

WHAM Diagnostic Plots

Anthony Wood

October 2022

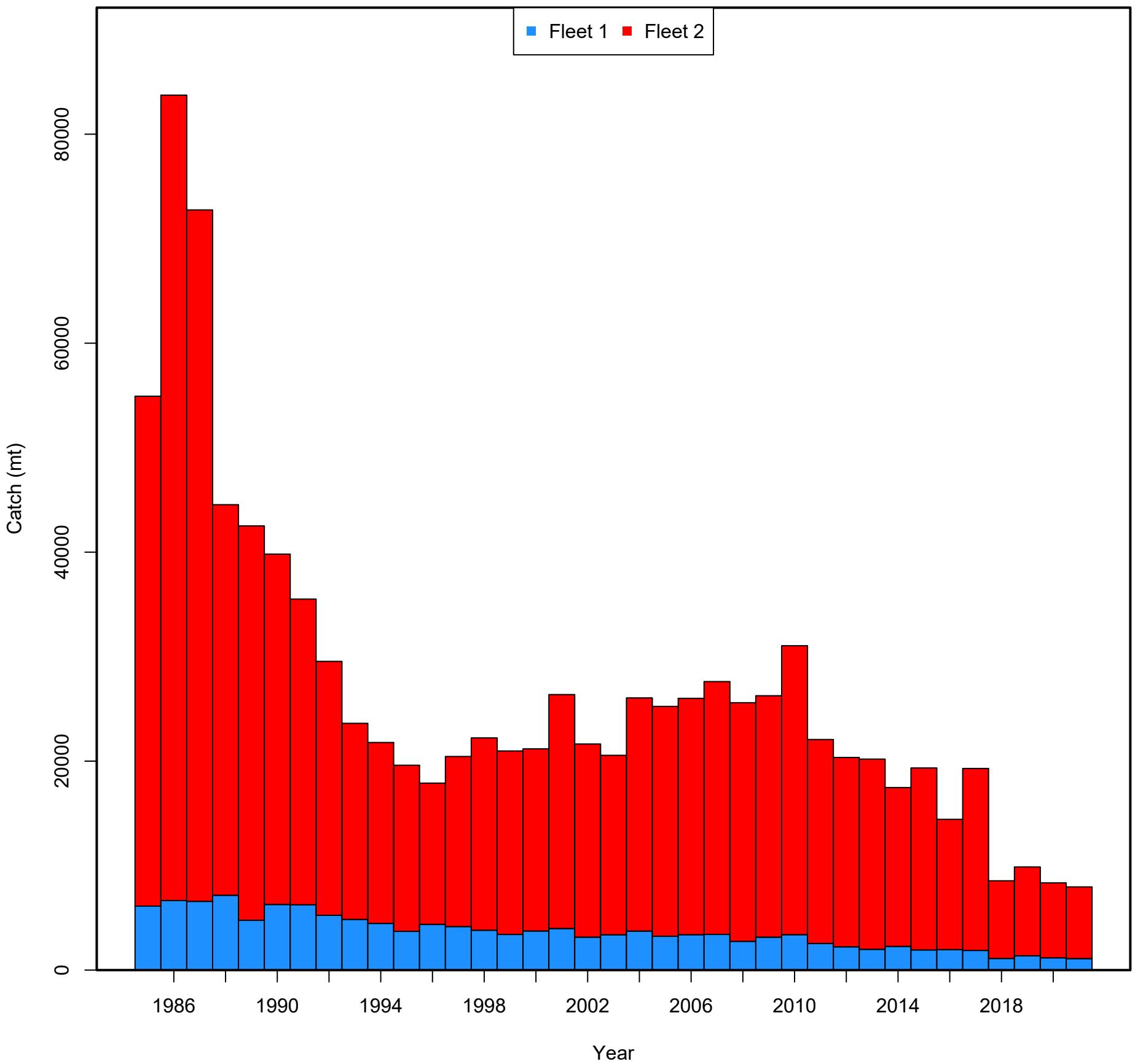
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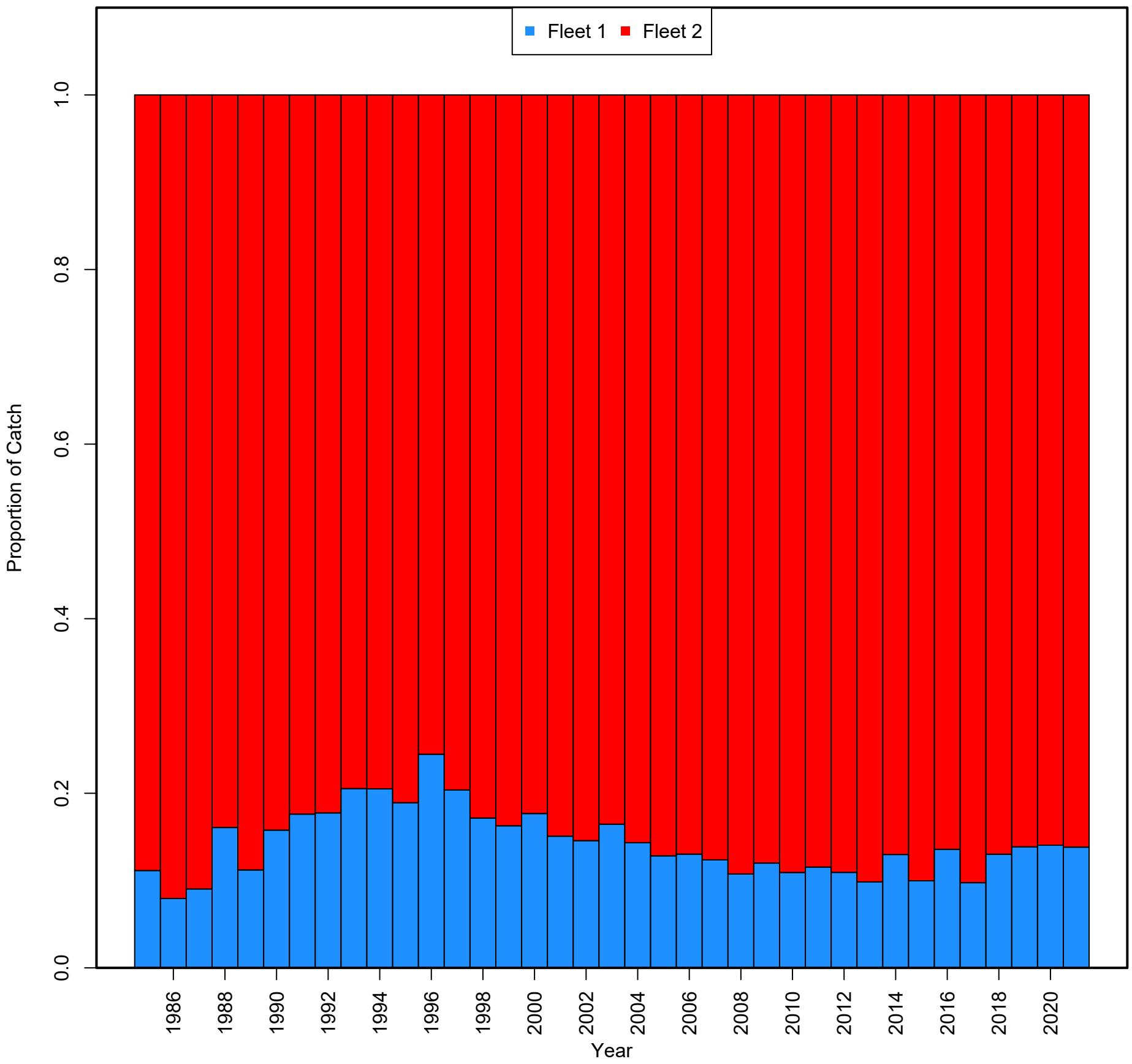
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BF28W_M7: FINAL MODEL

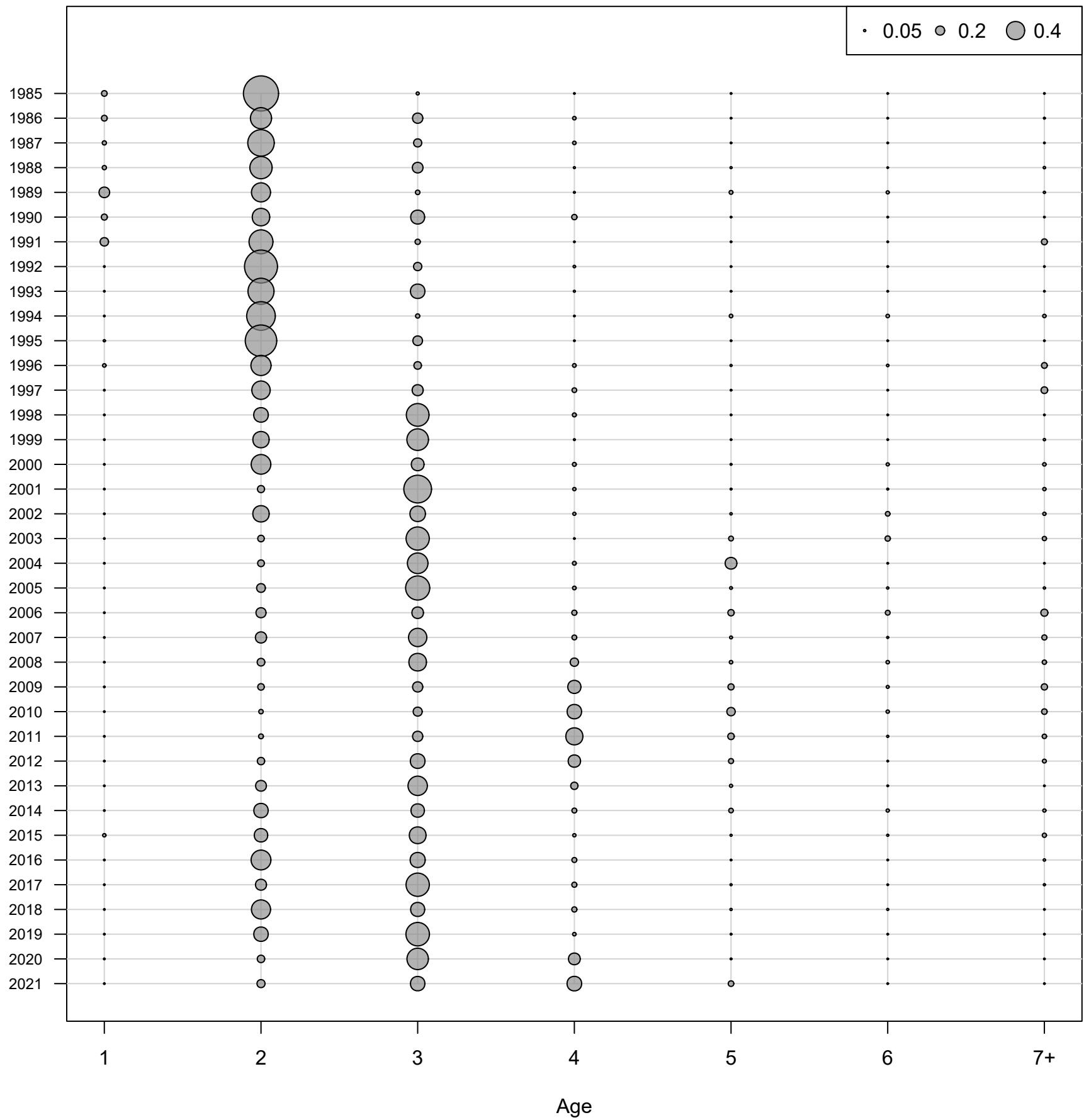
Final bluefish model with NAA transitions modeled as random effects correlated by age and year

DATA PLOTS

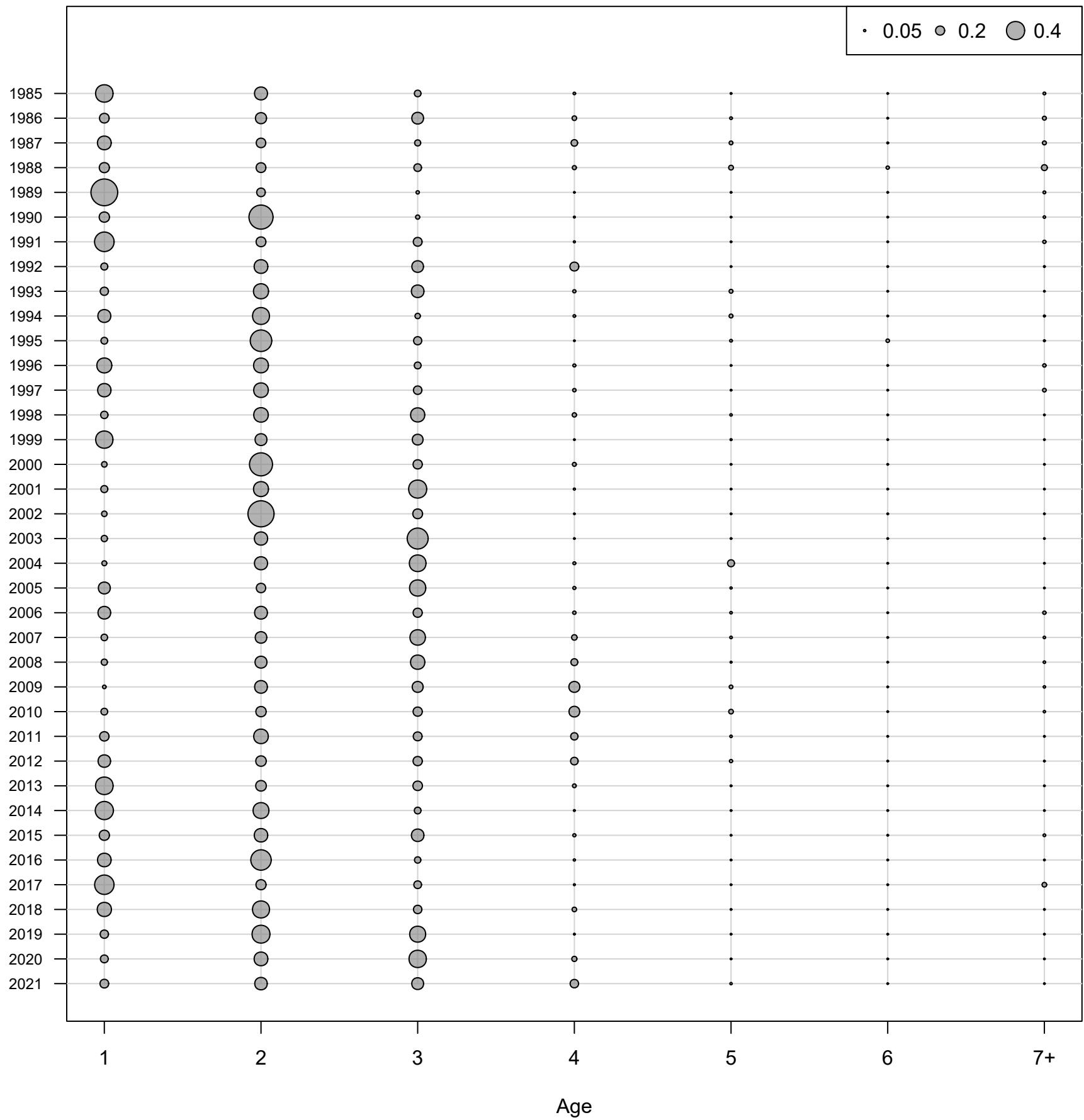


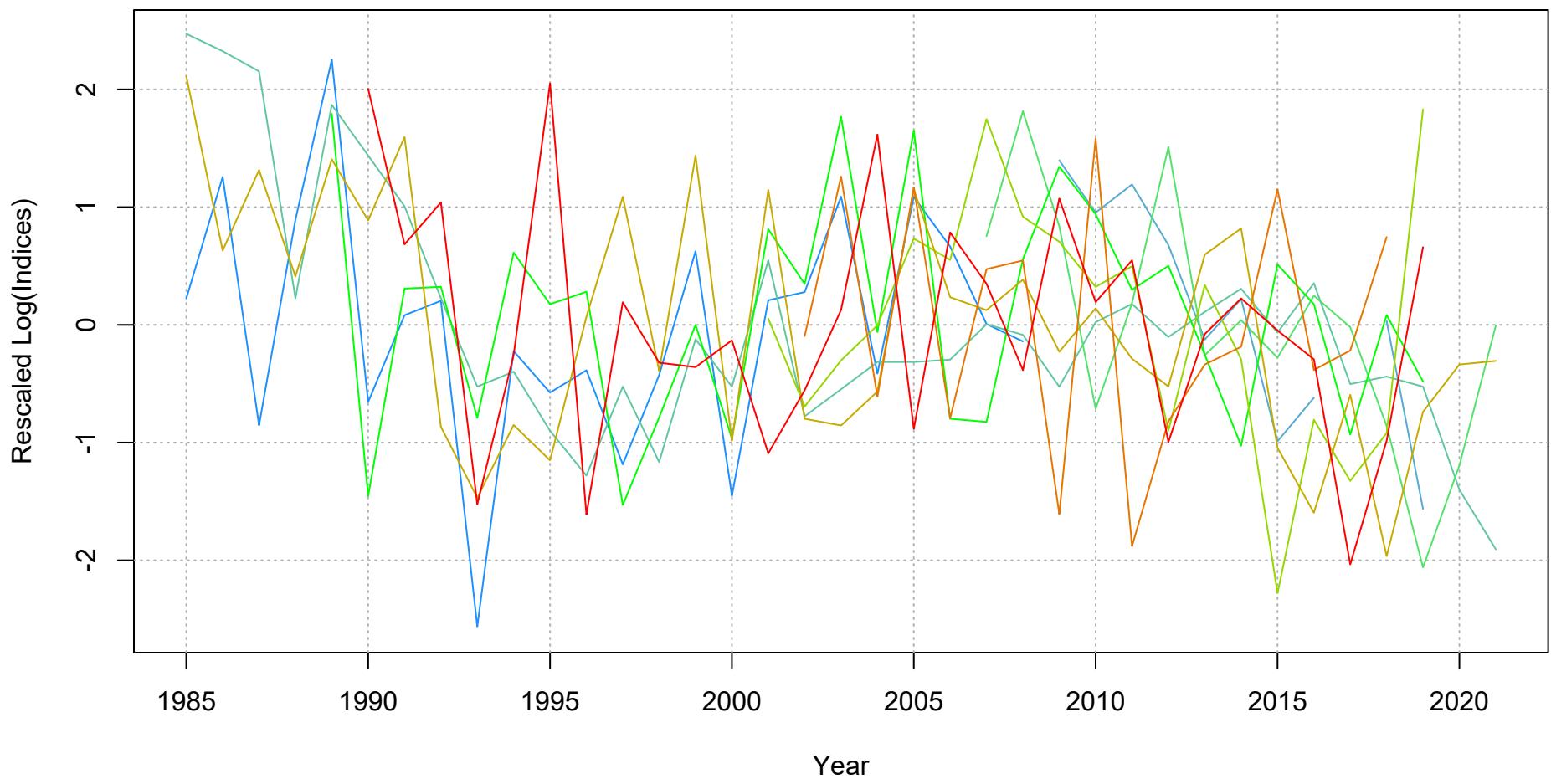
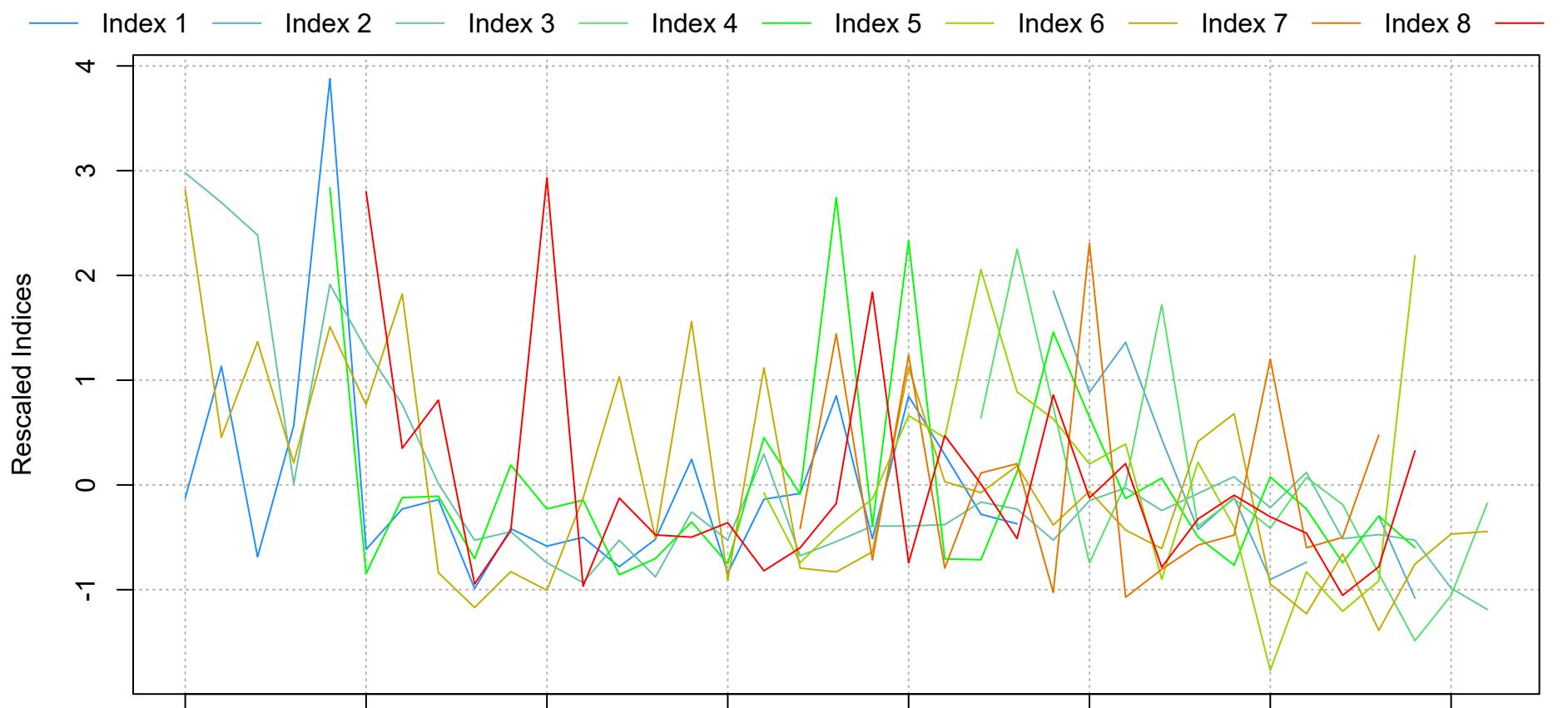


Age Comps for Catch for Fleet 1

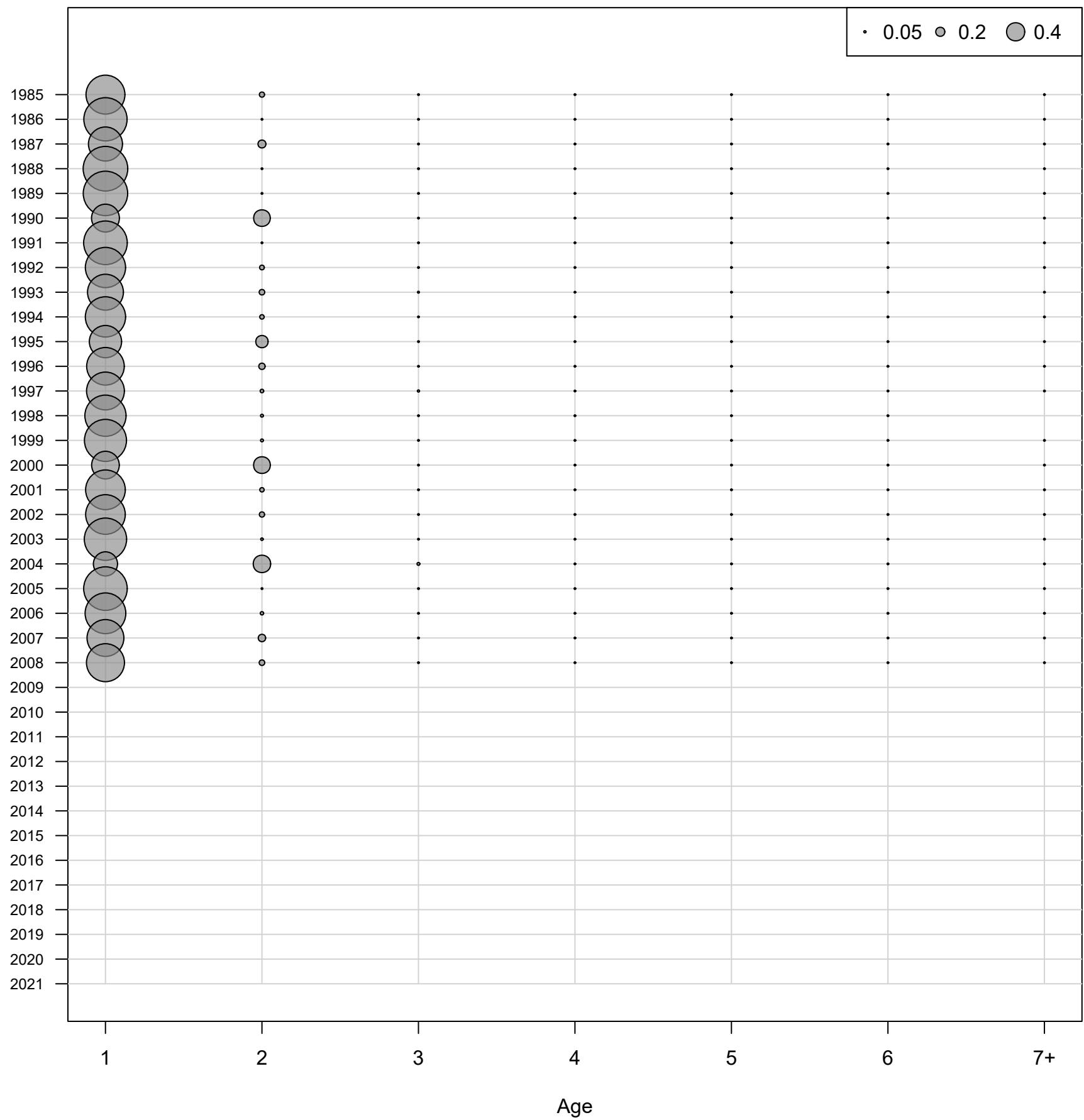


Age Comps for Catch for Fleet 2

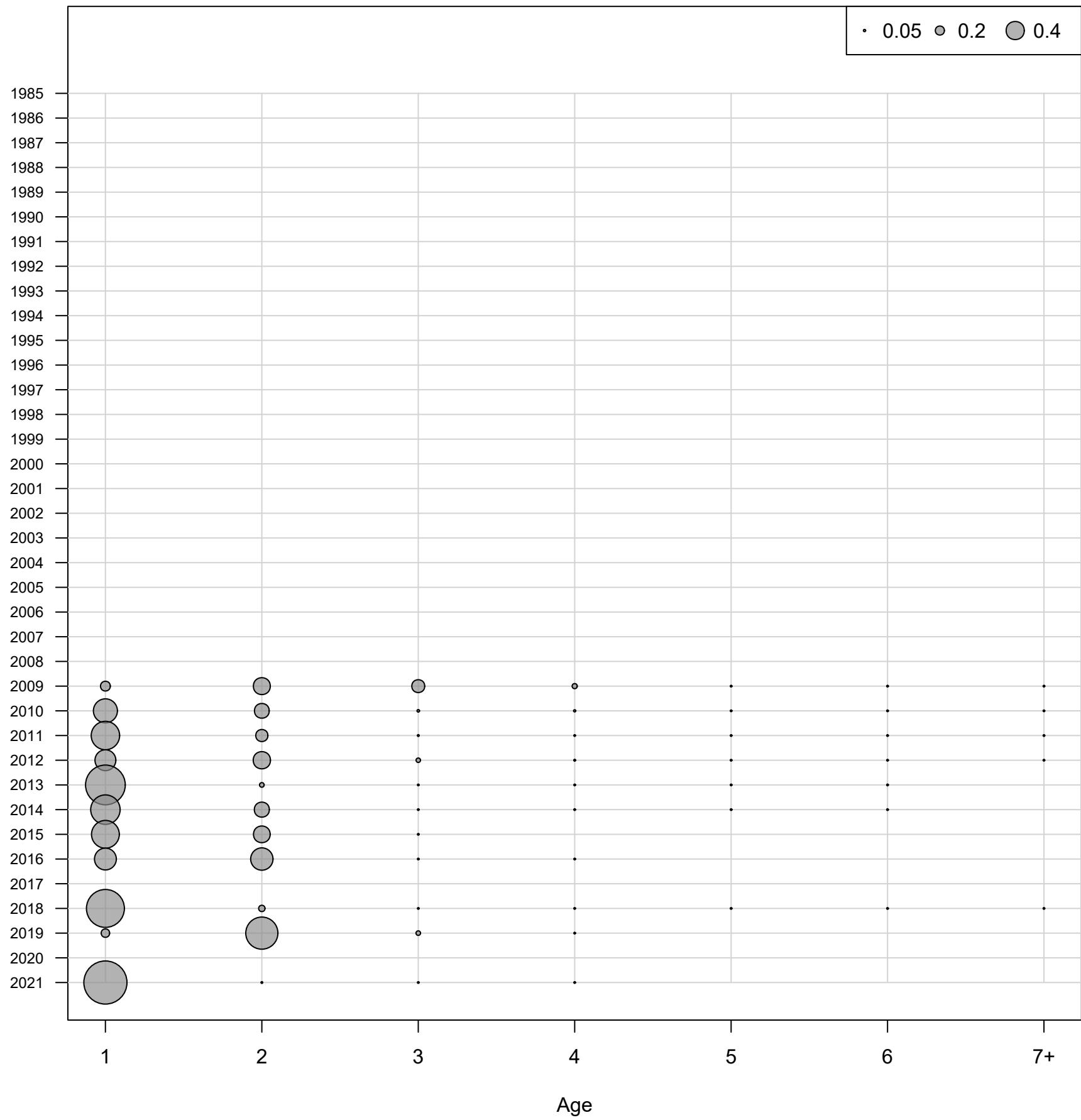




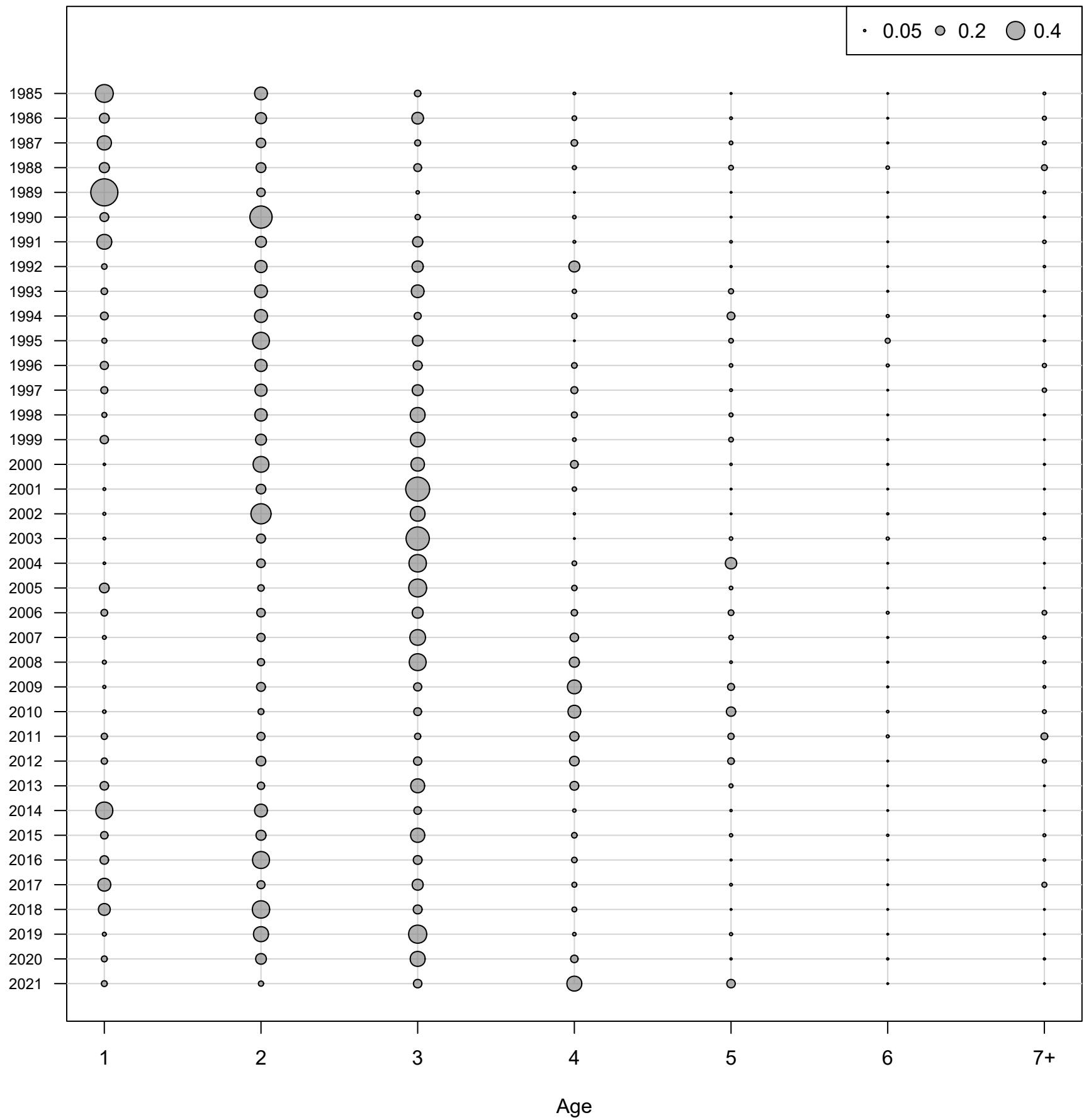
Age Comps for Index 1



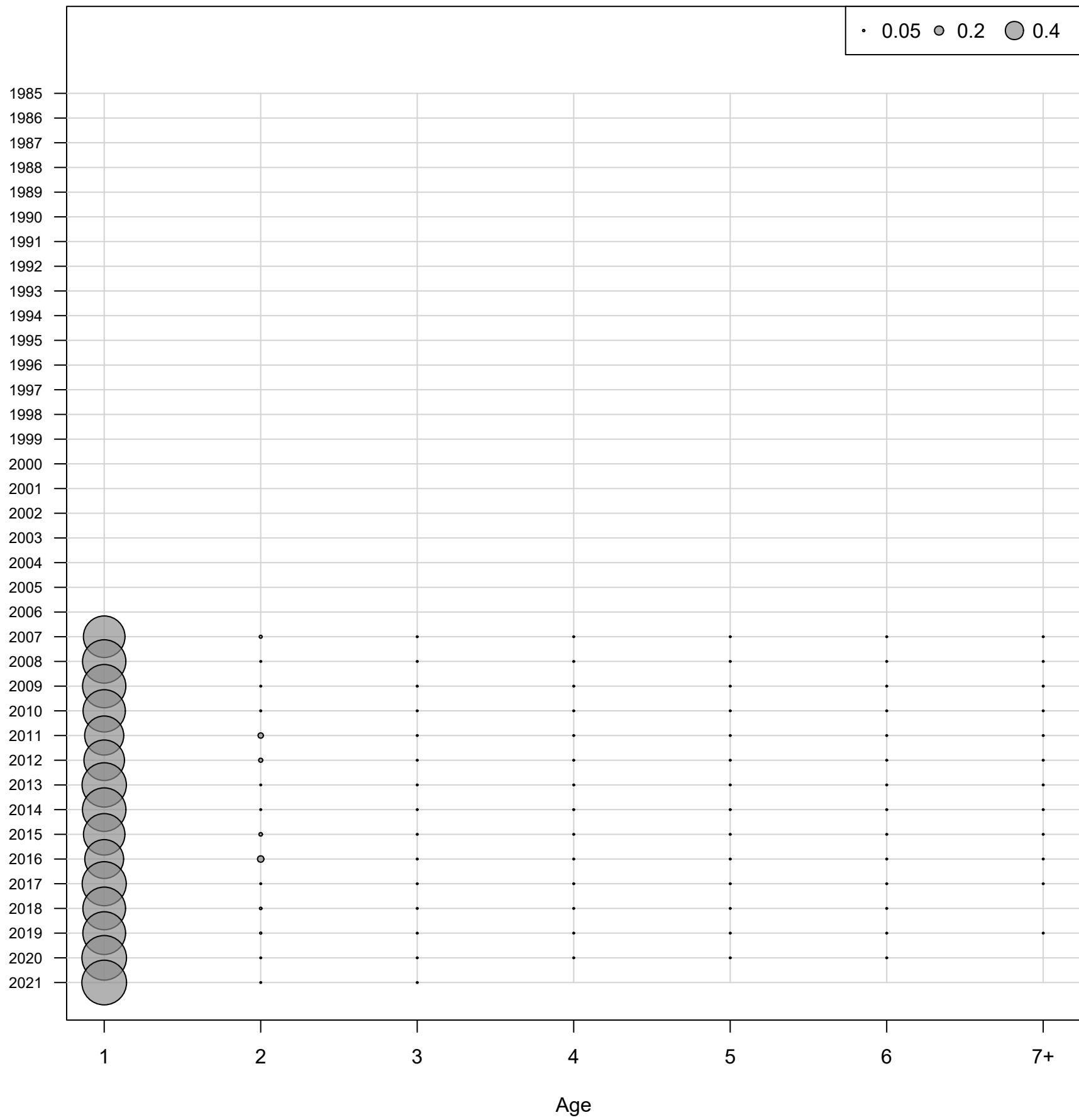
Age Comps for Index 2



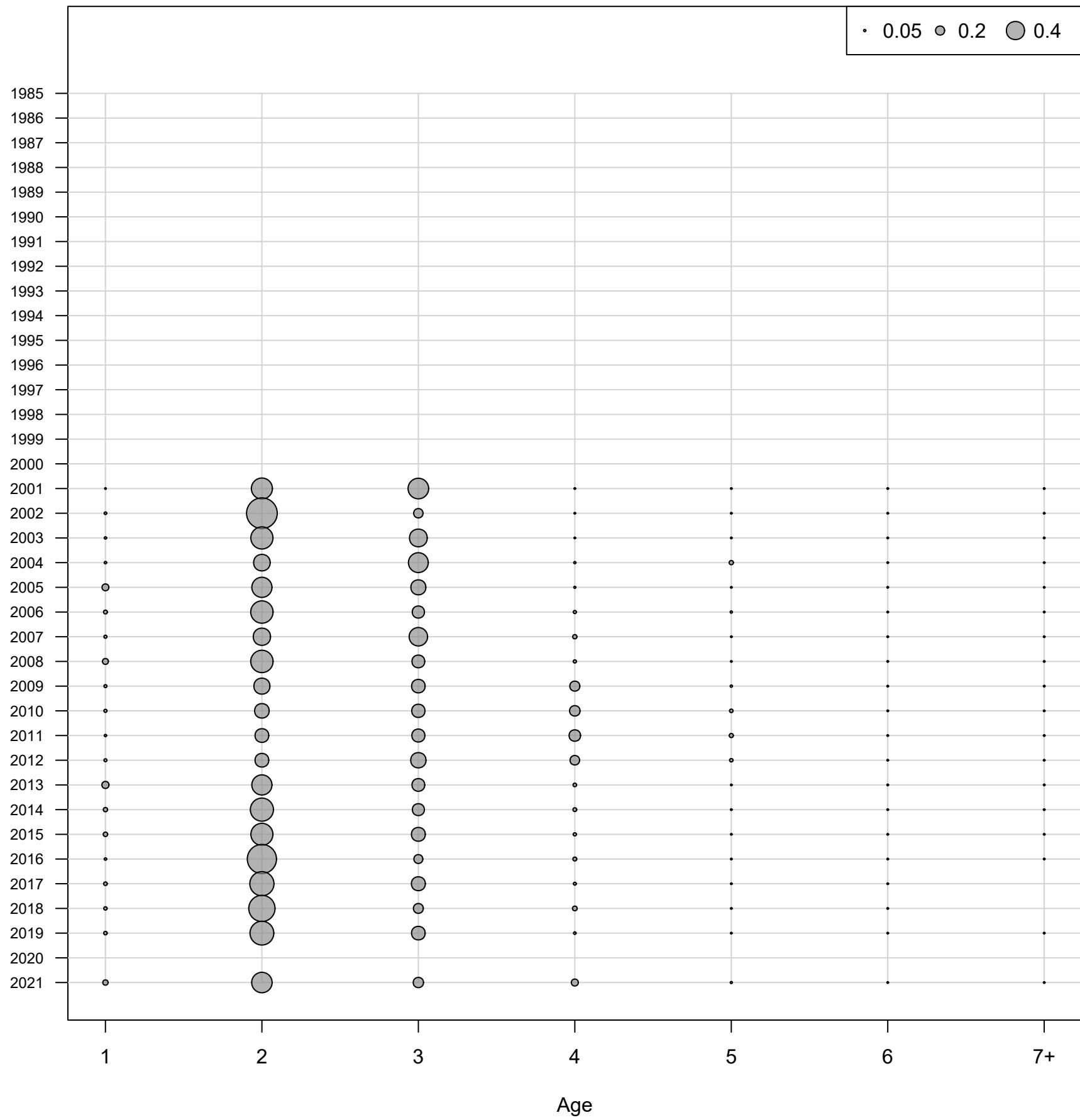
Age Comps for Index 3



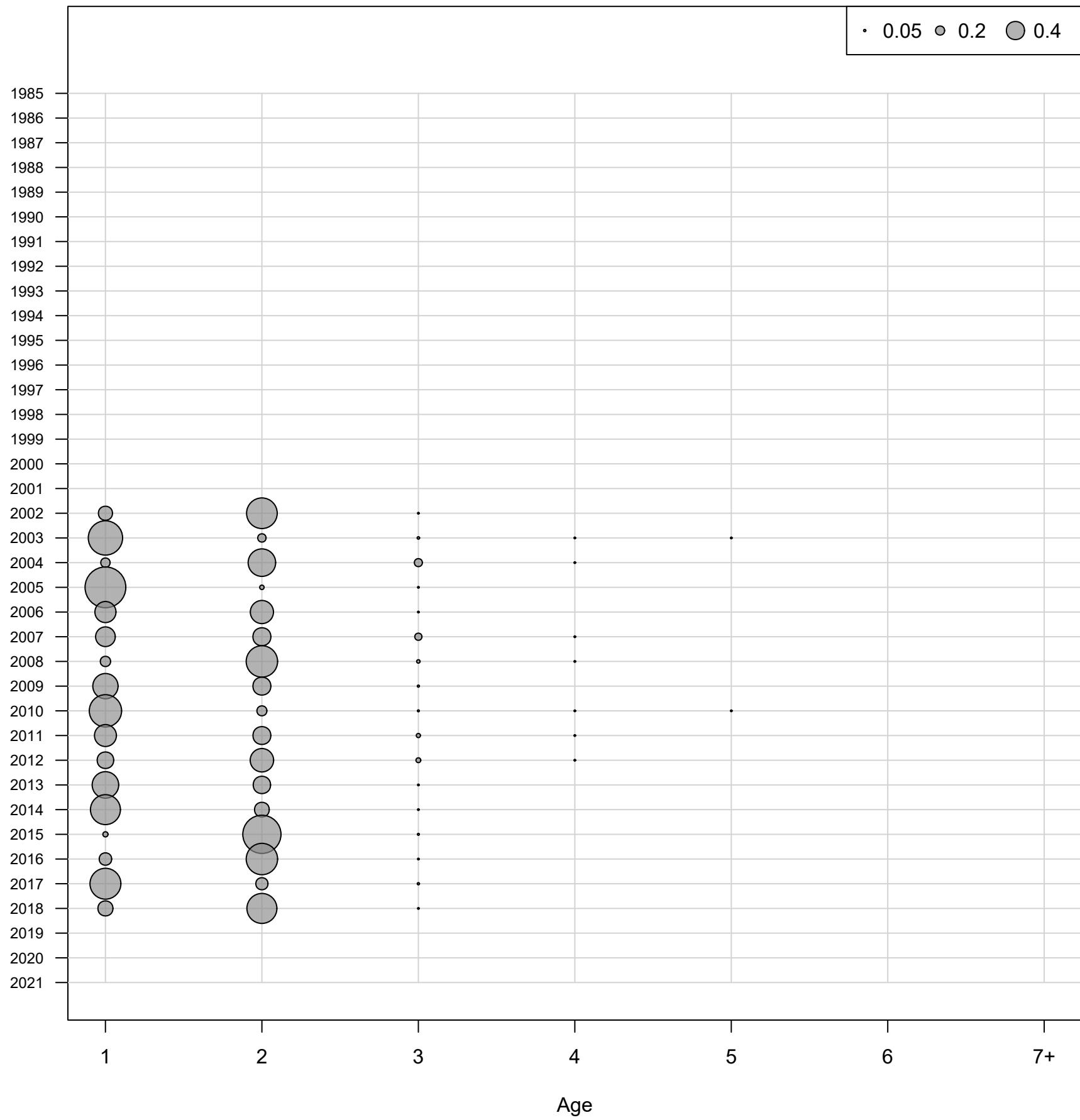
Age Comps for Index 4



Age Comps for Index 6



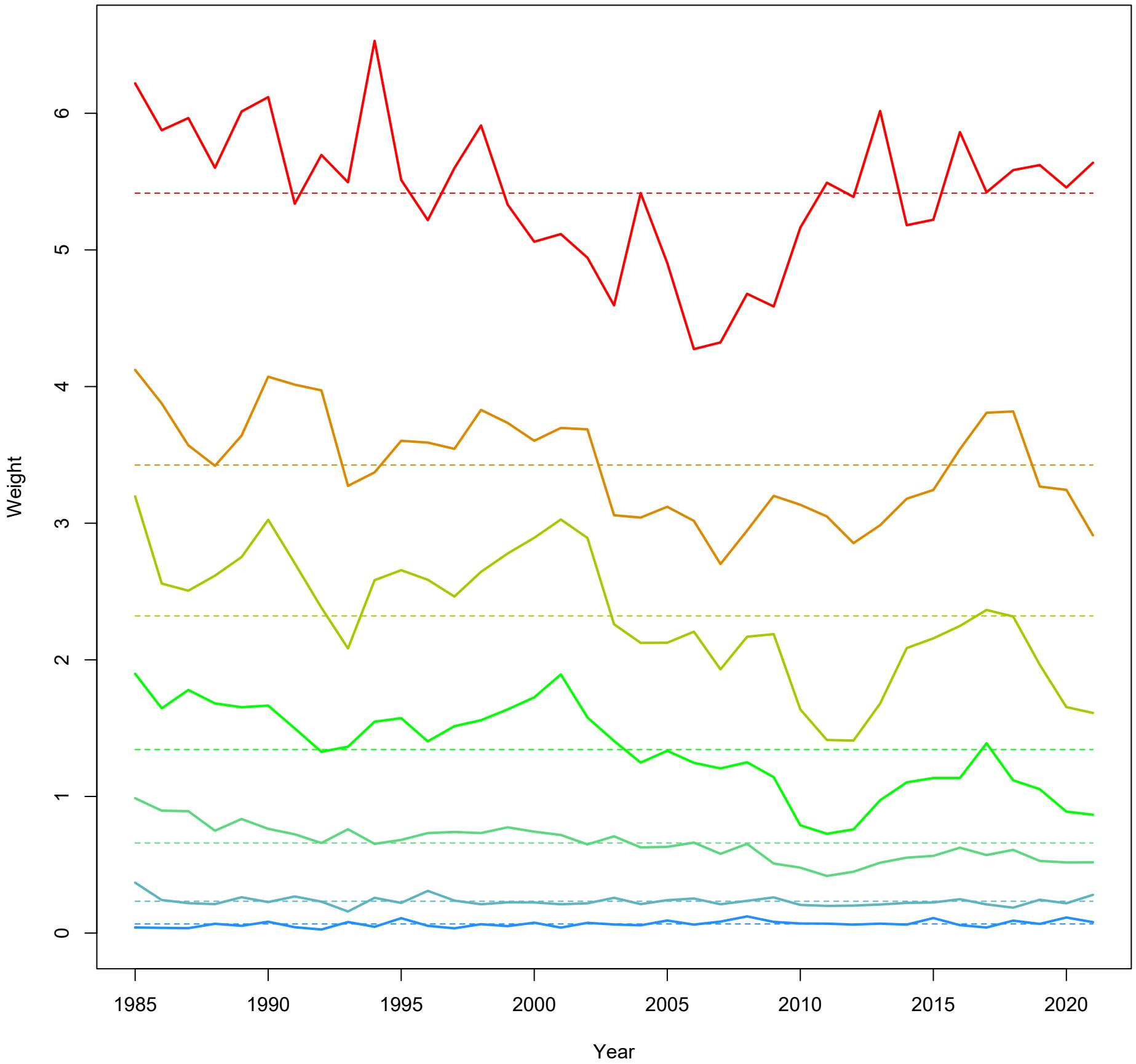
Age Comps for Index 8



Annual Weight-at-Age for SSB



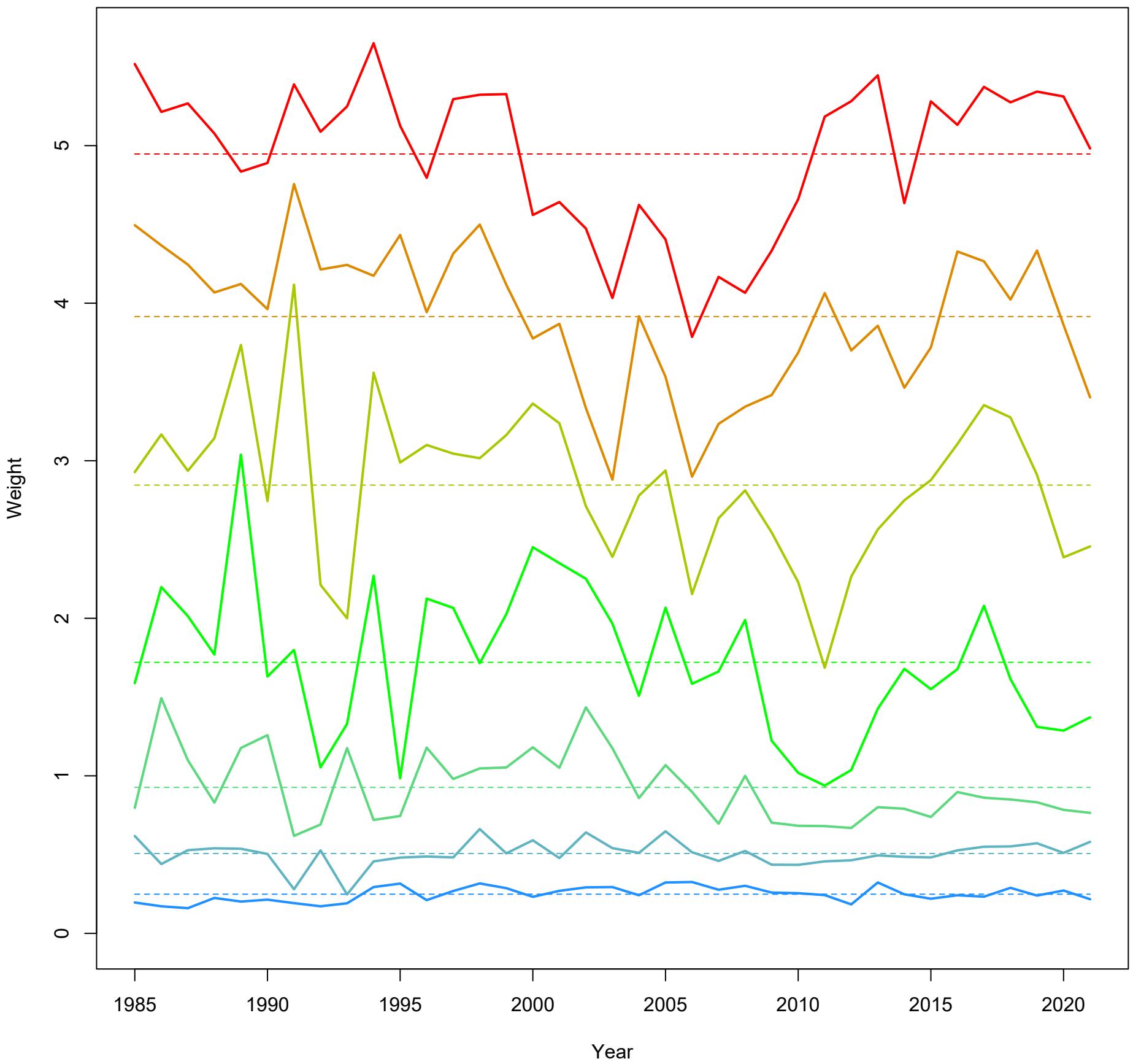
Annual Weight-at-Age for January 1 Biomass



Annual Weight-at-Age for Total Catch



Annual Weight-at-Age for Fleet 1



Annual Weight-at-Age for Fleet 2



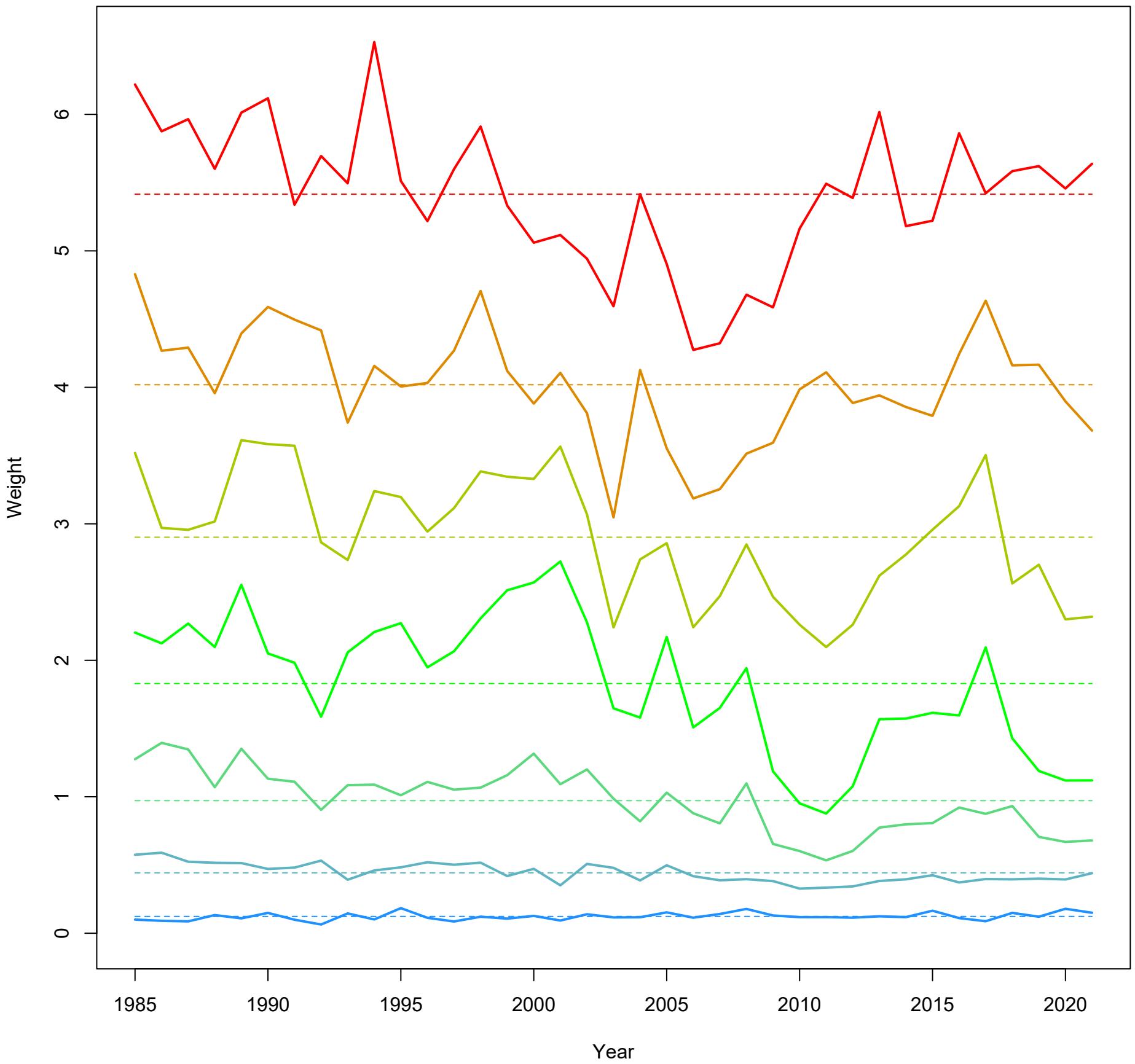
Annual Weight-at-Age for Index 1



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



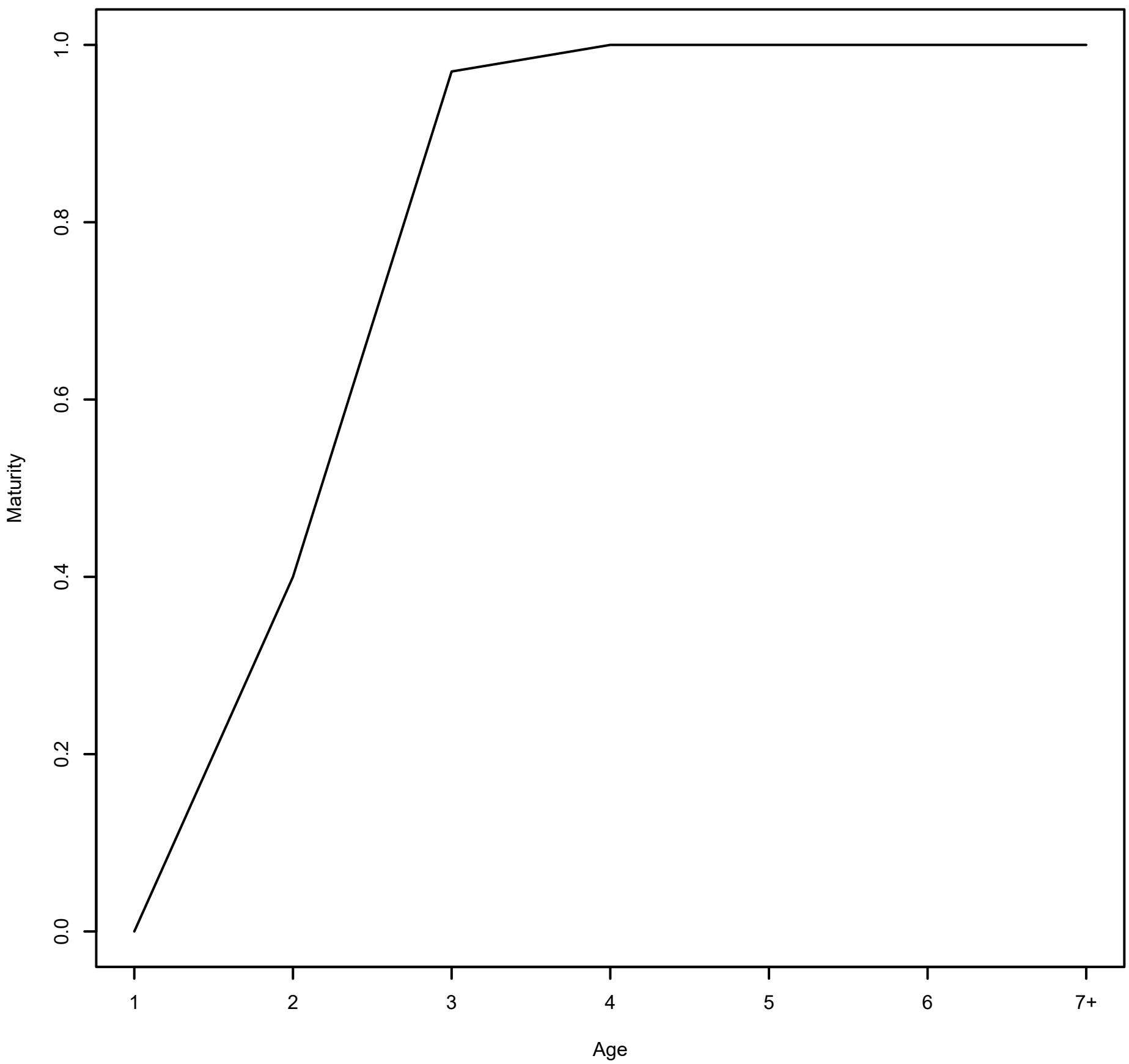
Annual Weight-at-Age for Index 8



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,

Fleet 1 Selectivity Blocks: c(1, 2)

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

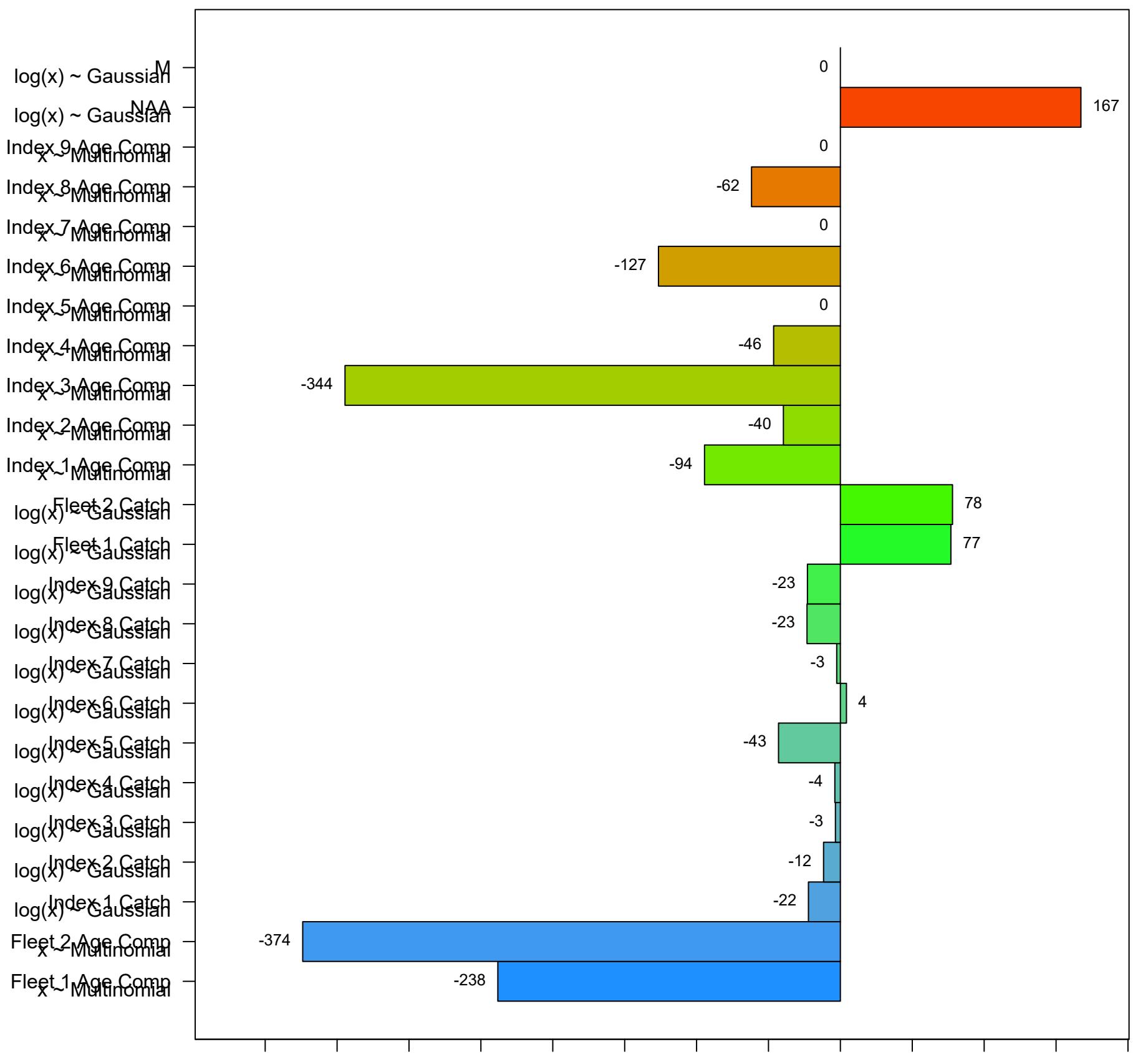
Index 1 Selectivity Blocks: 6

Index 2 Selectivity Blocks: 7

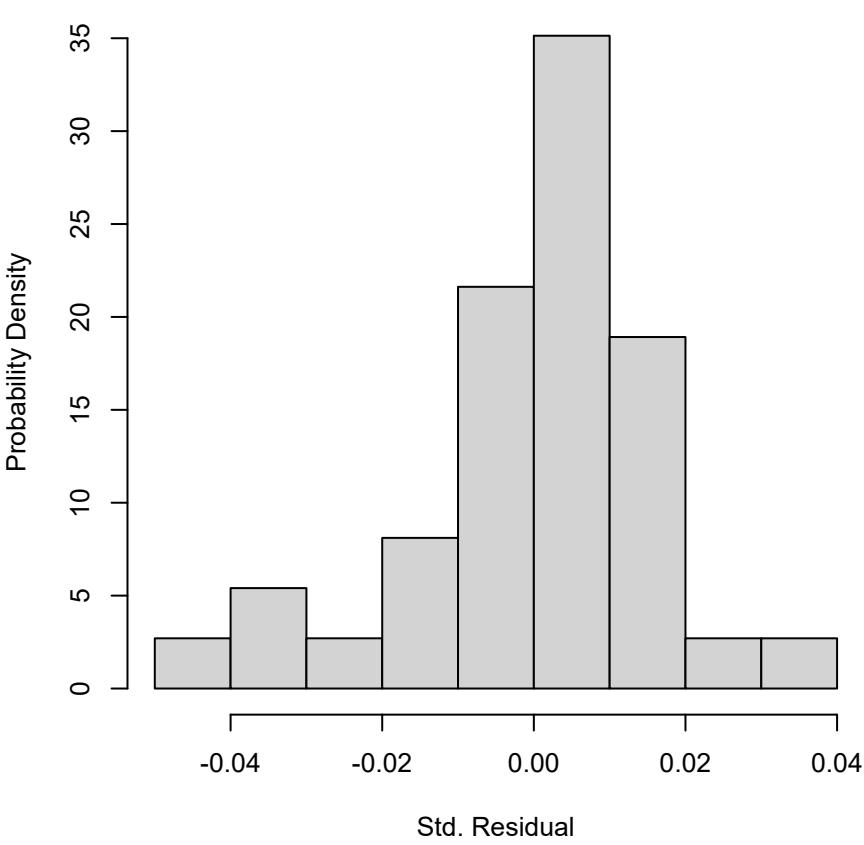
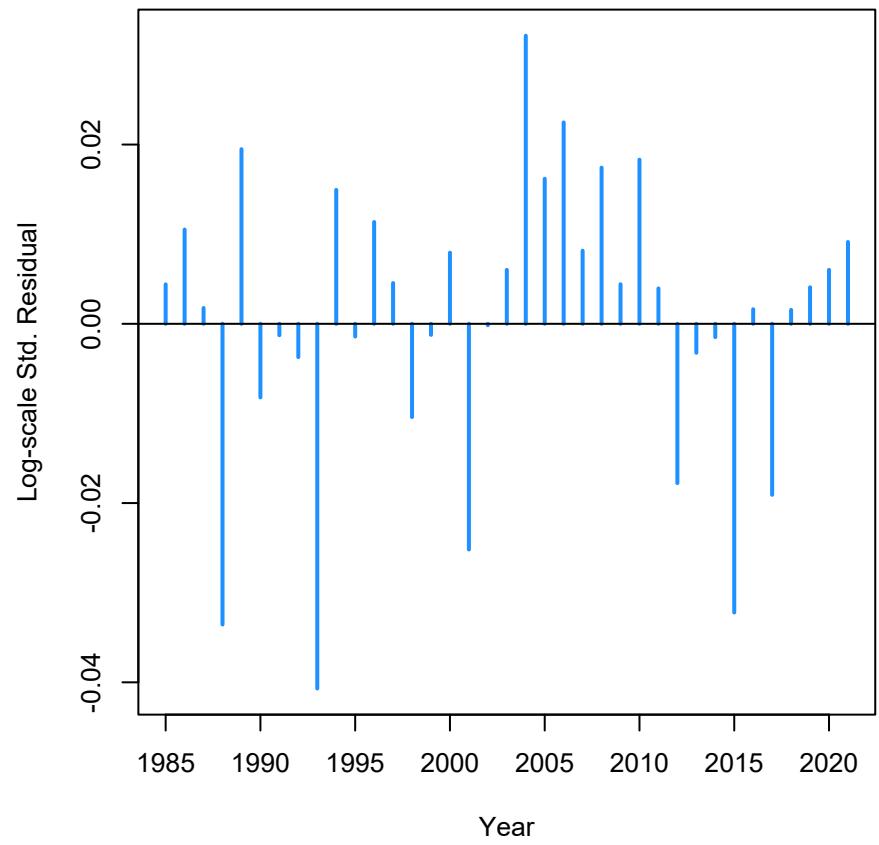
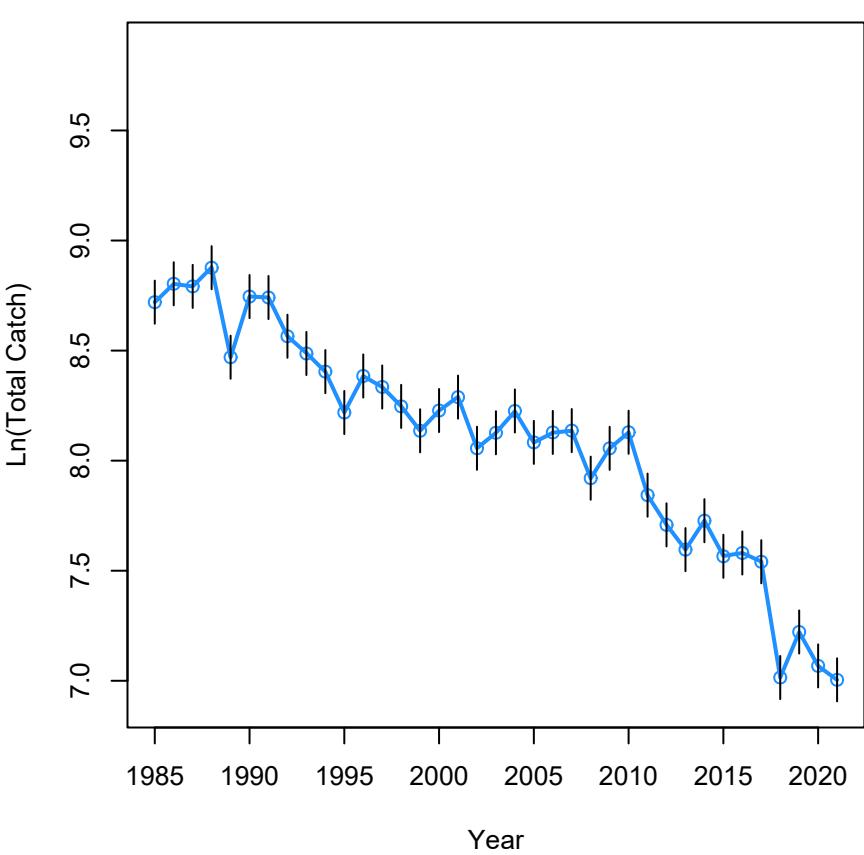
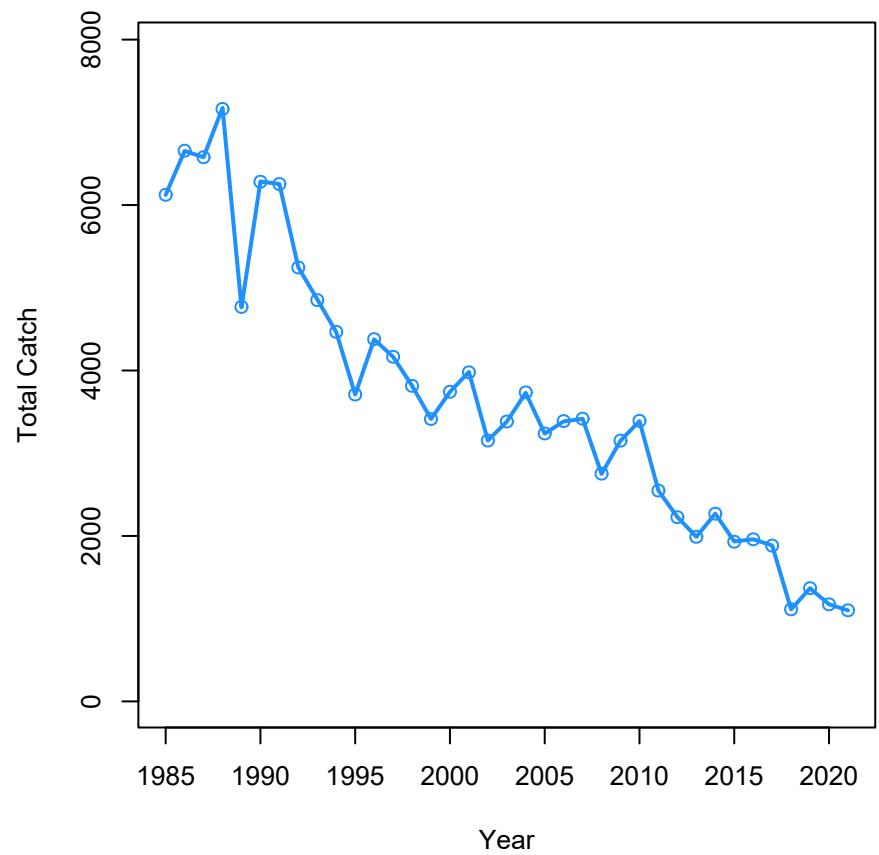
Index 3 Selectivity Blocks: 8

Index 4 Selectivity Blocks: 9

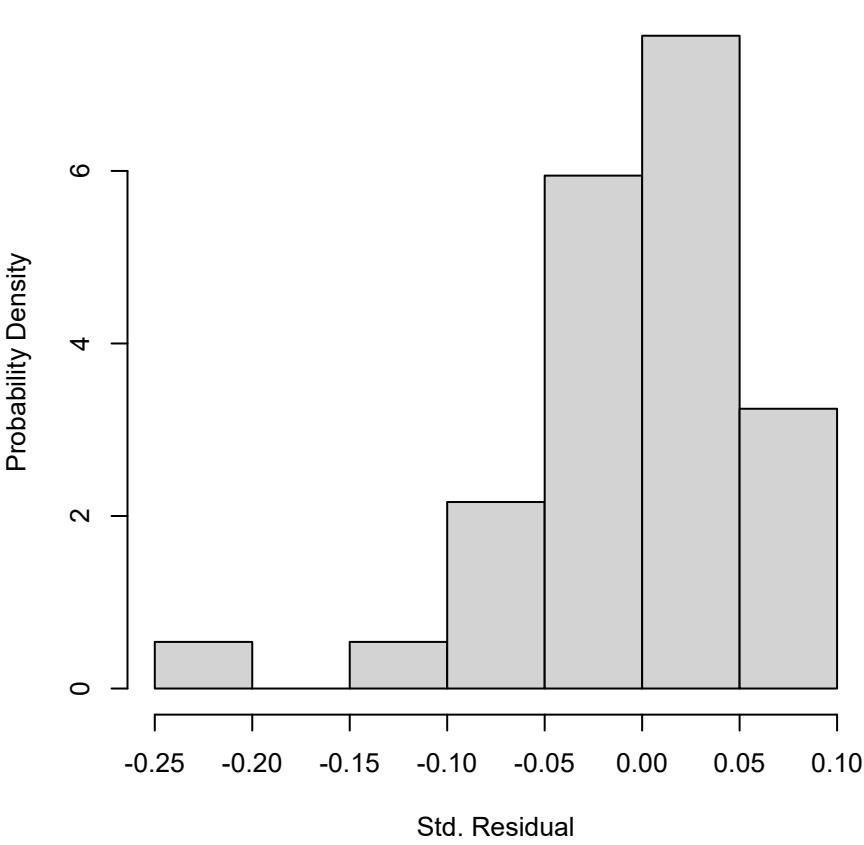
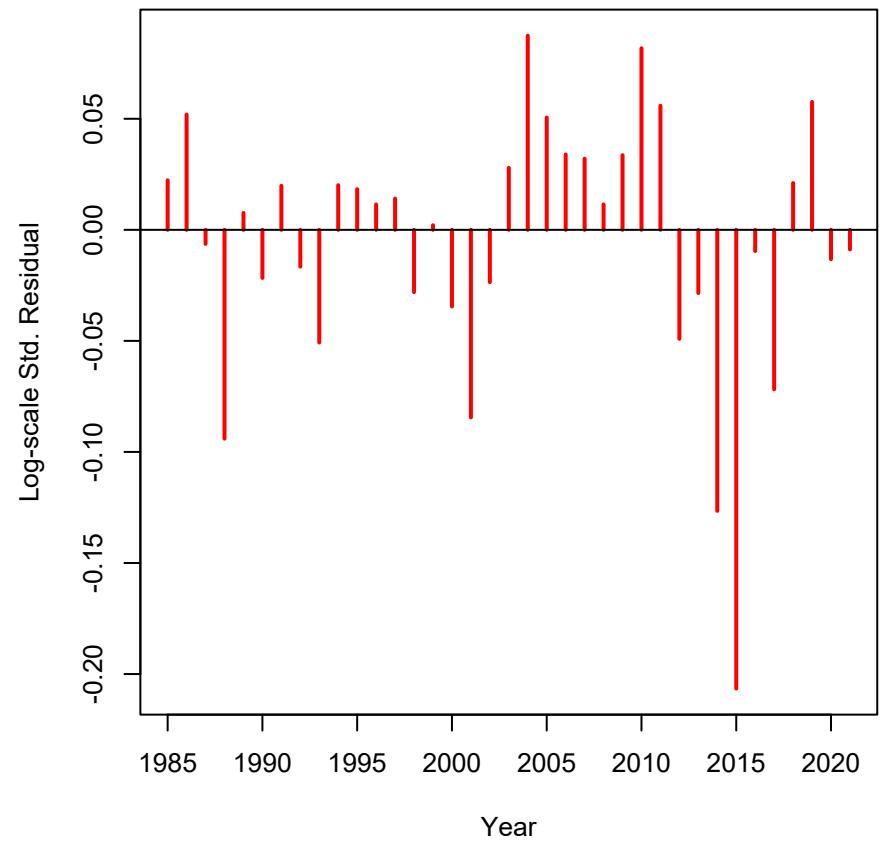
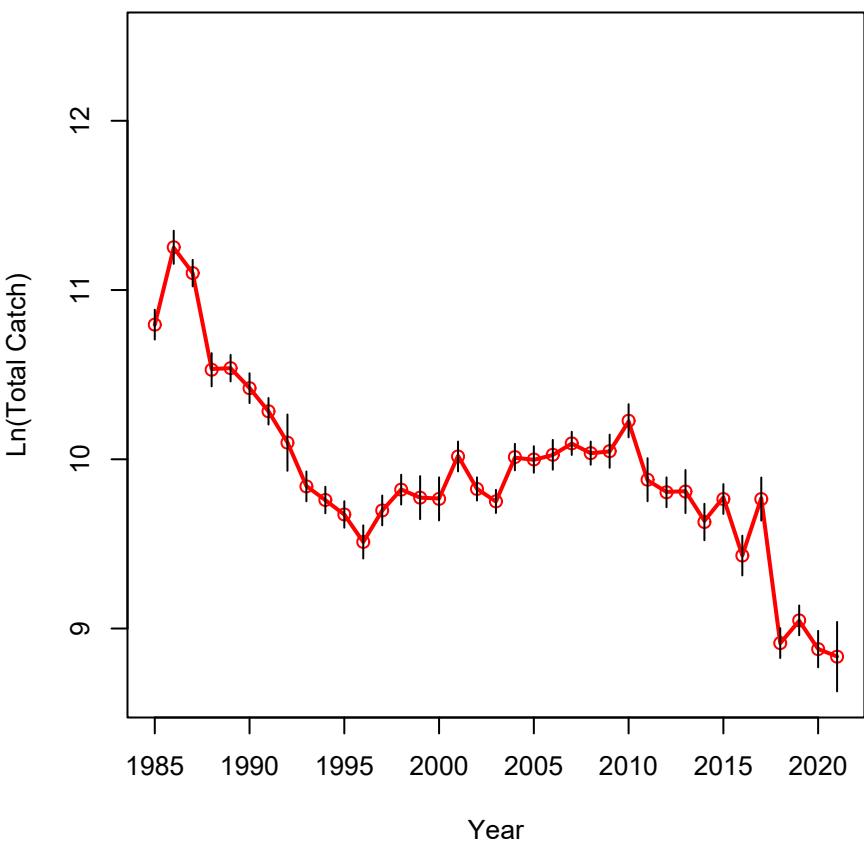
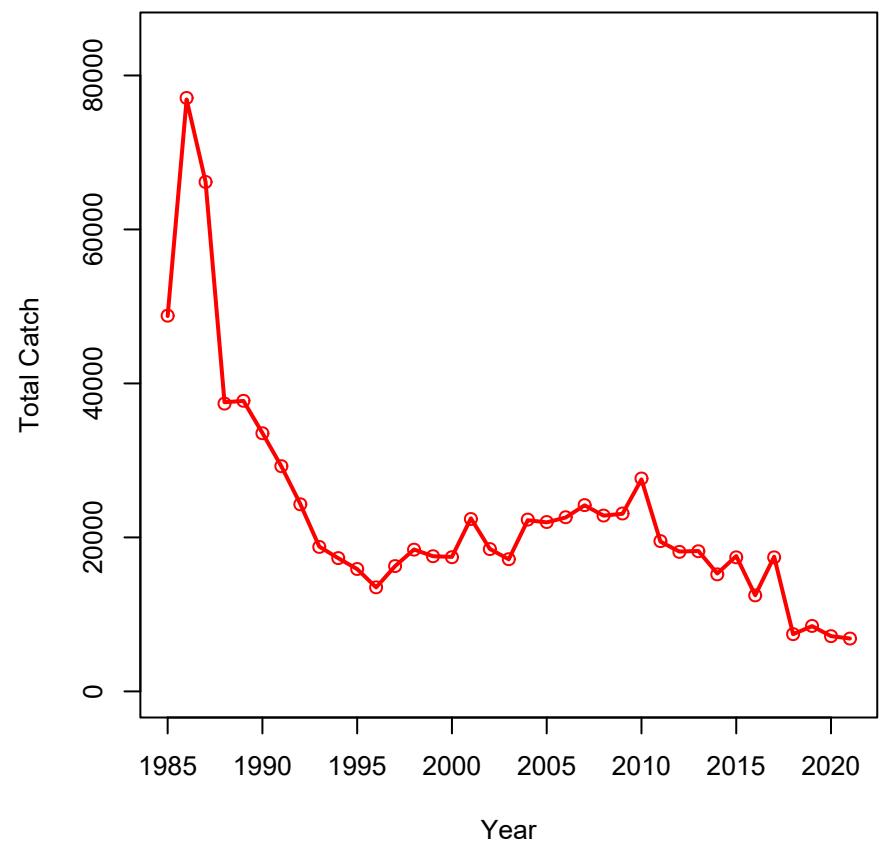
Index 5 Selectivity Blocks: 10

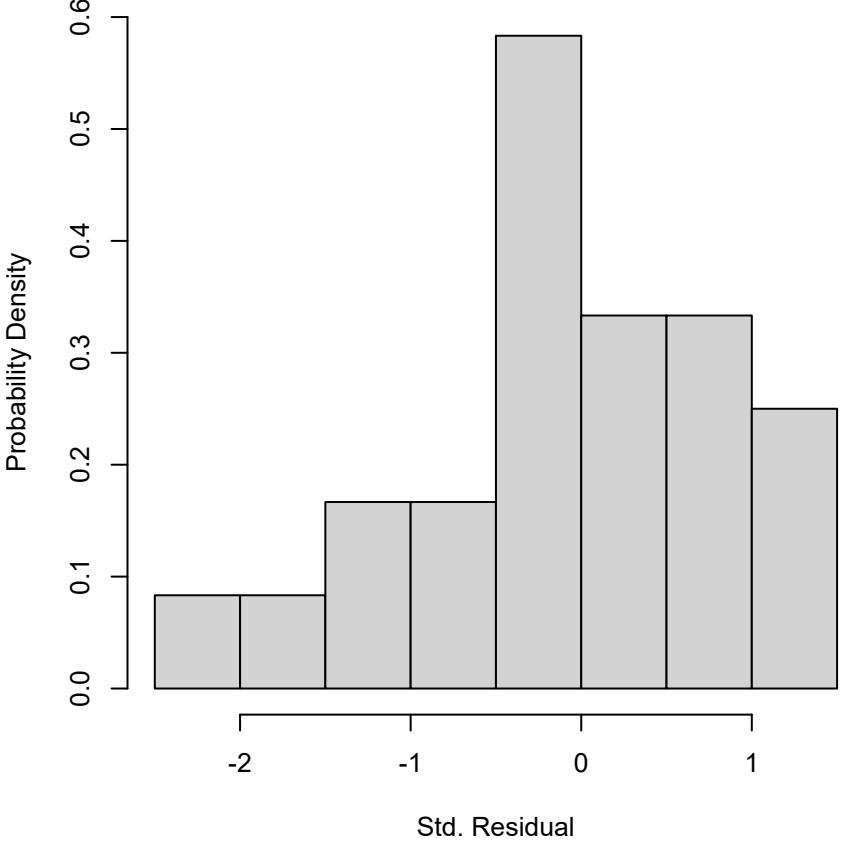
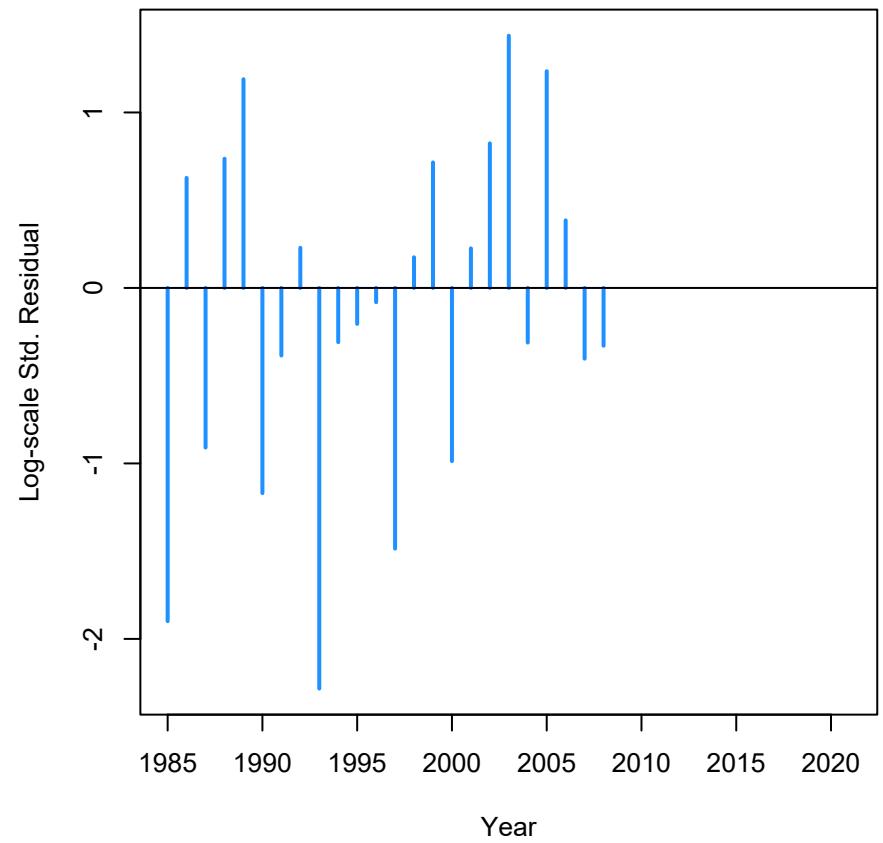
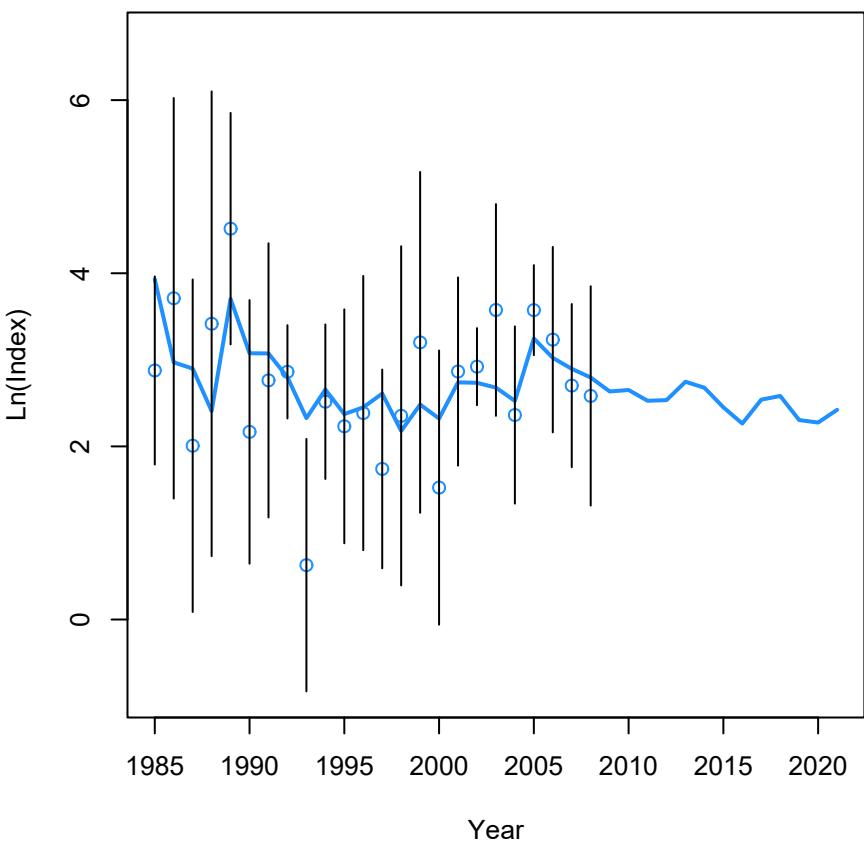
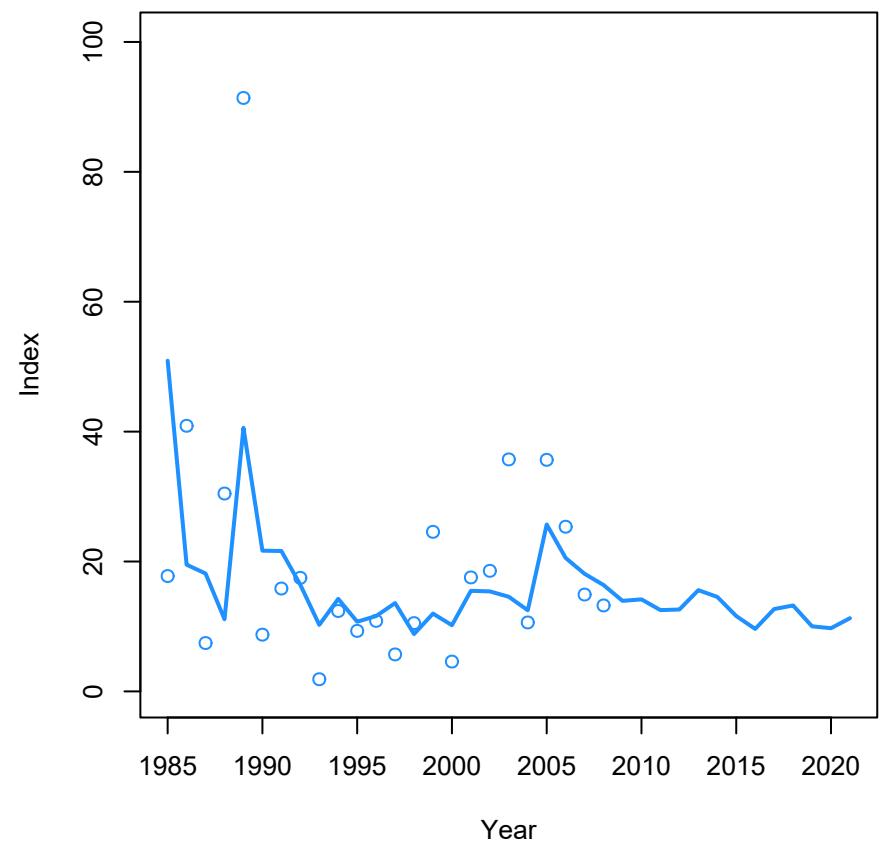


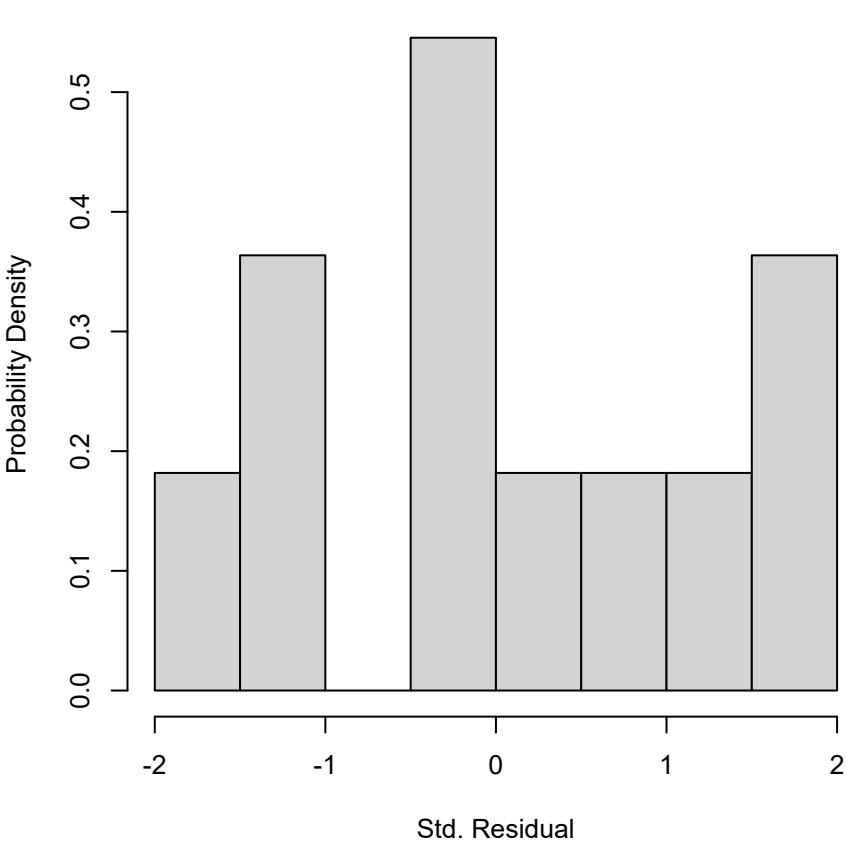
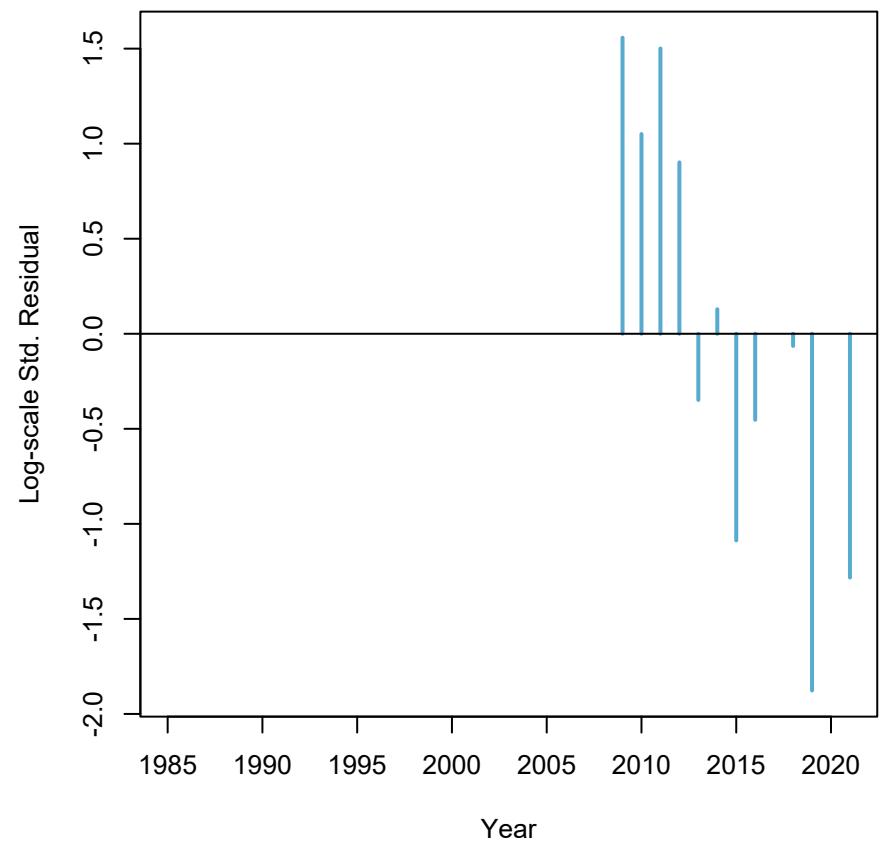
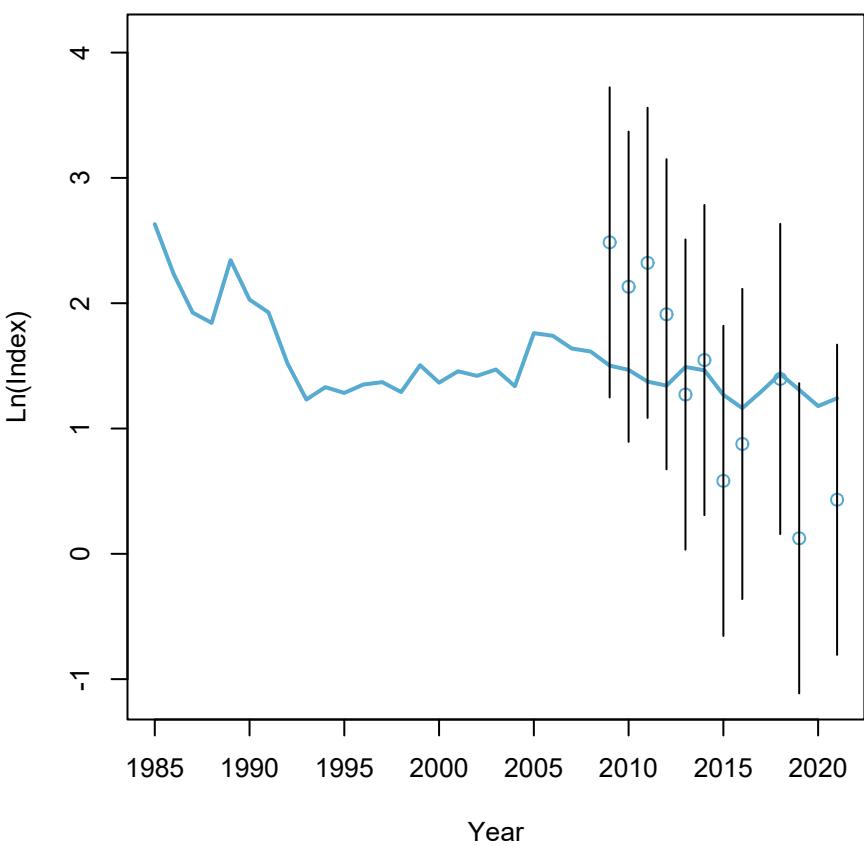
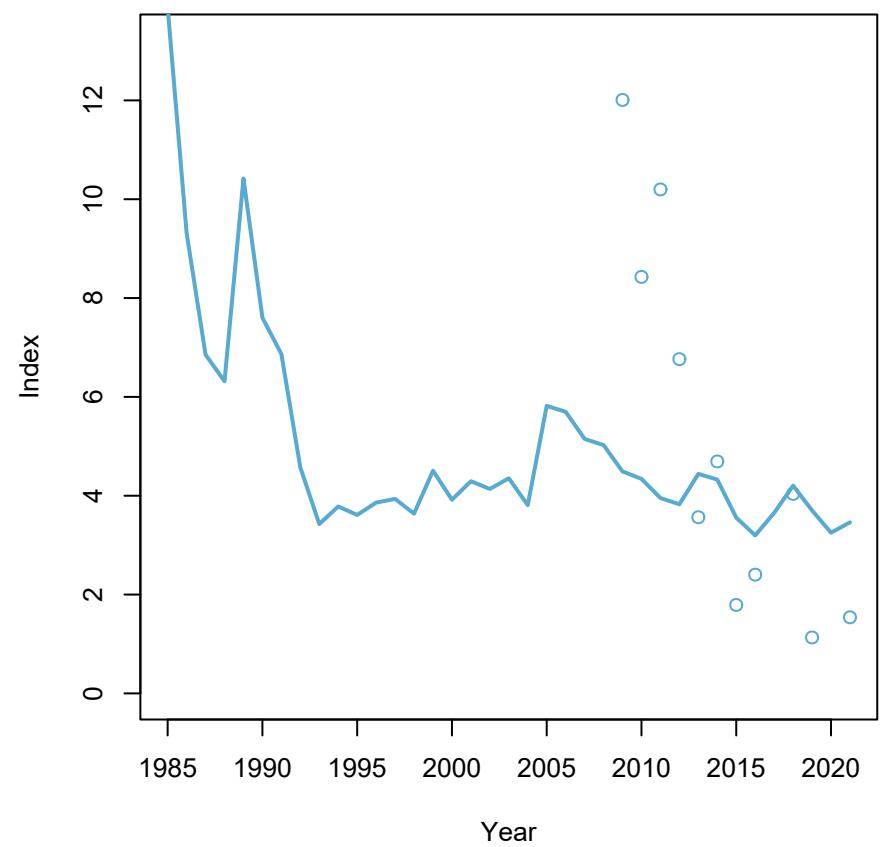
Fleet 1 Catch

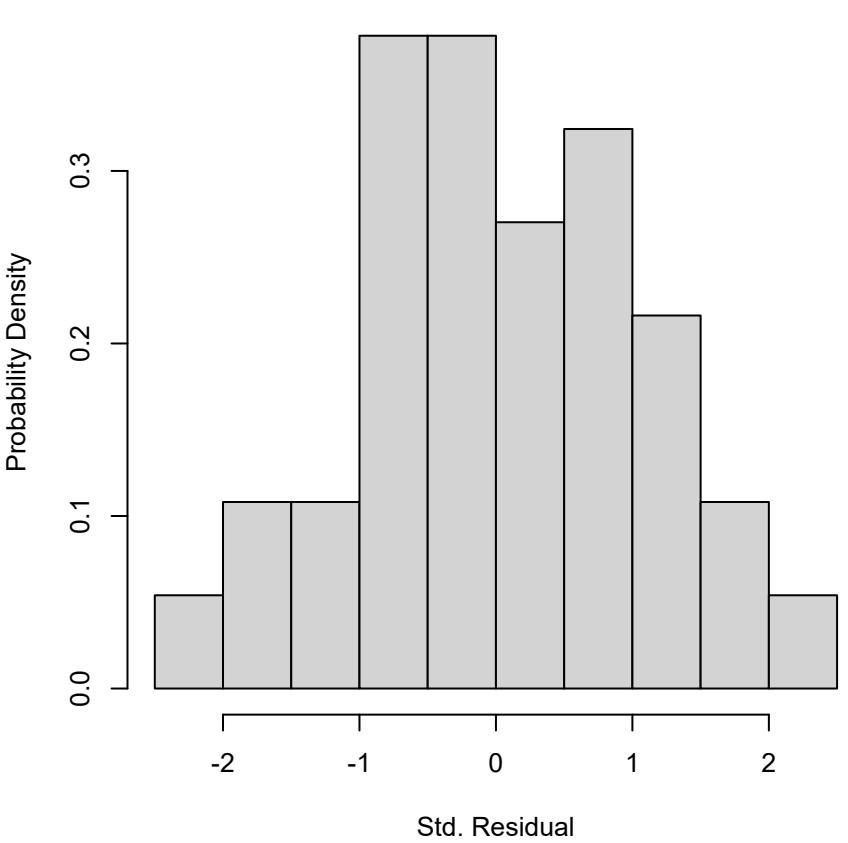
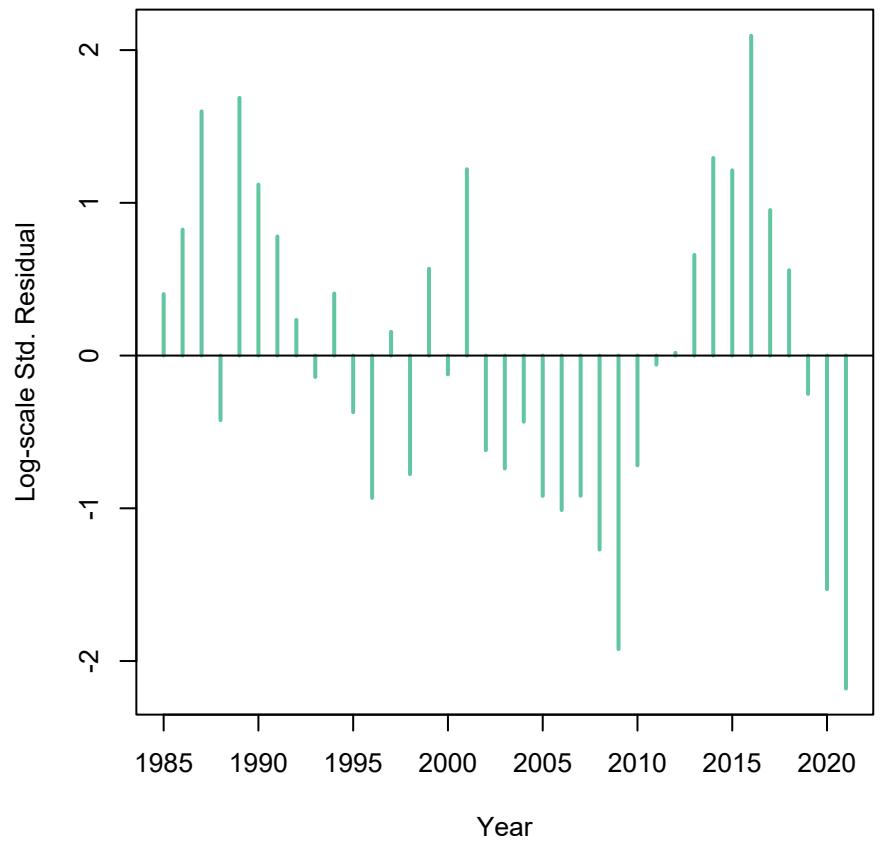
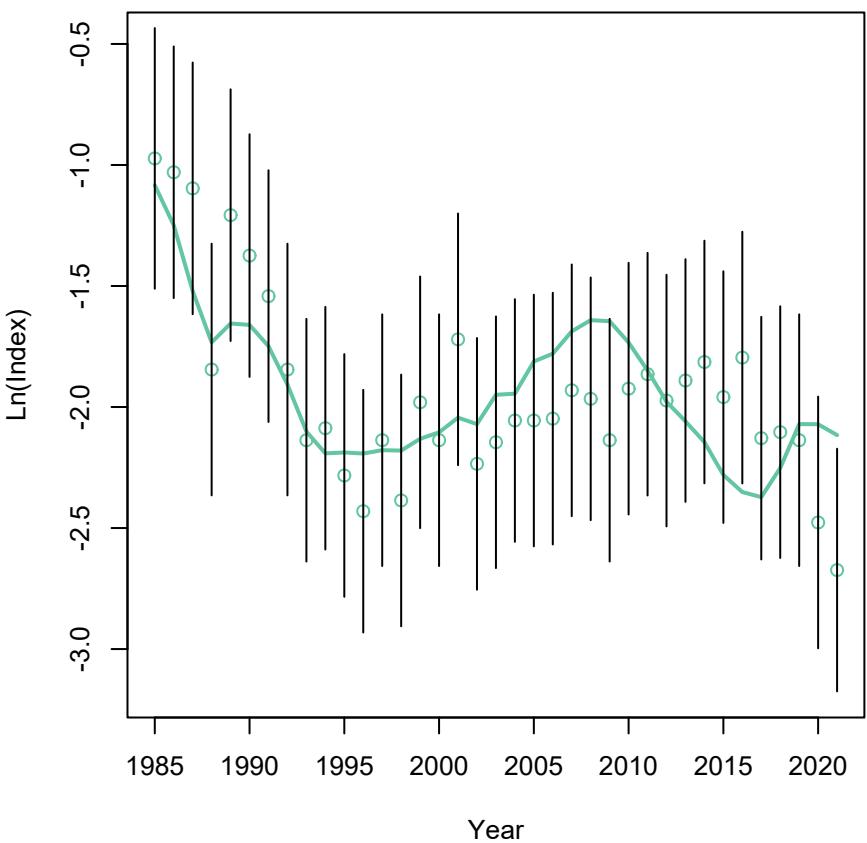
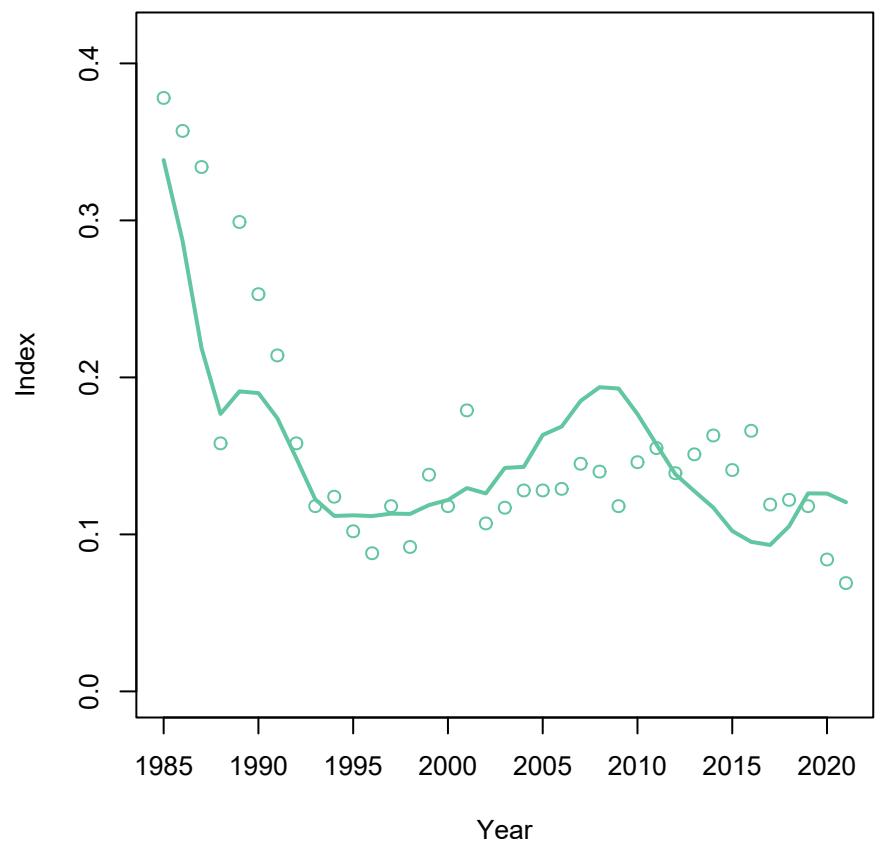


