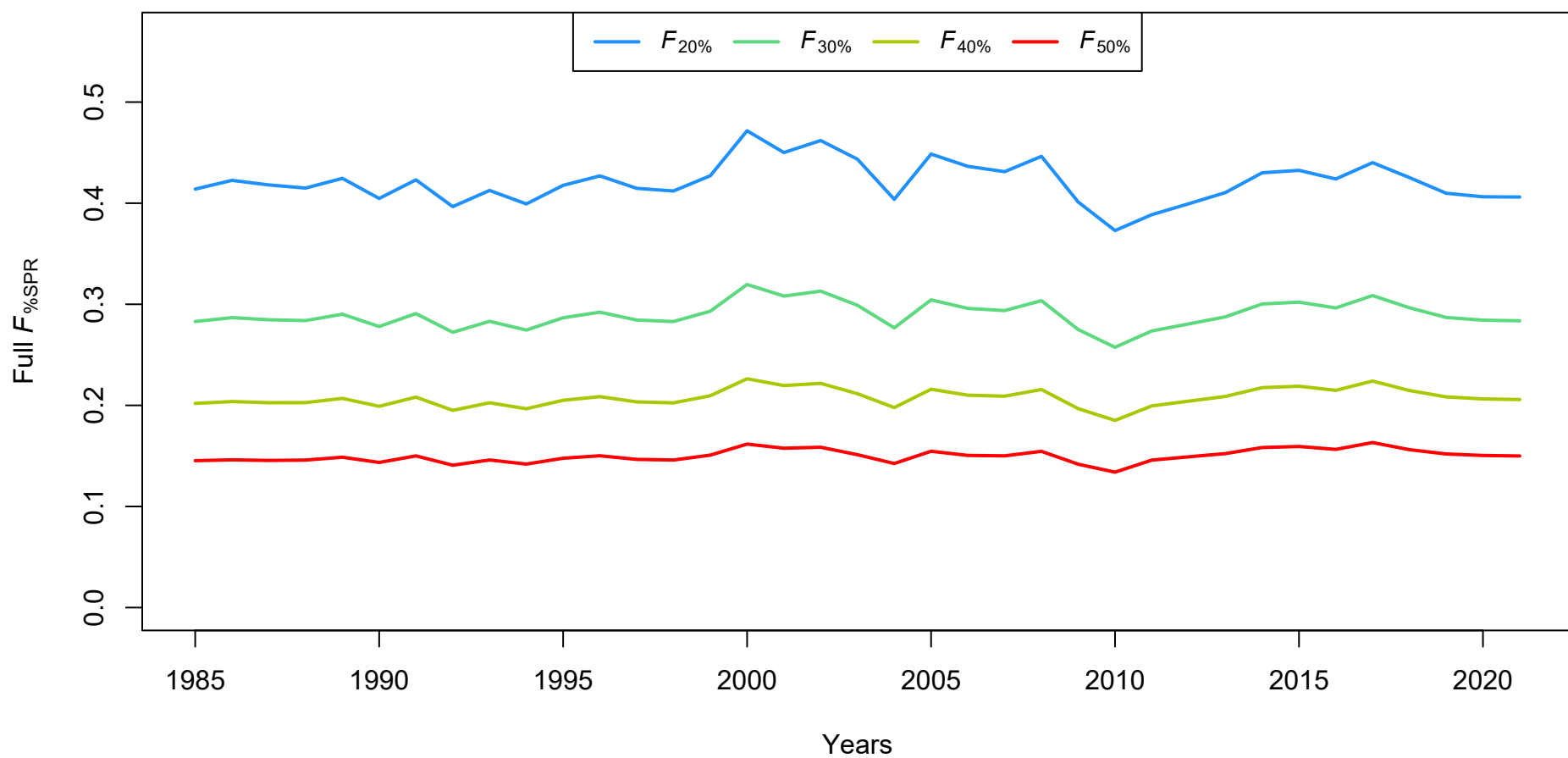
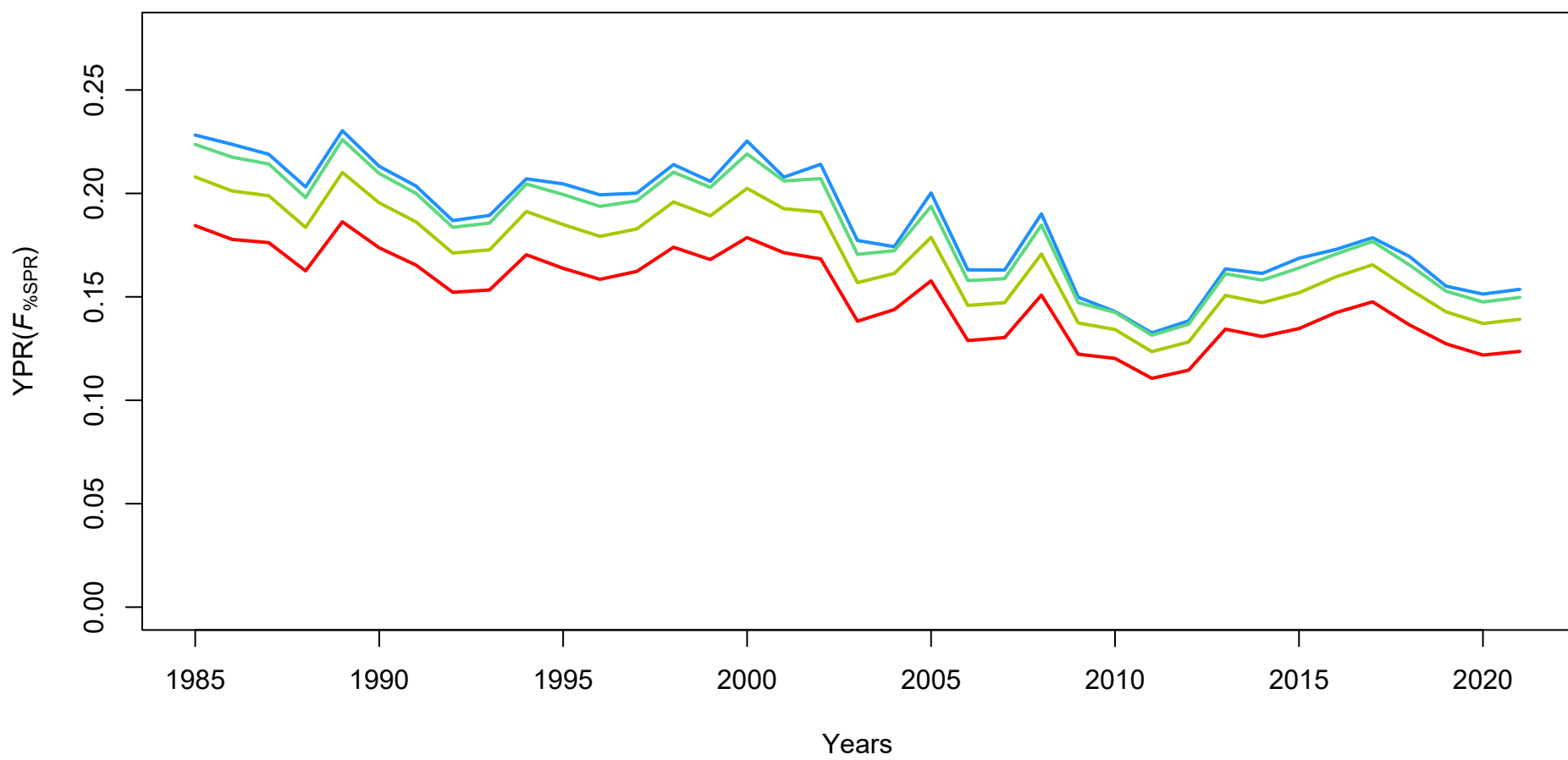
REFERENCE POINT PLOTS

SPR Target Reference Points (Years Avg = 5)

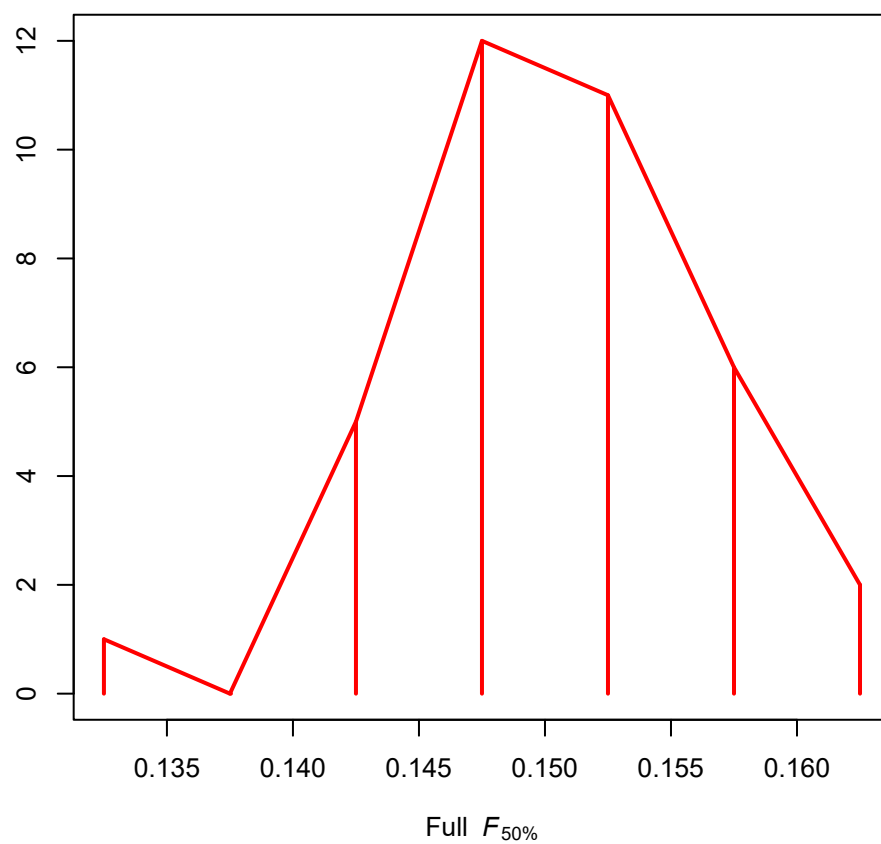
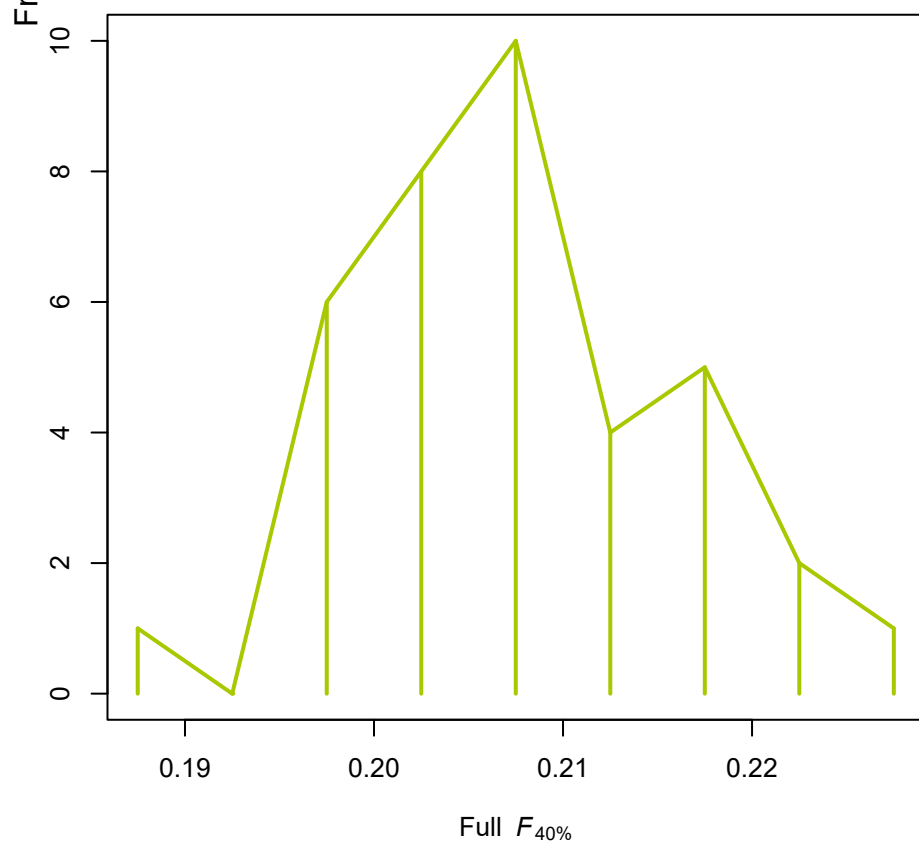
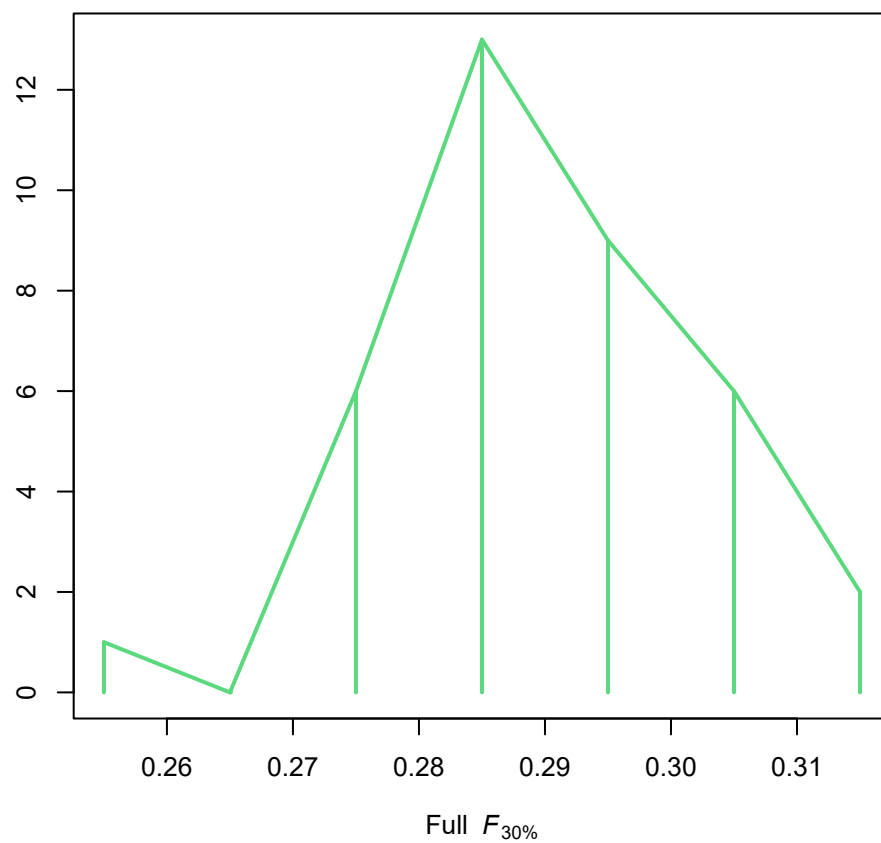
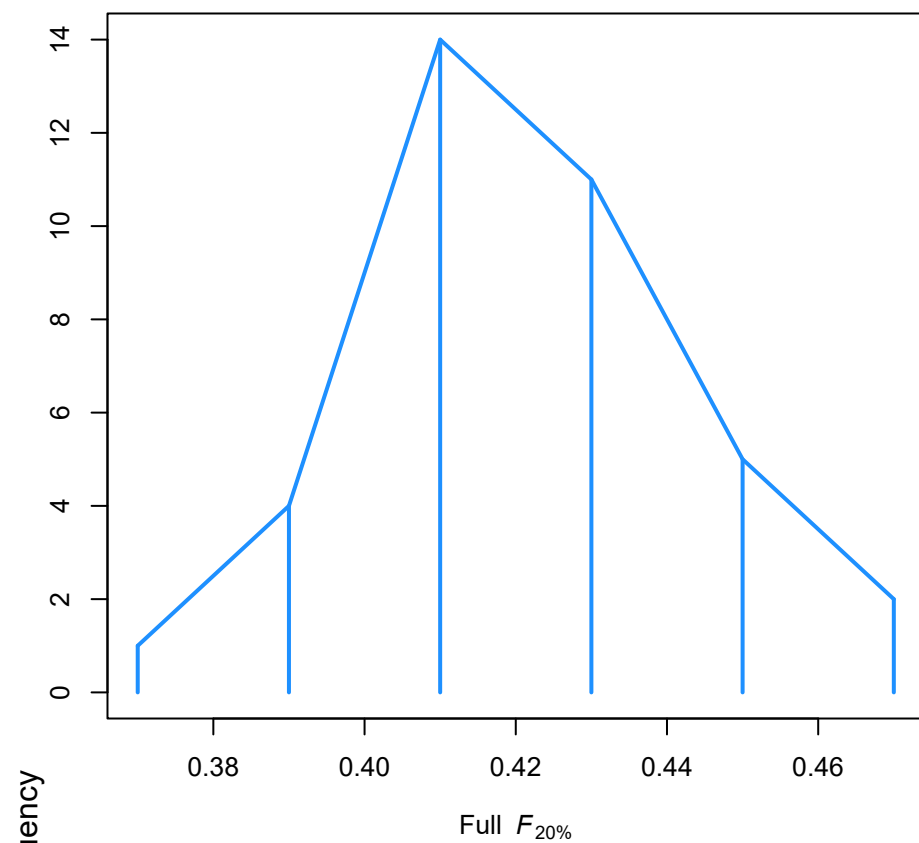


SPR Target Reference Points (Years Avg = 5)

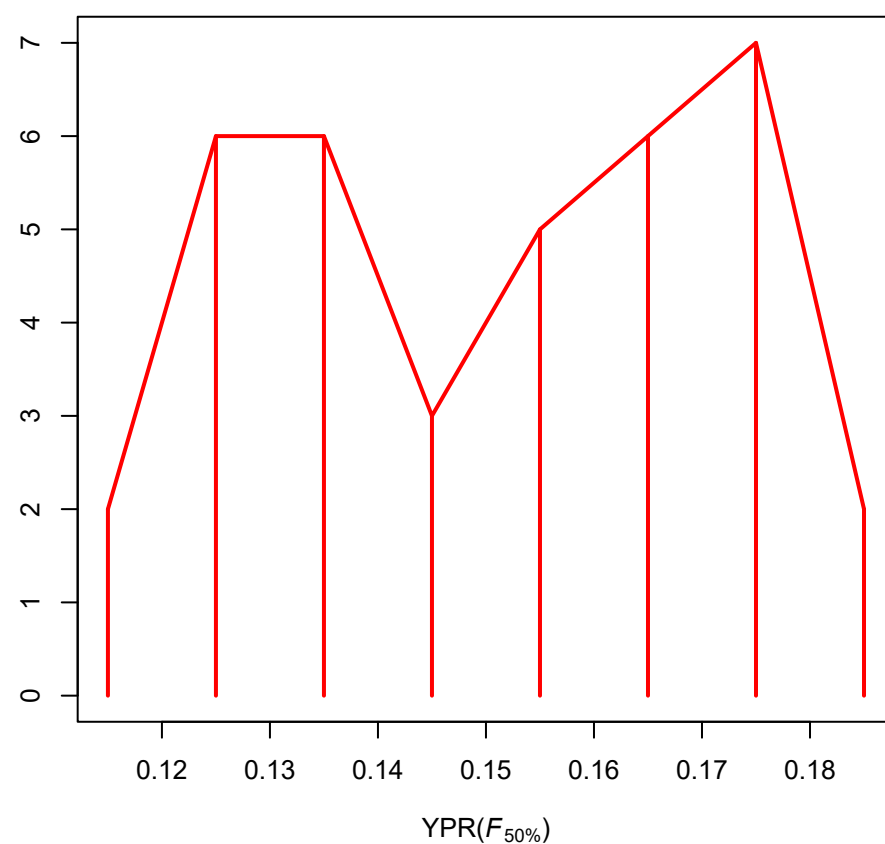
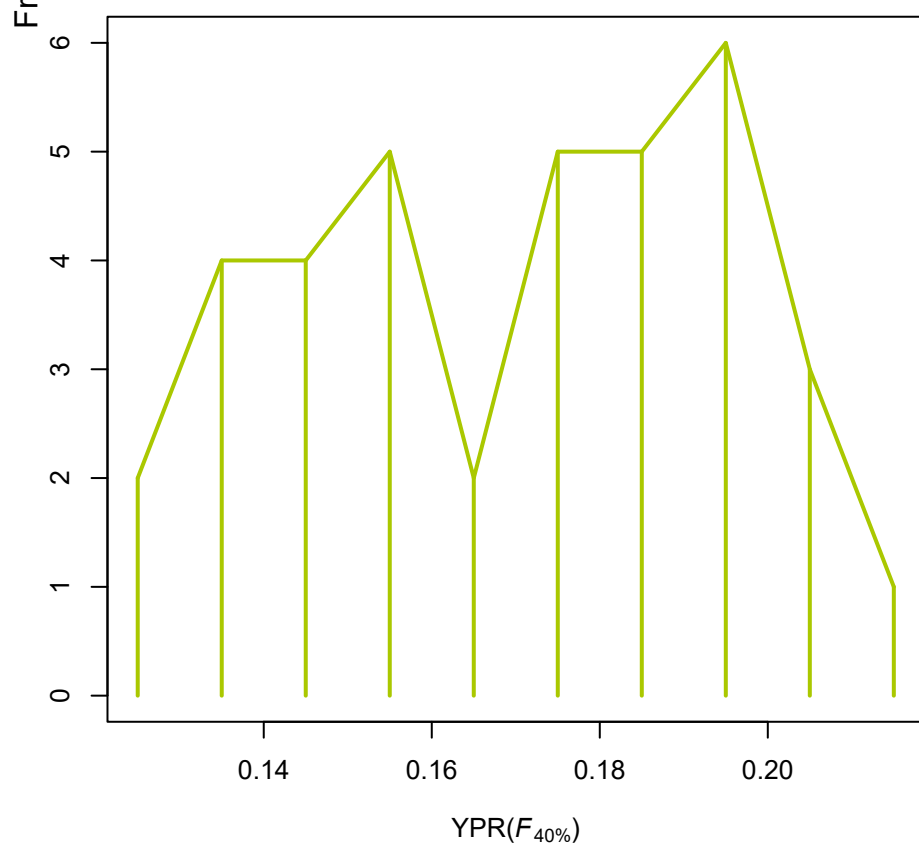
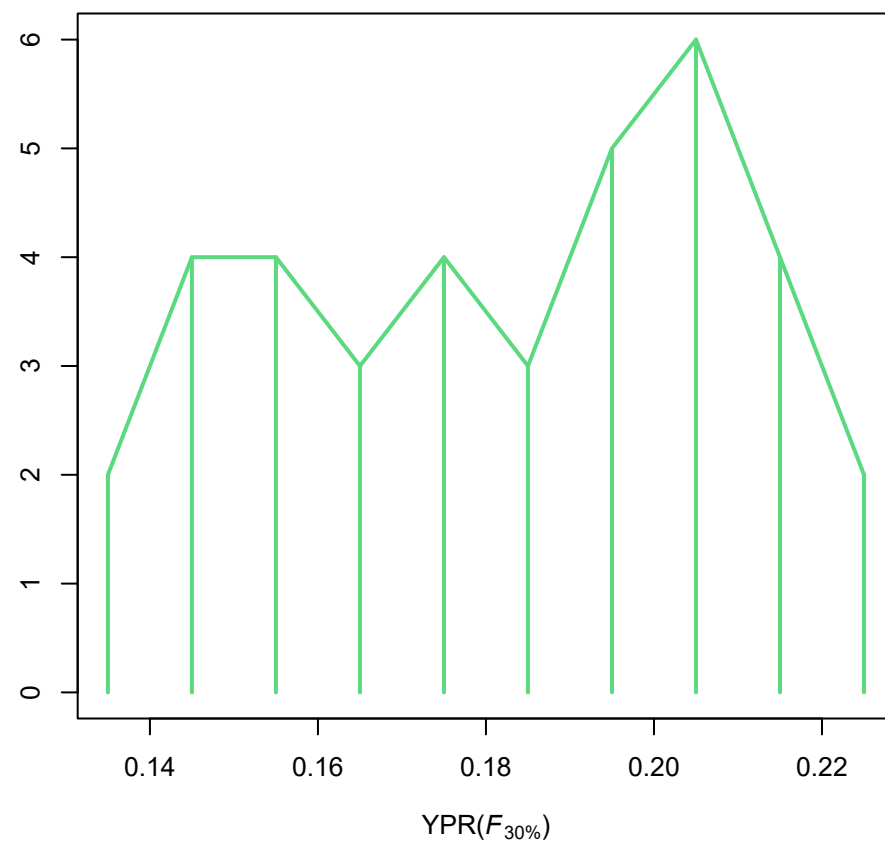
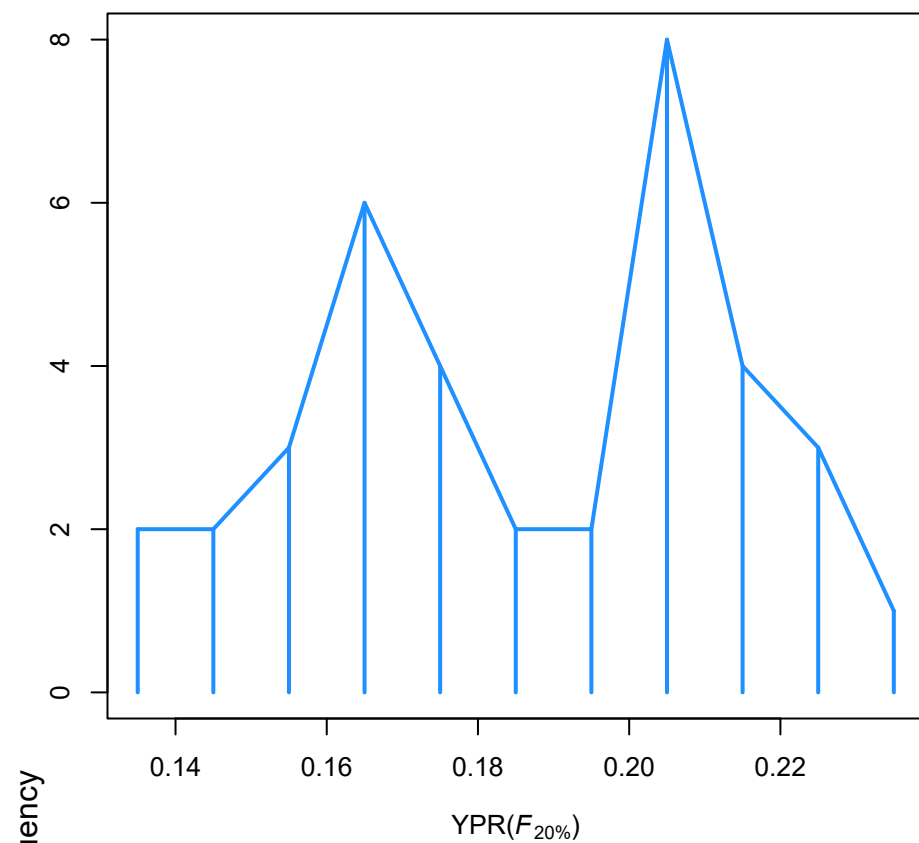
% SPR	F(%SPR)	YPR
0.2	0.4182	0.1617
0.25	0.3471	0.1611
0.3	0.2924	0.1584
0.35	0.2485	0.1537
0.4	0.2121	0.1475
0.45	0.1813	0.14
0.5	0.1546	0.1312
0.55	0.1312	0.1215
0.6	0.1104	0.1107
0.65	0.0918	0.0992
0.7	0.0751	0.0868
0.75	0.0598	0.0738
0.8	0.0459	0.0601

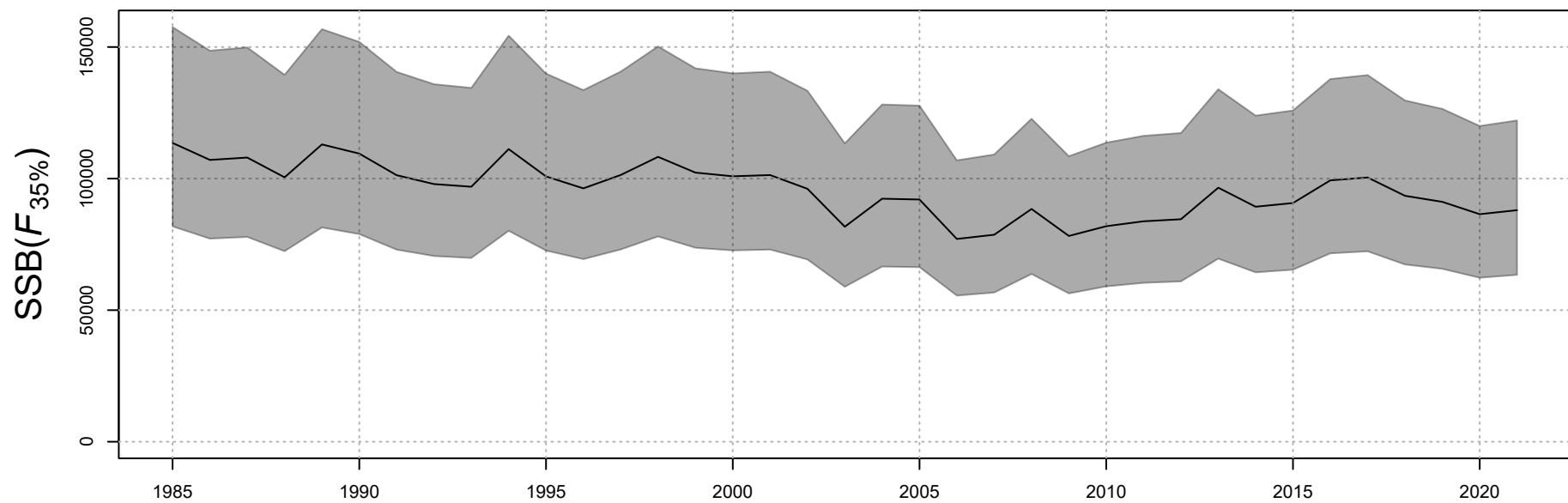