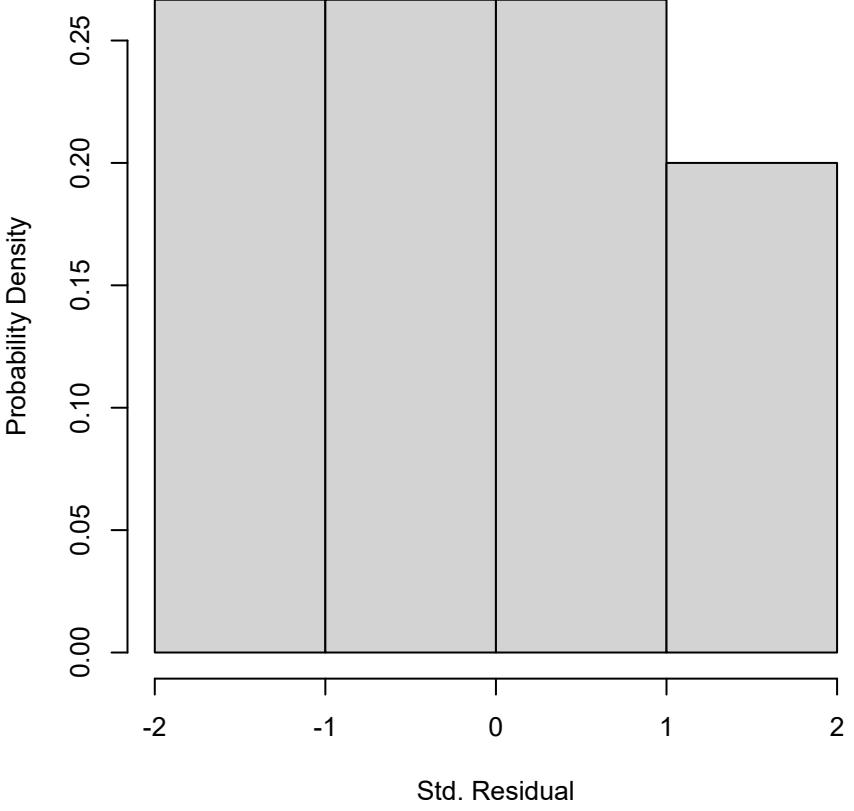
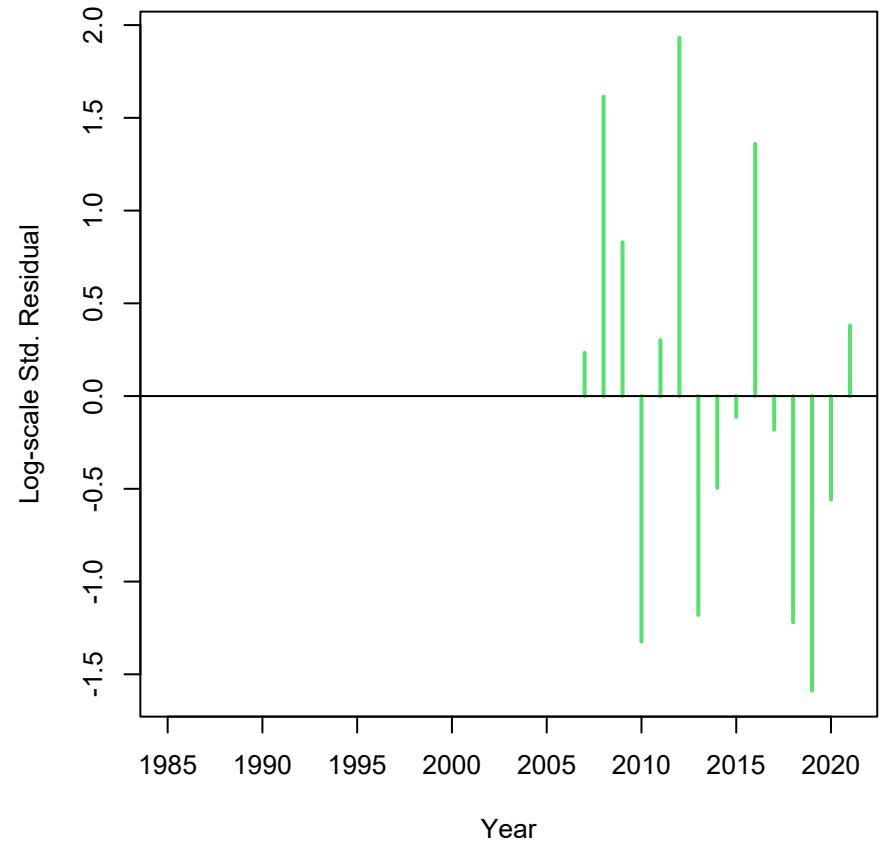
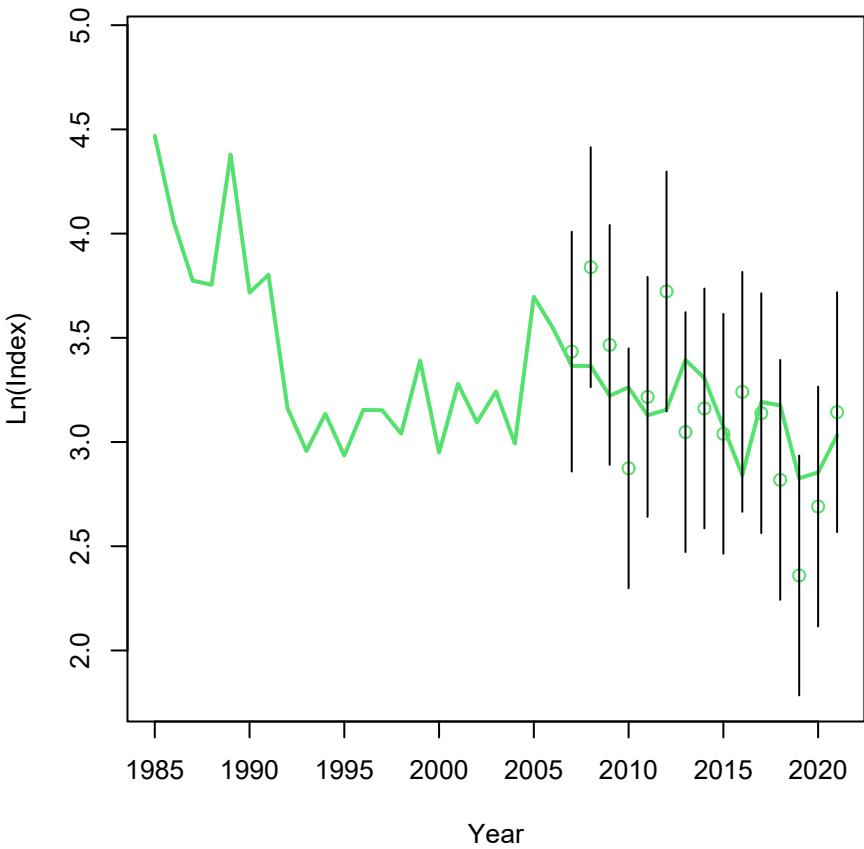
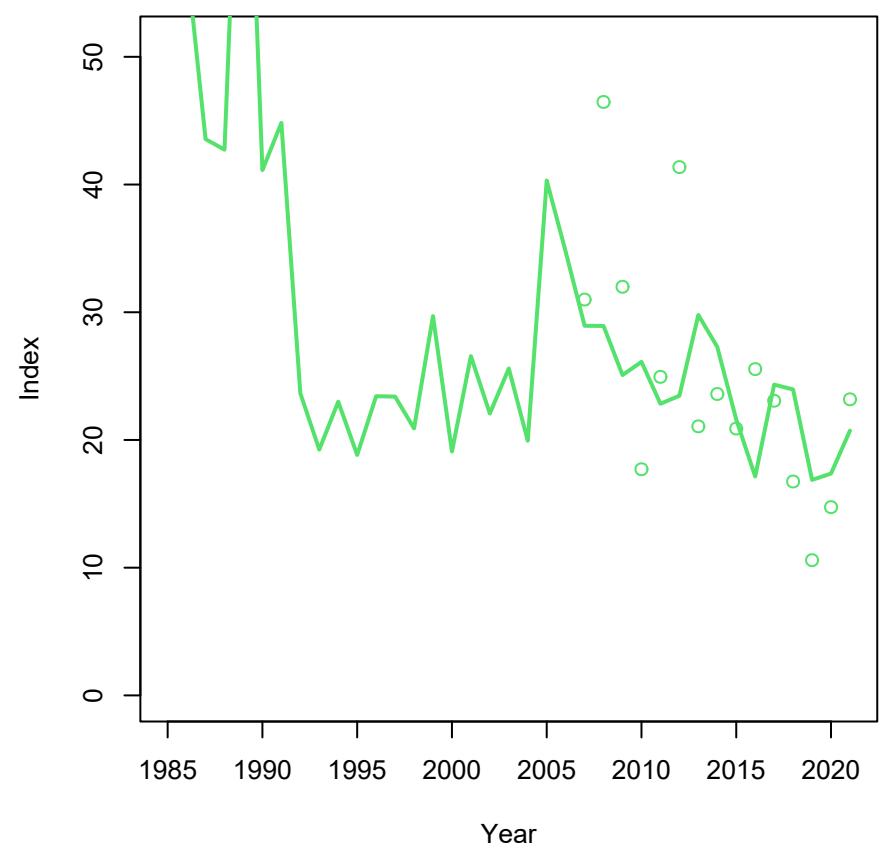
Fleet 2 Catch



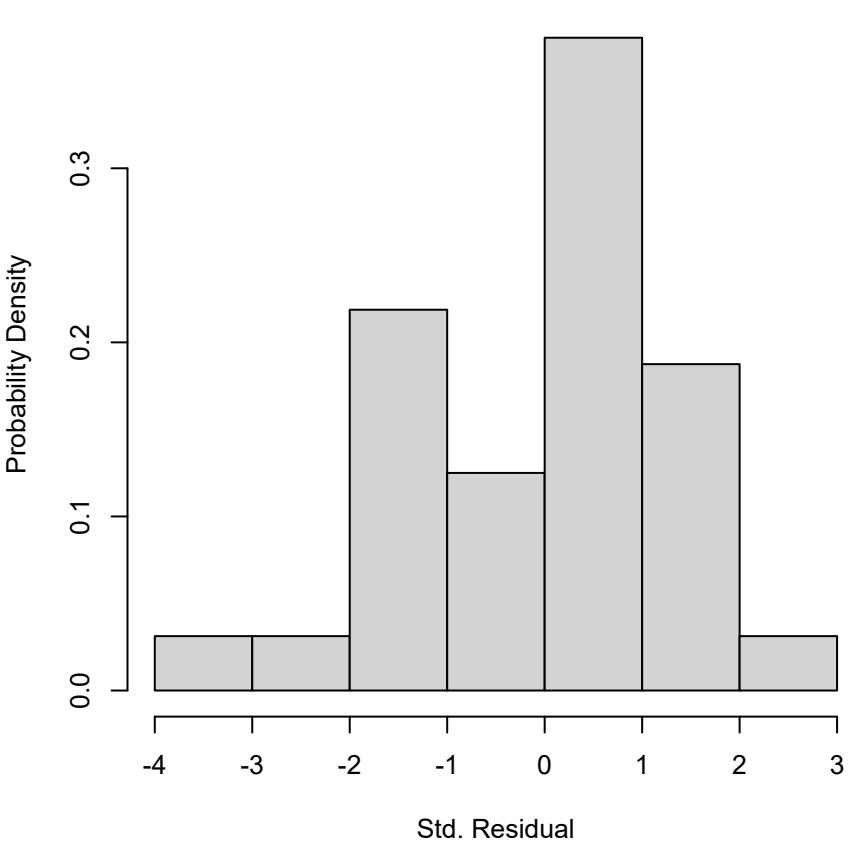
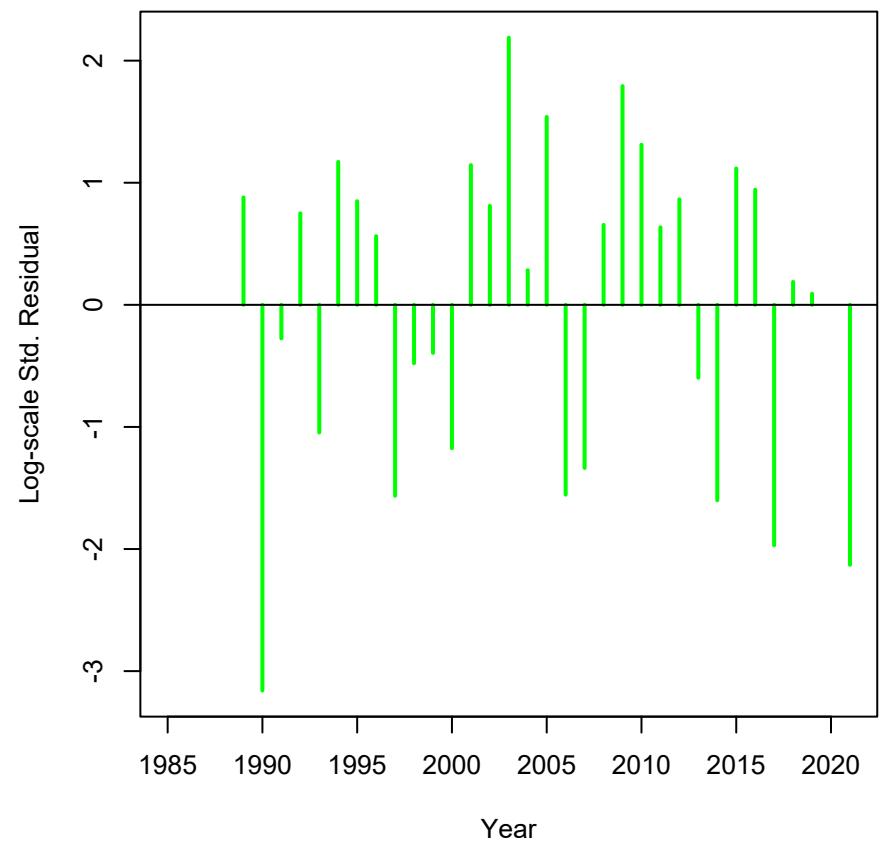
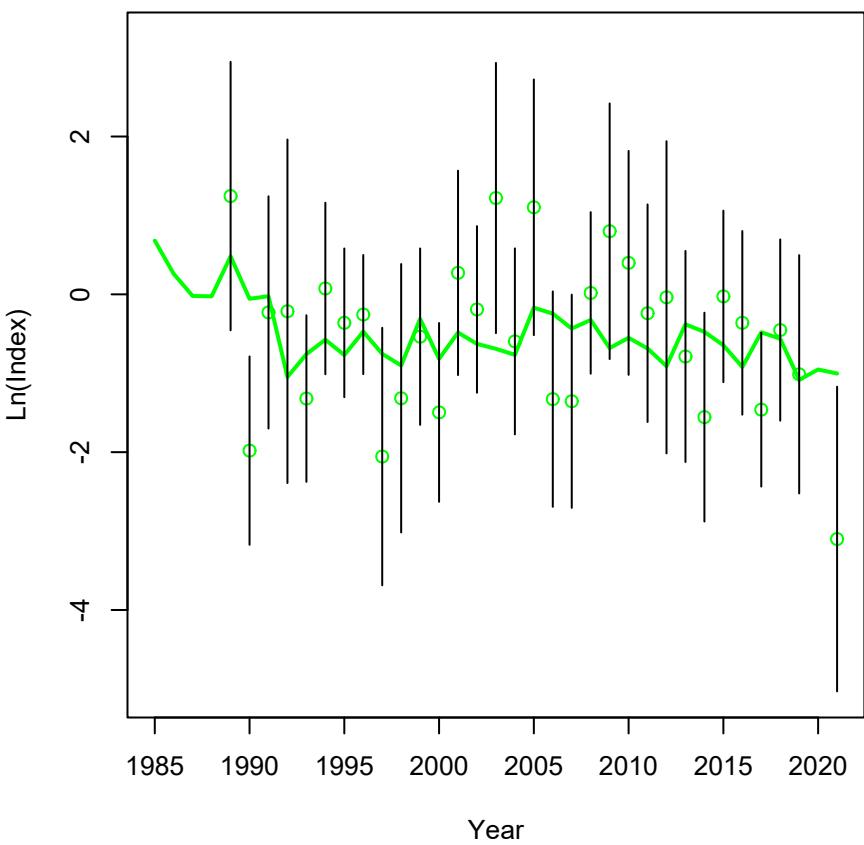
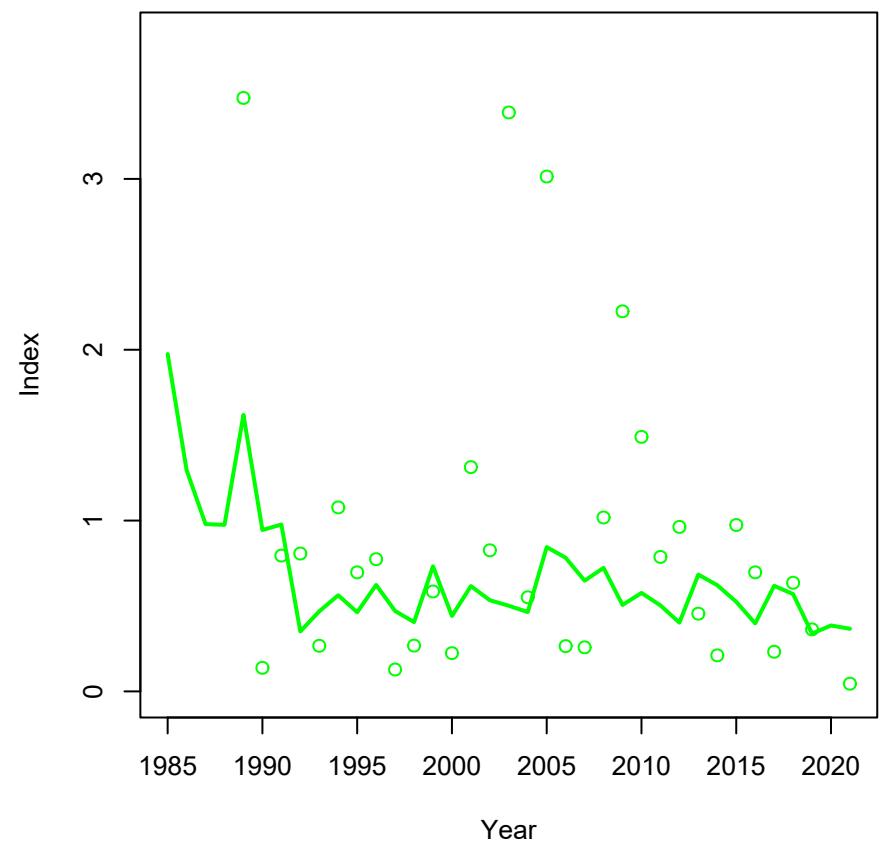
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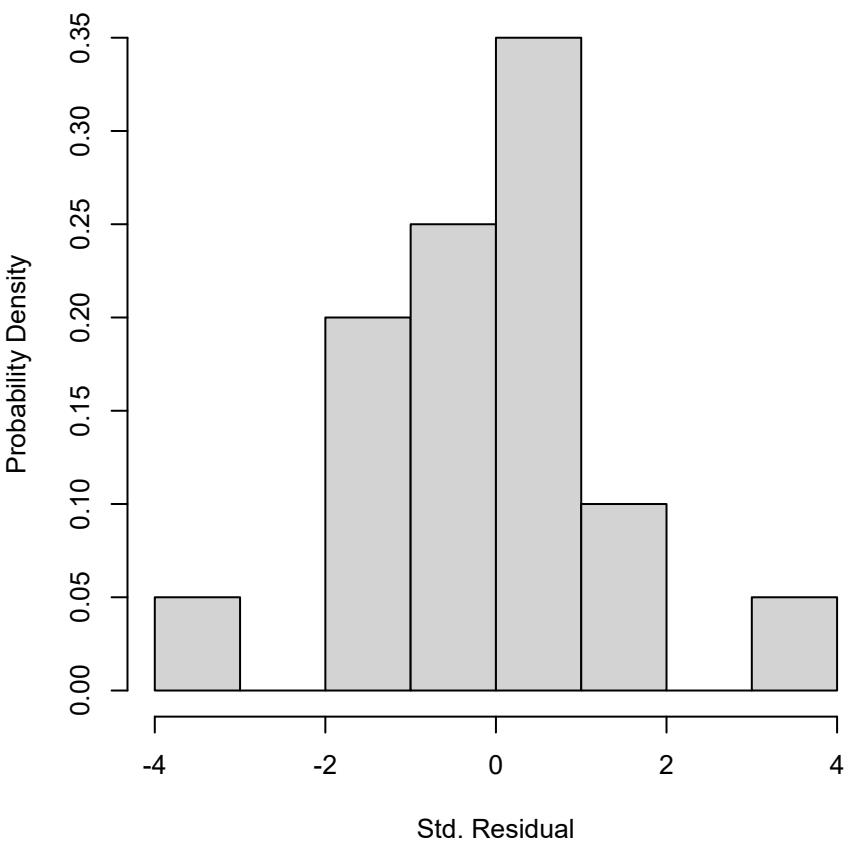
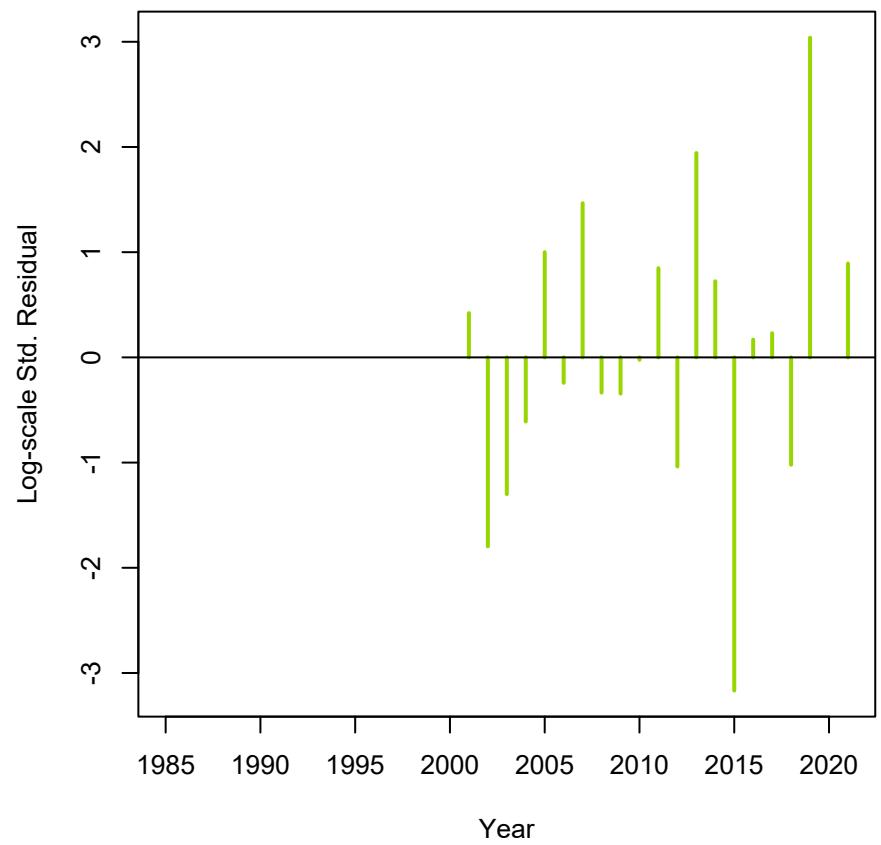
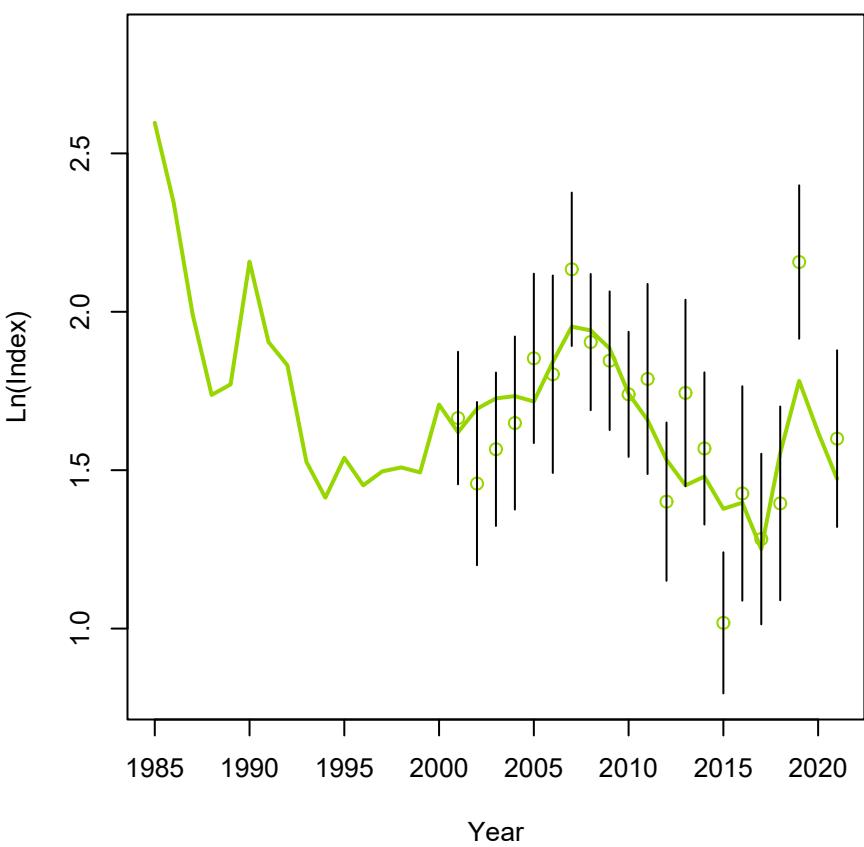
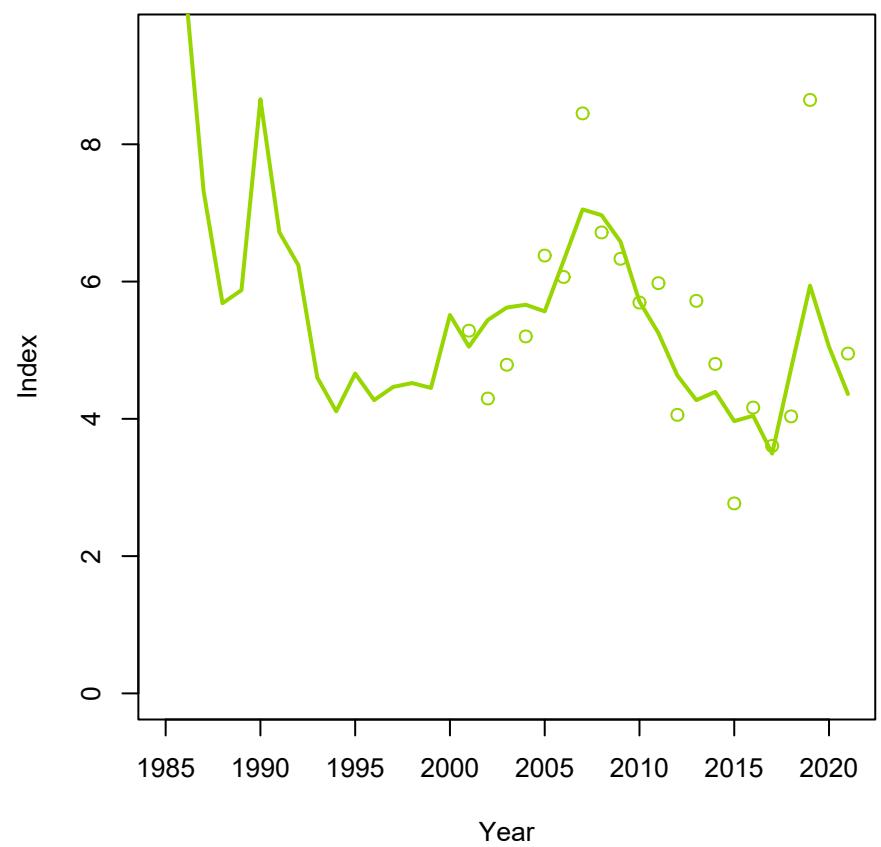
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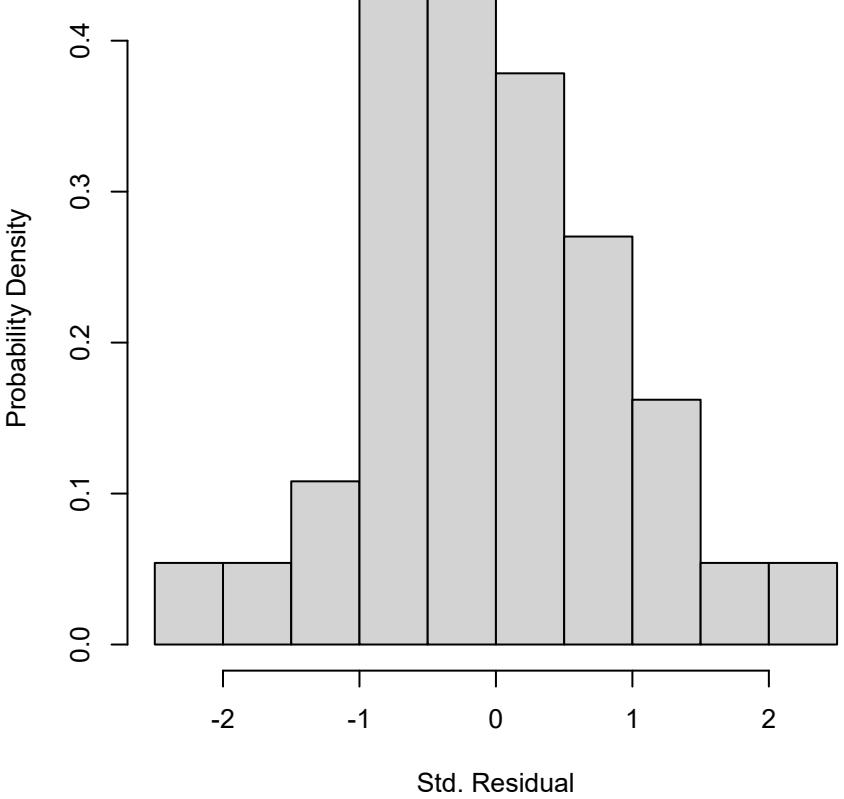
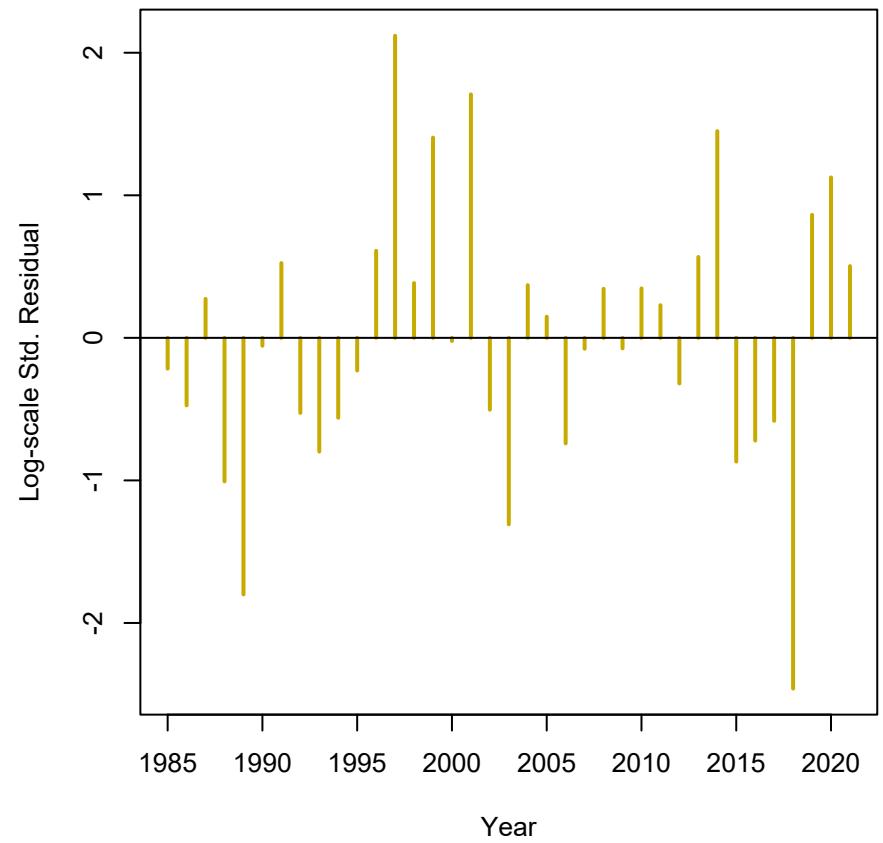
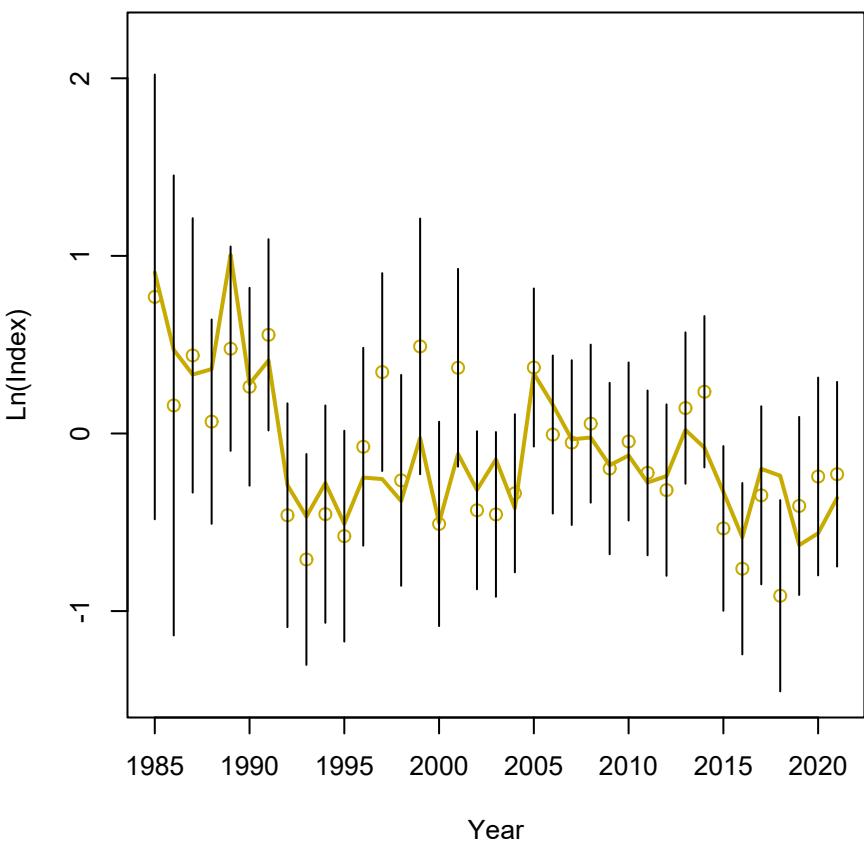
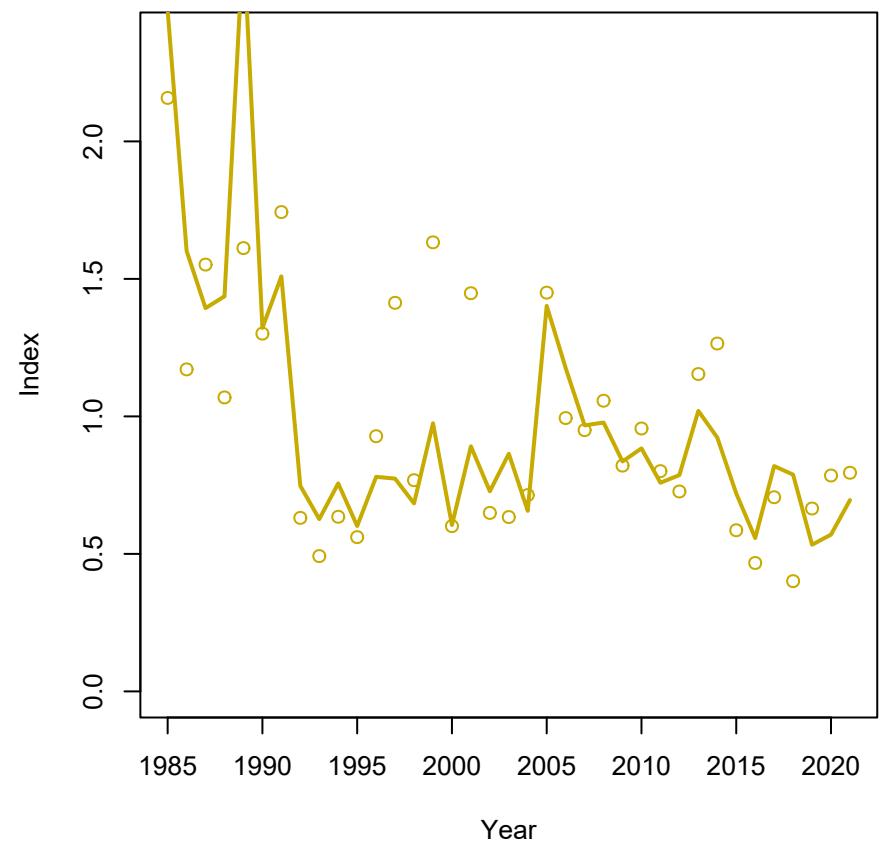
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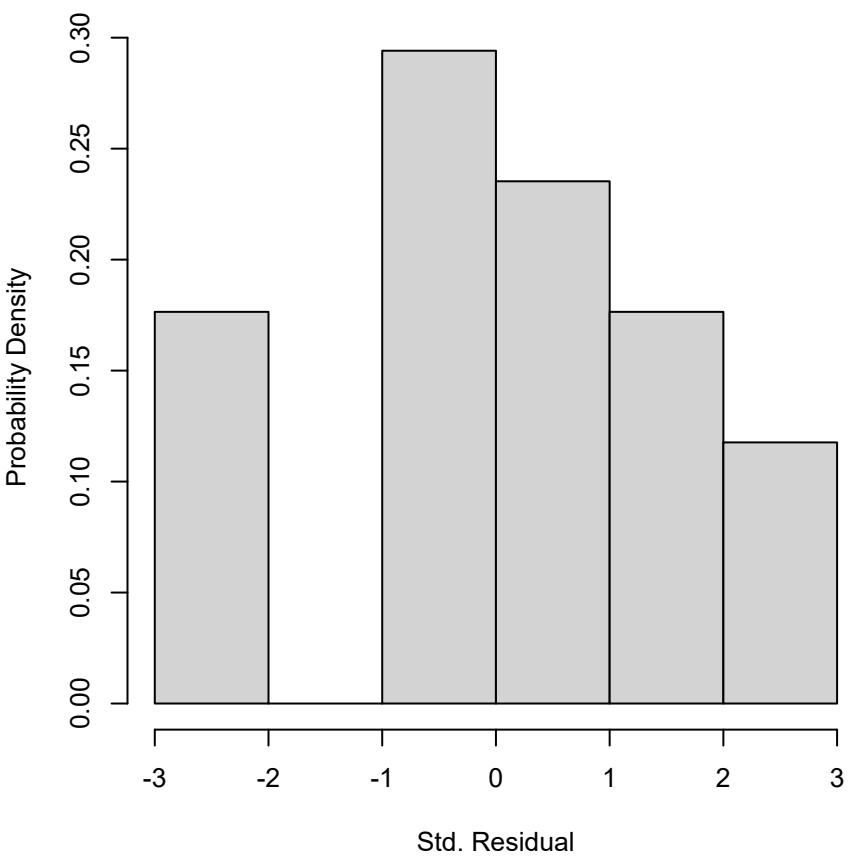
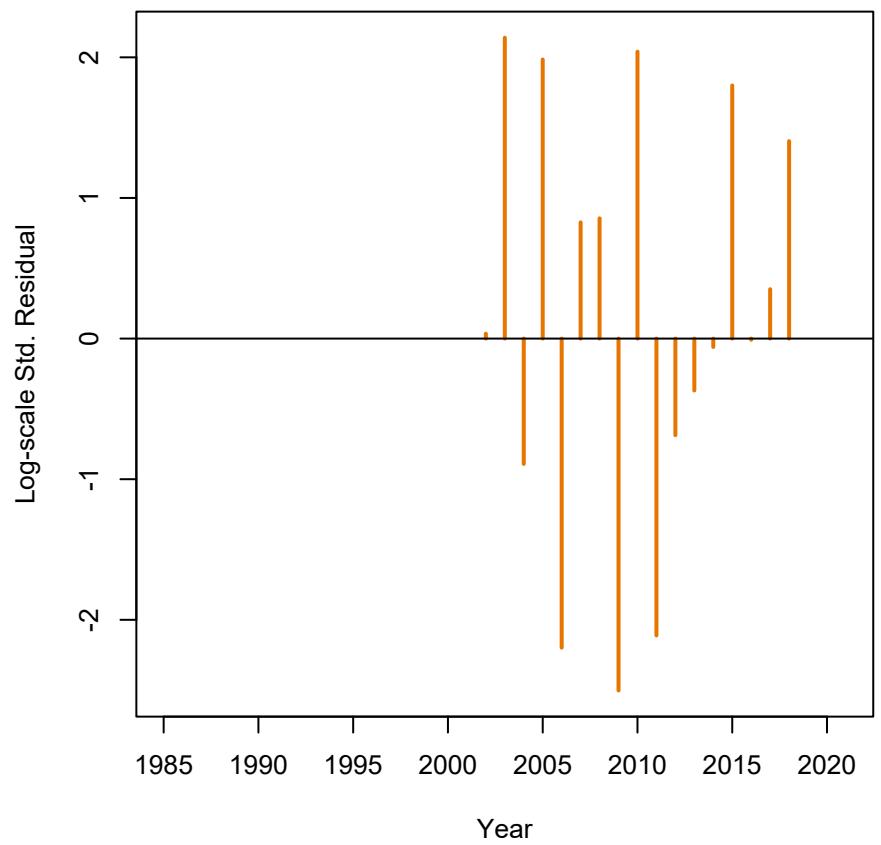
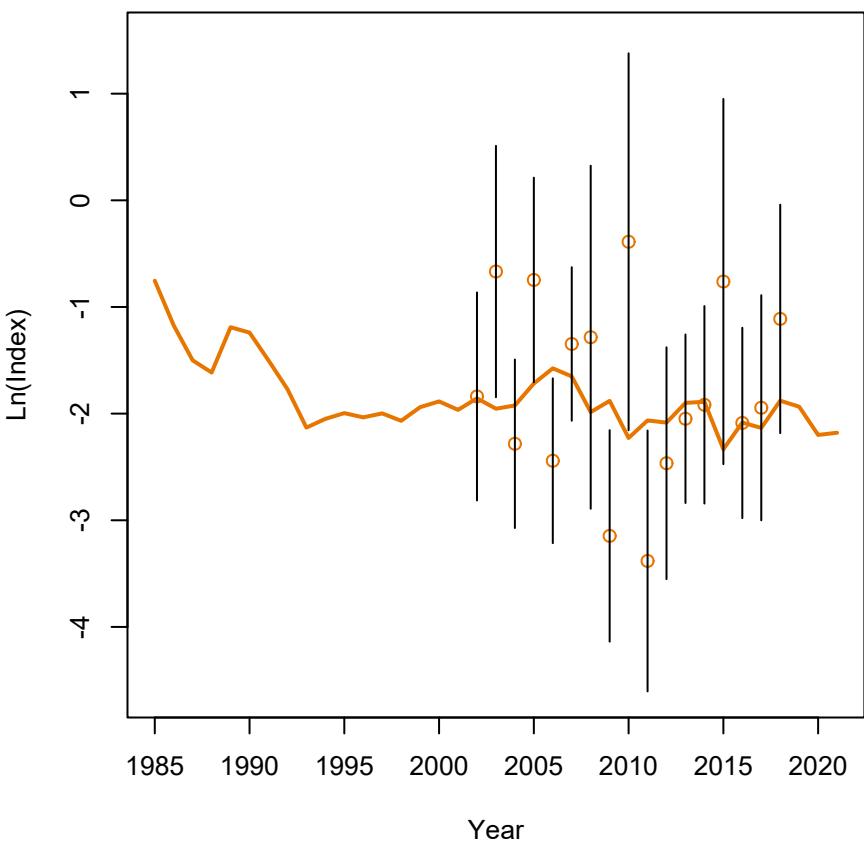
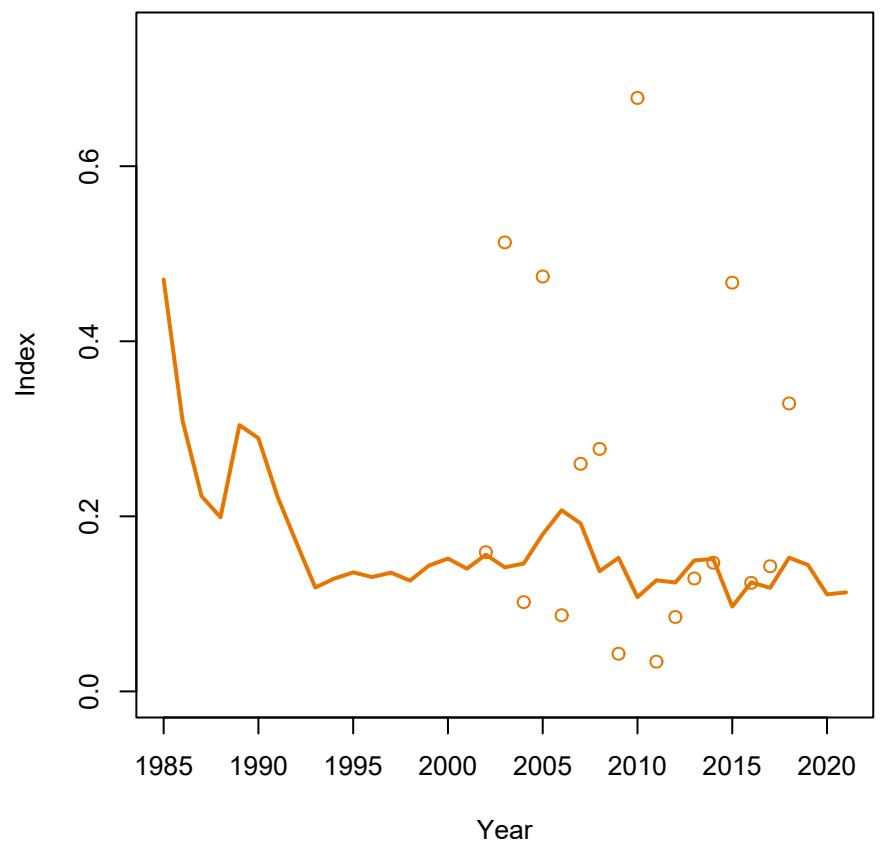


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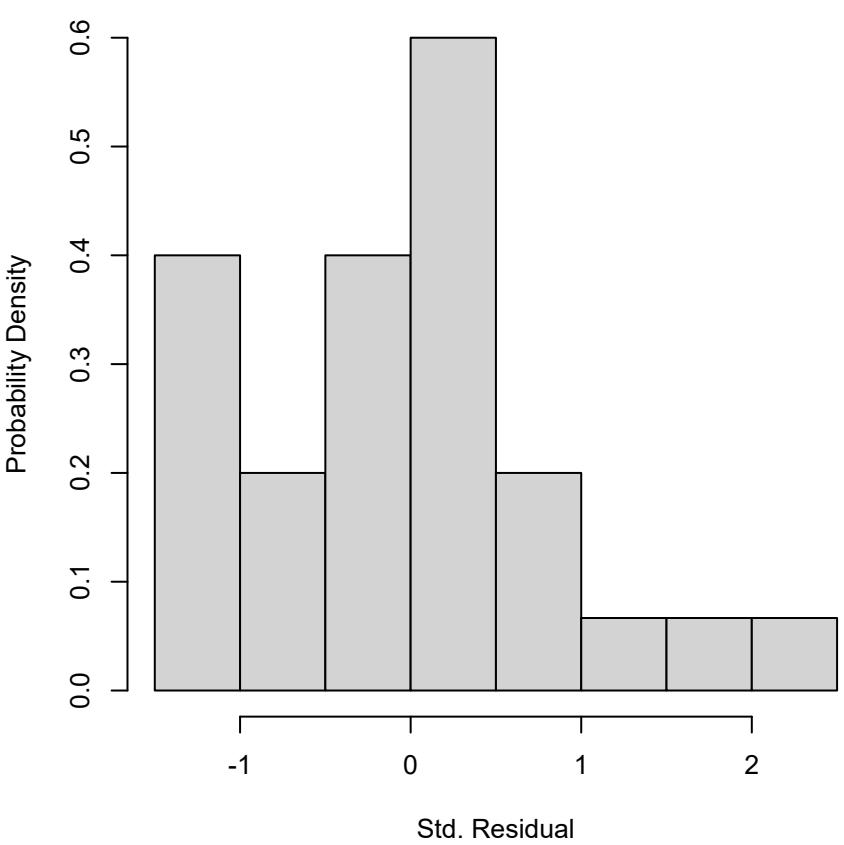
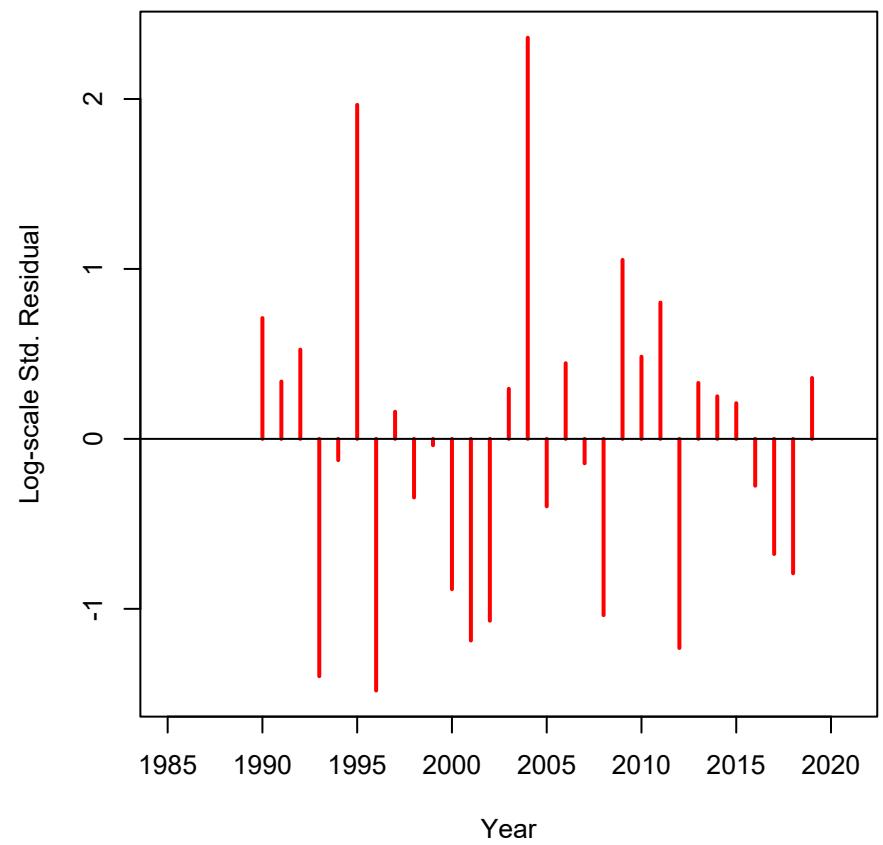
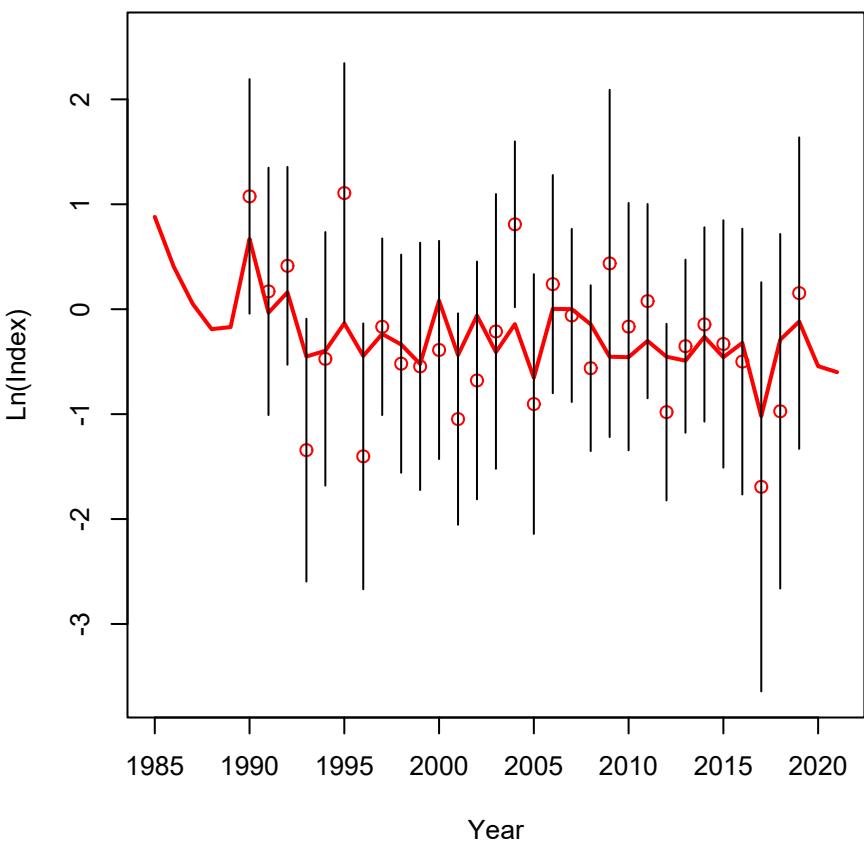
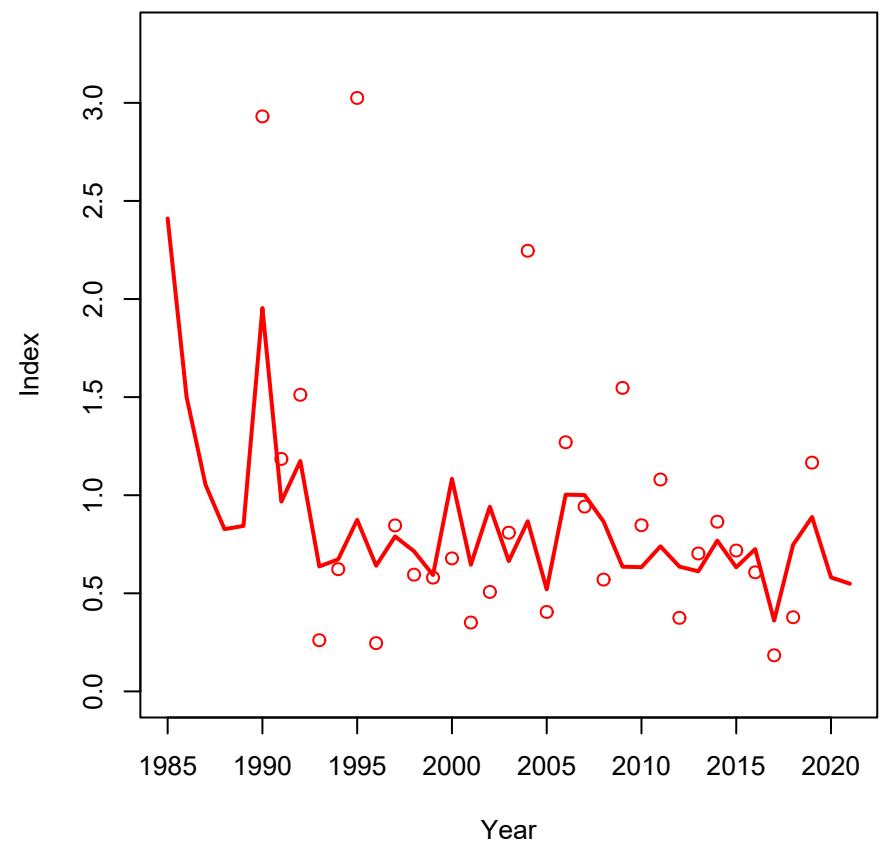
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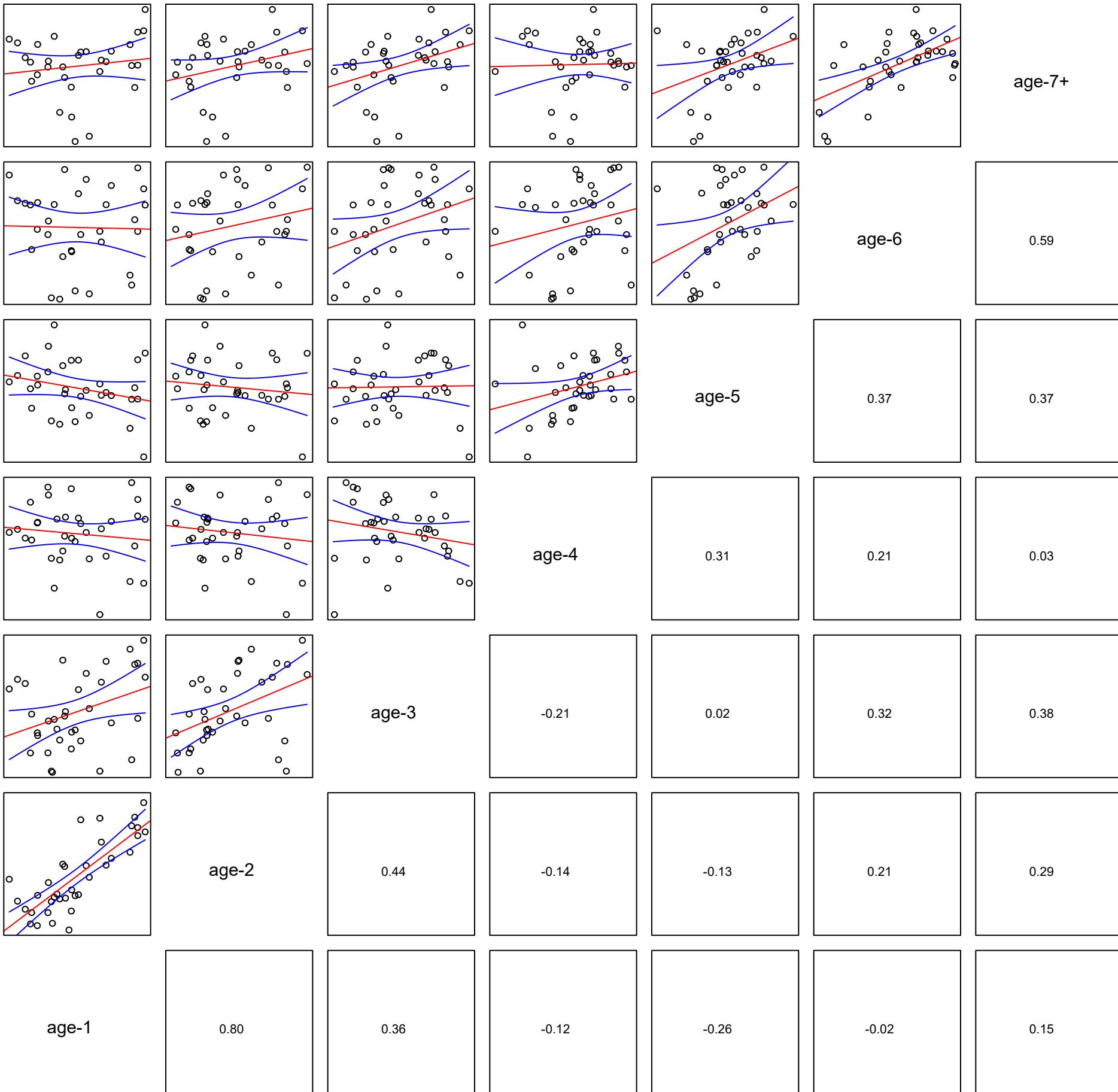
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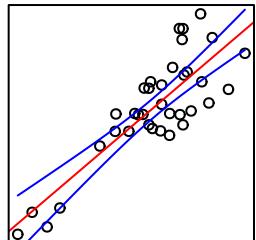
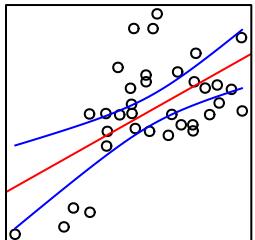
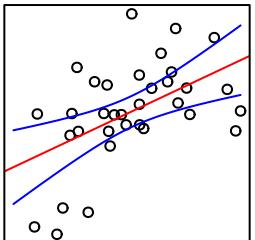
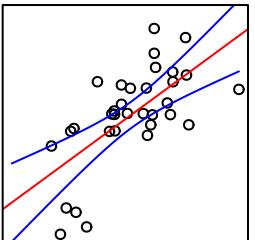
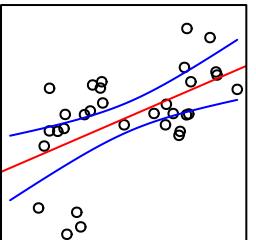
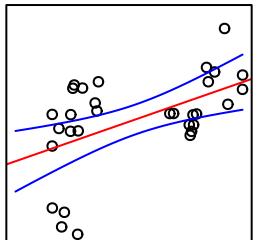
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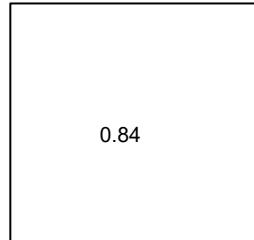
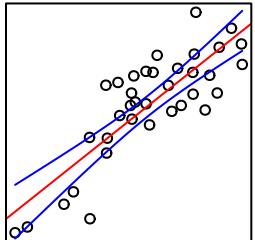
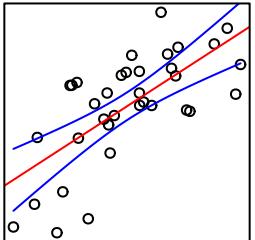
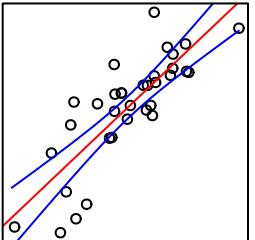
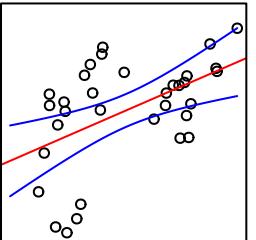
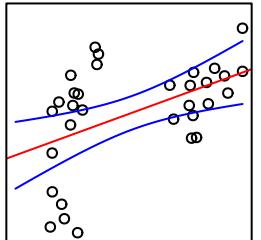
Catch for Fleet 1 Observed



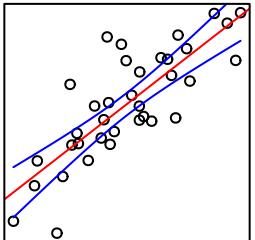
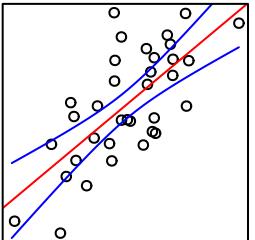
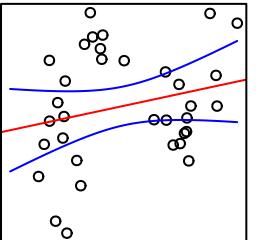
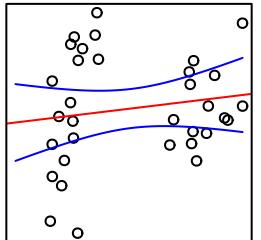
Catch for Fleet 1 Predicted



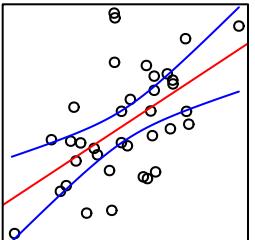
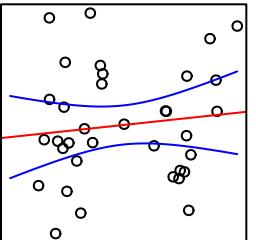
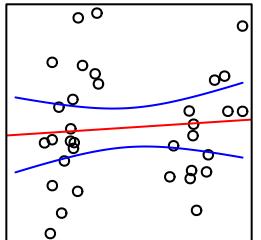
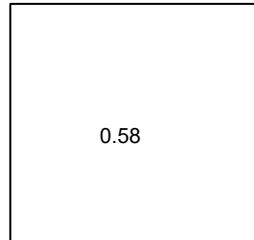
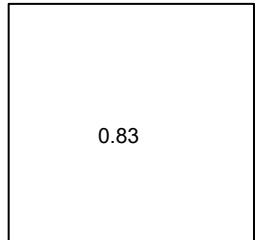
age-7+



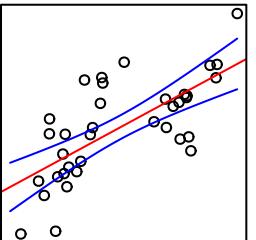
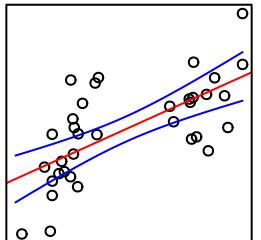
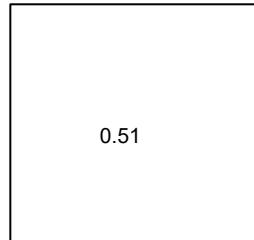
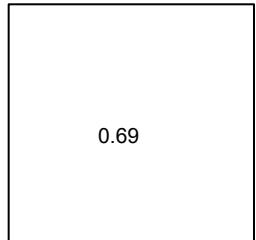
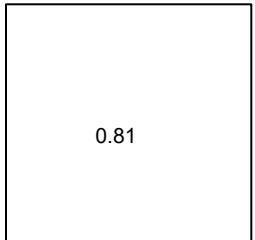
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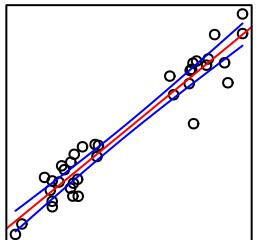
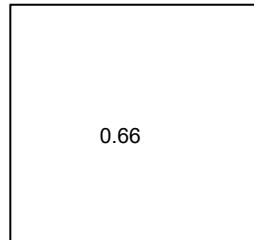
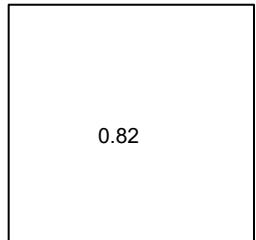
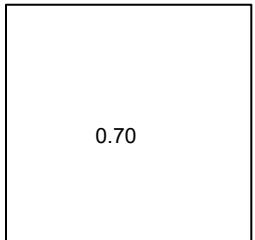
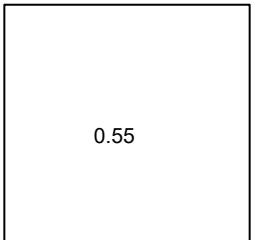
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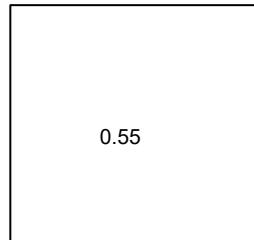
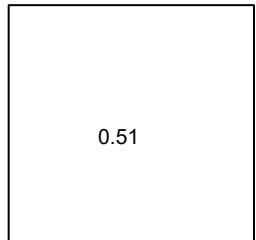
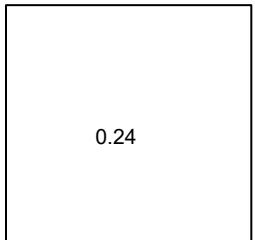
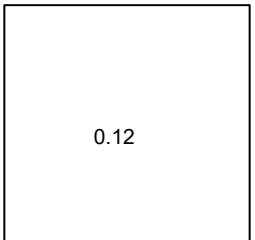
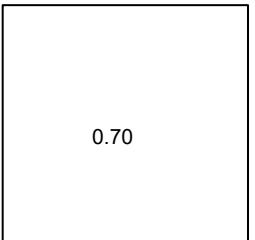
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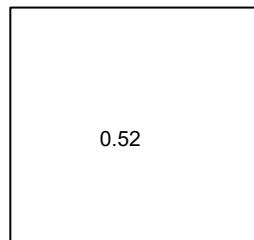
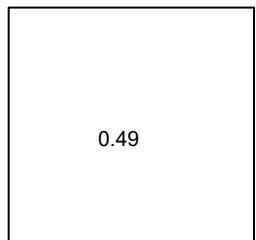
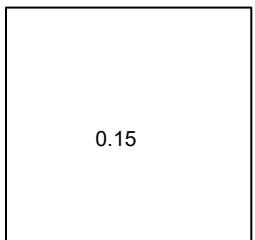
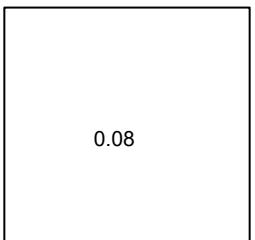
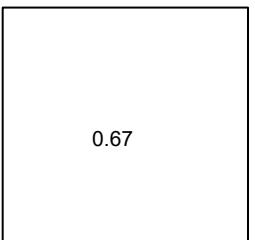
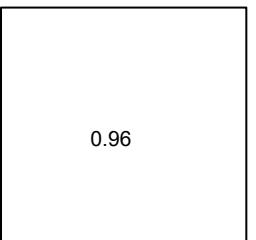
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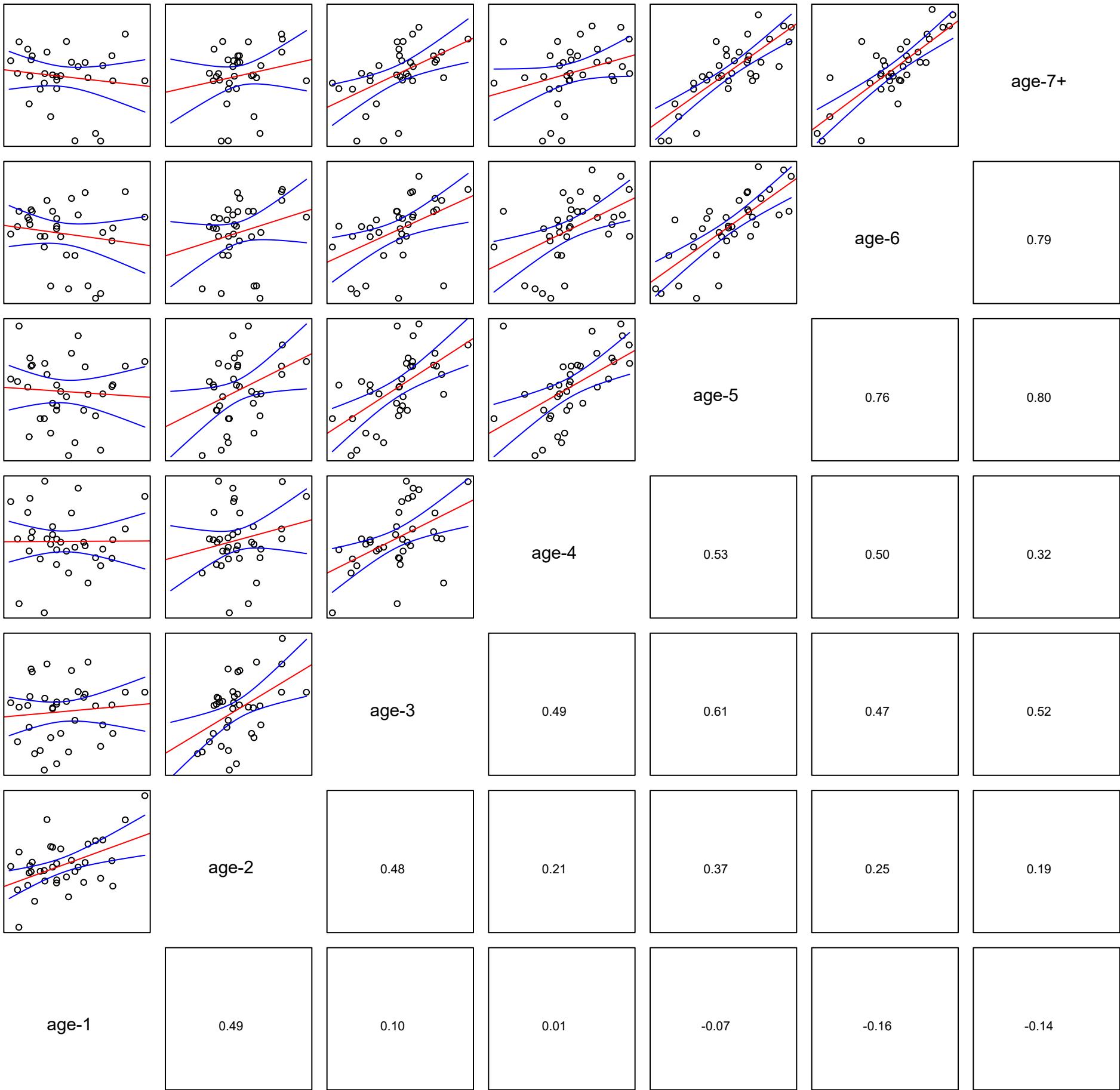
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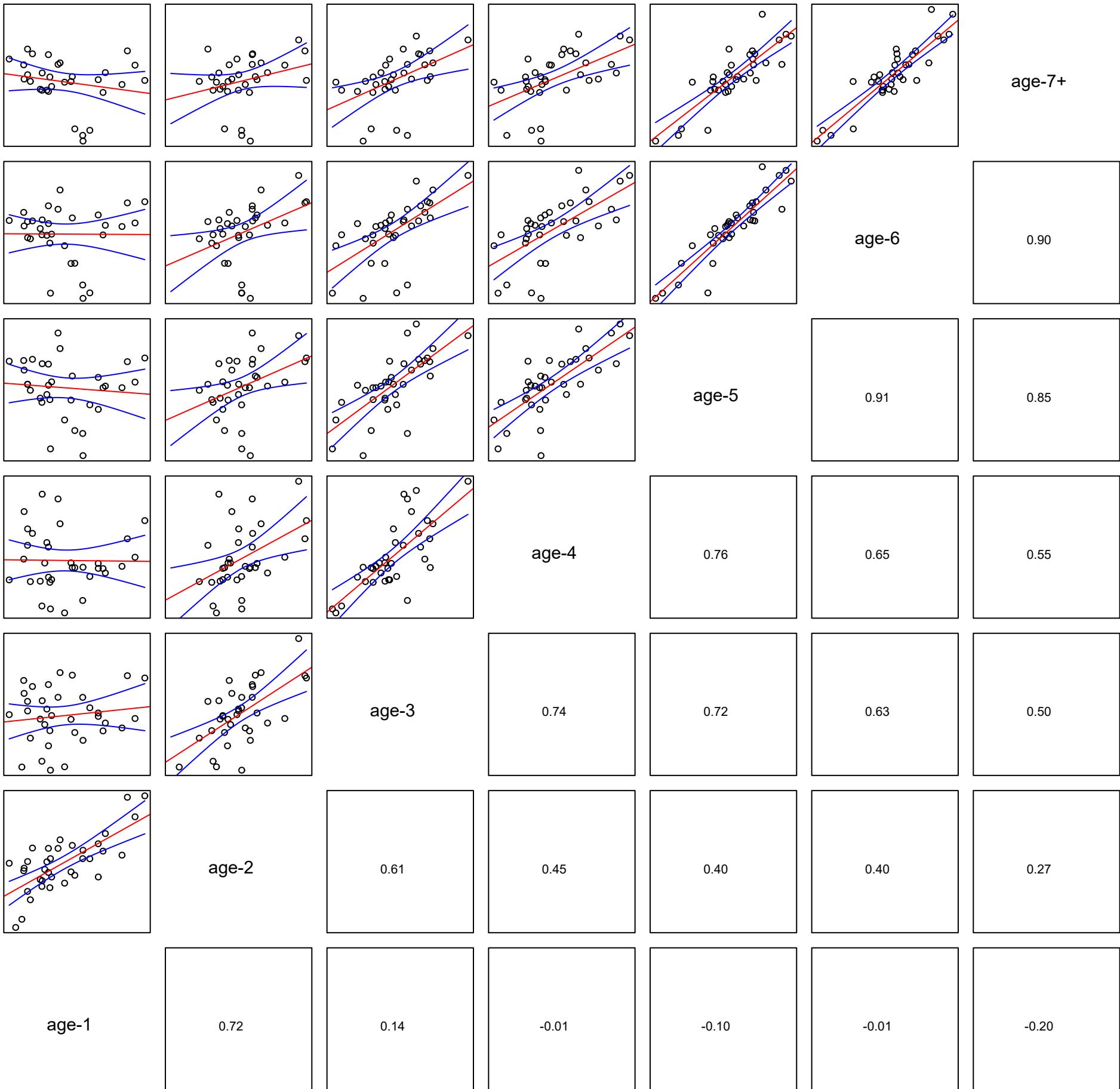
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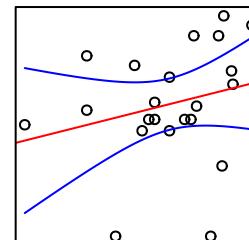
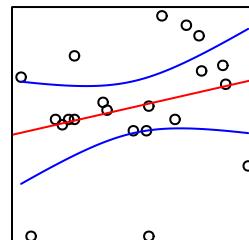
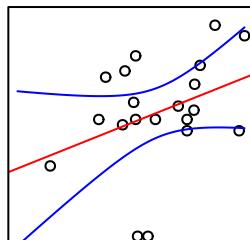
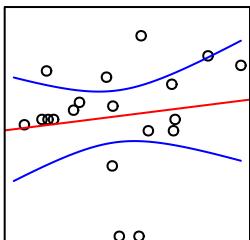
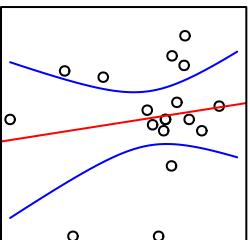
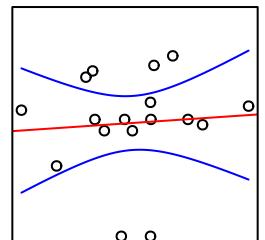
Catch for Fleet 2 Observed



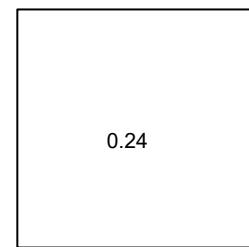
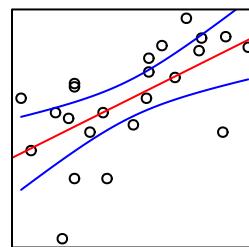
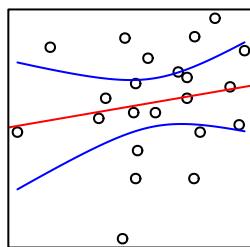
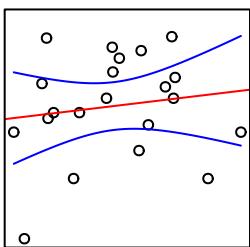
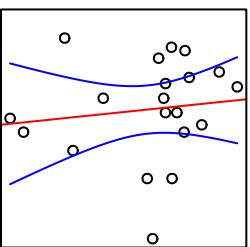
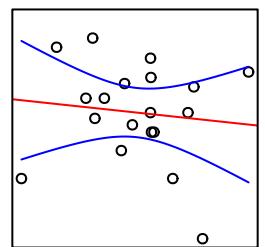
Catch for Fleet 2 Predicted



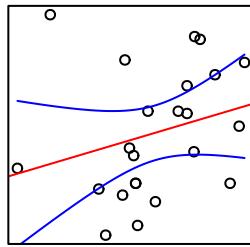
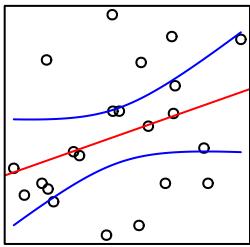
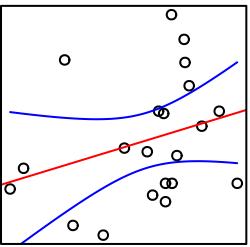
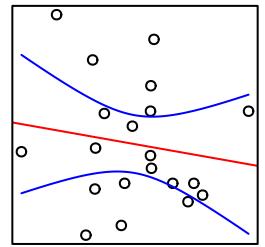
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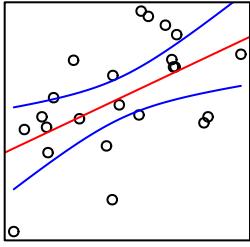
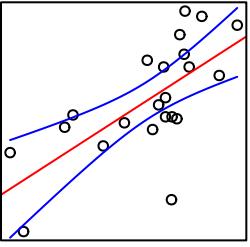
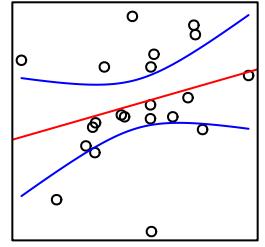
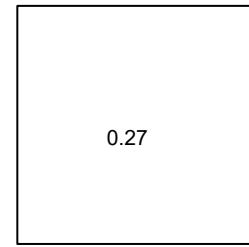
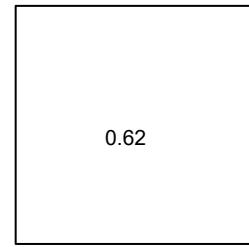
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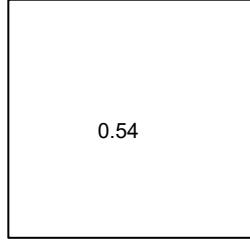
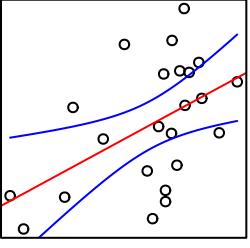
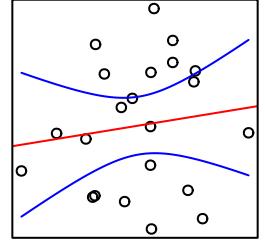
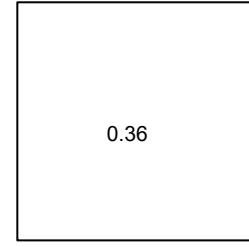
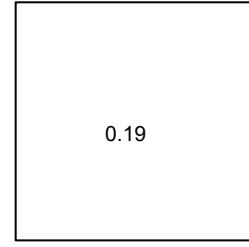
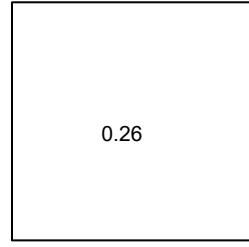
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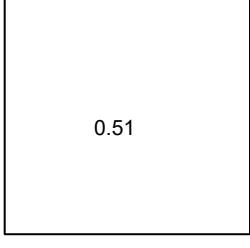
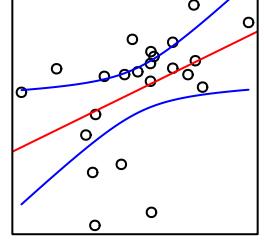
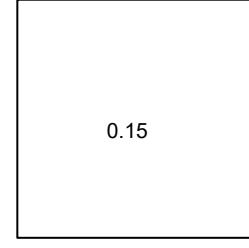
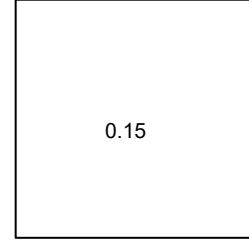
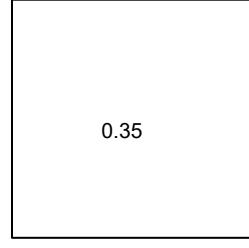
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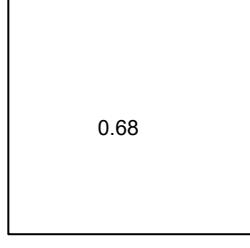
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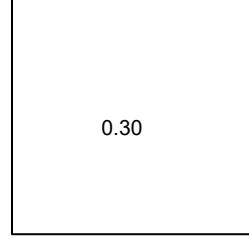
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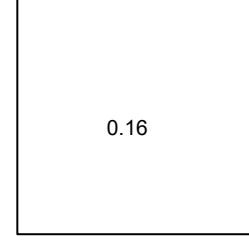
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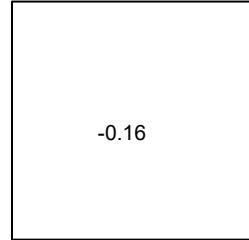
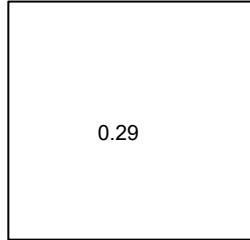
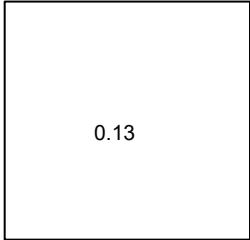
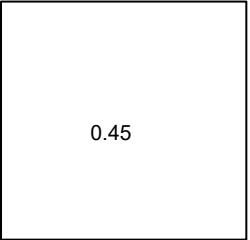
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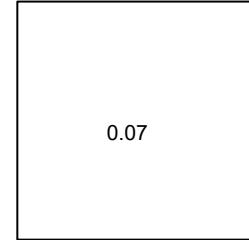
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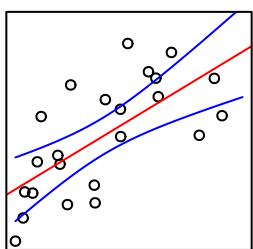
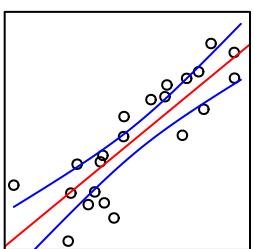
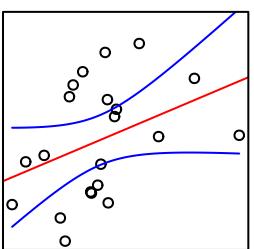
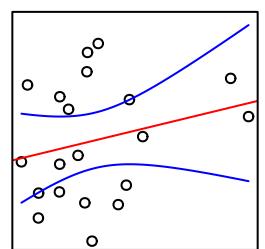
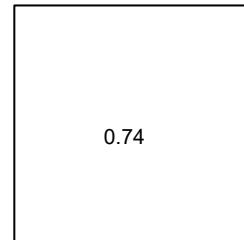
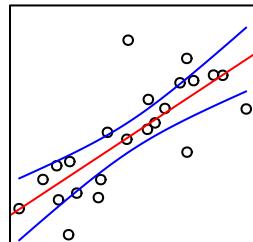
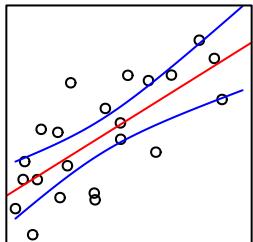
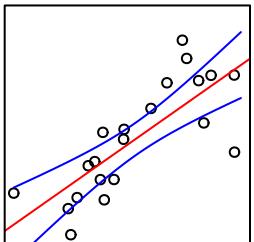
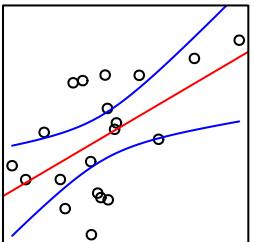
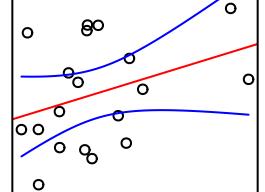
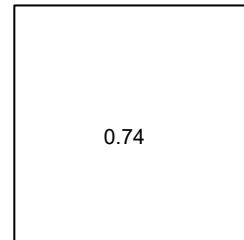
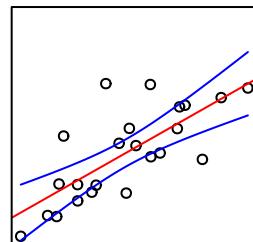
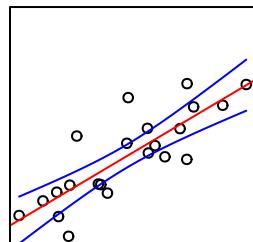
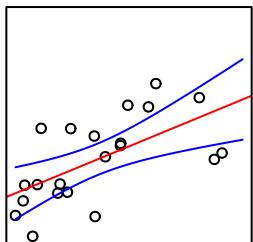
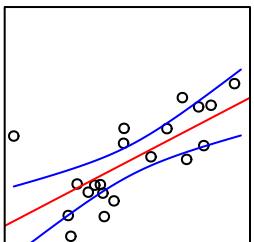
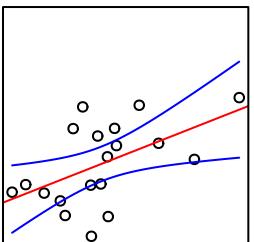
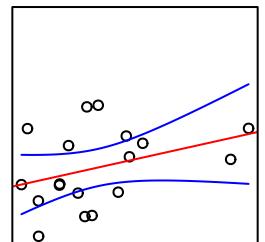
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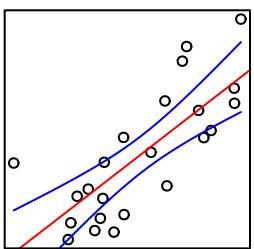
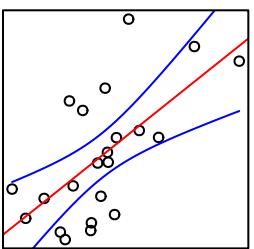
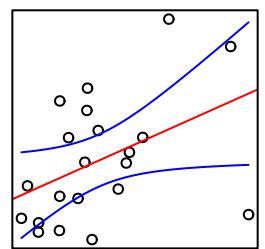
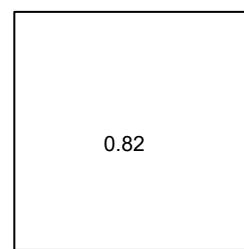
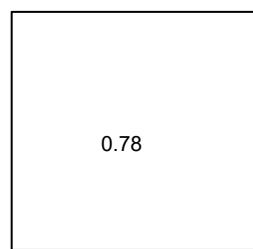
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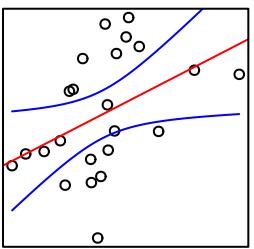
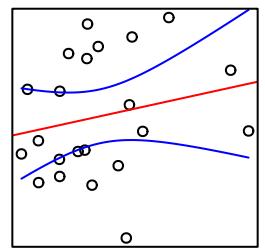
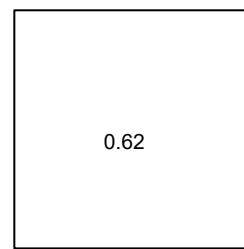
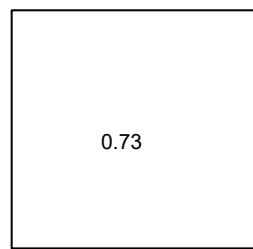
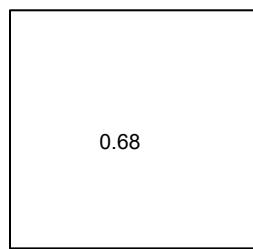
Index 1 Predicted



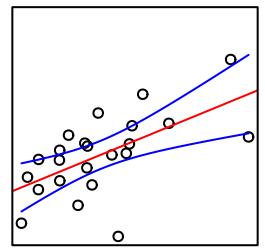
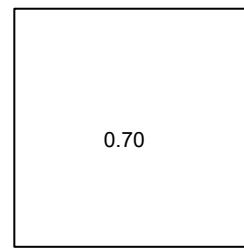
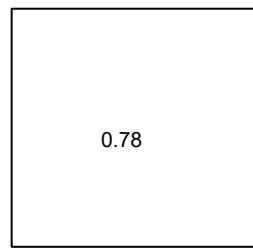
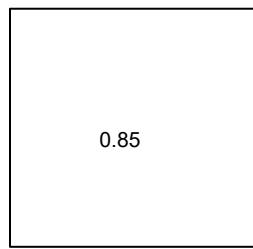
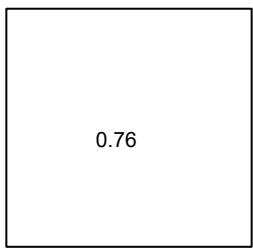
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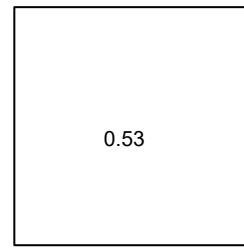
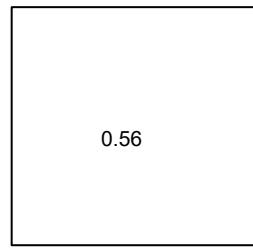
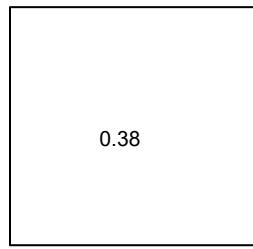
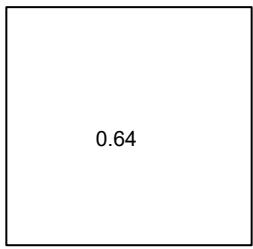
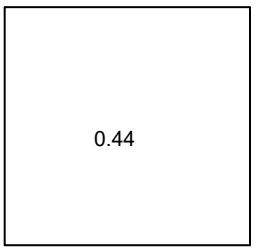
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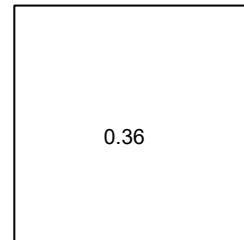
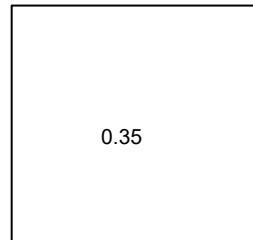
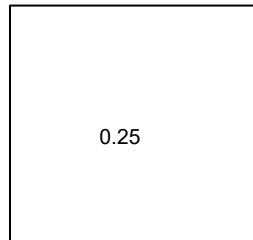
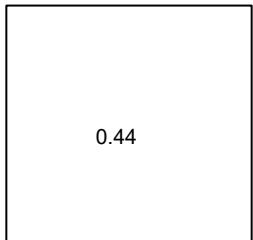
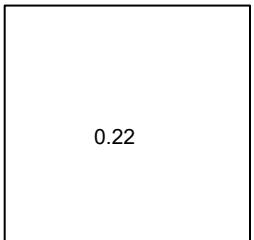
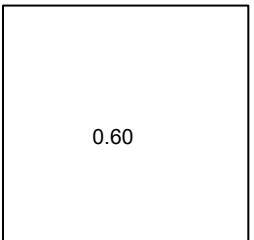
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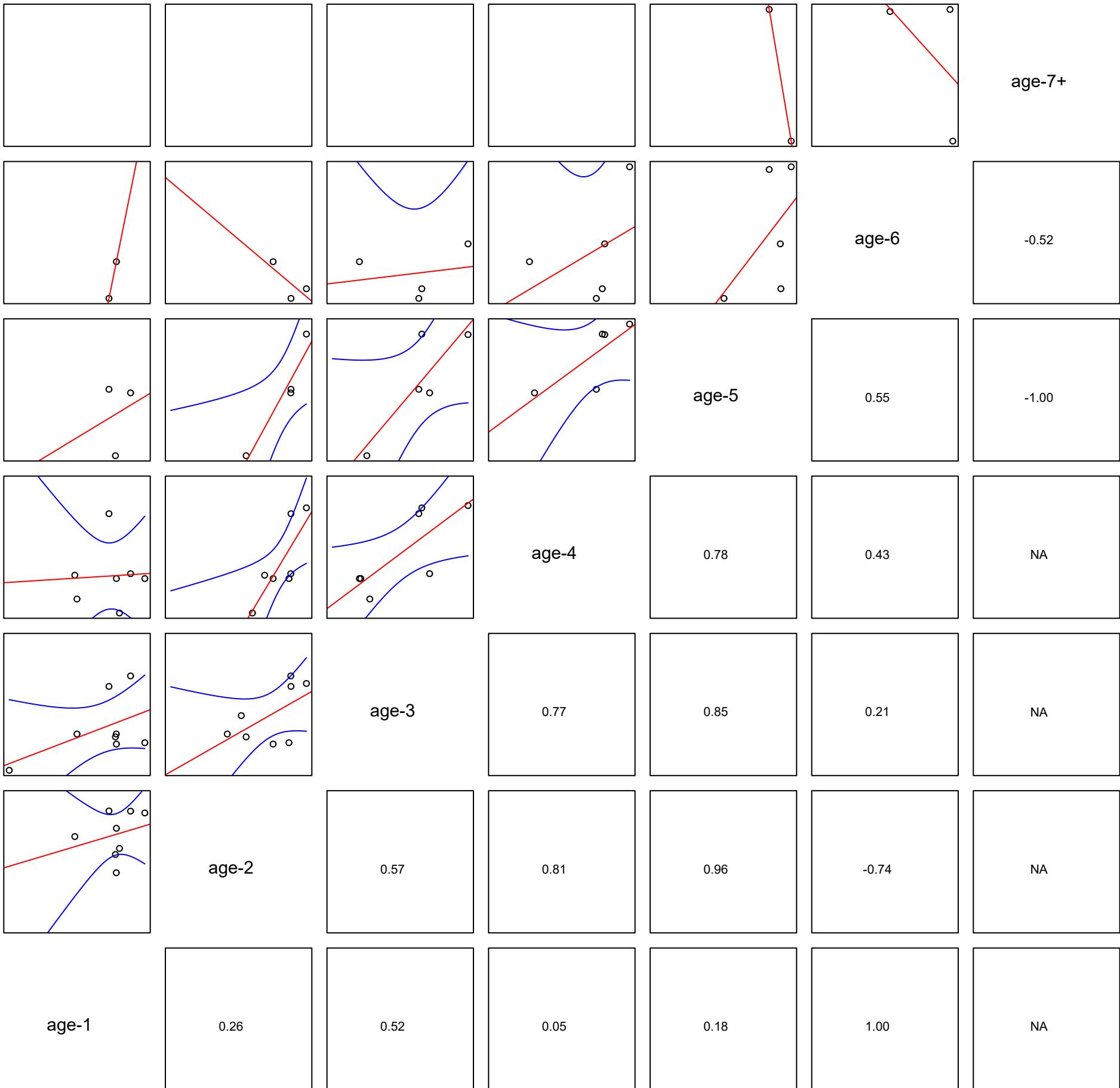
age-2



age-1

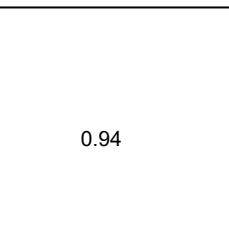
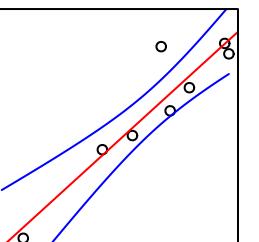
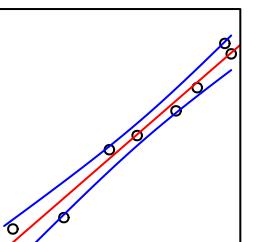
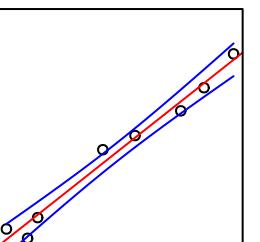
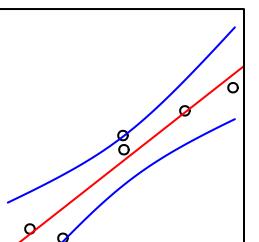
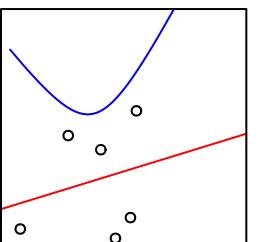
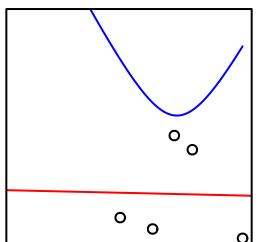


Index 2 Observed

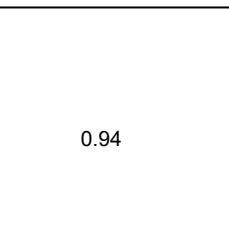
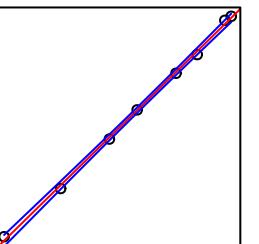
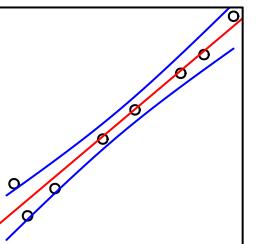
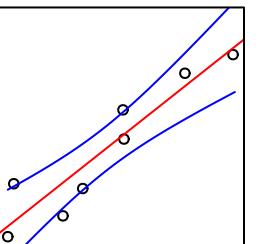
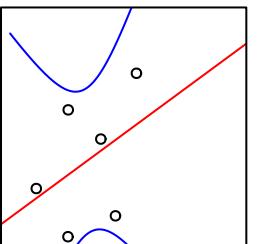
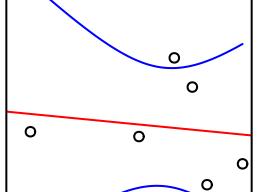


Index 2 Predicted

age-7+

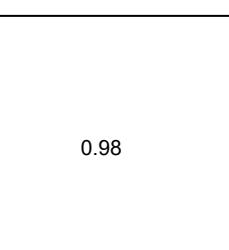
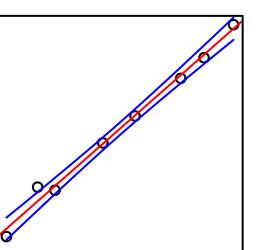
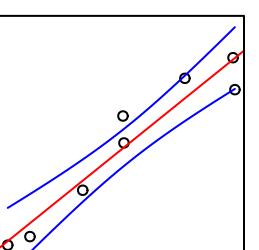
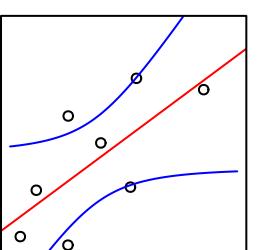
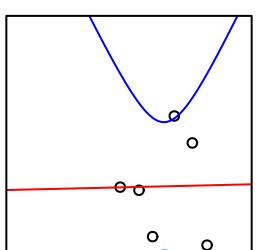


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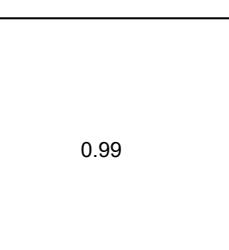
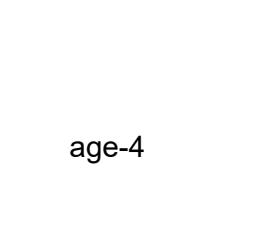
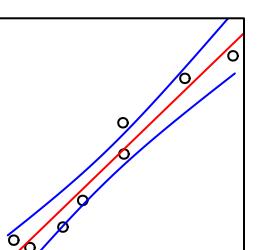
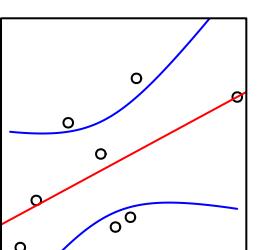
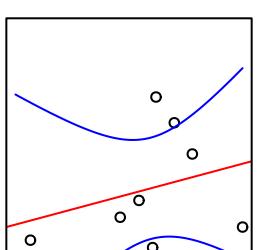
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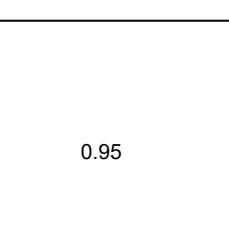
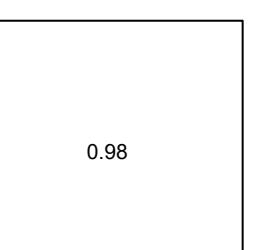
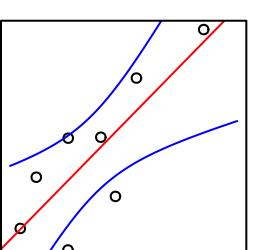
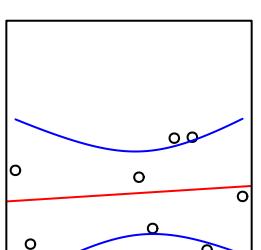
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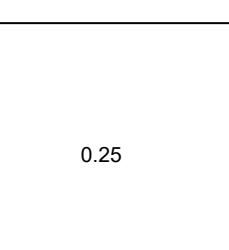
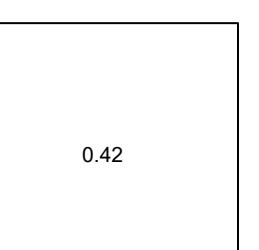
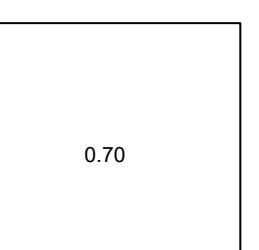
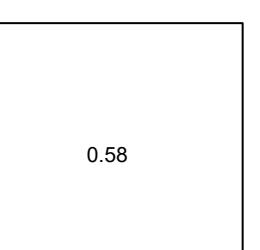
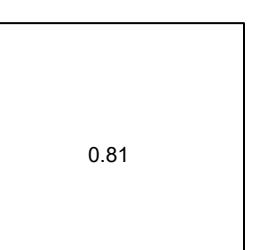
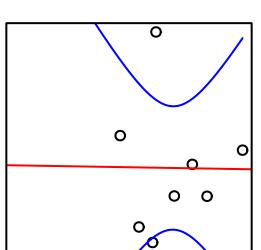
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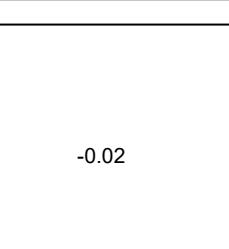
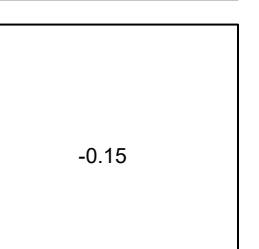
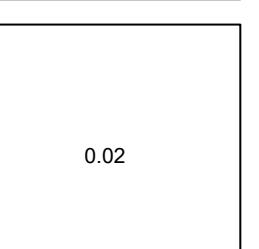
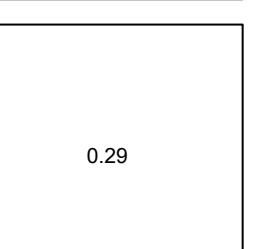
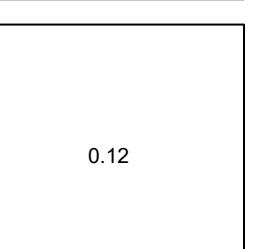
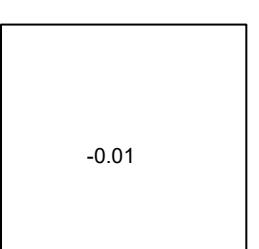
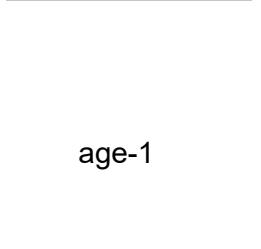
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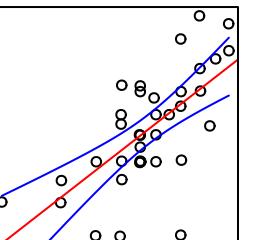
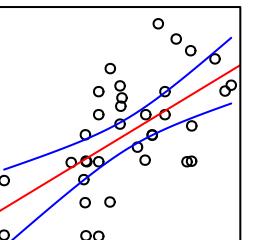
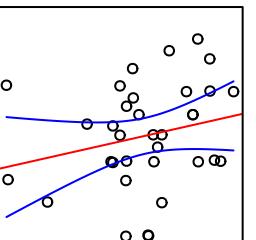
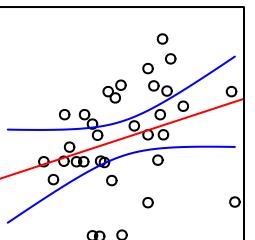
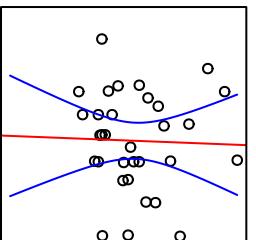
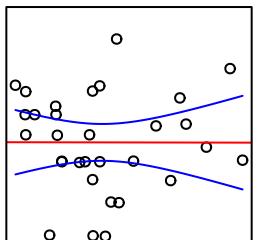


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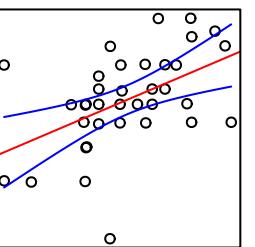
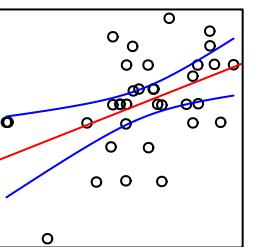
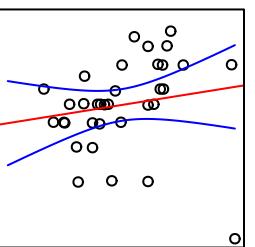
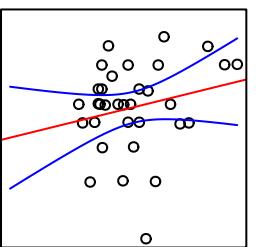
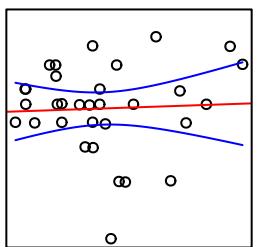
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Index 3 Observed

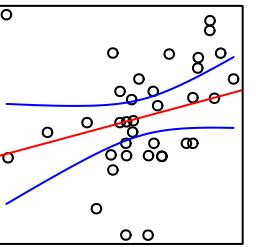
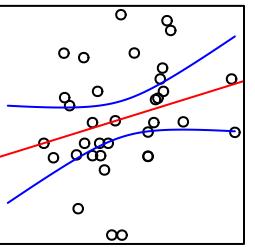
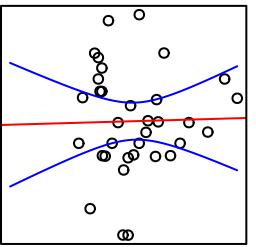
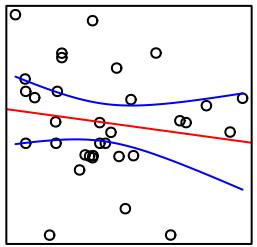


age-7+



age-6

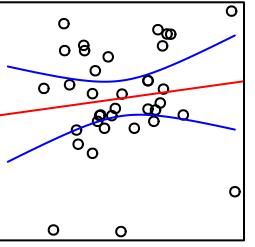
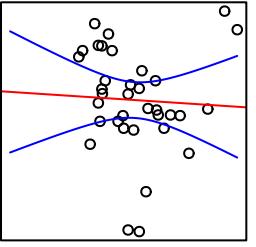
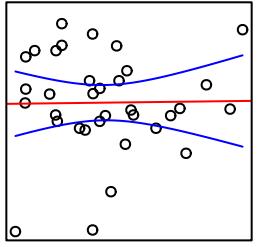
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age-5

0.49

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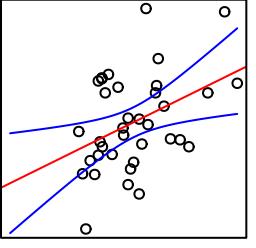
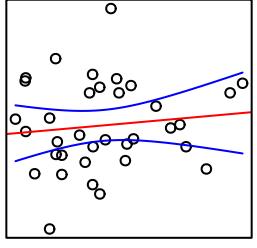


age-4

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0.46

0.24



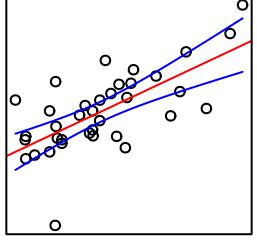
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0.12

0.27

0.17

0.31



age-2

0.41

-0.05

0.22

-0.03



age-1

0.68

0.12

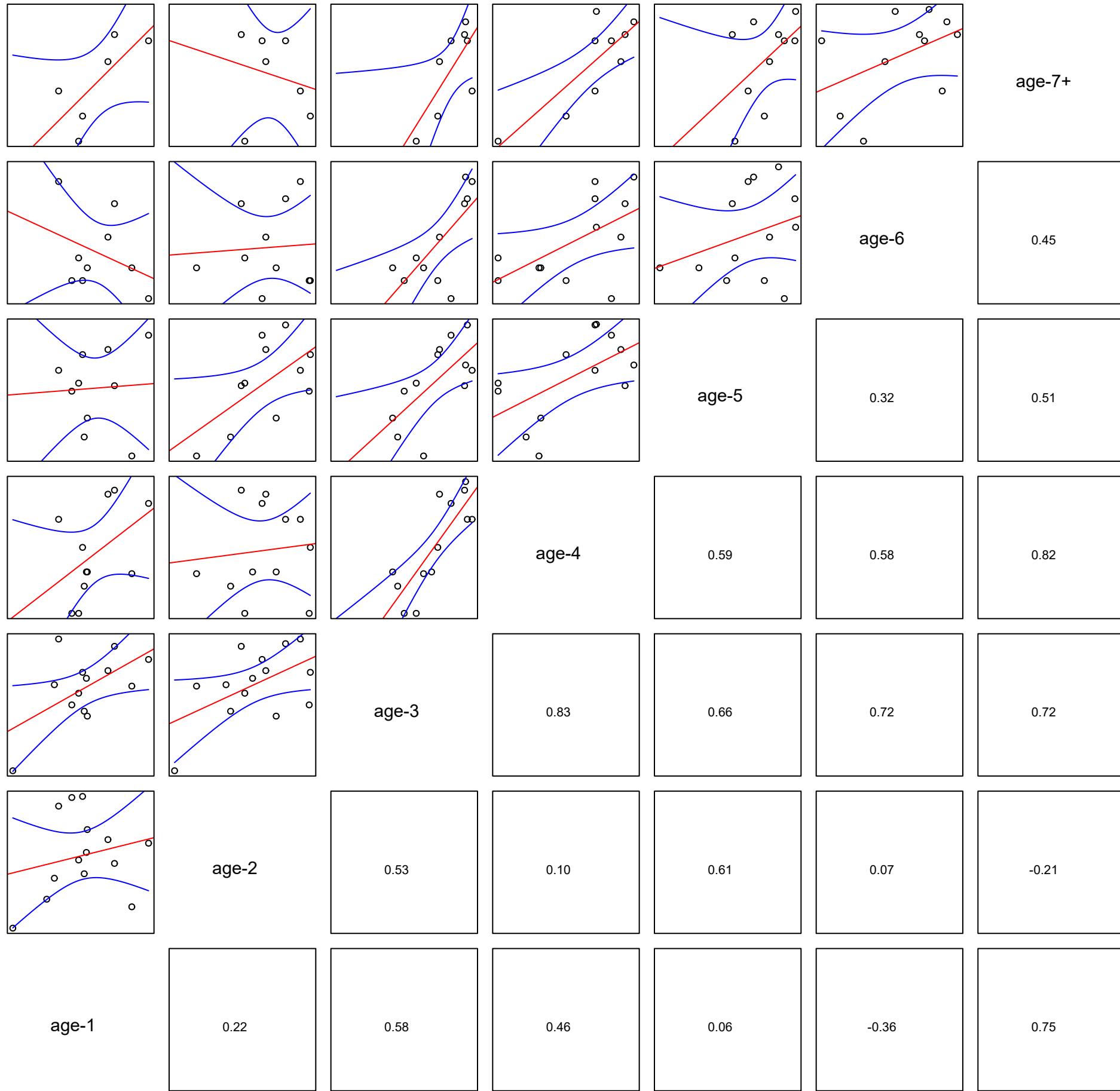
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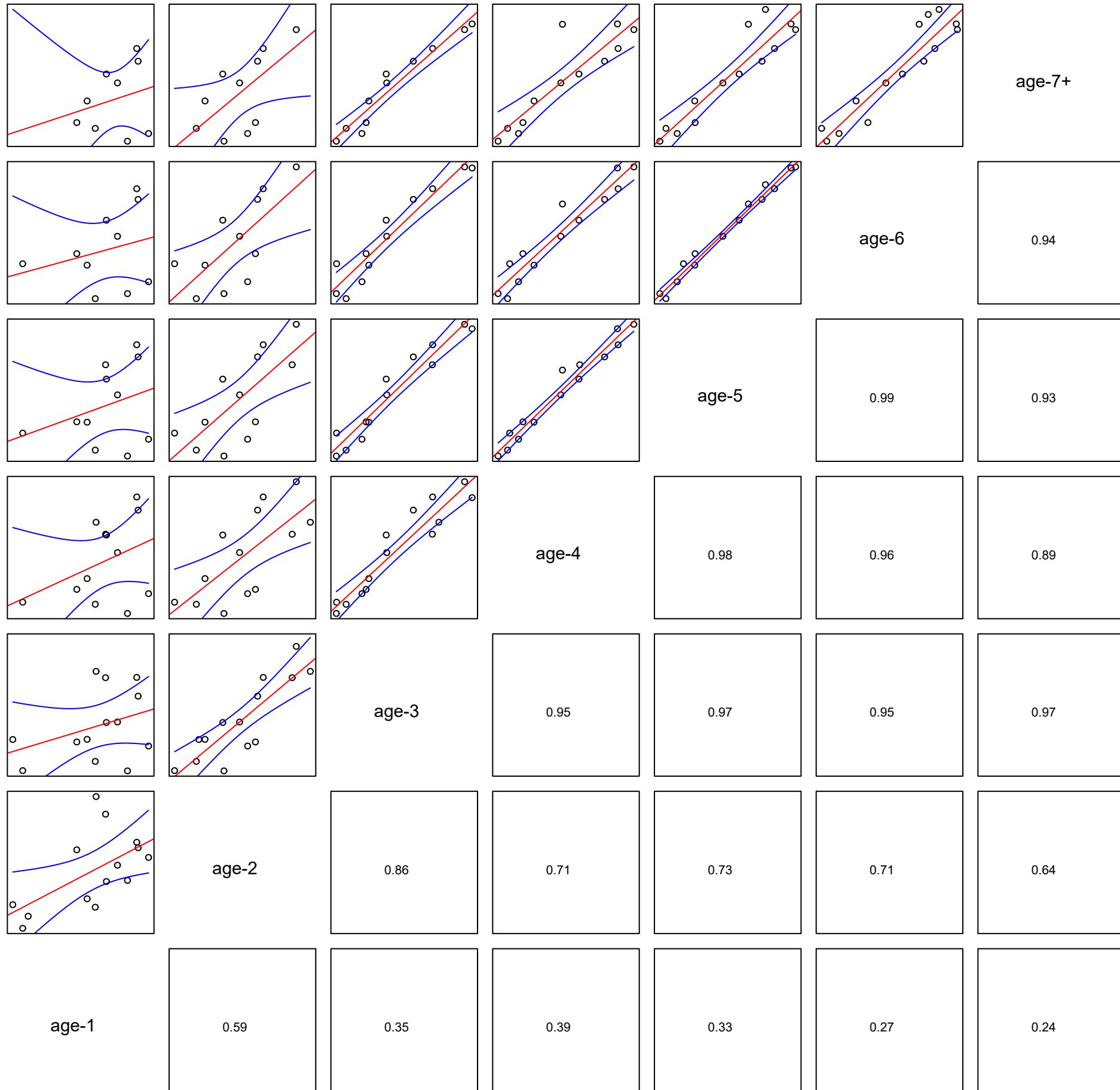
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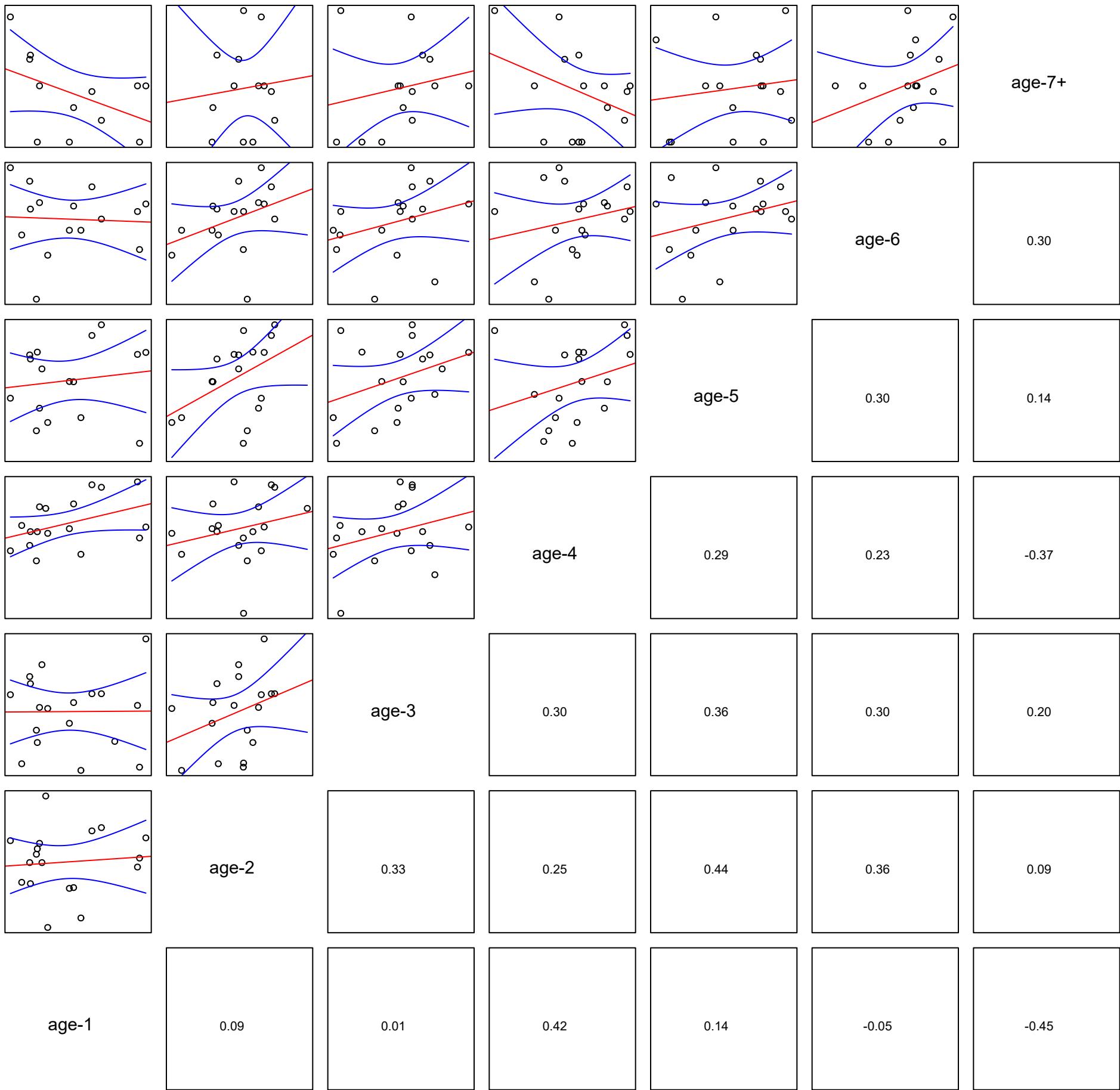
Index 4 Observed



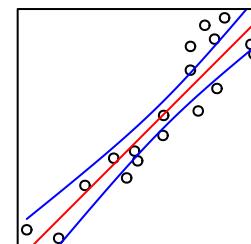
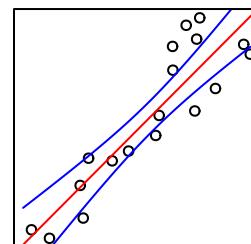
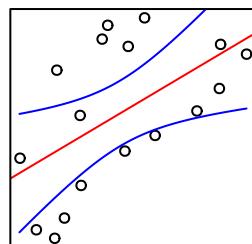
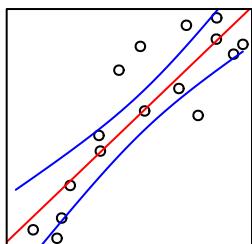
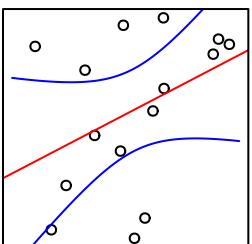
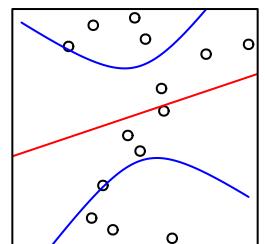
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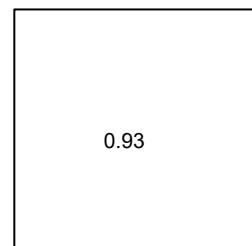
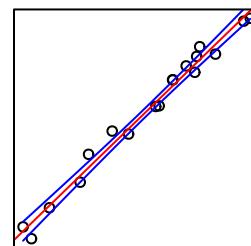
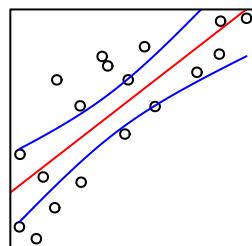
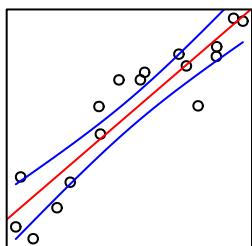
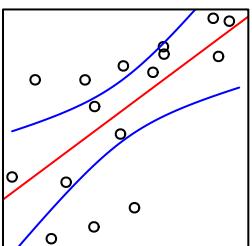
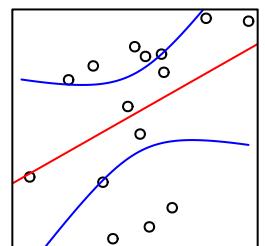
Index 6 Observed



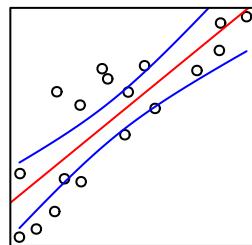
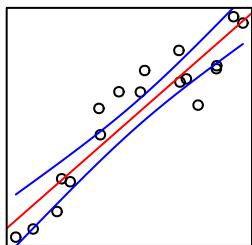
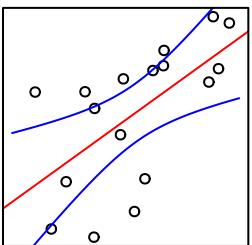
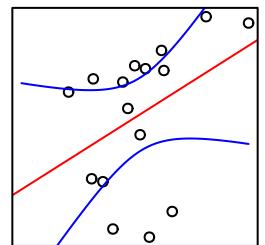
Index 6 Predicted



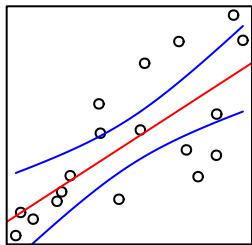
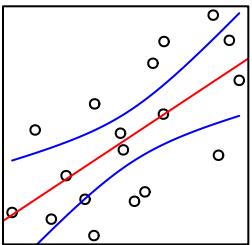
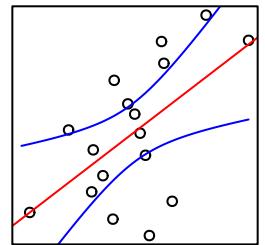
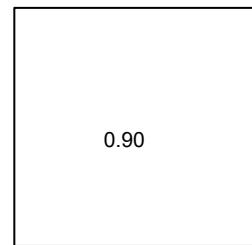
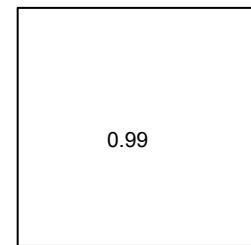
age-7+



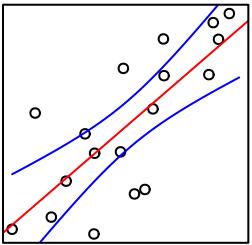
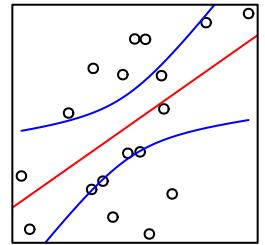
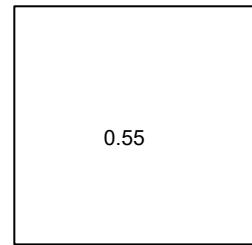
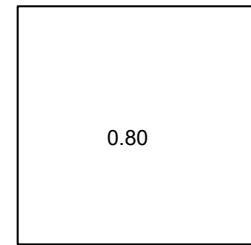
age-6



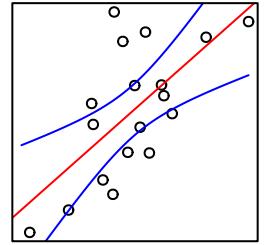
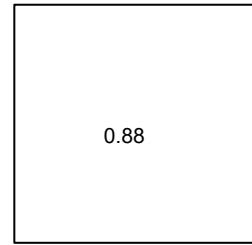
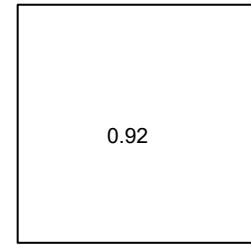
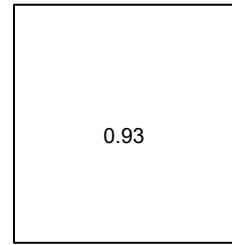
age-5



0.84

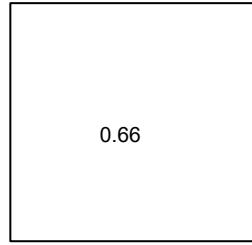


0.74

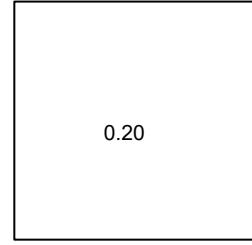
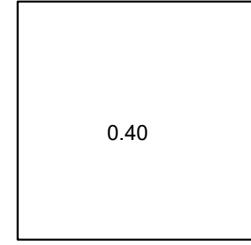
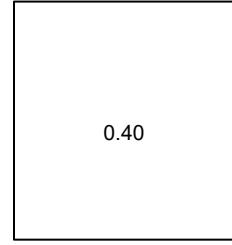
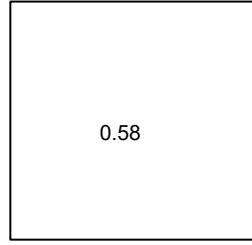
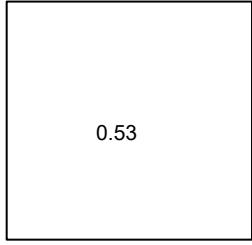
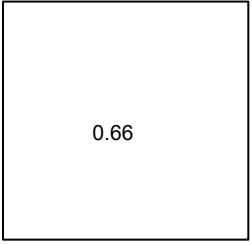
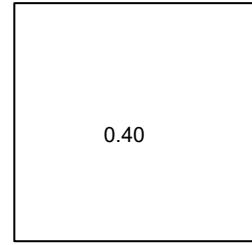
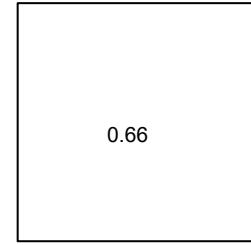


age-2

0.77



0.62



Index 8 Observed

age-1

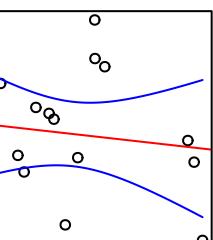
-0.14

0.20

0.01

NA

NA



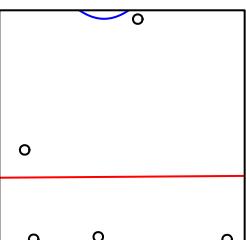
age-2

-0.20

0.46

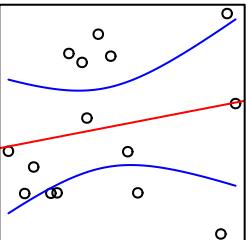
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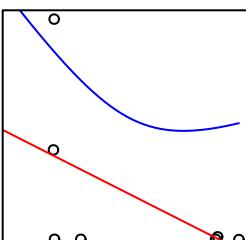


age-3

-0.53



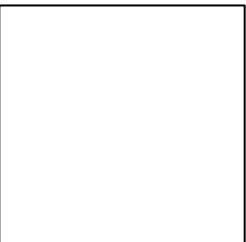
age-4



NA

NA

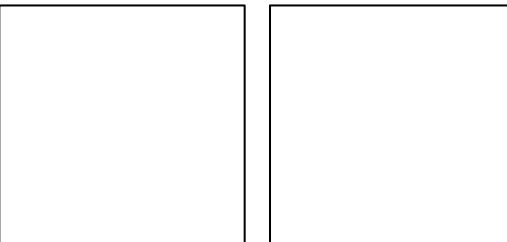
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age-5

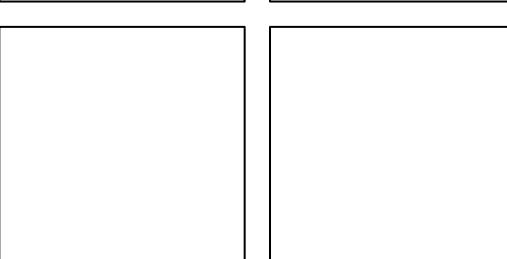
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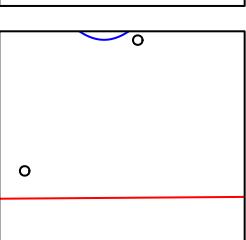


age-6

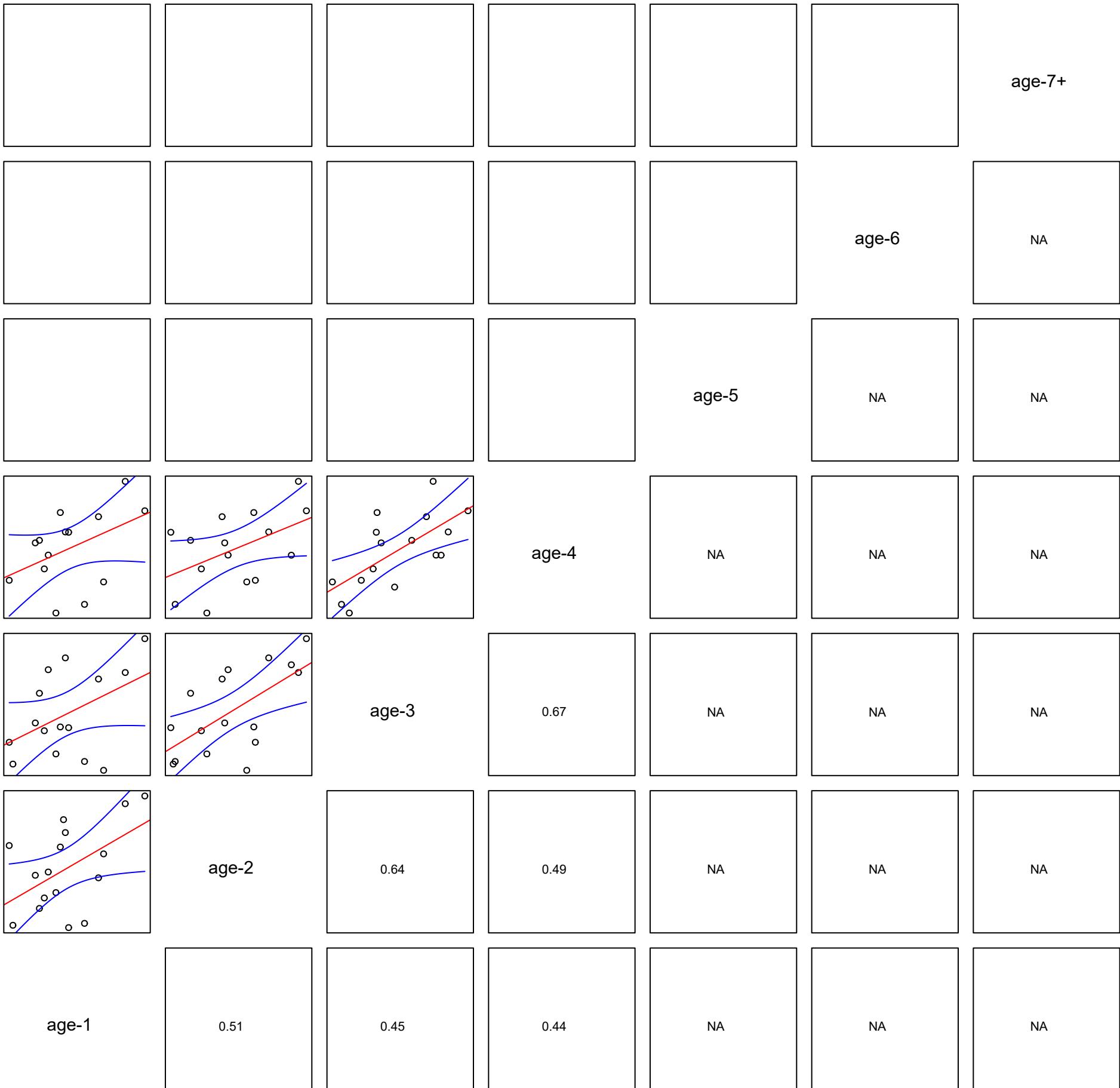
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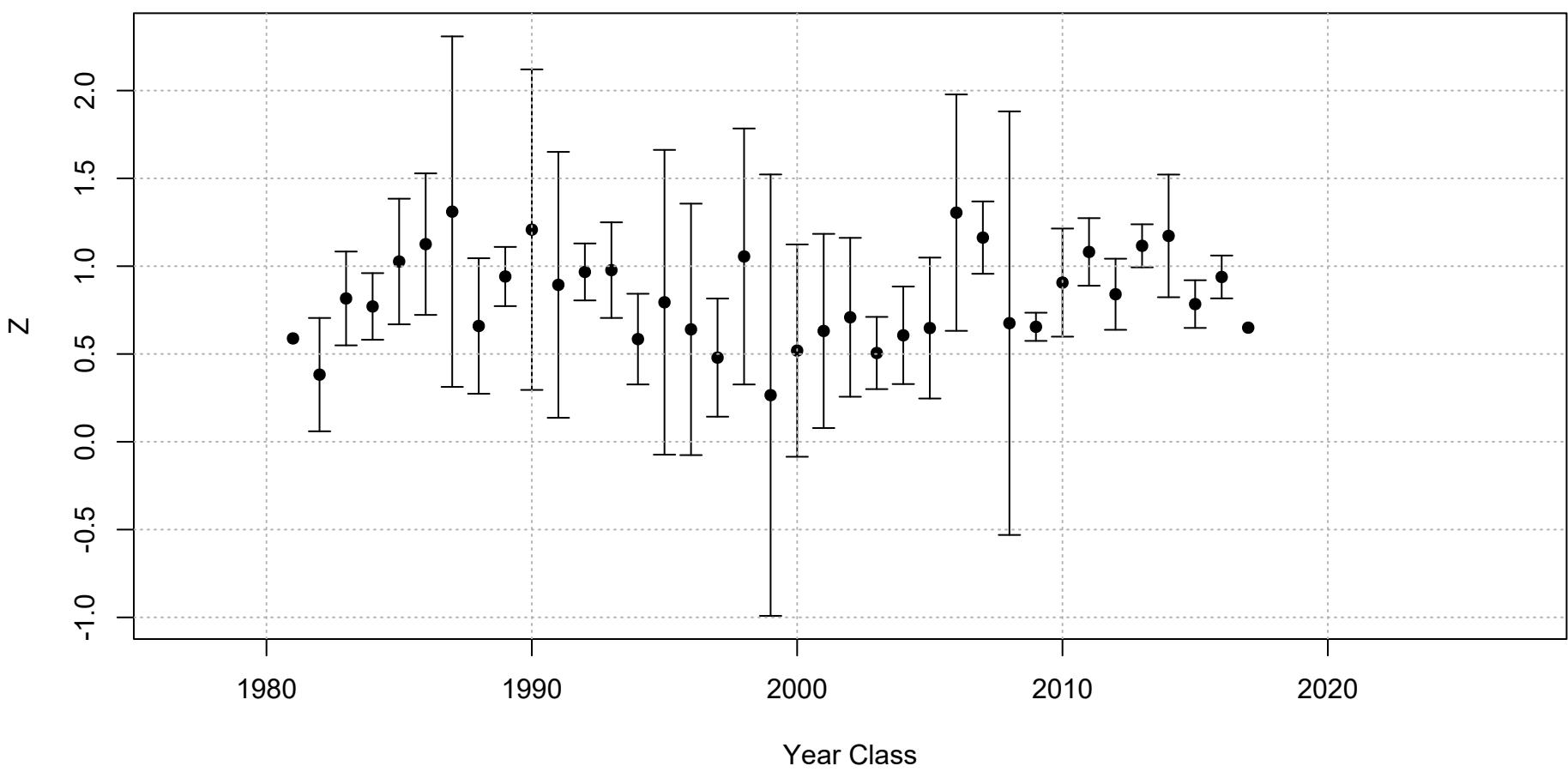
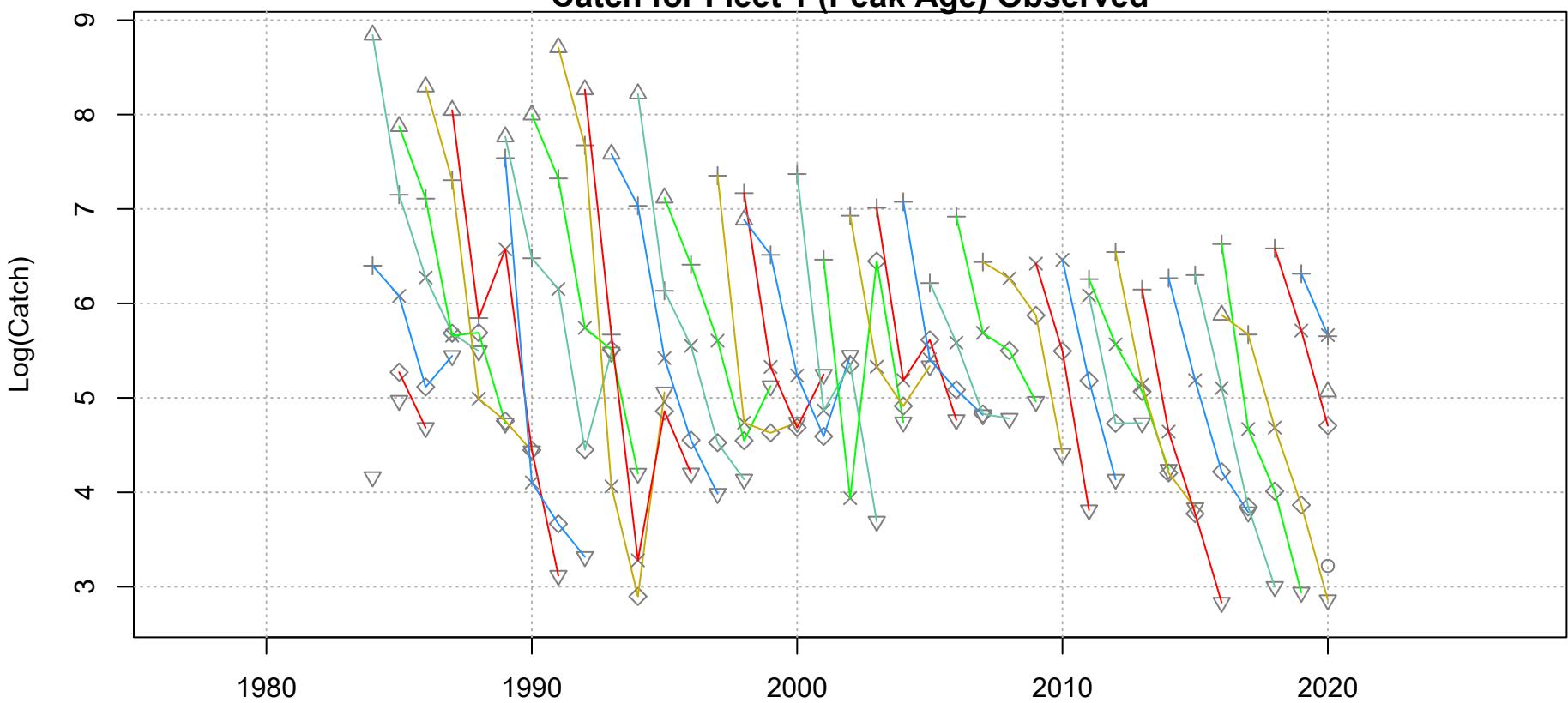
age-7+



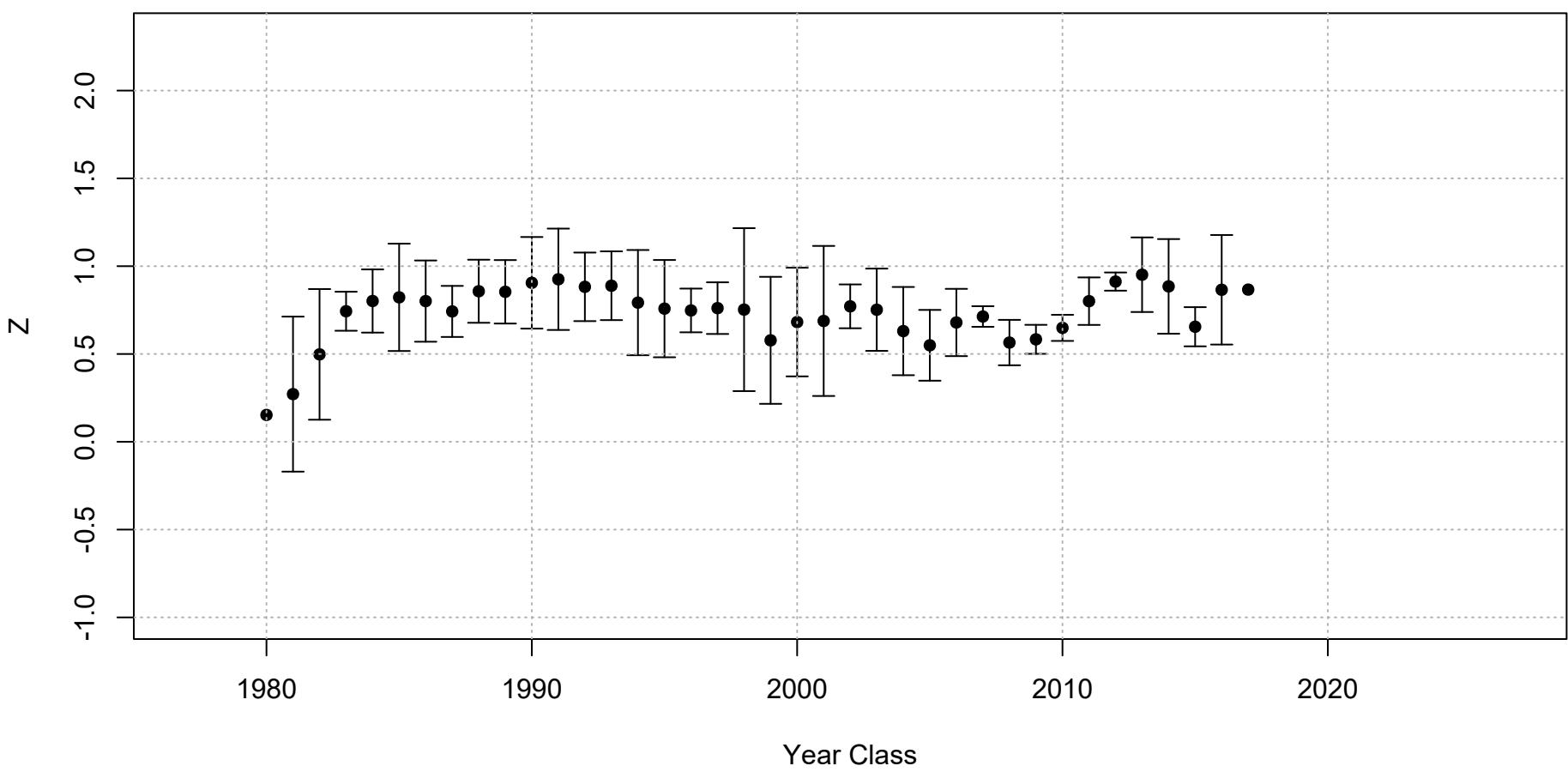
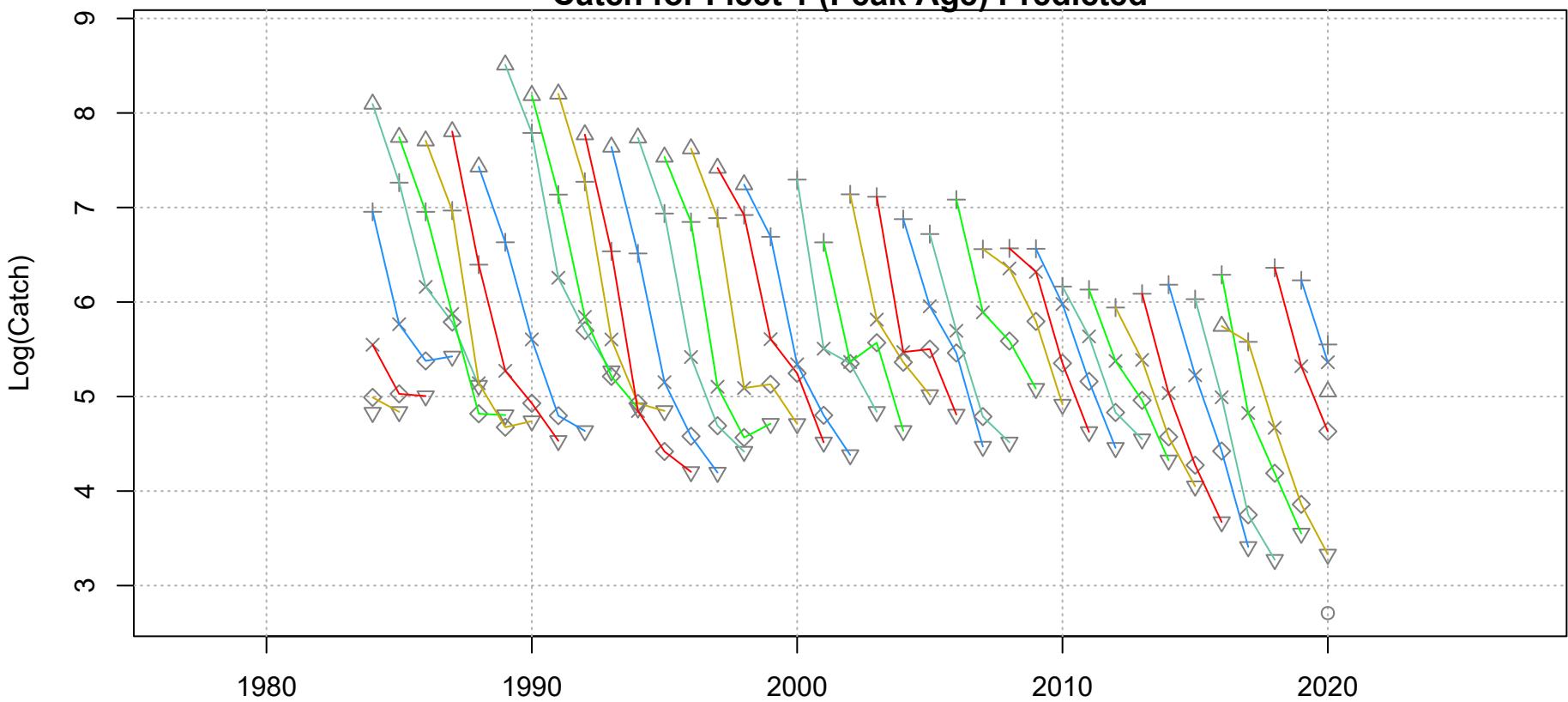
Index 8 Predicted



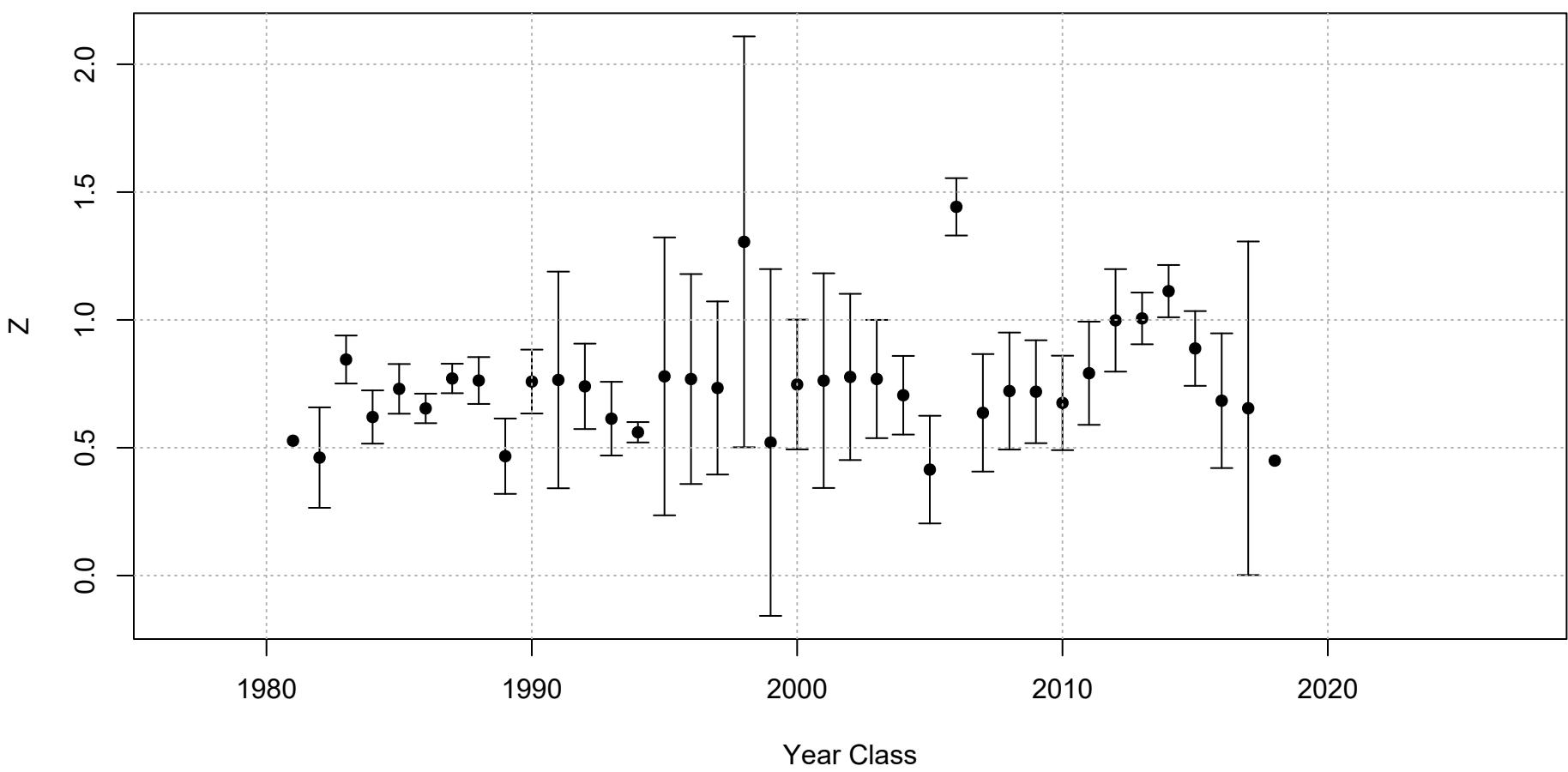
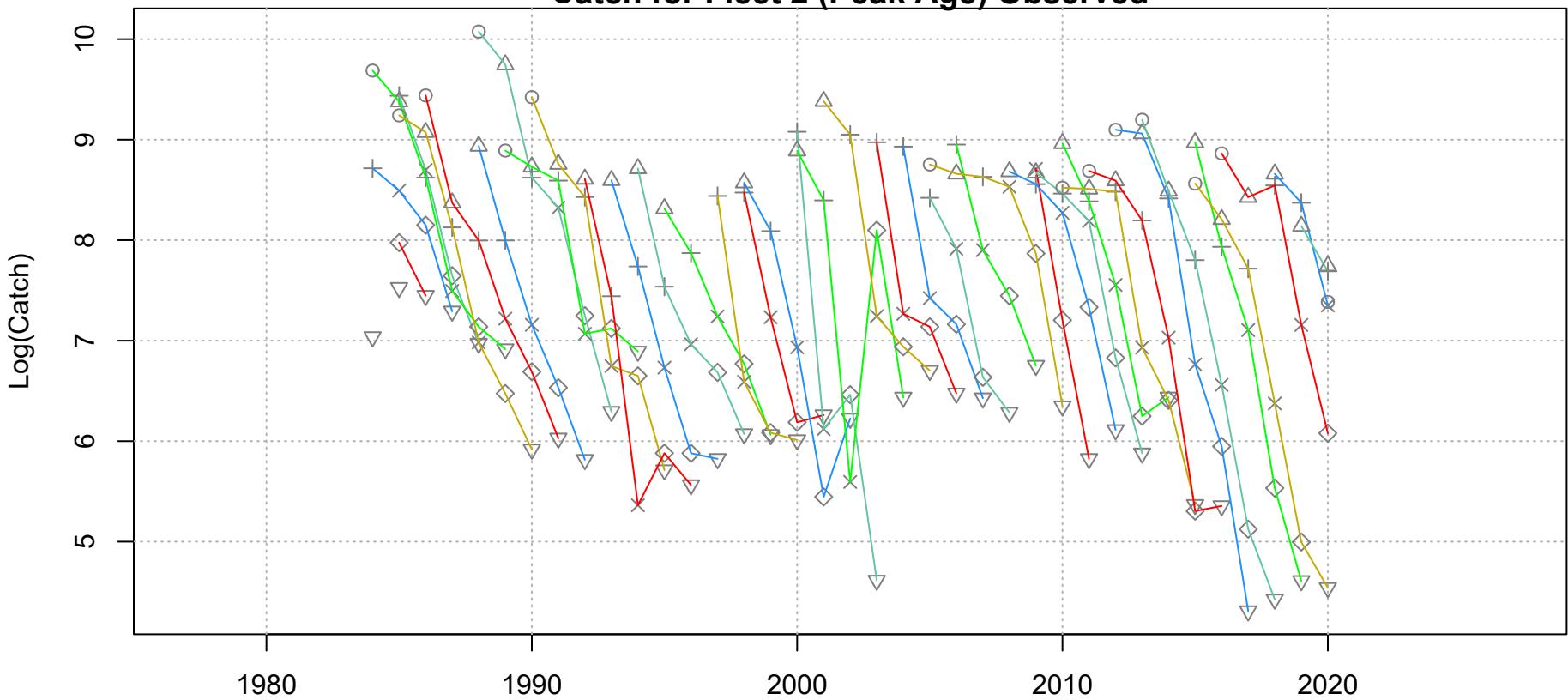
Catch for Fleet 1 (Peak Age) Observed



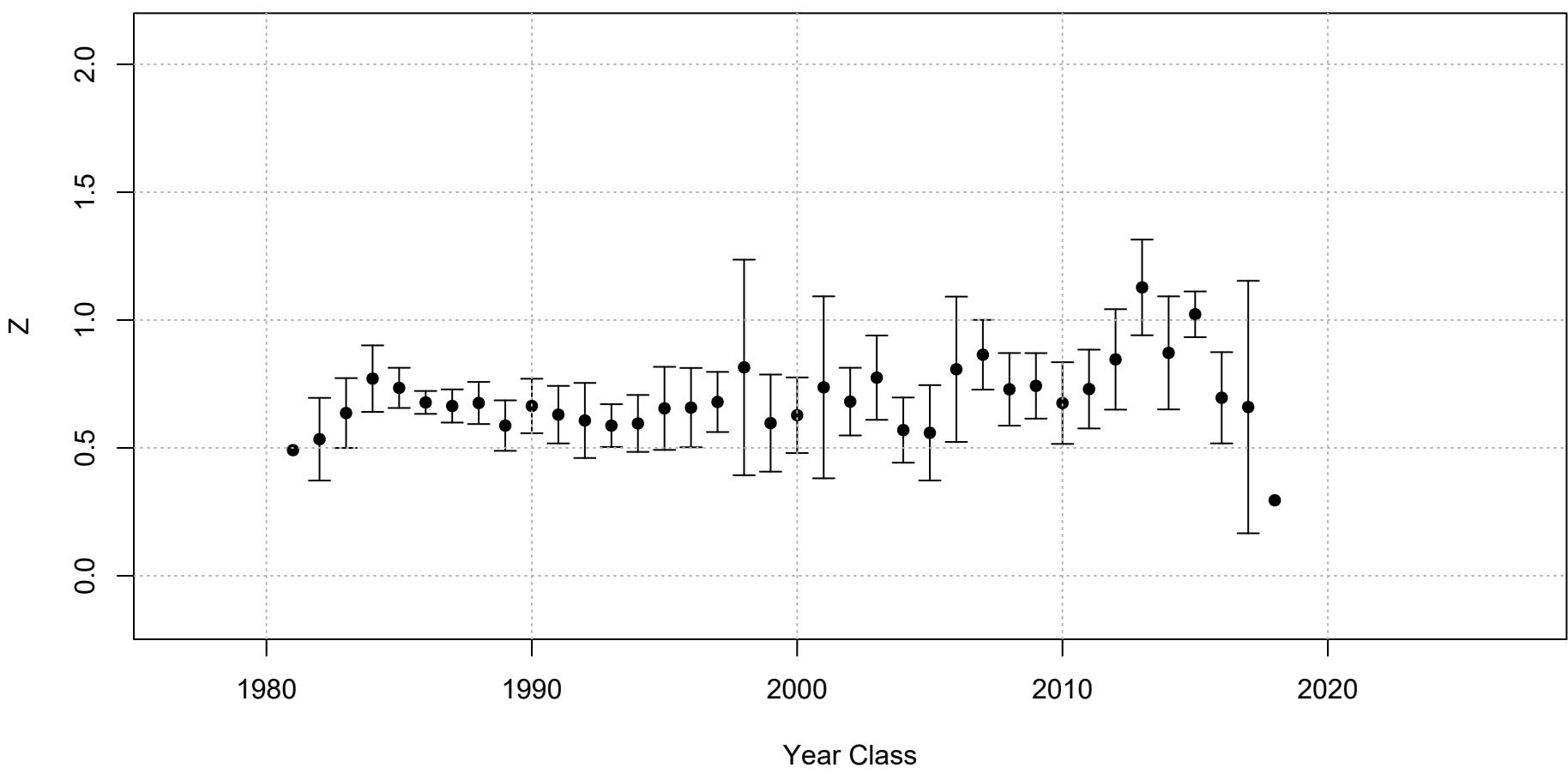
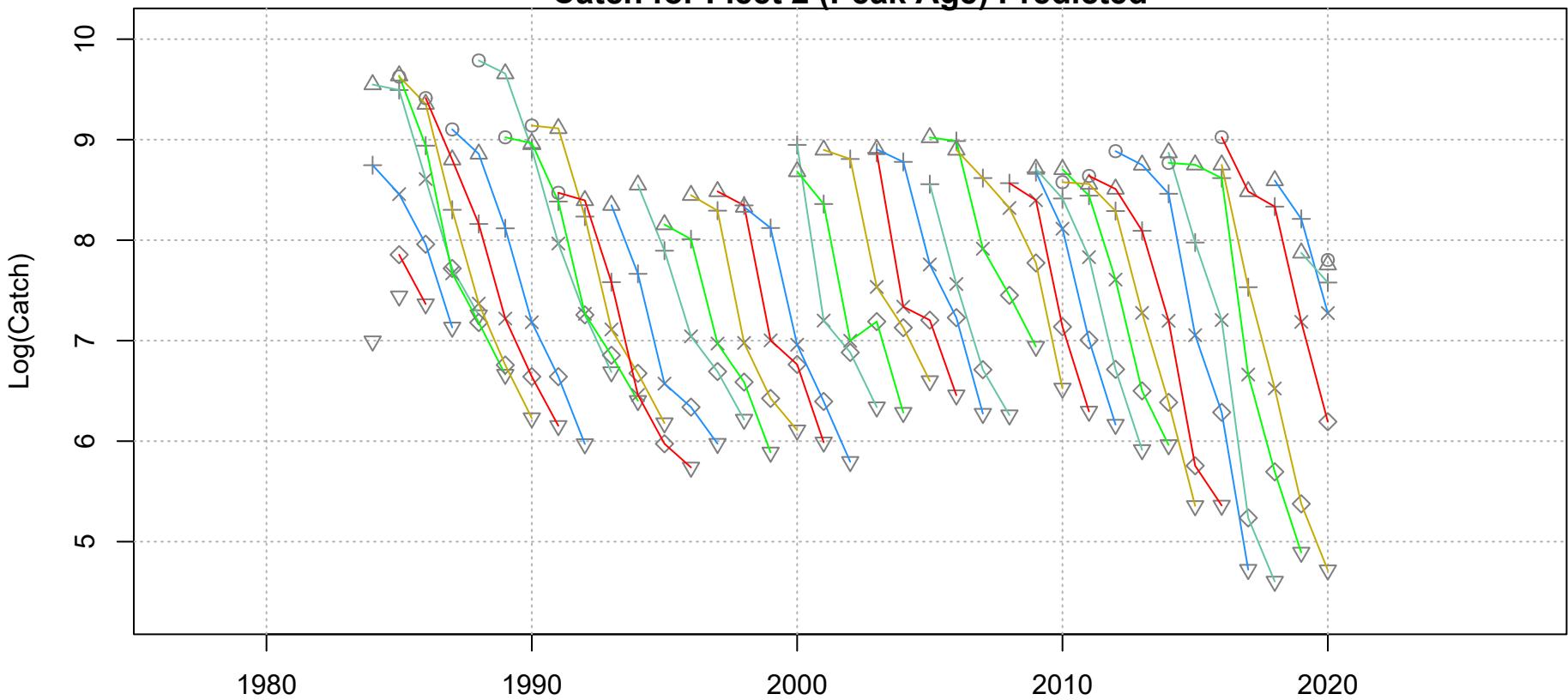
Catch for Fleet 1 (Peak Age) Predicted



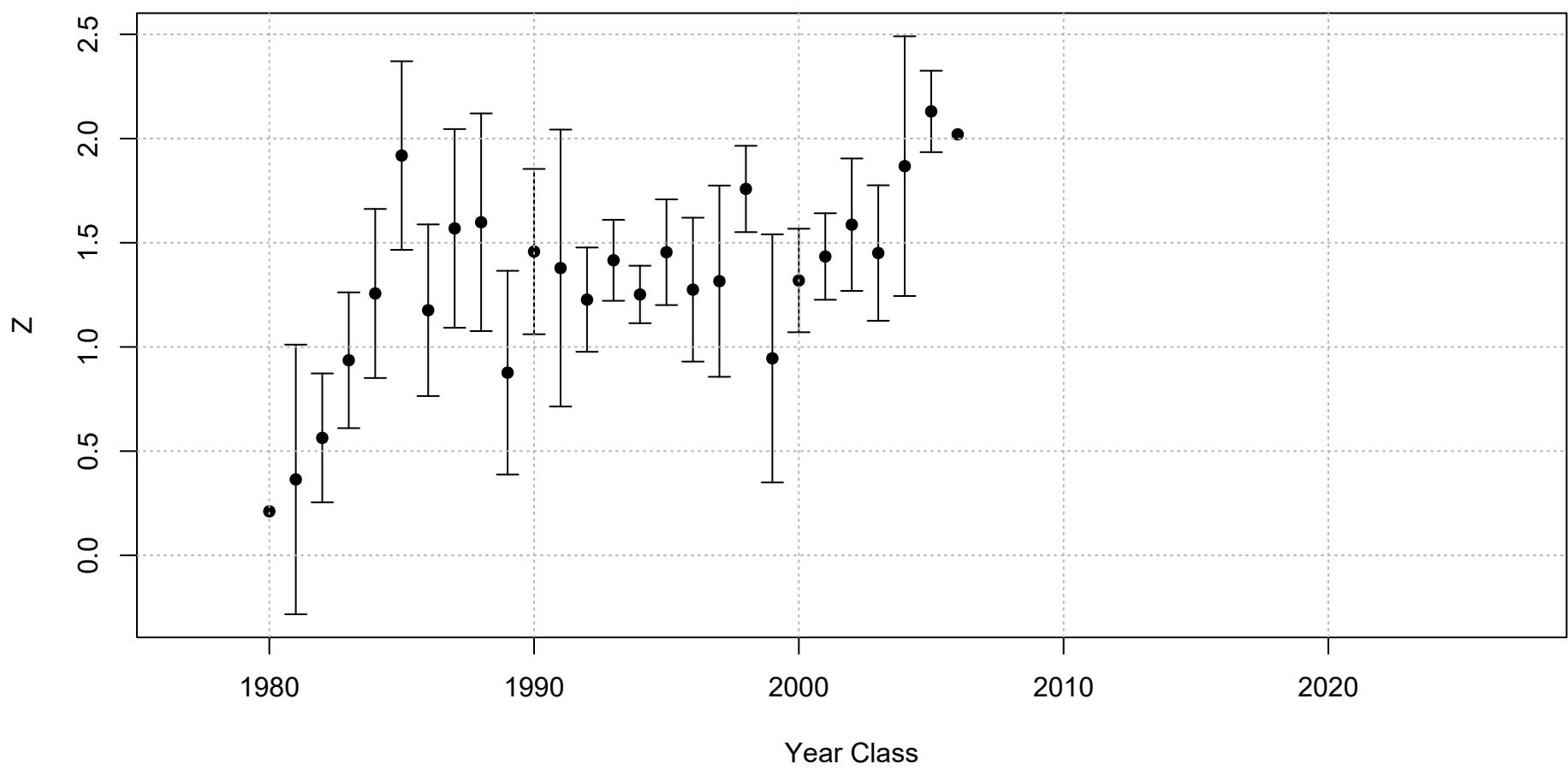
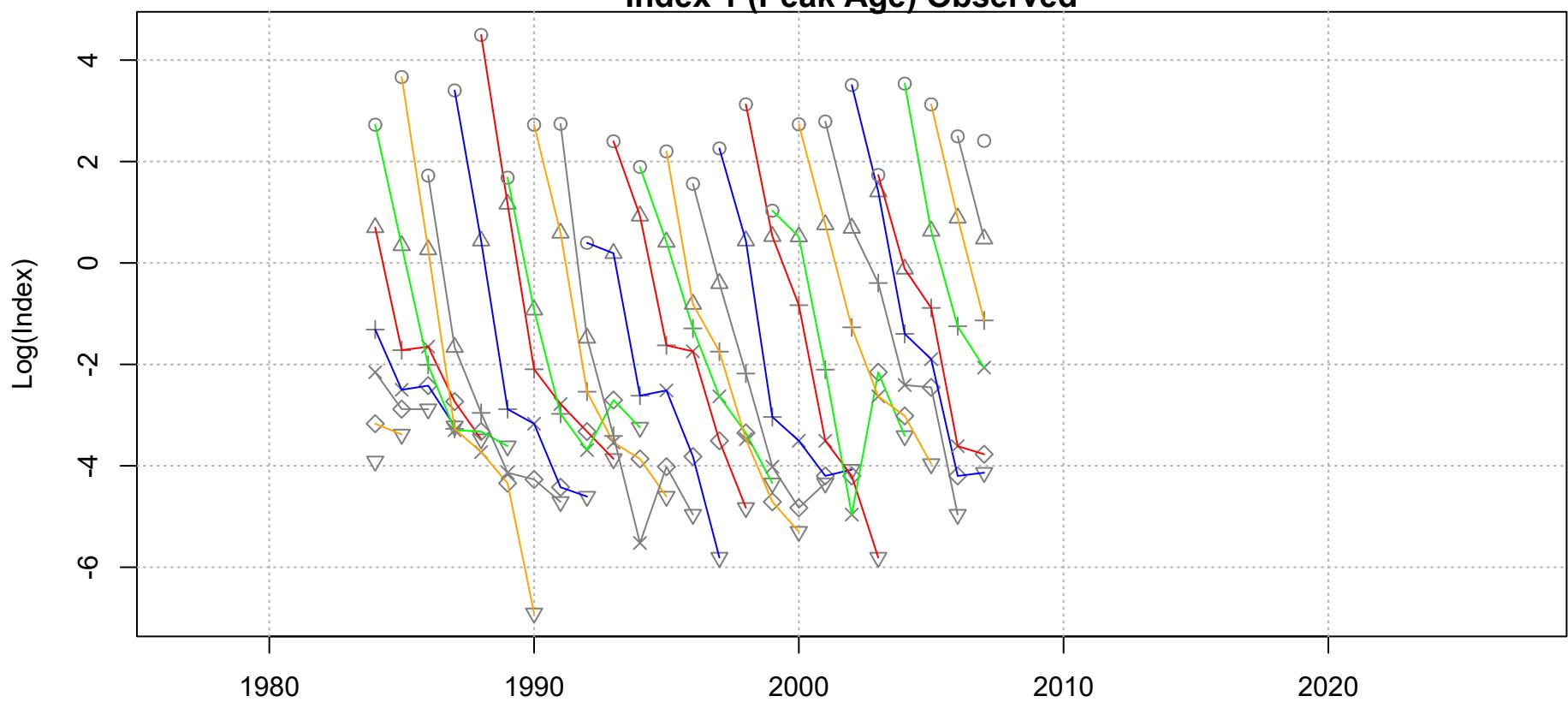
Catch for Fleet 2 (Peak Age) Observed



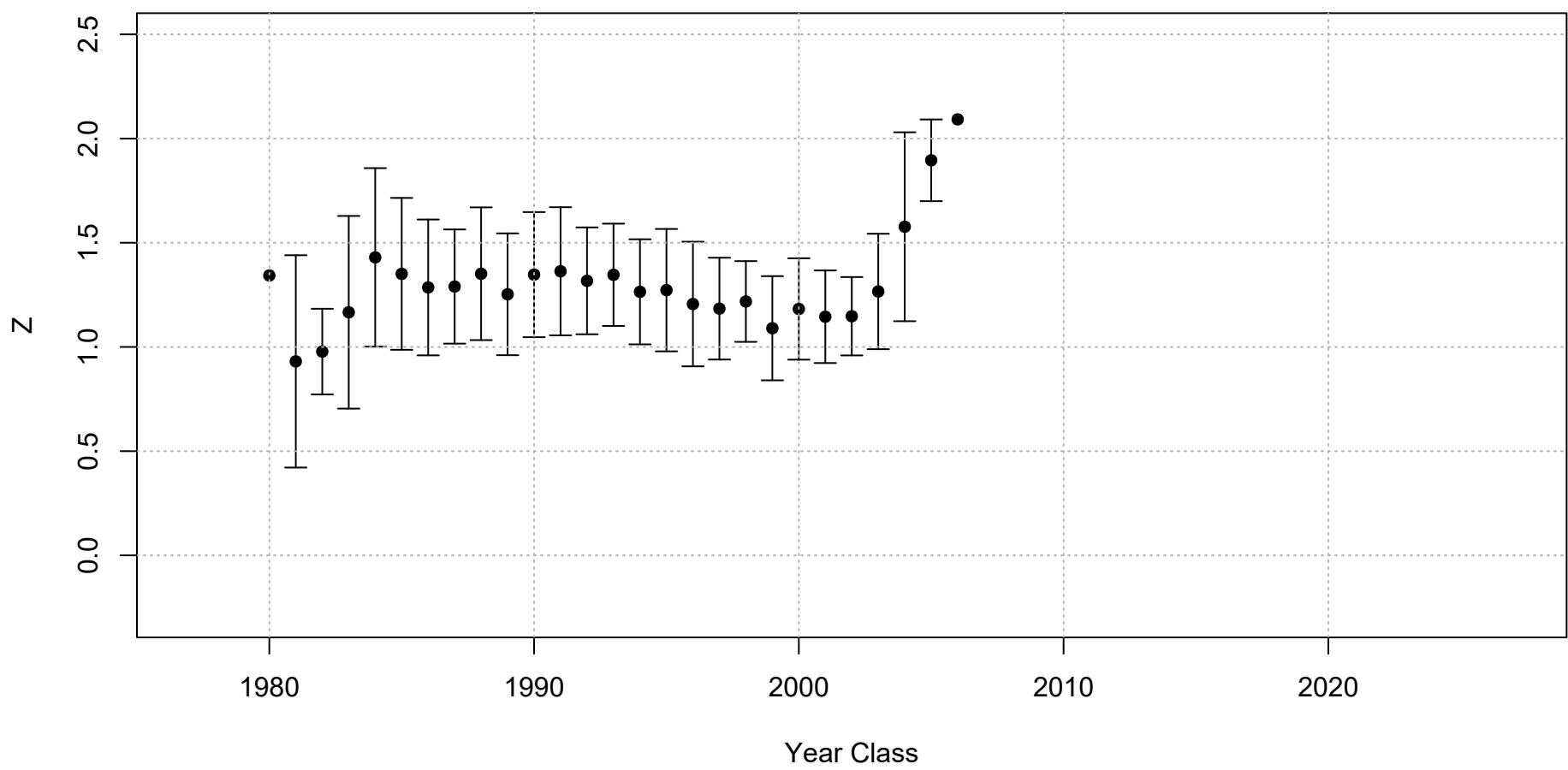
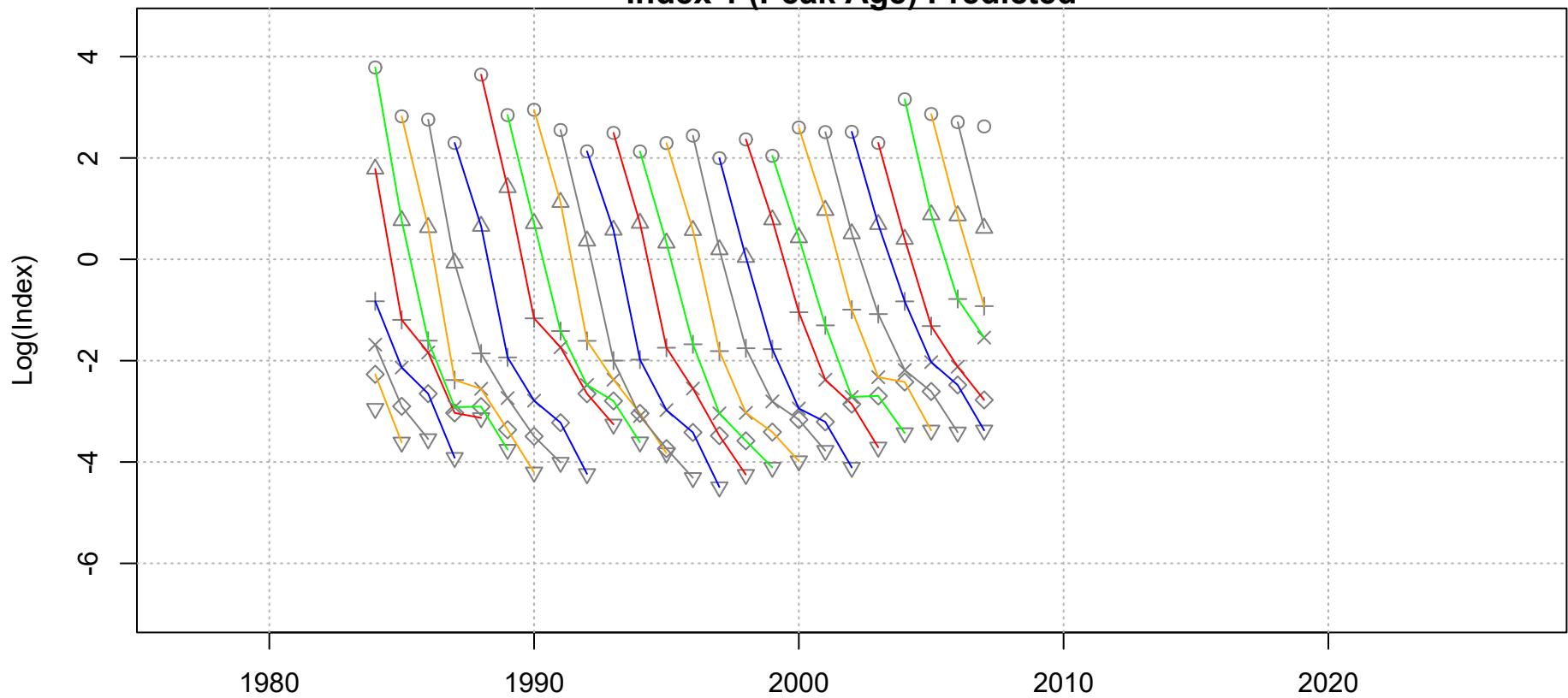
Catch for Fleet 2 (Peak Age) Predicted



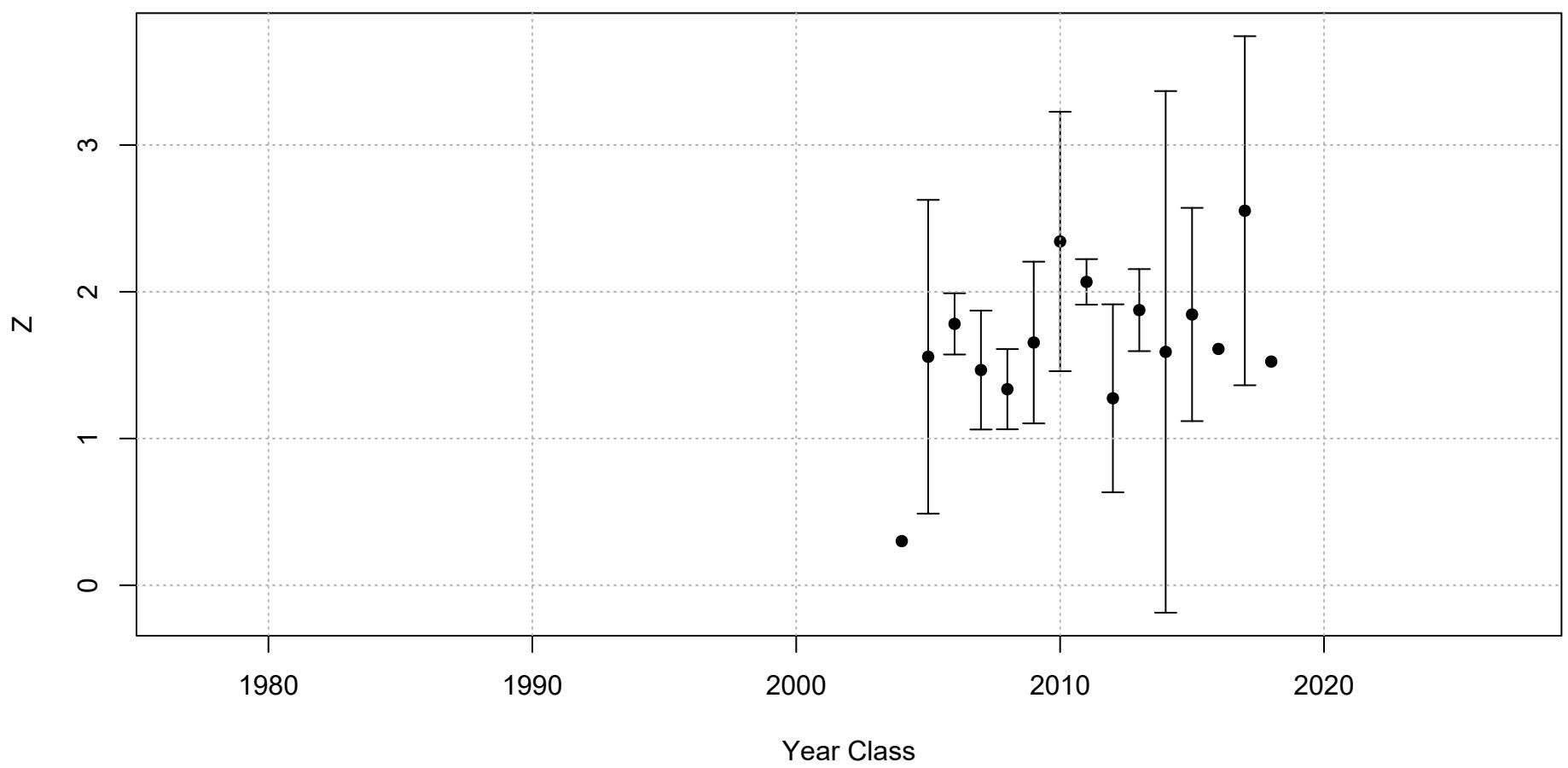
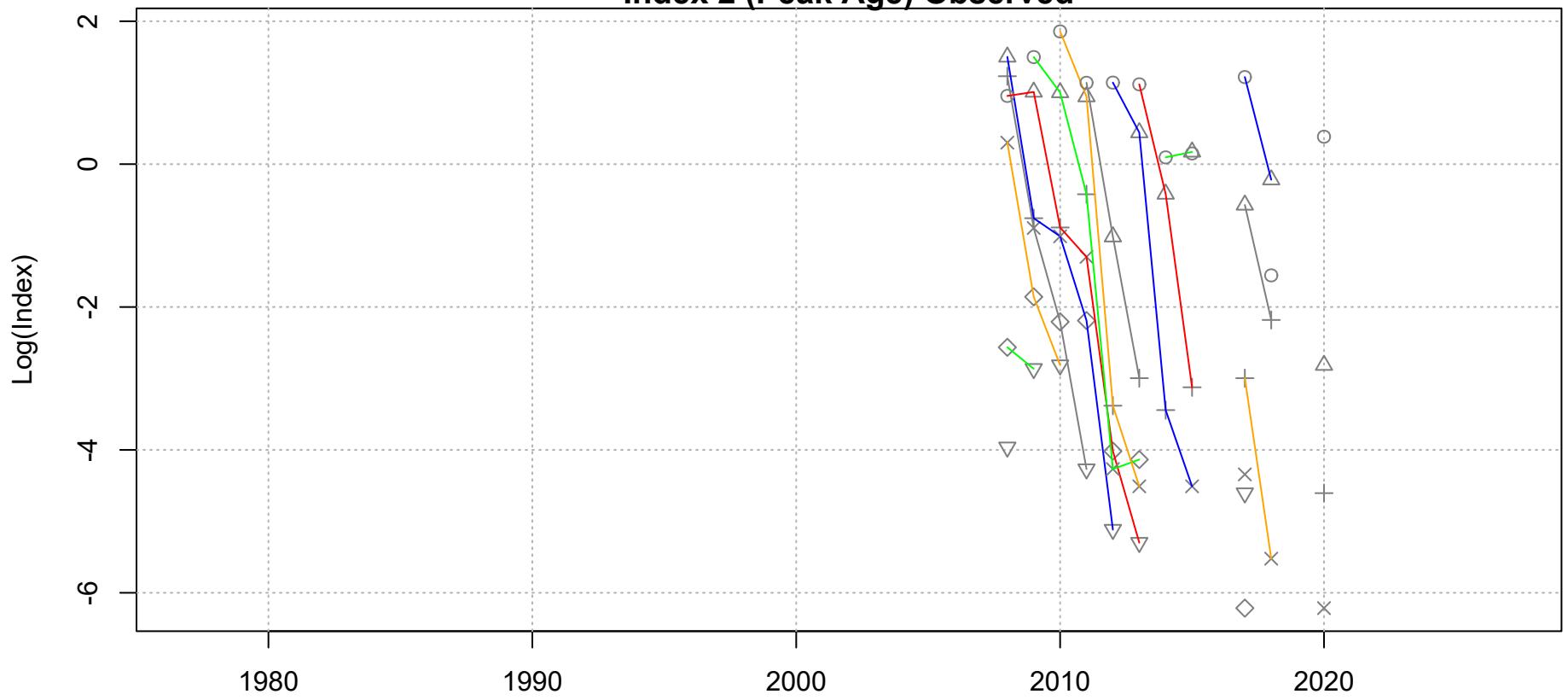
Index 1 (Peak Age) Observed



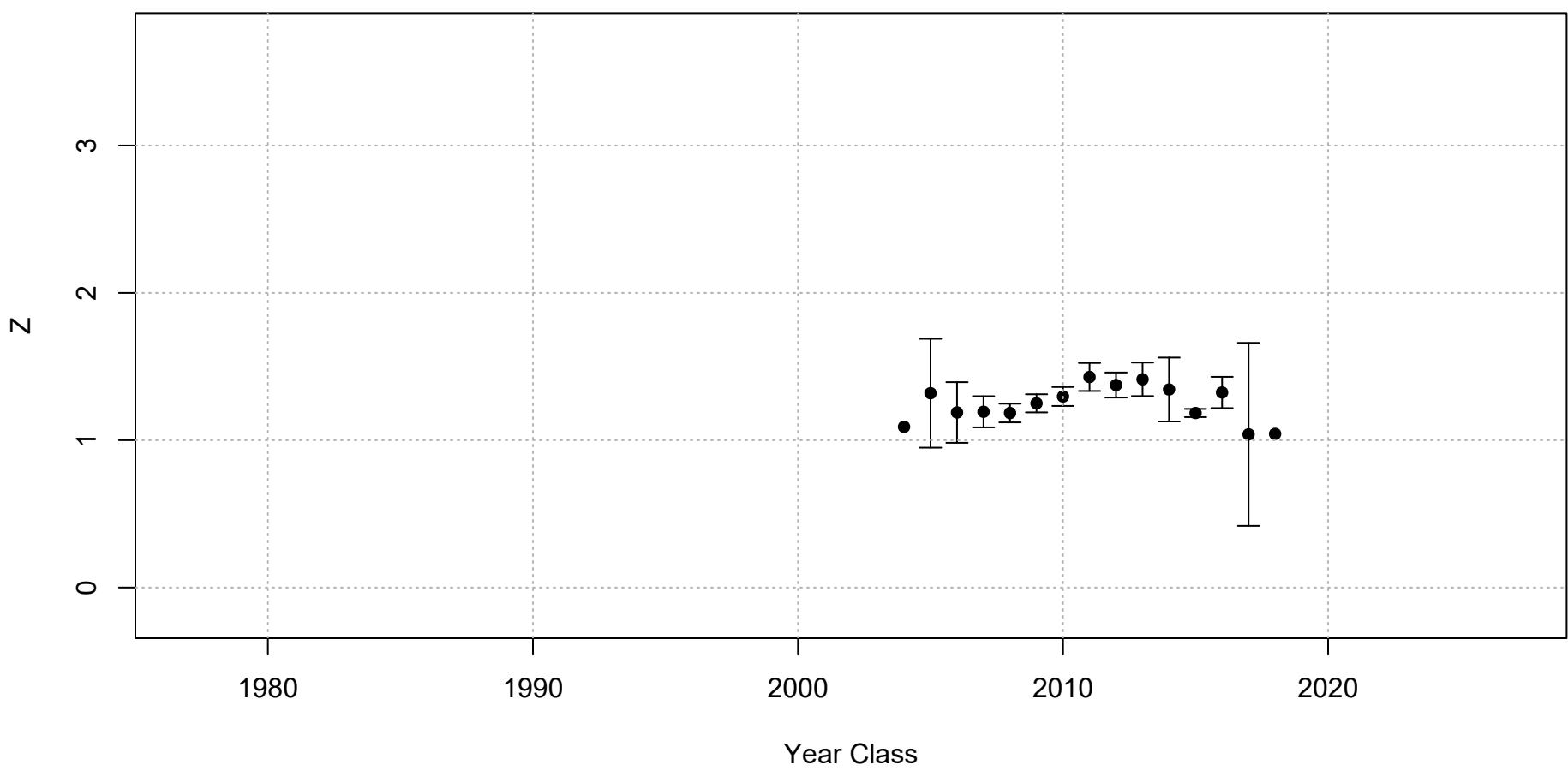
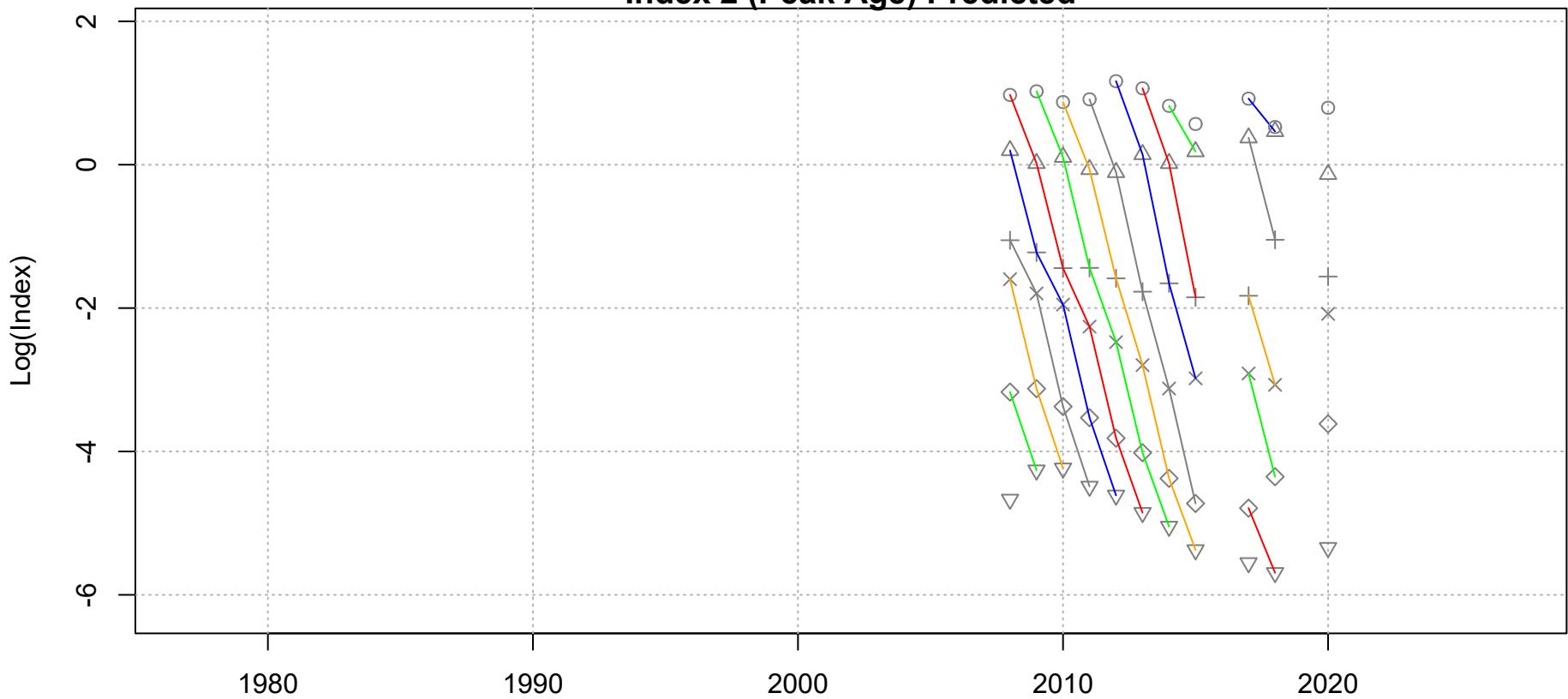
Index 1 (Peak Age) Predicted



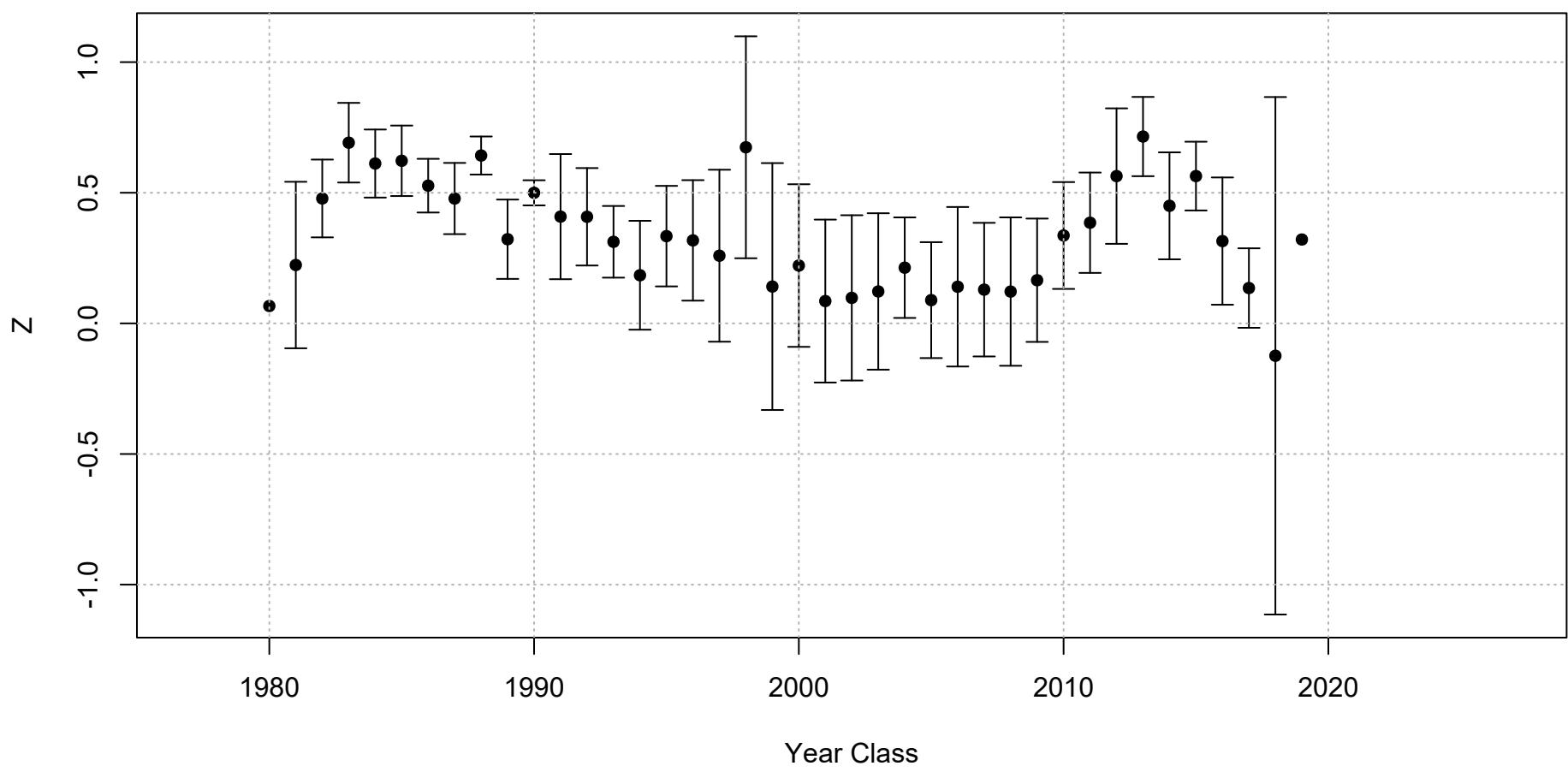
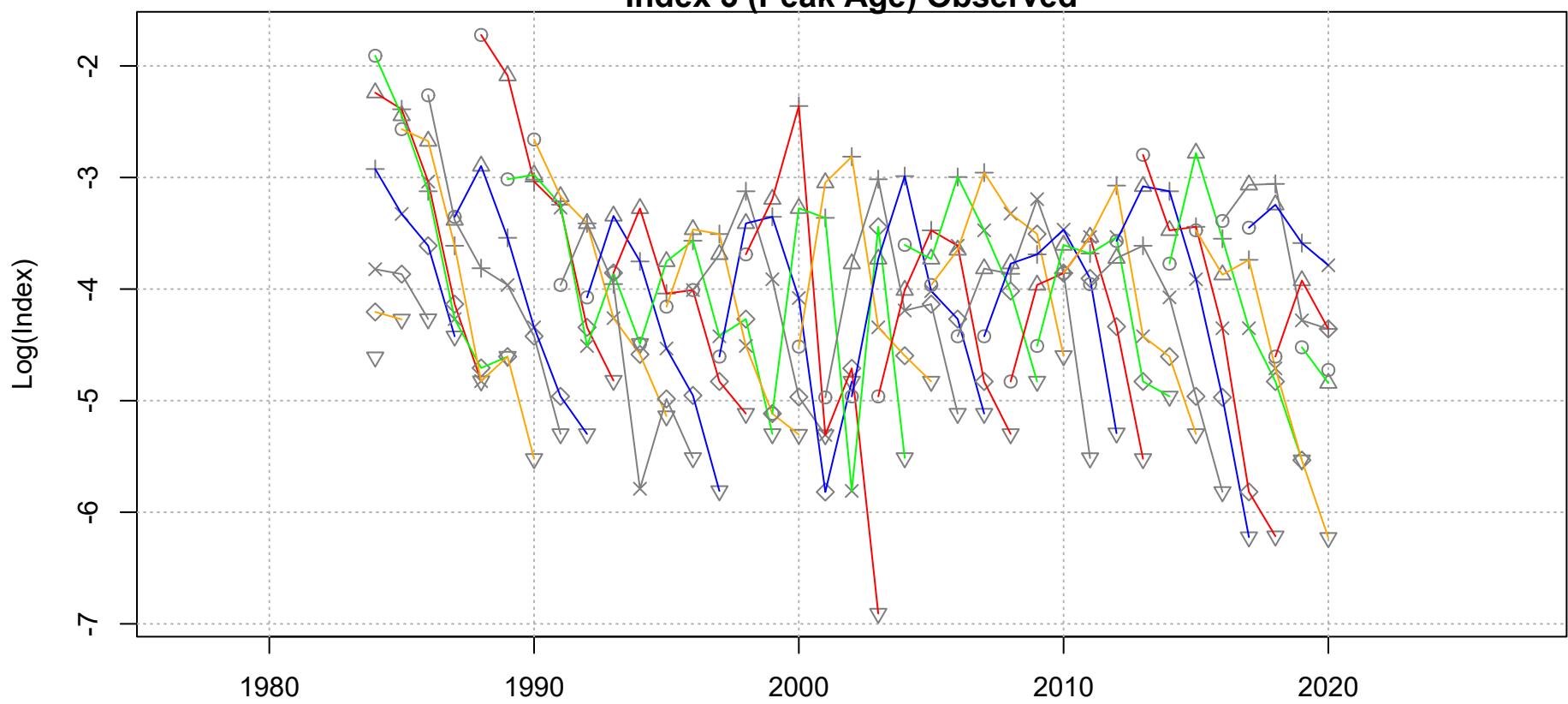
Index 2 (Peak Age) Observed



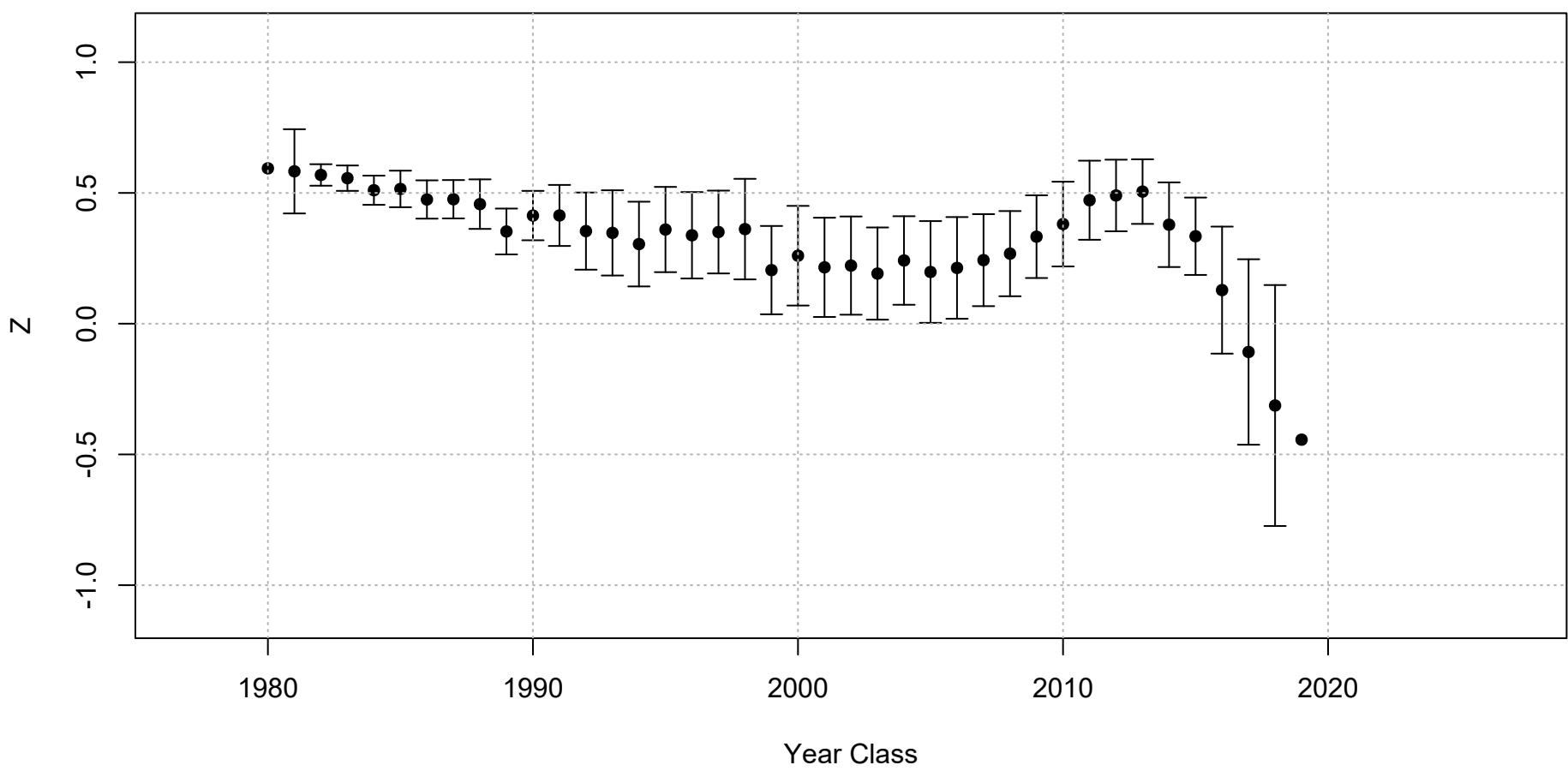
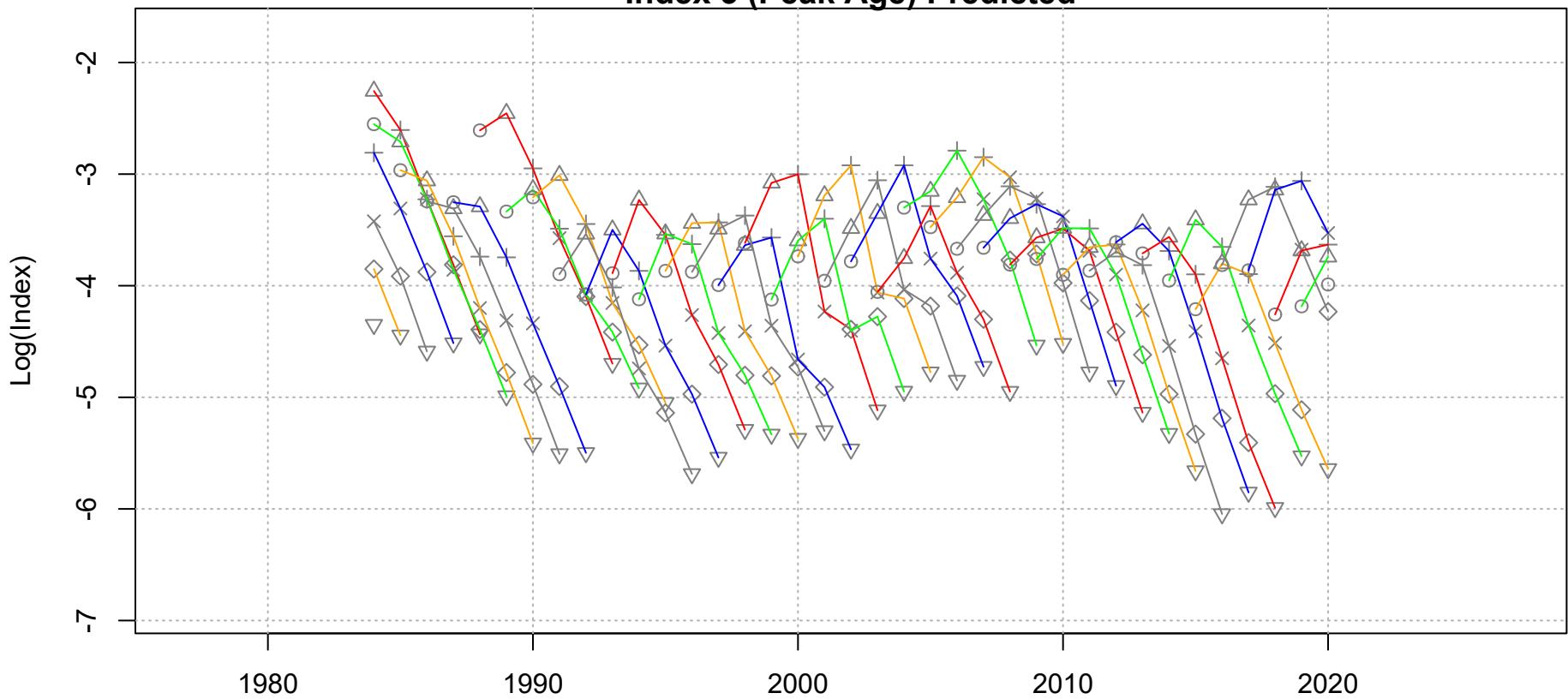
Index 2 (Peak Age) Predicted