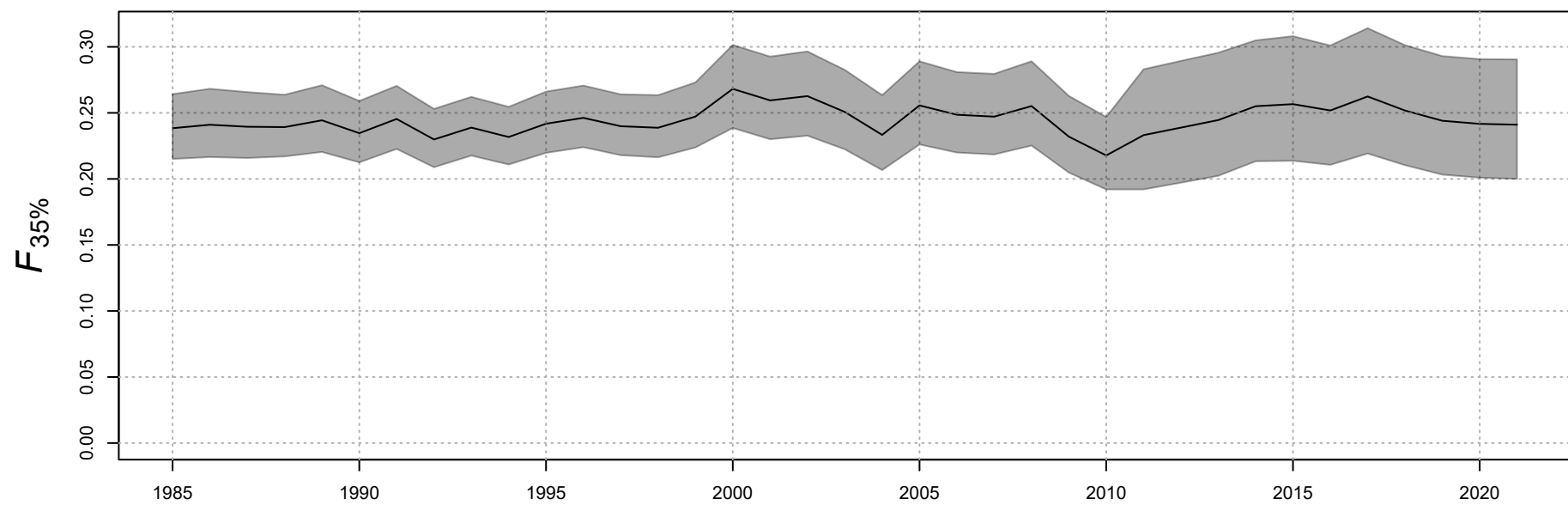
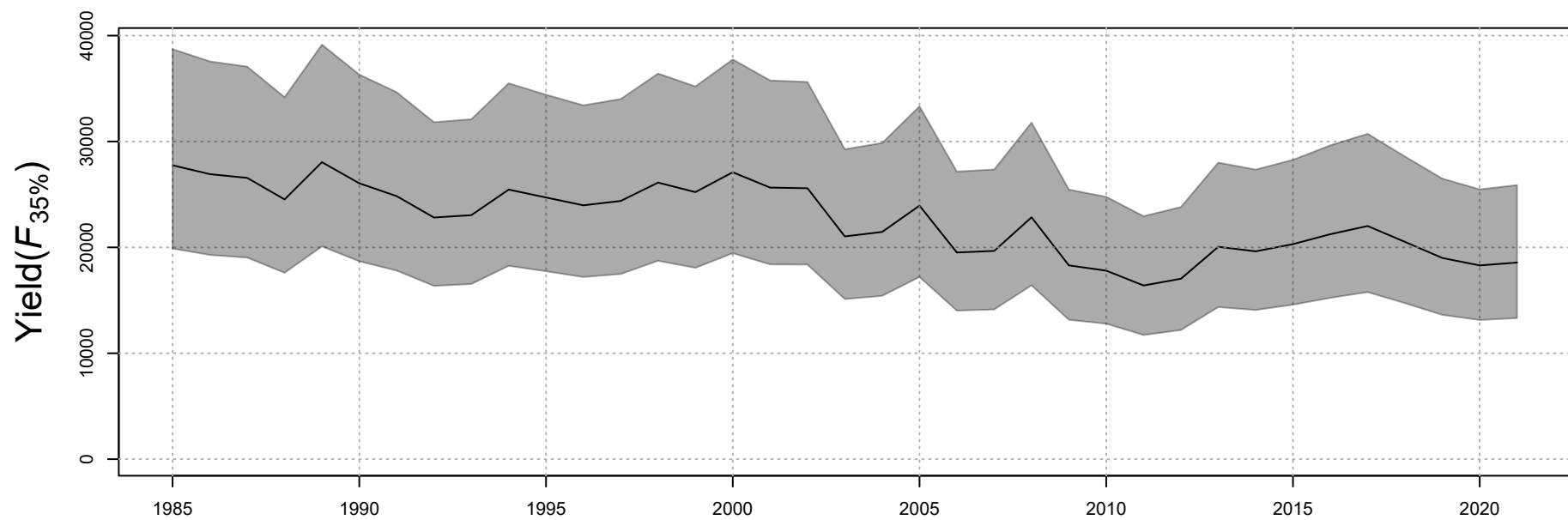
Annual $F_{\%SPR}$ Reference PointsAnnual $YPR(F_{\%SPR})$ Reference Points

Frequencies of Annual $F_{\%SPR}$ Reference Points

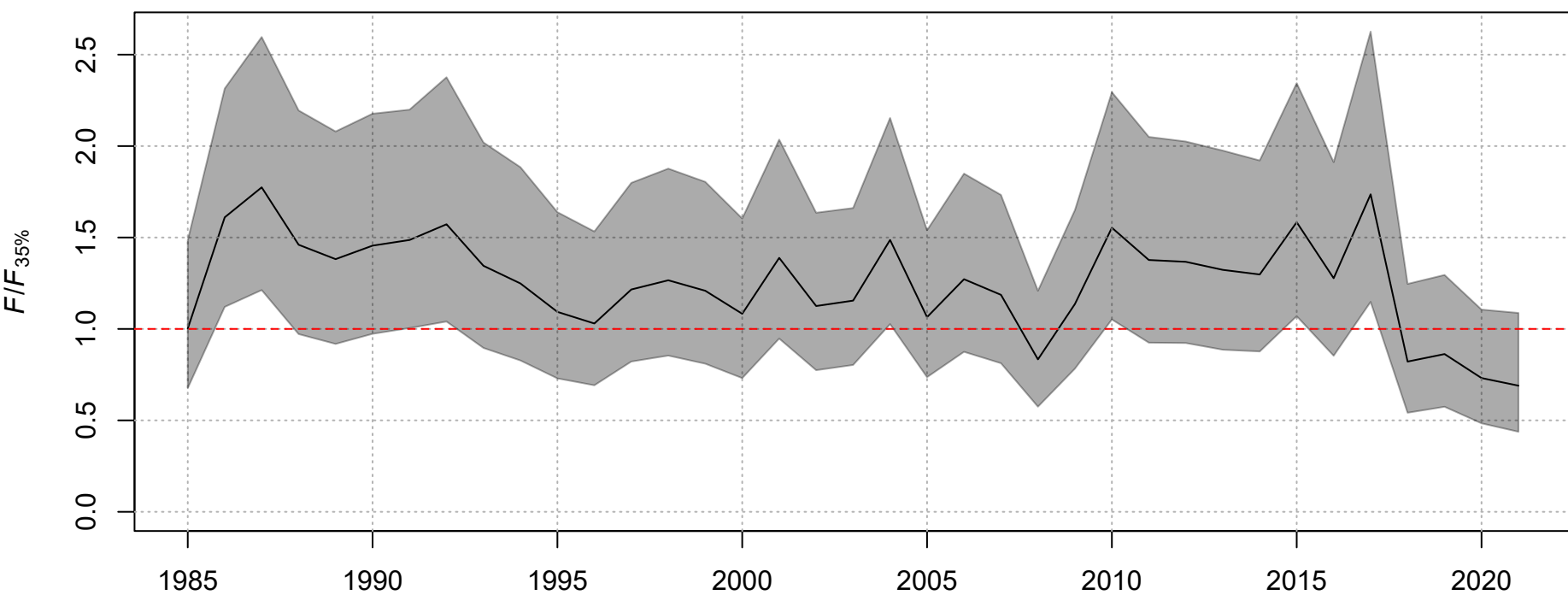
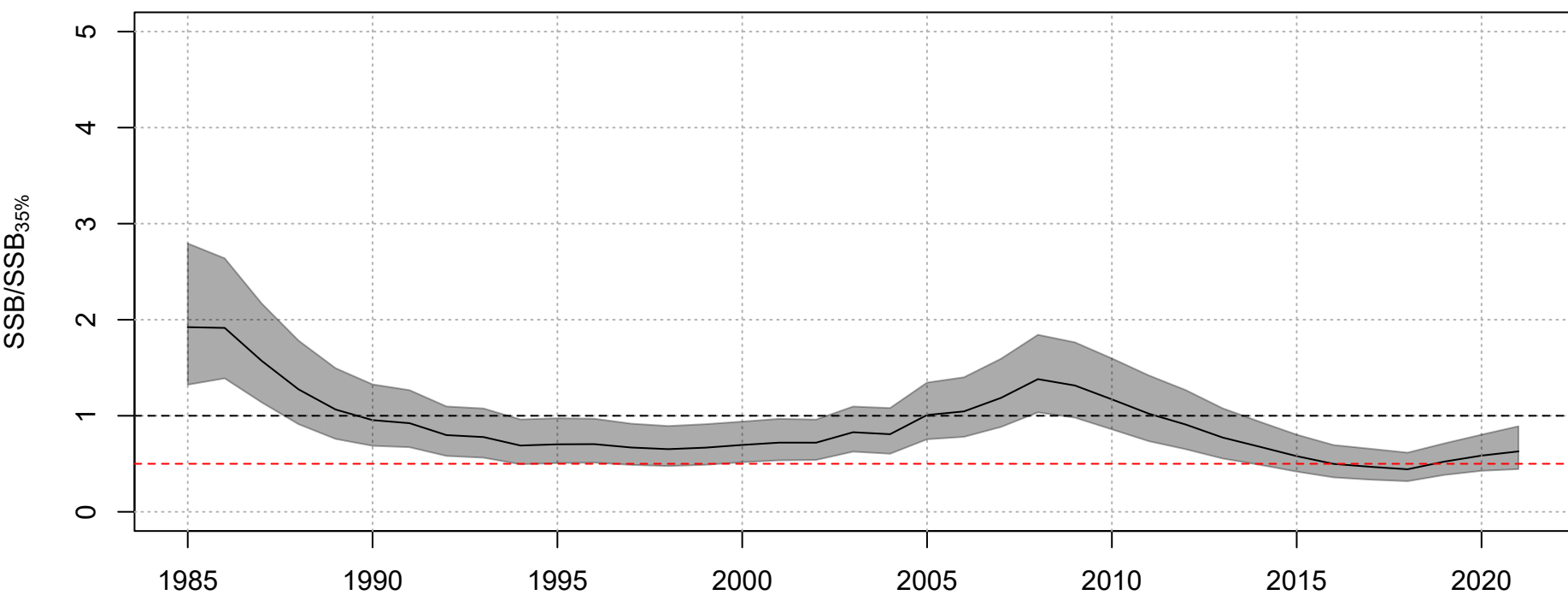


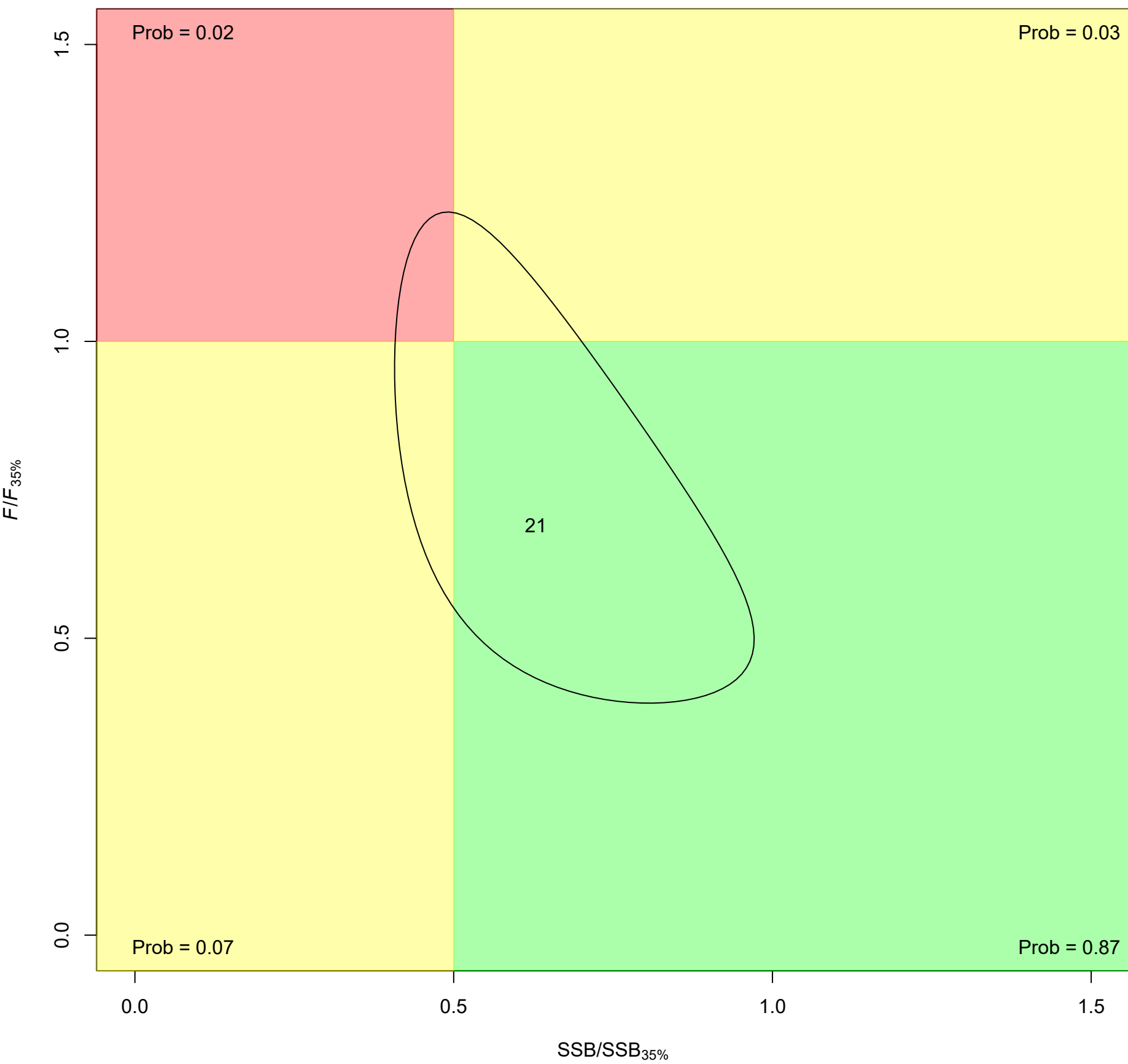
Frequencies of Annual YPR($F_{\%SPR}$) Reference Points