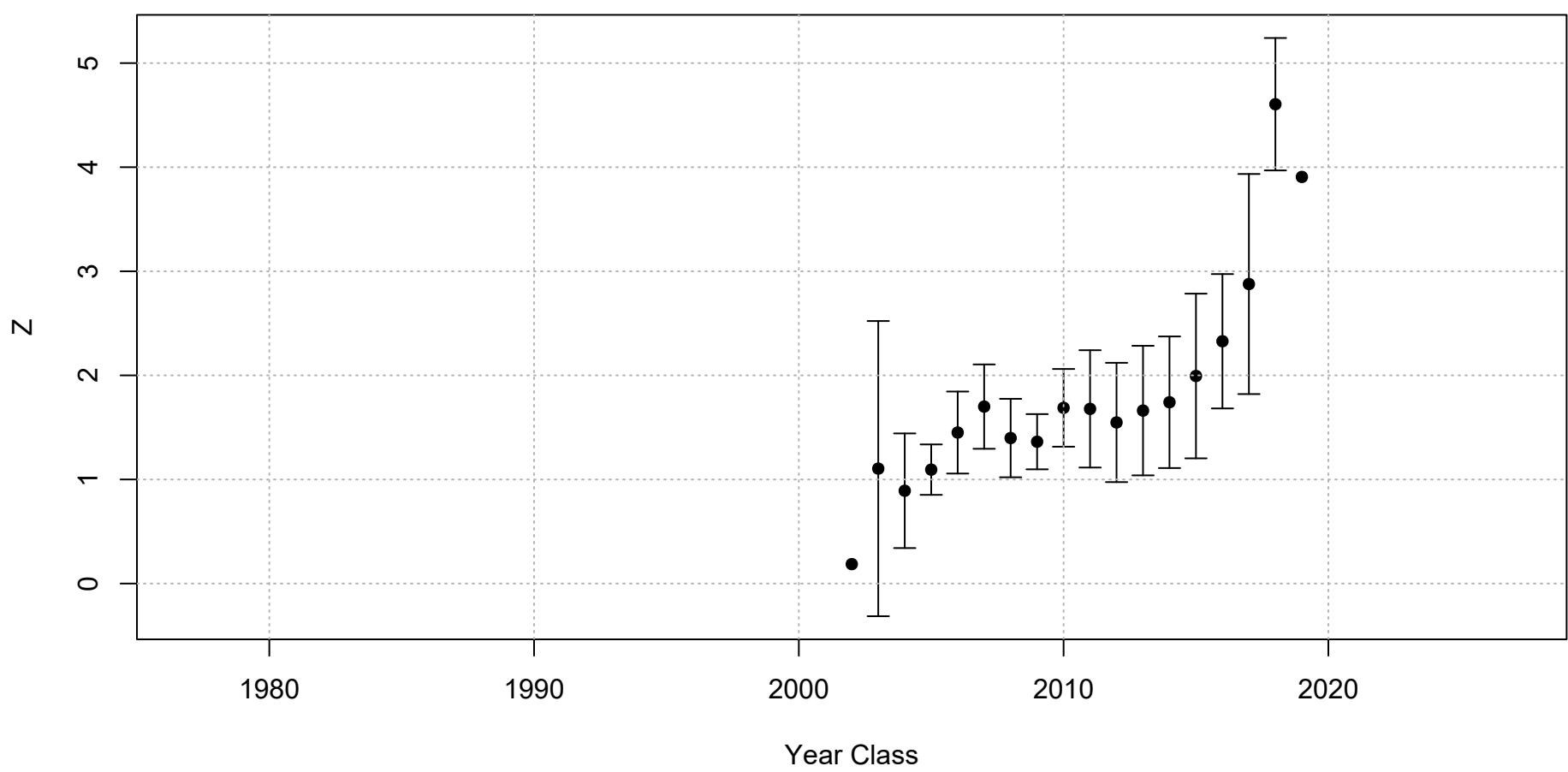
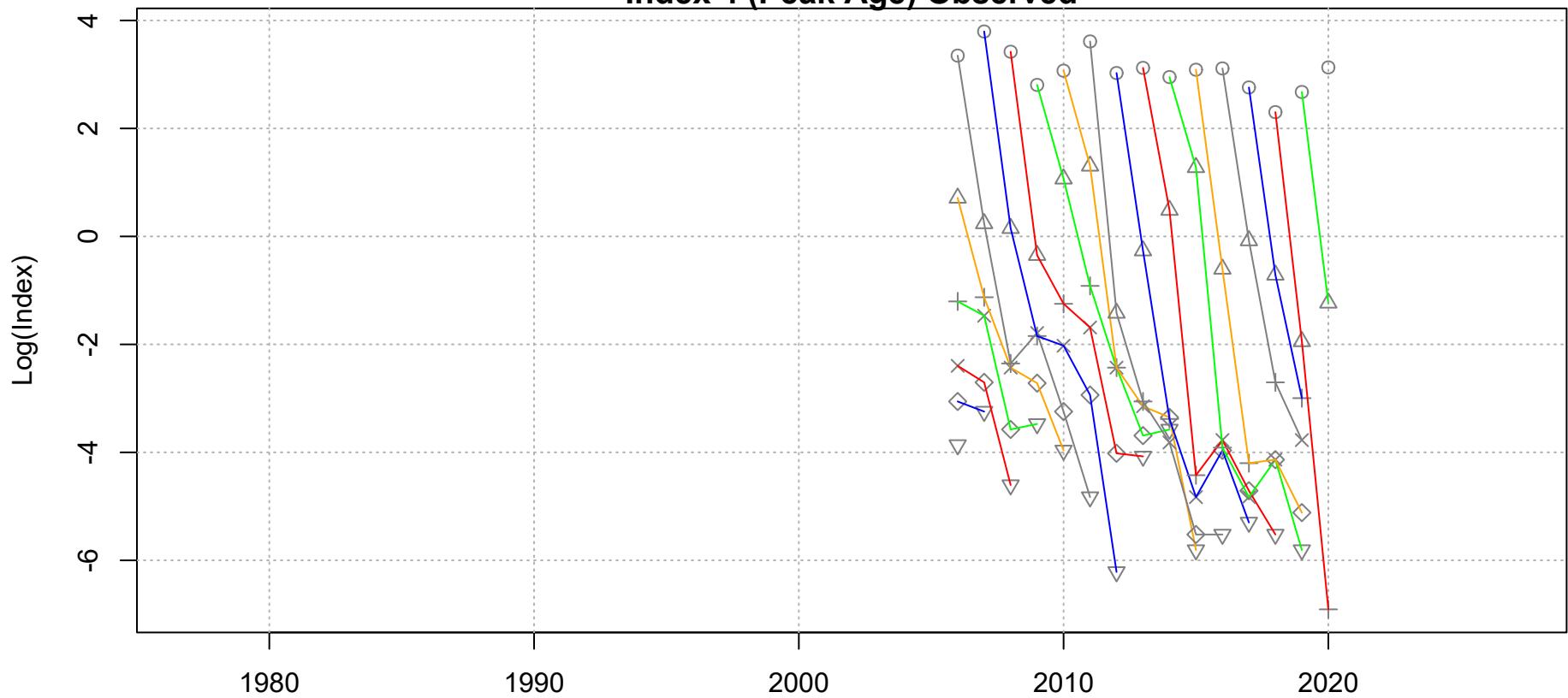
Index 3 (Peak Age) Observed



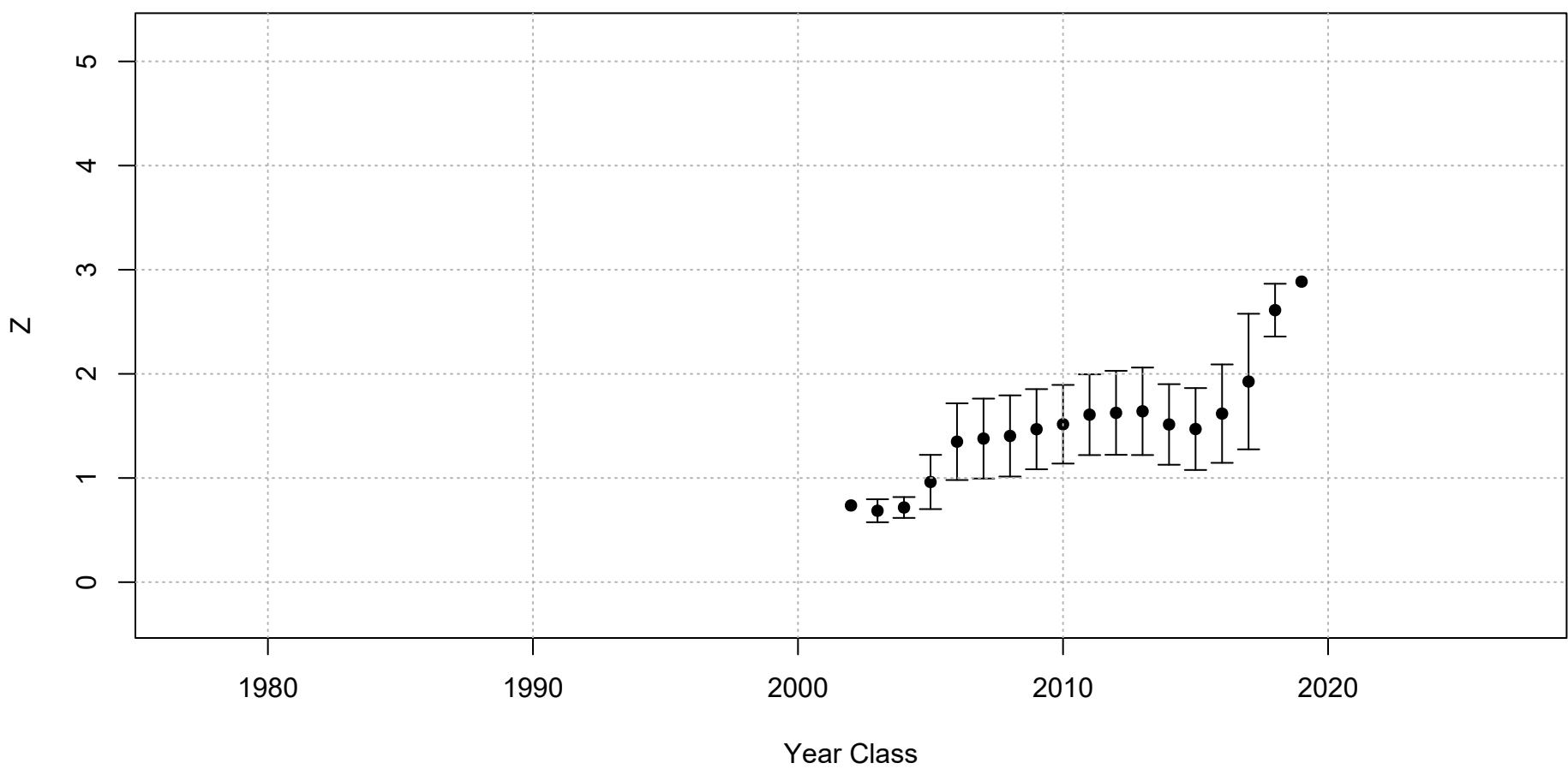
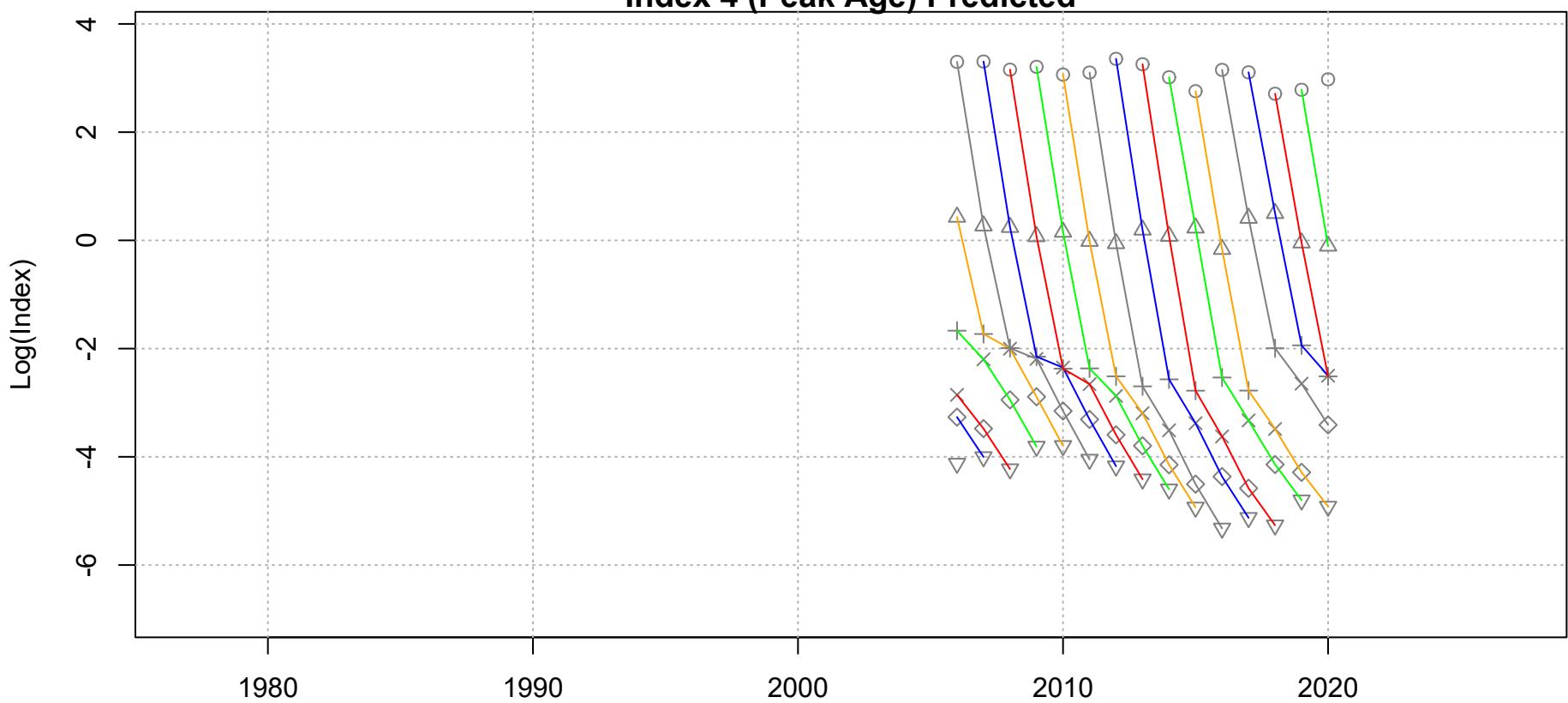
Index 3 (Peak Age) Predicted



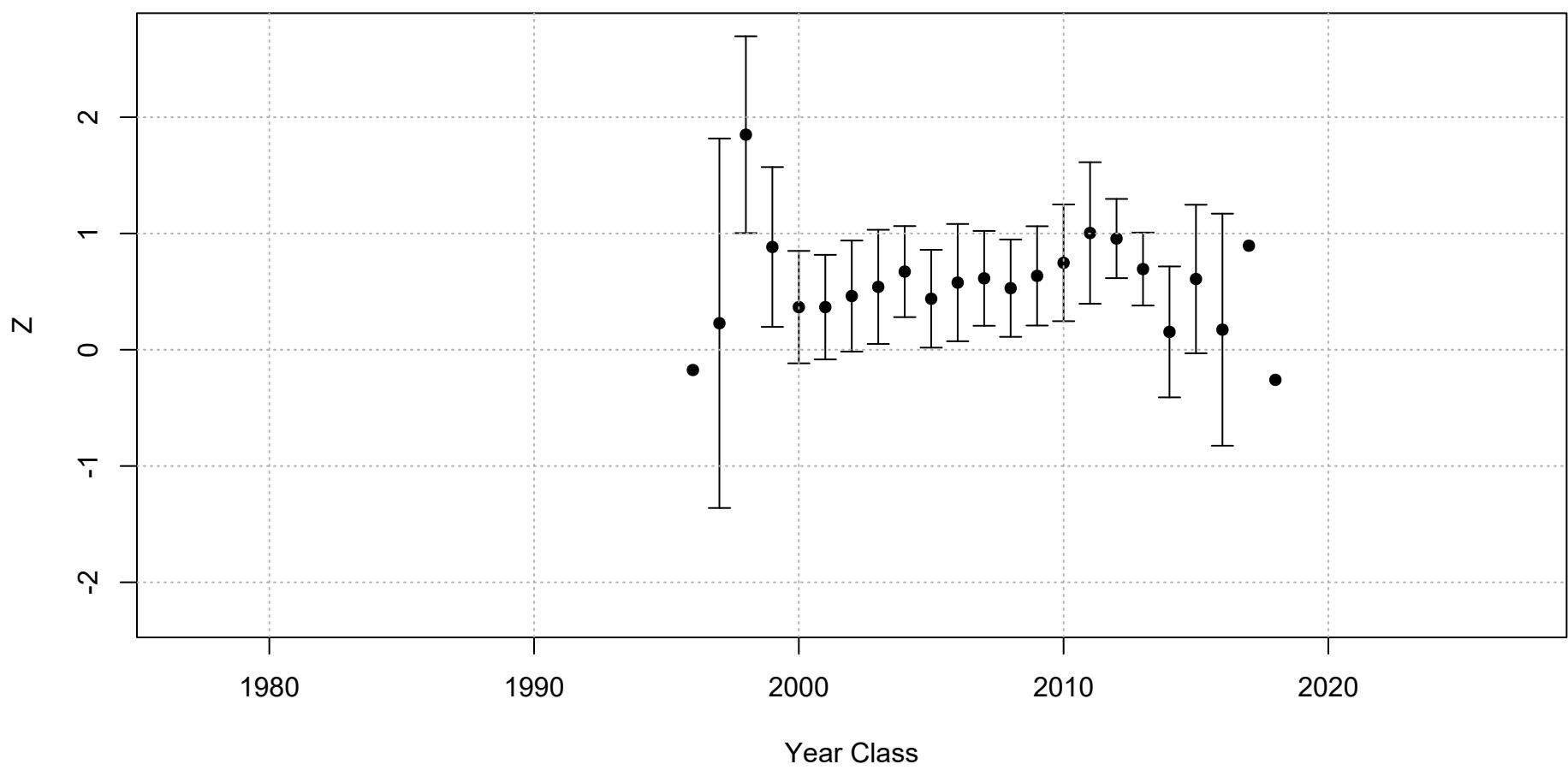
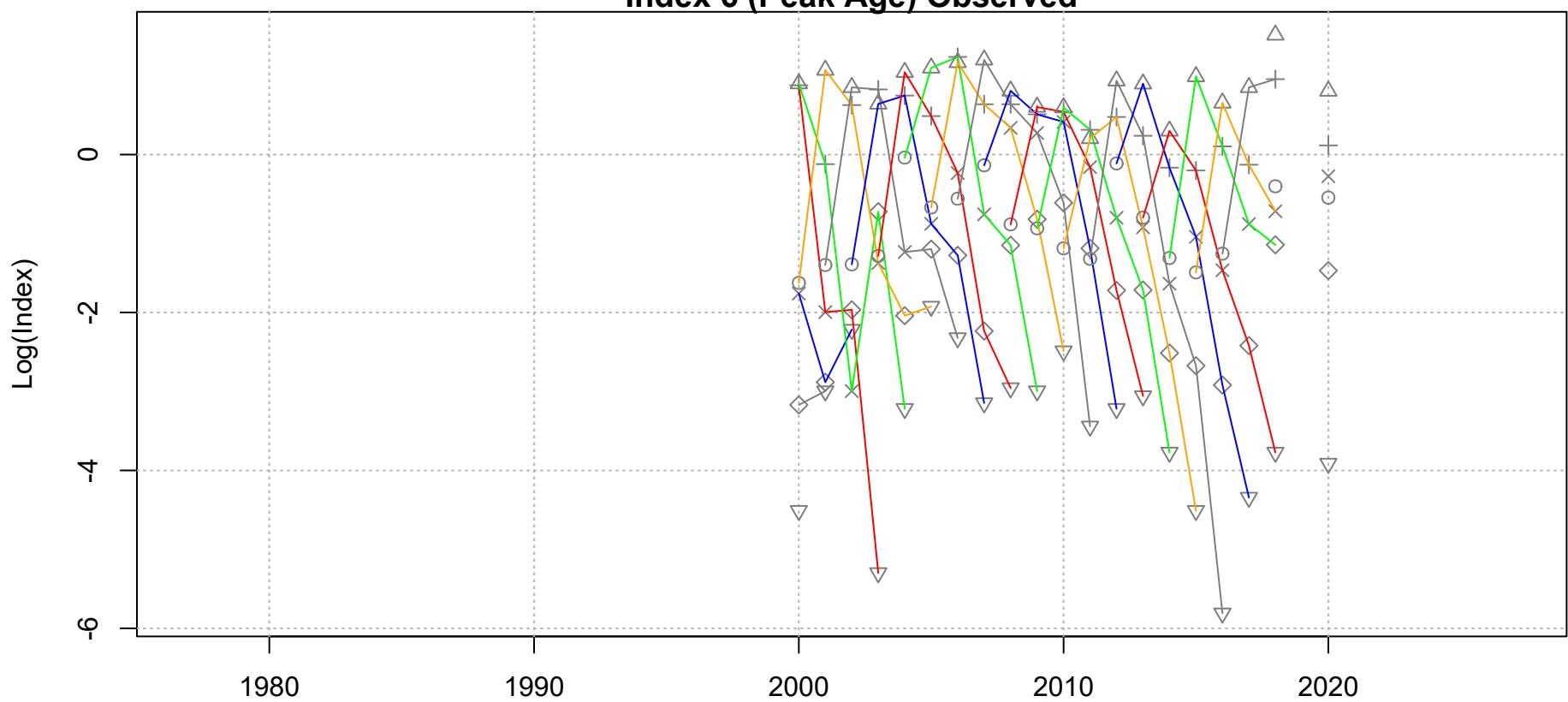
Index 4 (Peak Age) Observed



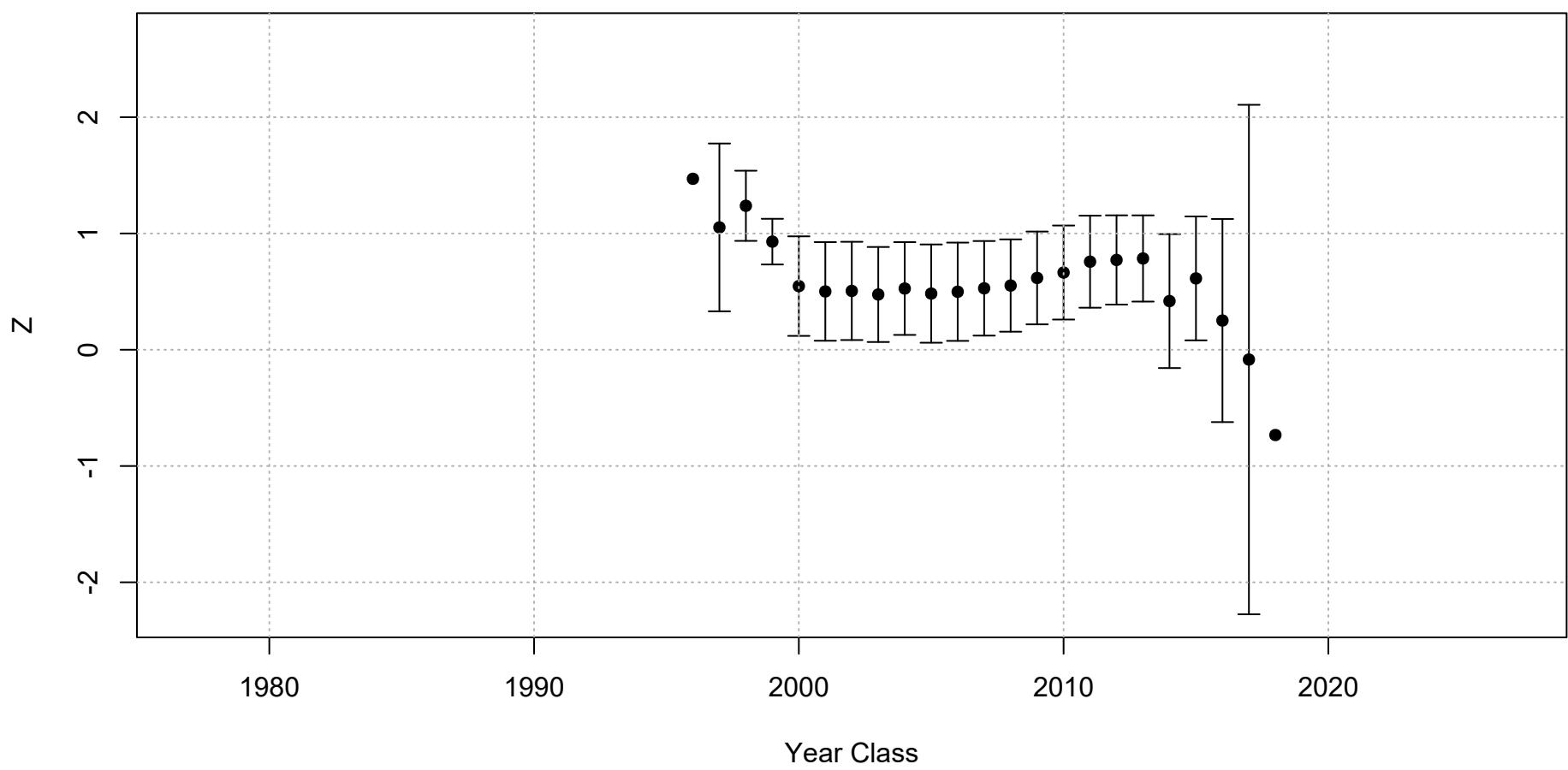
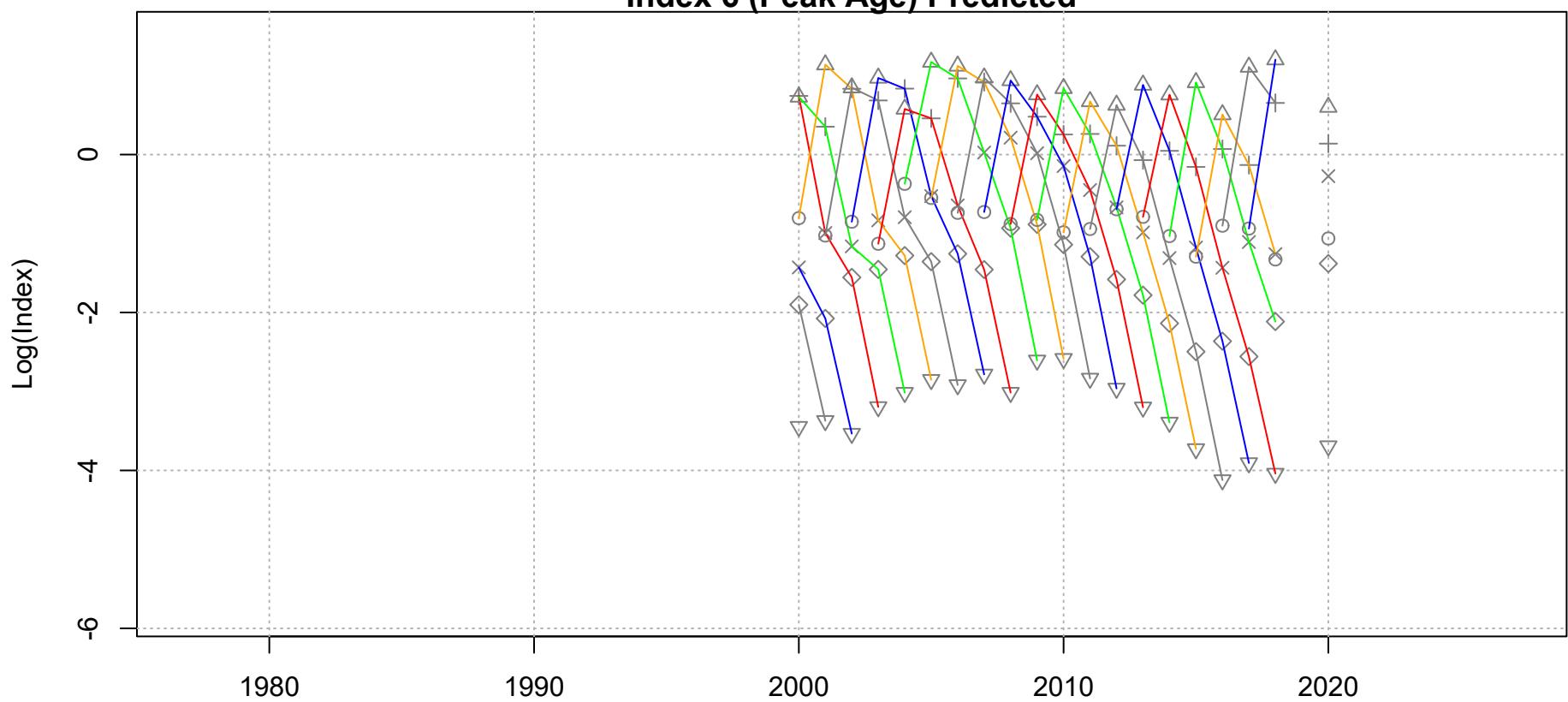
Index 4 (Peak Age) Predicted



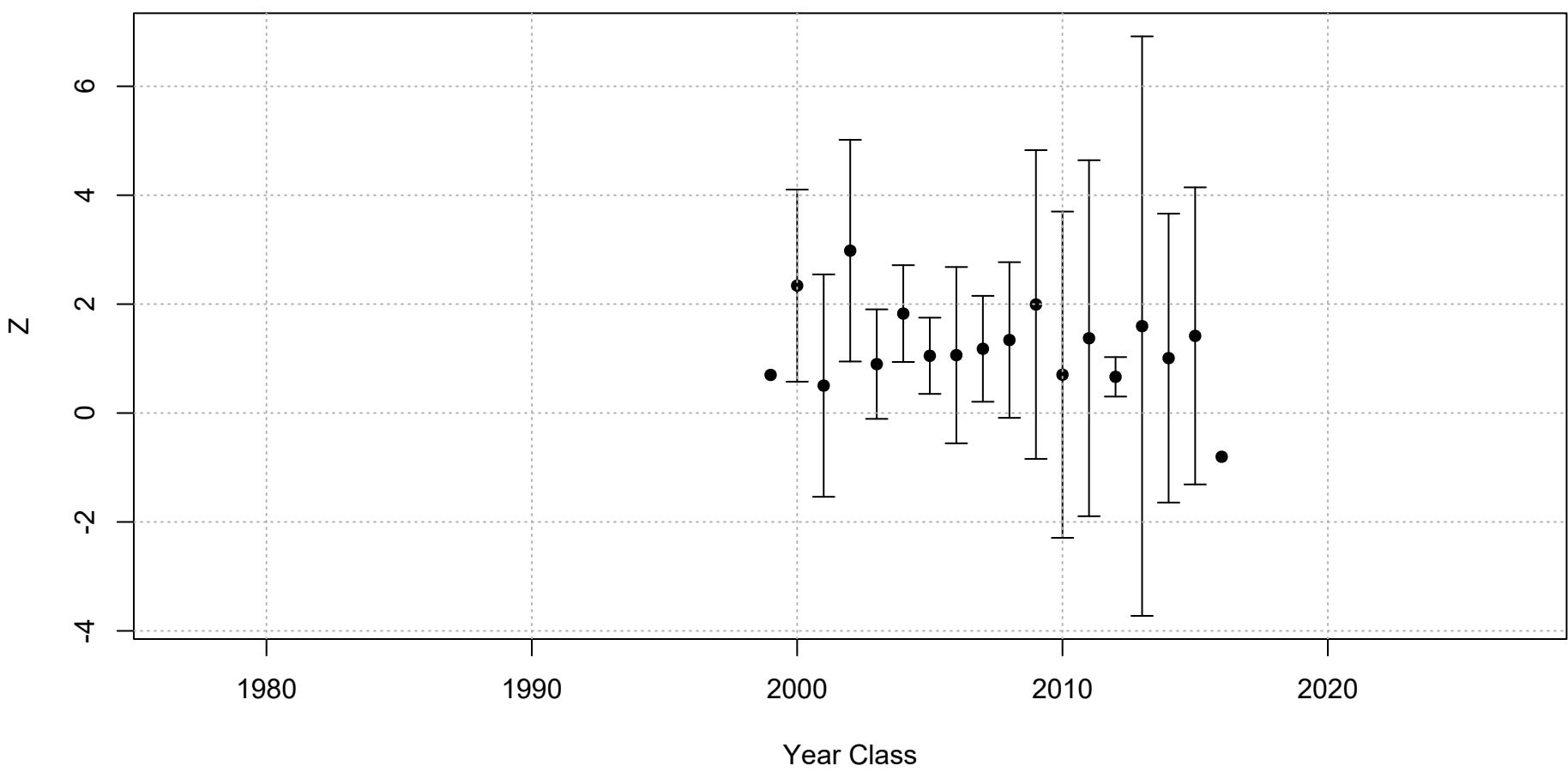
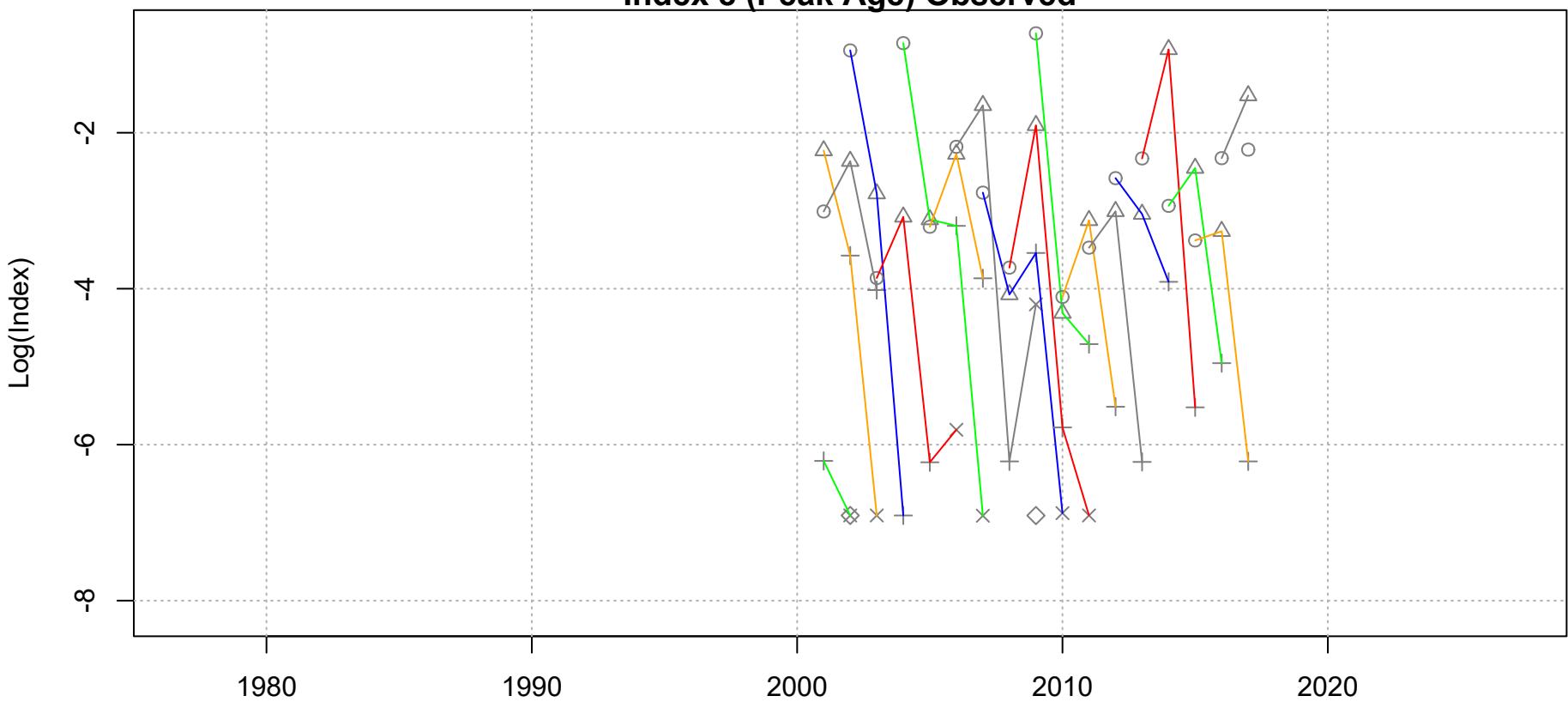
Index 6 (Peak Age) Observed



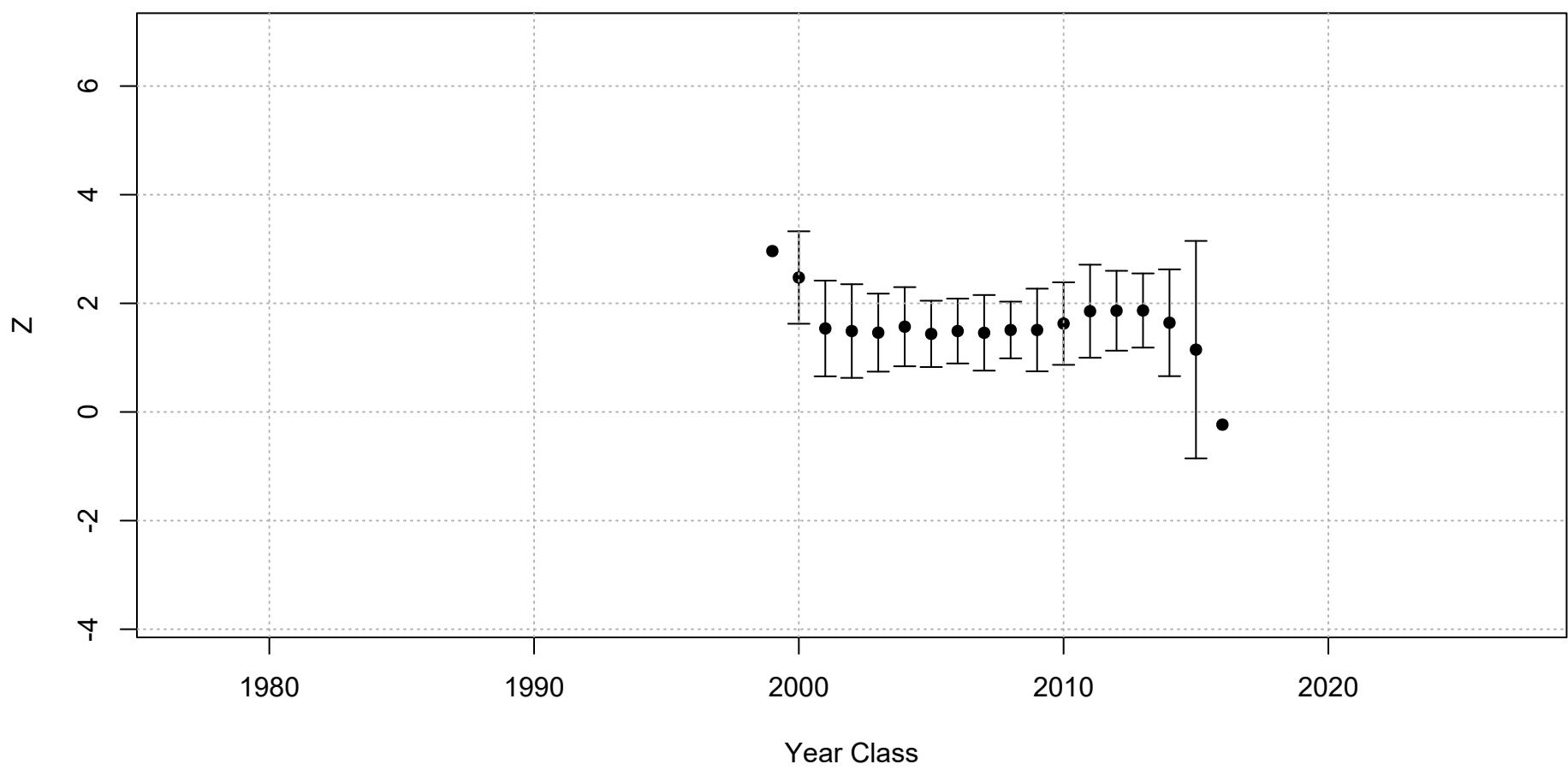
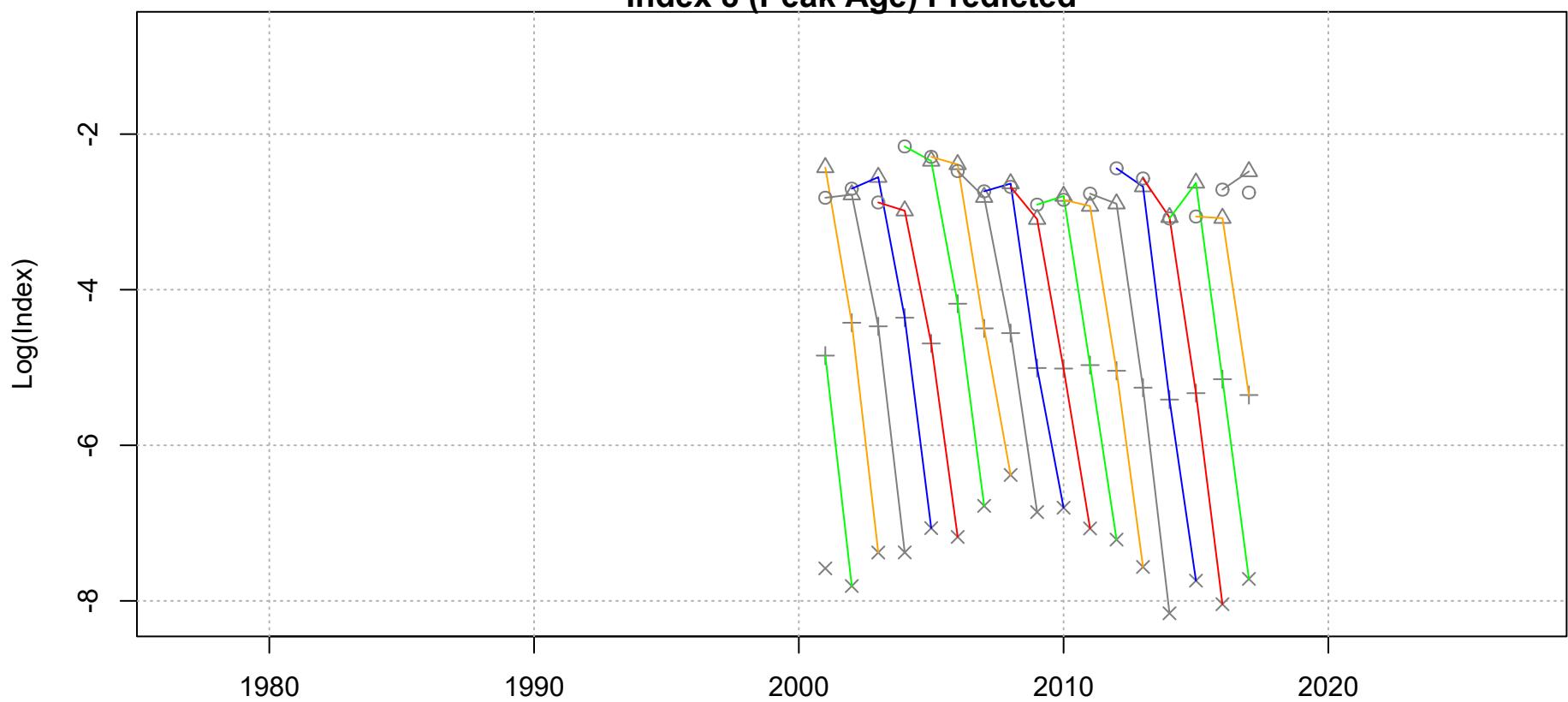
Index 6 (Peak Age) Predicted



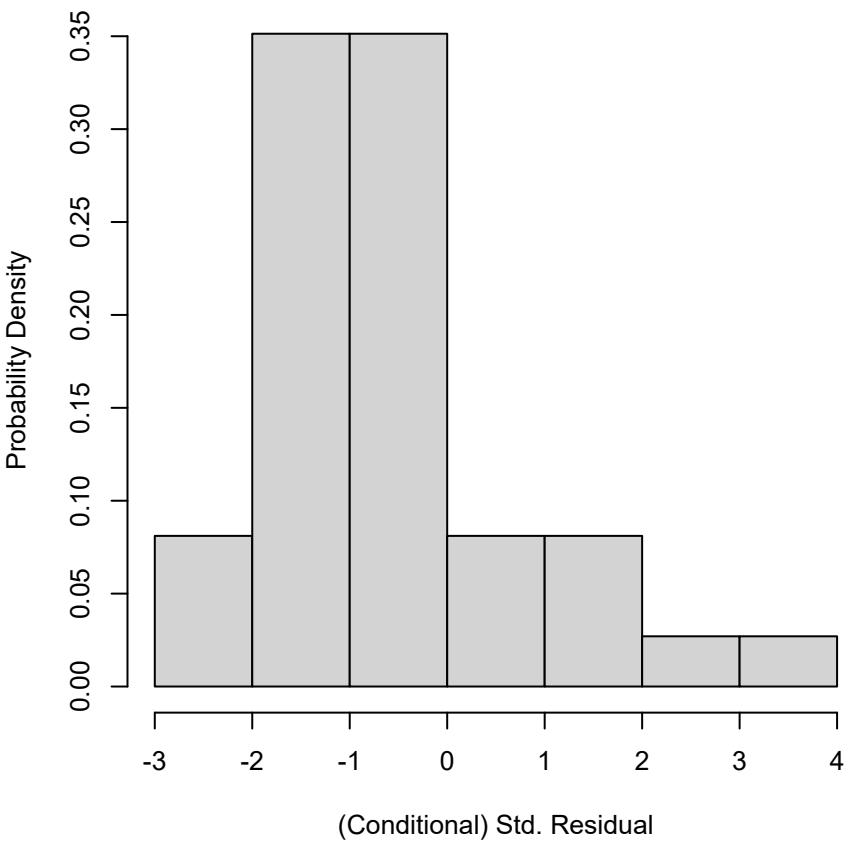
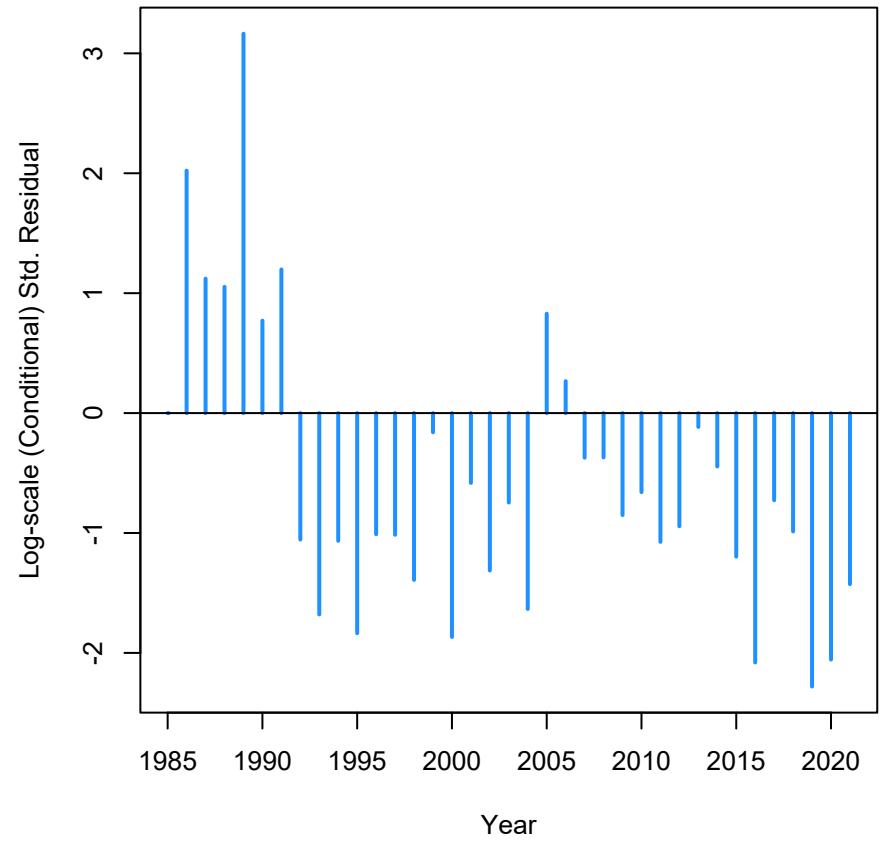
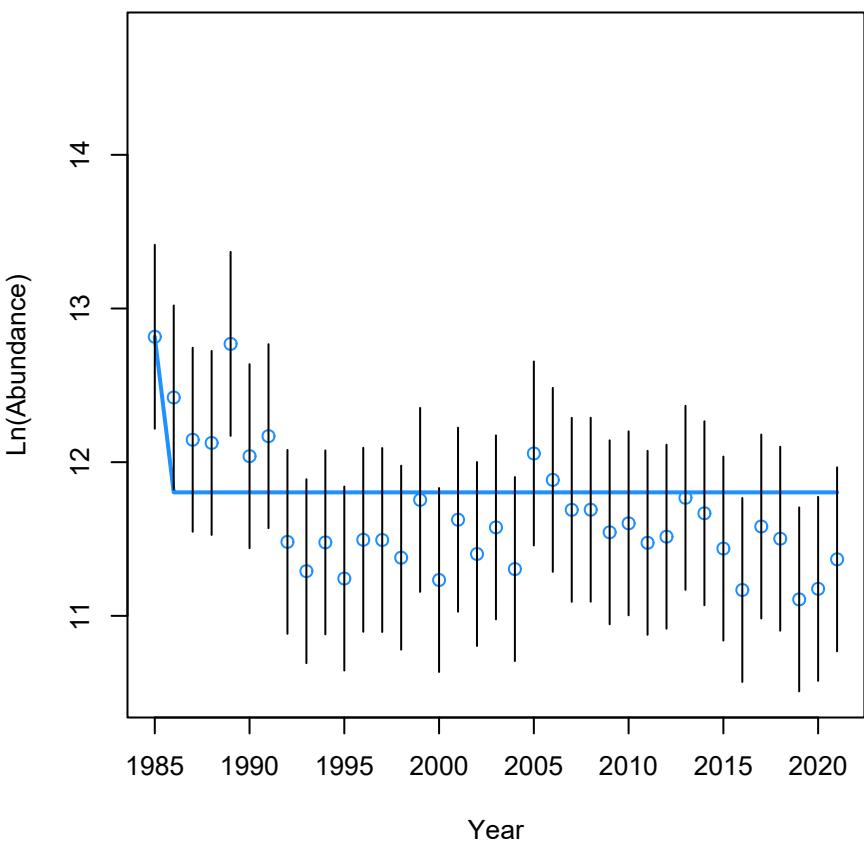
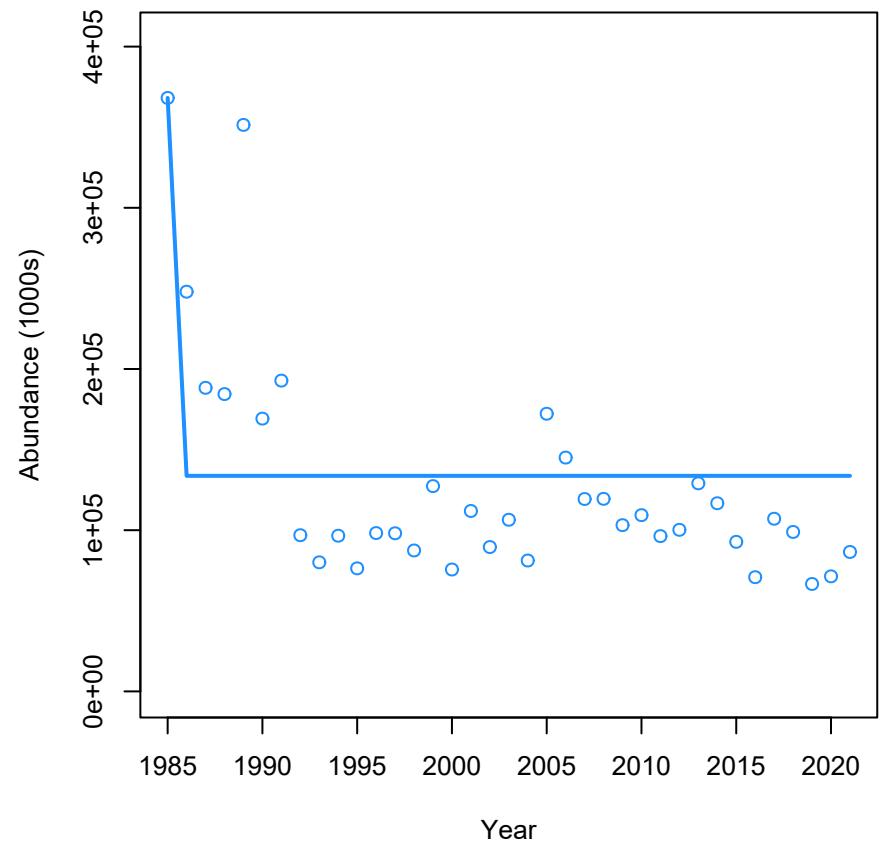
Index 8 (Peak Age) Observed



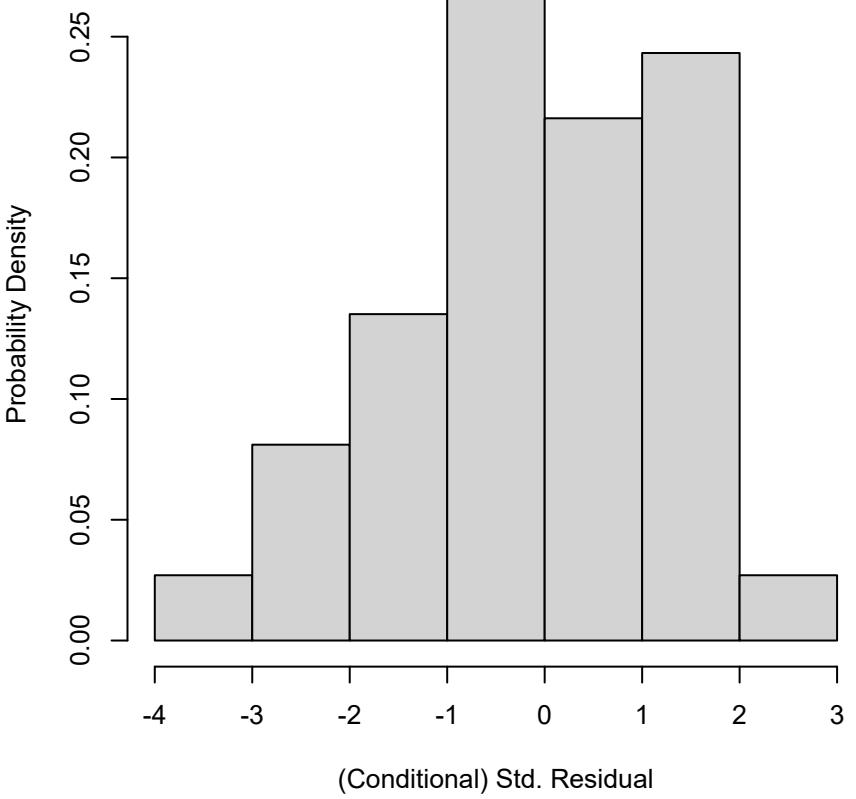
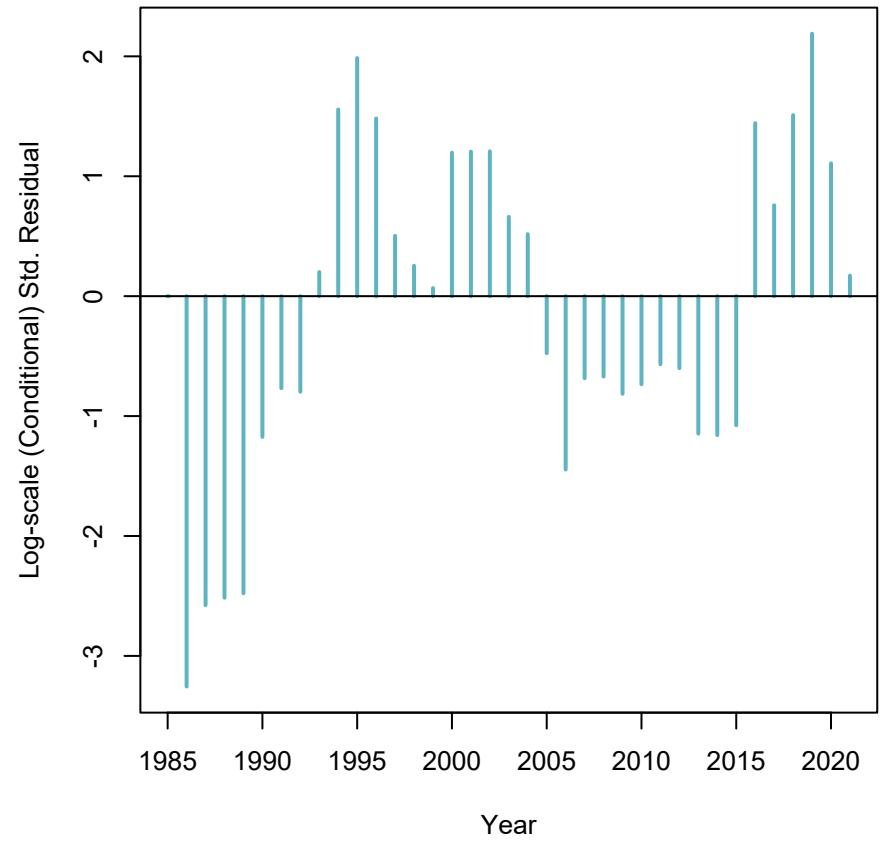
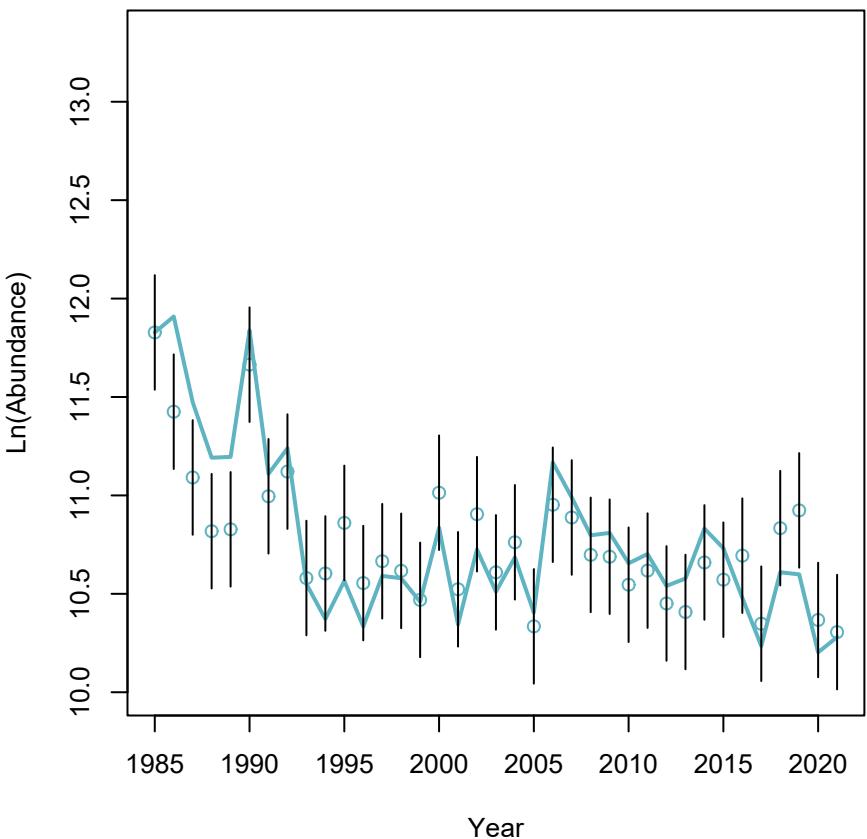
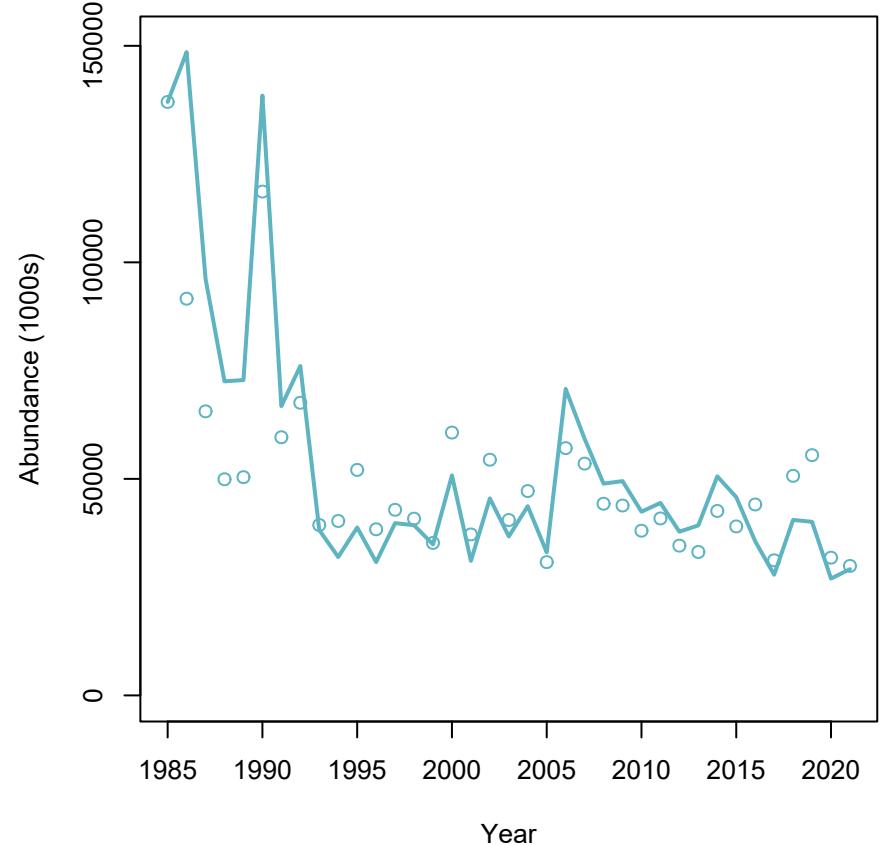
Index 8 (Peak Age) Predicted



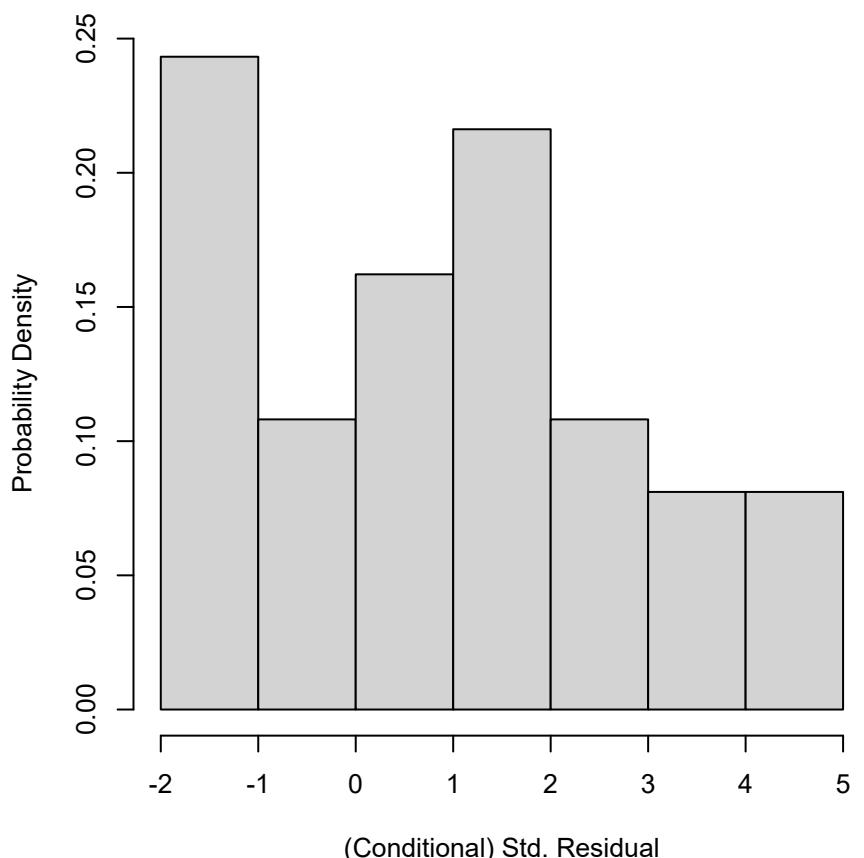
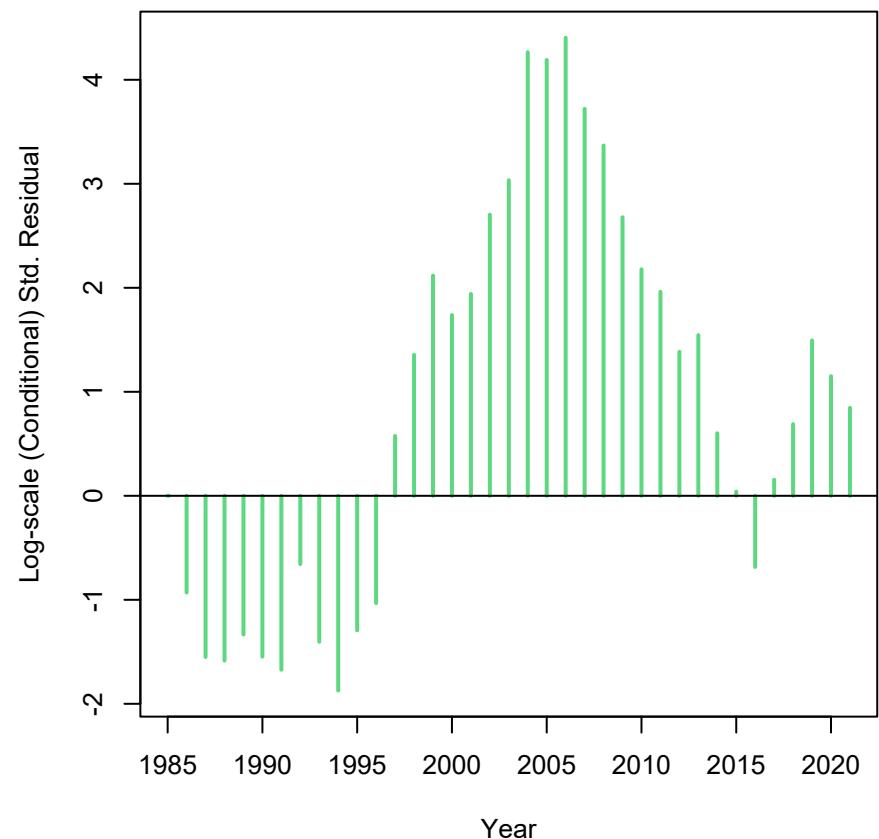
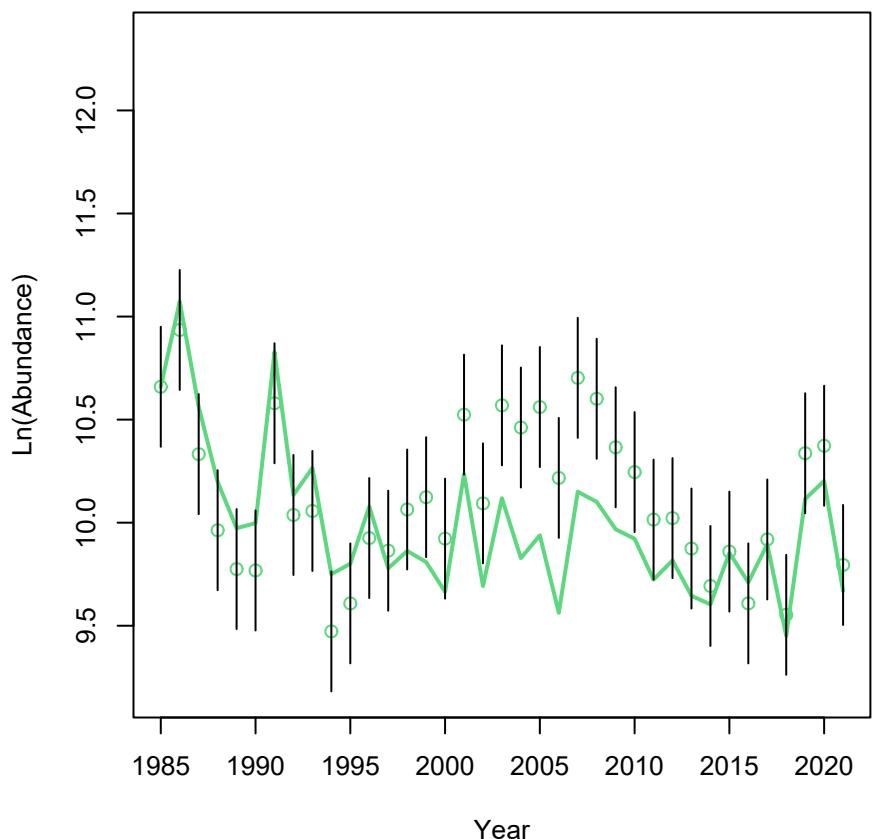
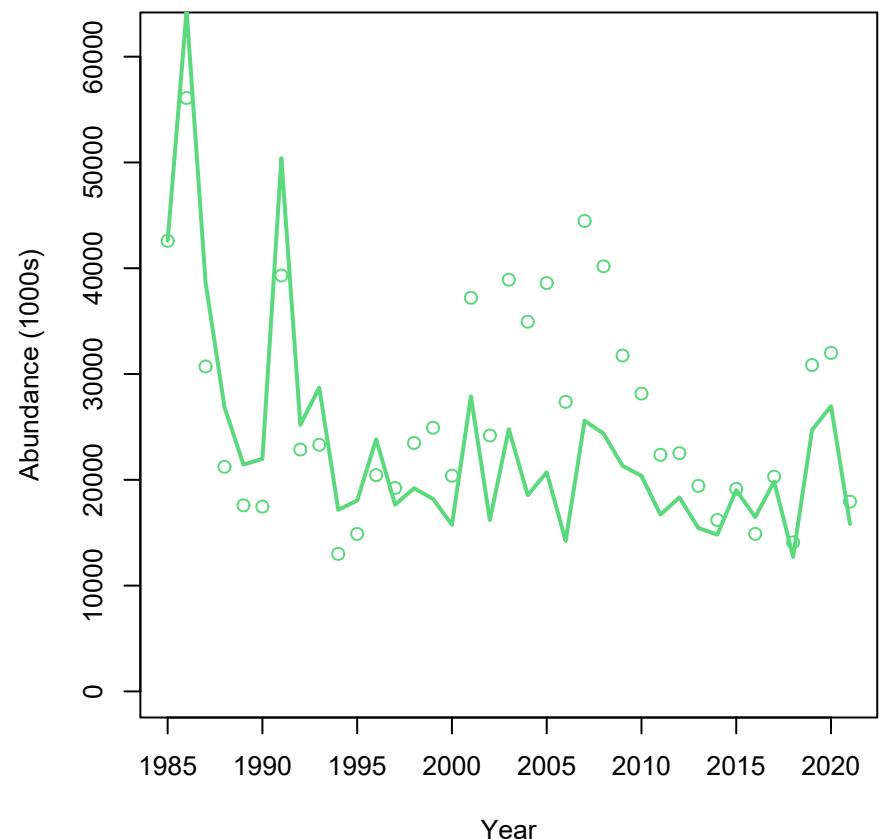
Conditional Expected and Posterior Estimates of Age 1 Abundance



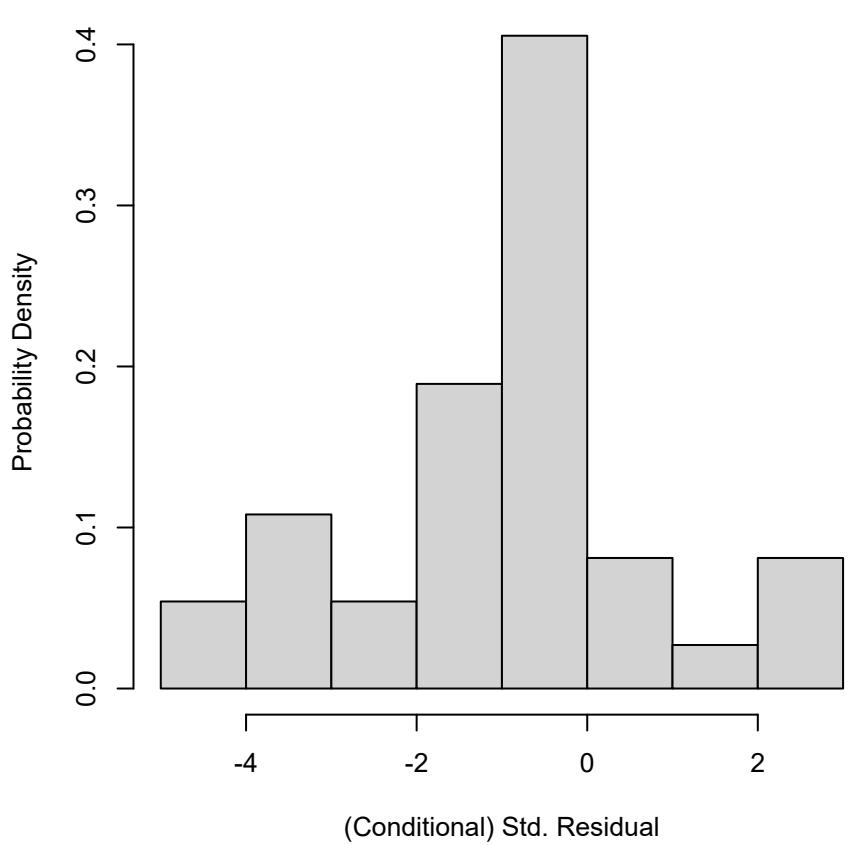
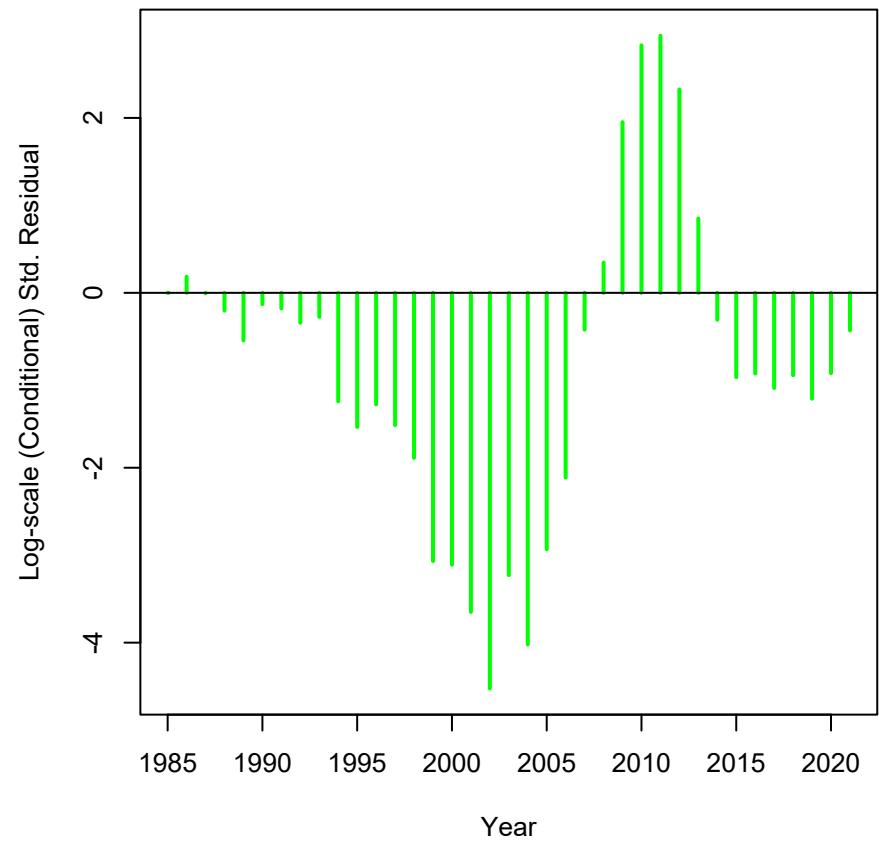
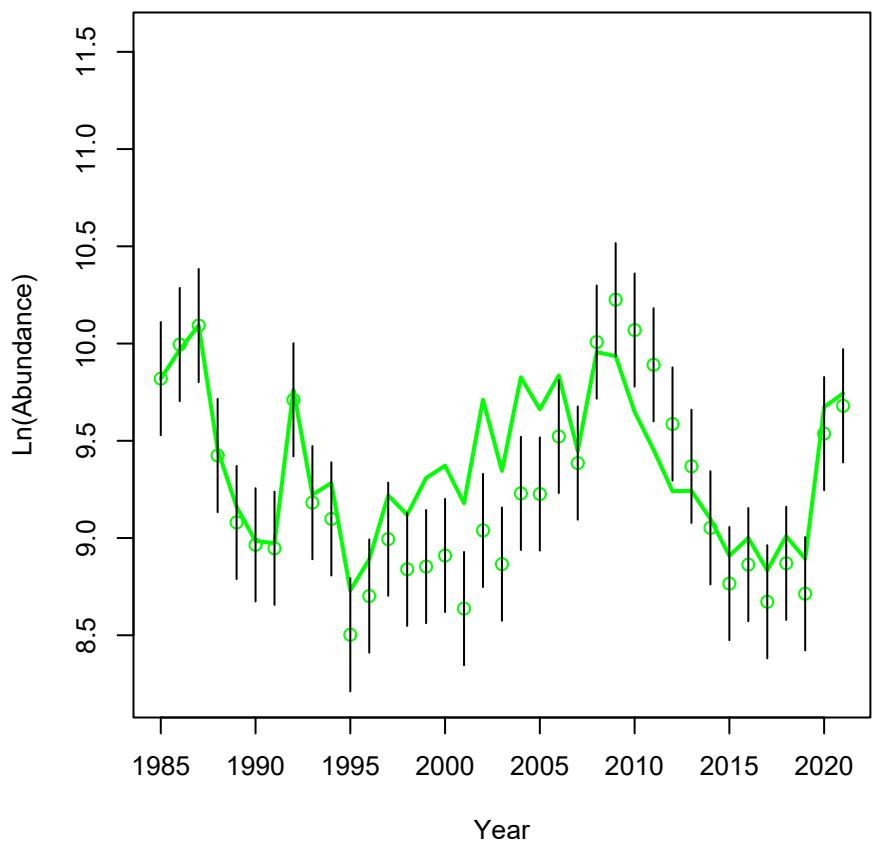
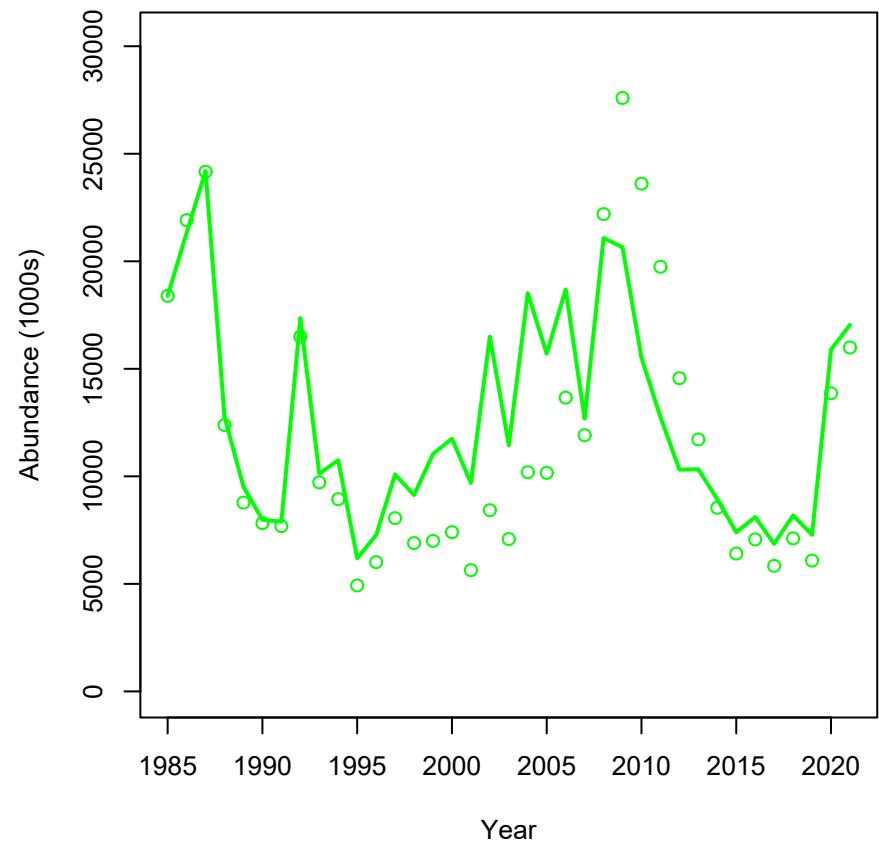
Conditional Expected and Posterior Estimates of Age 2 Abundance



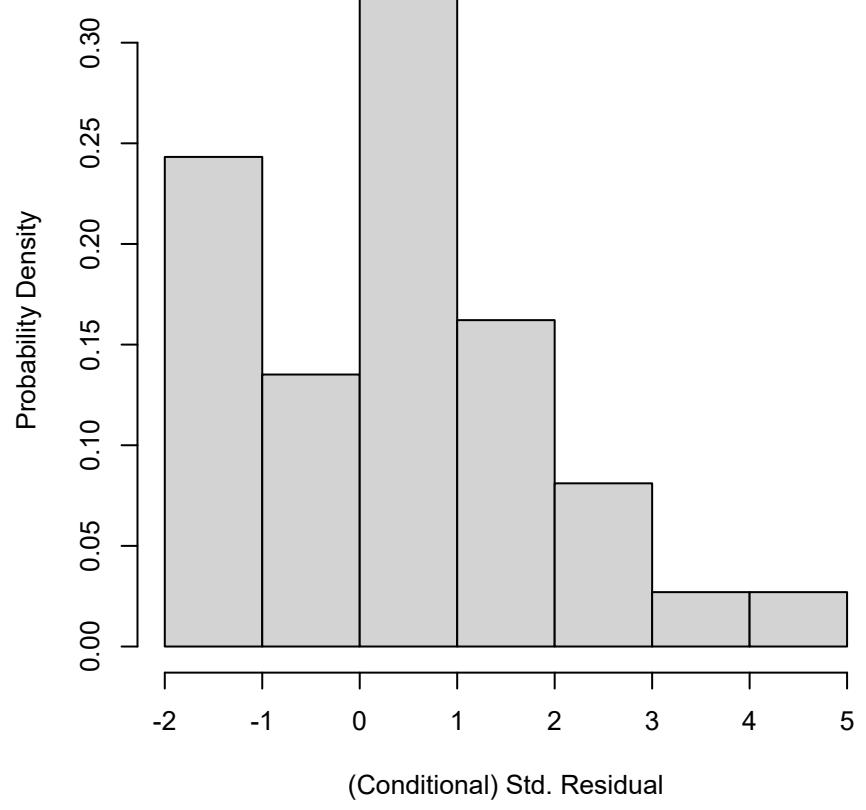
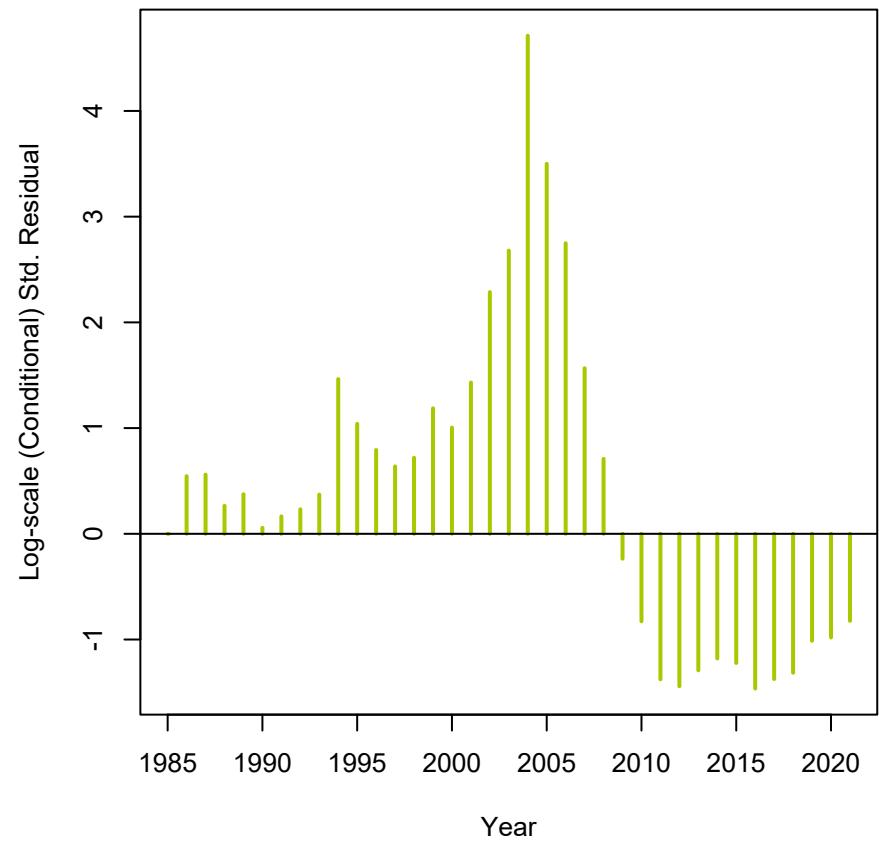
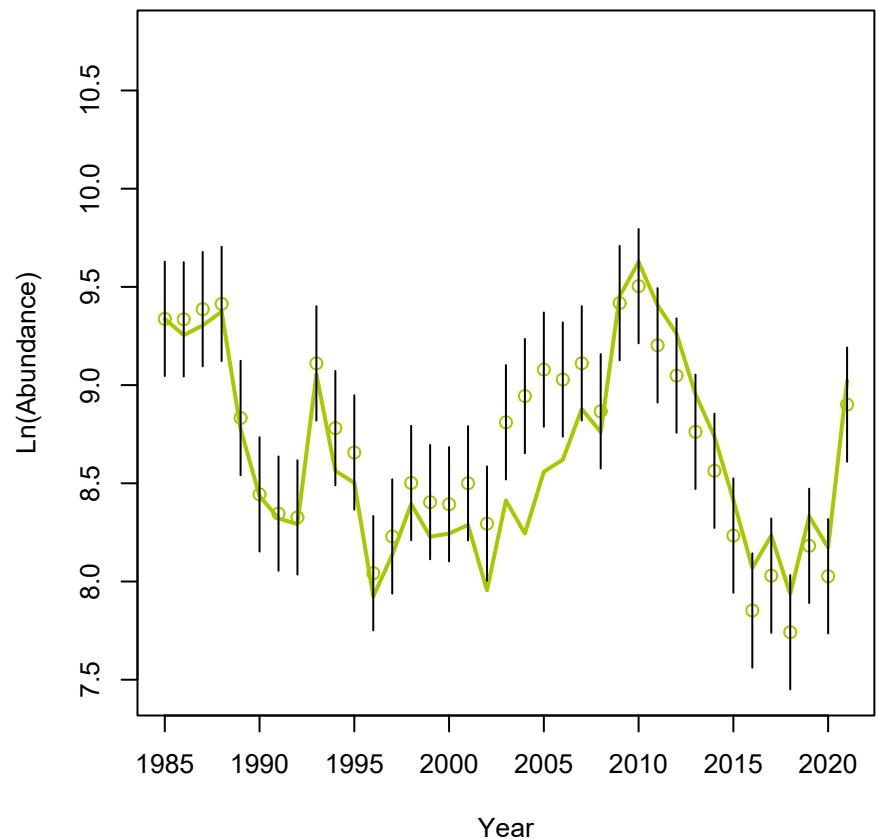
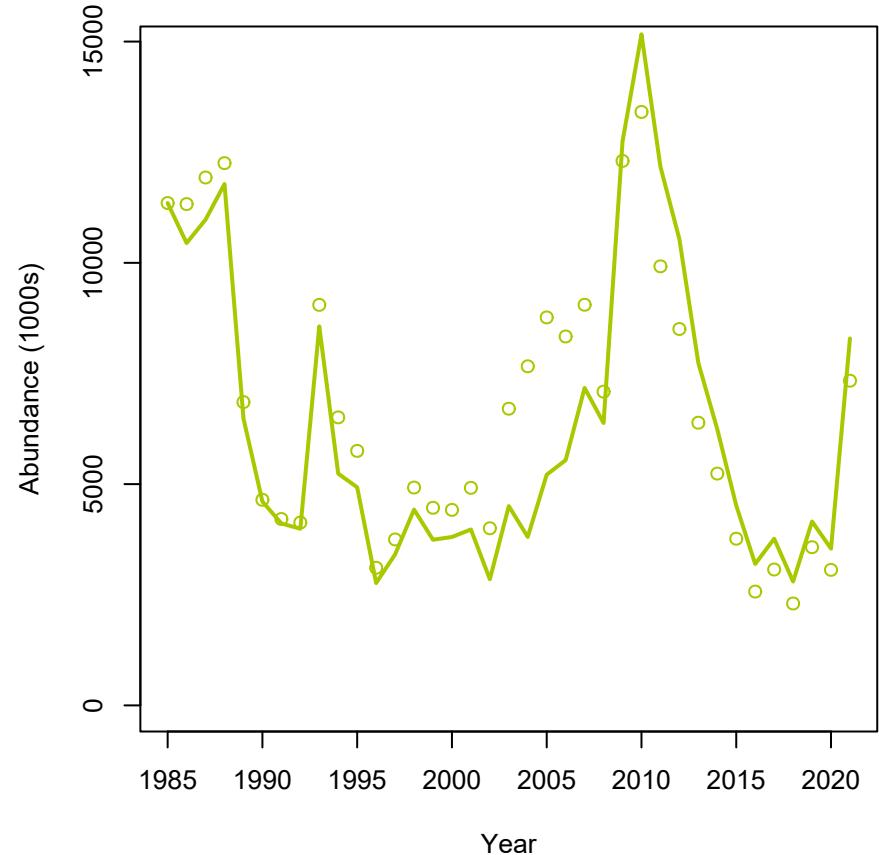
Conditional Expected and Posterior Estimates of Age 3 Abundance



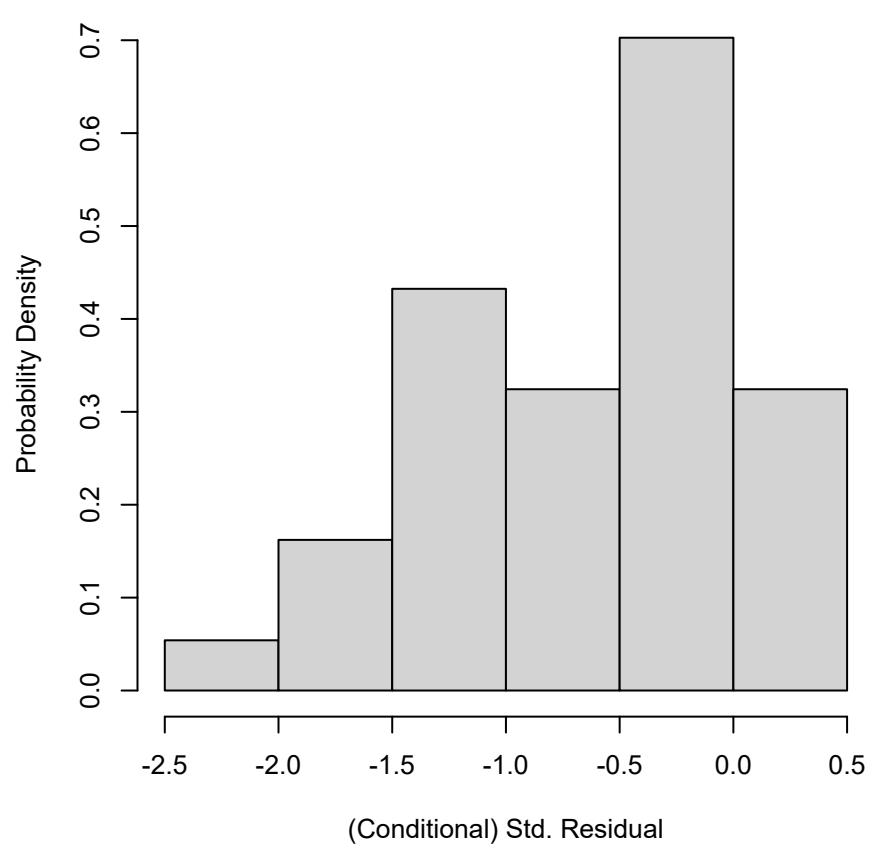
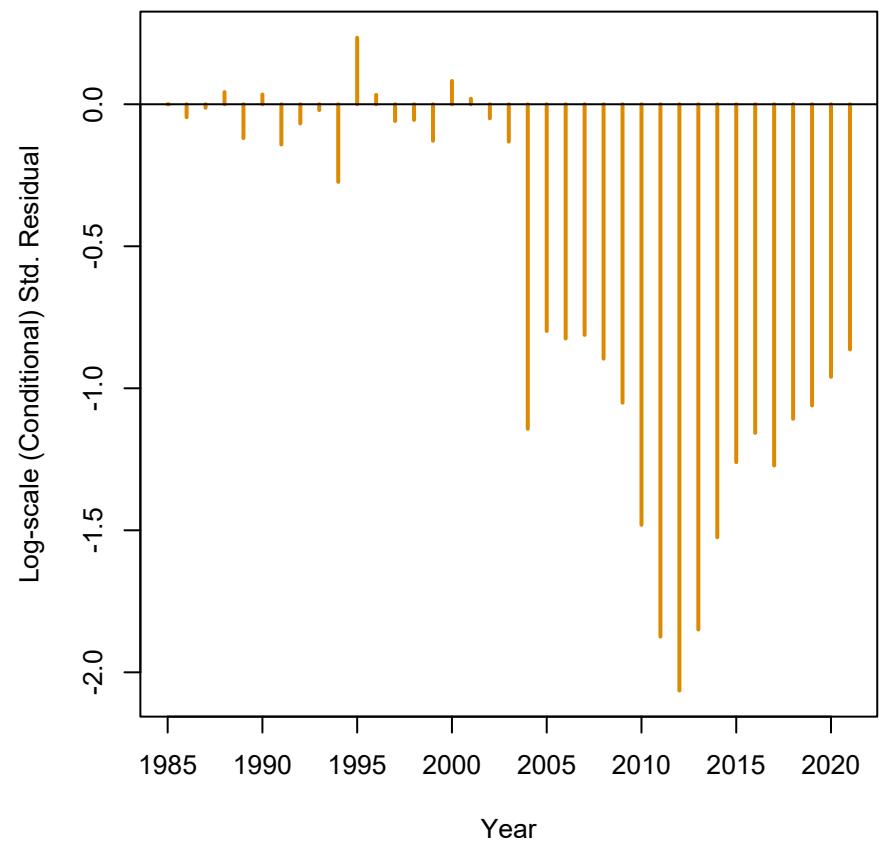
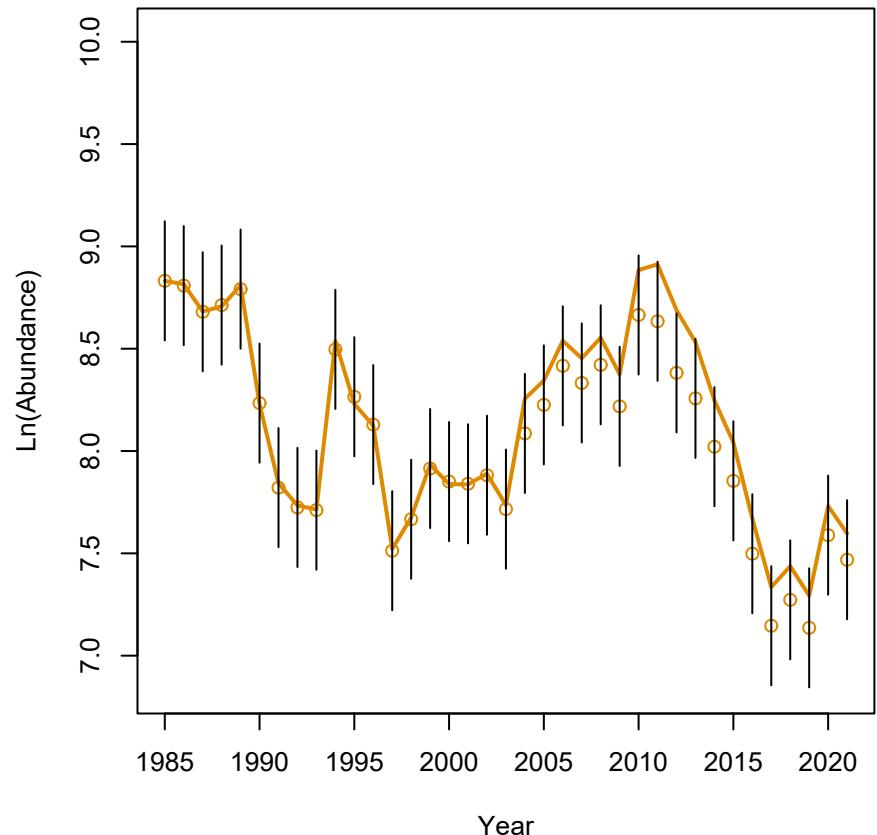
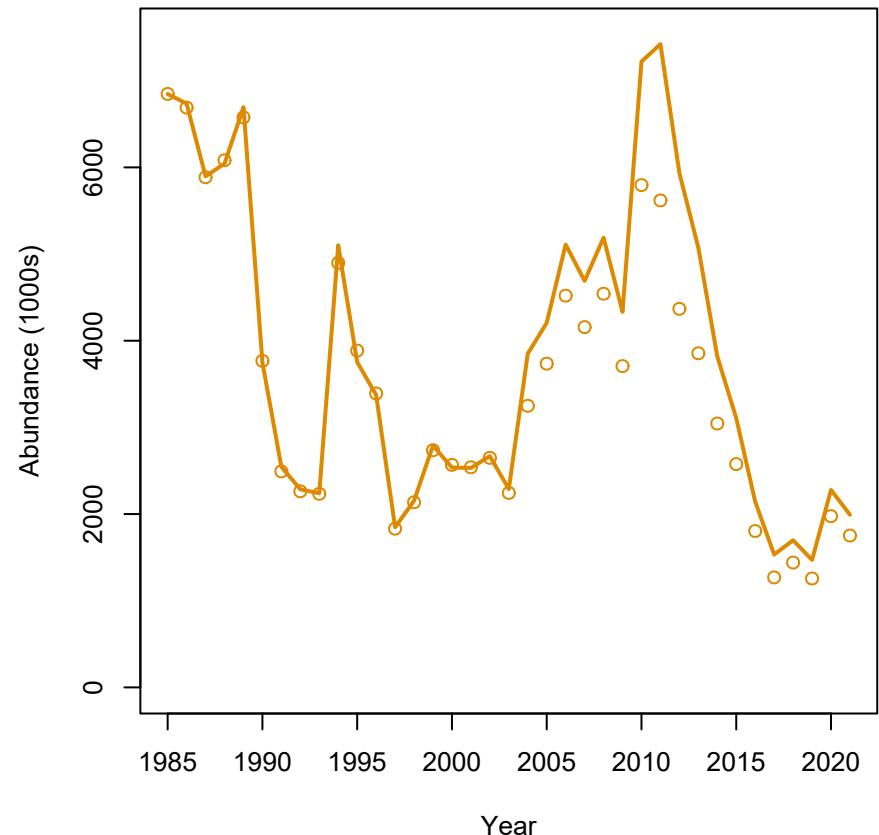
Conditional Expected and Posterior Estimates of Age 4 Abundance



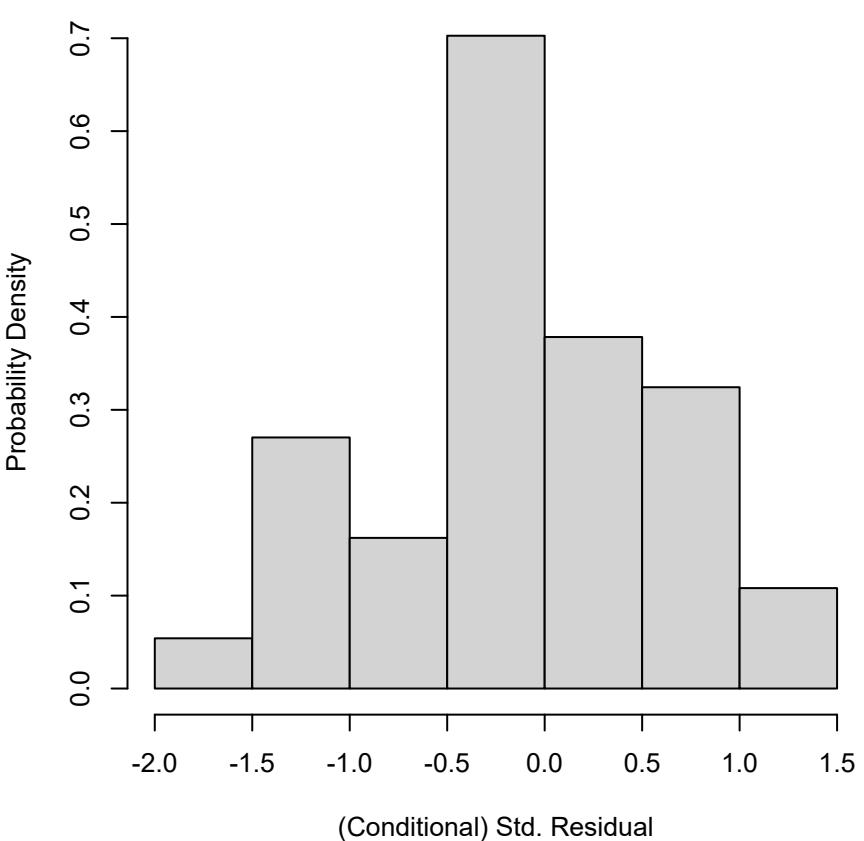
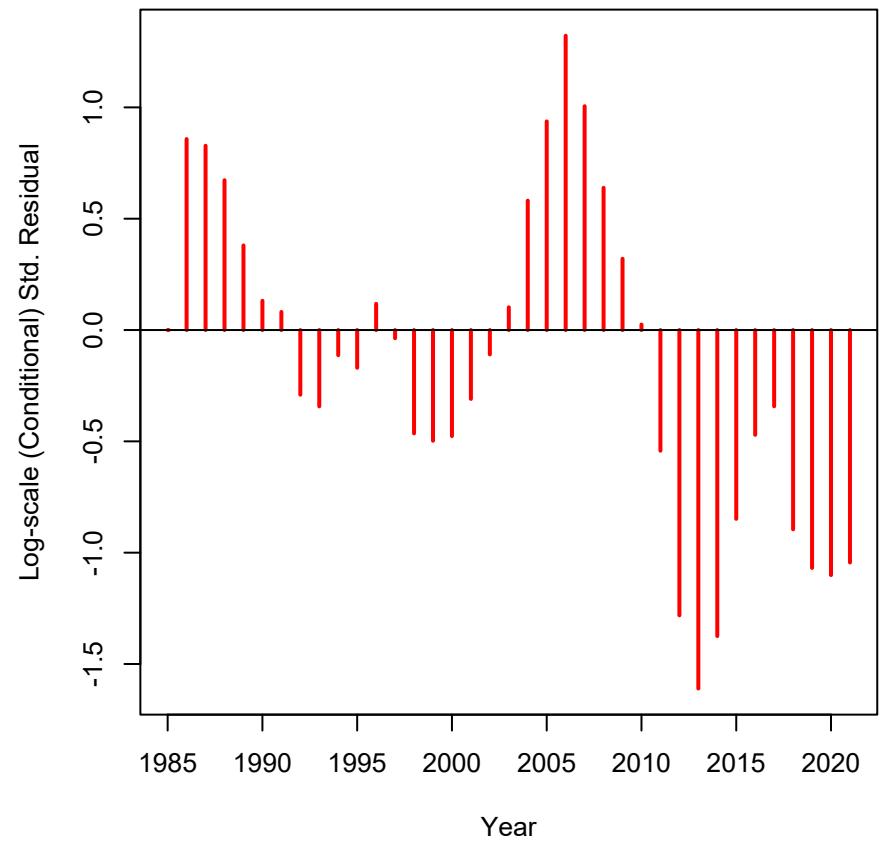
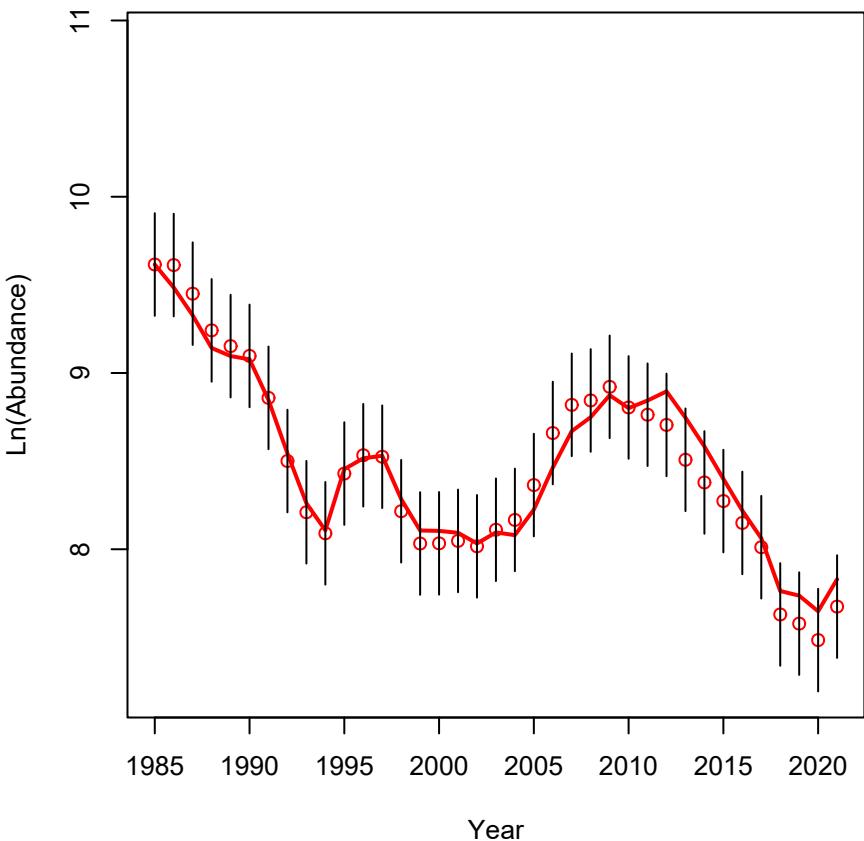
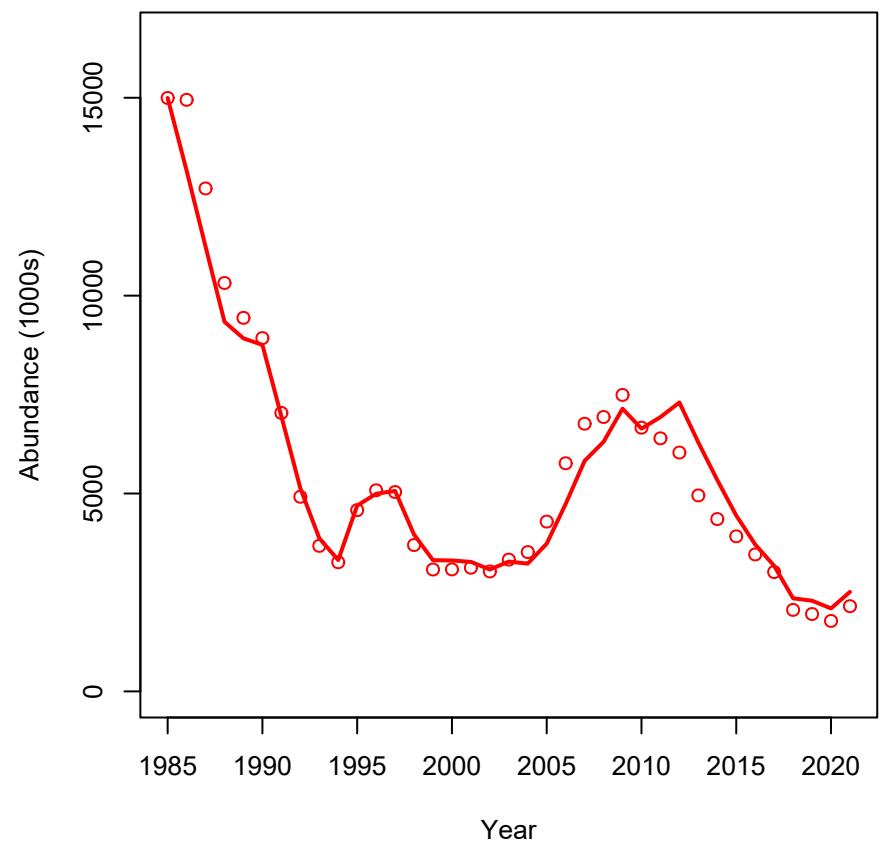
Conditional Expected and Posterior Estimates of Age 5 Abundance

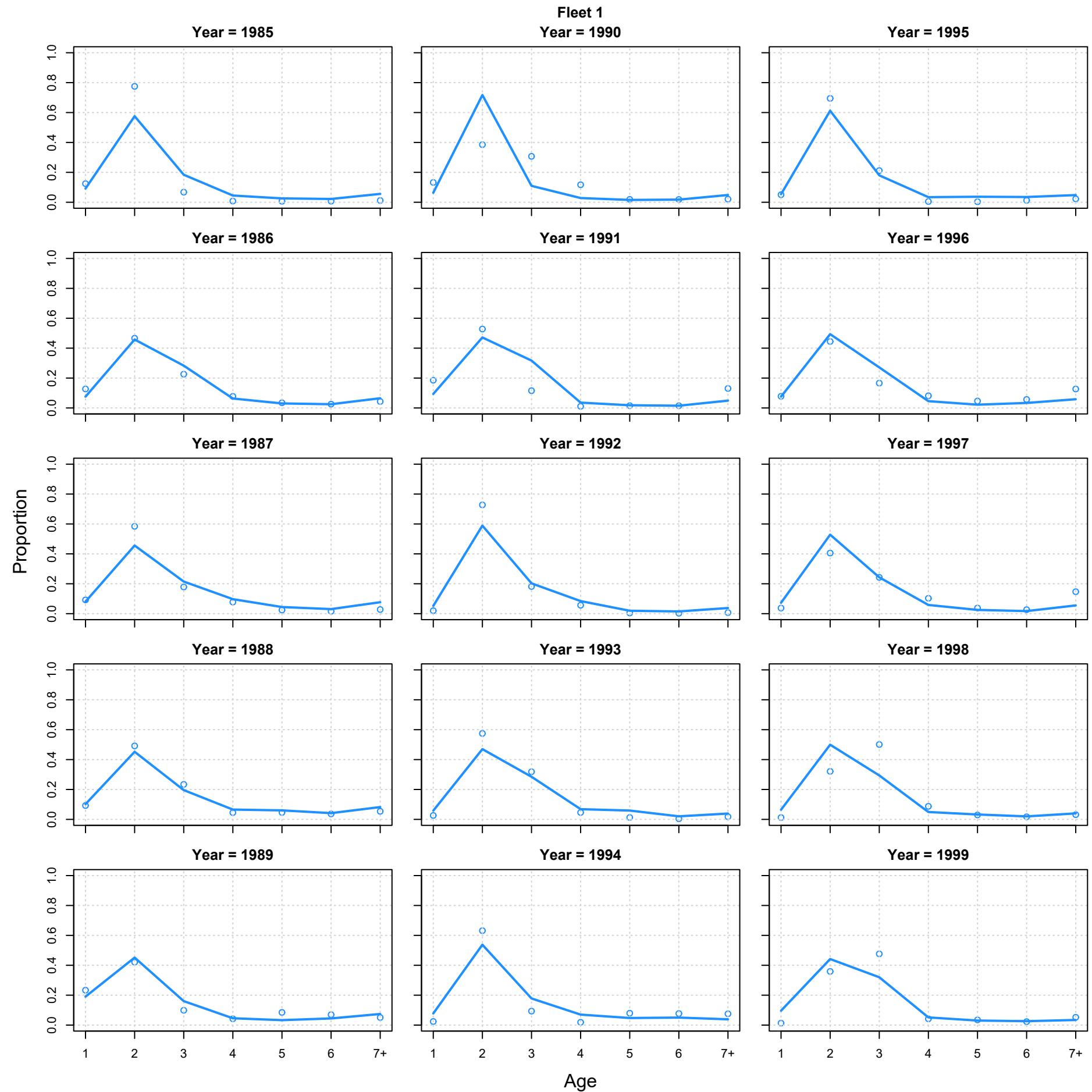


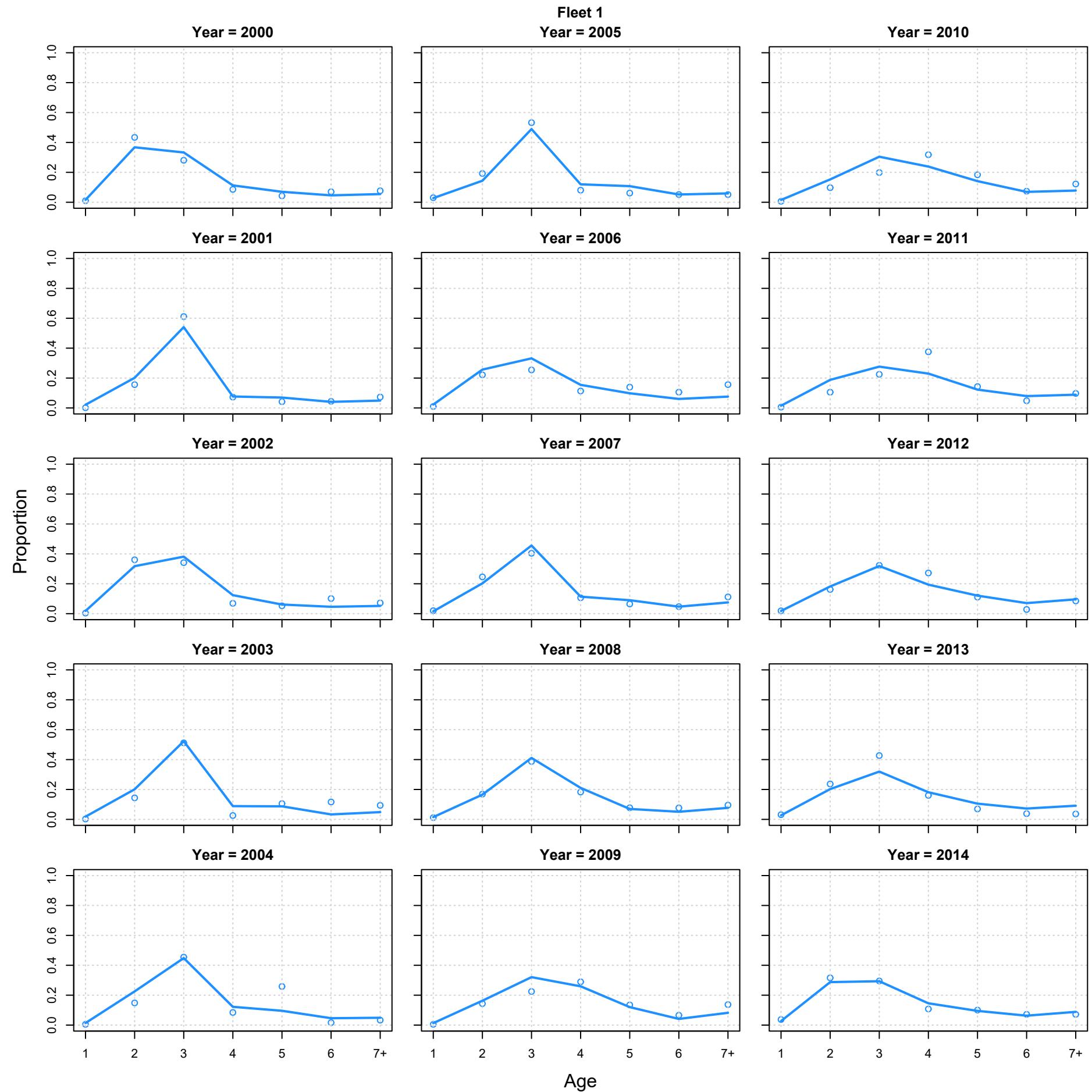
Conditional Expected and Posterior Estimates of Age 6 Abundance



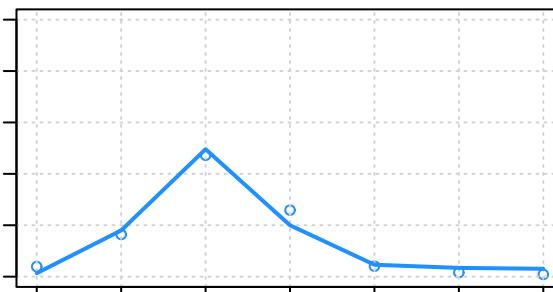
Conditional Expected and Posterior Estimates of Age 7 Abundance



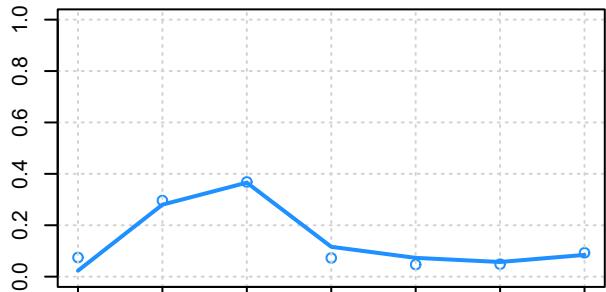




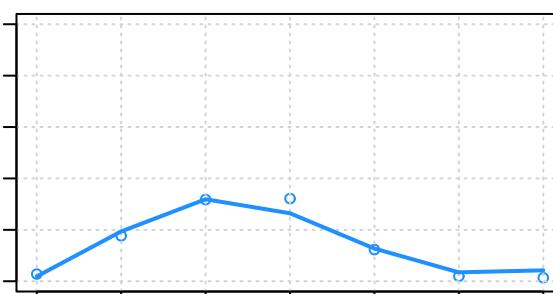
Fleet 1
Year = 2020



Year = 2015



Year = 2021



Year = 2016

Year = 2017

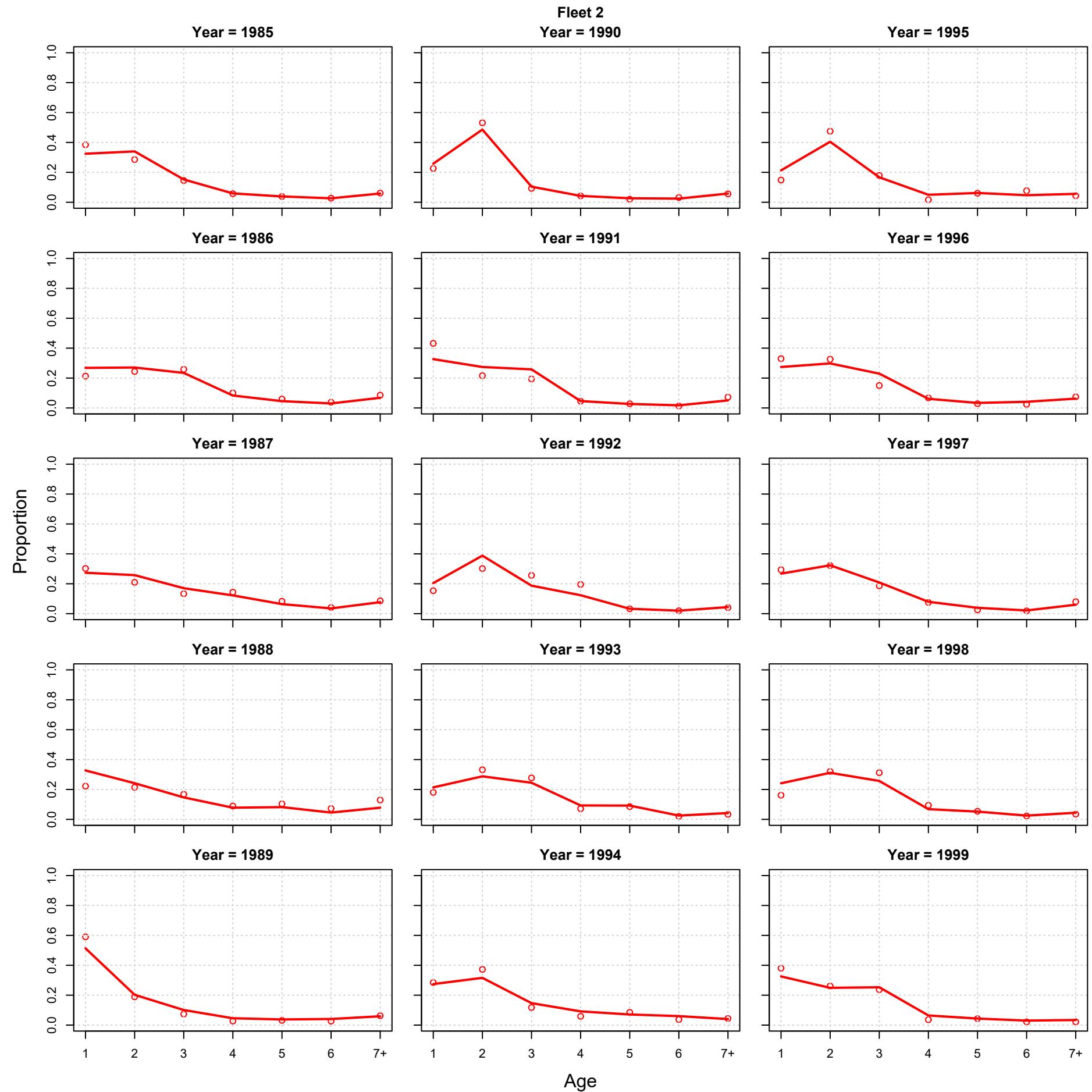
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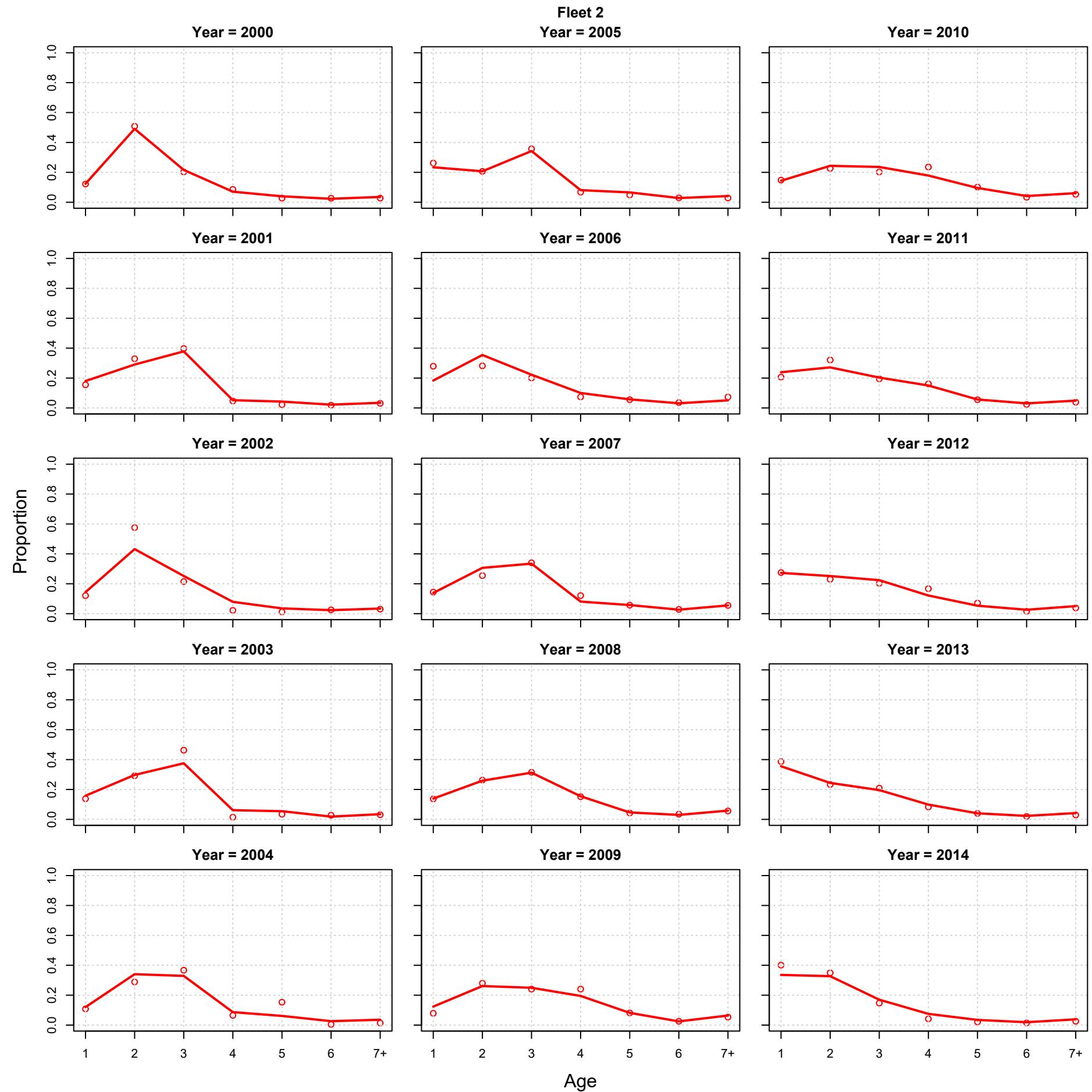
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Age

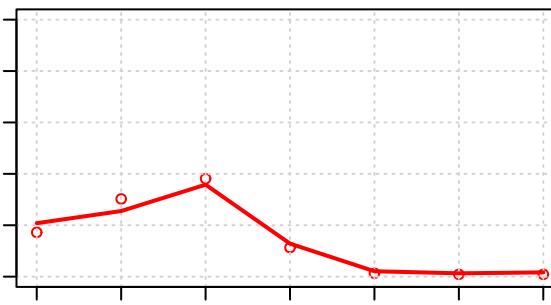
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Proportion

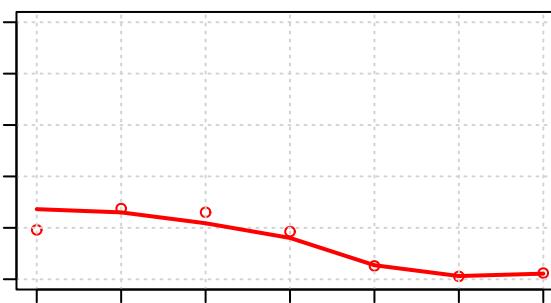




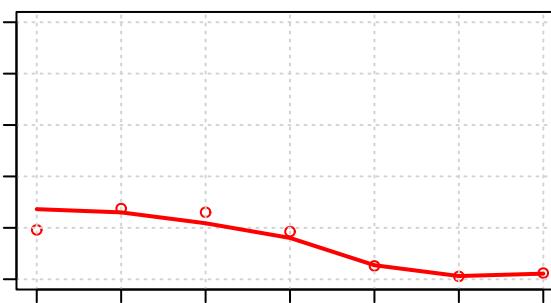
Fleet 2
Year = 2020



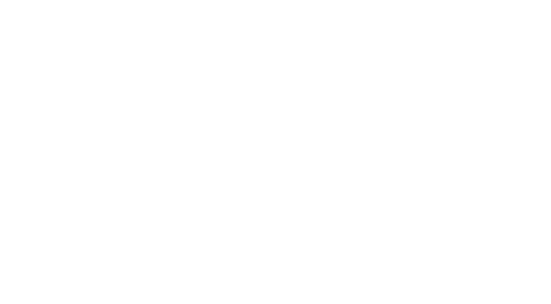
Year = 2016



Year = 2021



Year = 2017



Year = 2018



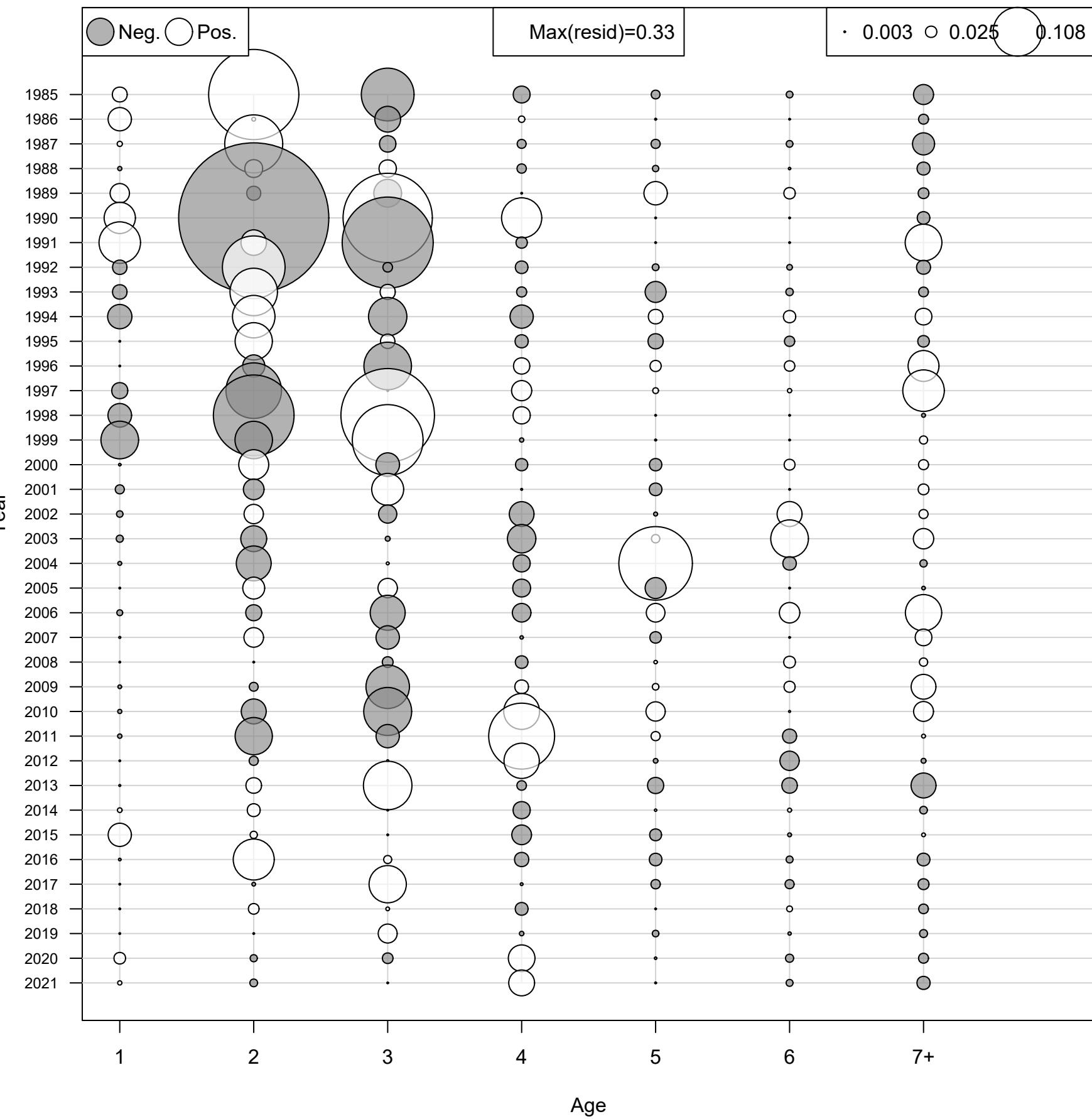
Year = 2019



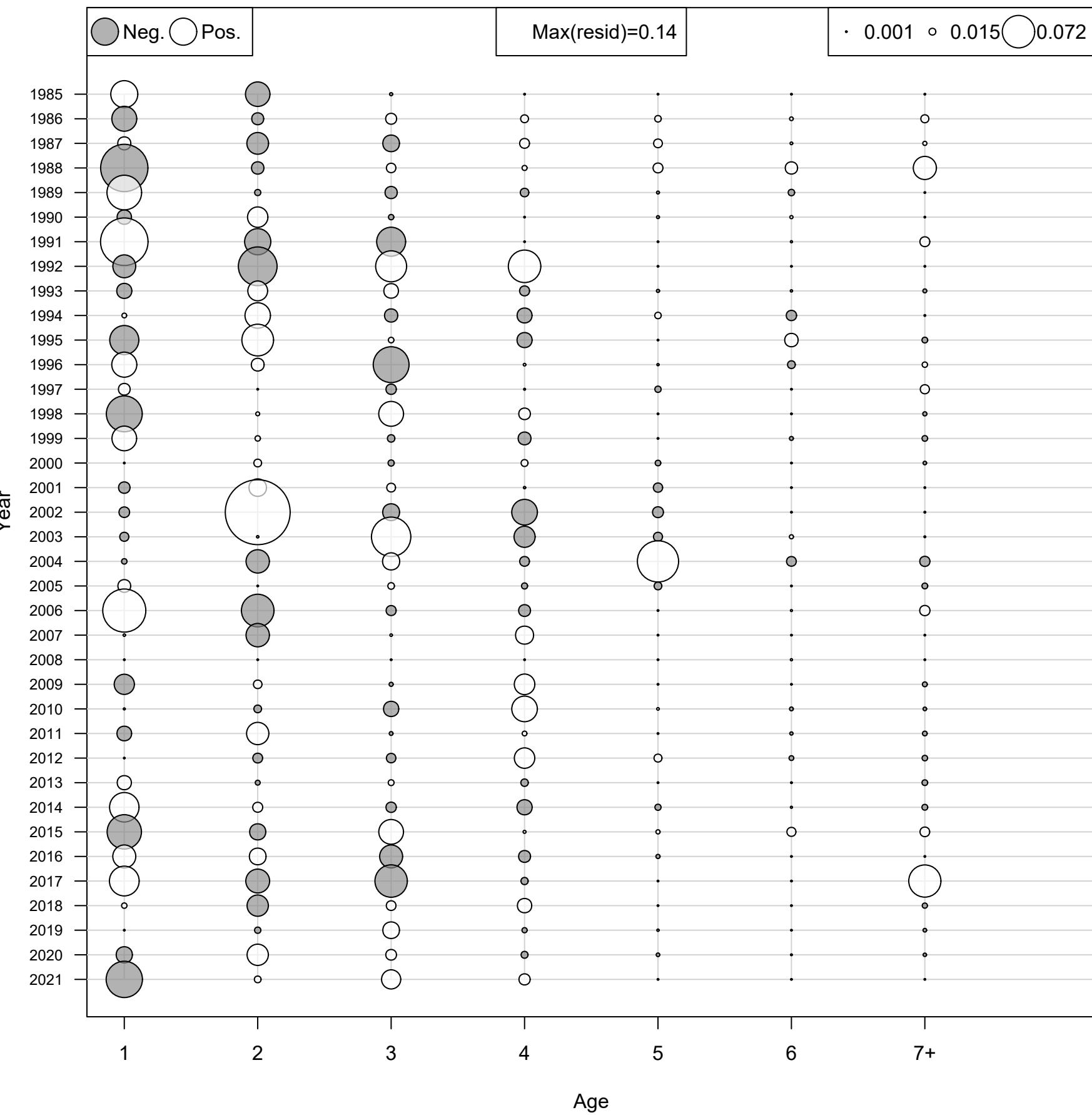
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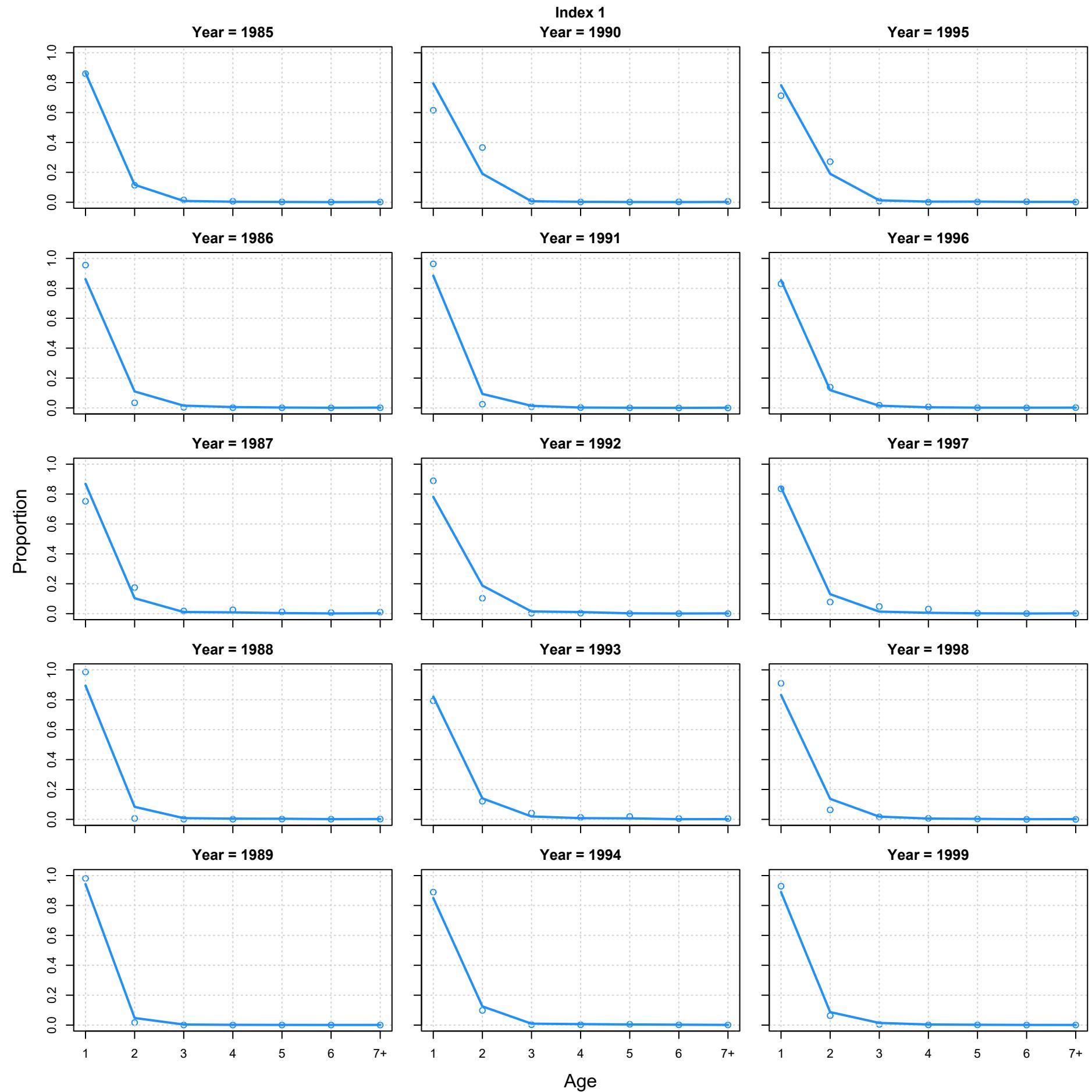
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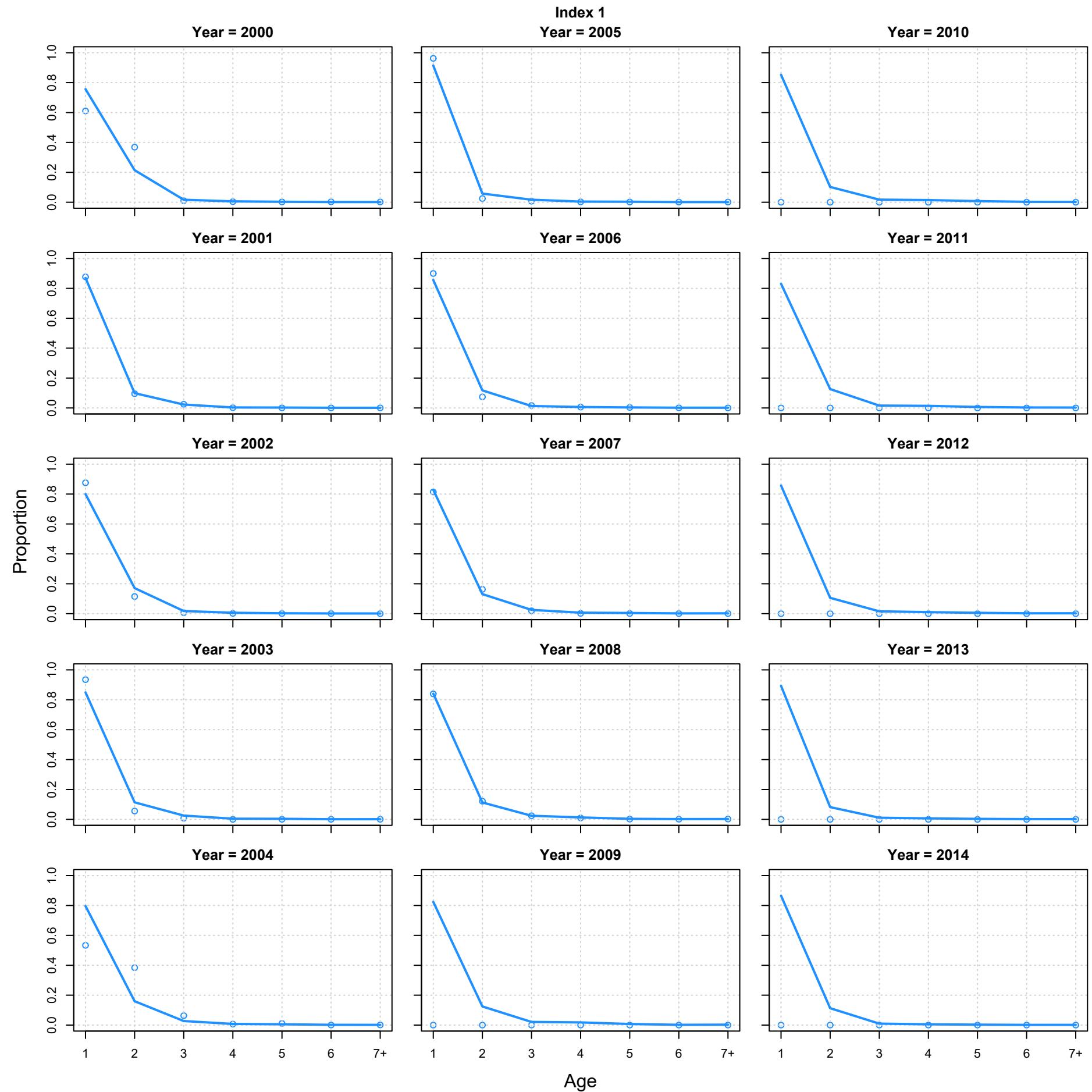
Age Comp Residuals (Observed-Predicted) for Fleet 1

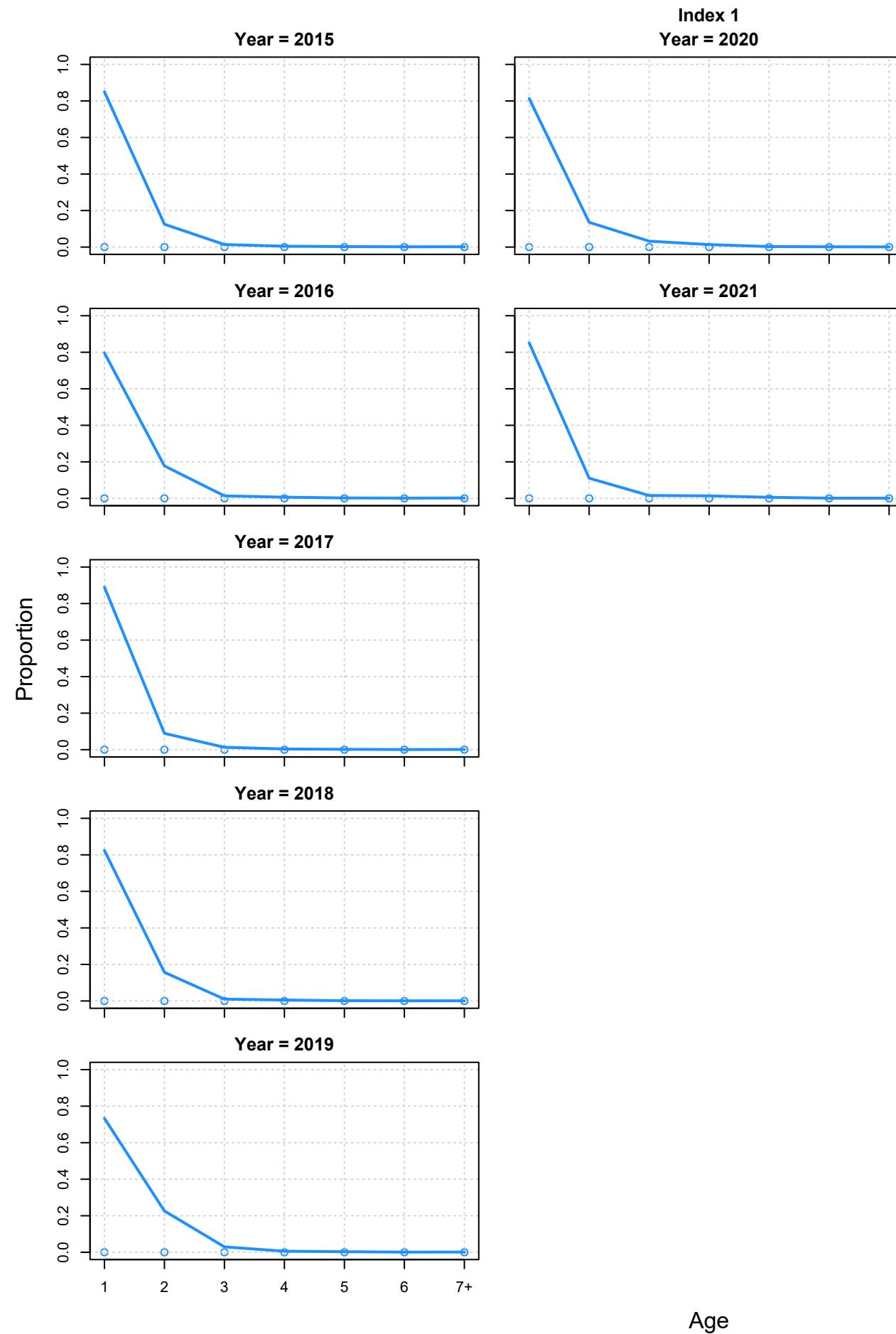


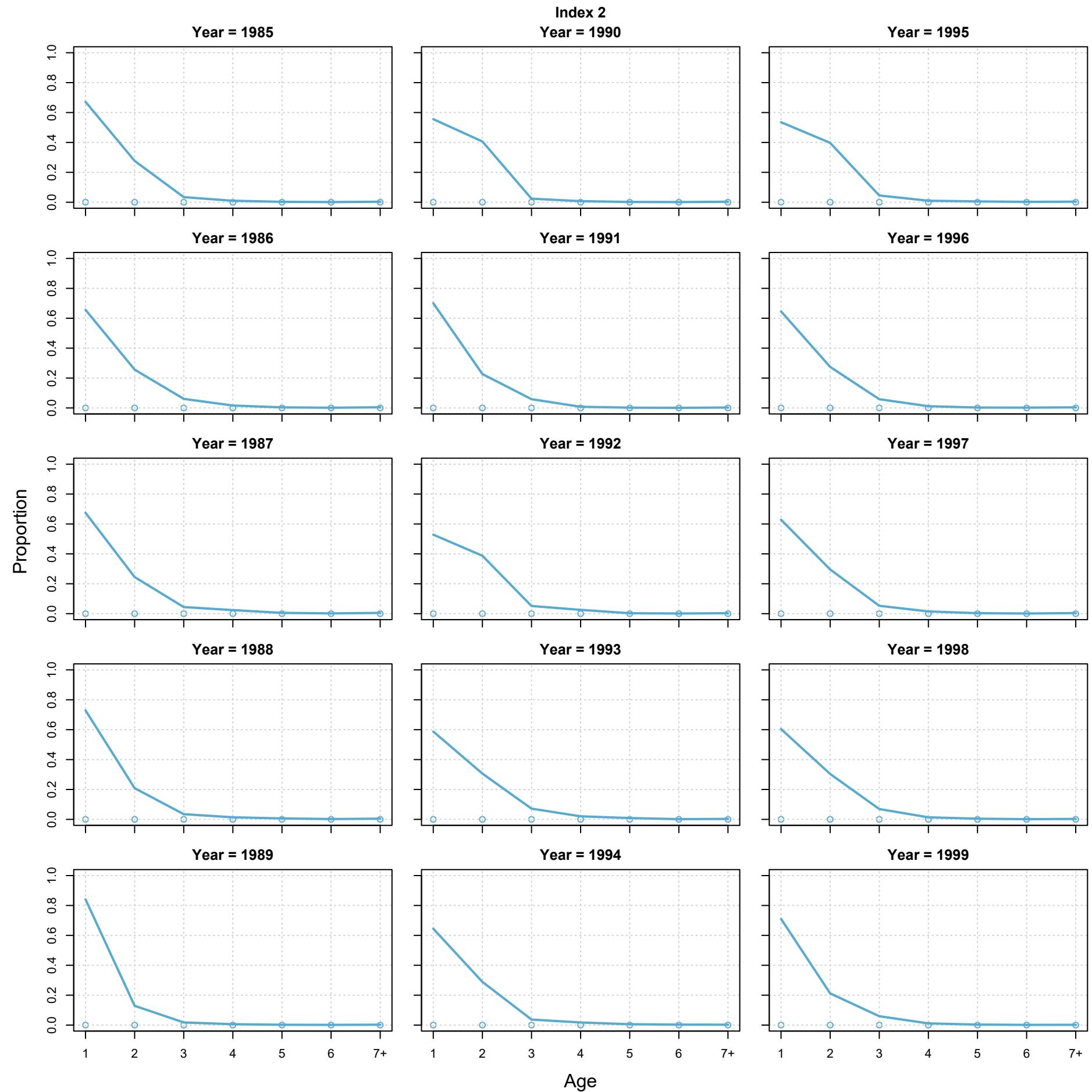
Age Comp Residuals (Observed-Predicted) for Fleet 2

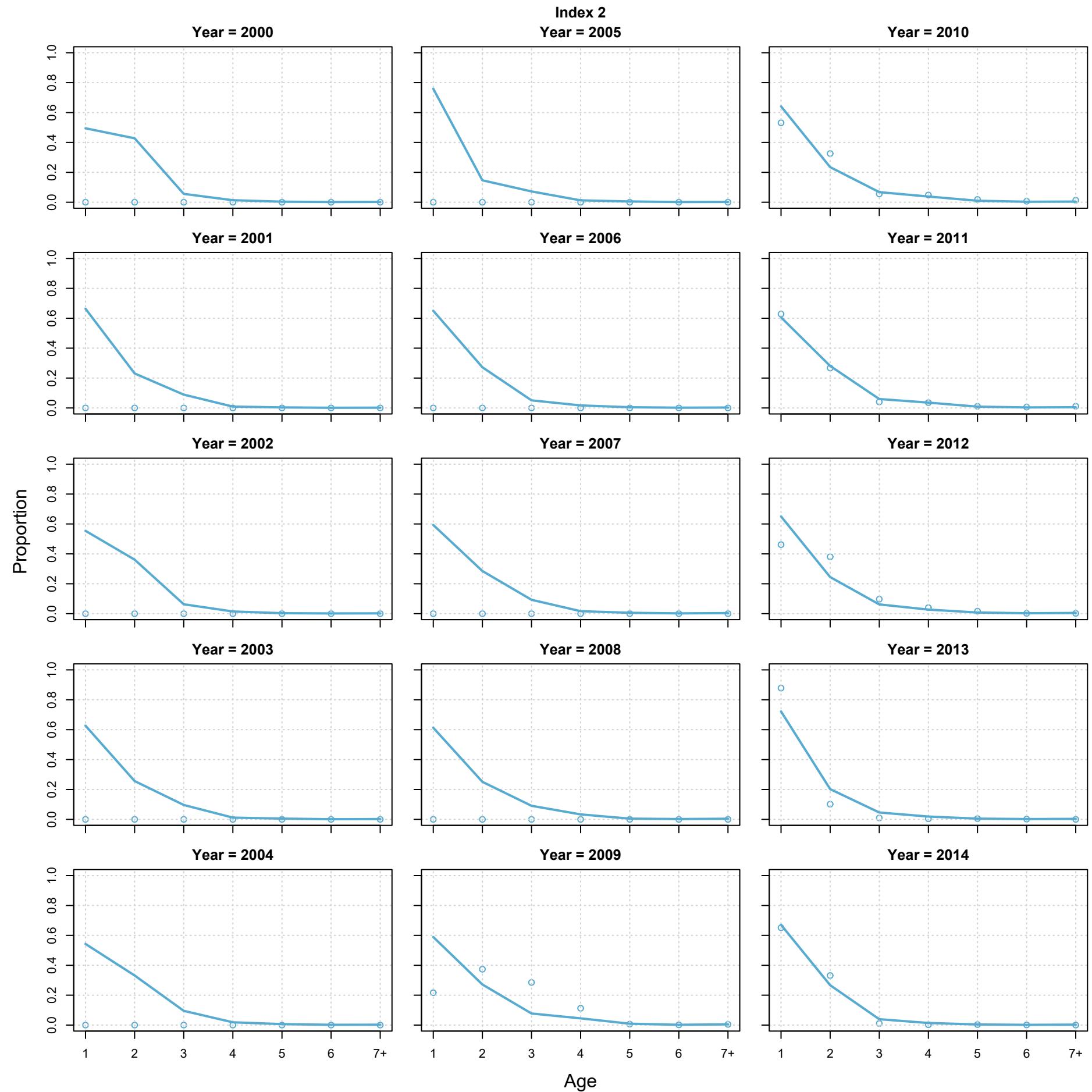






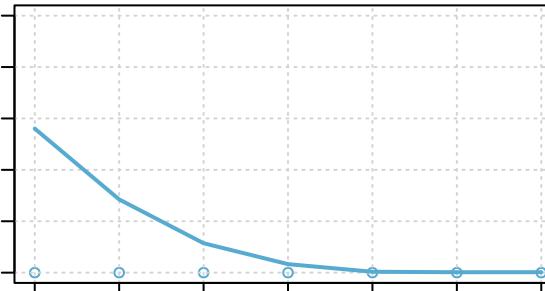
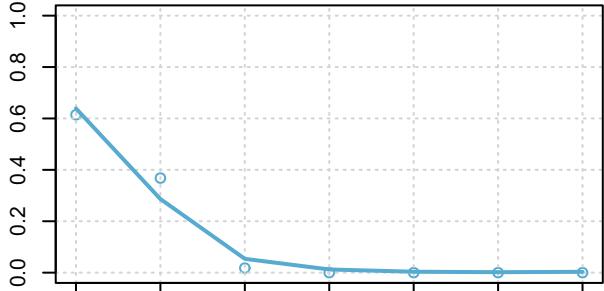






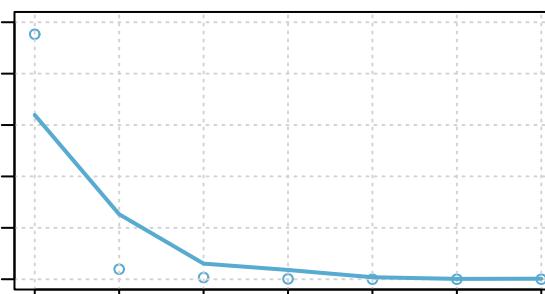
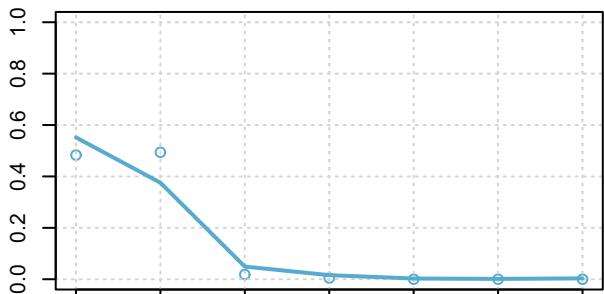
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Index 2
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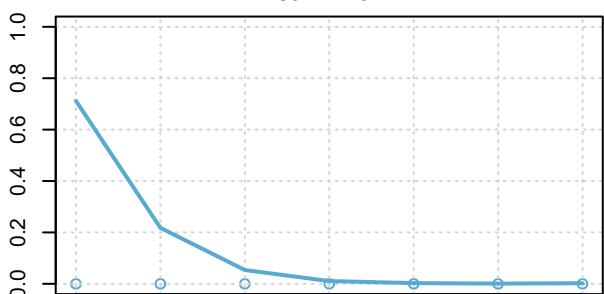


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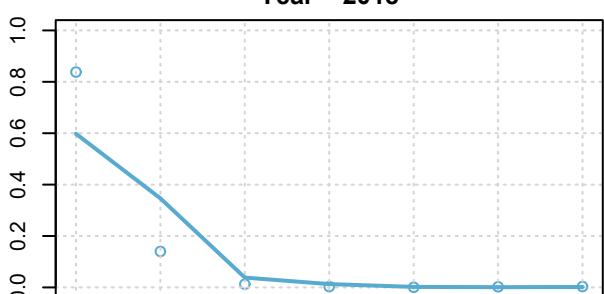
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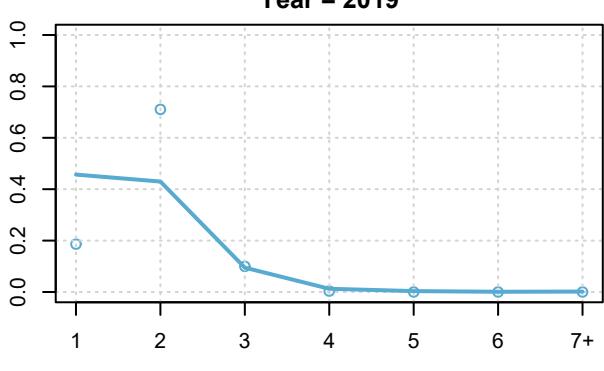
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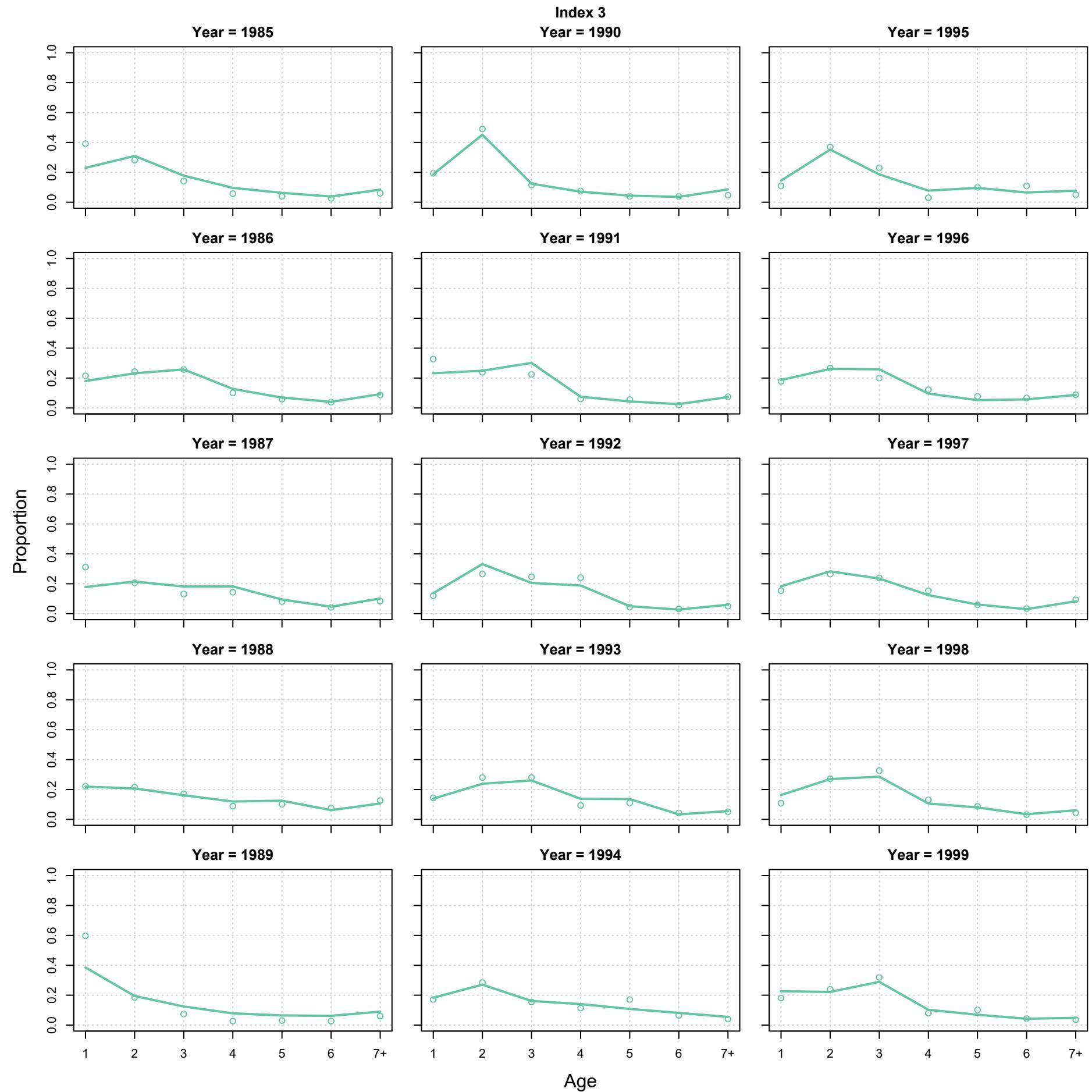
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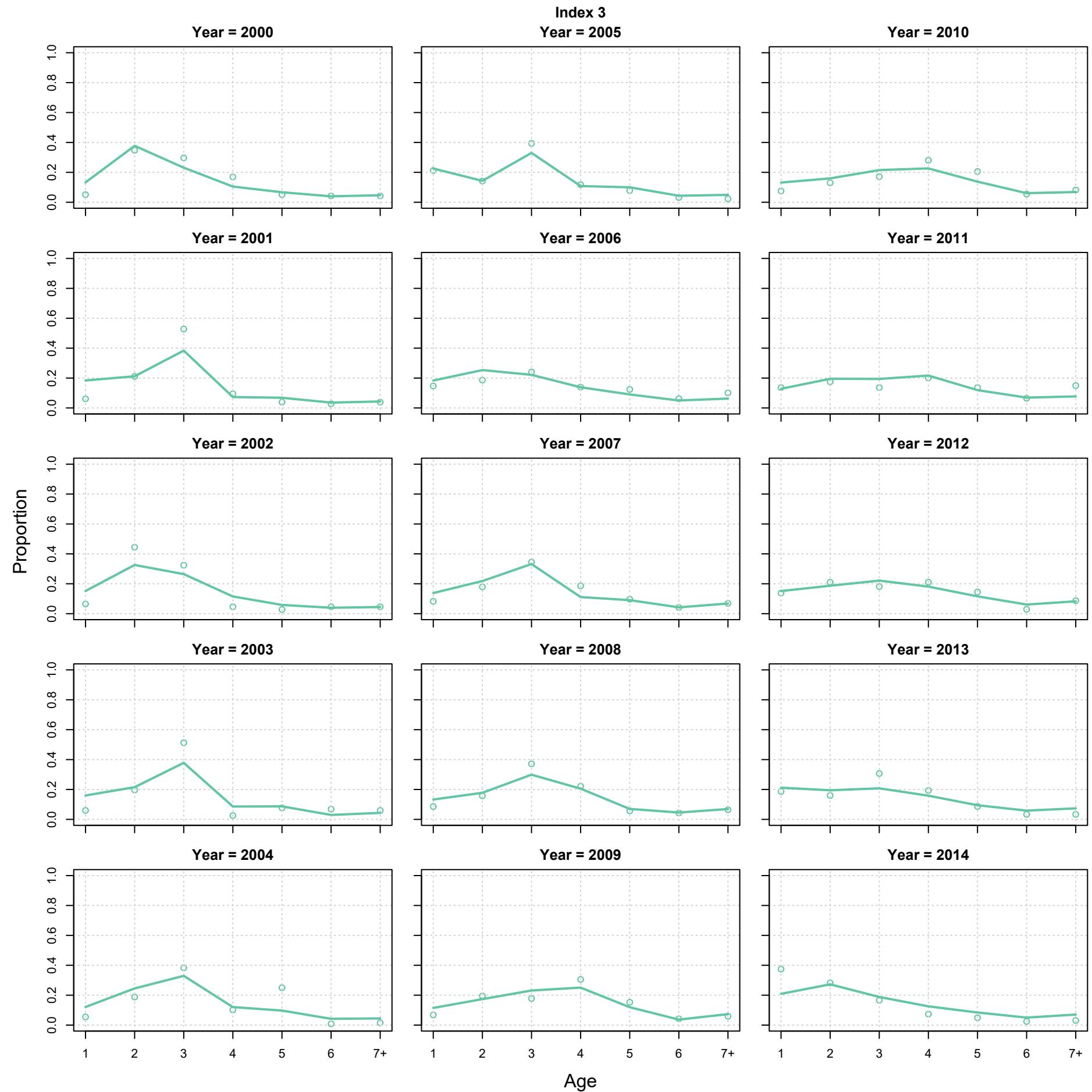


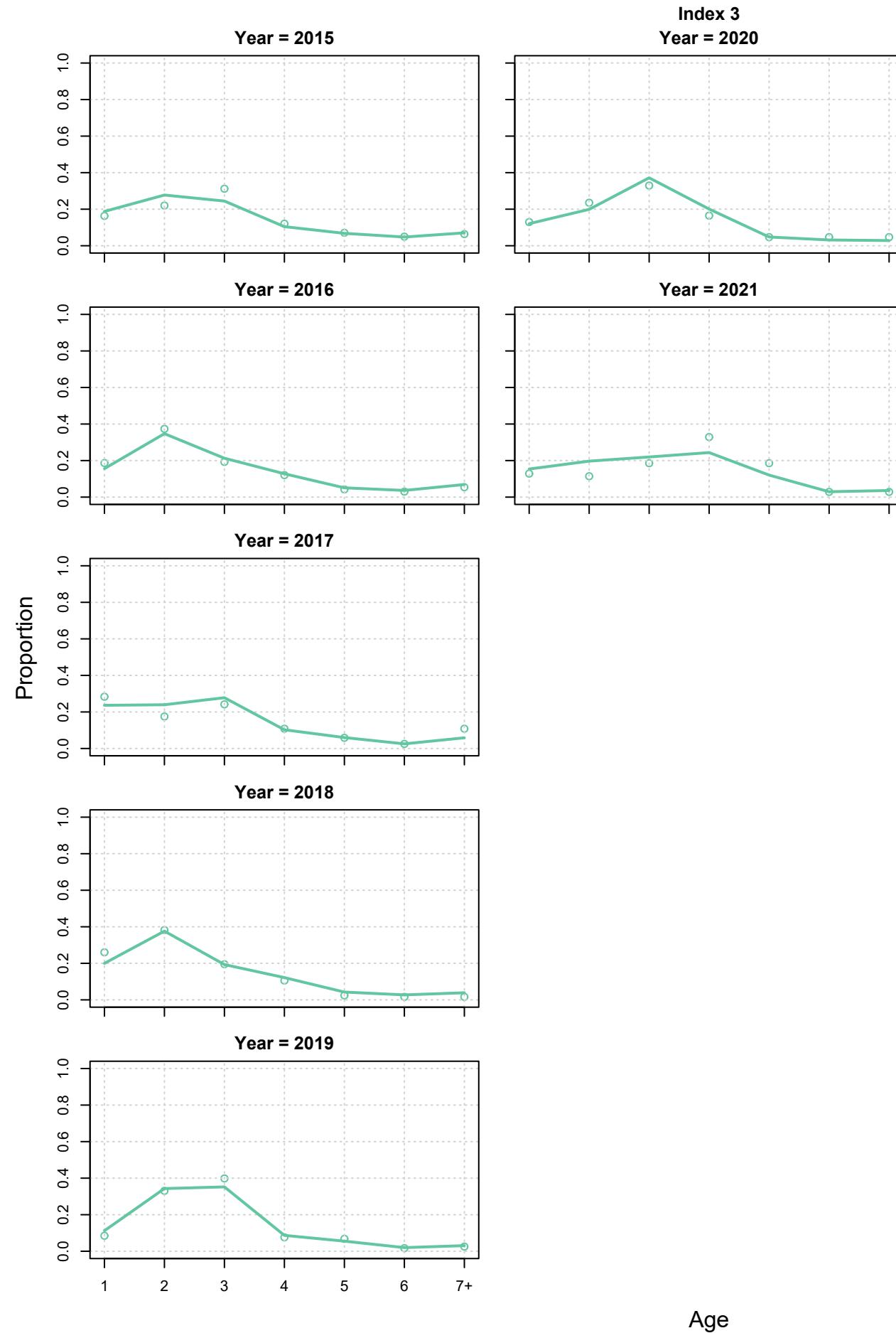
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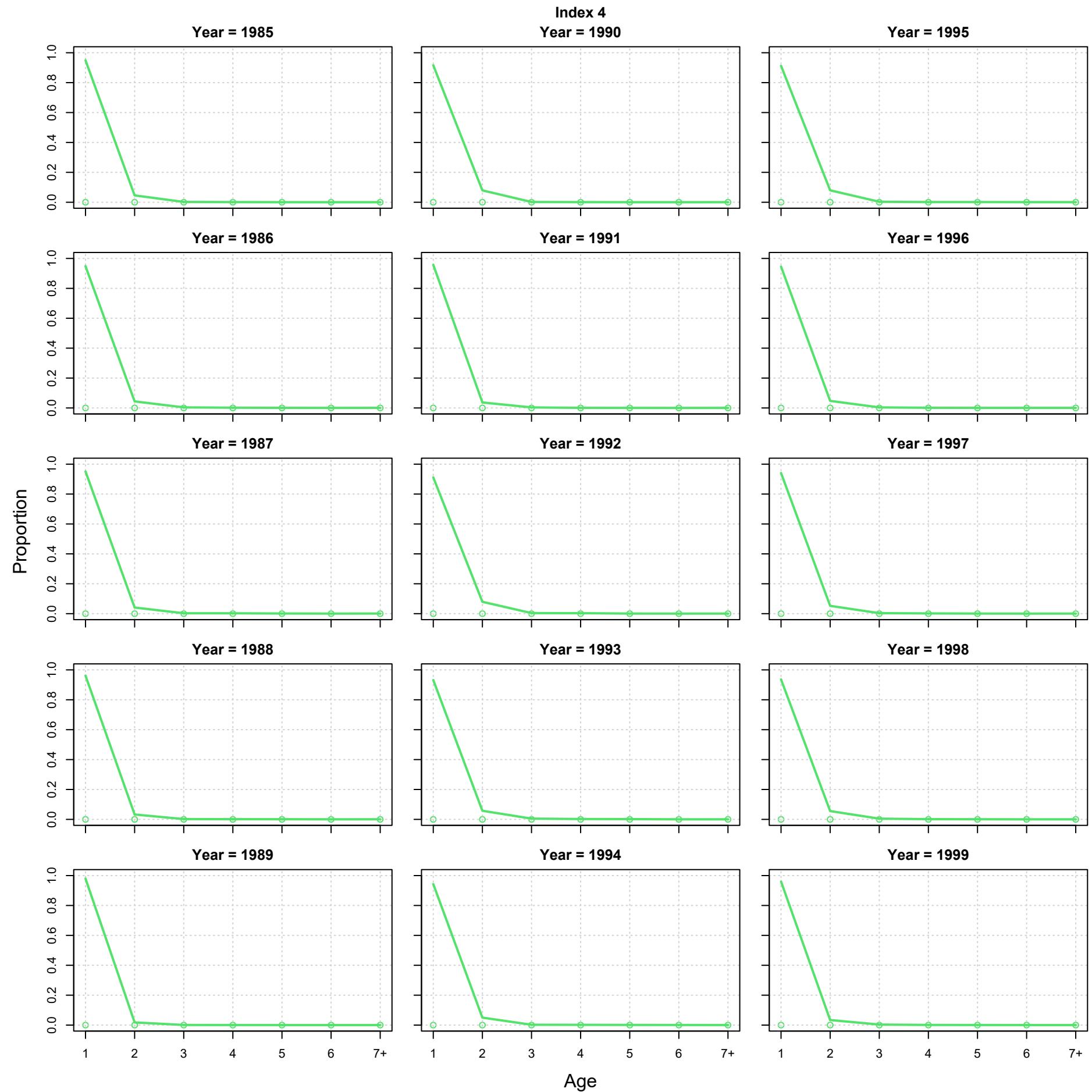


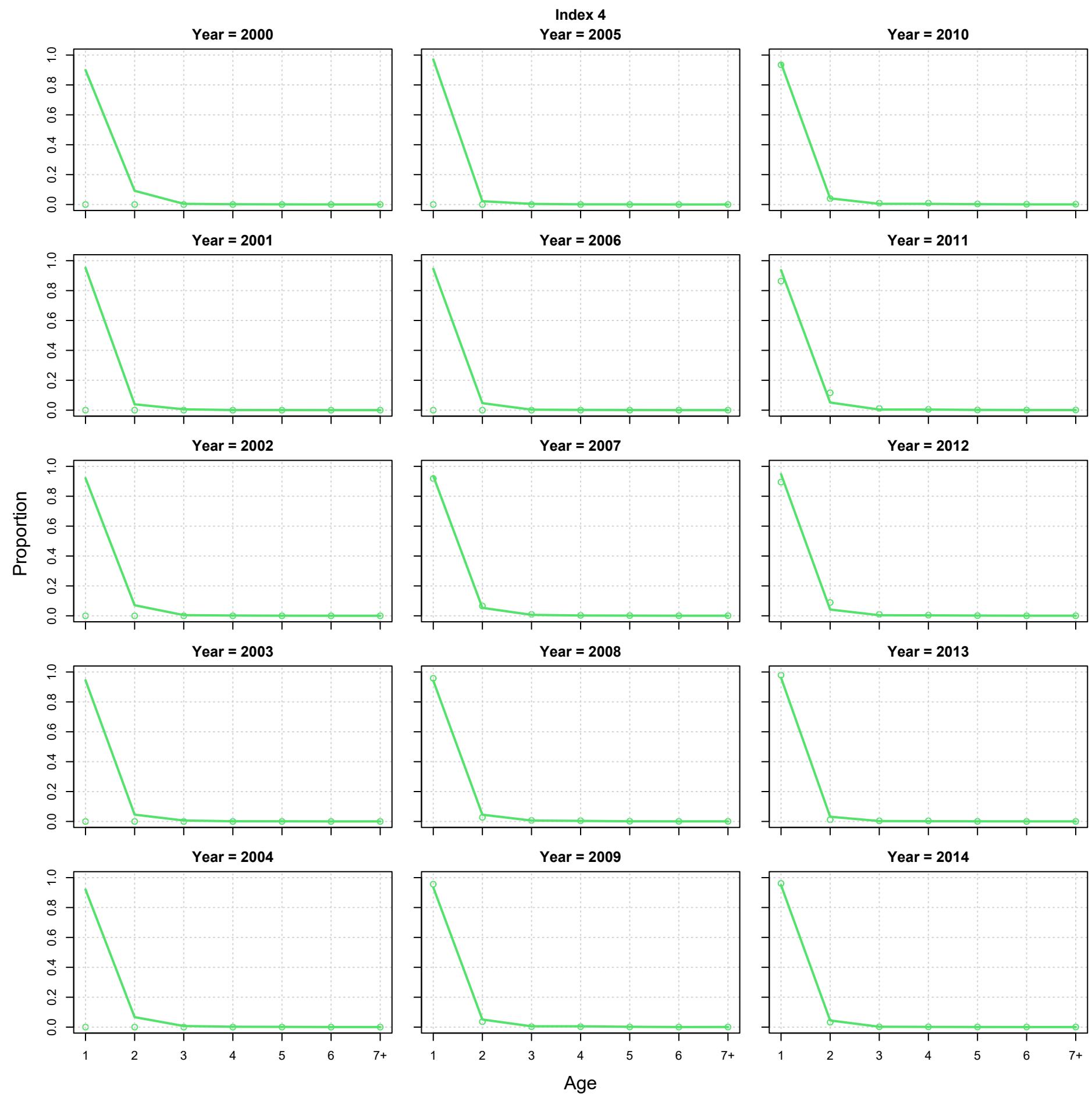
Age





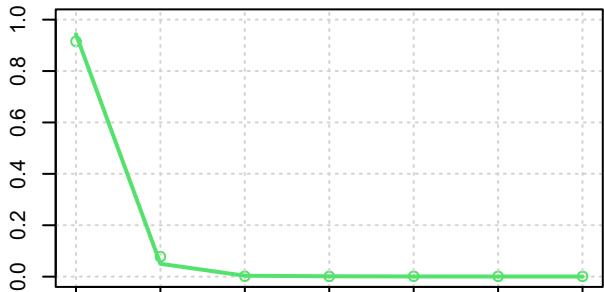






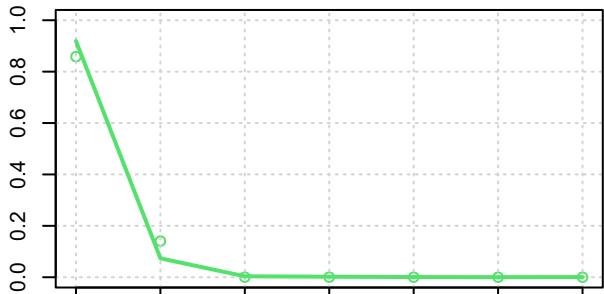
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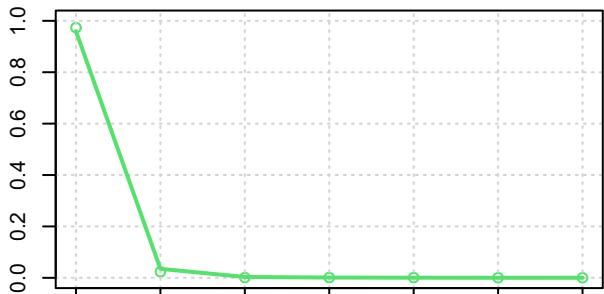


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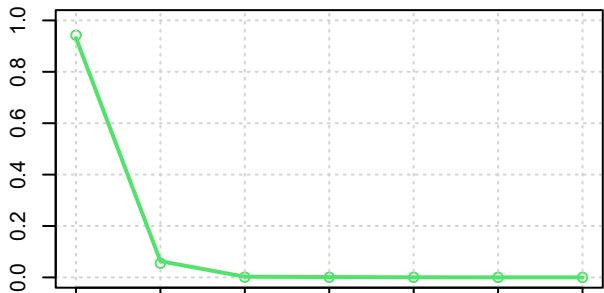
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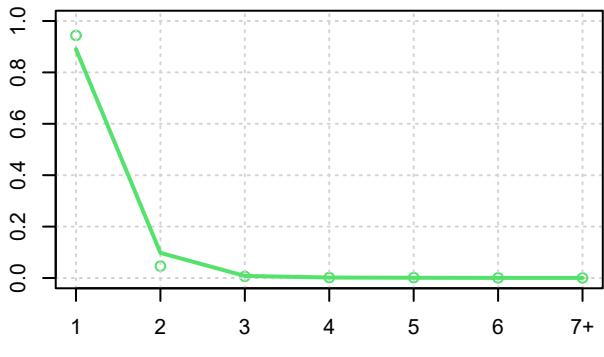
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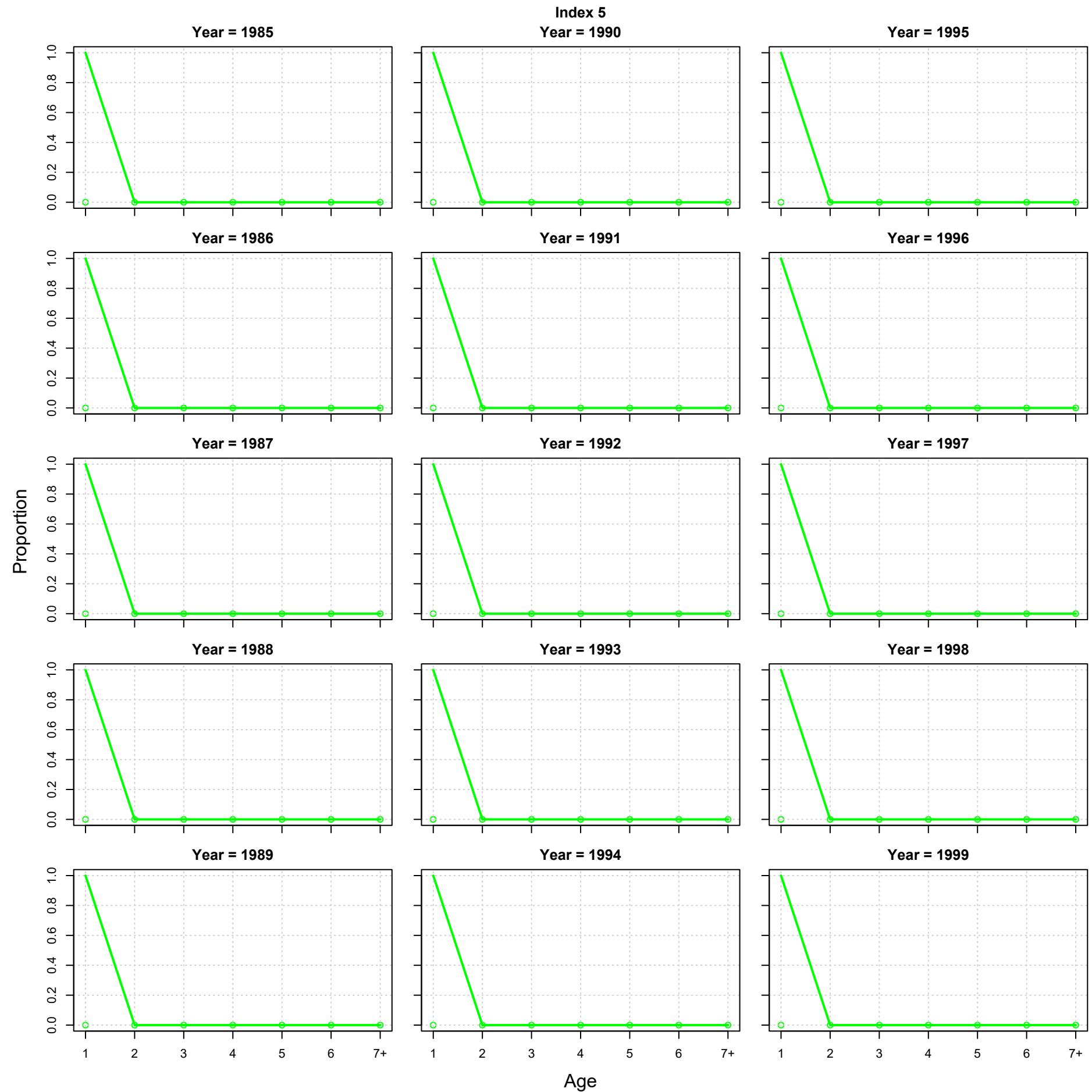
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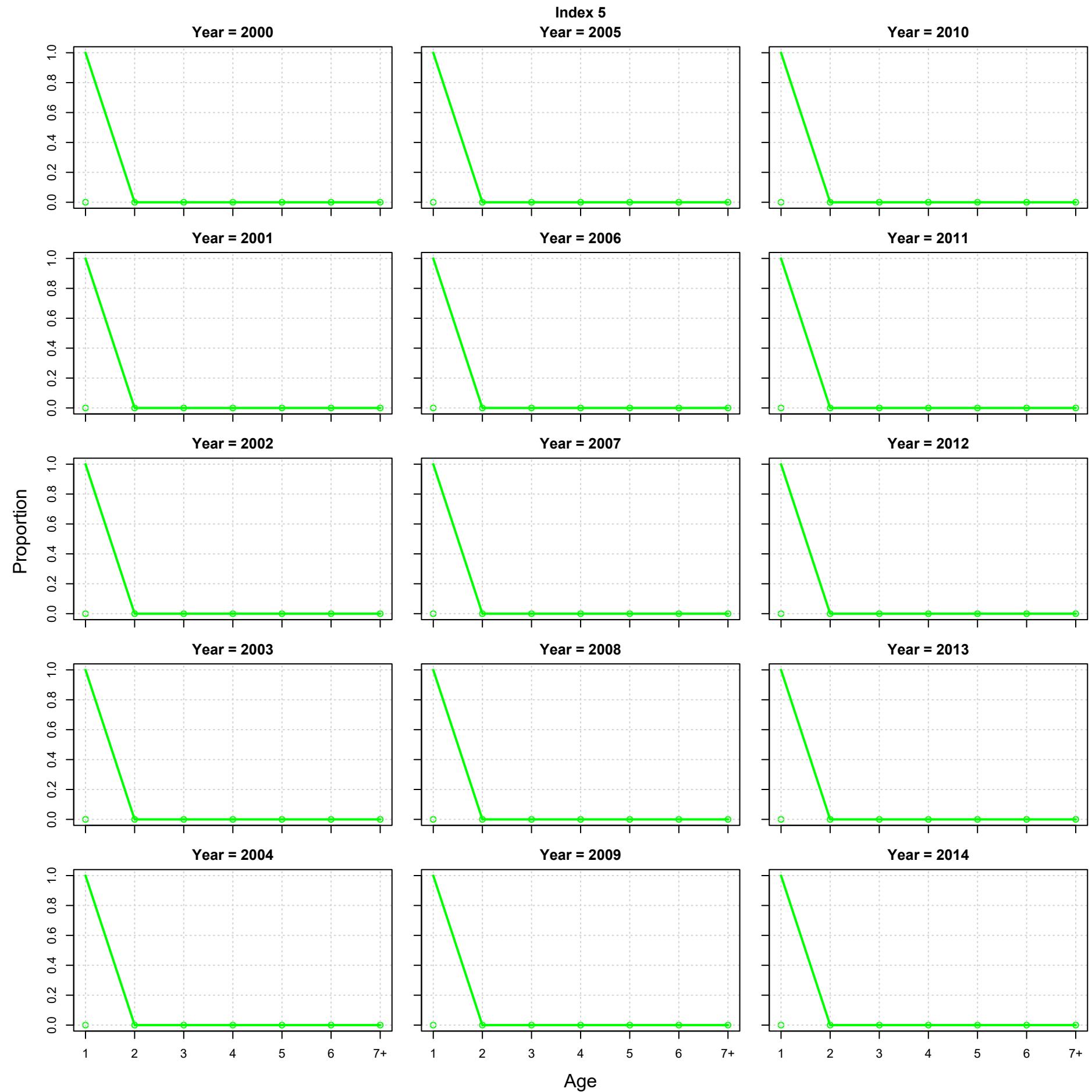


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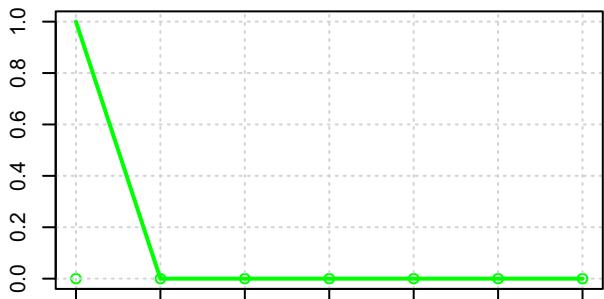
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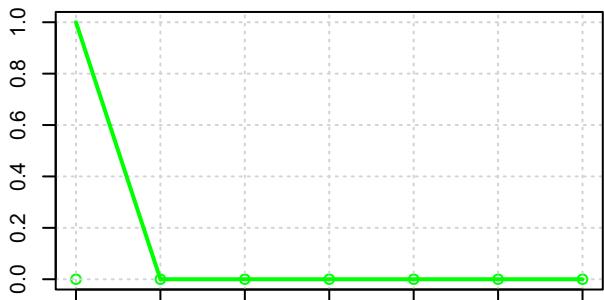
Year = 2015

Index 5
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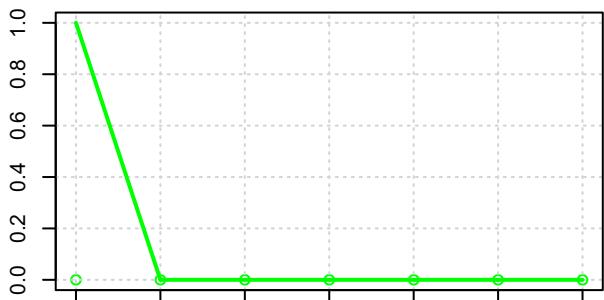


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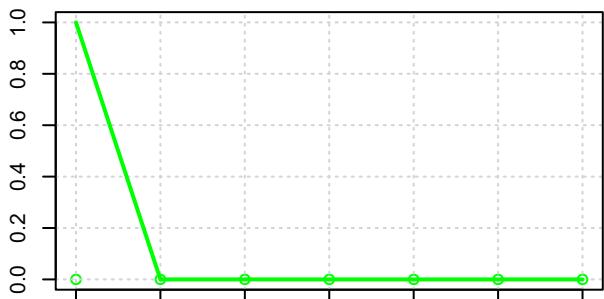
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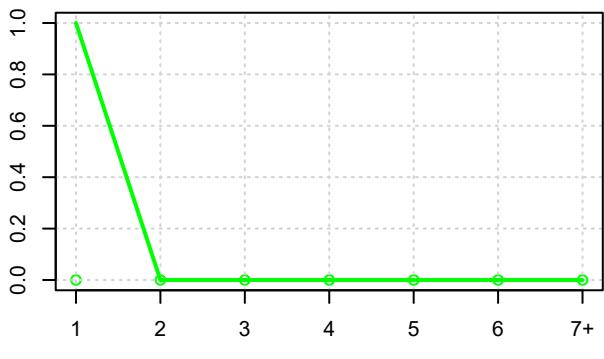
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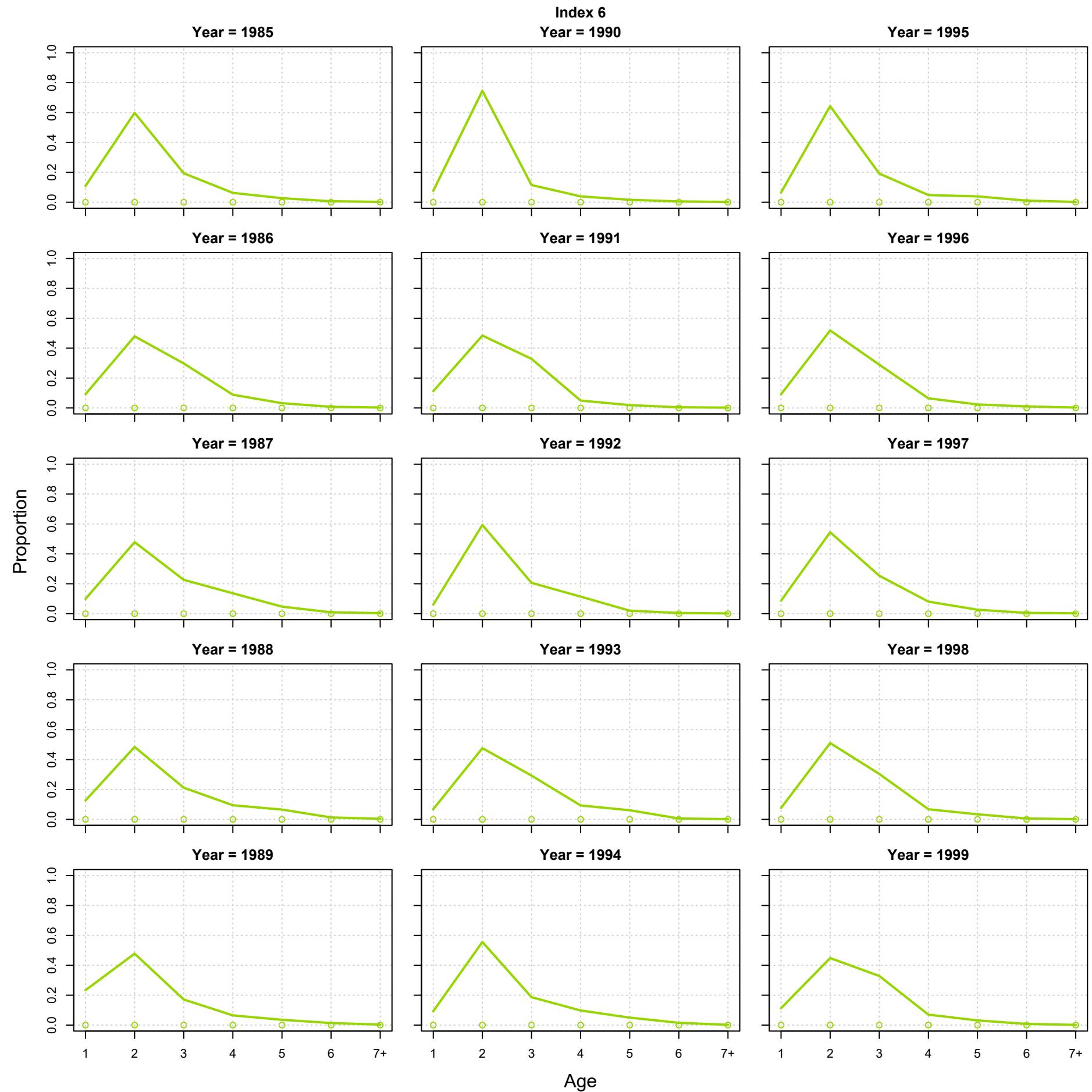
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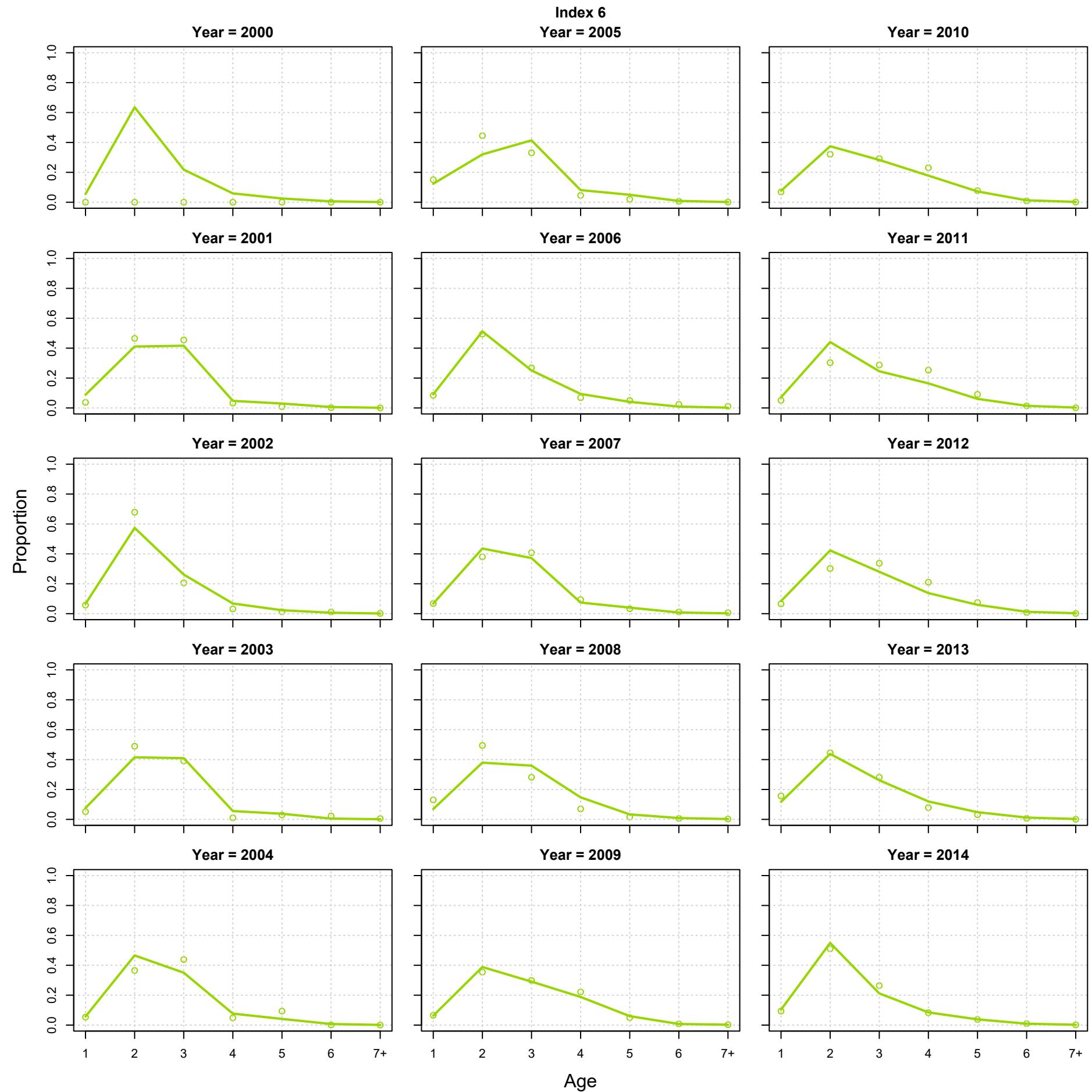


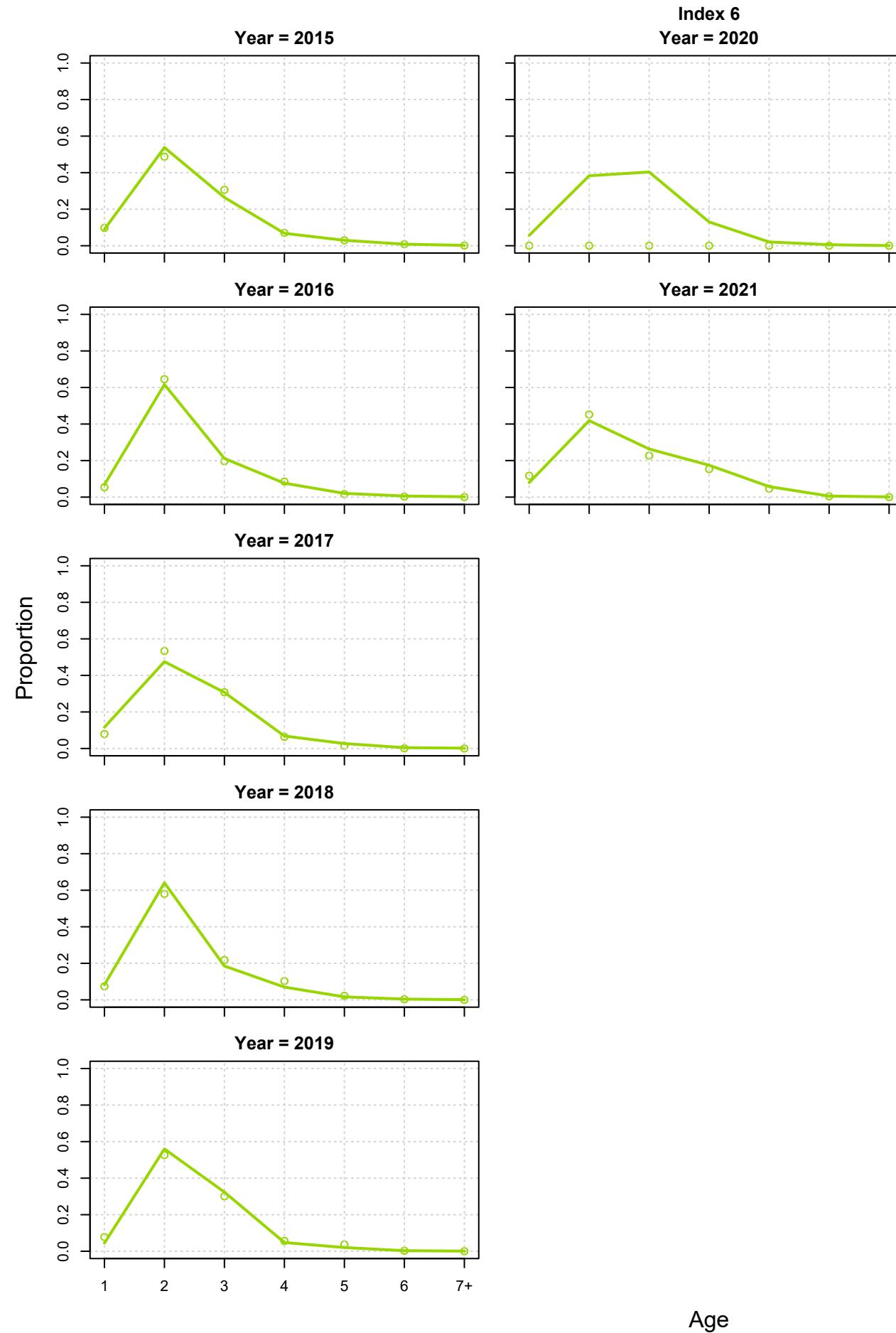
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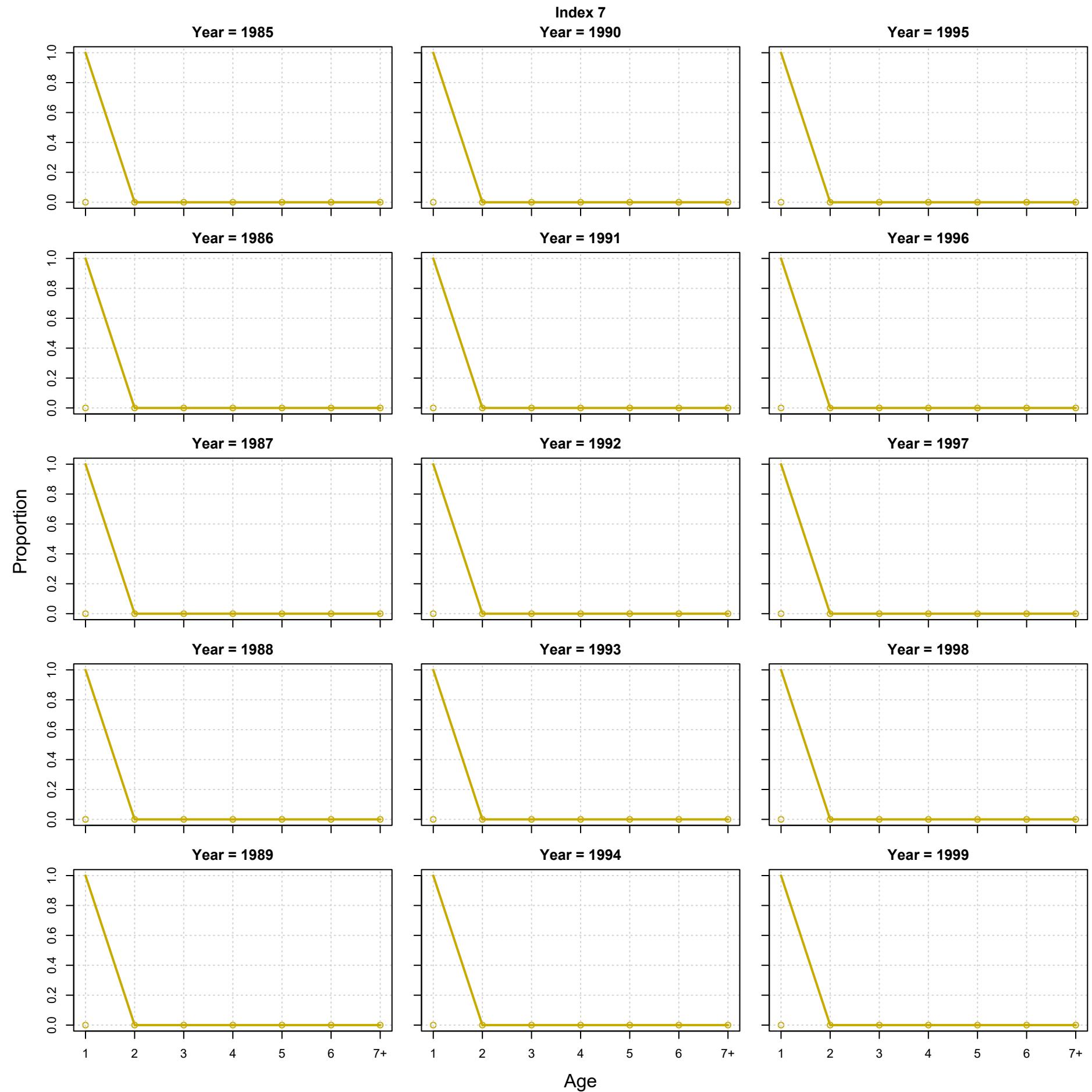


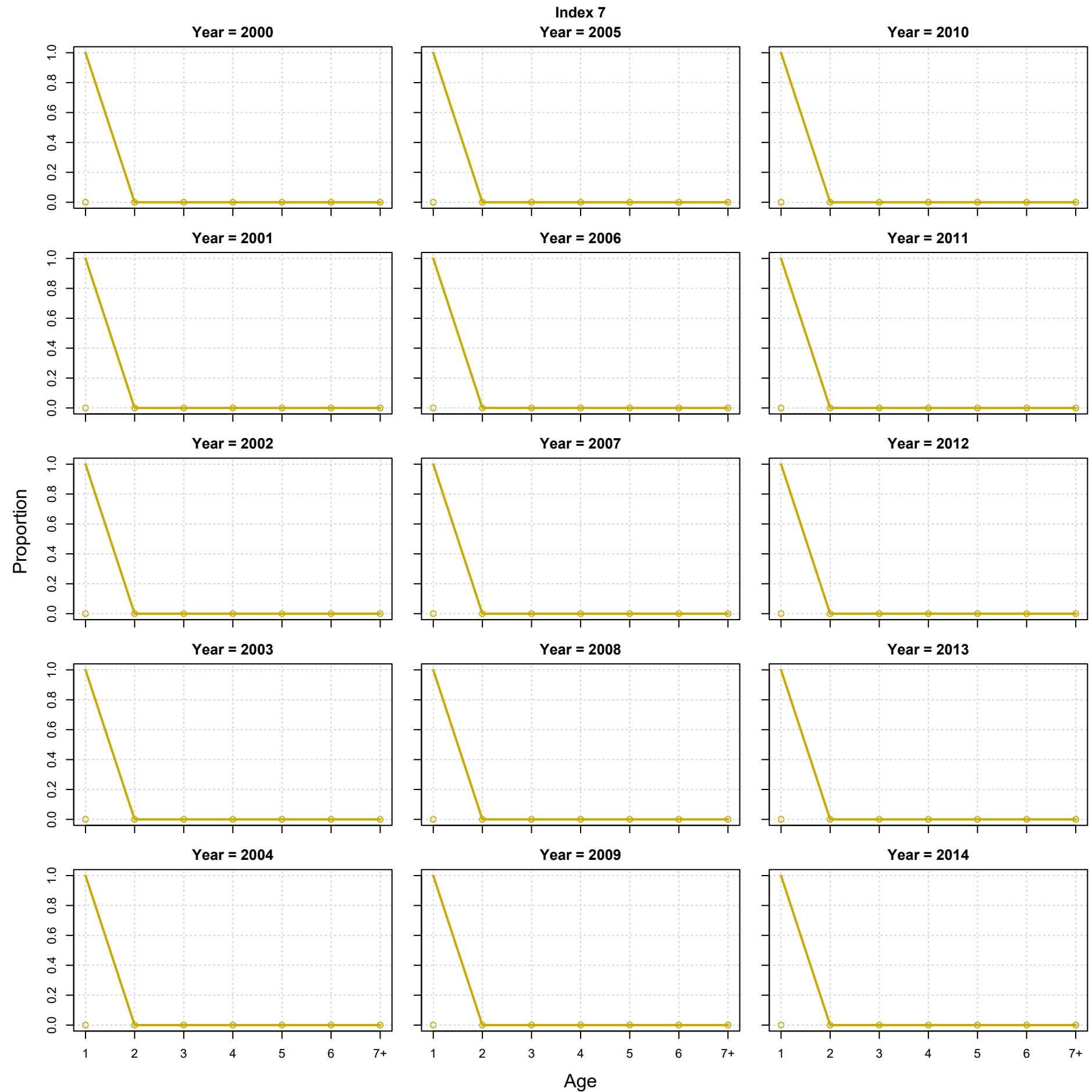
Age



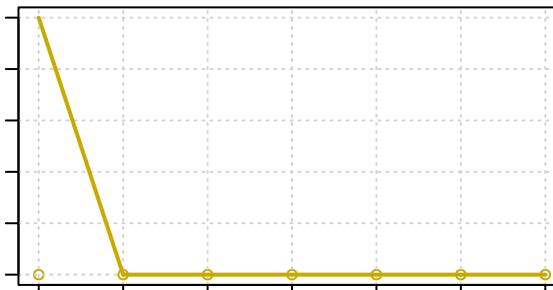




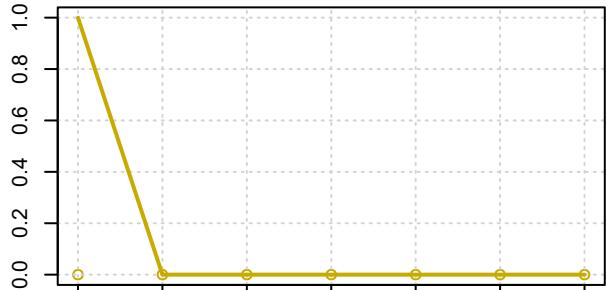




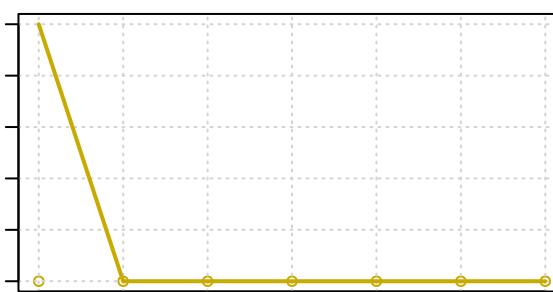
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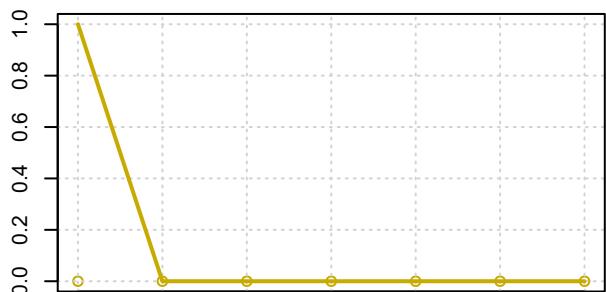
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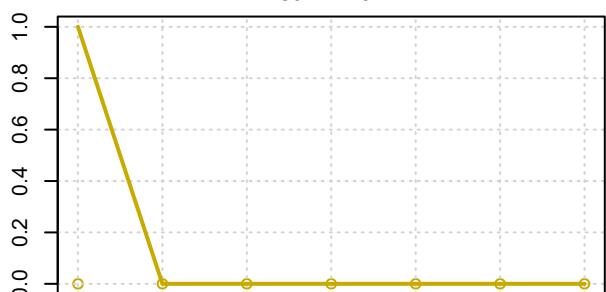
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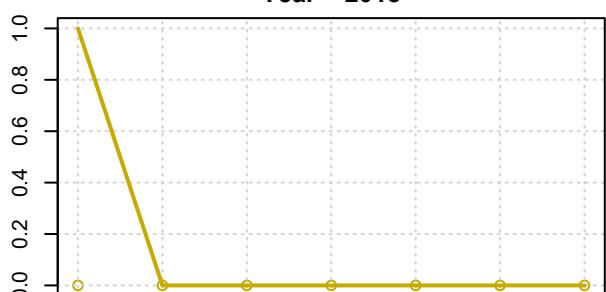
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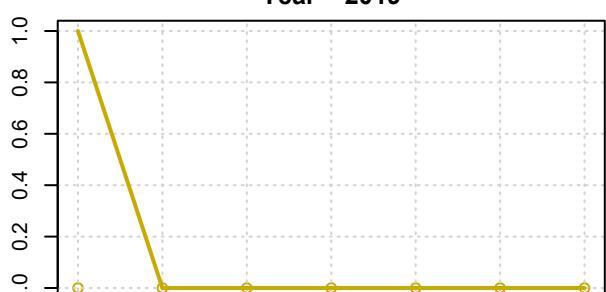
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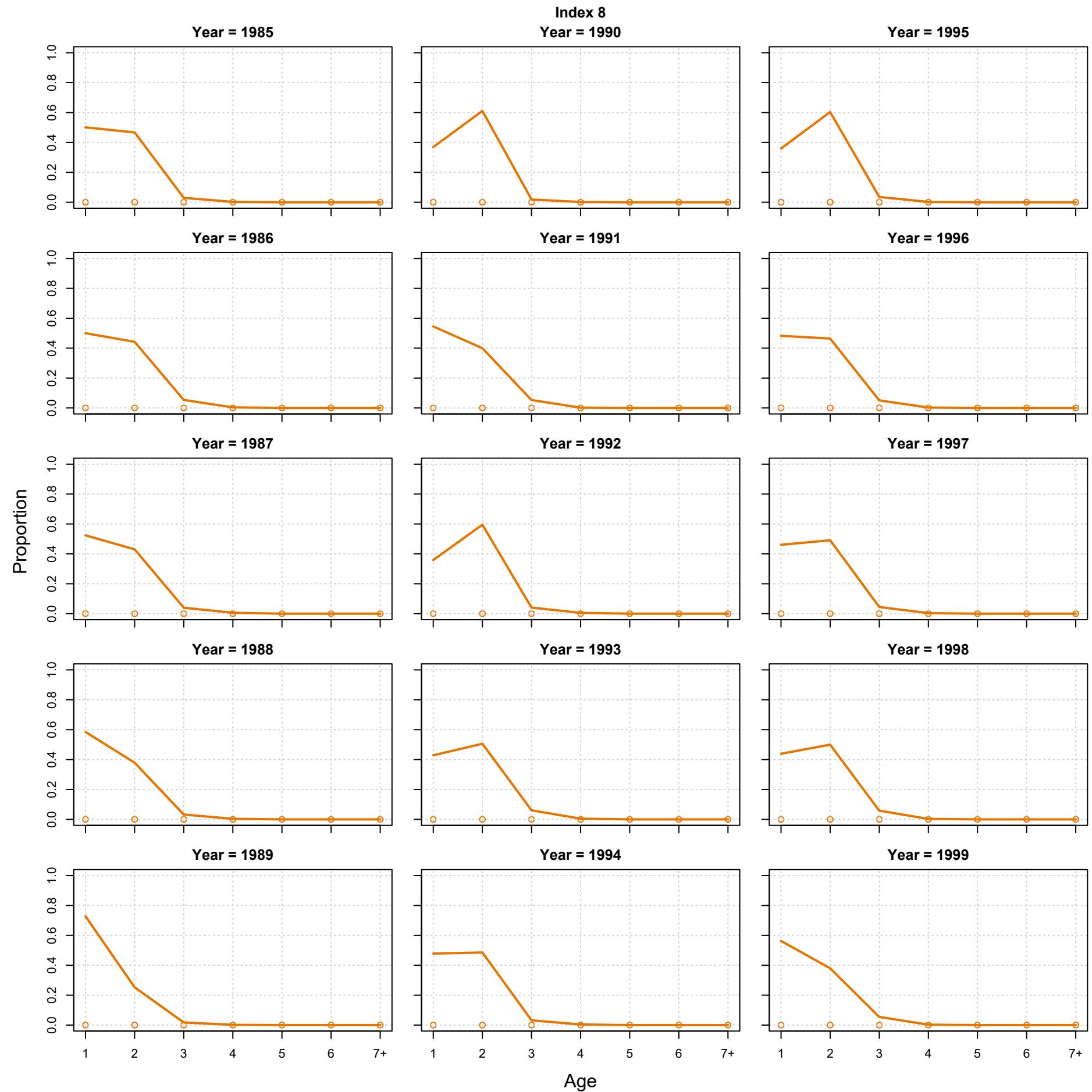
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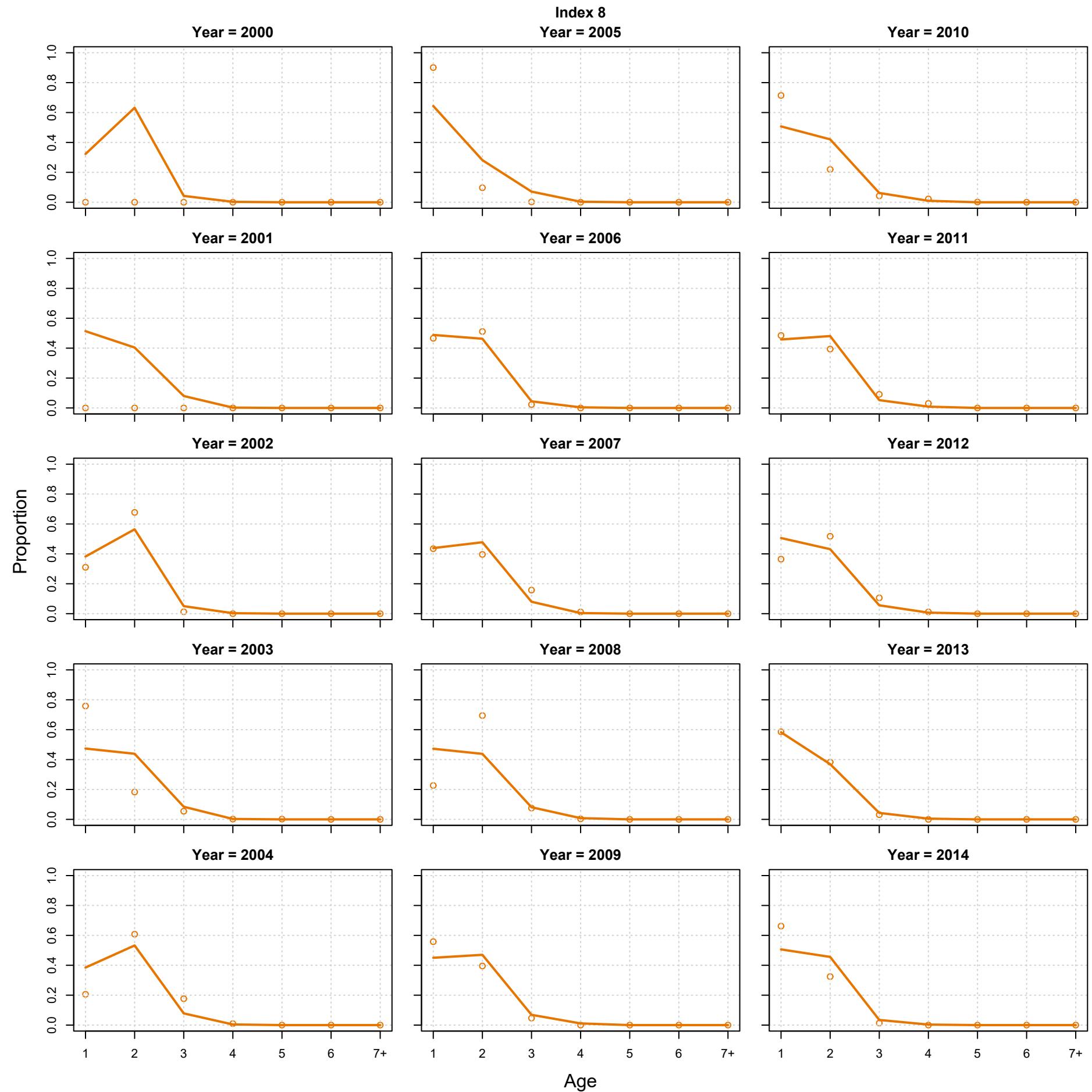