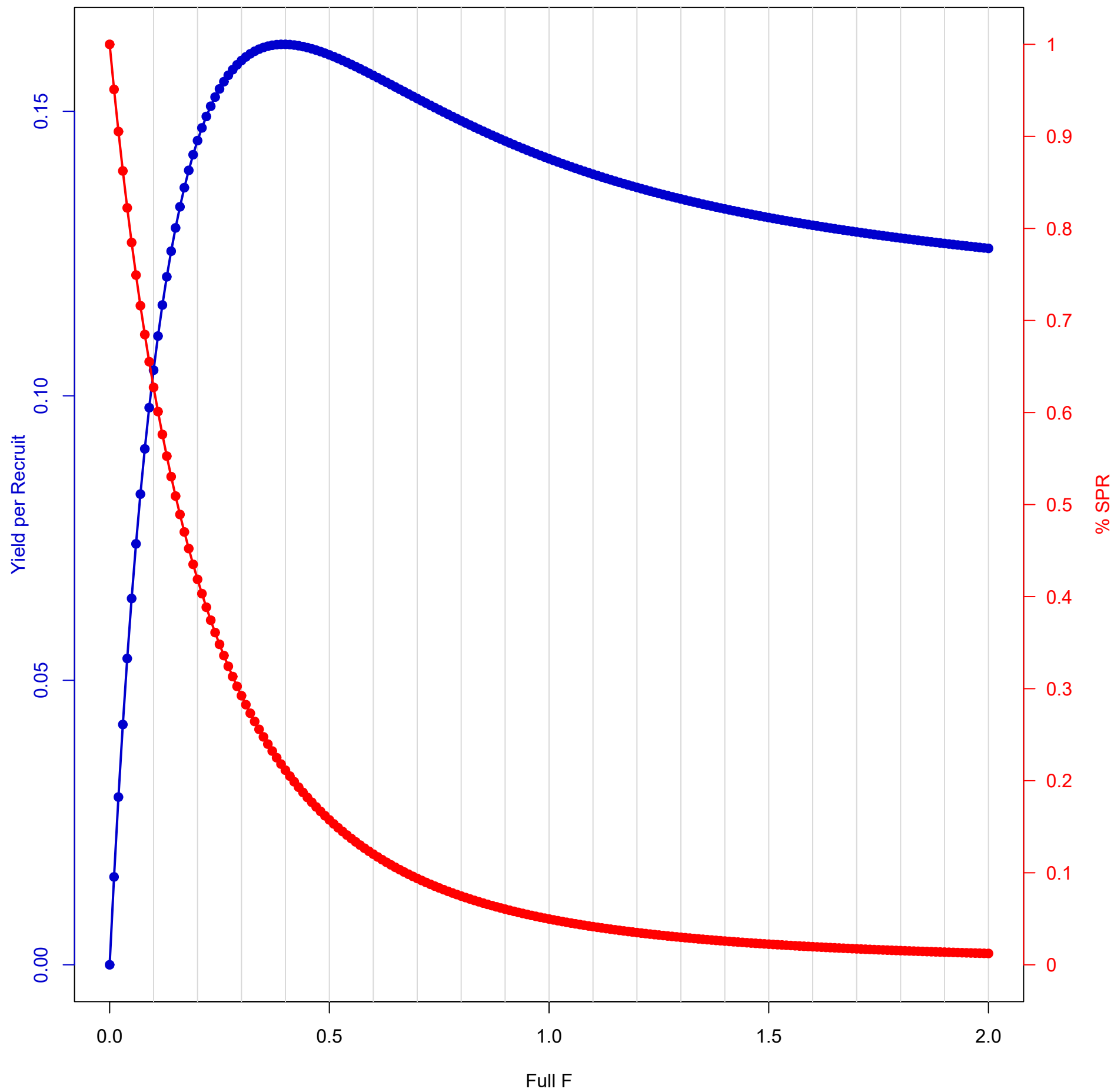


Year





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	0.1612	0.2476	0.7	0.1522	0.0938
0.01	0.0154	0.951	0.36	0.1614	0.2398	0.71	0.1518	0.0916
0.02	0.0295	0.9053	0.37	0.1616	0.2322	0.72	0.1514	0.0895
0.03	0.0422	0.8625	0.38	0.1617	0.225	0.73	0.151	0.0874
0.04	0.0538	0.8224	0.39	0.1618	0.2181	0.74	0.1506	0.0854
0.05	0.0644	0.7847	0.4	0.1618	0.2114	0.75	0.1503	0.0835