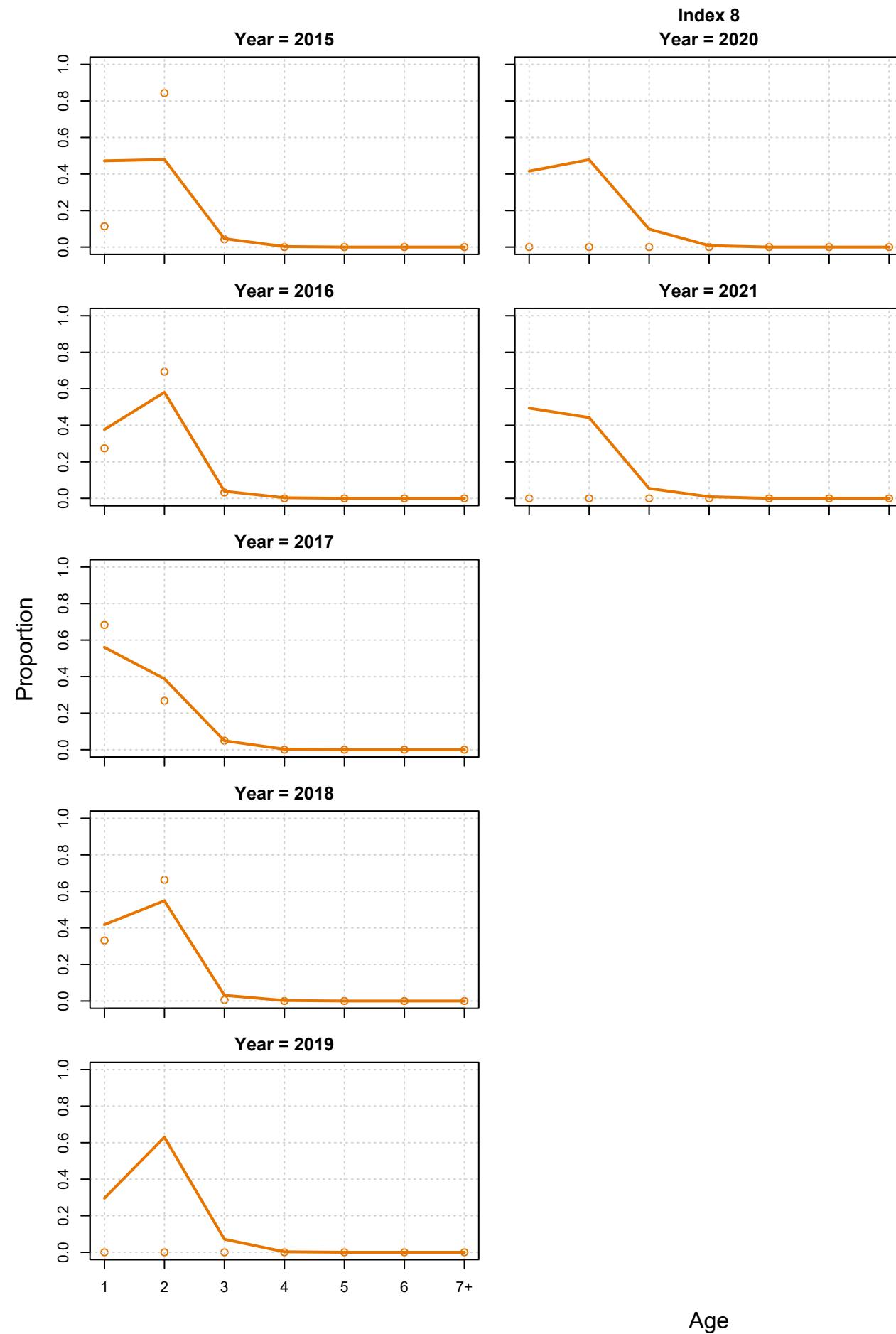
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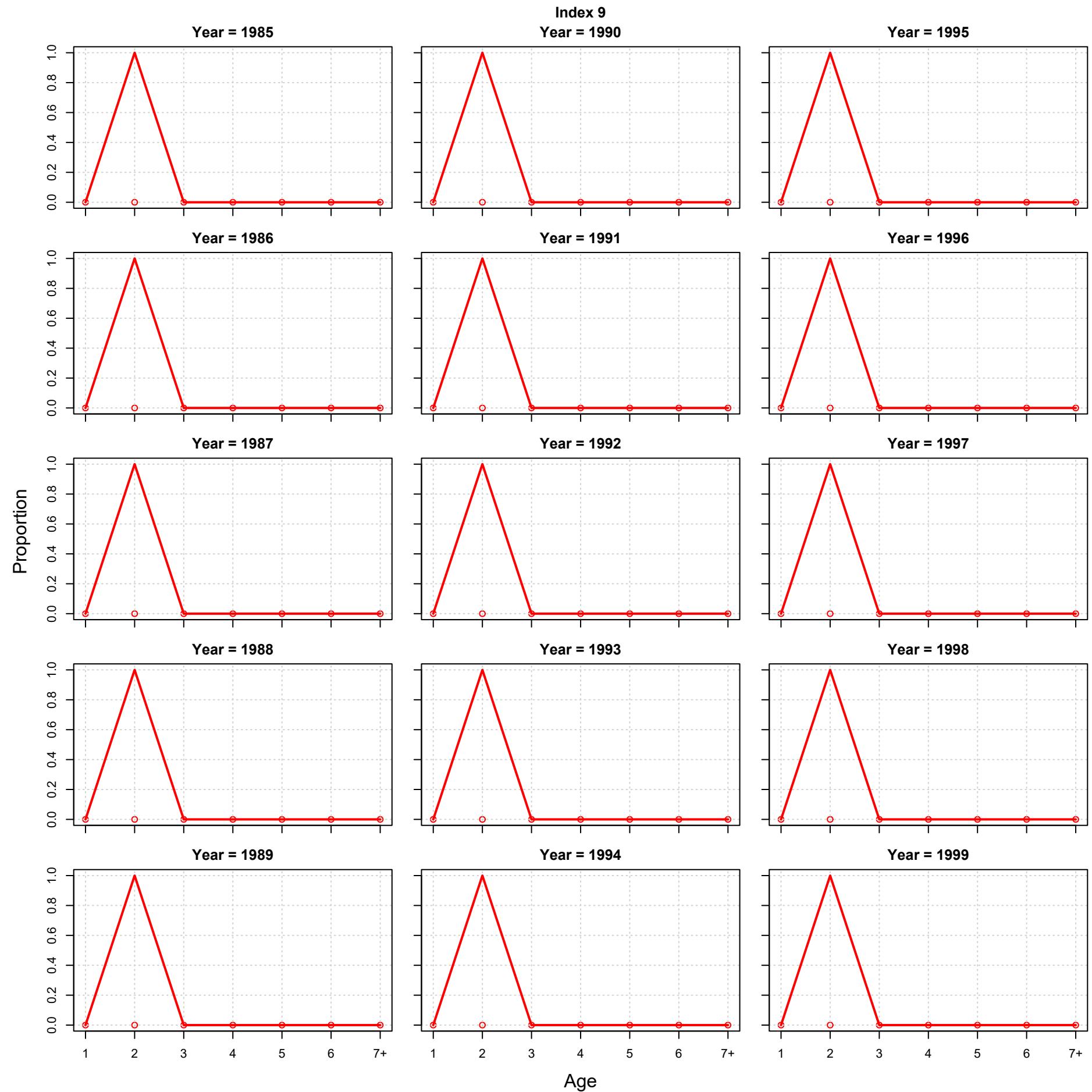


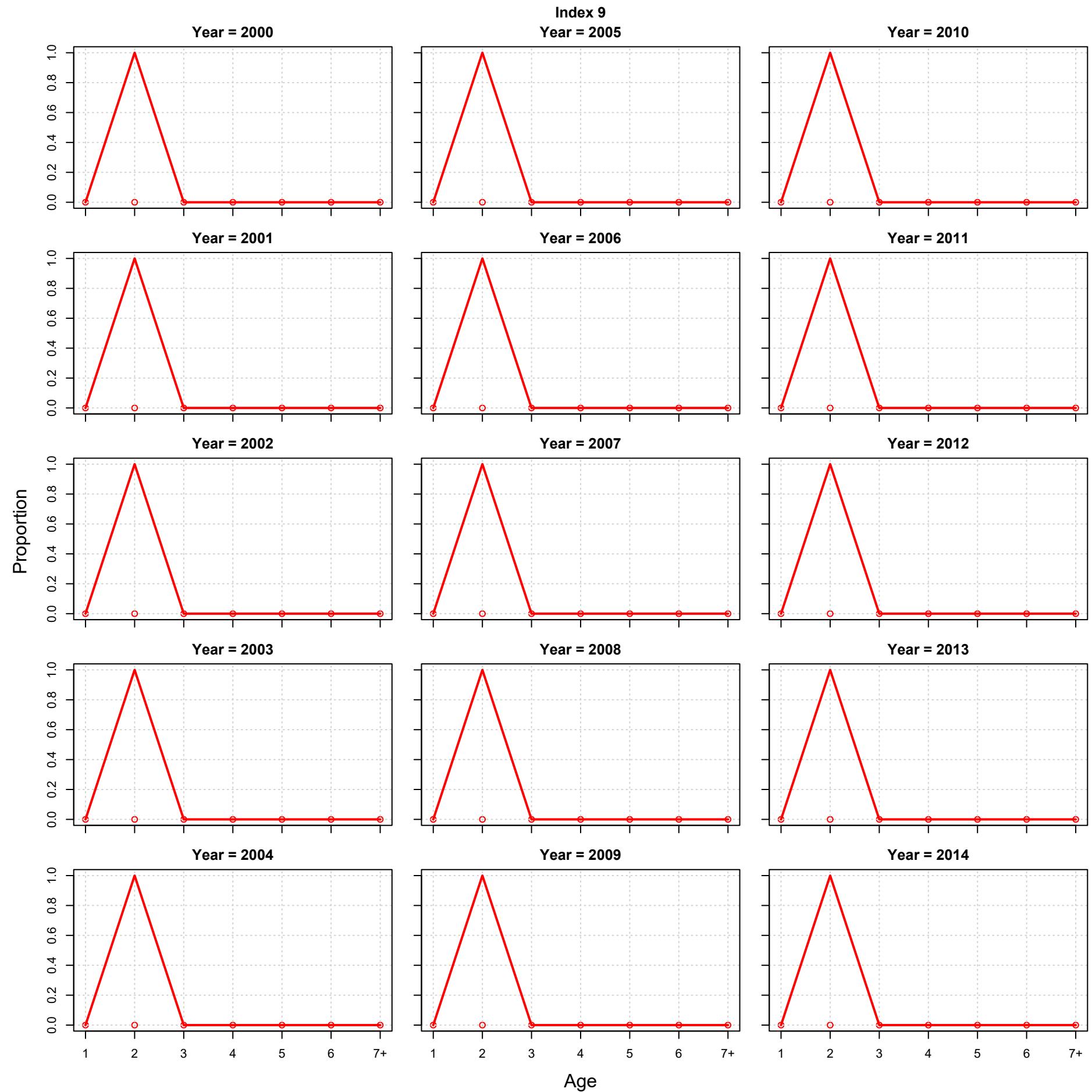
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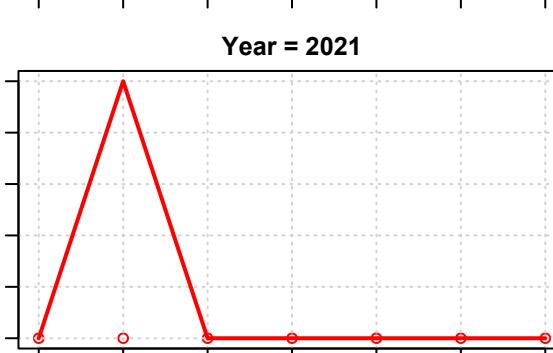




Index 9
Year = 2020

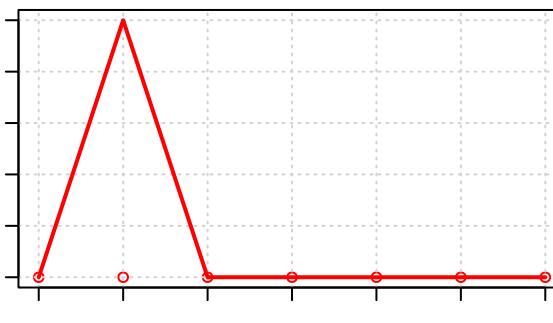


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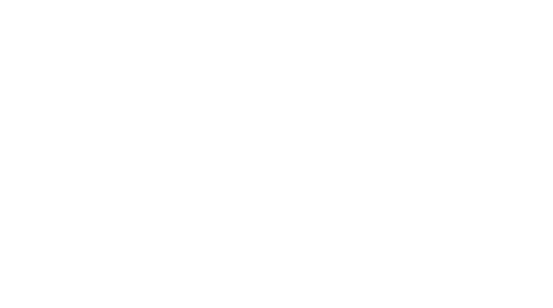


Year = 2021

Year = 2017



Year = 2018



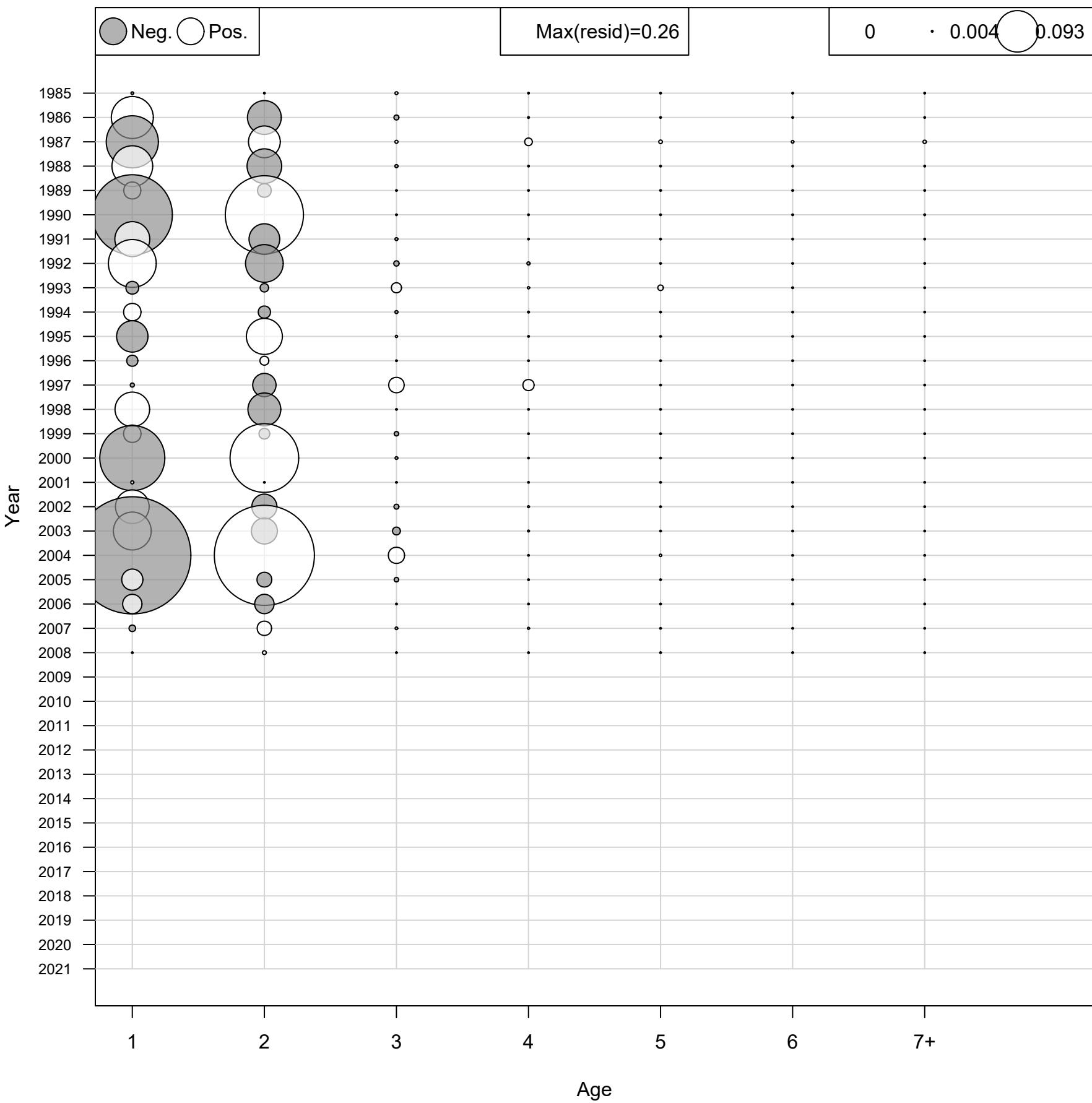
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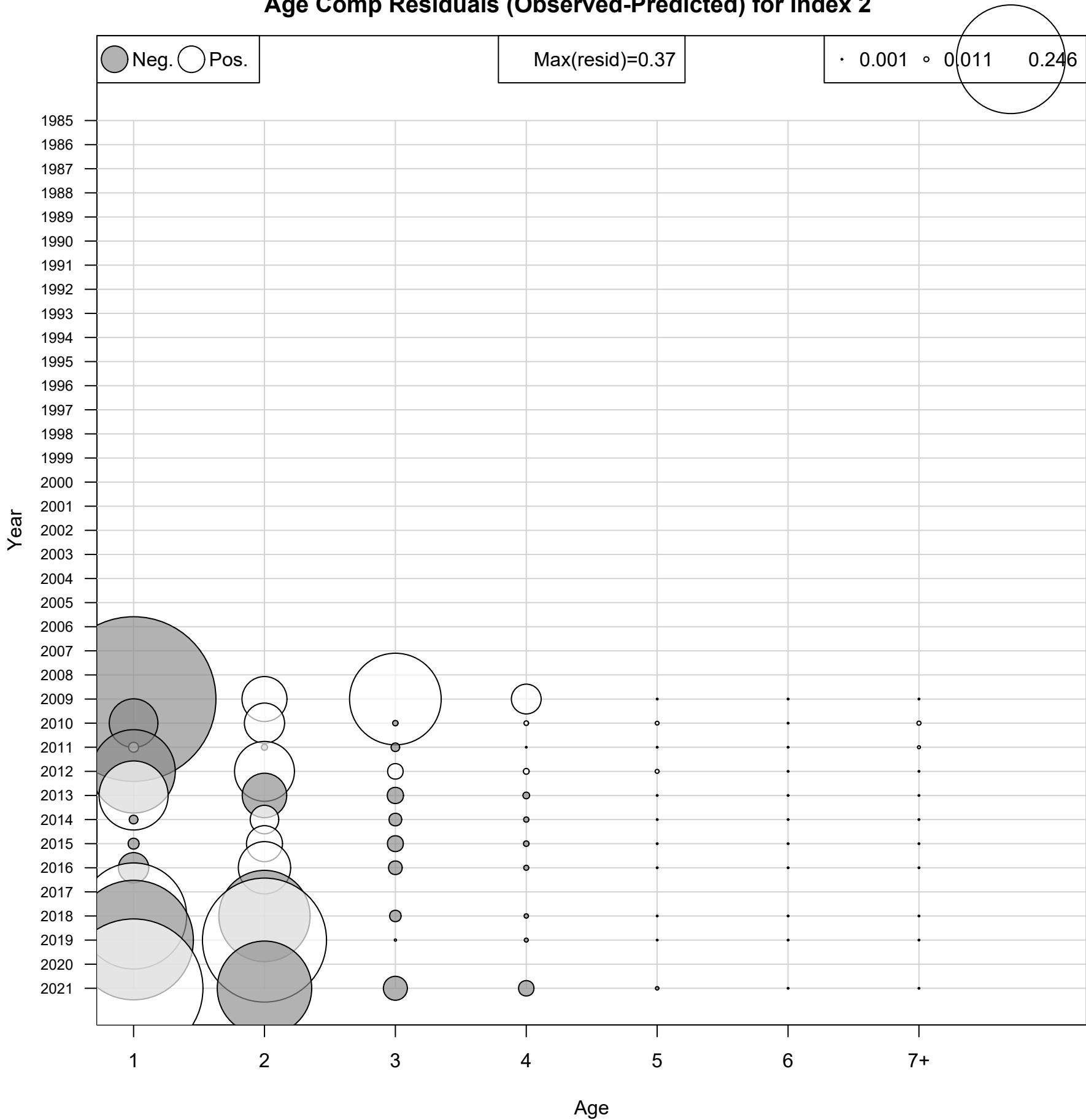
Age

Proportion

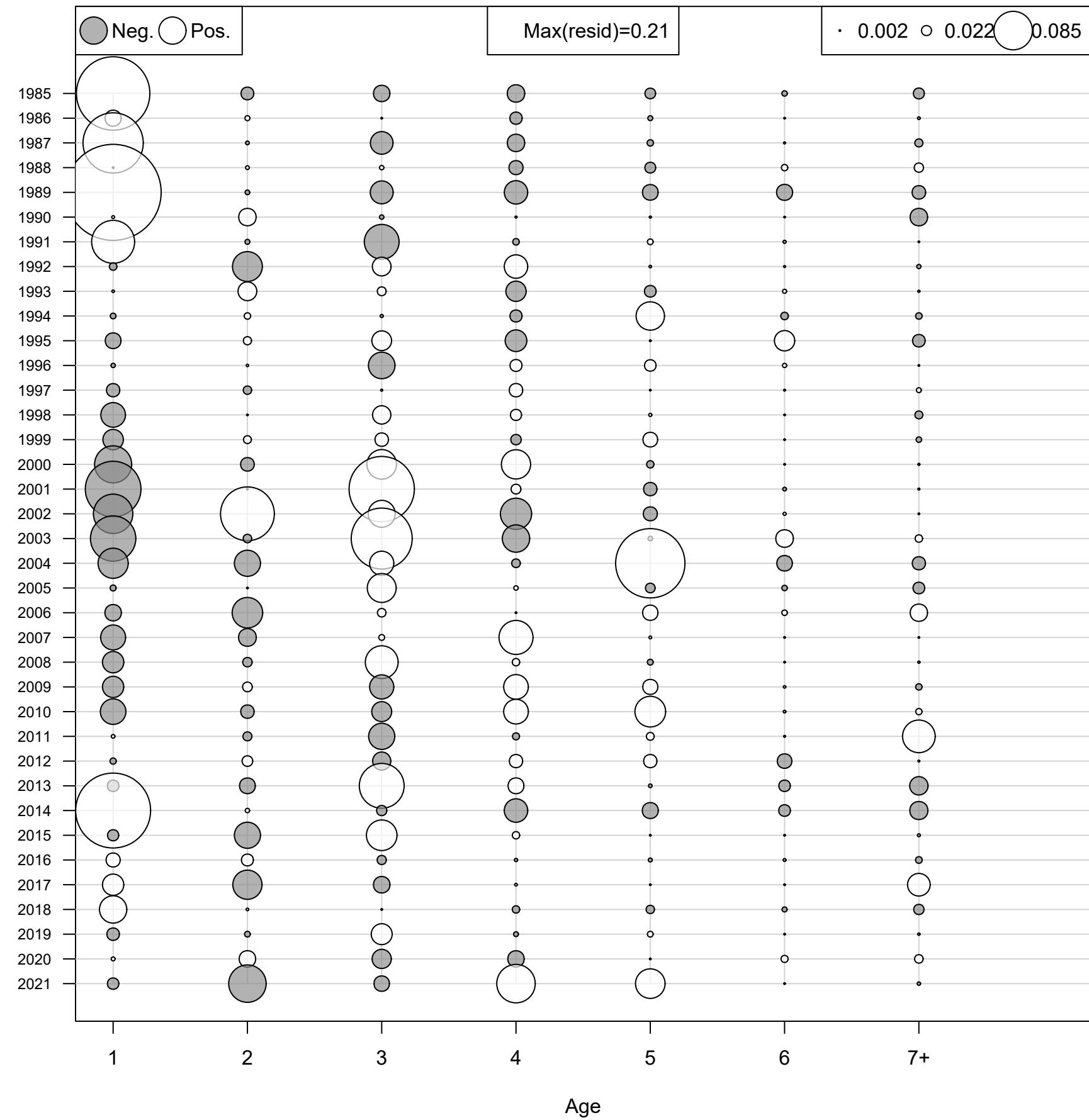
Age Comp Residuals (Observed-Predicted) for Index 1



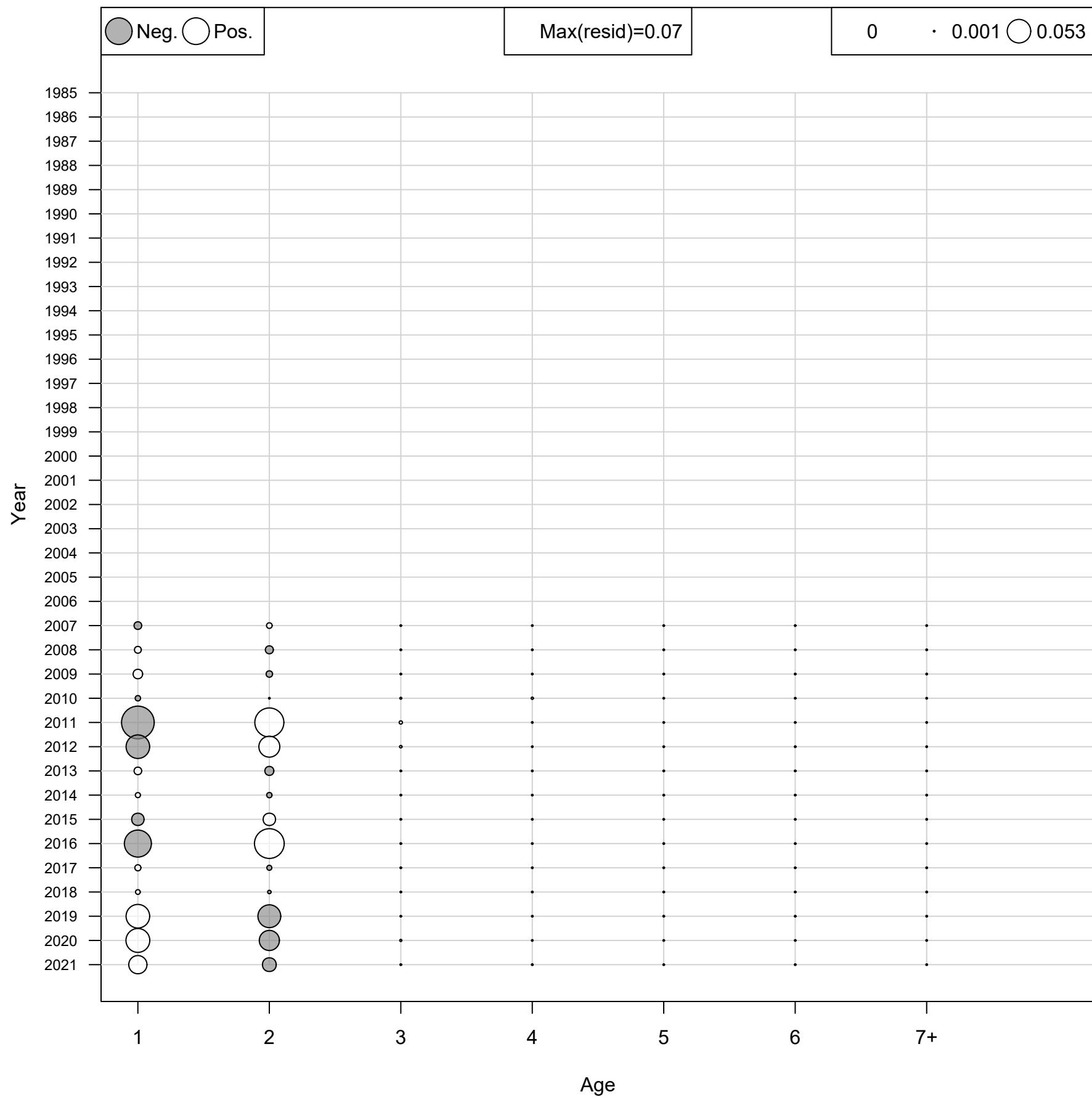
Age Comp Residuals (Observed-Predicted) for Index 2



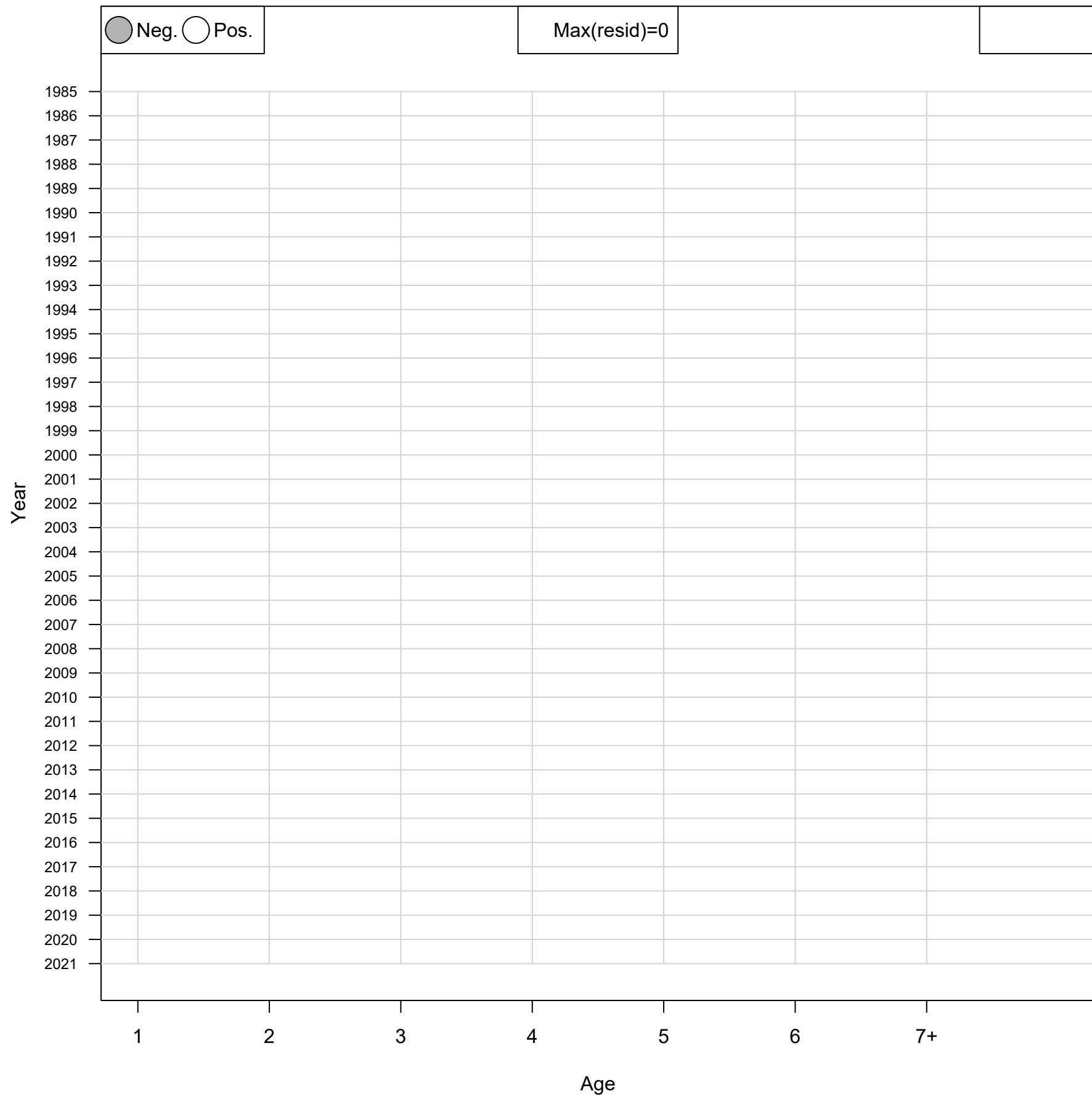
Age Comp Residuals (Observed-Predicted) for Index 3



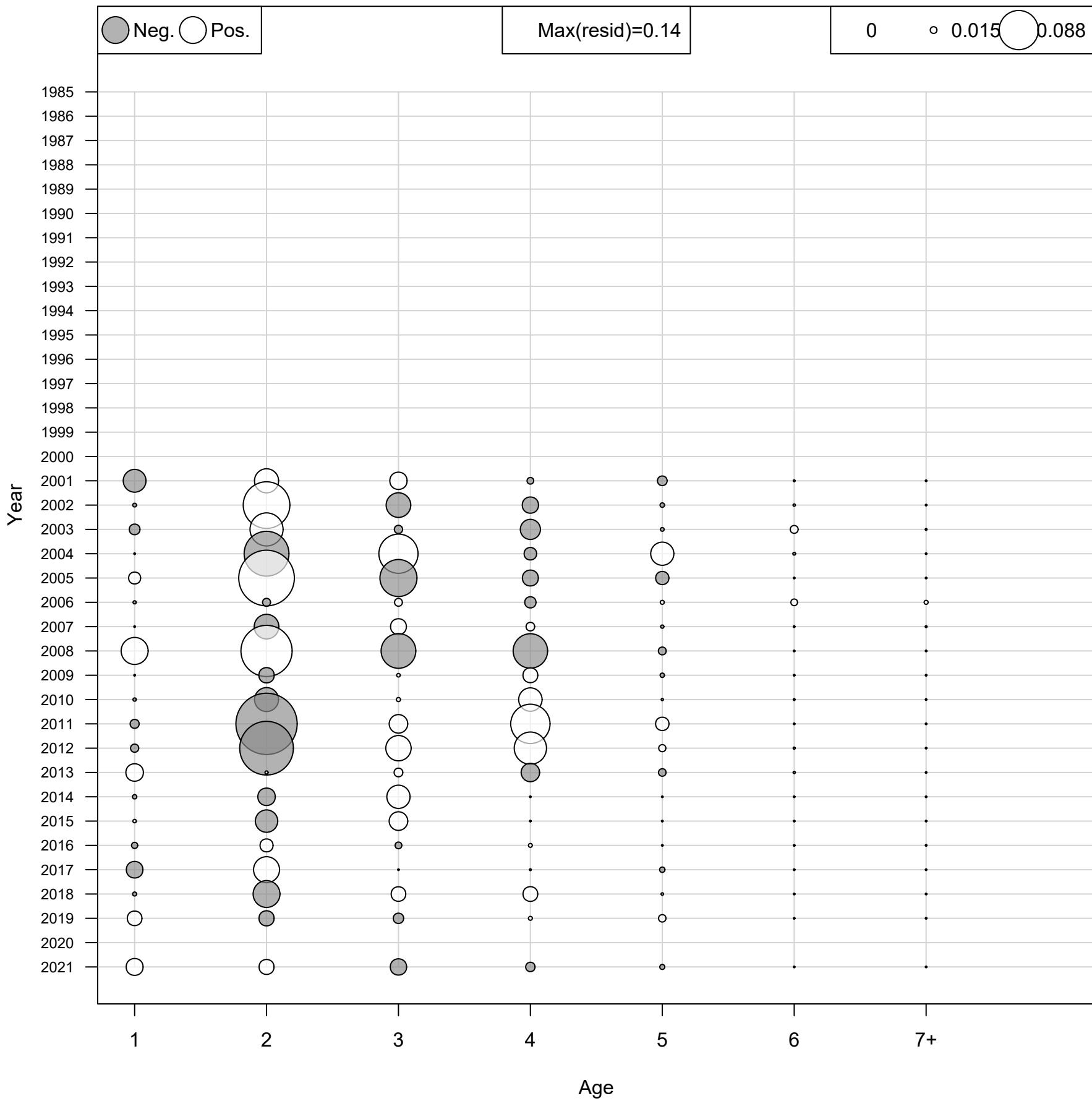
Age Comp Residuals (Observed-Predicted) for Index 4



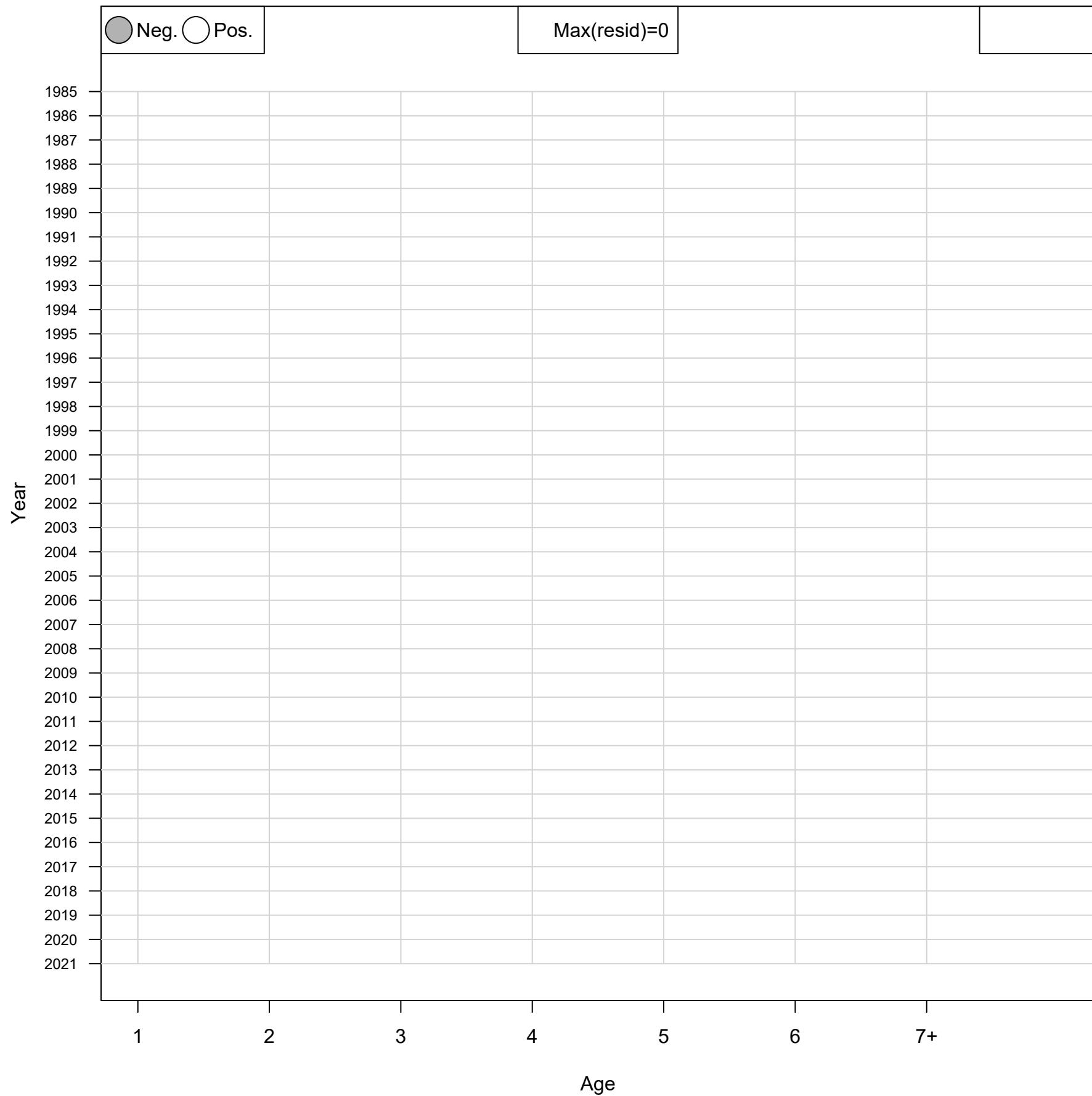
Age Comp Residuals (Observed-Predicted) for Index 5



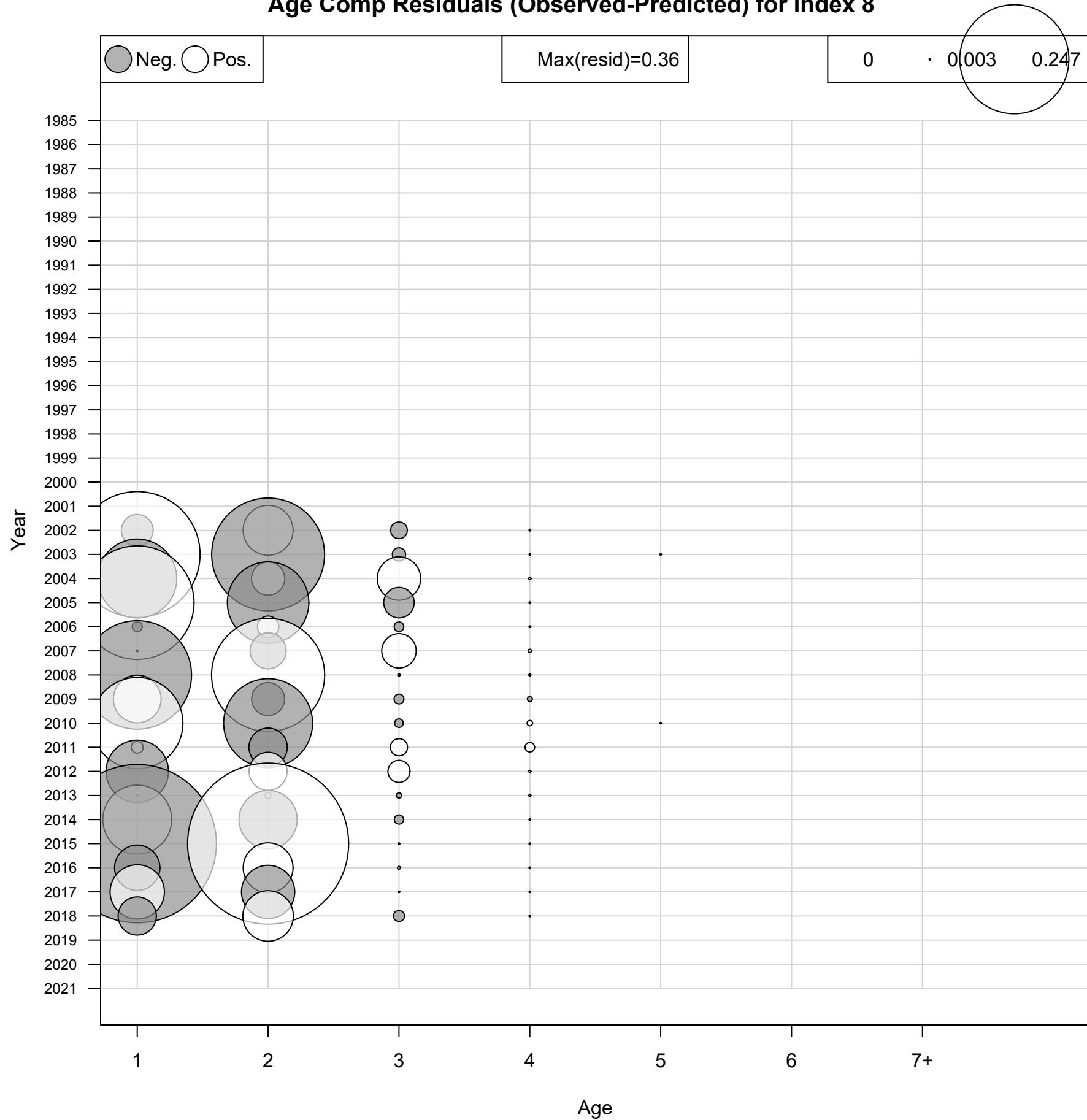
Age Comp Residuals (Observed-Predicted) for Index 6



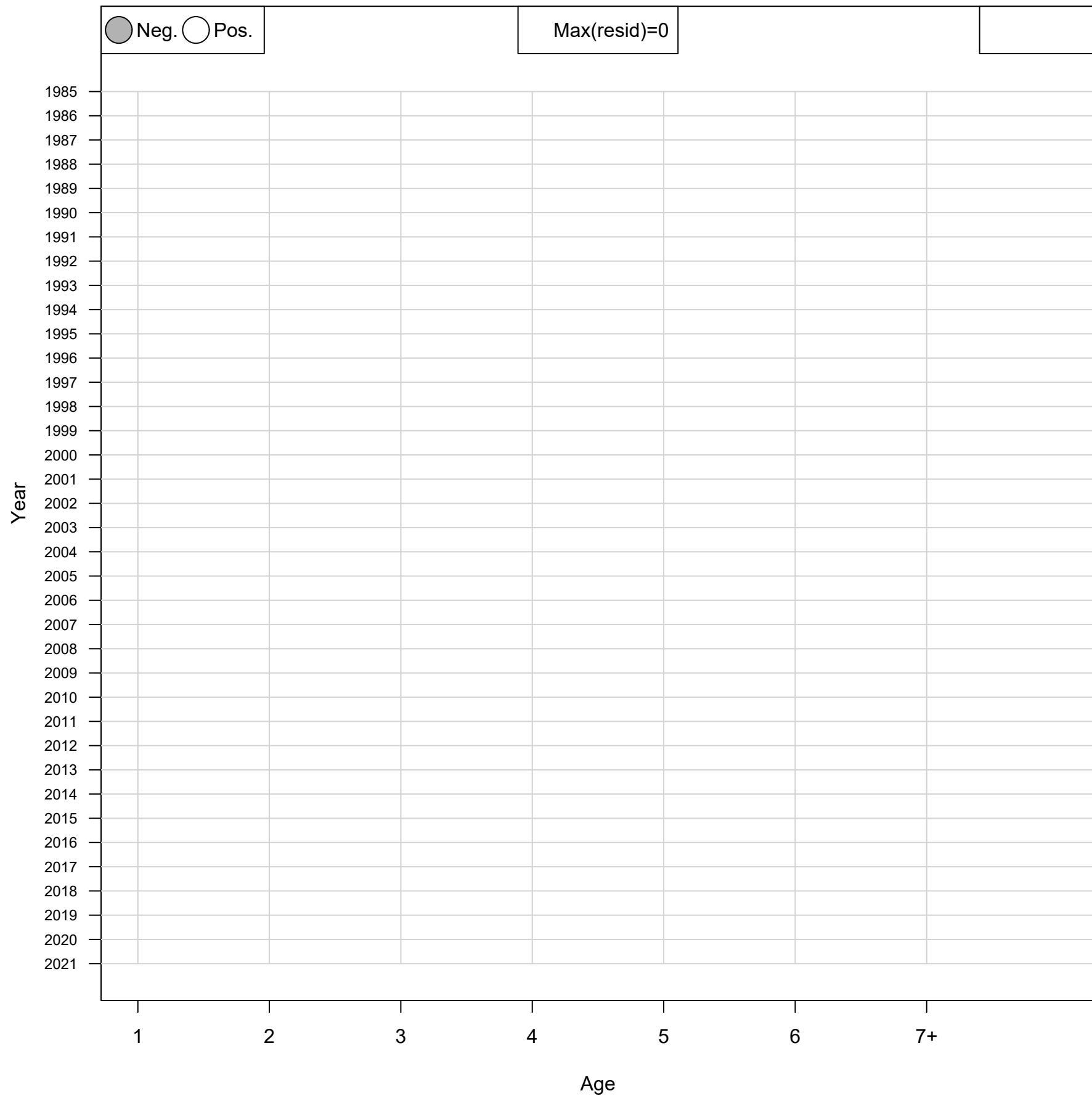
Age Comp Residuals (Observed-Predicted) for Index 7



Age Comp Residuals (Observed-Predicted) for Index 8

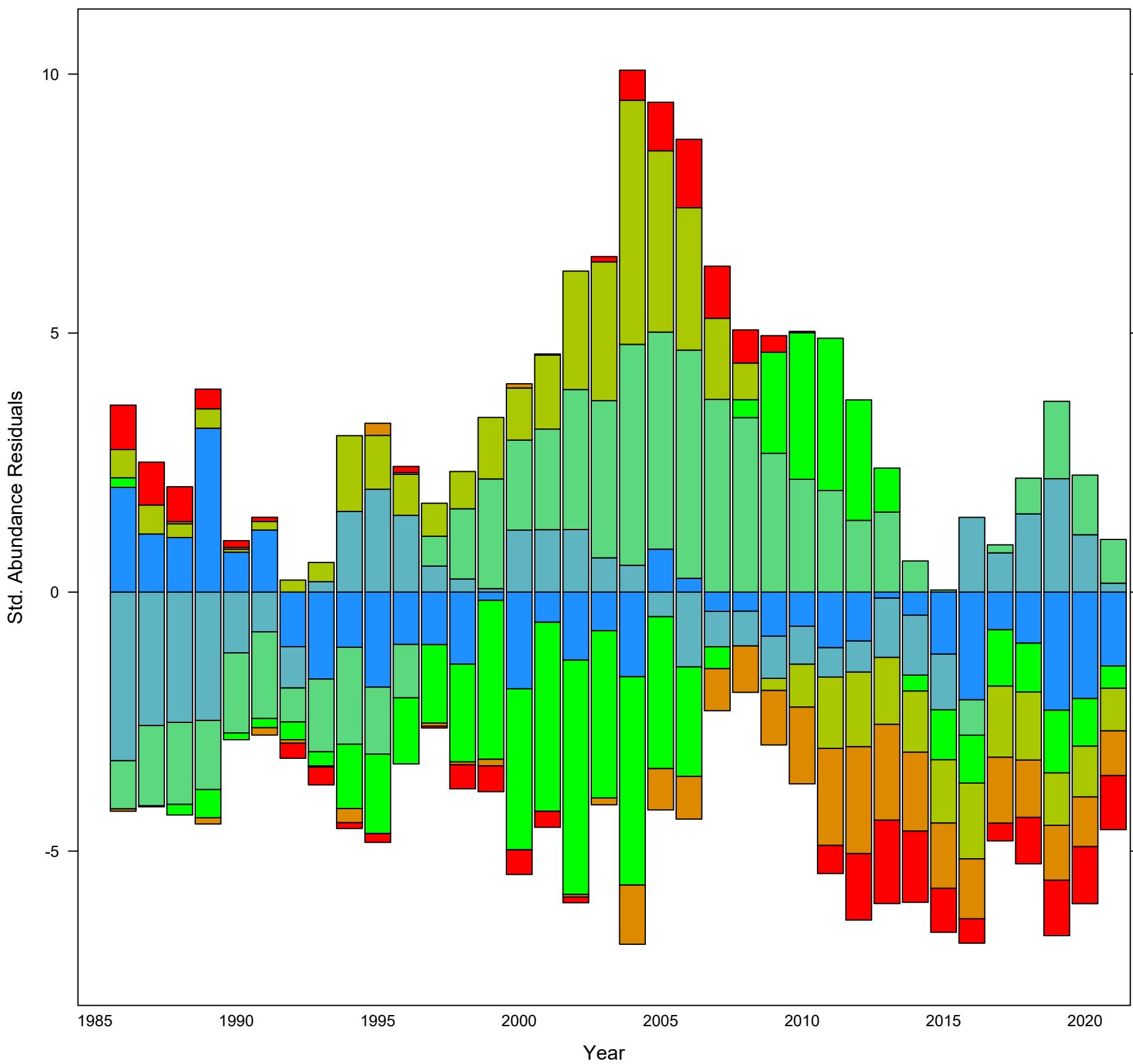


Age Comp Residuals (Observed-Predicted) for Index 9

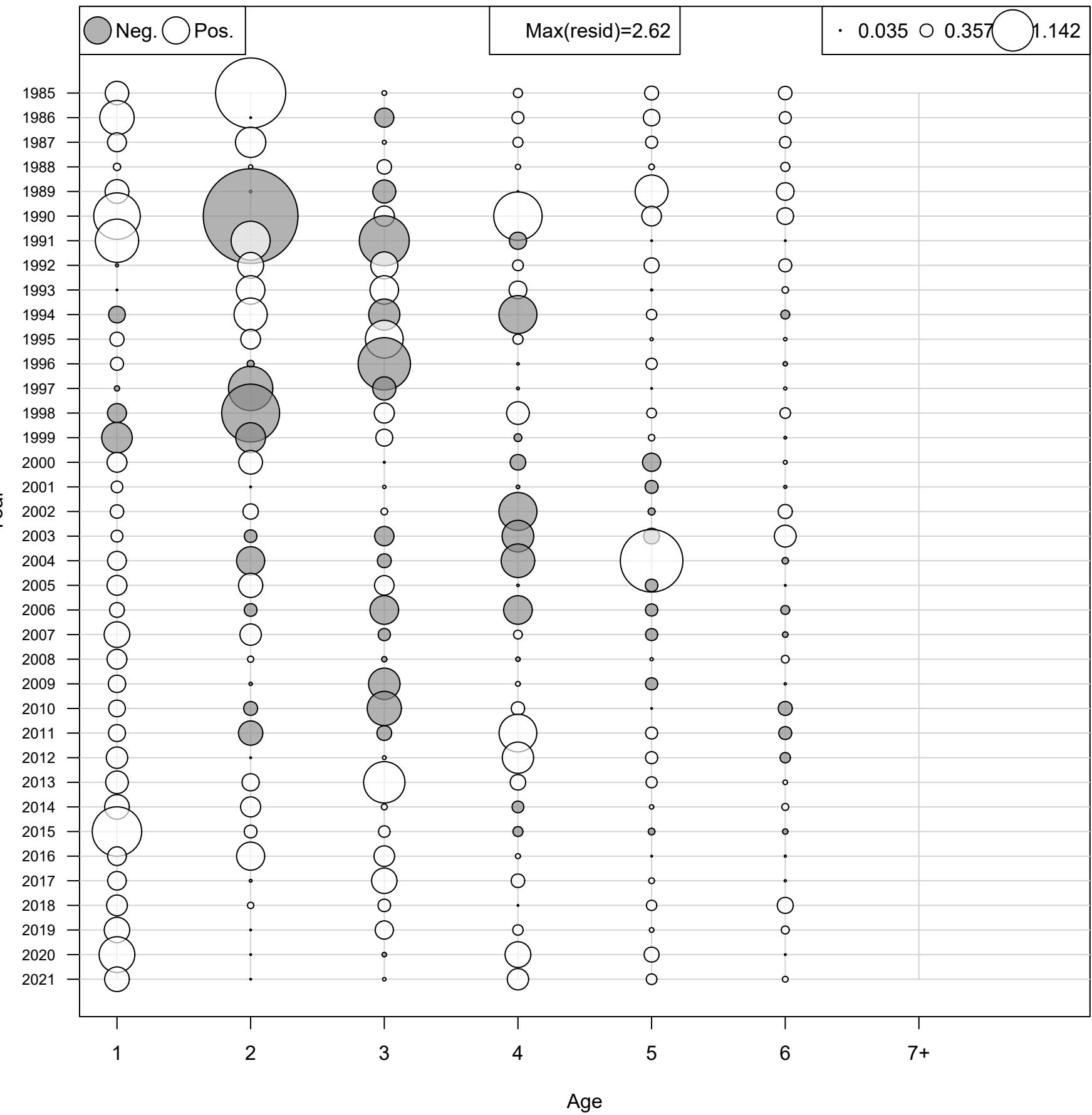


Age

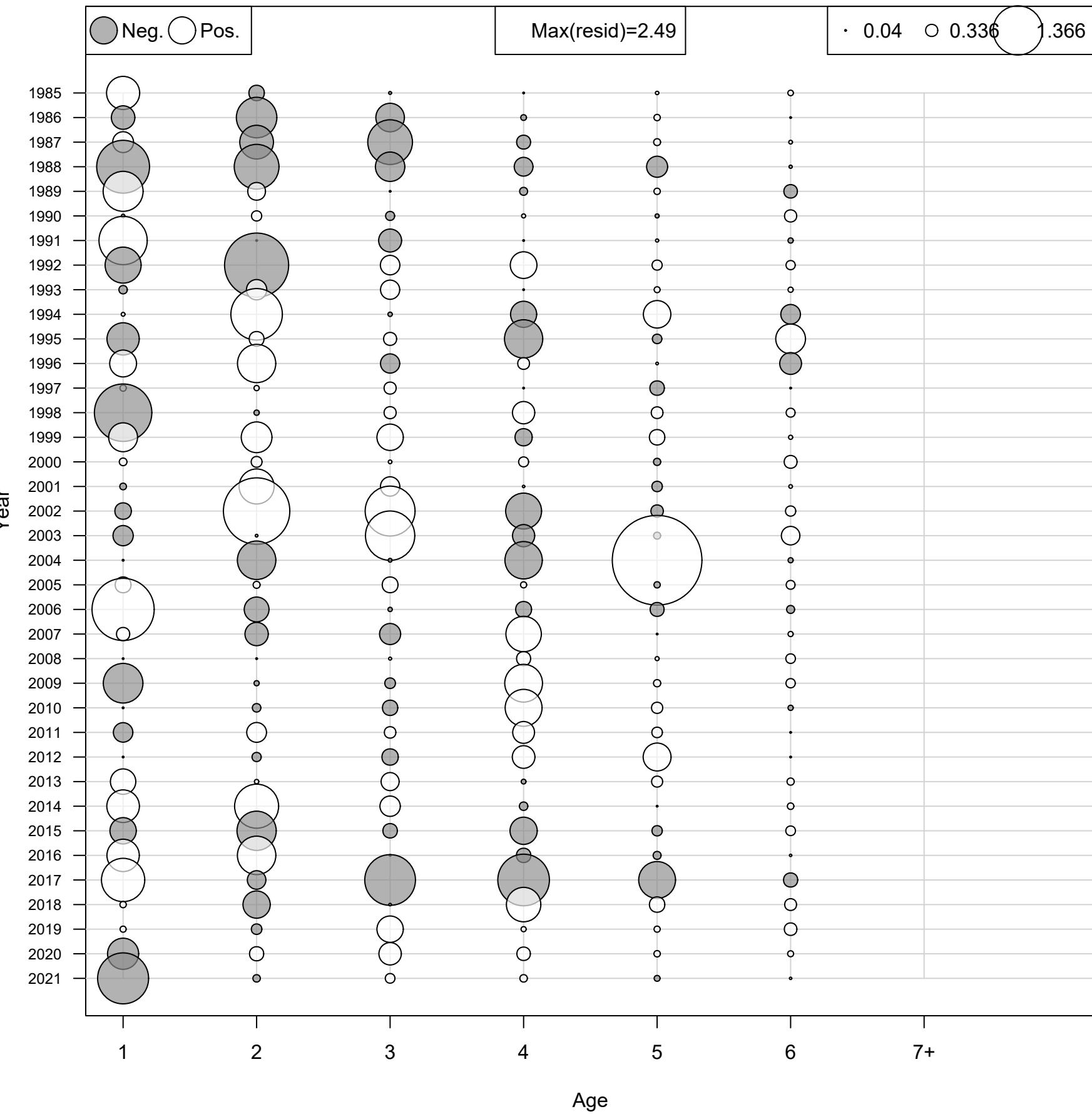
- 1
- 2
- 3
- 4
- 5
- 6
- 7+



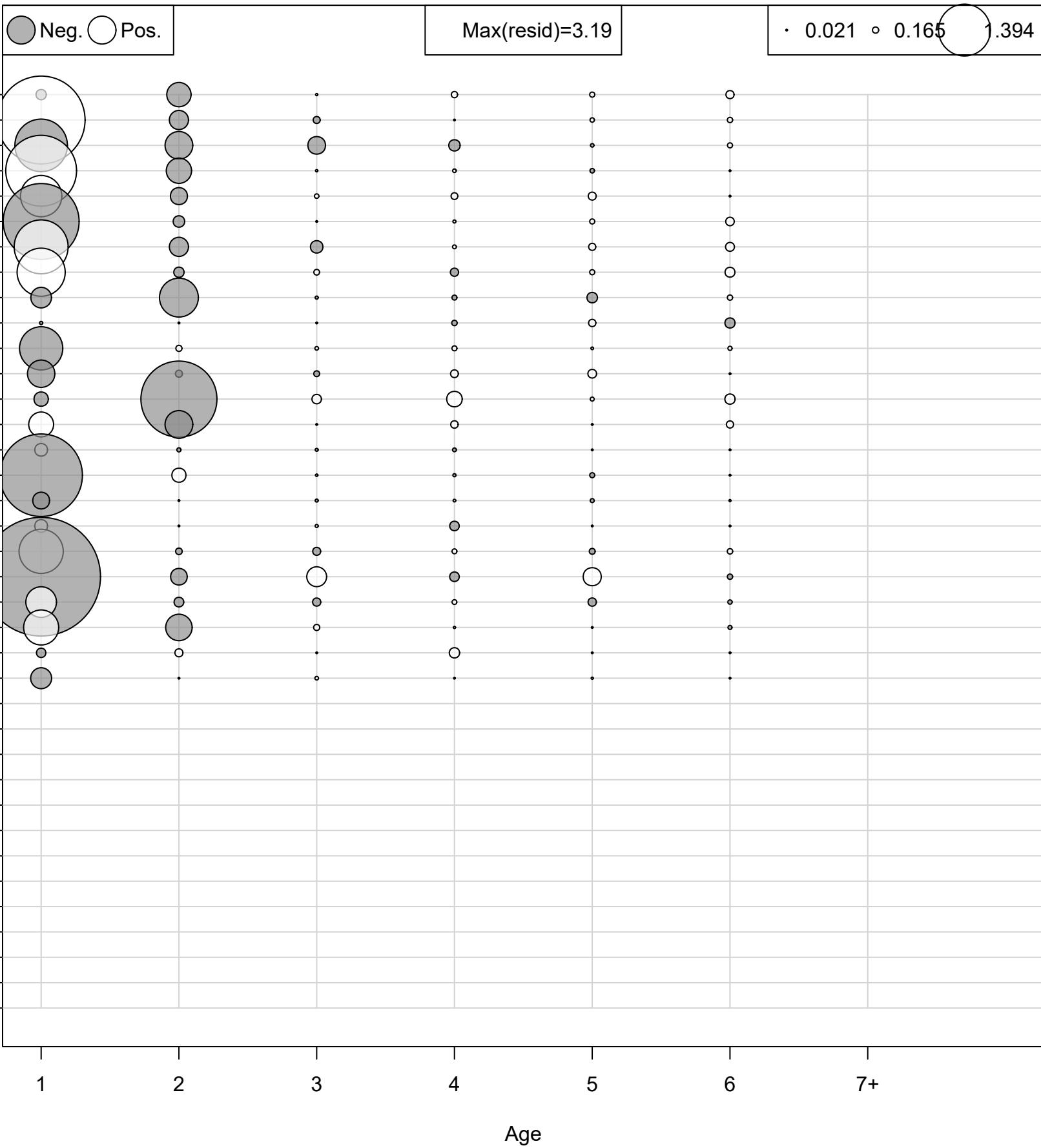
Age Comp OSA Quantile Residuals for Fleet 1



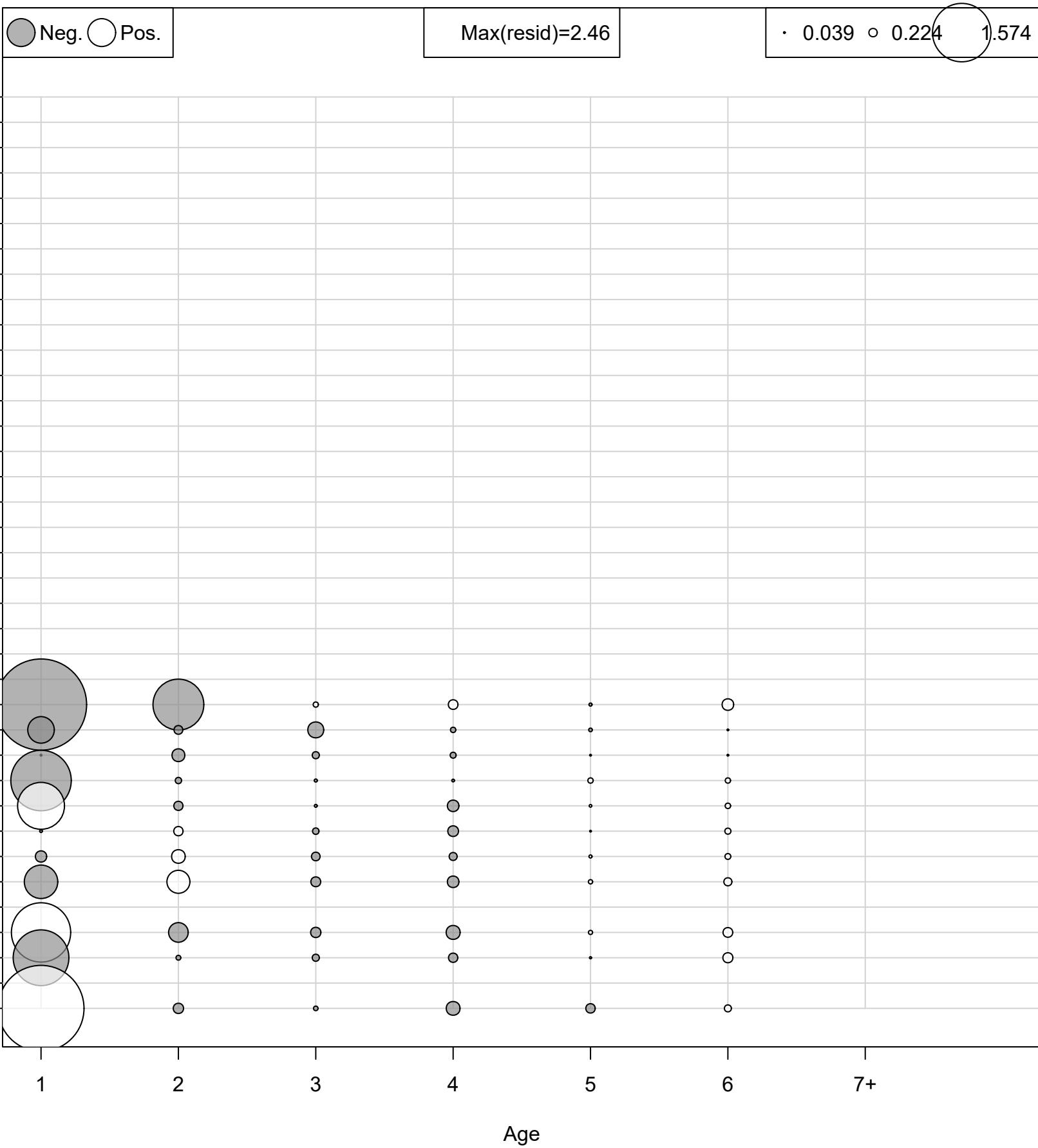
Age Comp OSA Quantile Residuals for Fleet 2



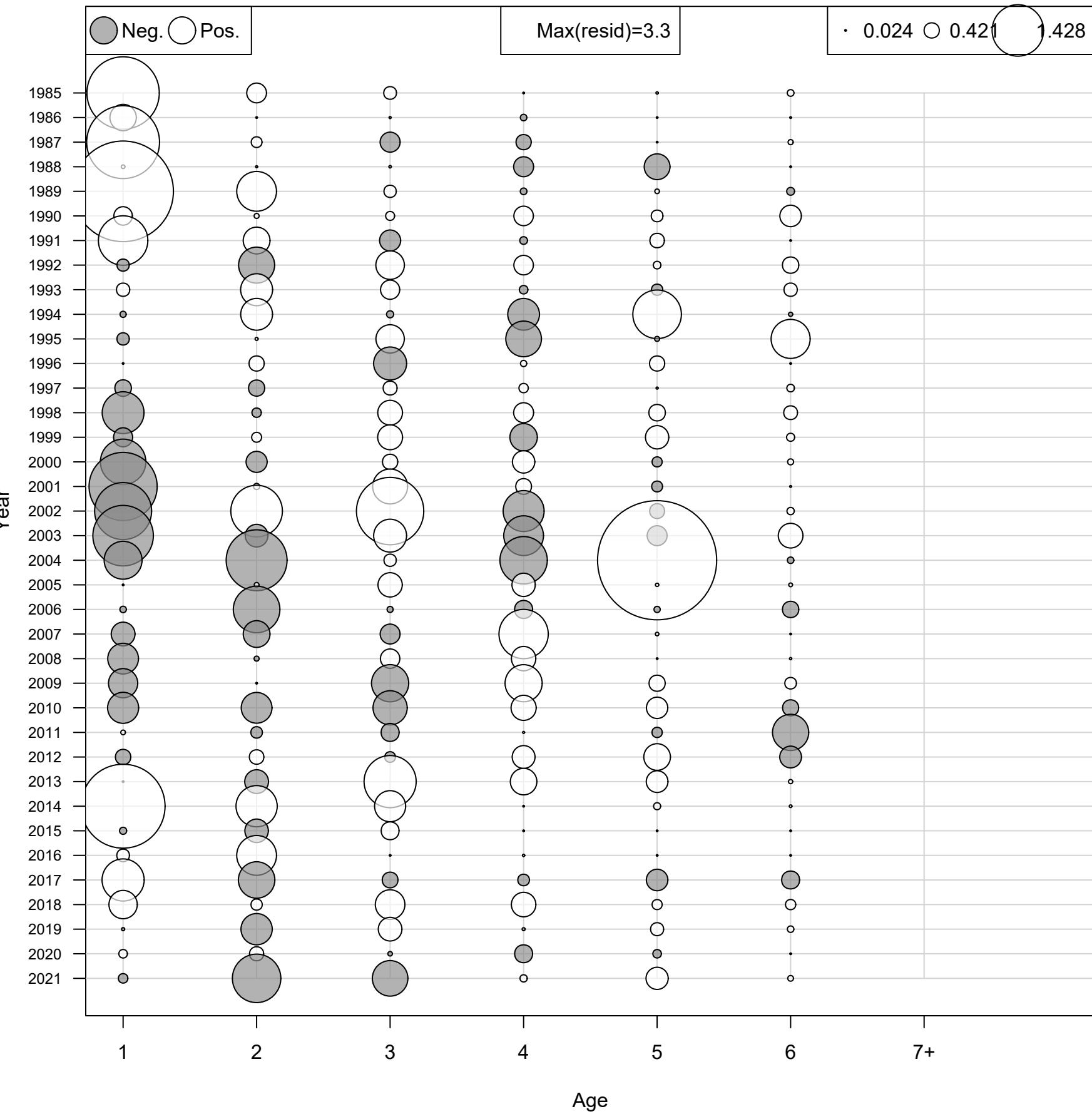
Age Comp OSA Quantile Residuals for Index 1



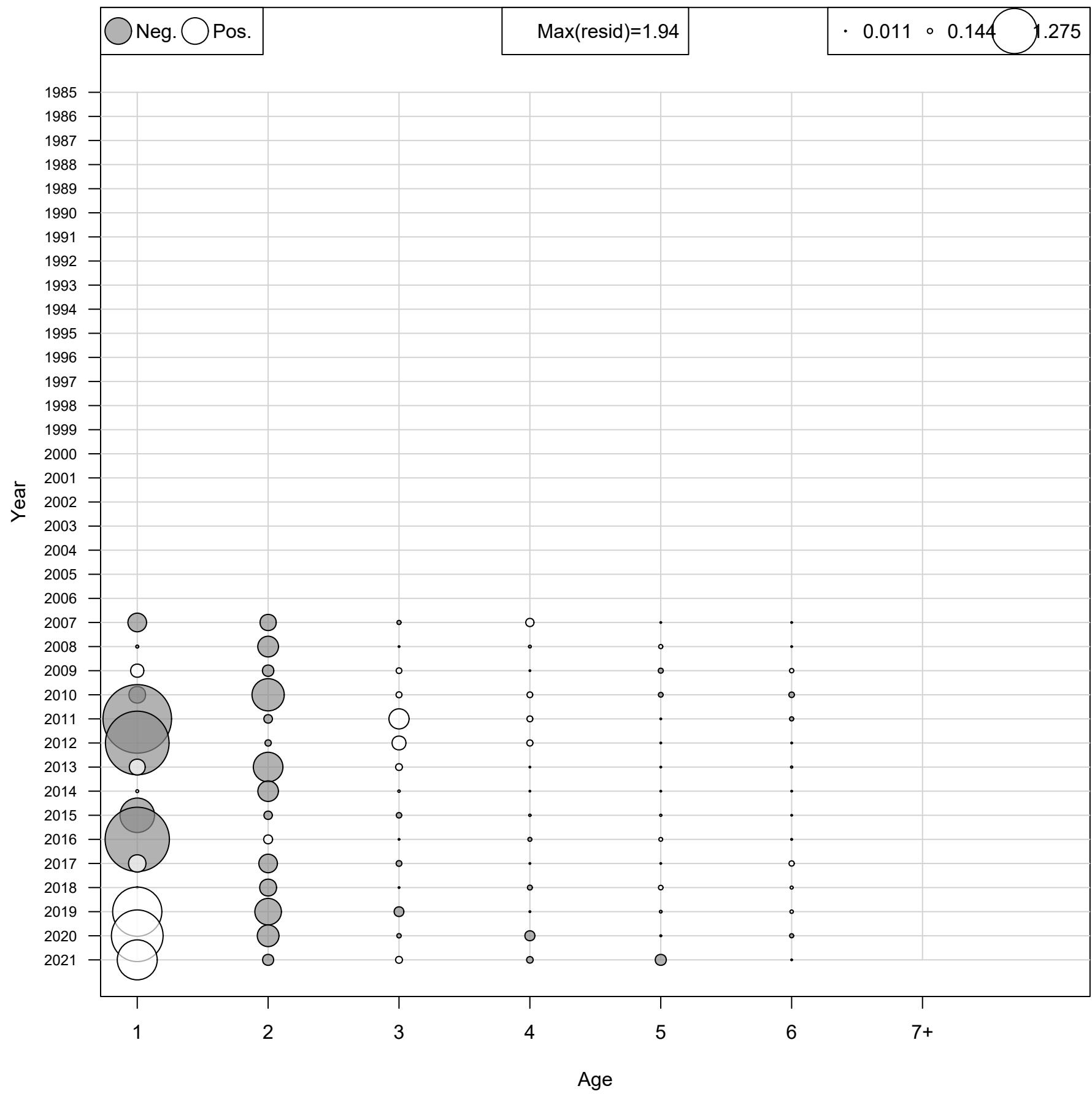
Age Comp OSA Quantile Residuals for Index 2



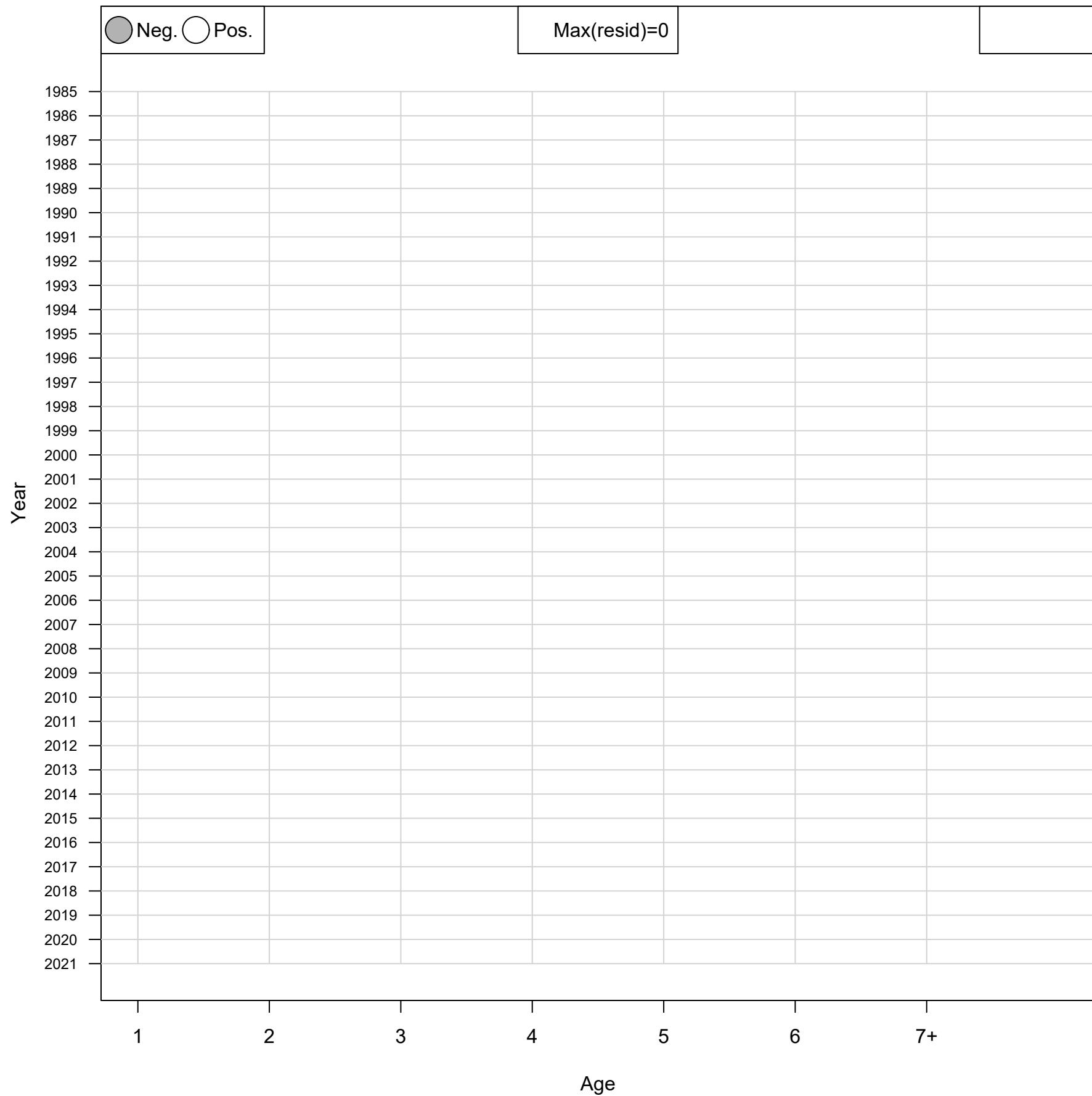
Age Comp OSA Quantile Residuals for Index 3



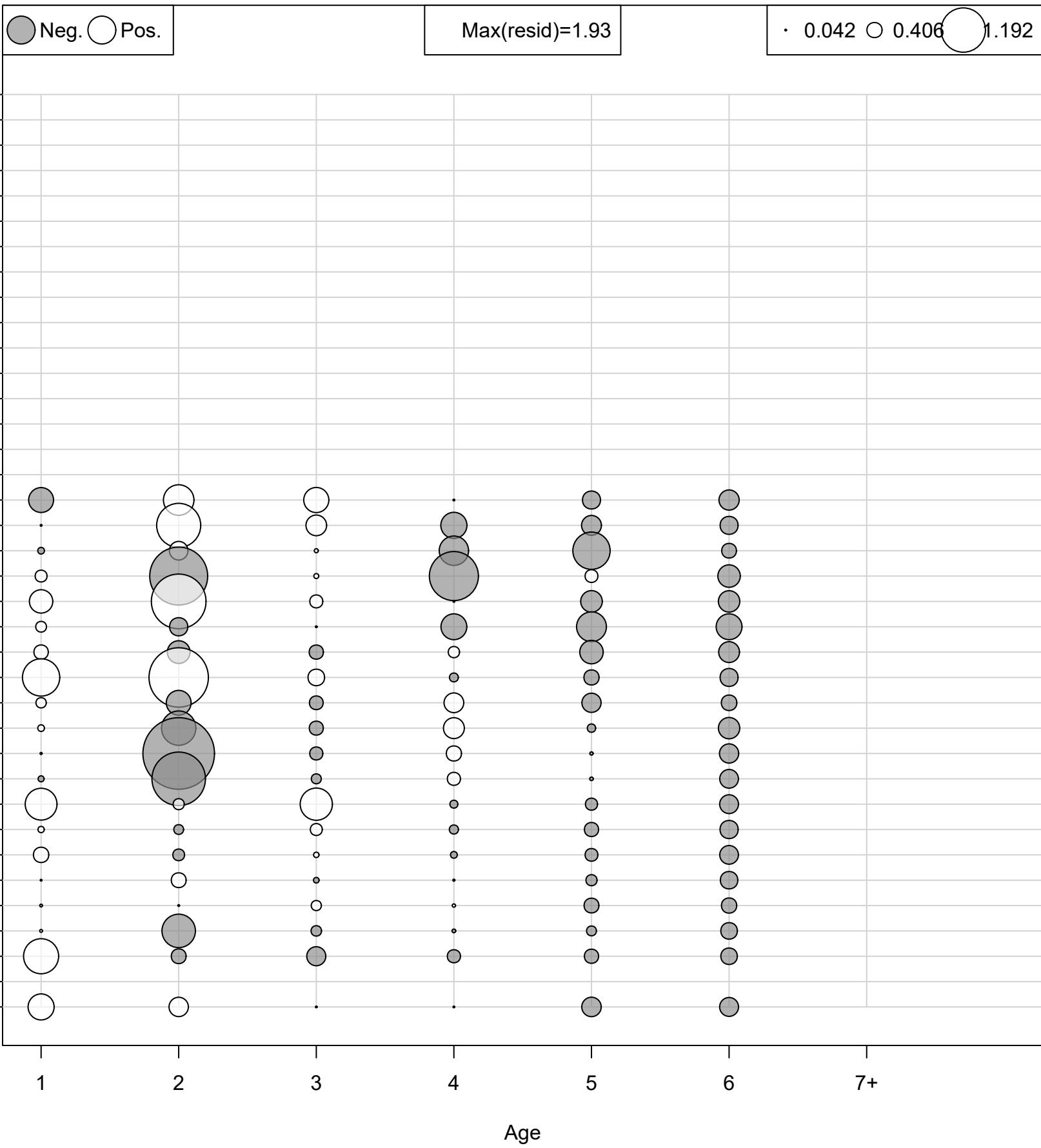
Age Comp OSA Quantile Residuals for Index 4



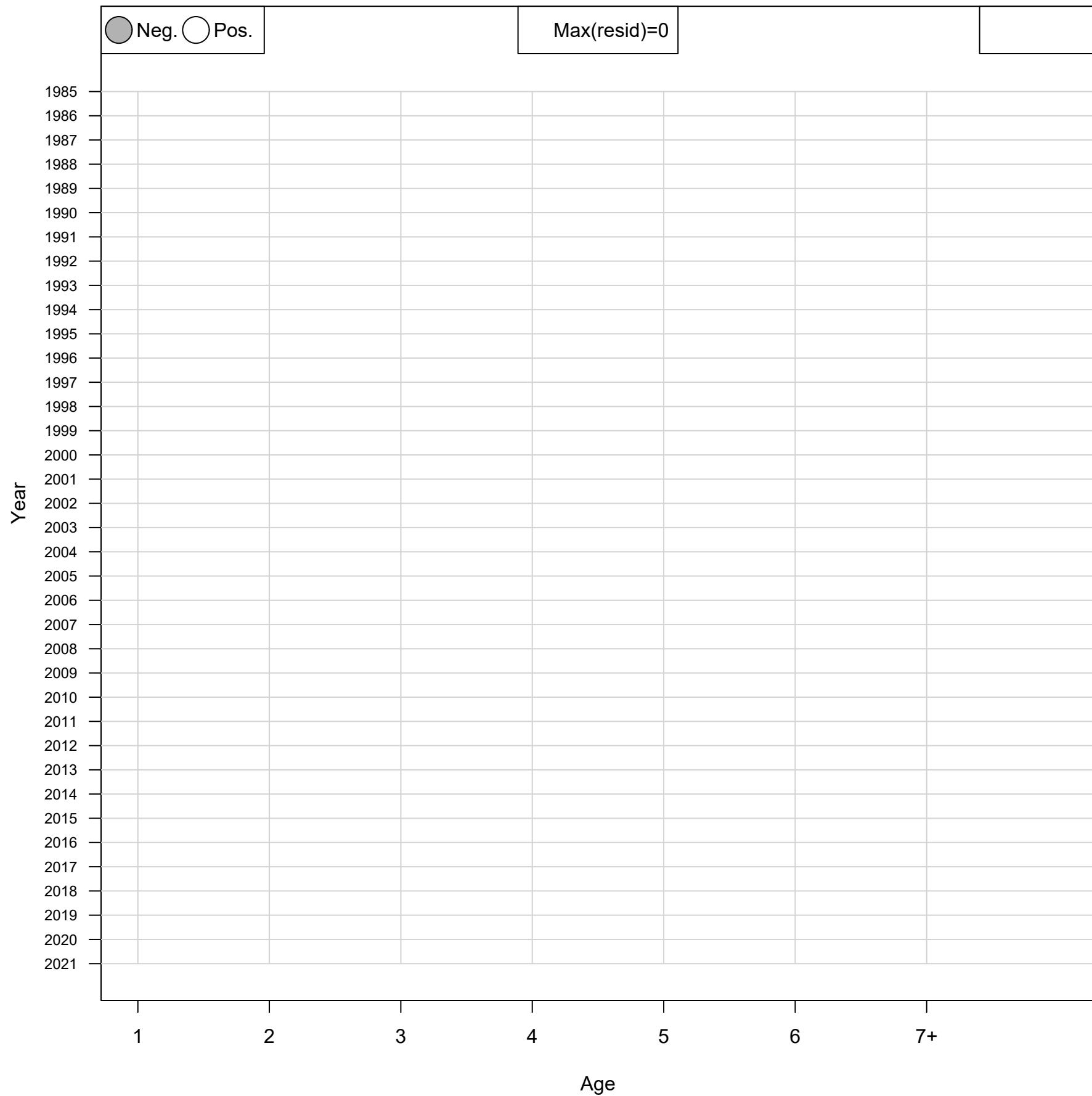
Age Comp OSA Quantile Residuals for Index 5



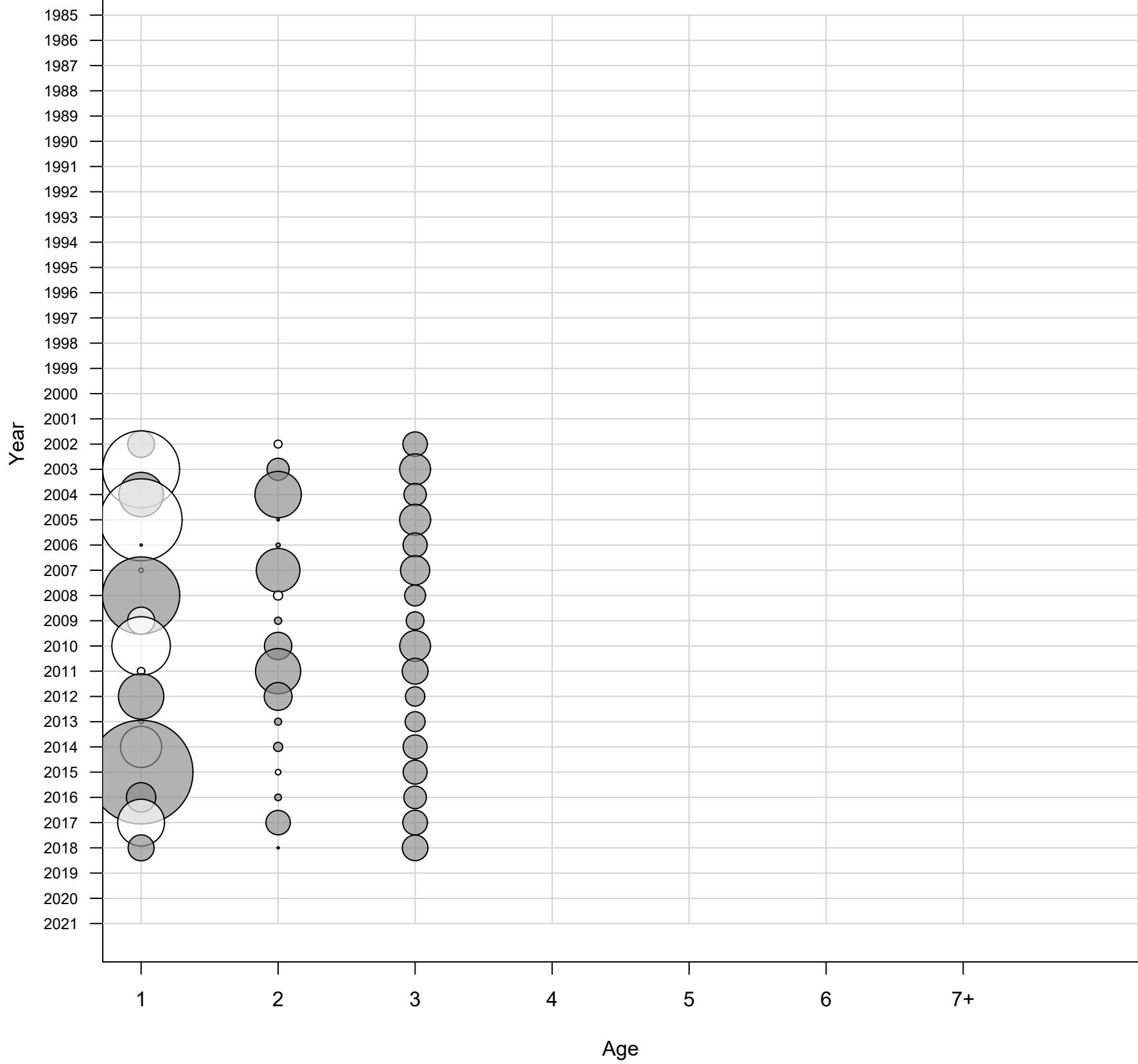
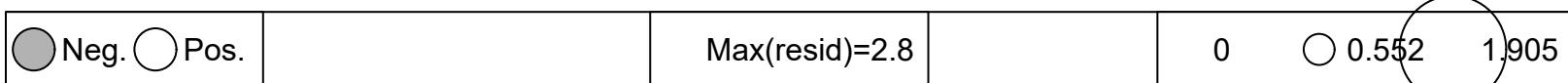
Age Comp OSA Quantile Residuals for Index 6



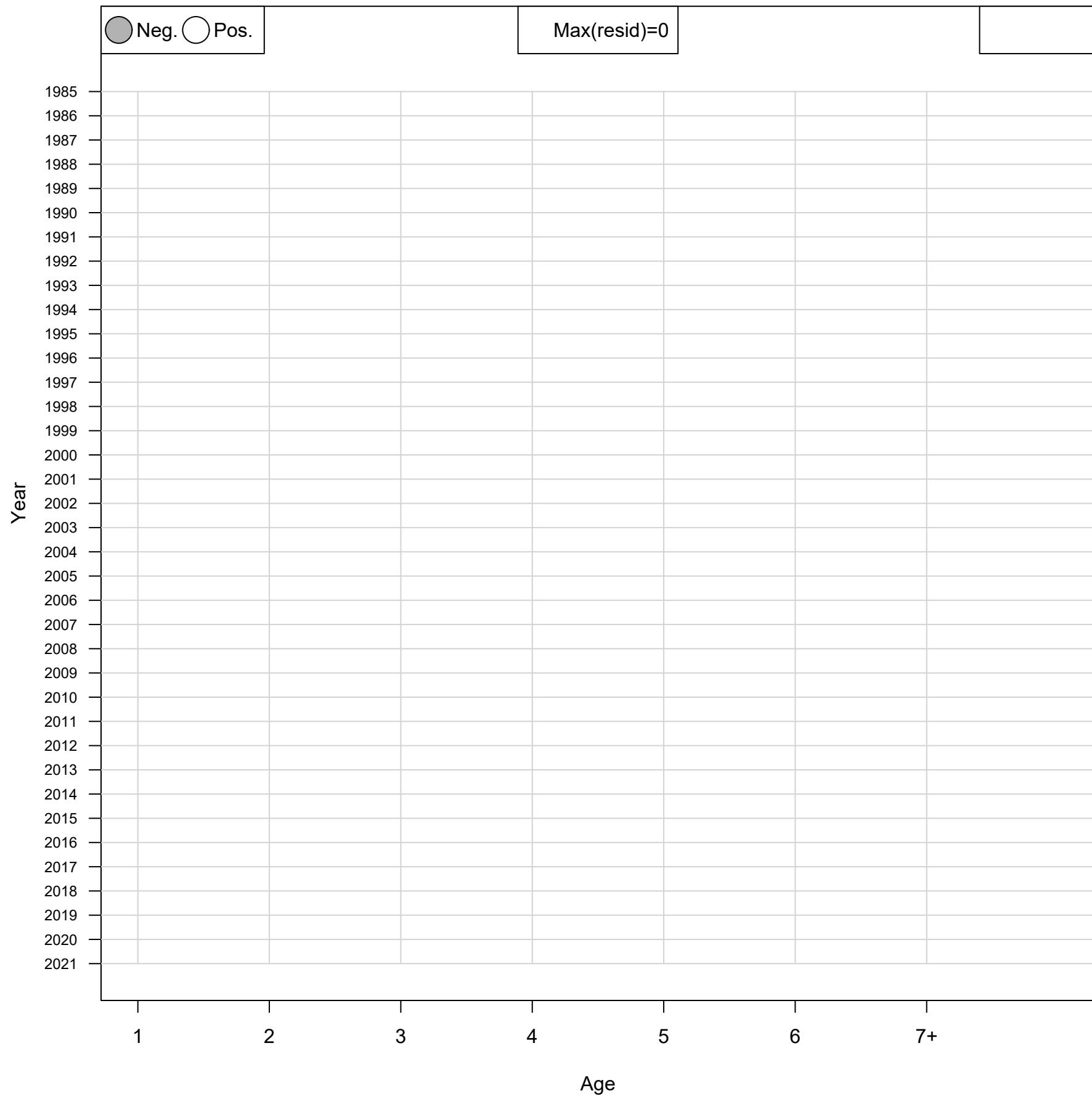
Age Comp OSA Quantile Residuals for Index 7



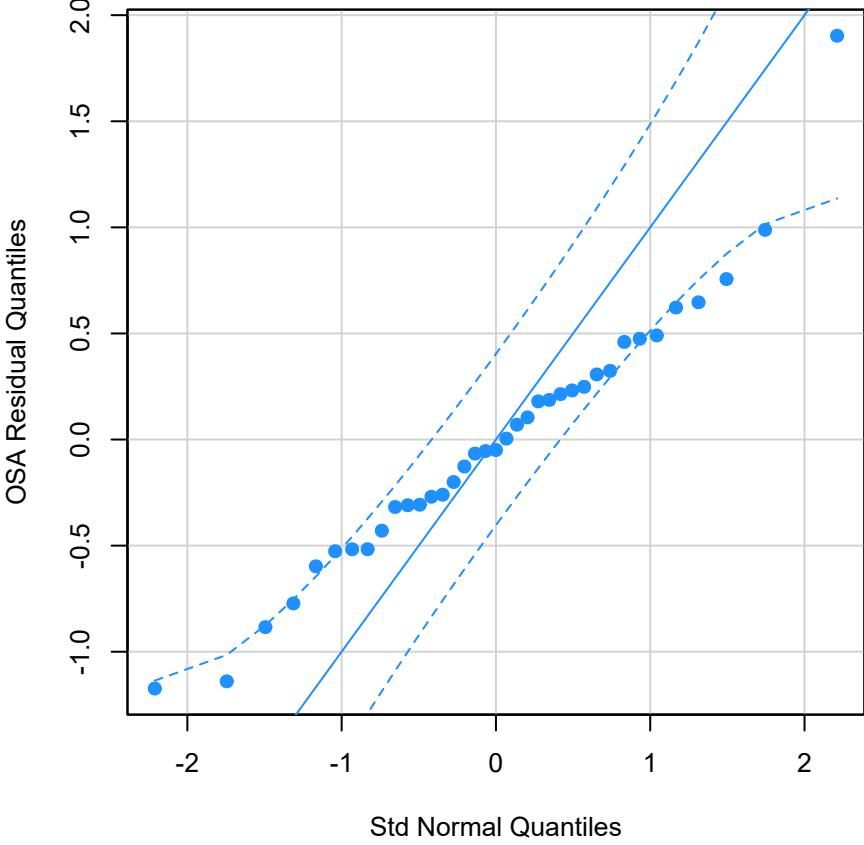
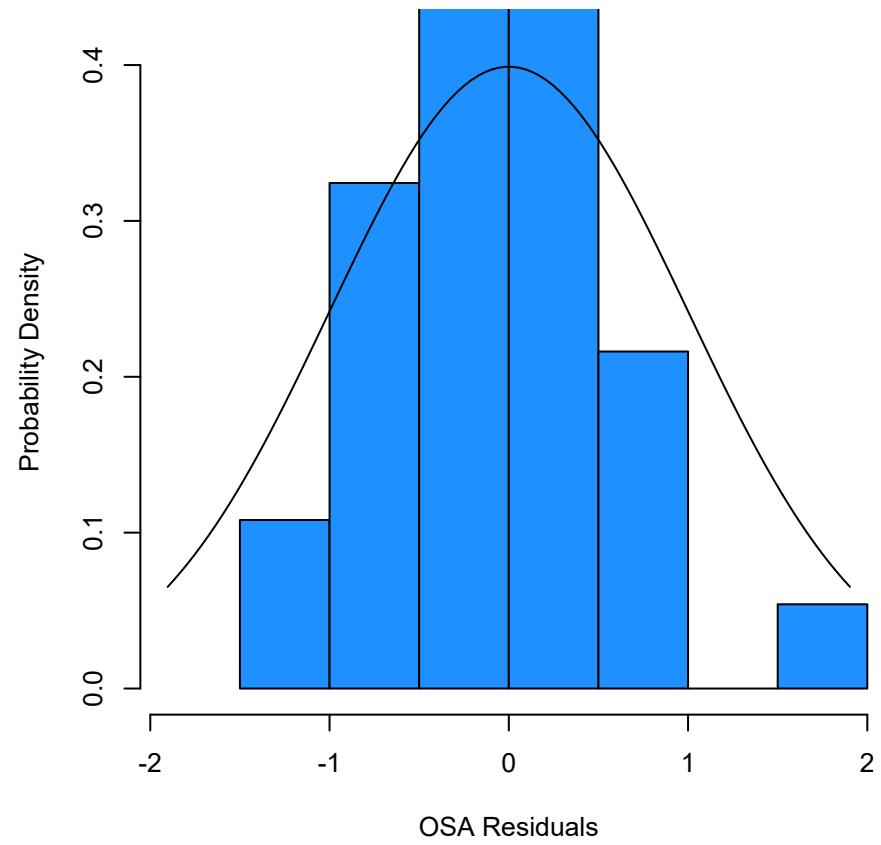
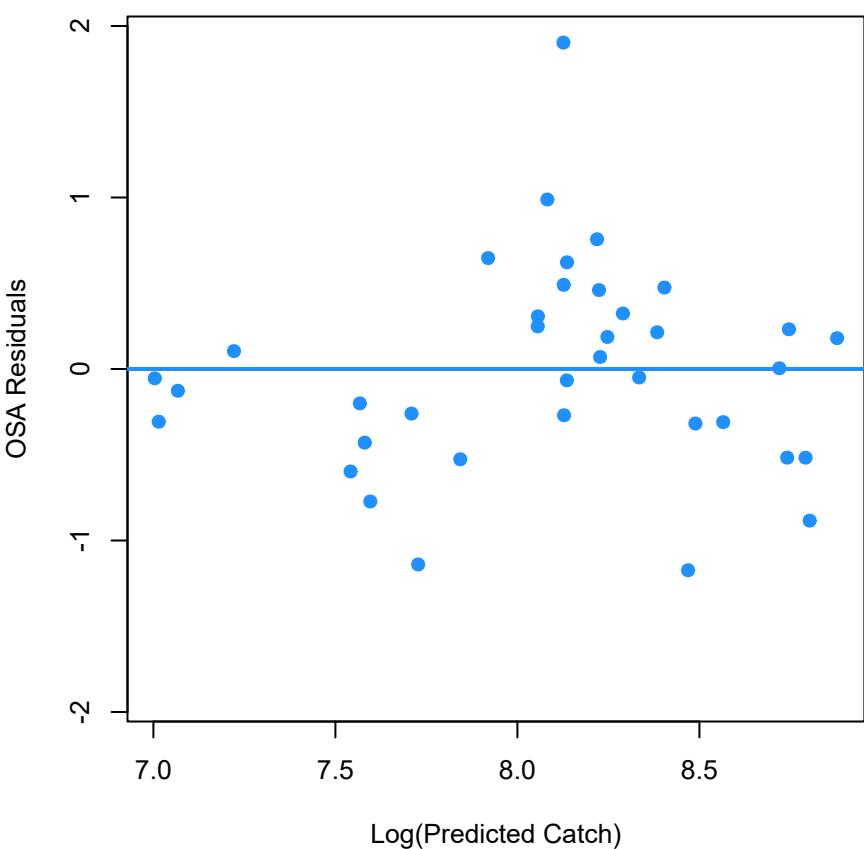
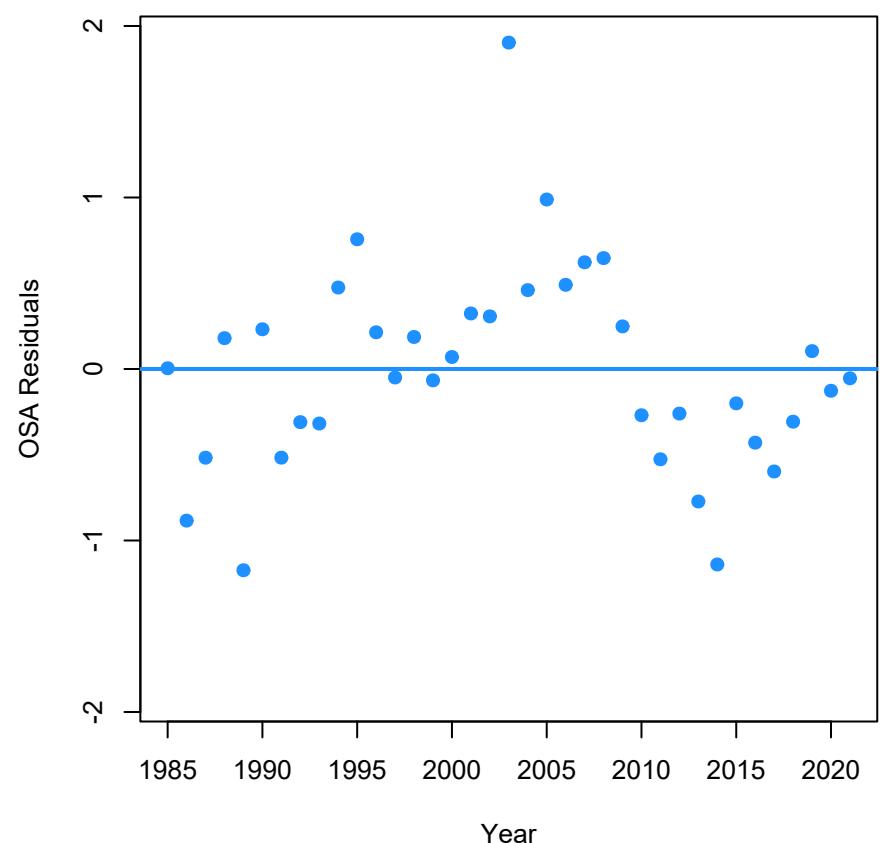
Age Comp OSA Quantile Residuals for Index 8