0.06	0.074	0.7493	0.41	0.1617	0.205	0.76	0.1499	0.0816
0.07	0.0827	0.7161	0.42	0.1616	0.1989	0.77	0.1495	0.0798
0.08	0.0907	0.6847	0.43	0.1615	0.193	0.78	0.1491	0.078
0.09	0.0979	0.6552	0.44	0.1614	0.1873	0.79	0.1487	0.0763
0.1	0.1045	0.6273	0.45	0.1612	0.1818	0.8	0.1483	0.0747
0.11	0.1105	0.601	0.46	0.161	0.1766	0.81	0.148	0.0731
0.12	0.116	0.5762	0.47	0.1607	0.1715	0.82	0.1476	0.0715
0.13	0.1209	0.5526	0.48	0.1605	0.1666	0.83	0.1472	0.07
0.14	0.1254	0.5304	0.49	0.1602	0.162	0.84	0.1469	0.0685
0.15	0.1295	0.5093	0.5	0.1599	0.1574	0.85	0.1465	0.0671
0.16	0.1332	0.4892	0.51	0.1596	0.1531	0.86	0.1462	0.0657
0.17	0.1366	0.4702	0.52	0.1593	0.1489	0.87	0.1458	0.0643
0.18	0.1396	0.4522	0.53	0.1589	0.1448	0.88	0.1455	0.063
0.19	0.1424	0.435	0.54	0.1586	0.1409	0.89	0.1451	0.0617