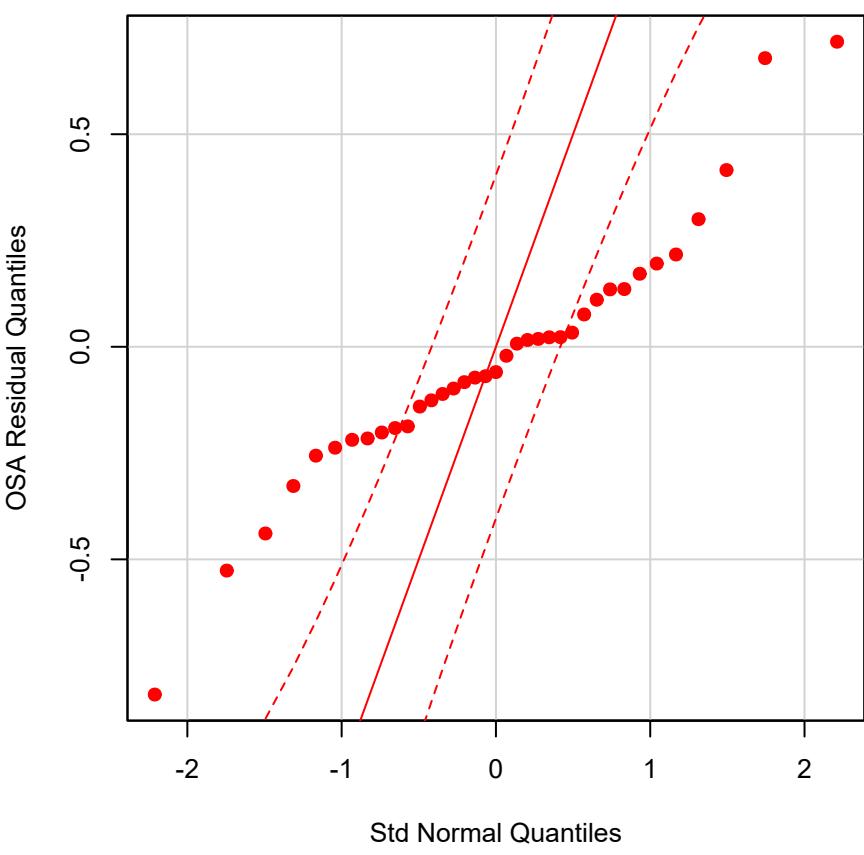
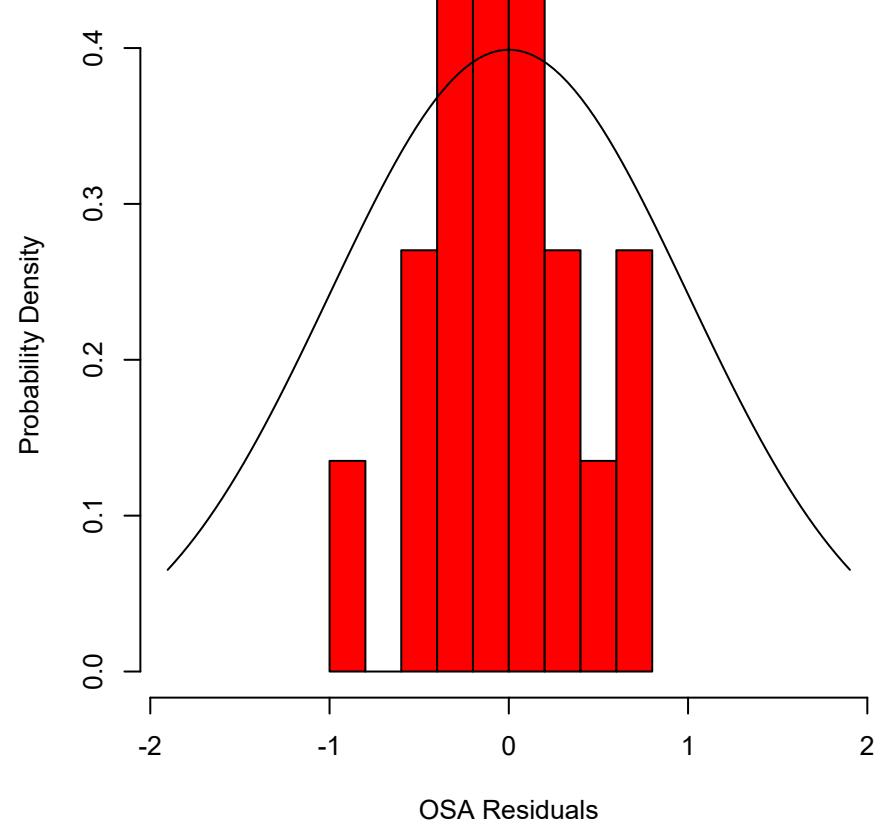
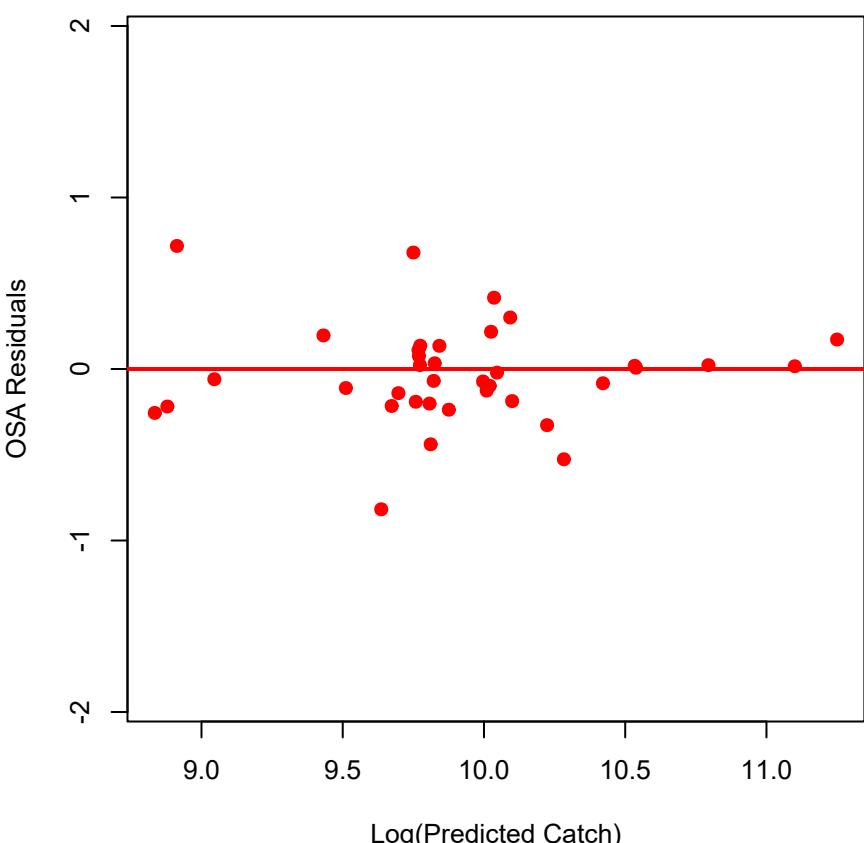
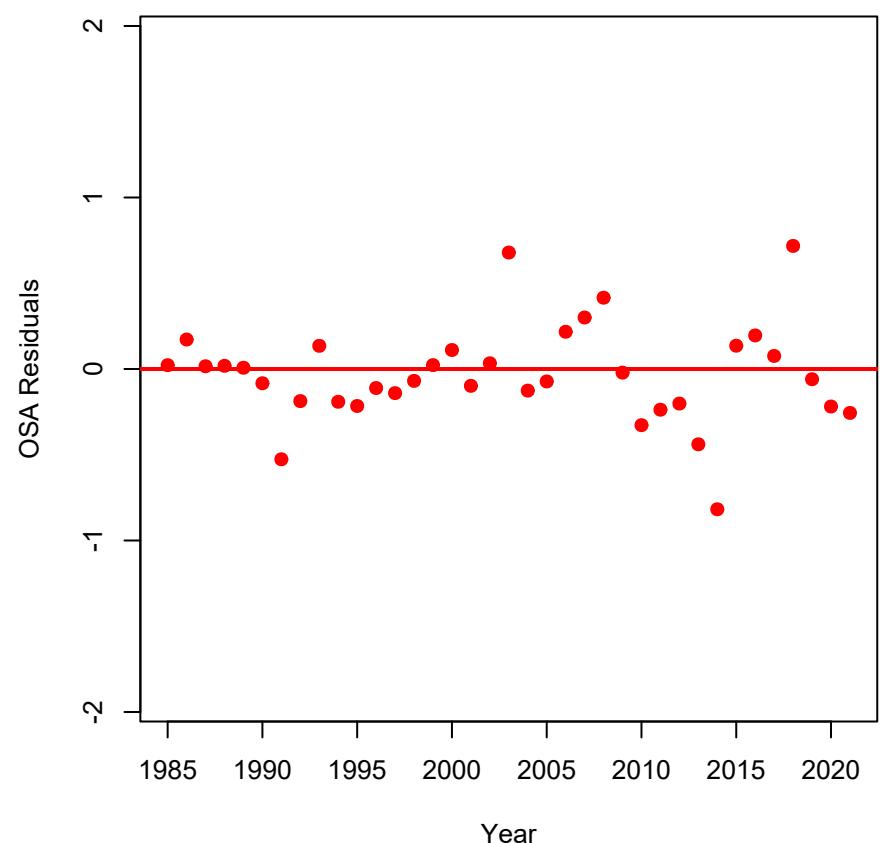
Age Comp OSA Quantile Residuals for Index 9



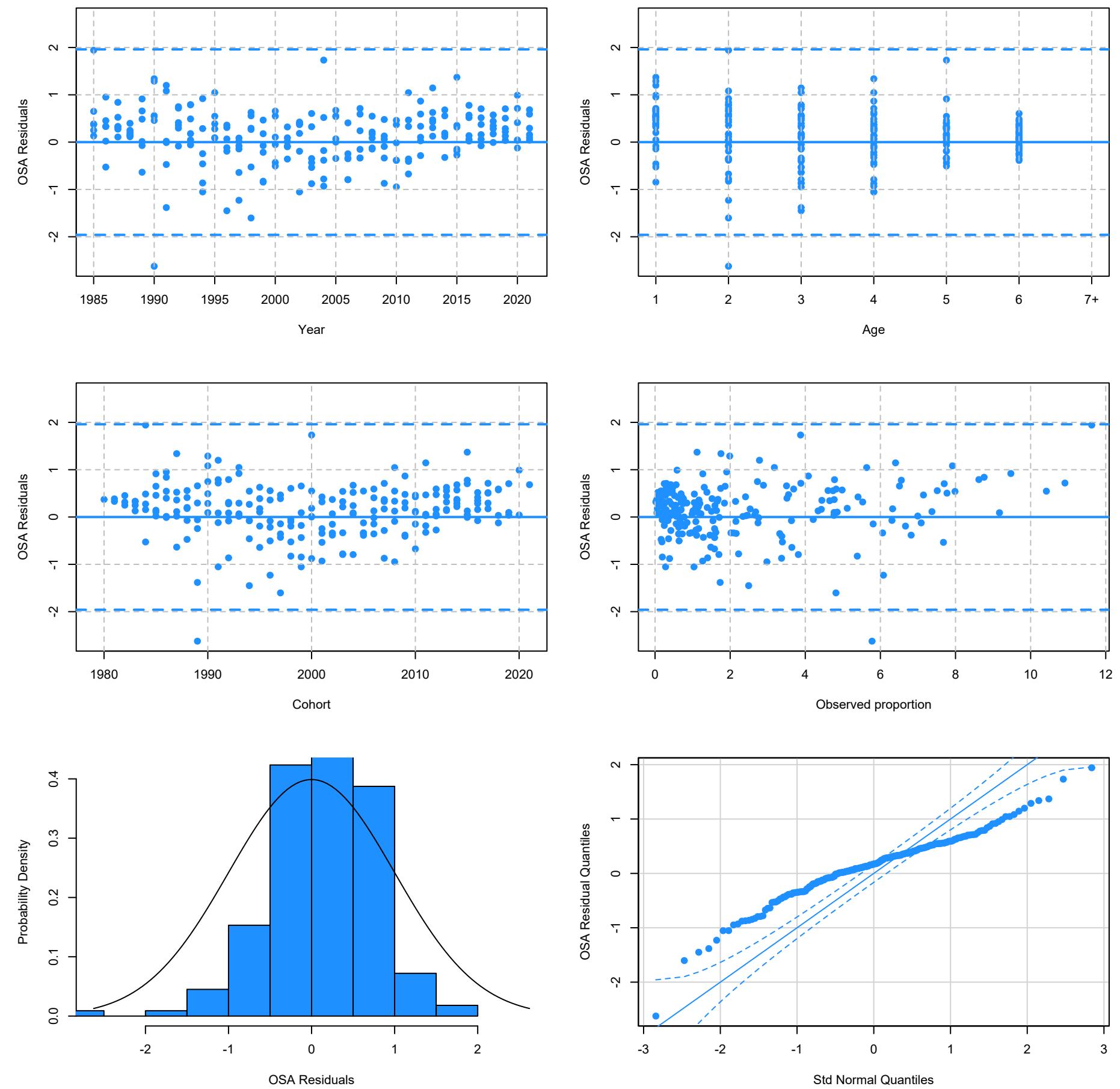
OSA residual diagnostics: Fleet 1



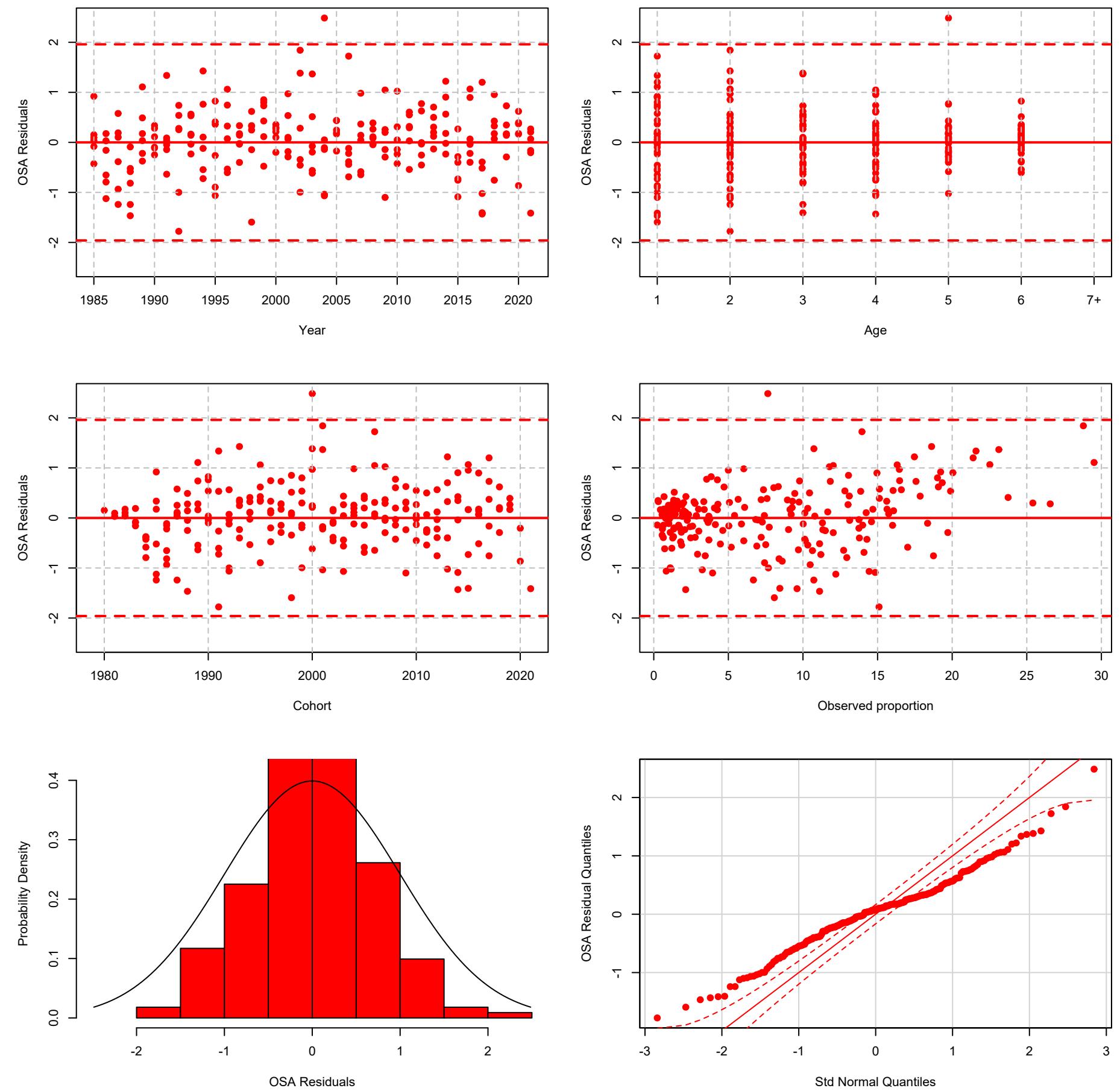
OSA residual diagnostics: Fleet 2



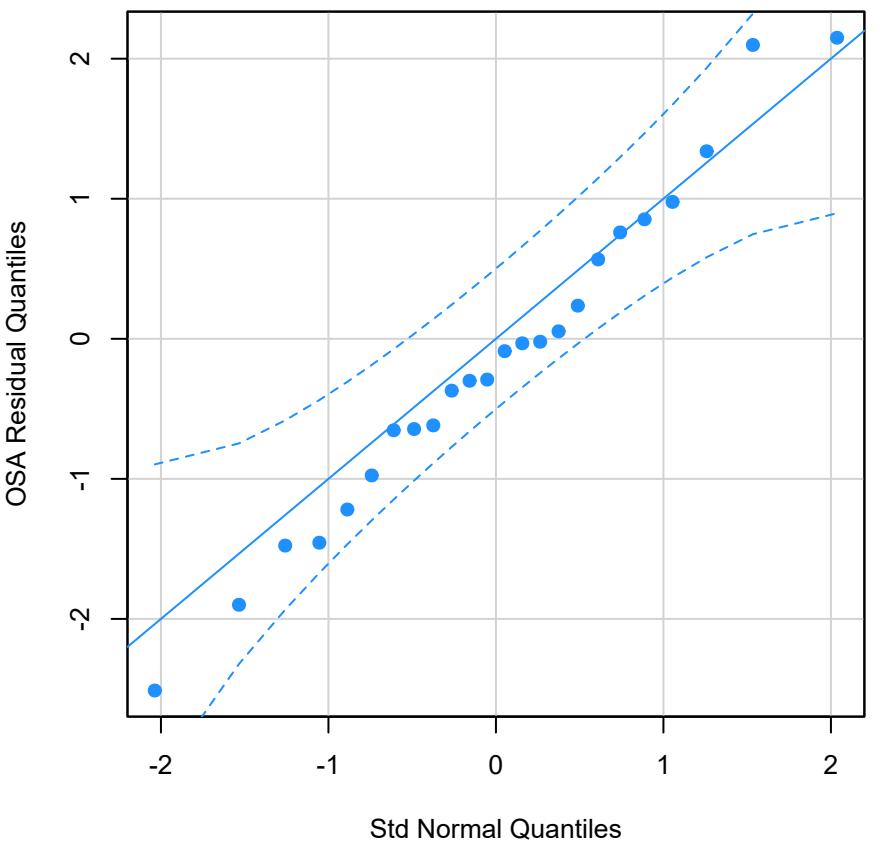
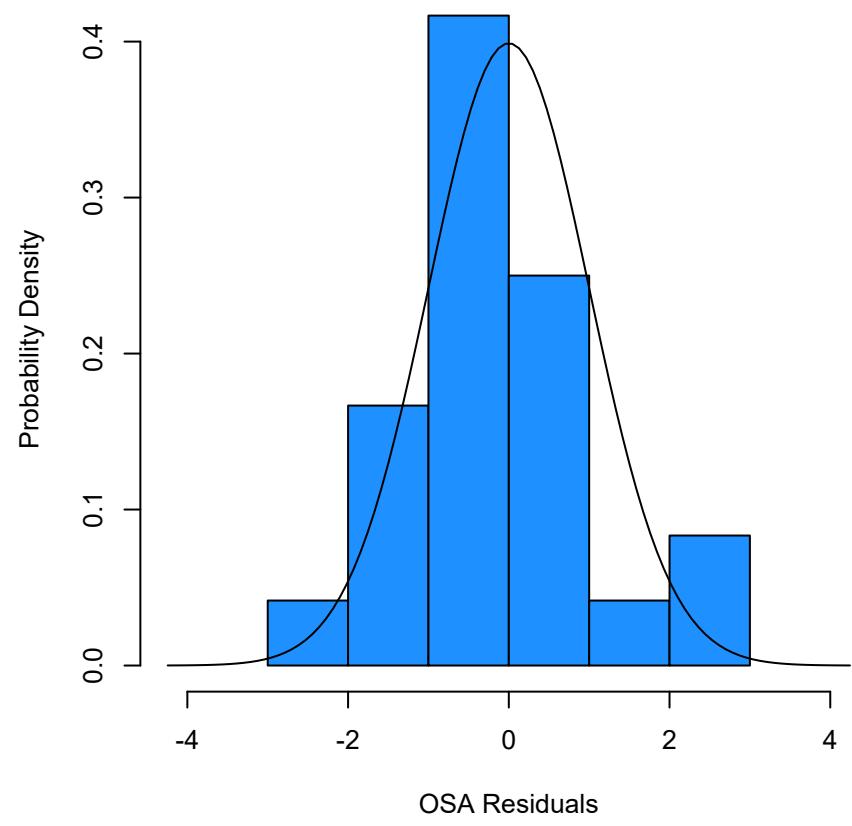
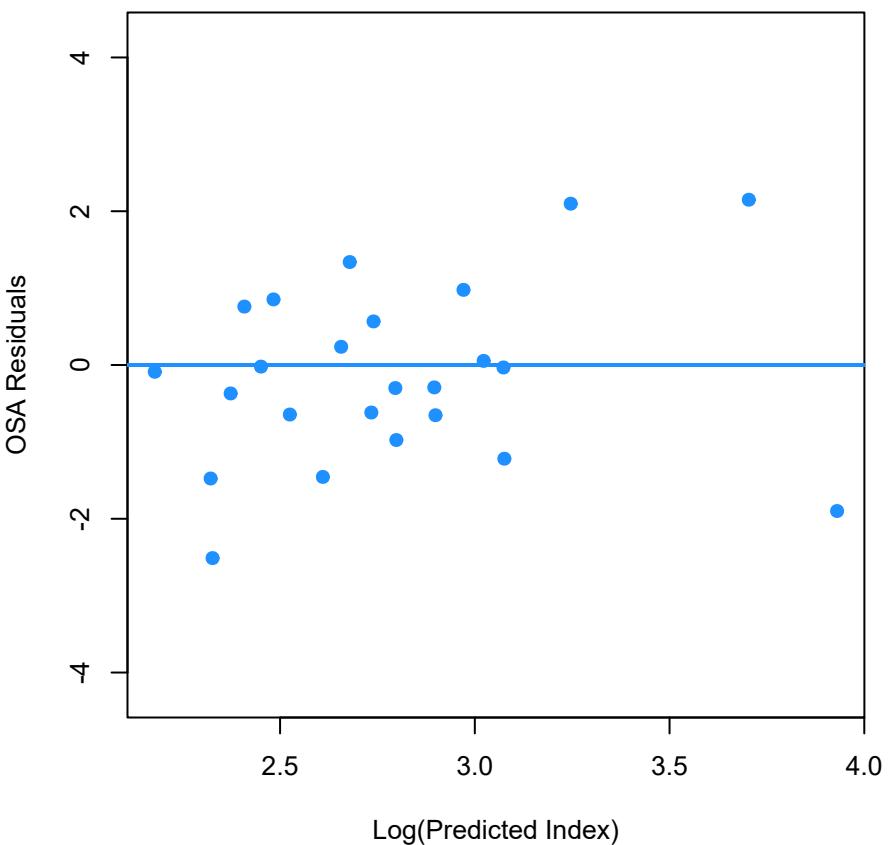
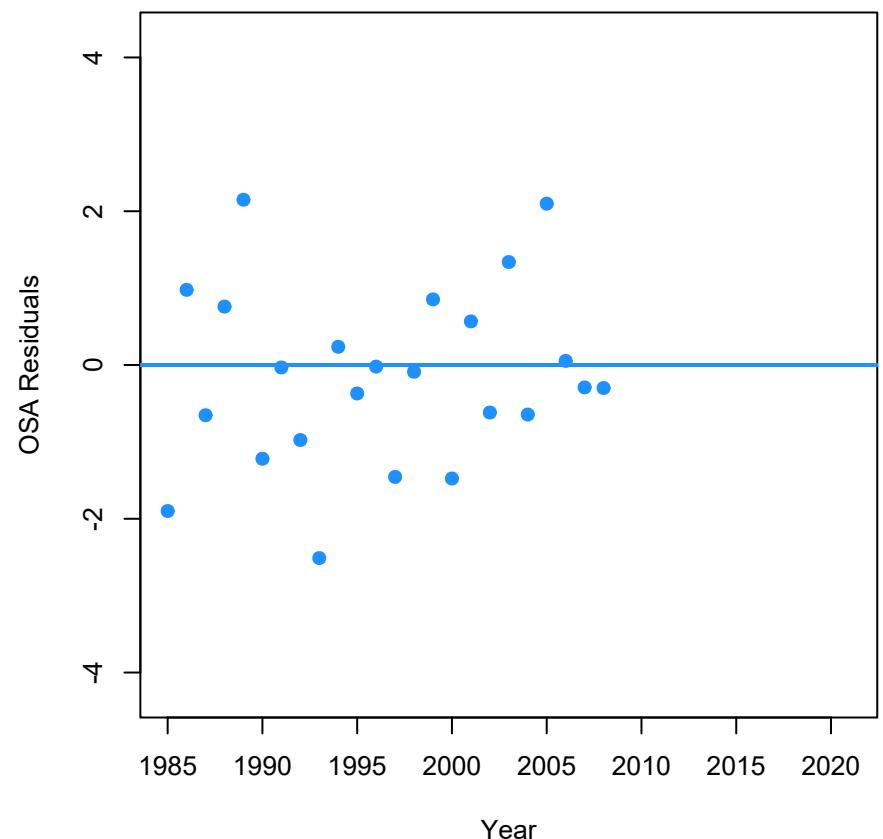
age composition OSA residual diagnostics: Fleet 1



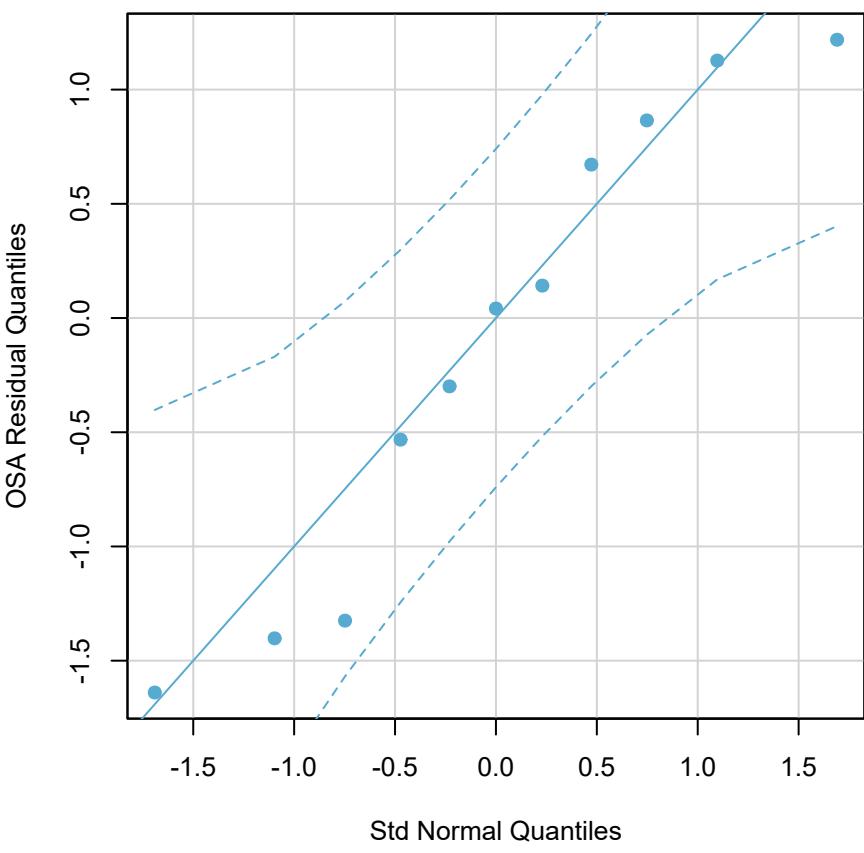
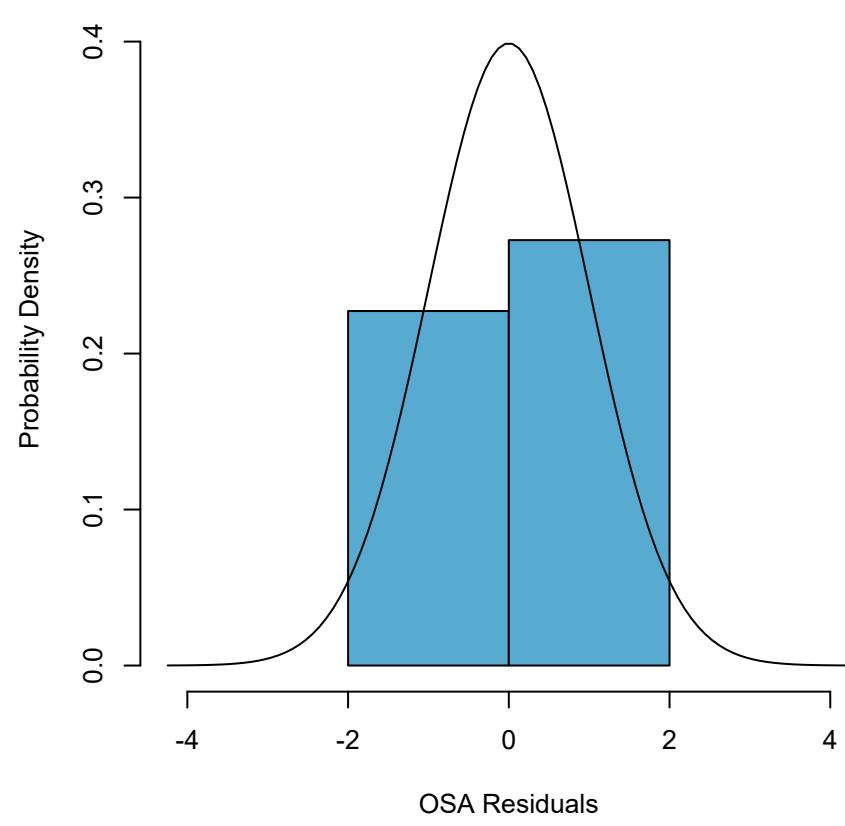
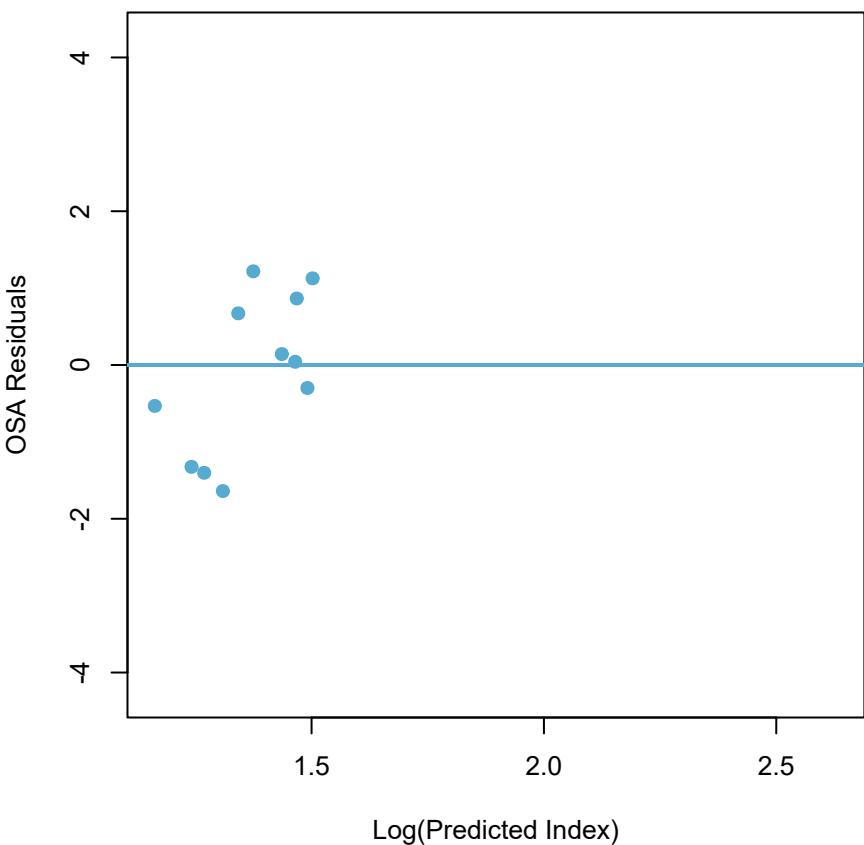
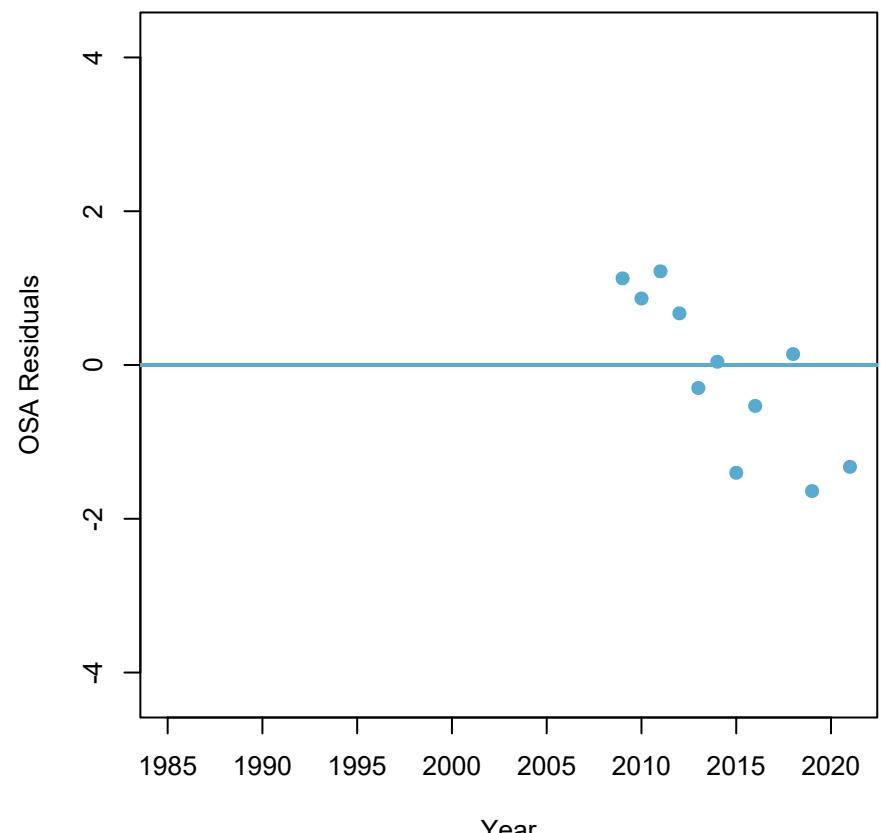
age composition OSA residual diagnostics: Fleet 2



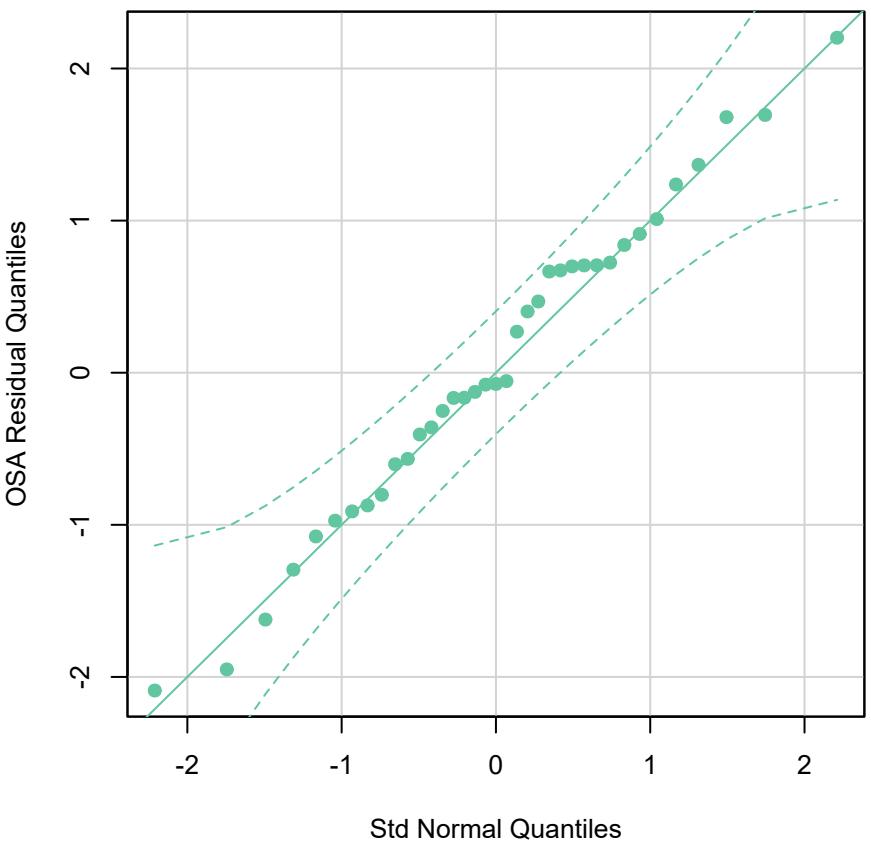
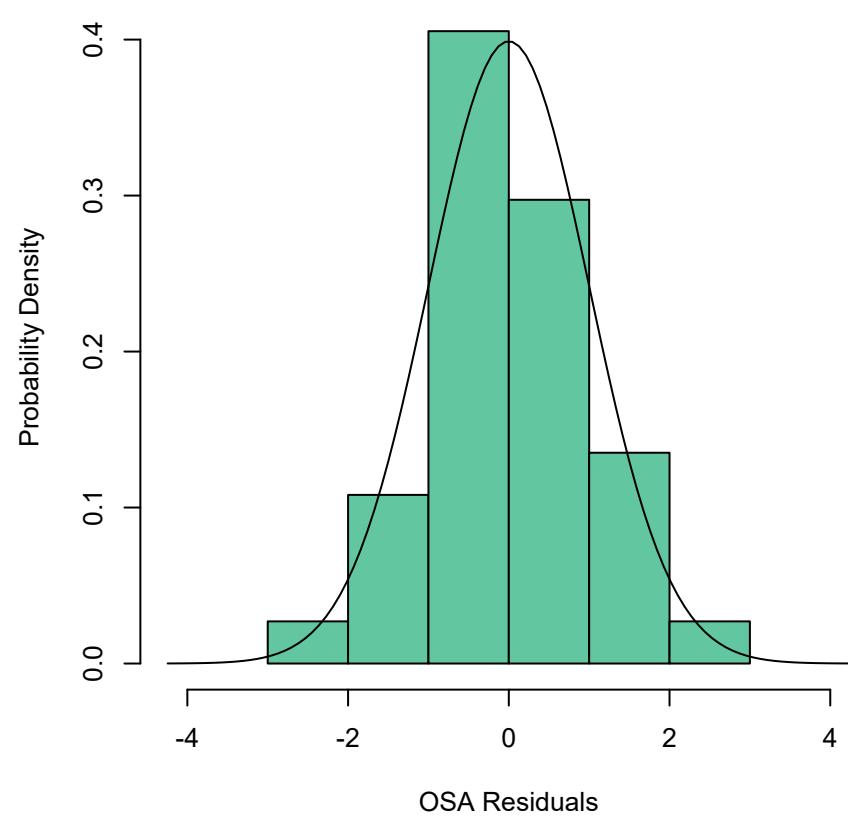
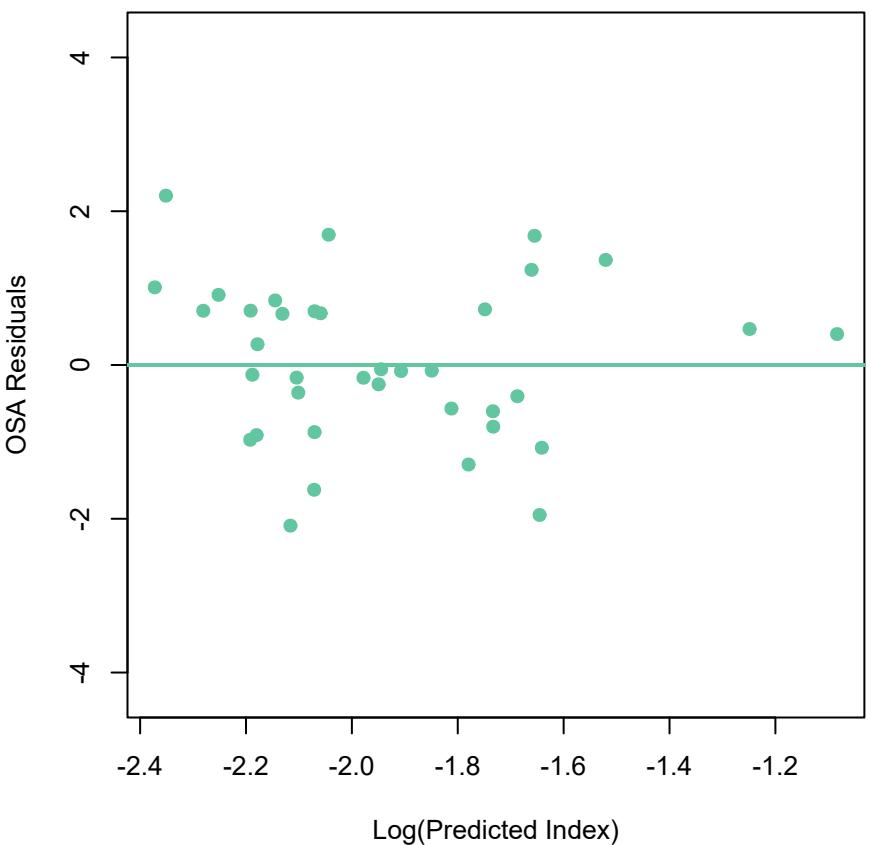
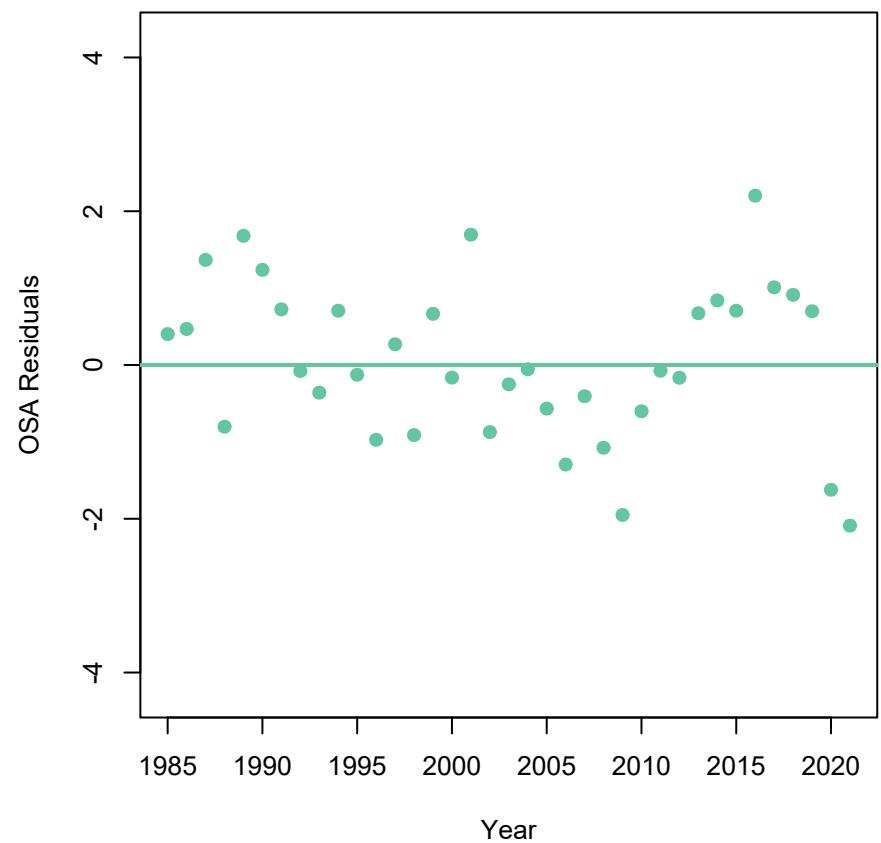
OSA residual diagnostics: Index 1



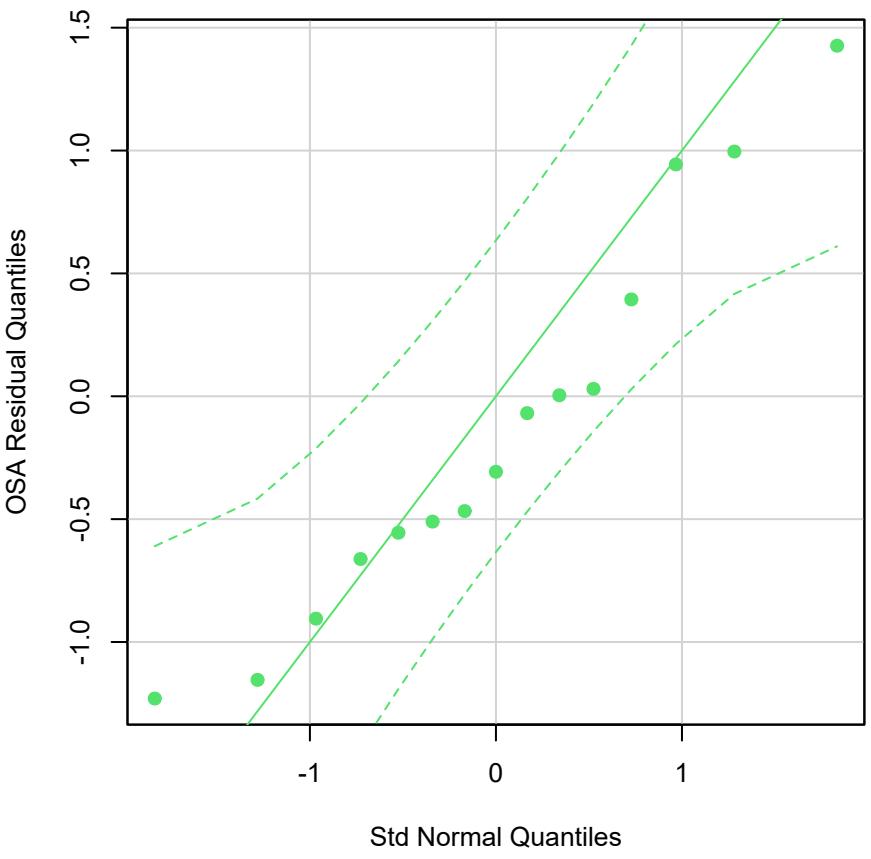
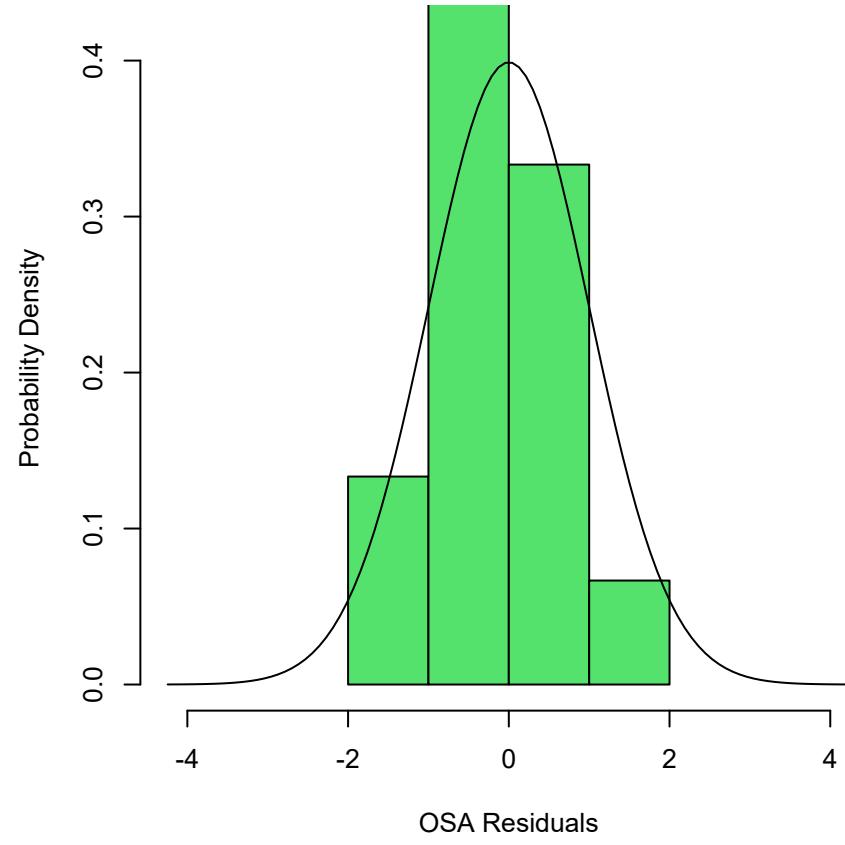
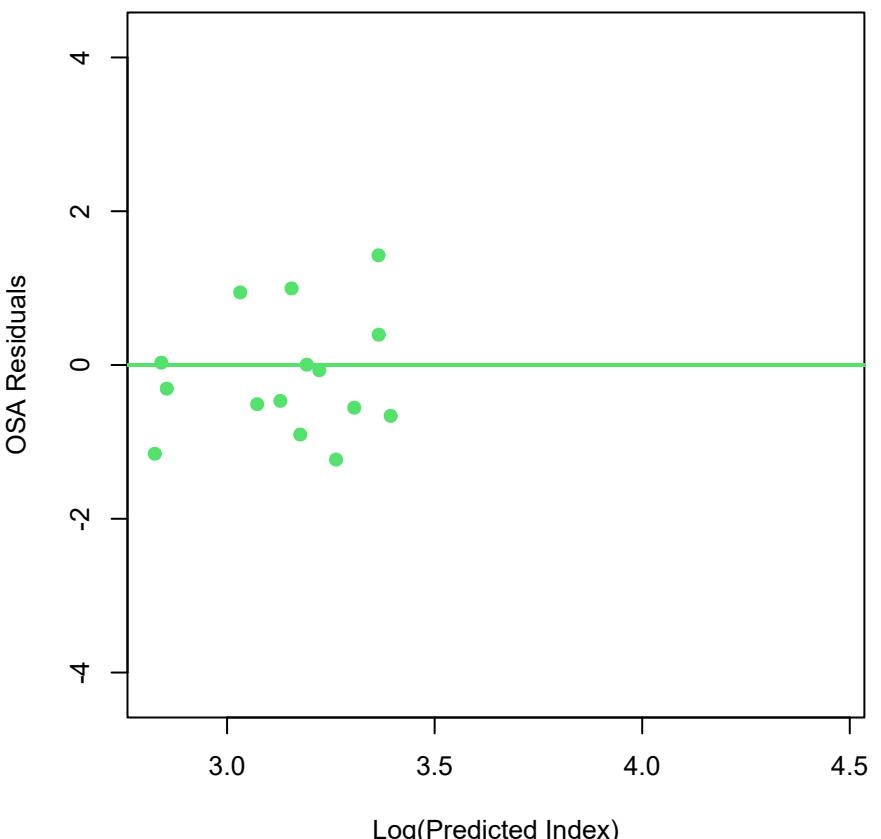
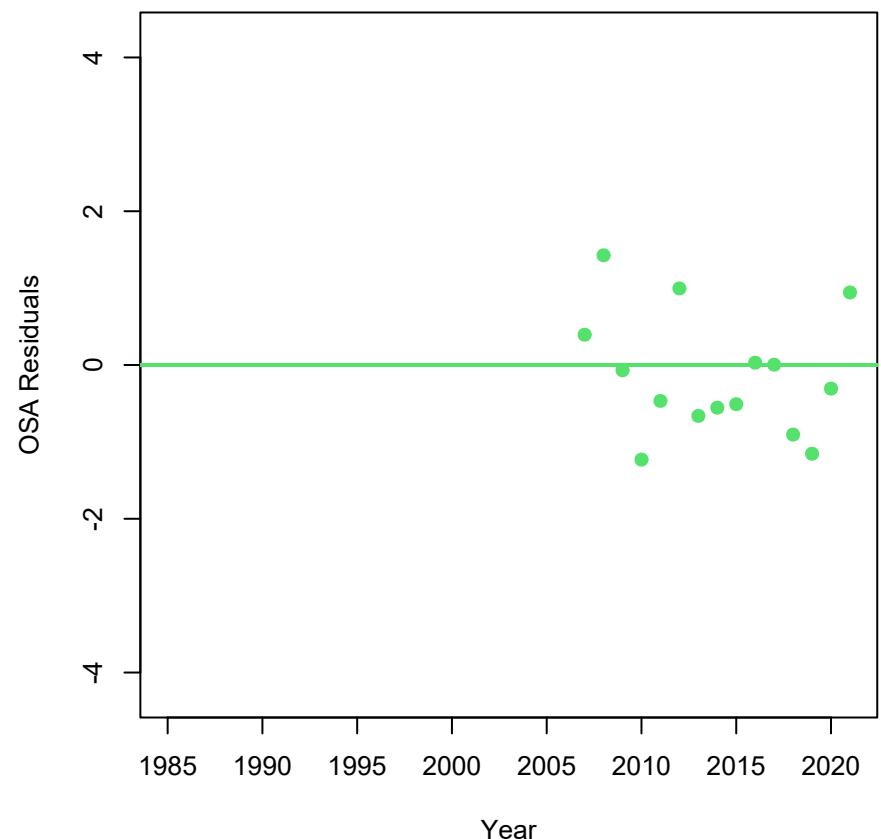
OSA residual diagnostics: Index 2



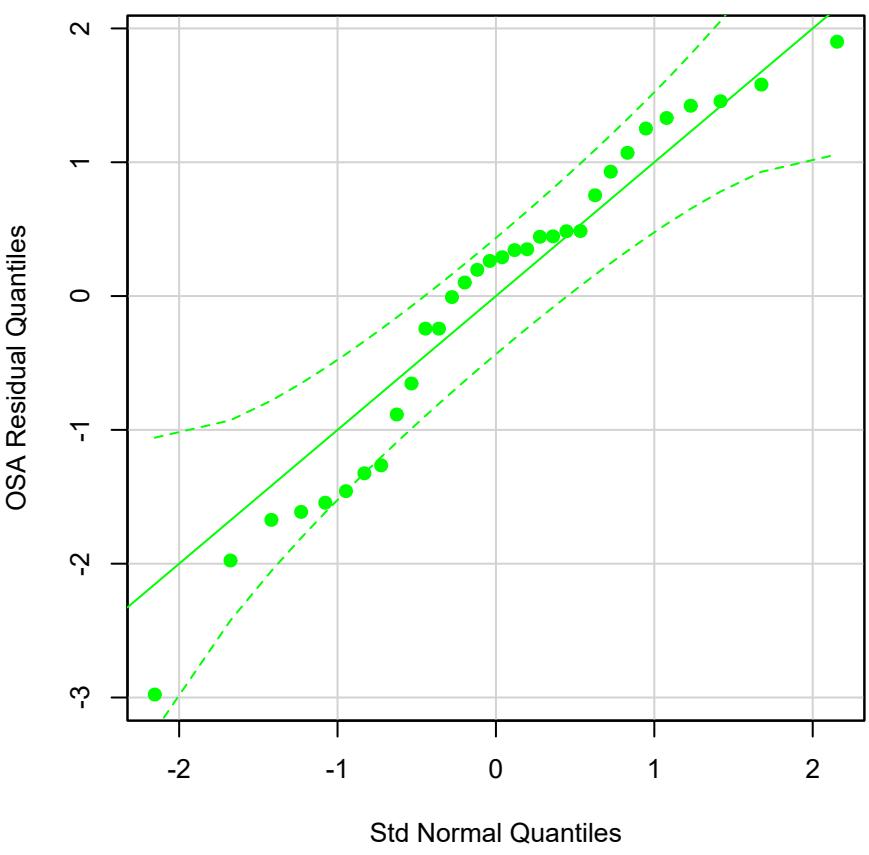
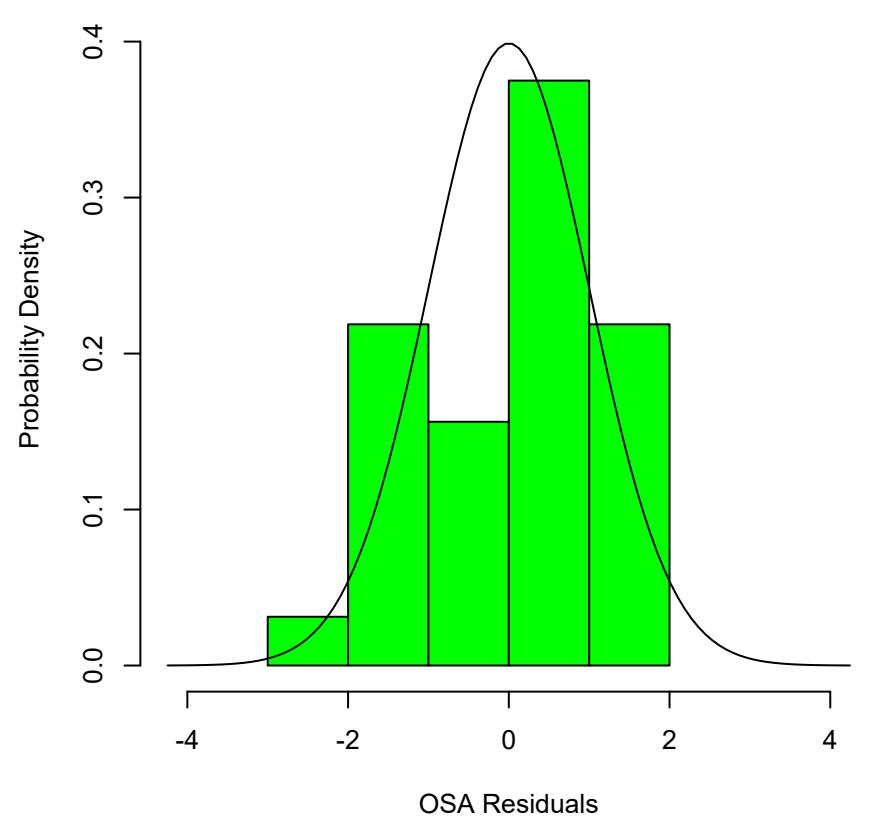
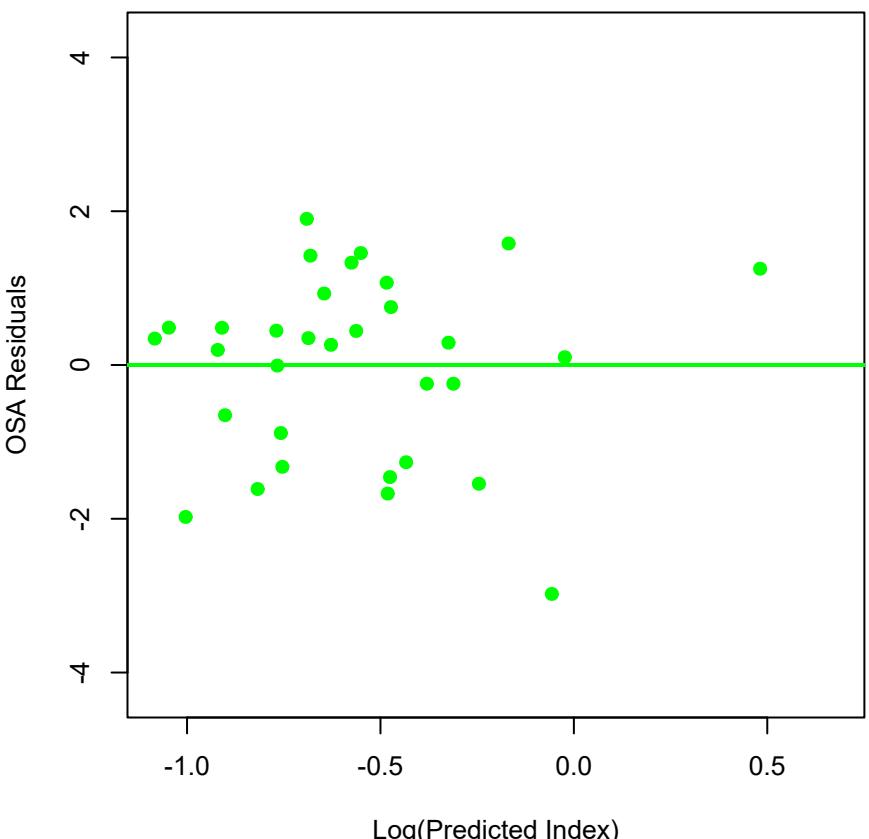
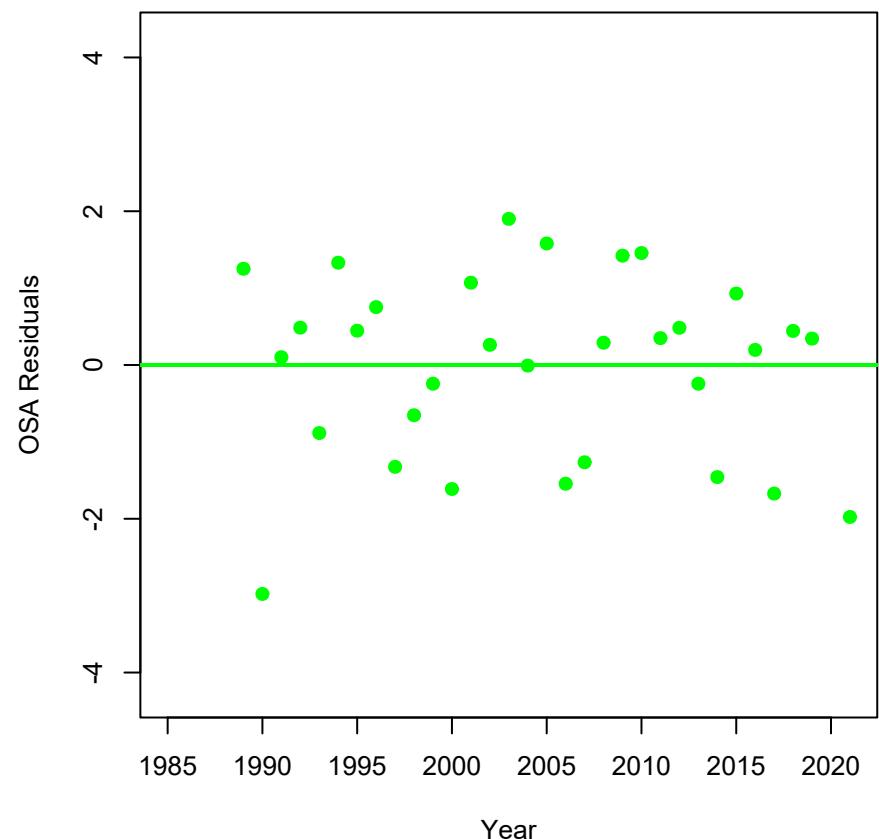
OSA residual diagnostics: Index 3



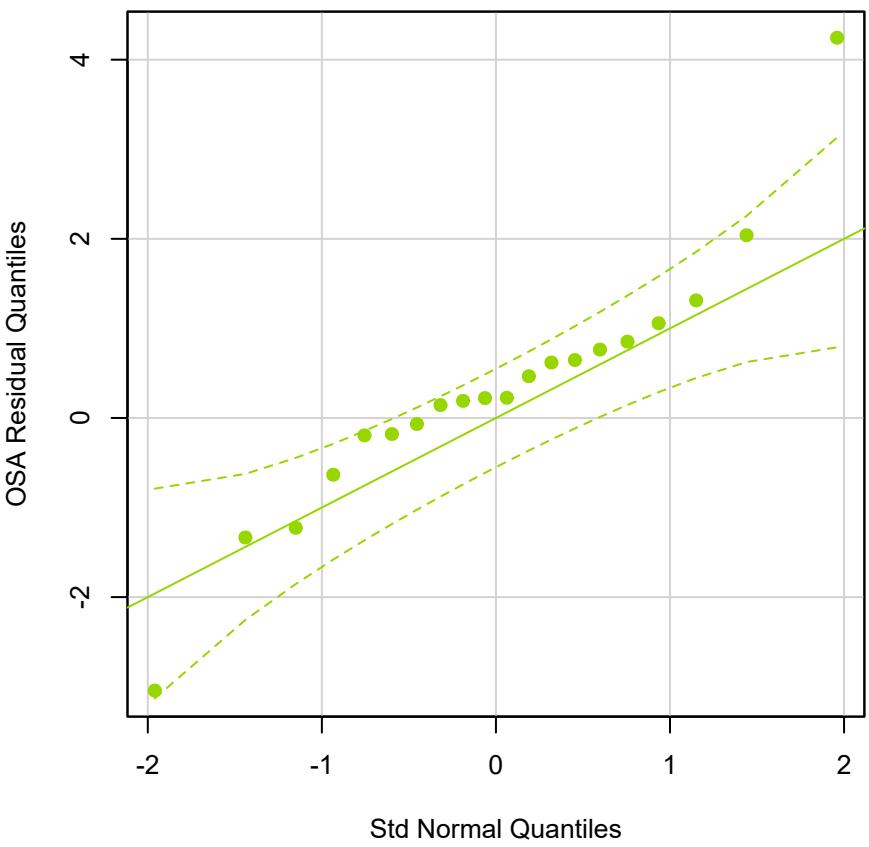
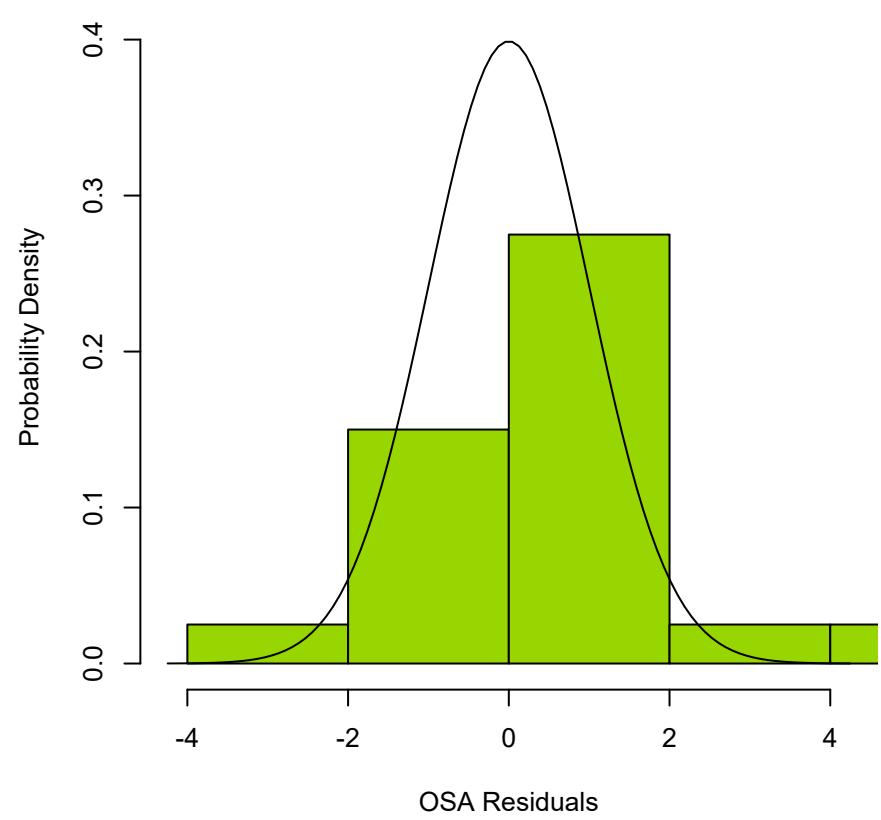
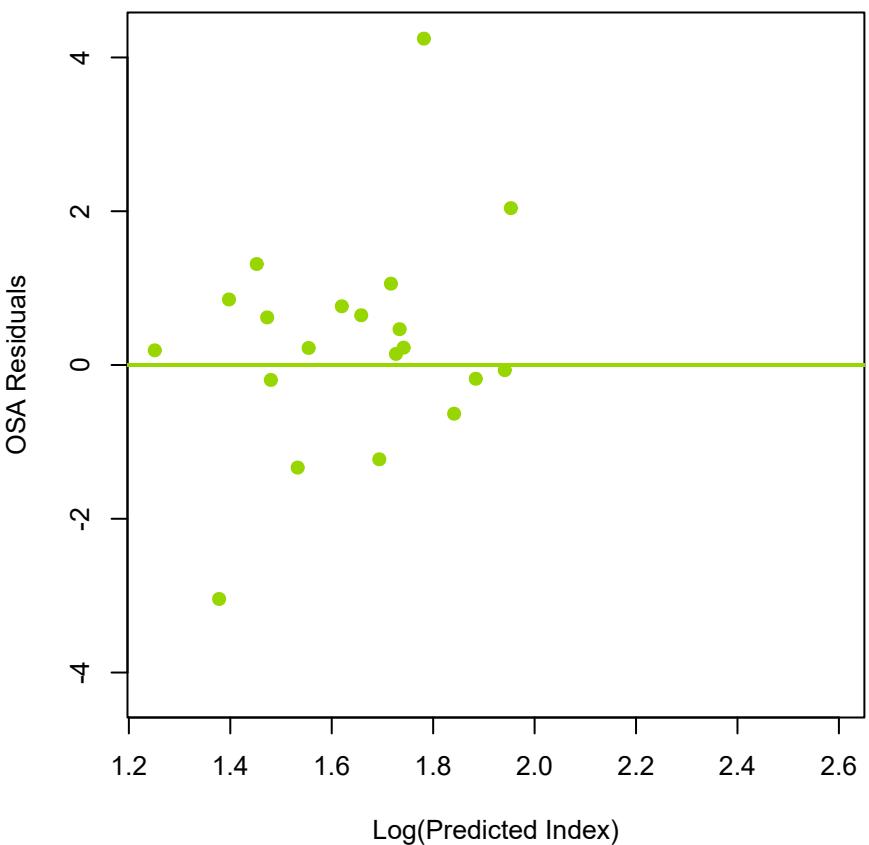
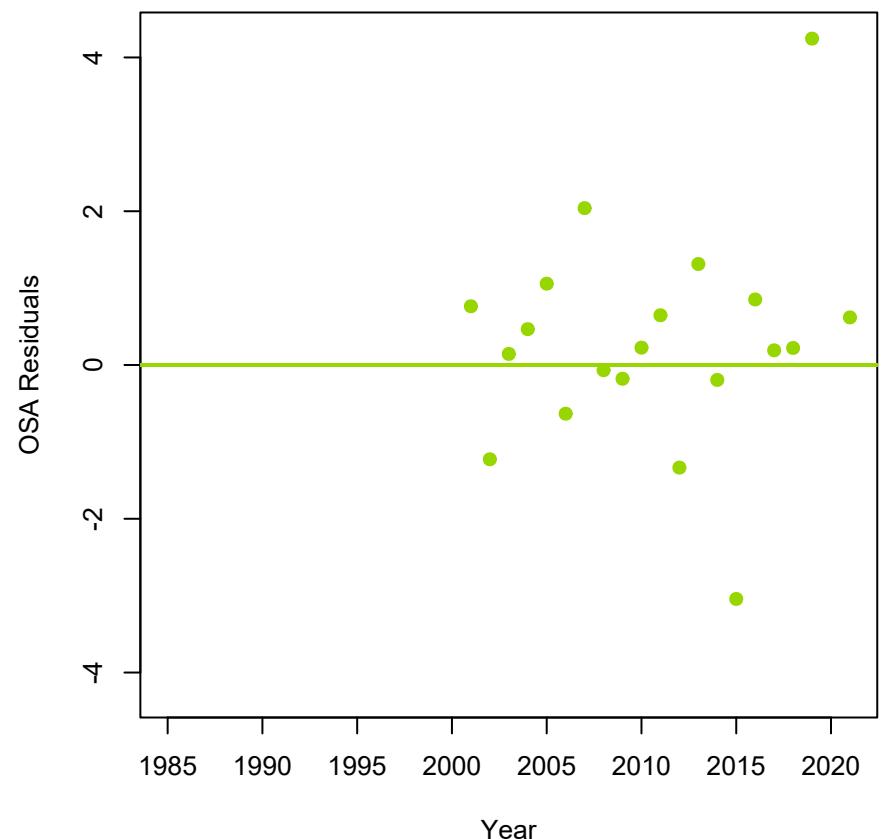
OSA residual diagnostics: Index 4



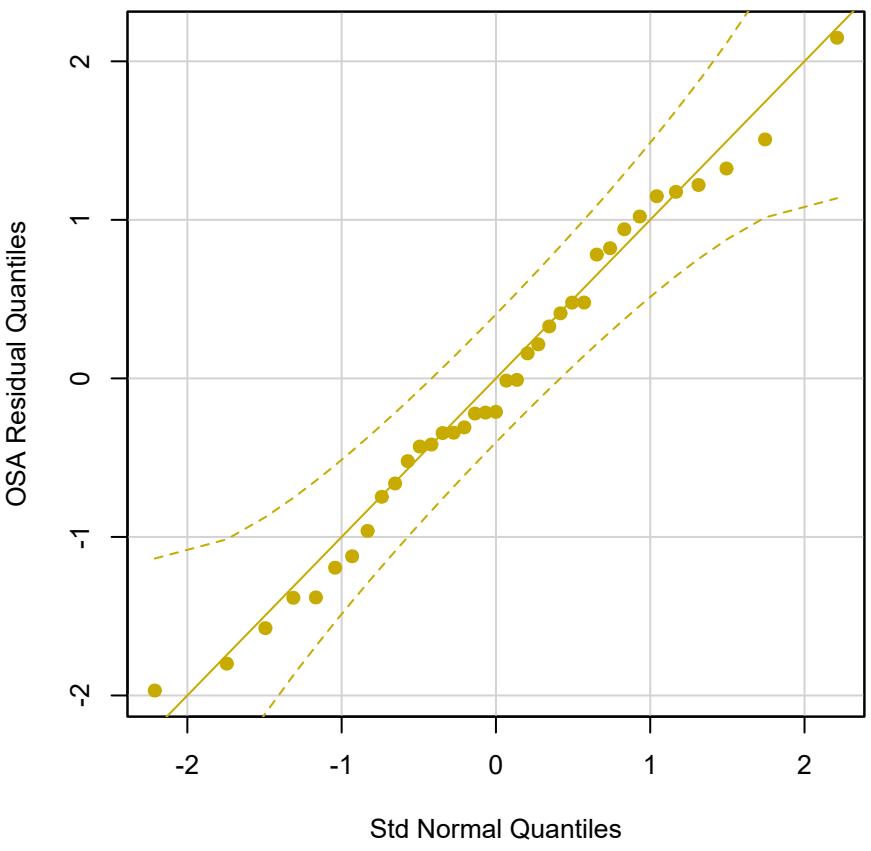
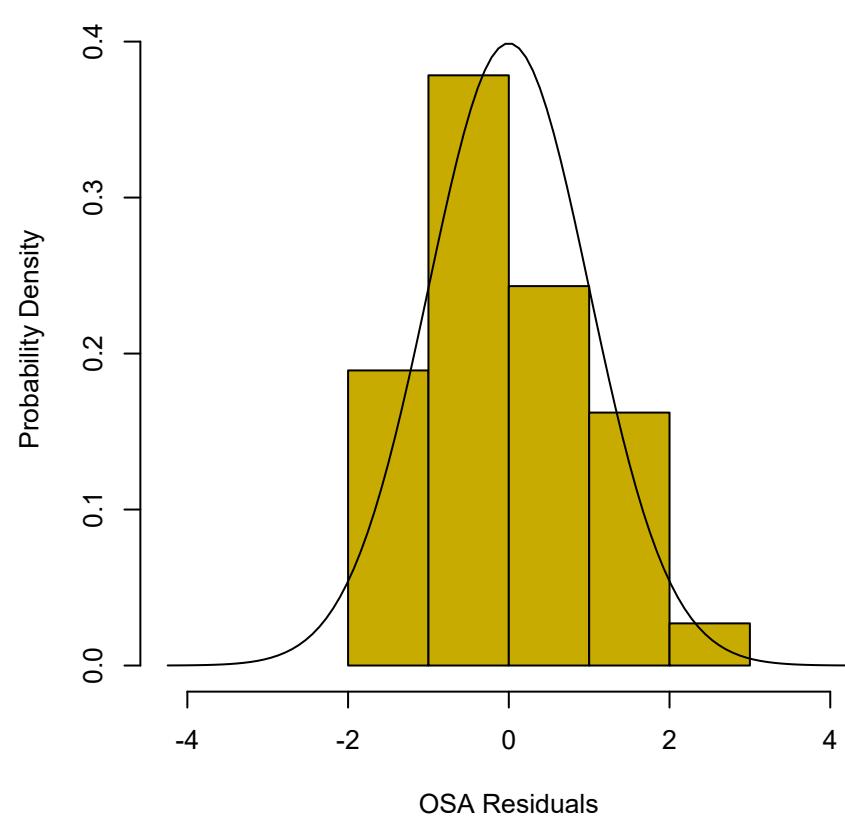
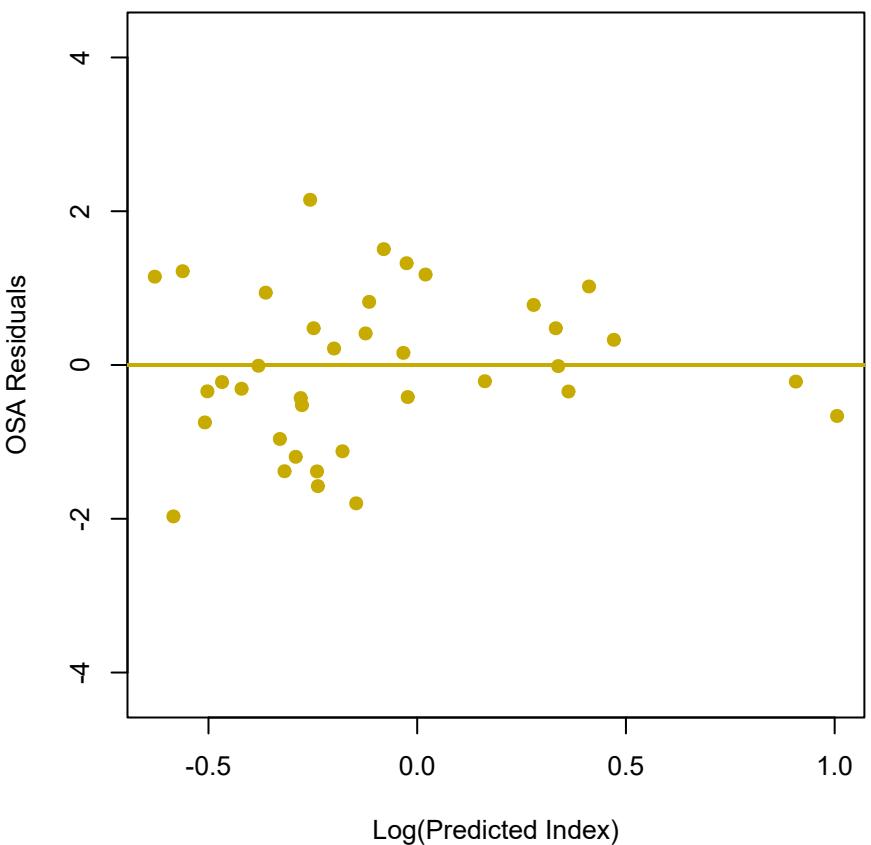
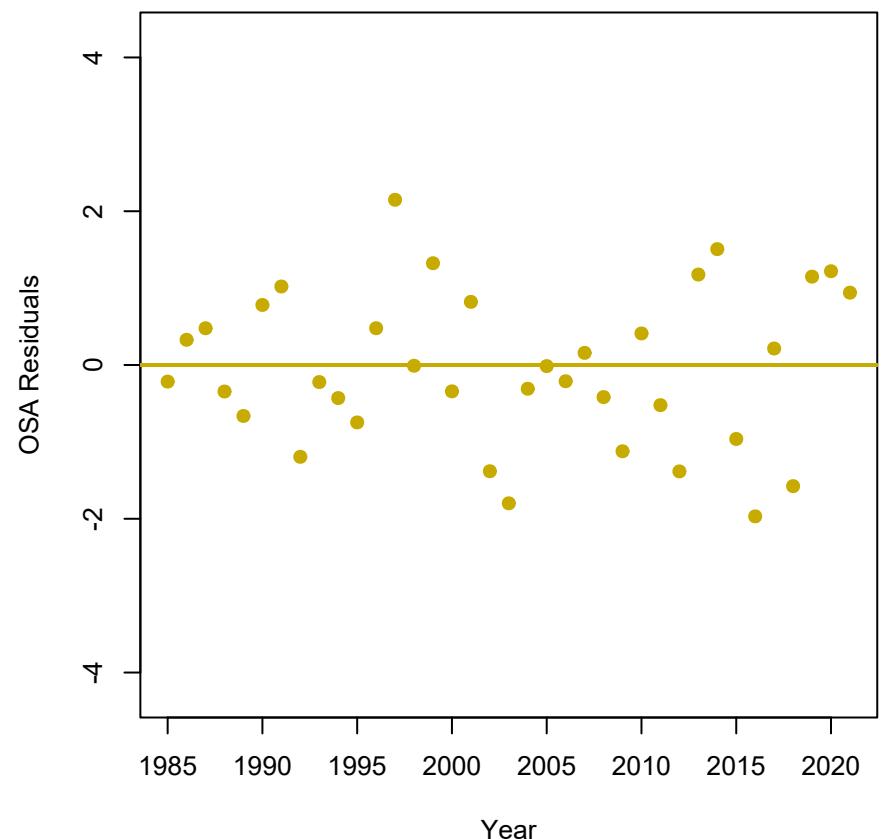
OSA residual diagnostics: Index 5



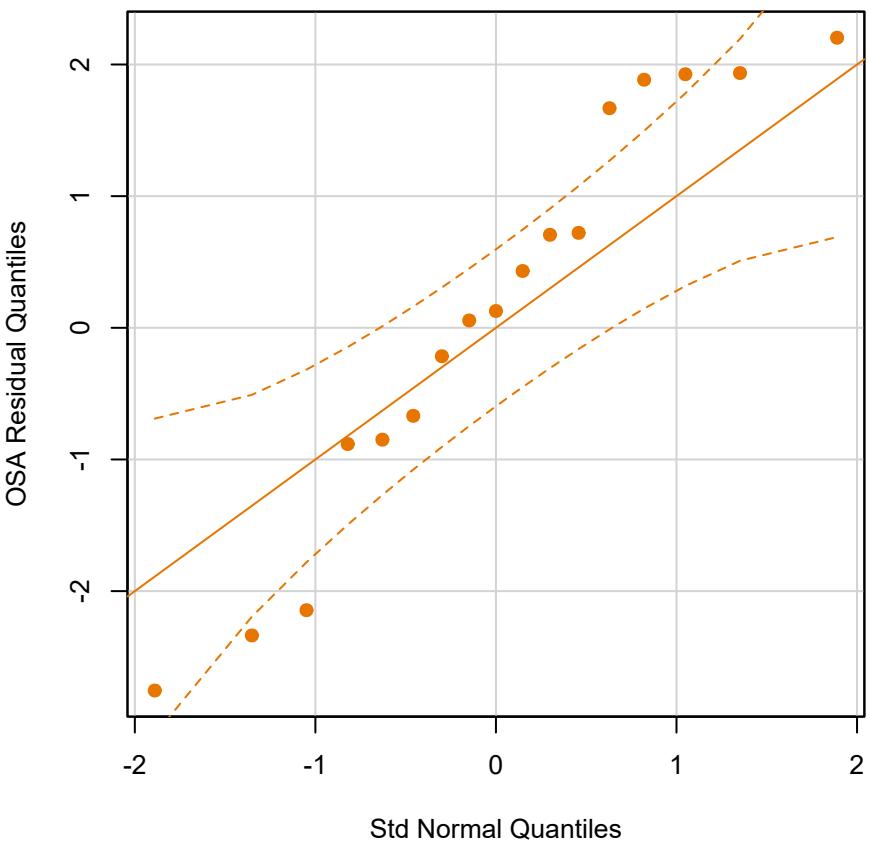
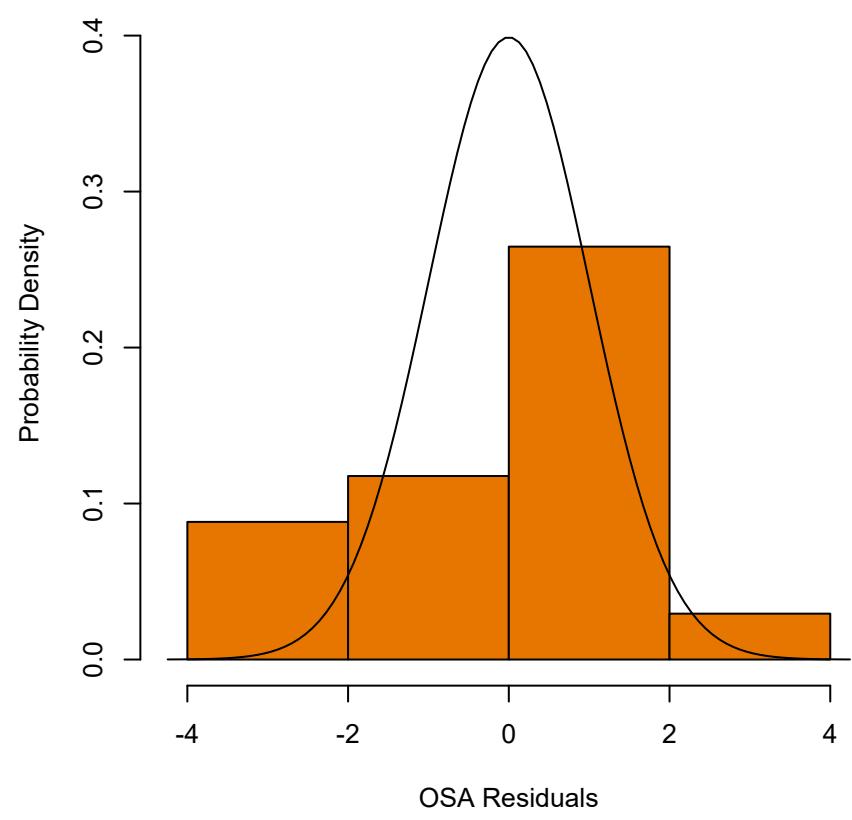
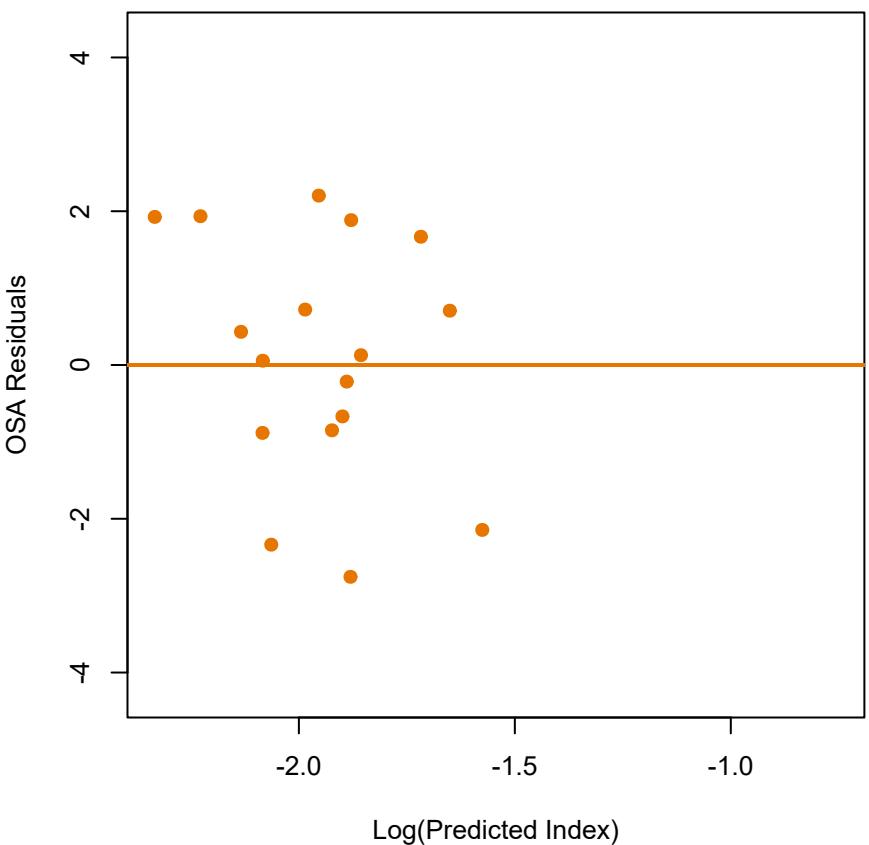
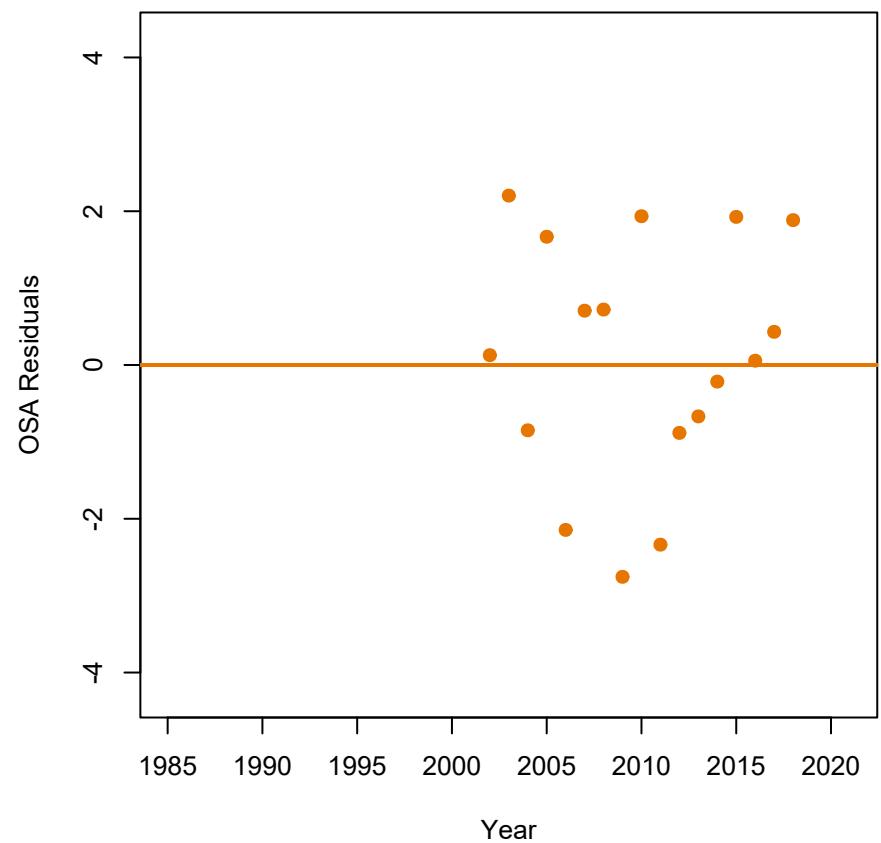
OSA residual diagnostics: Index 6



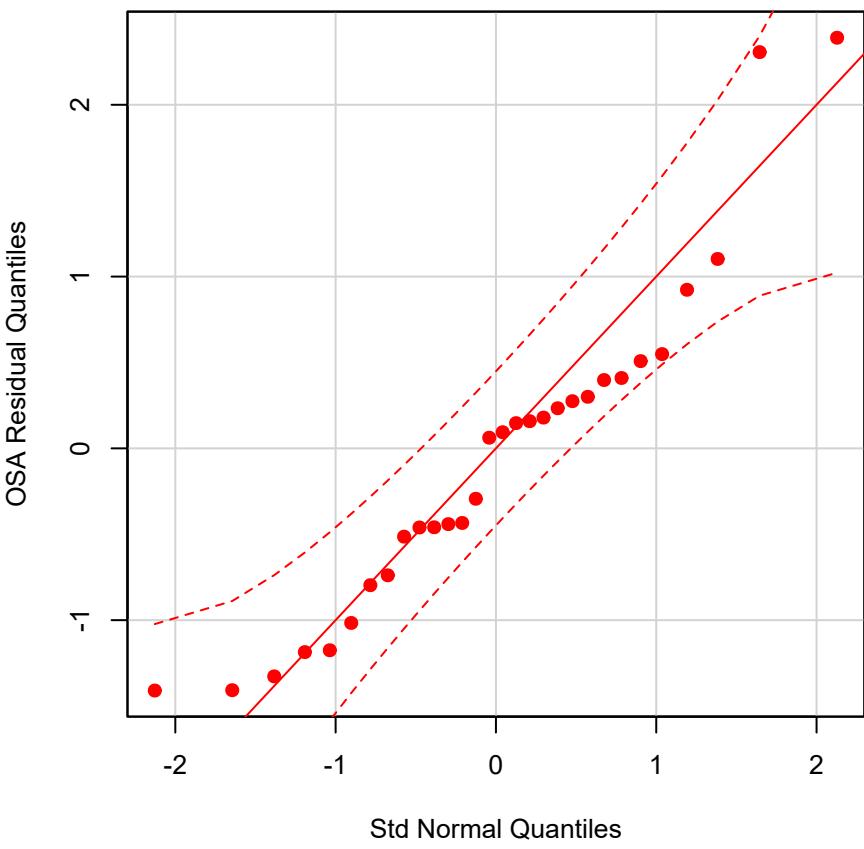
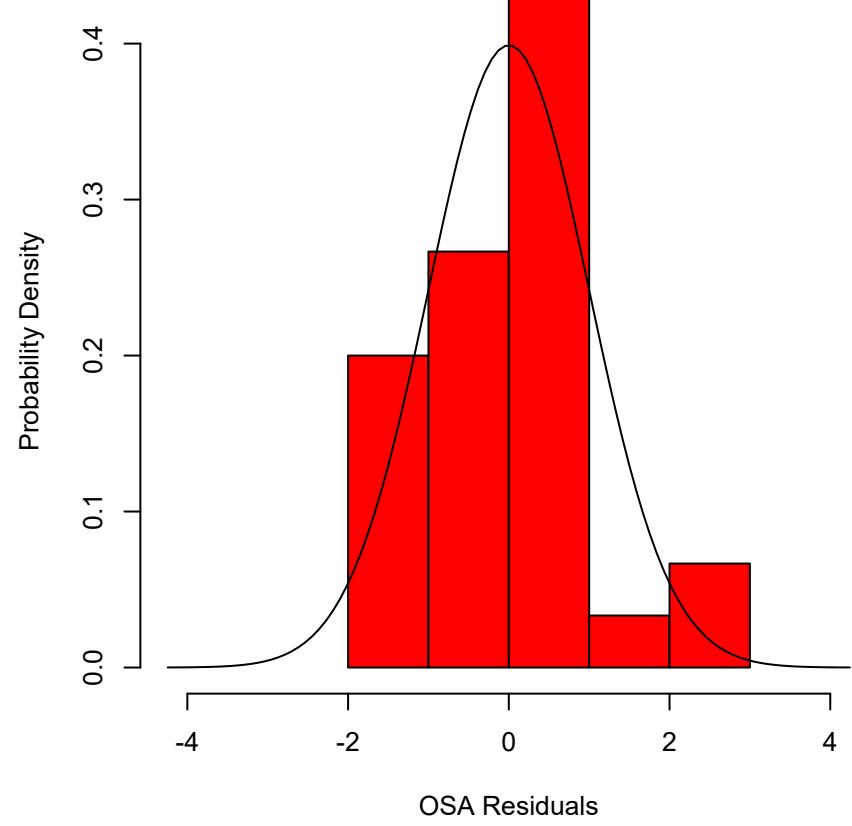
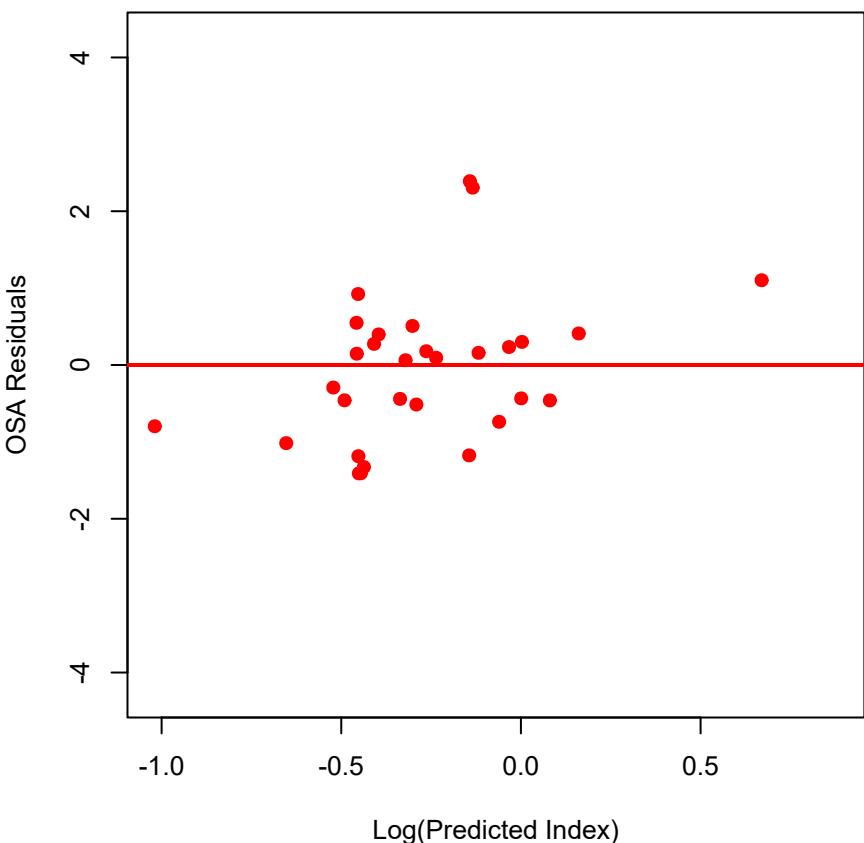
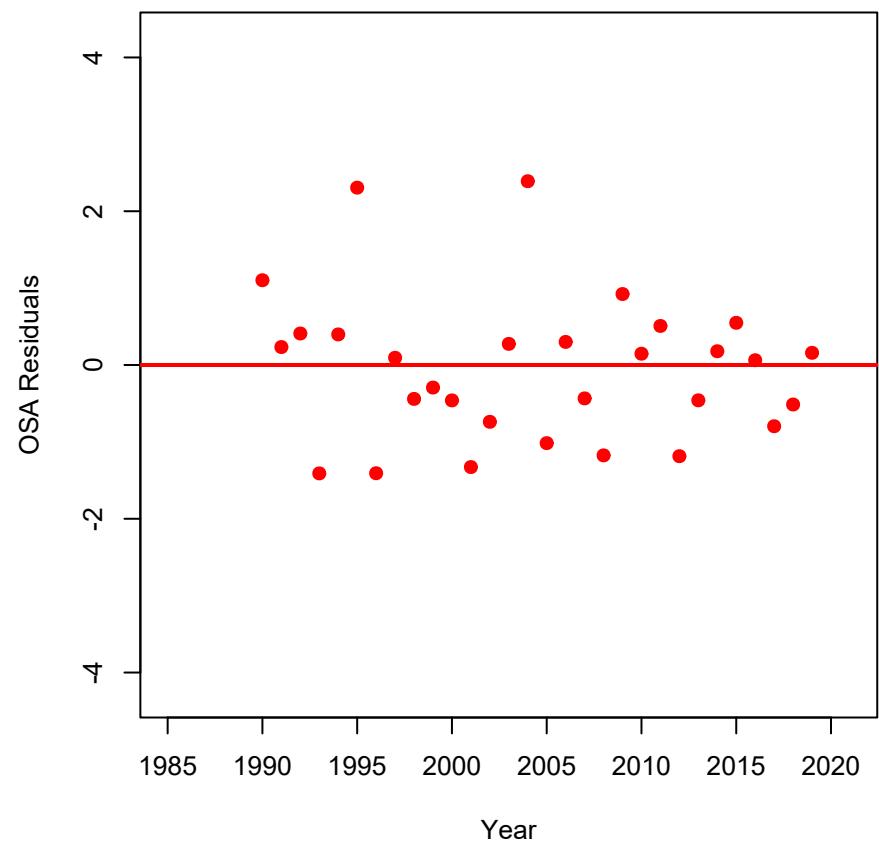
OSA residual diagnostics: Index 7



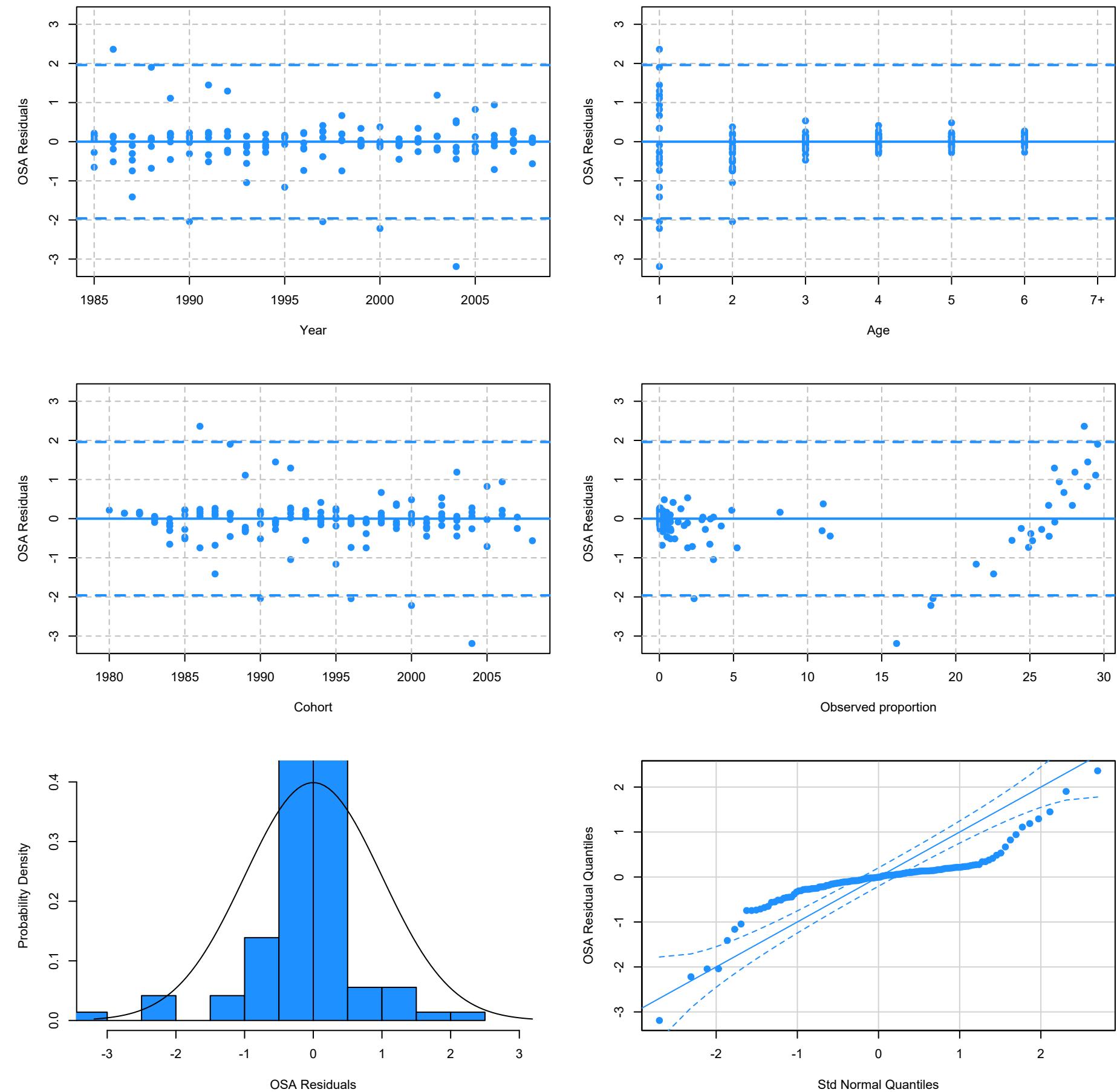
OSA residual diagnostics: Index 8



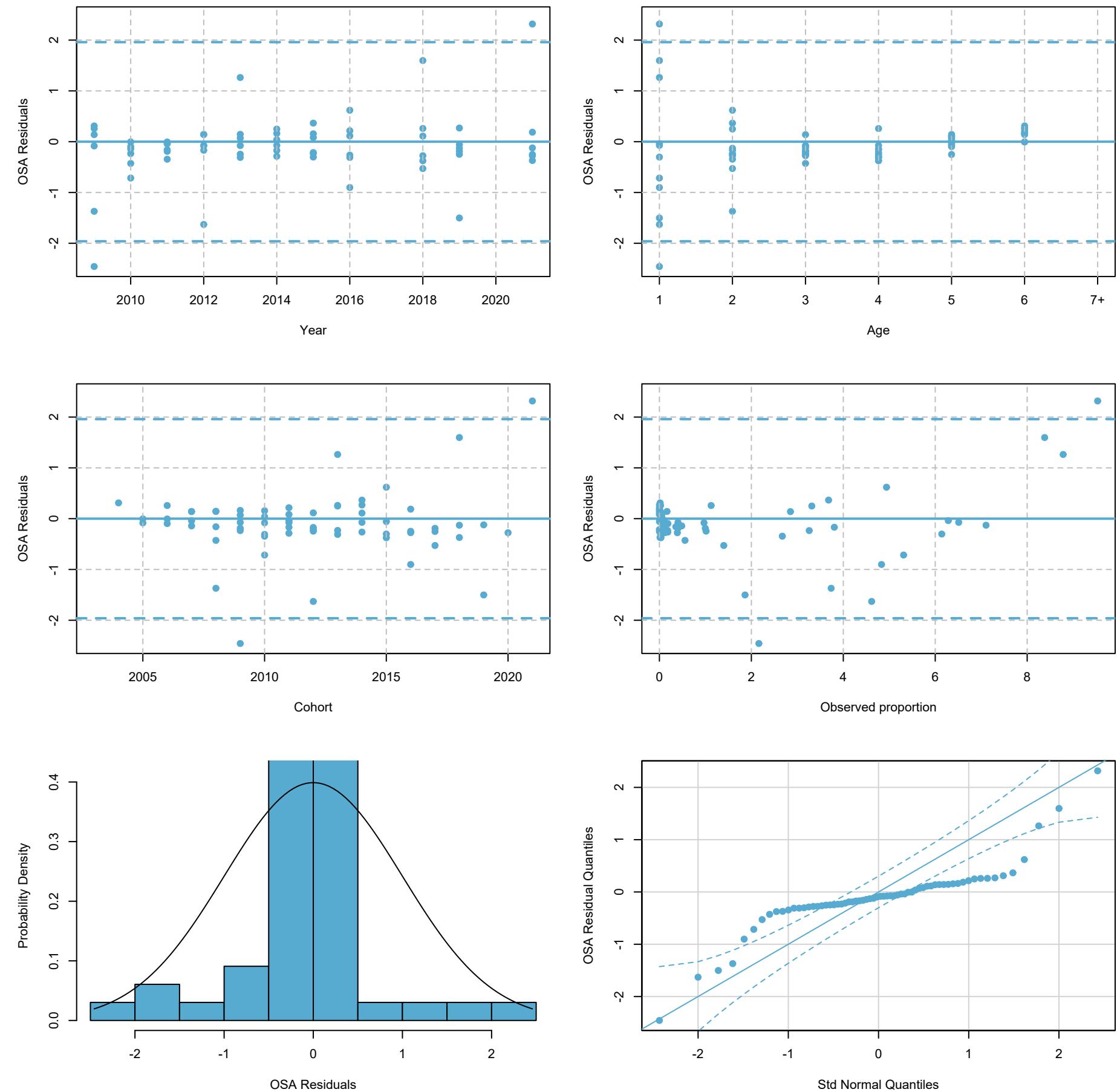
OSA residual diagnostics: Index 9



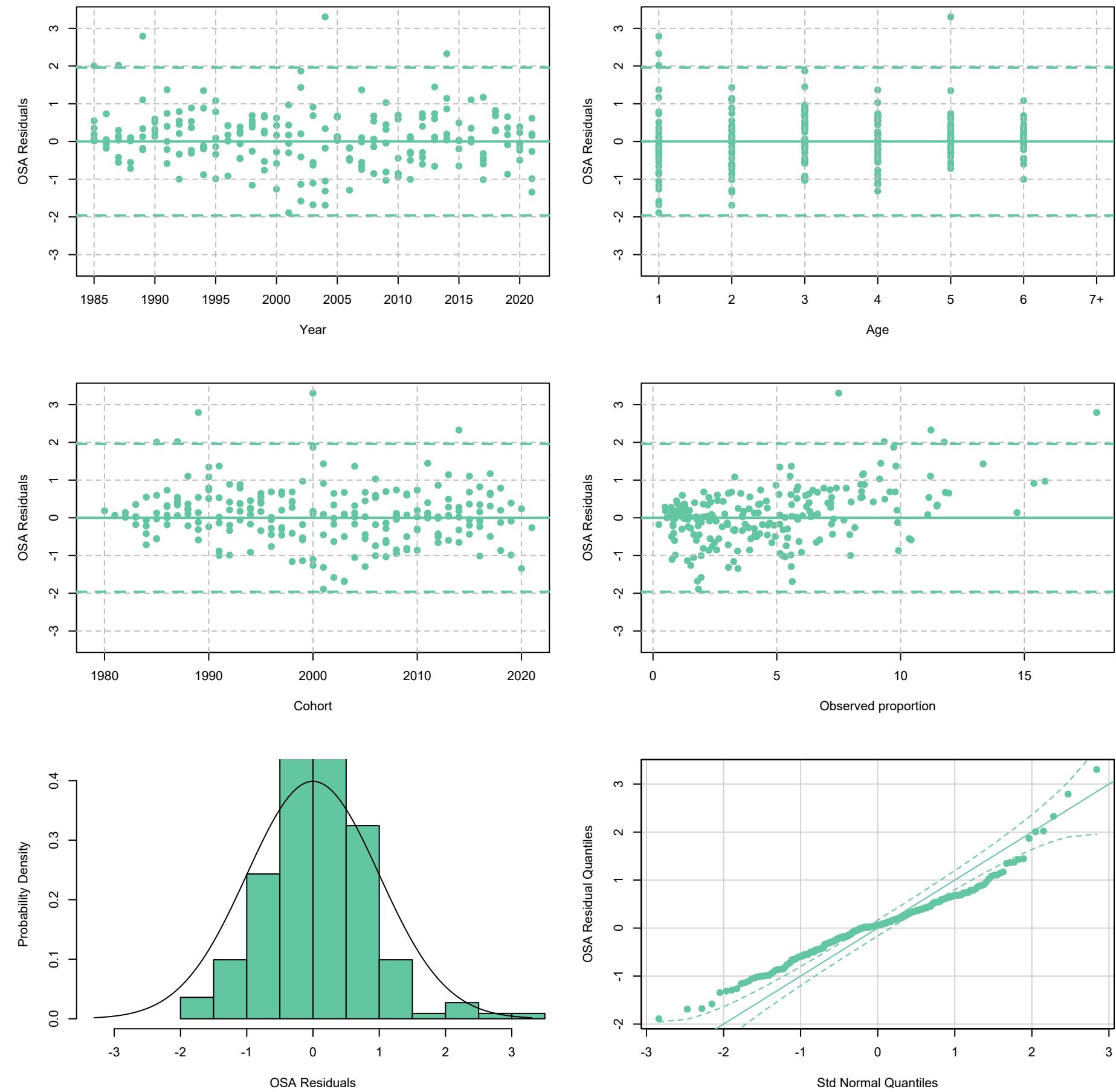
age composition OSA residual diagnostics: Index 1