0.2	0.1449	0.4187	0.55	0.1582	0.1372	0.9	0.1448	0.0605
0.21	0.1471	0.4032	0.56	0.1579	0.1335	0.91	0.1445	0.0593
0.22	0.1491	0.3885	0.57	0.1575	0.13	0.92	0.1441	0.0581
0.23	0.1509	0.3744	0.58	0.1571	0.1266	0.93	0.1438	0.0569
0.24	0.1525	0.361	0.59	0.1567	0.1234	0.94	0.1435	0.0558
0.25	0.1539	0.3482	0.6	0.1563	0.1202	0.95	0.1432	0.0547
0.26	0.1552	0.336	0.61	0.1559	0.1172	0.96	0.1429	0.0537
0.27	0.1563	0.3243	0.62	0.1555	0.1142	0.97	0.1426	0.0527
0.28	0.1573	0.3132	0.63	0.1551	0.1114	0.98	0.1423	0.0517
0.29	0.1582	0.3025	0.64	0.1547	0.1086	0.99	0.142	0.0507
0.3	0.1589	0.2923	0.65	0.1543	0.1059	1	0.1417	0.0497
0.31	0.1596	0.2826	0.66	0.1539	0.1033	1.01	0.1414	0.0488
0.32	0.1601	0.2733	0.67	0.1535	0.1009	1.02	0.1411	0.0479
0.33	0.1606	0.2644	0.68	0.1531	0.0984	1.03	0.1408	0.047
0.34	0.1609	0.2558	0.69	0.1527	0.0961	1.04	0.1405	0.0462