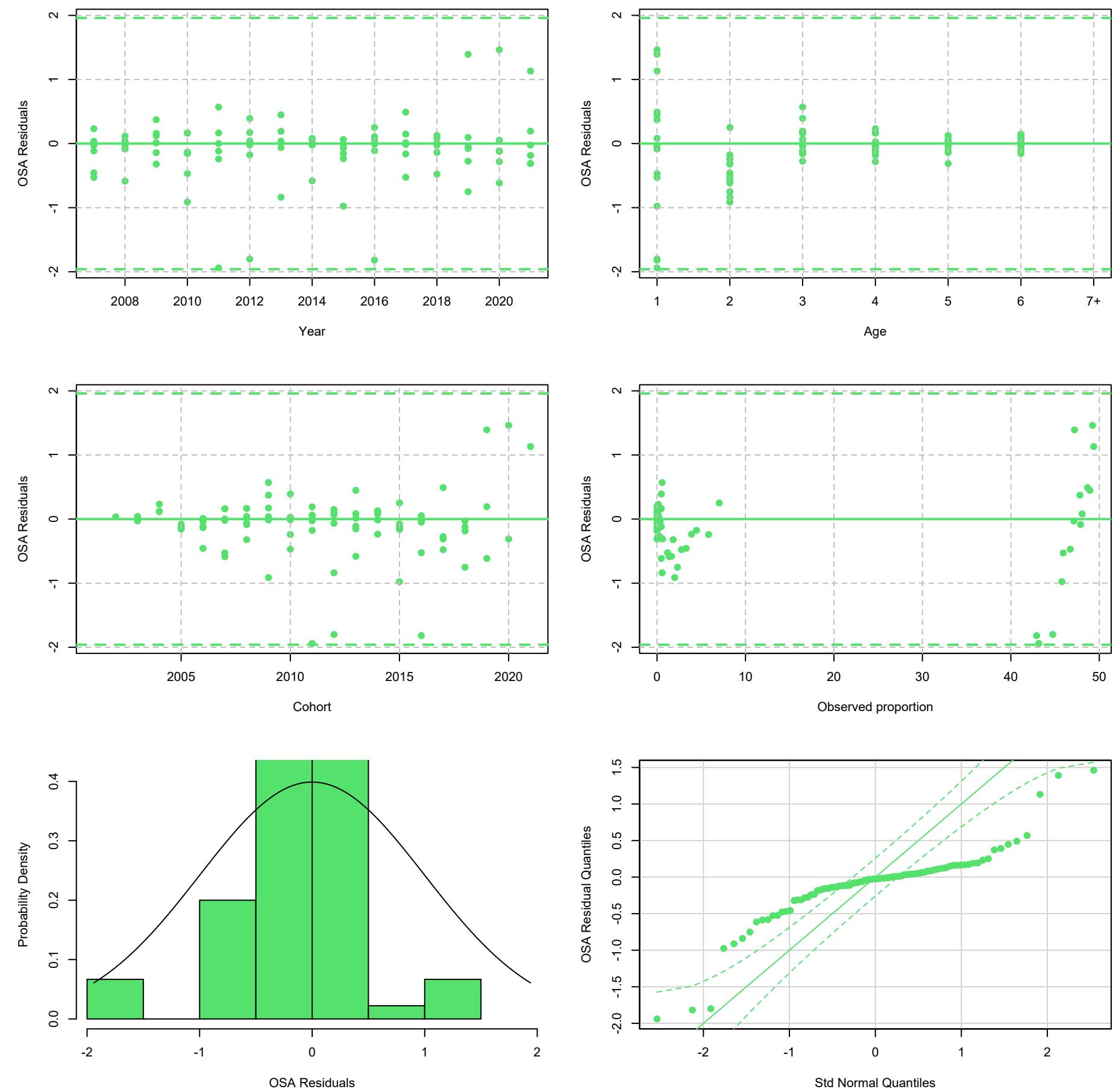
age composition OSA residual diagnostics: Index 2



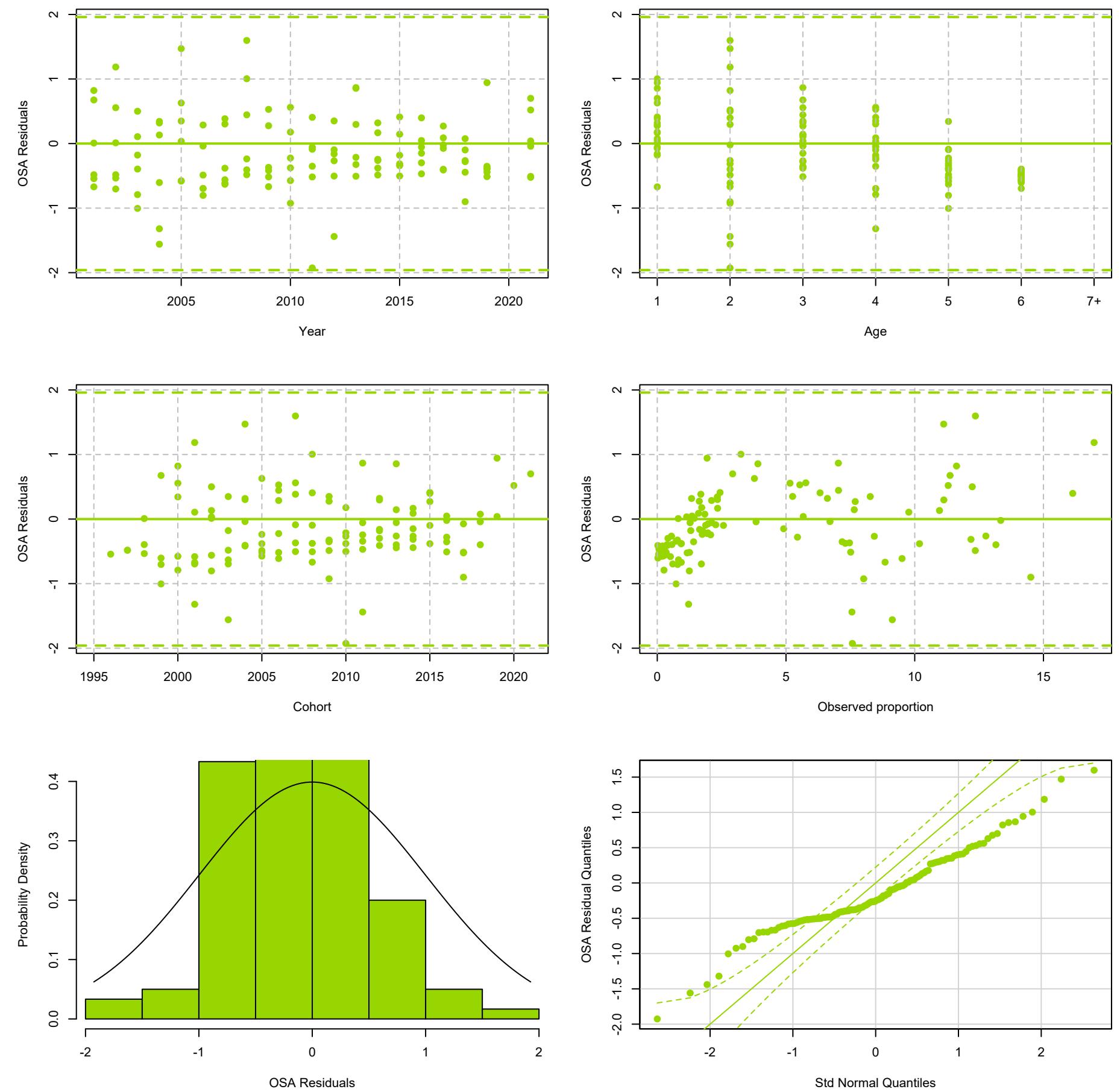
age composition OSA residual diagnostics: Index 3



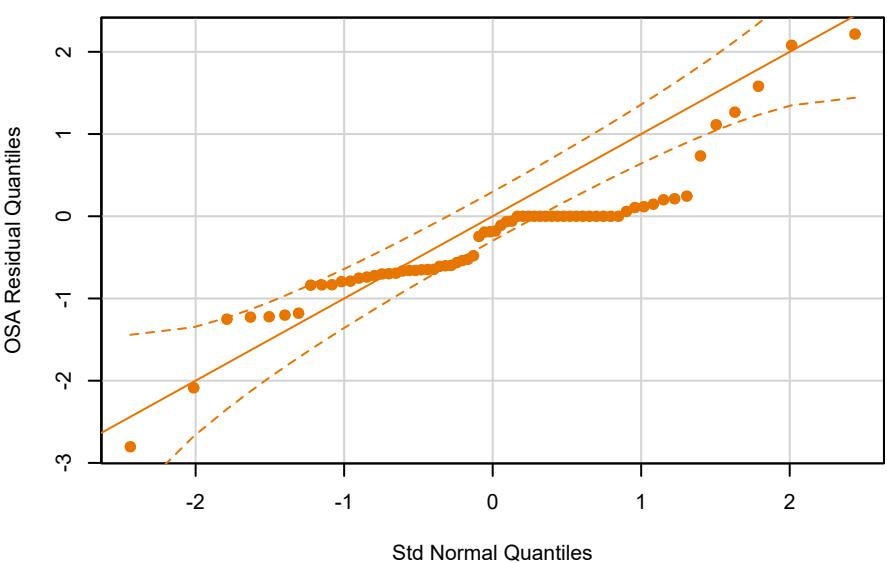
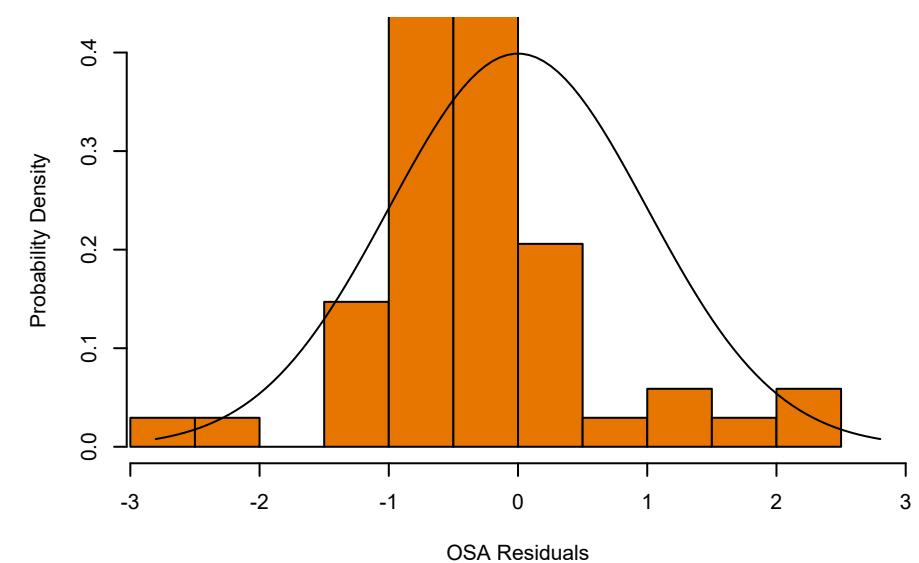
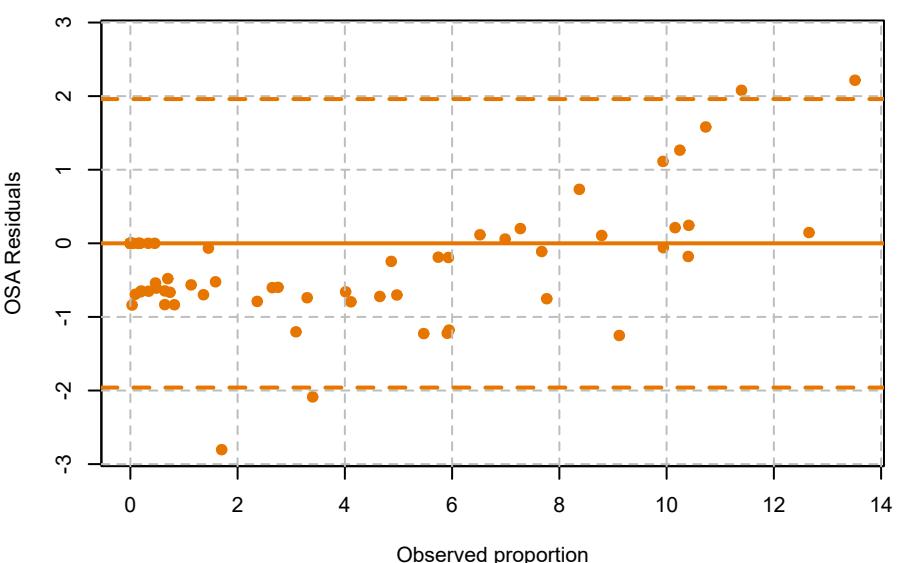
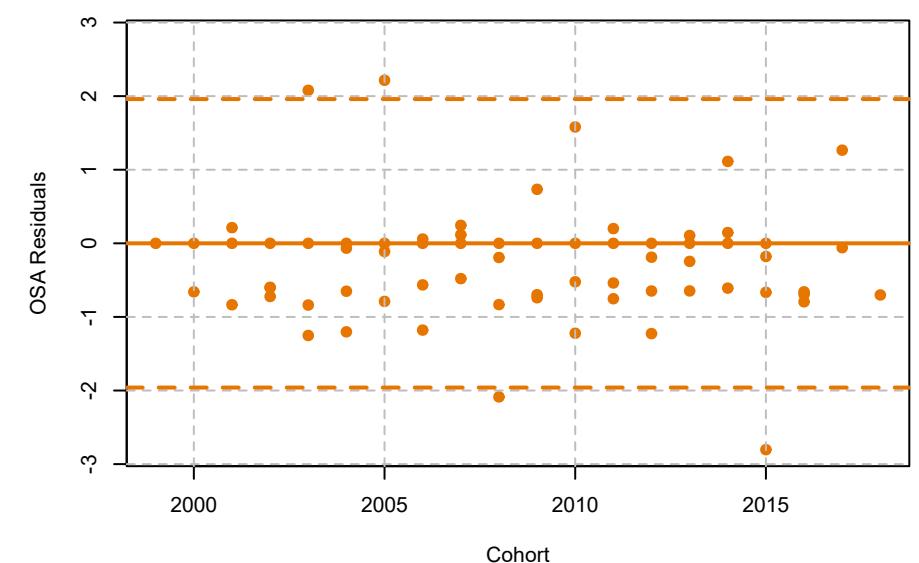
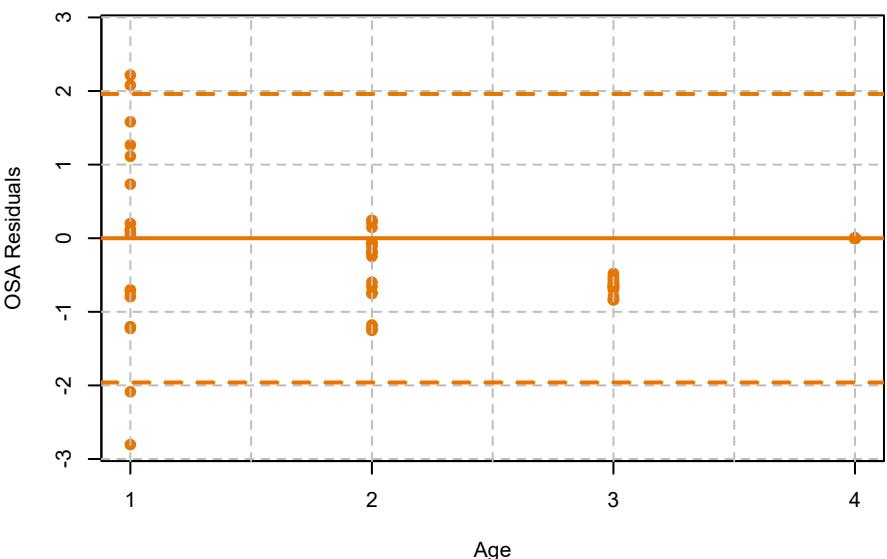
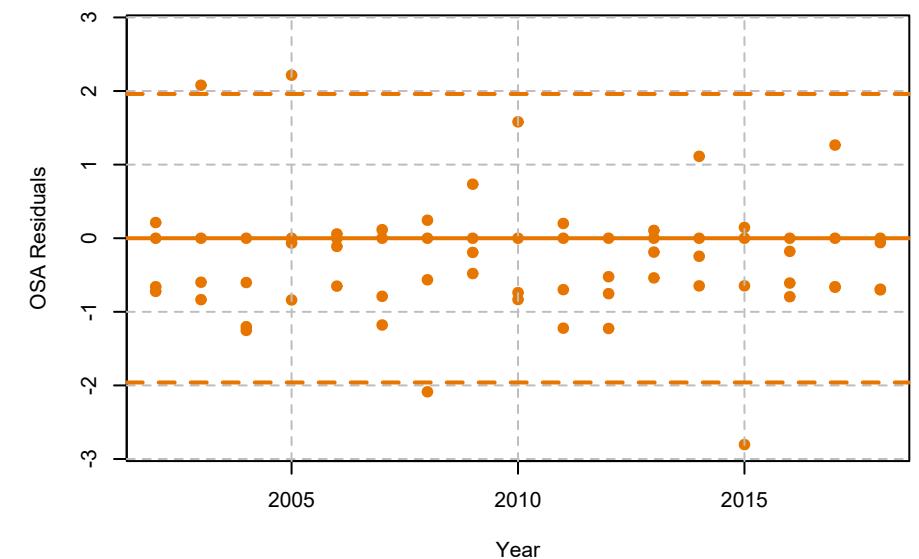
age composition OSA residual diagnostics: Index 4

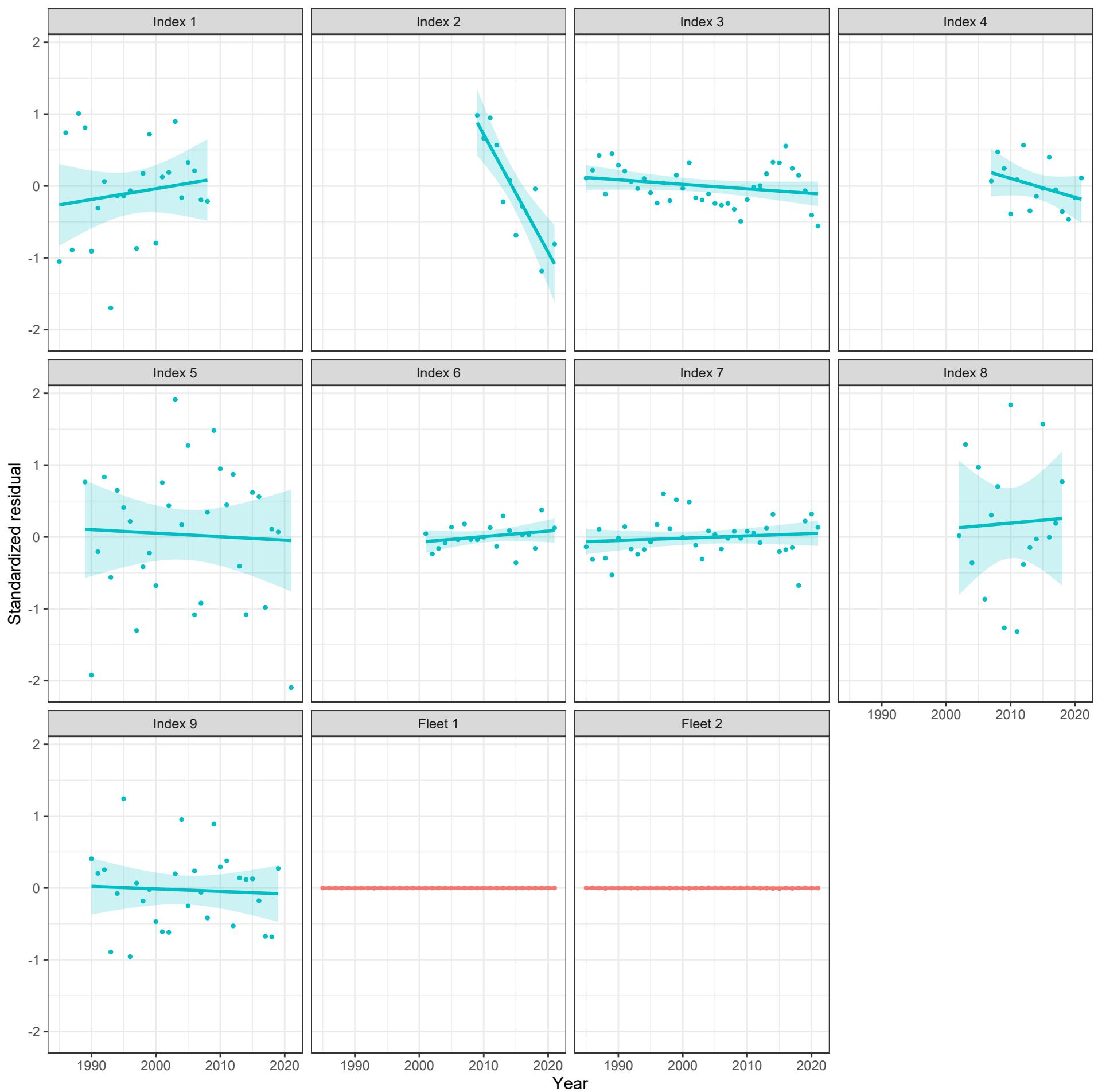


age composition OSA residual diagnostics: Index 6



age composition OSA residual diagnostics: Index 8



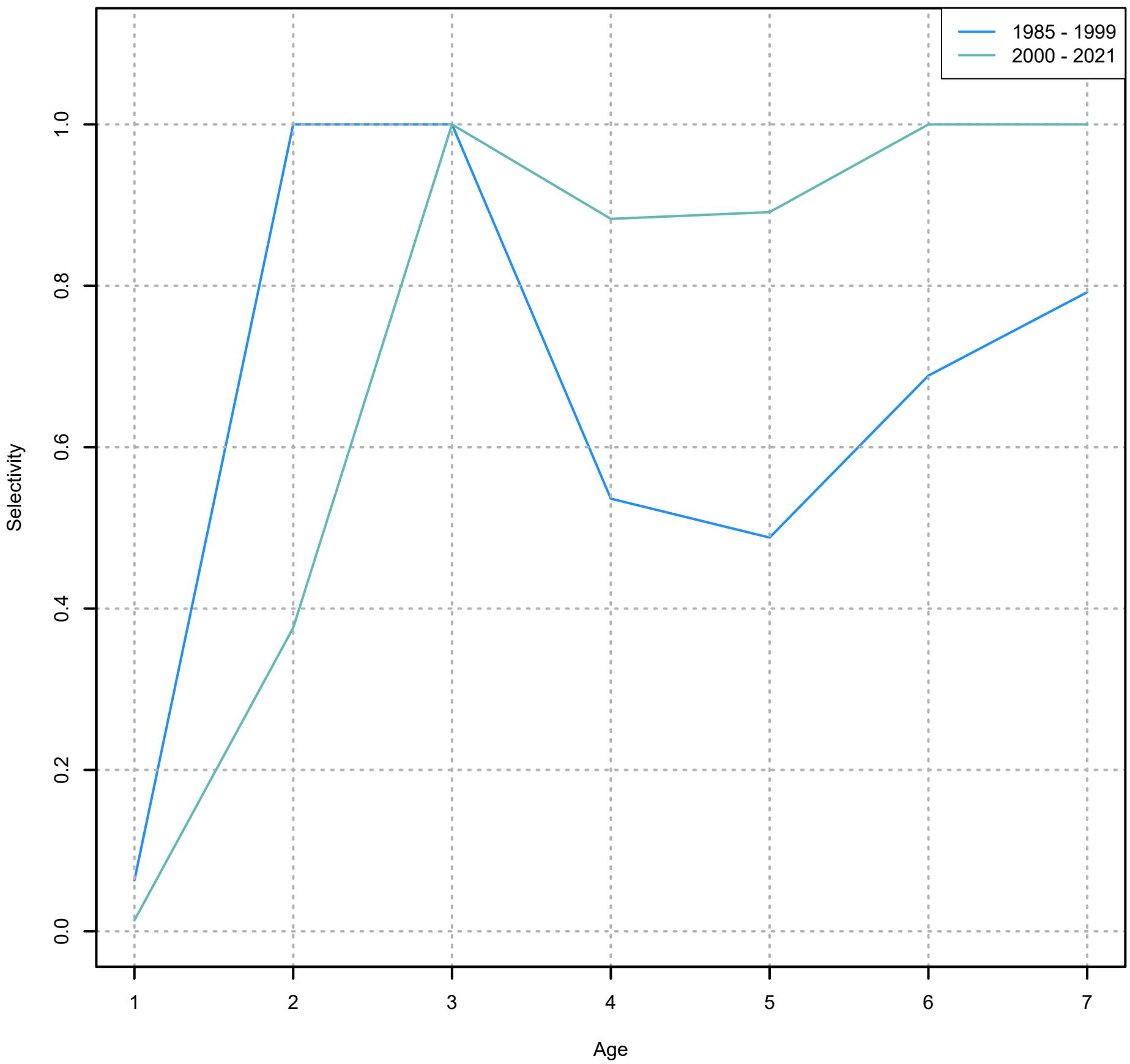


BF28W_M7: FINAL MODEL

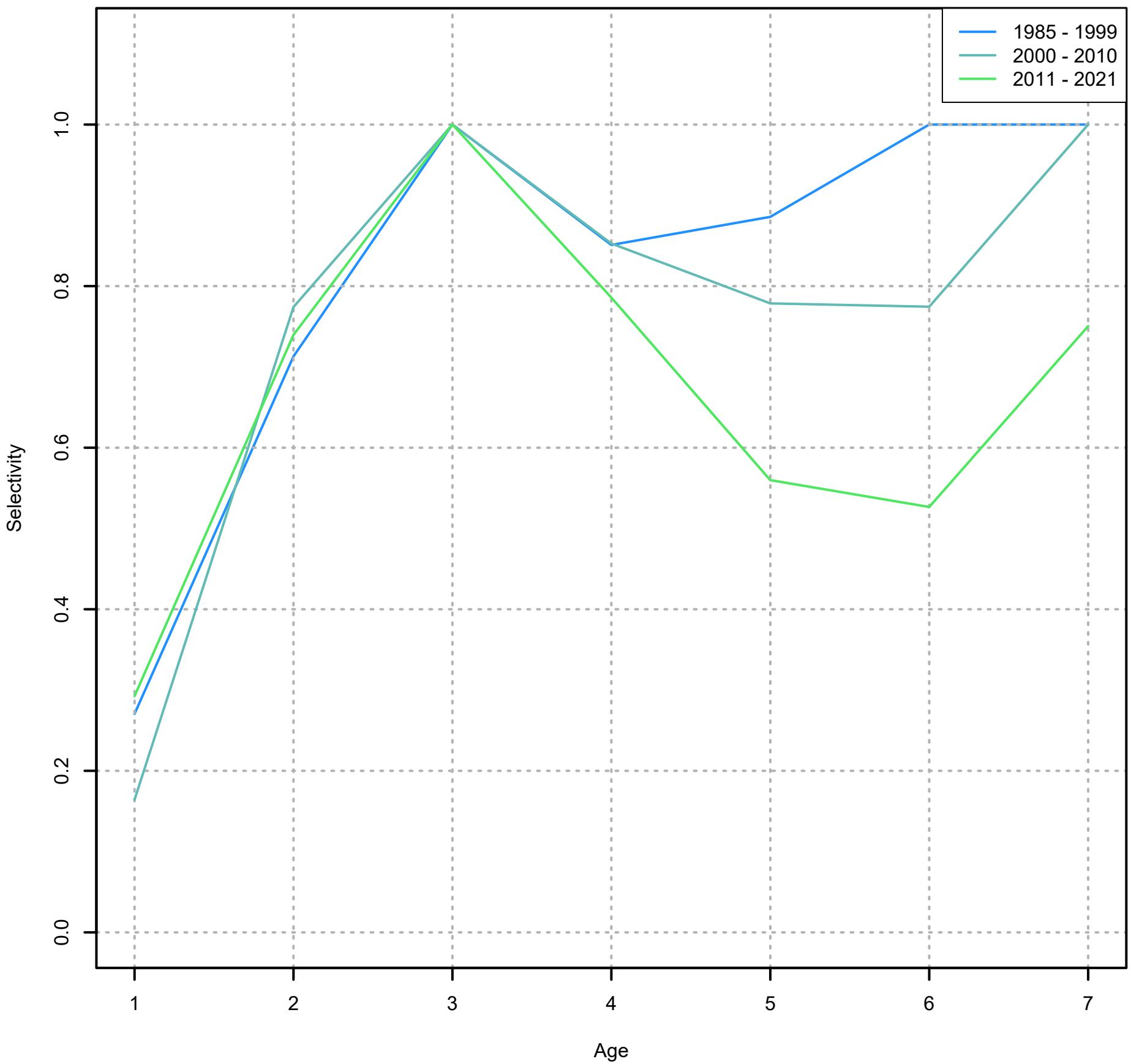
Final bluefish model with NAA transitions modeled as random effects correlated by age and year

RESULTS PLOTS

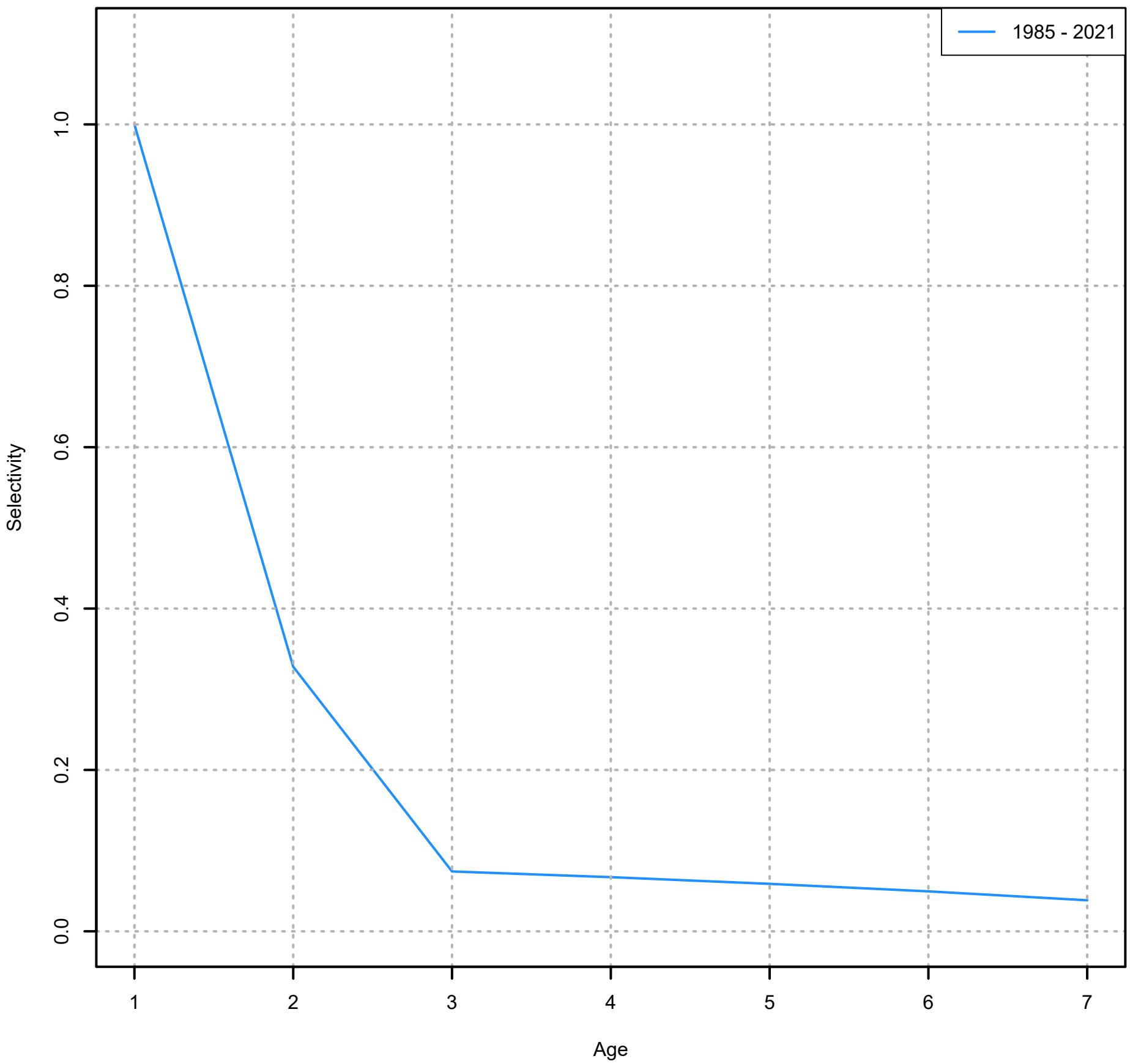
Fleet 1



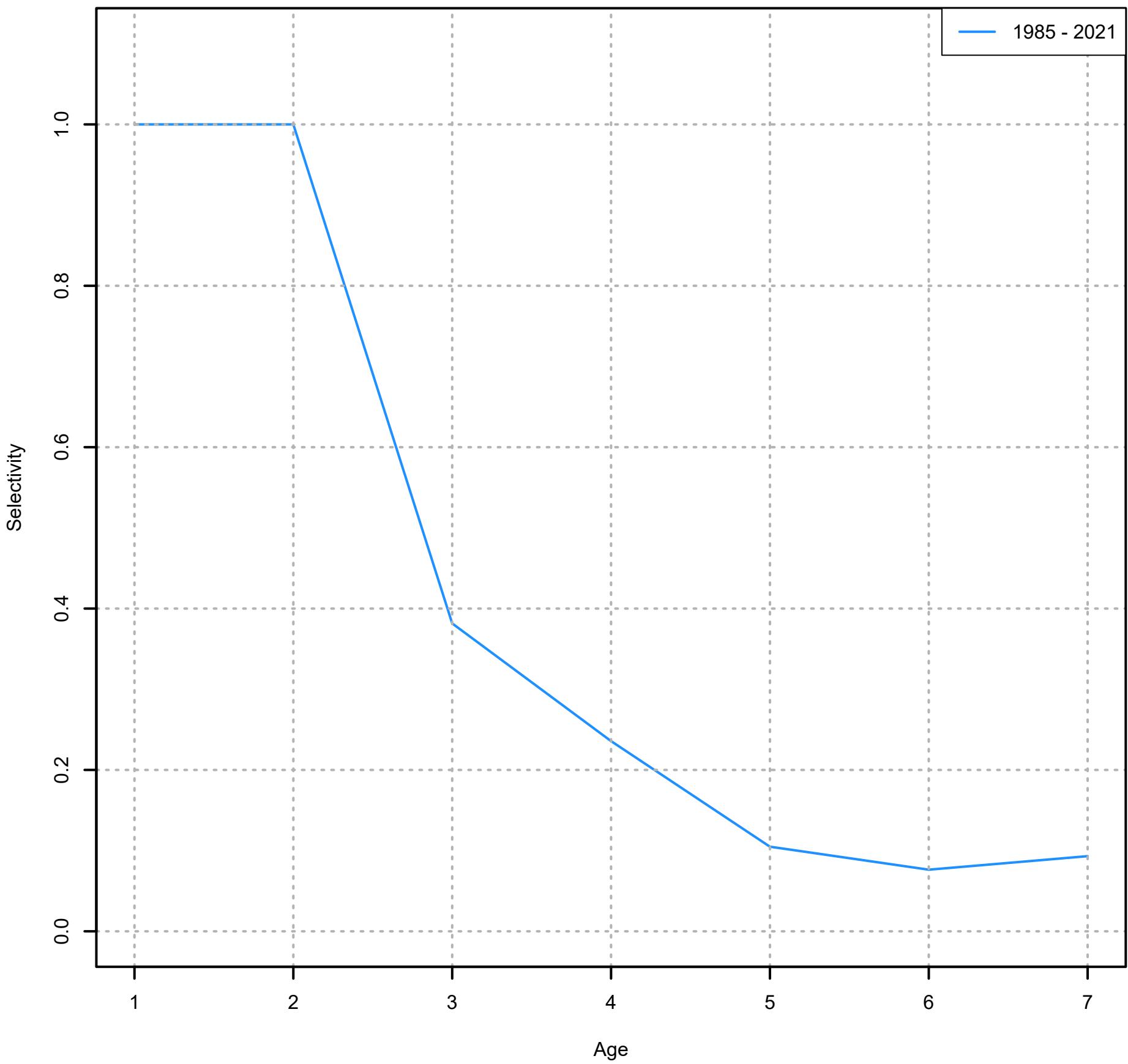
Fleet 2



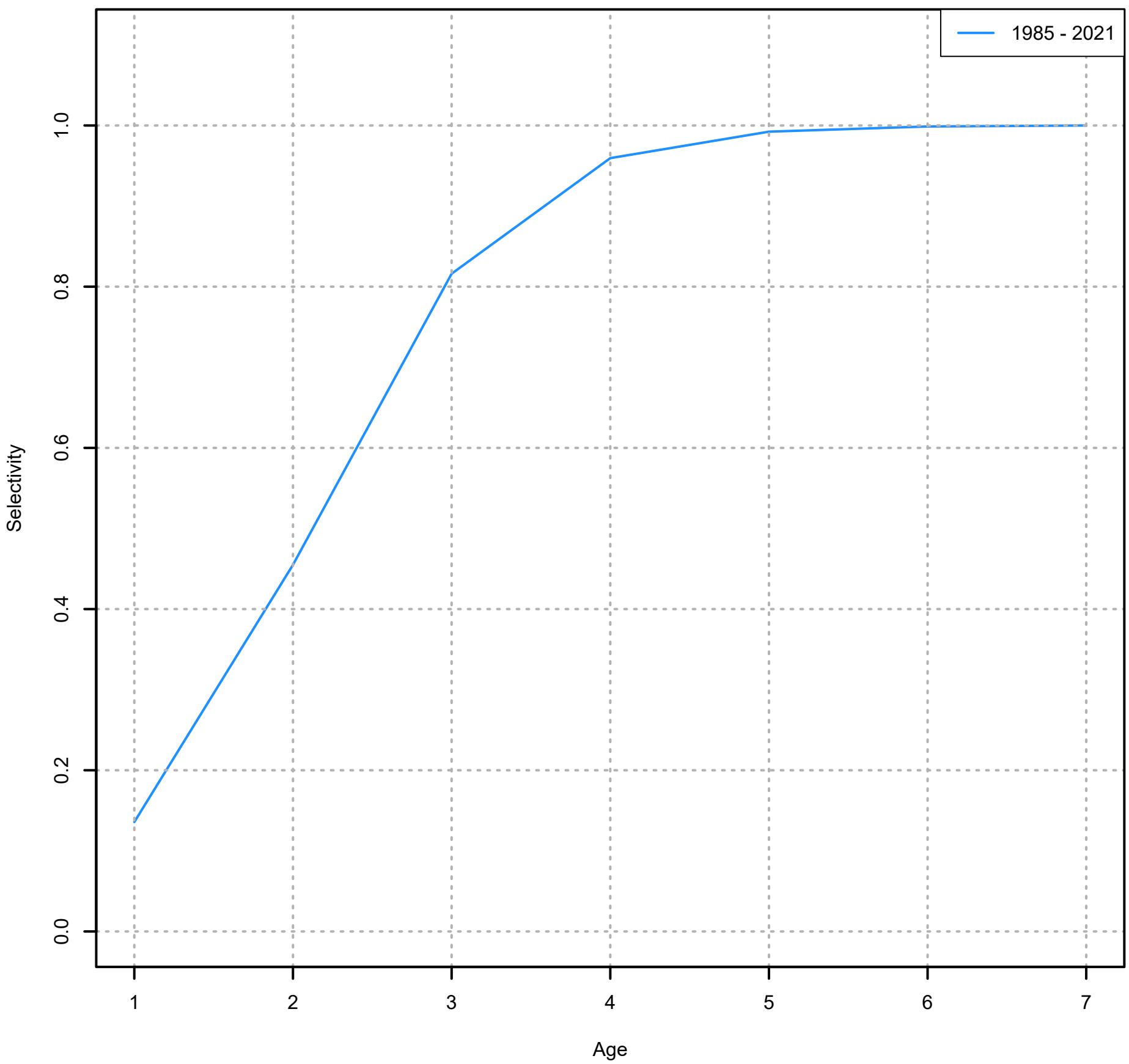
Index 1



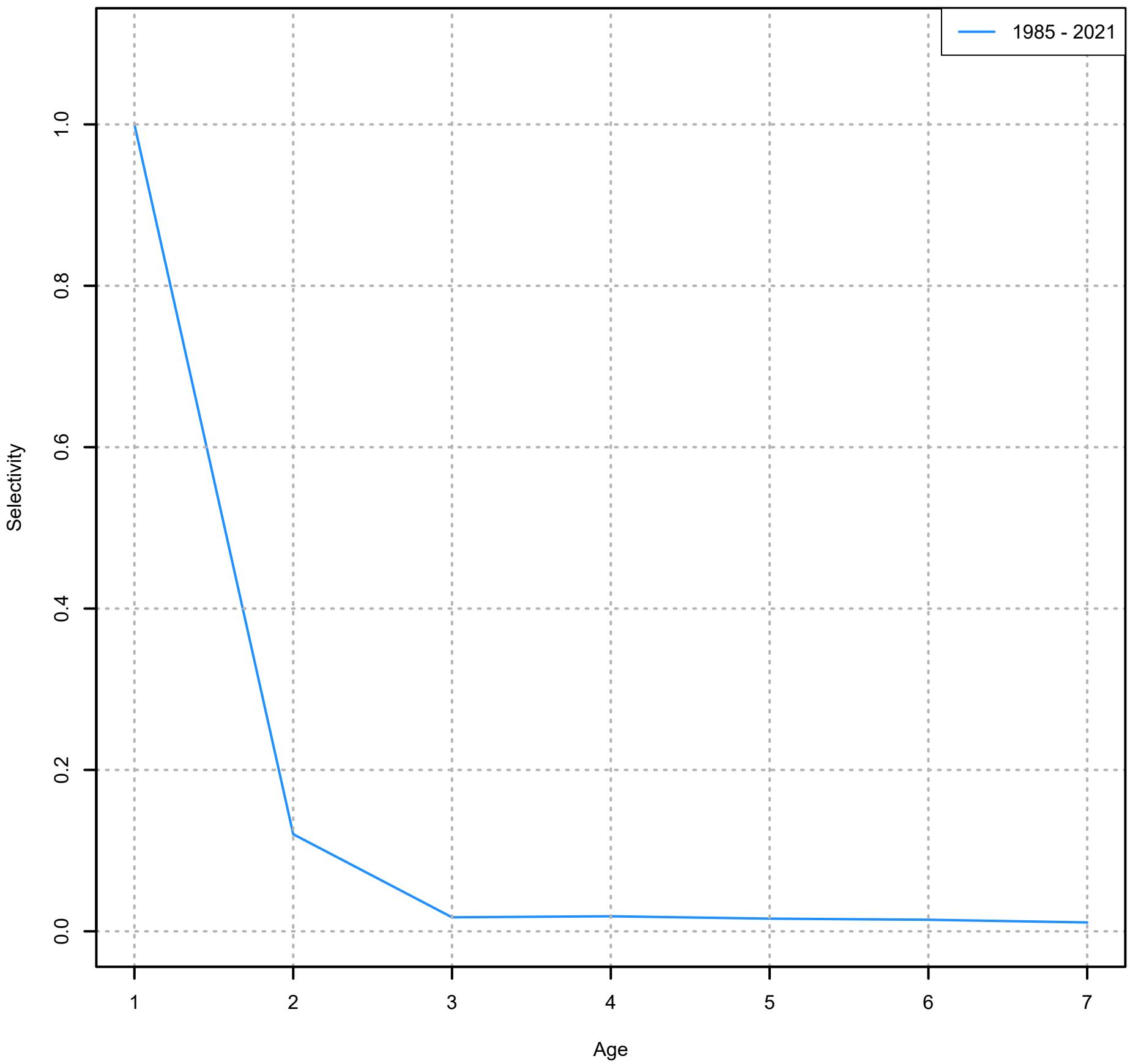
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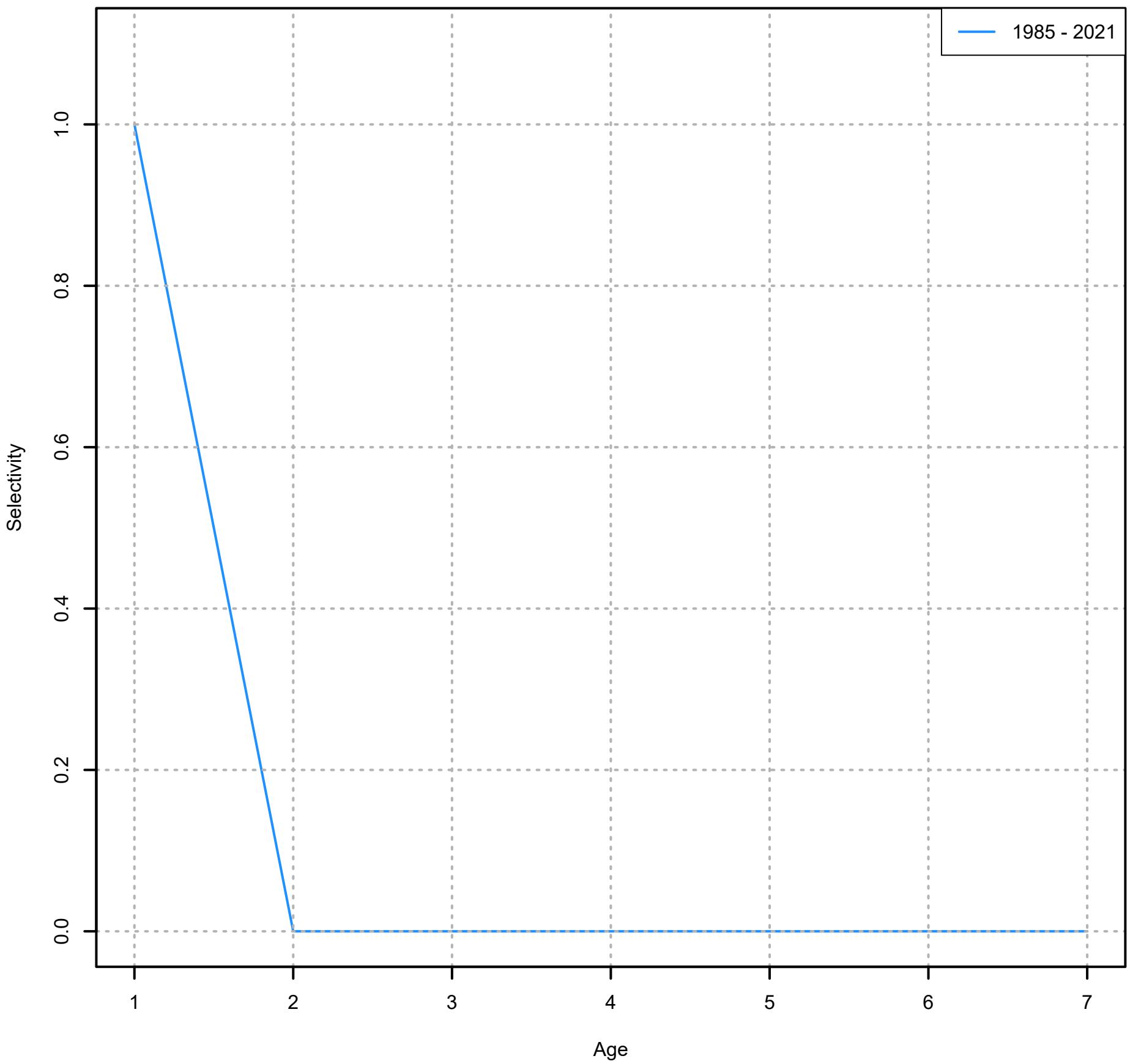
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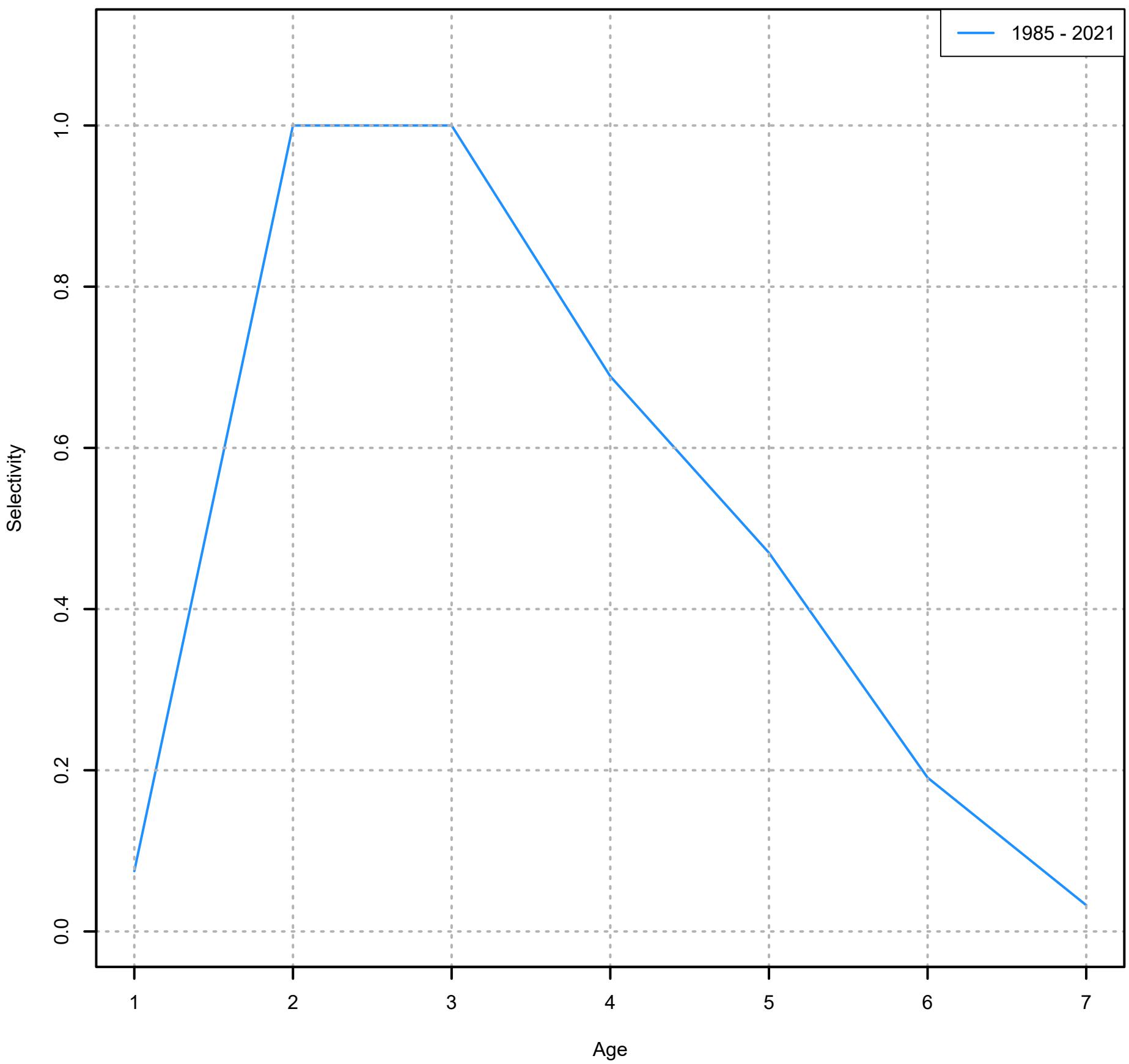
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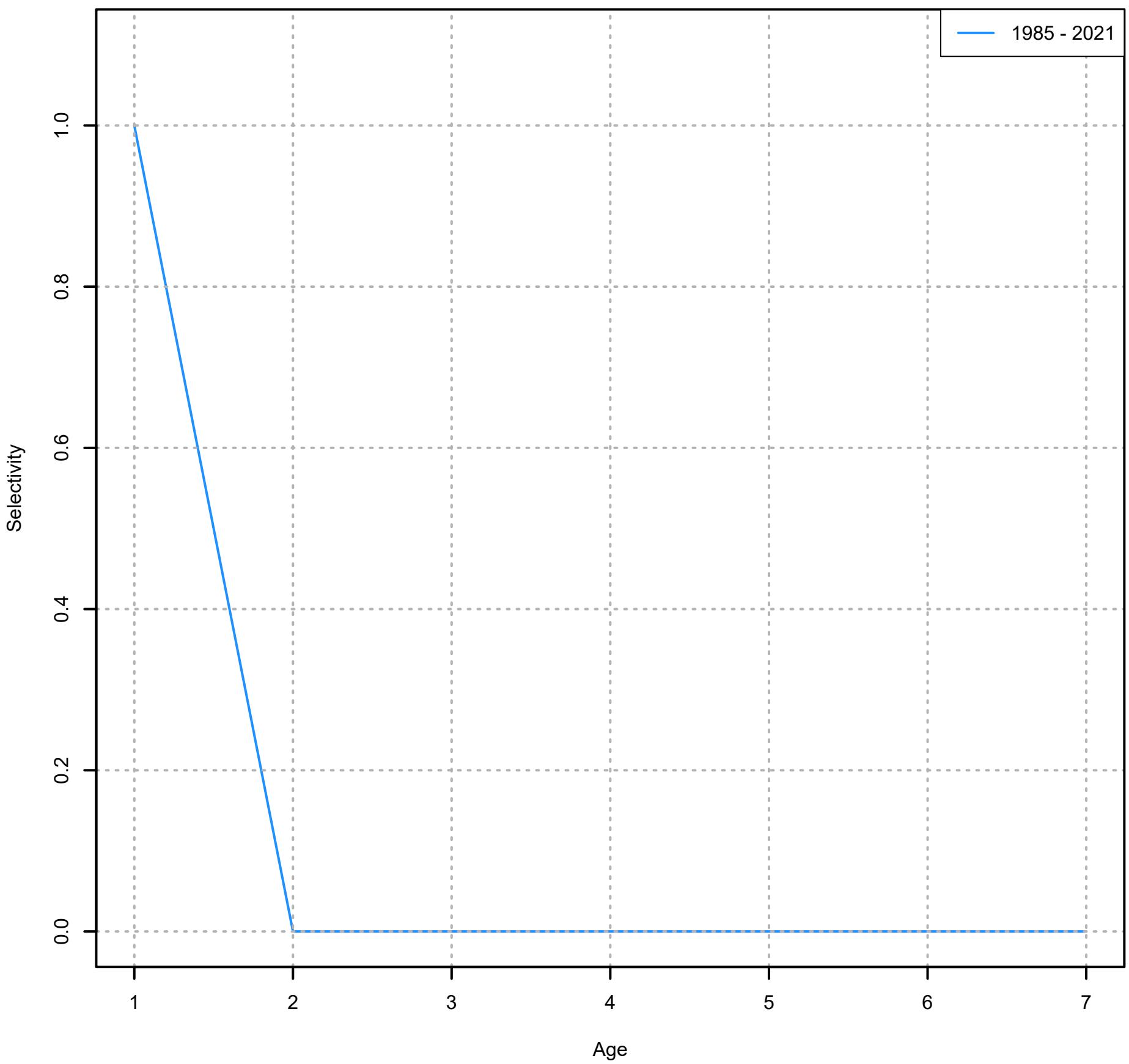
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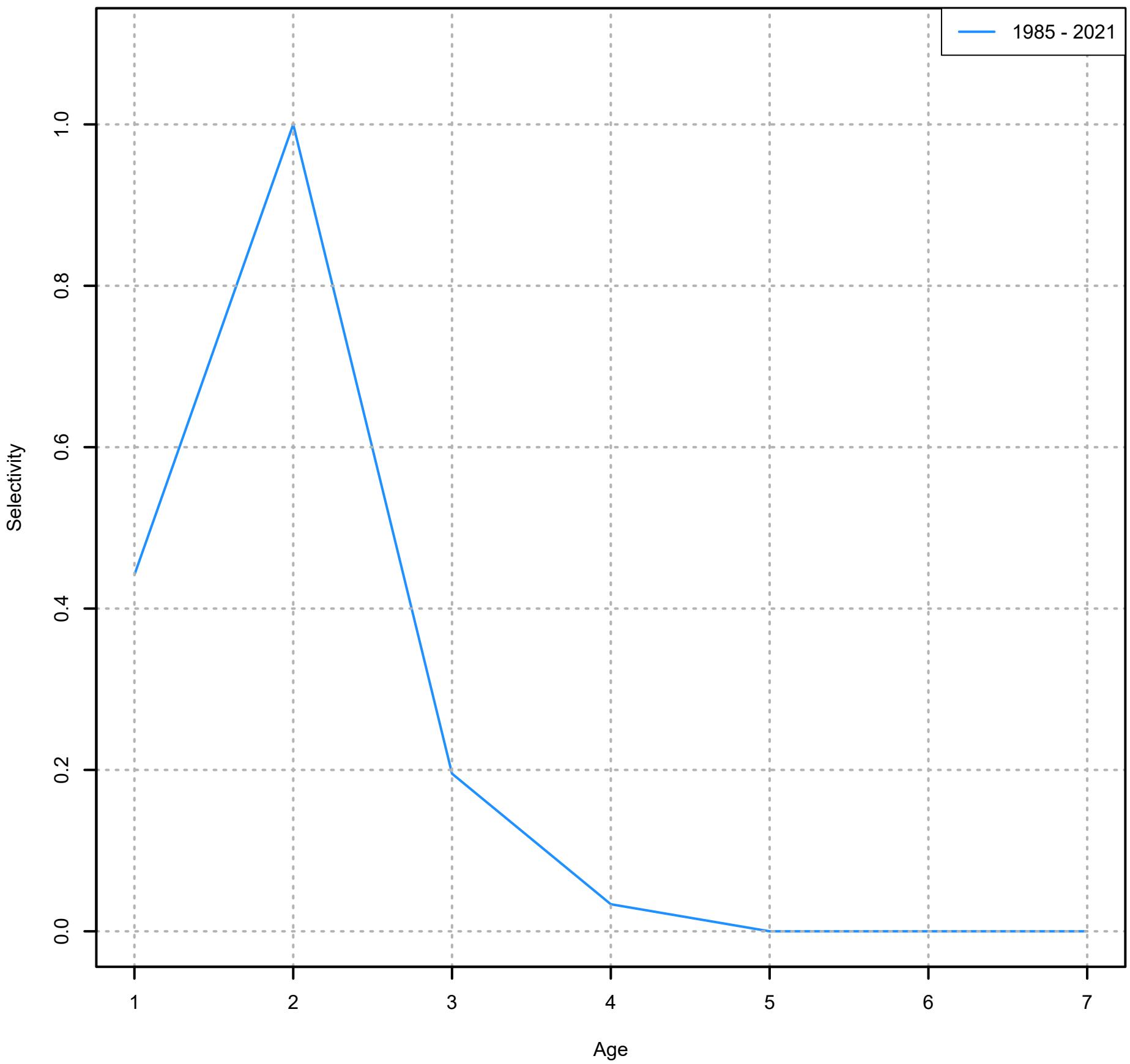
Index 6



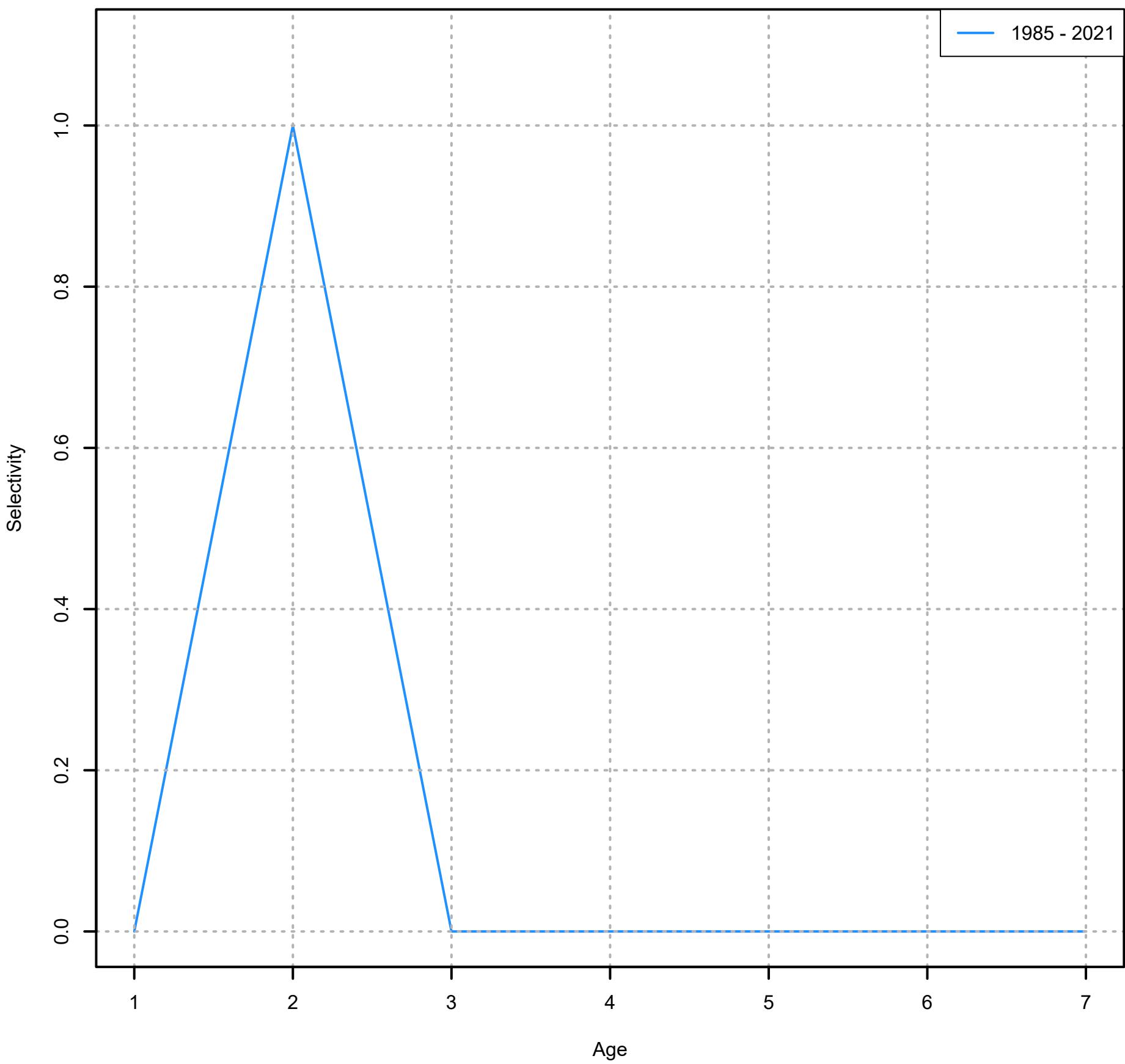
Index 7



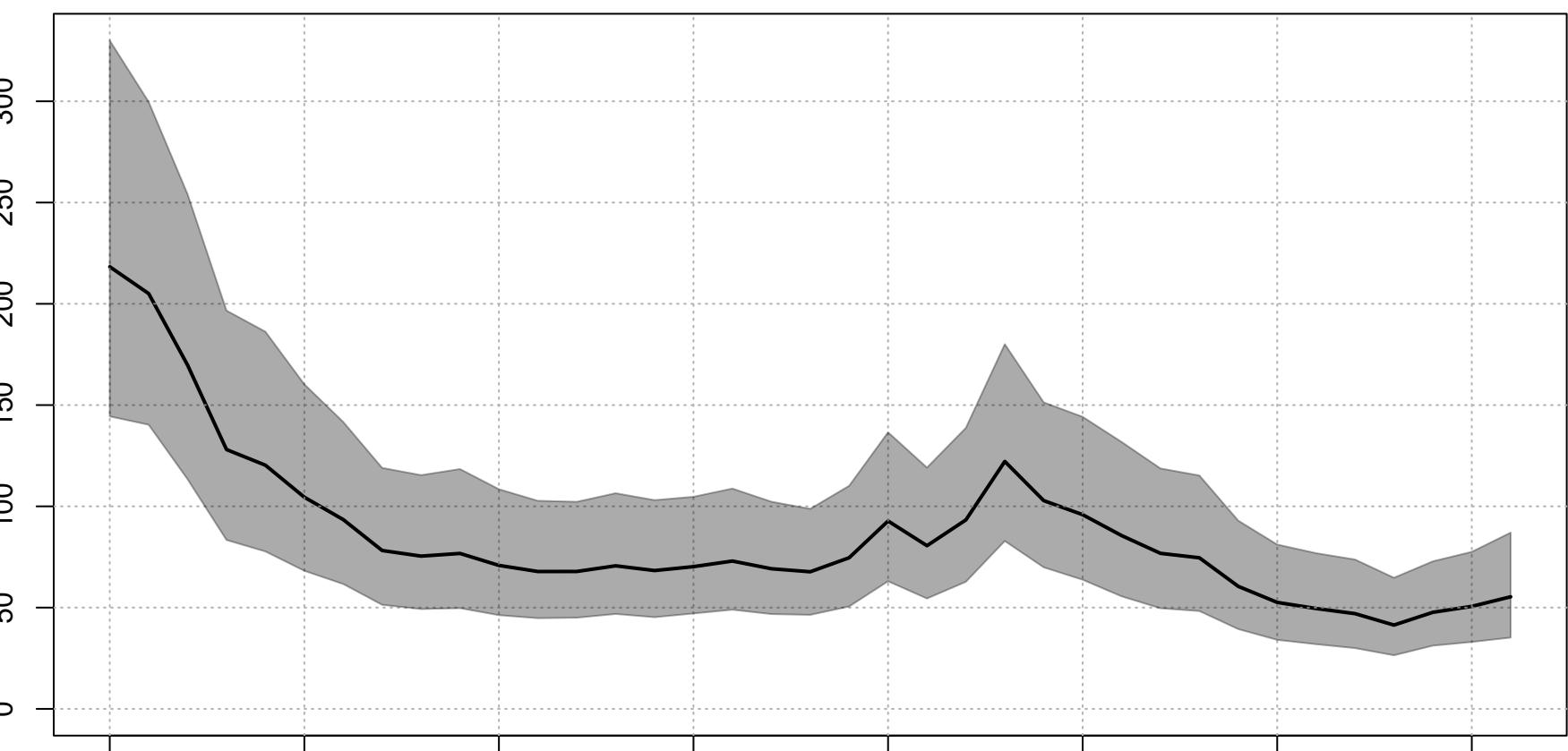
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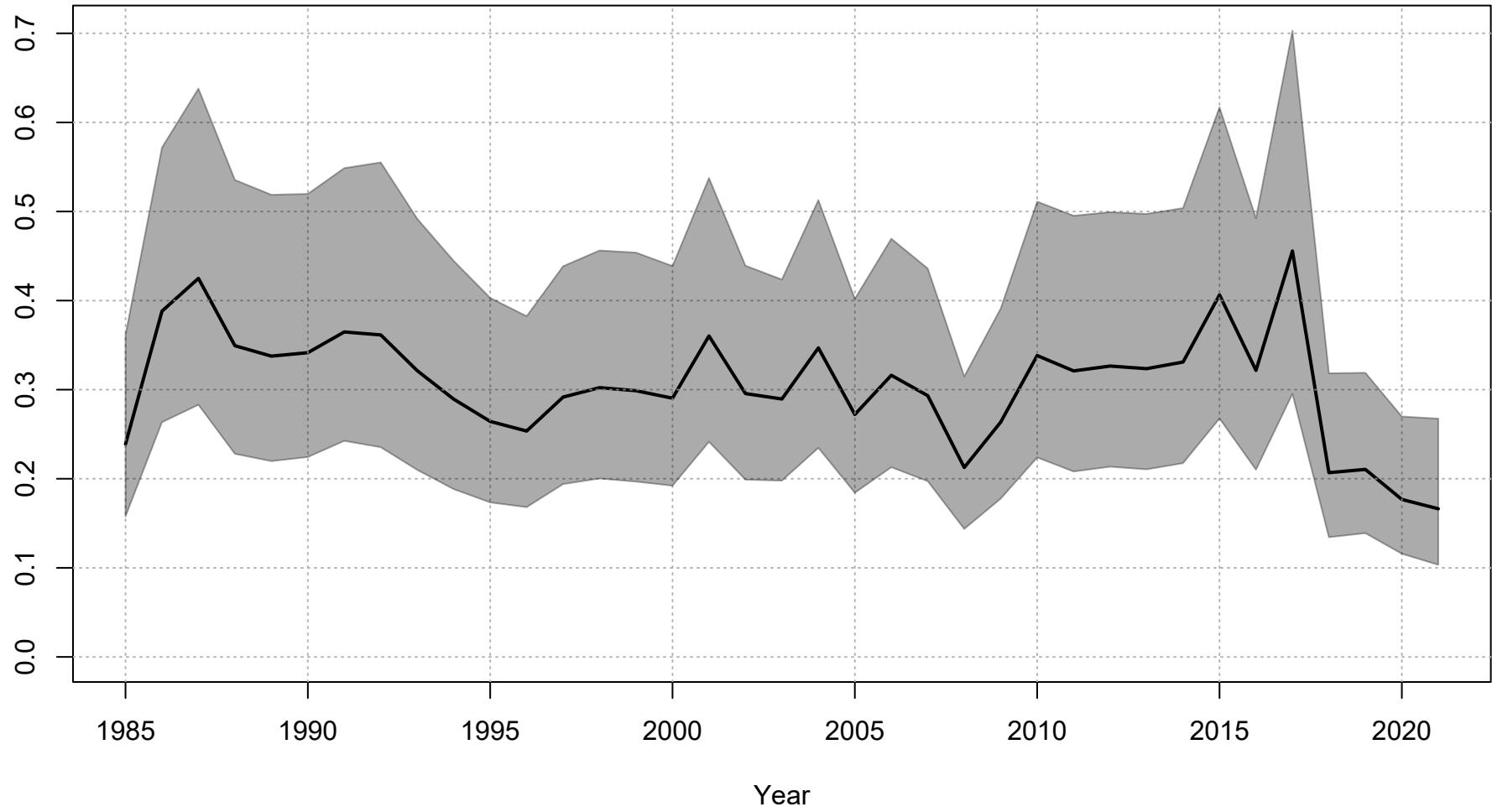
Index 9

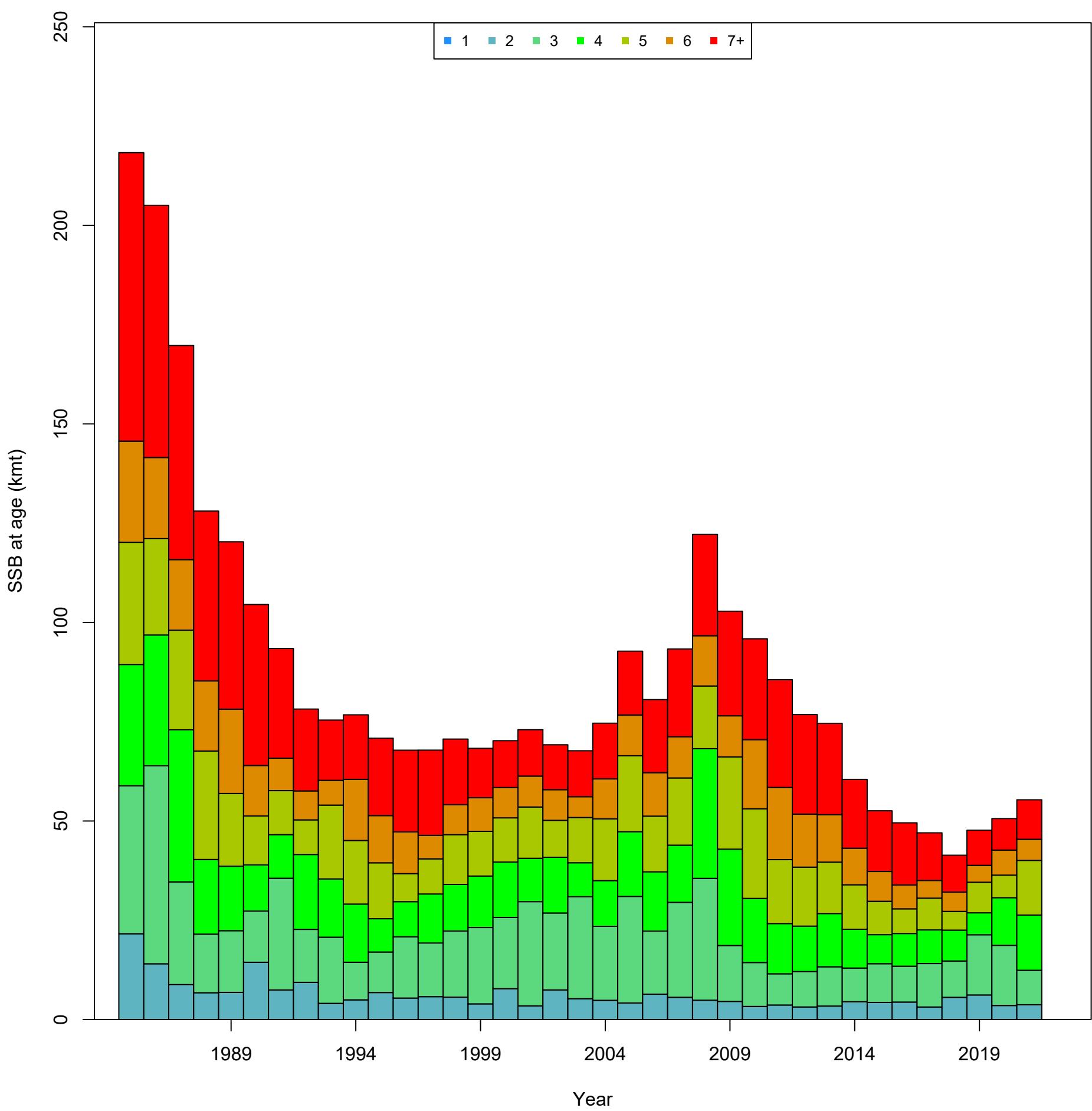


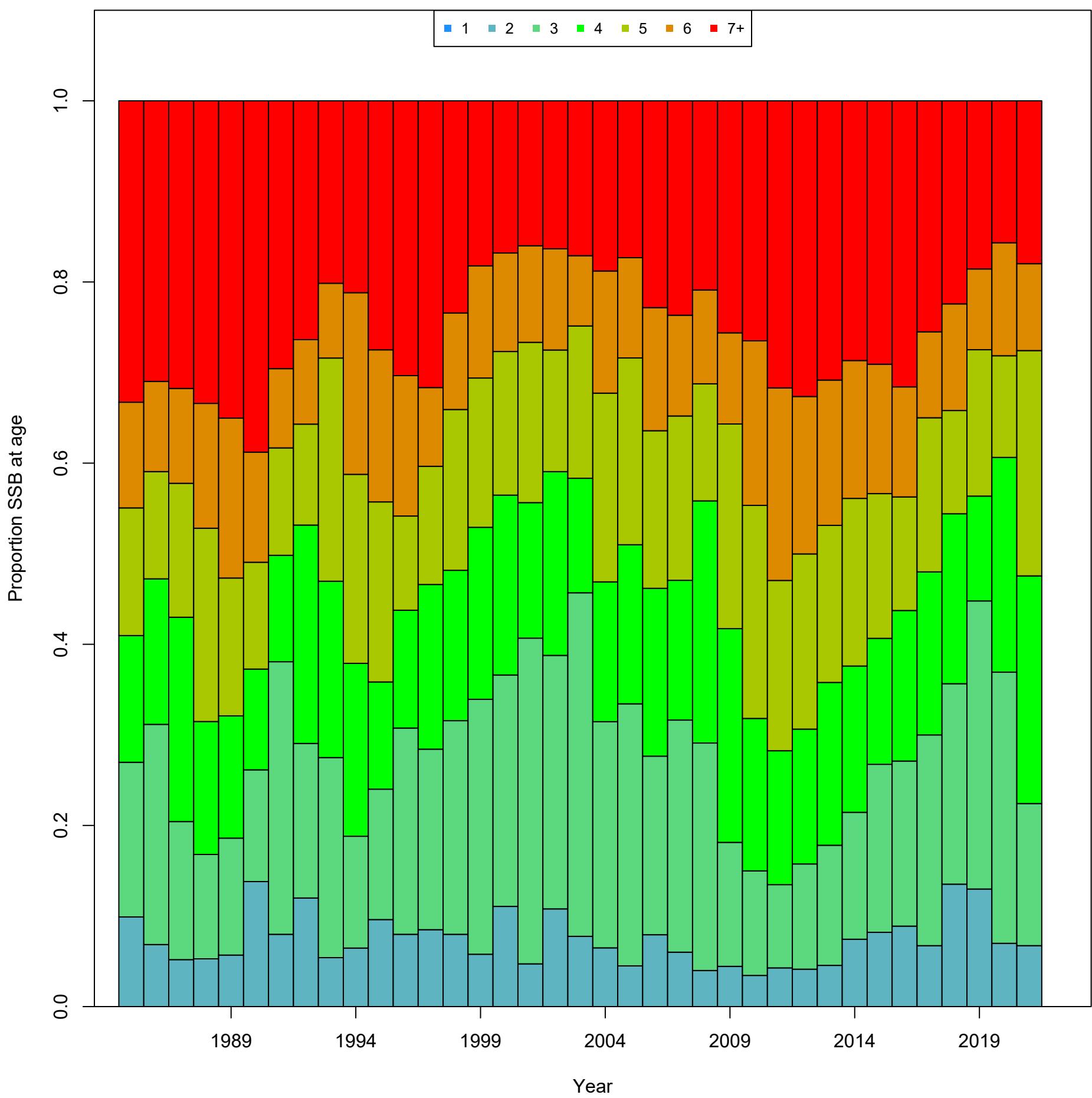
SSB (kmt)

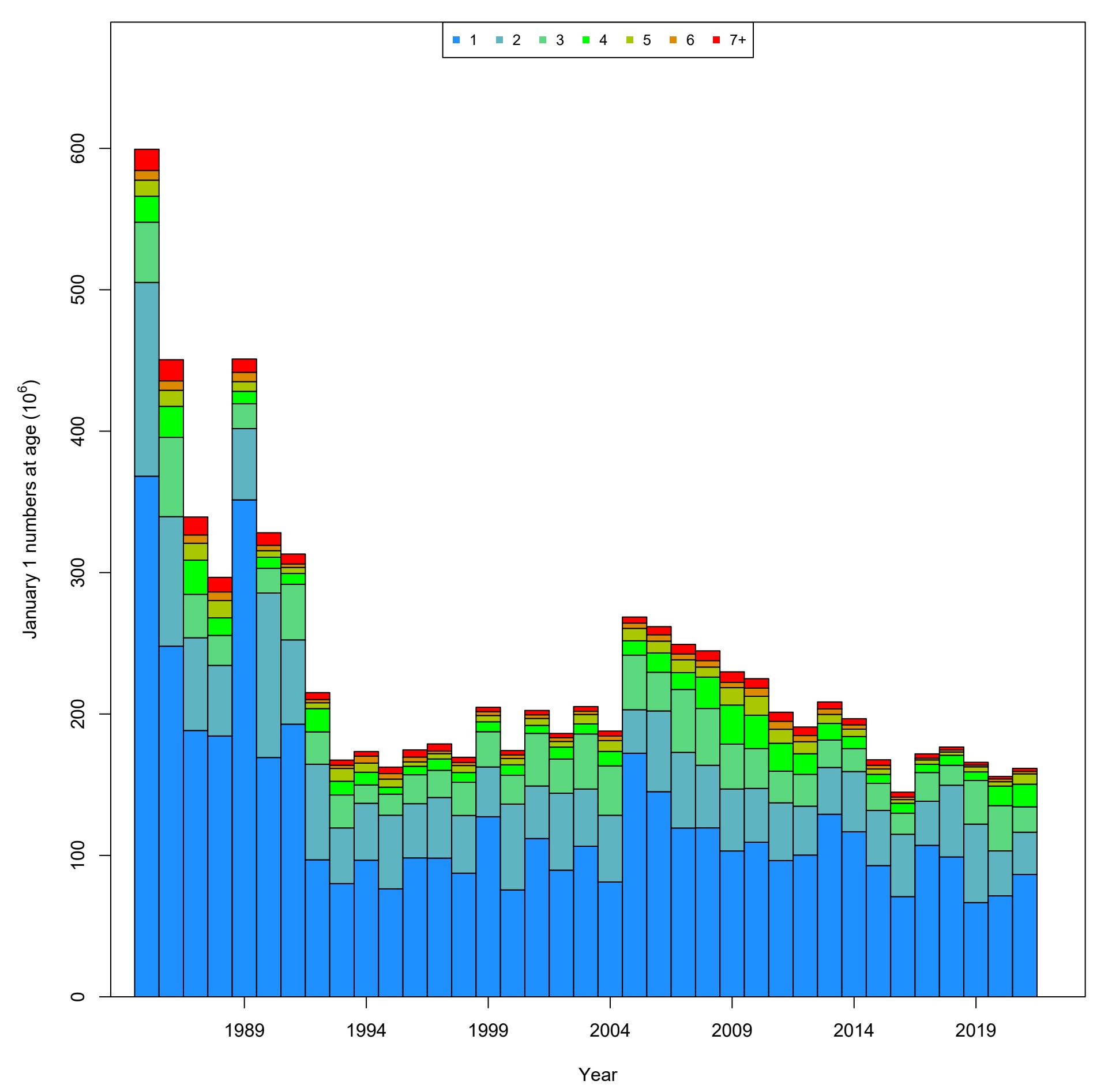


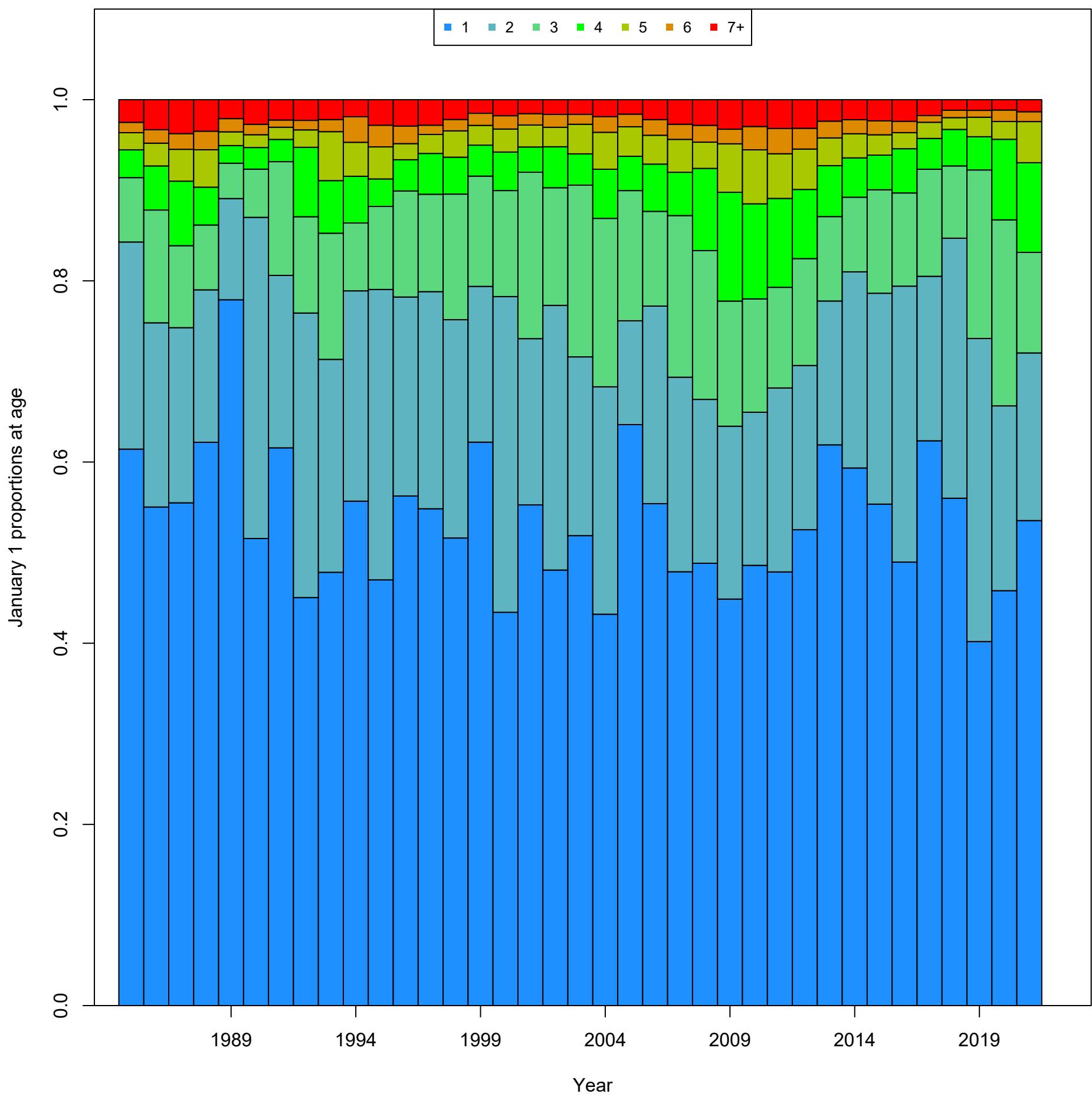
Fully-selected F

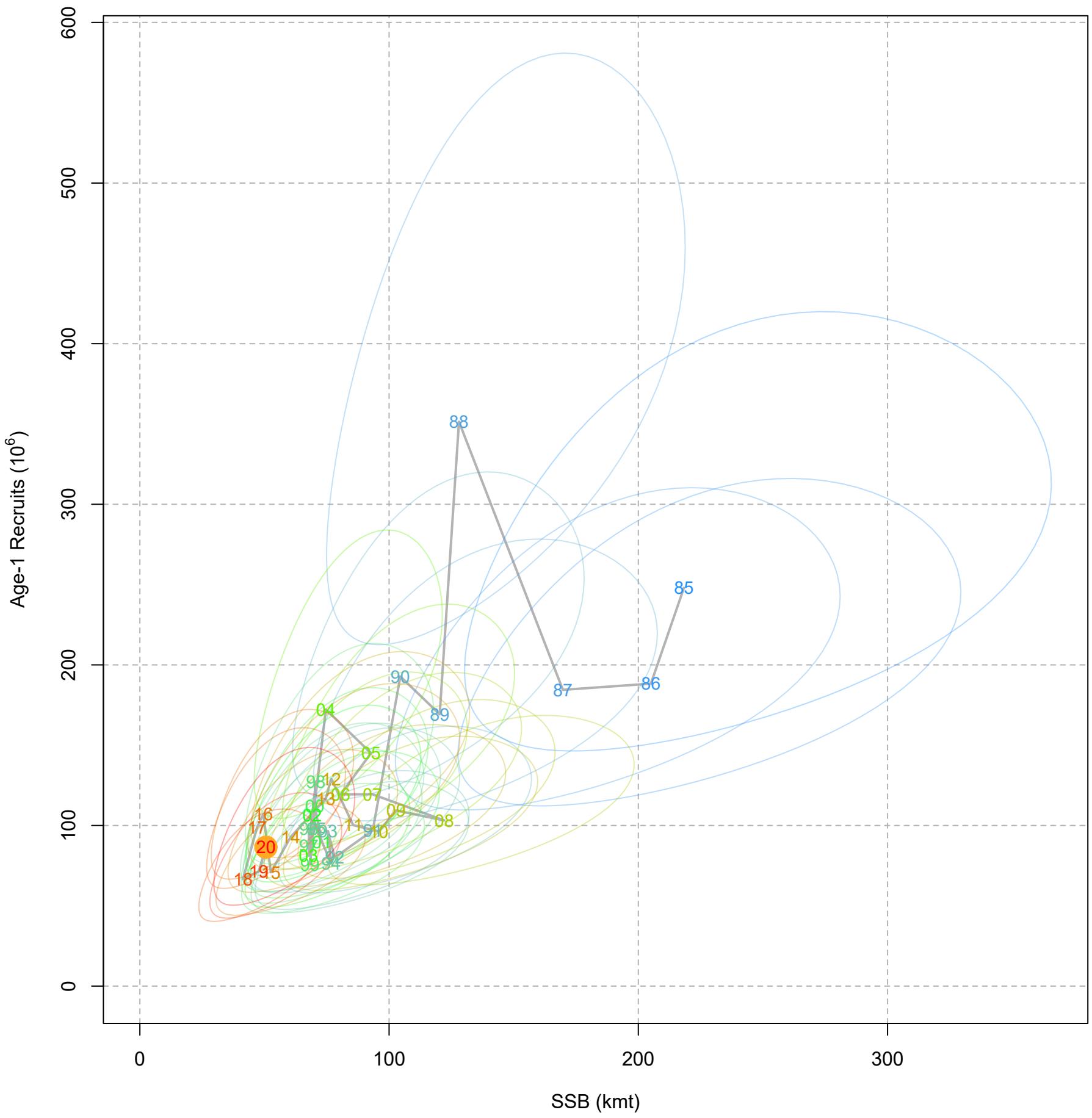


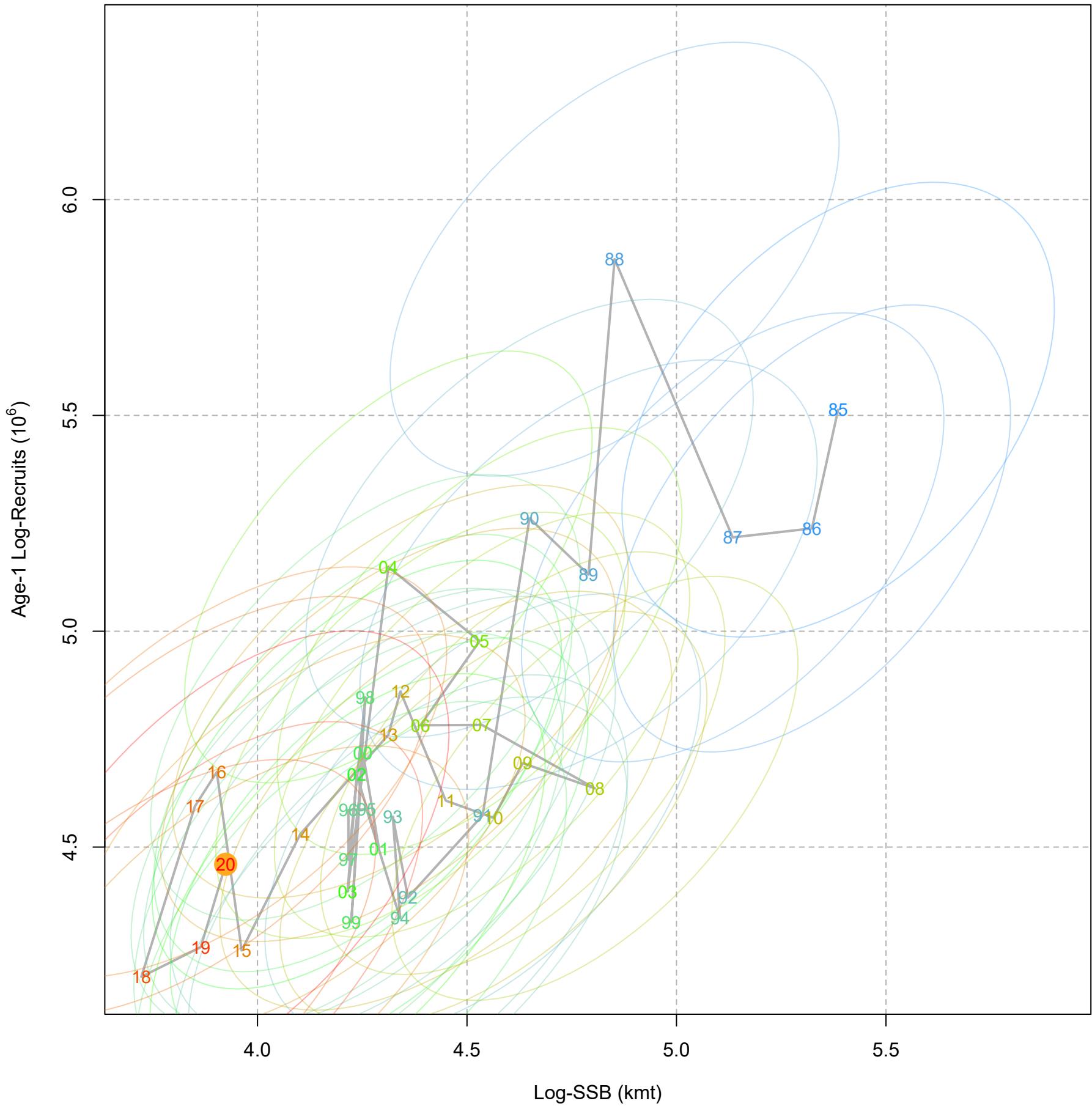


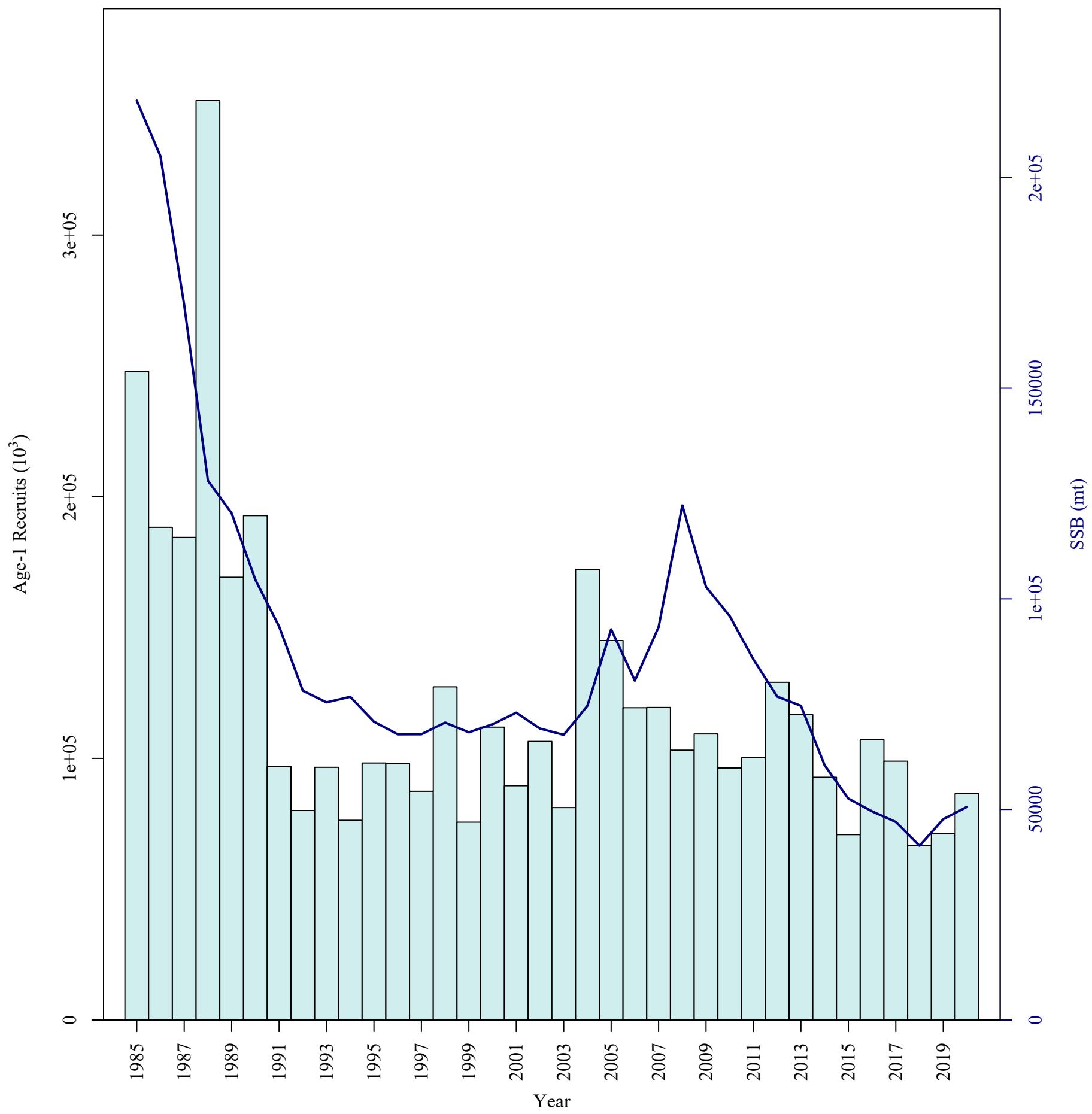


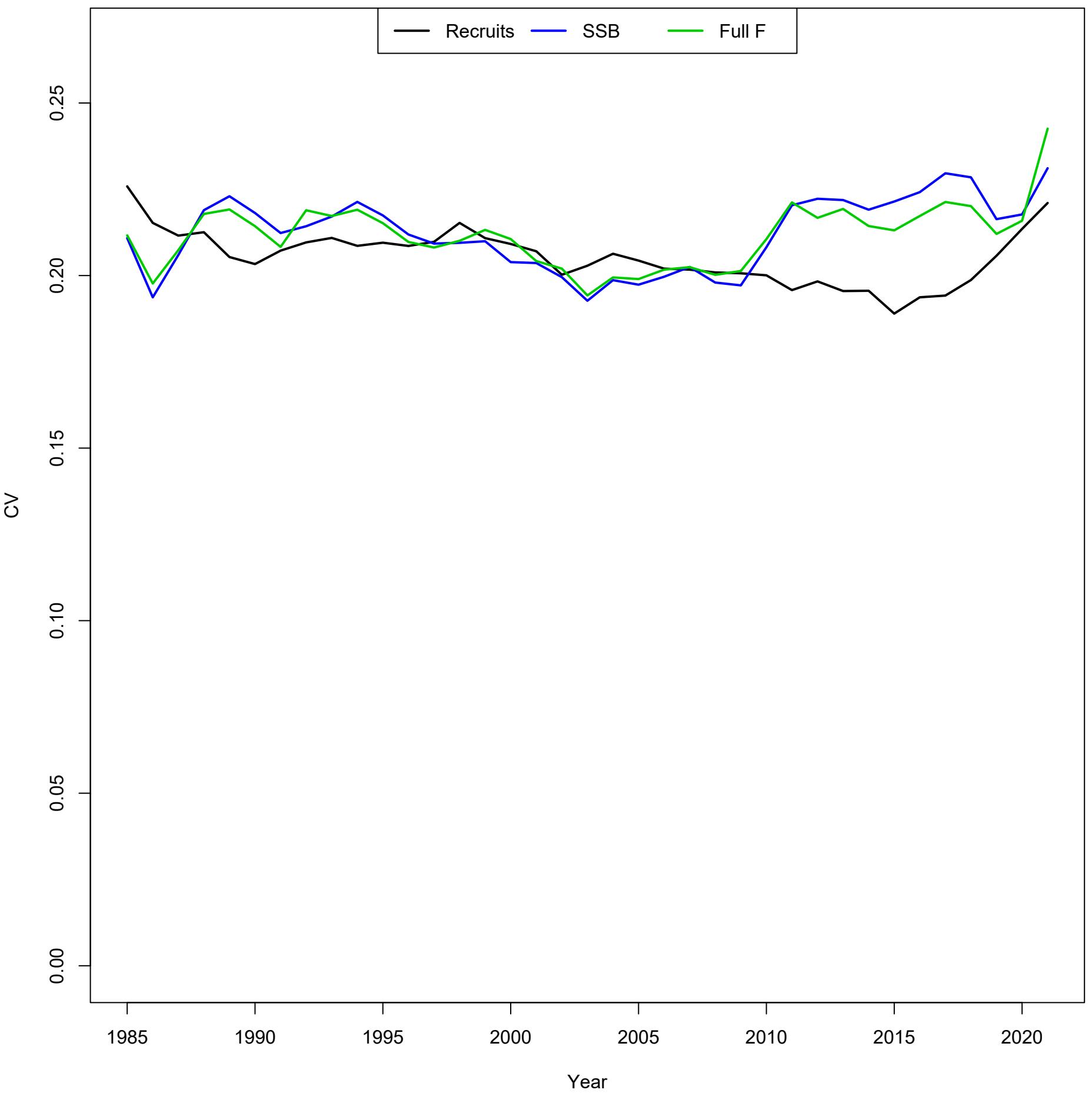


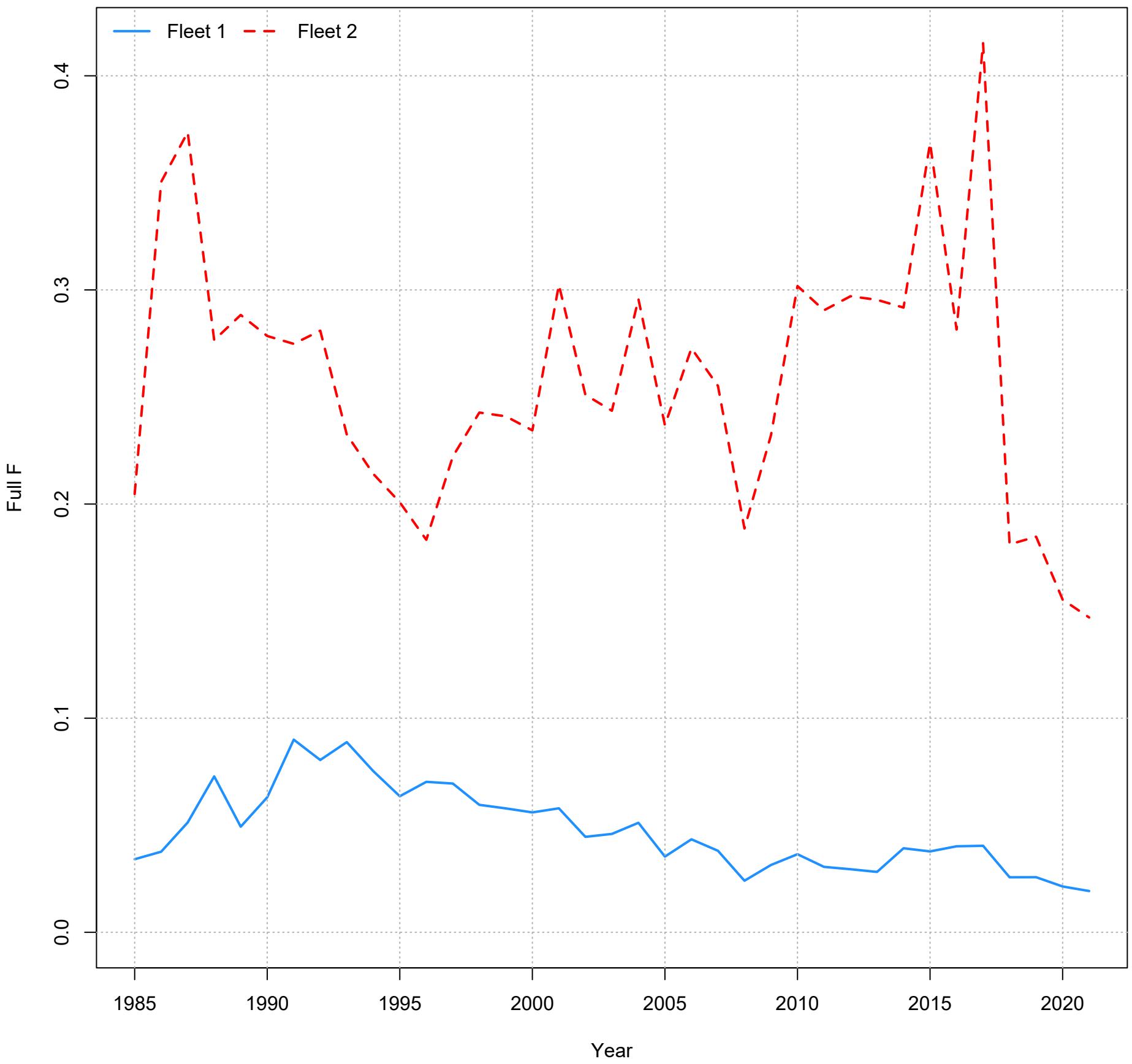


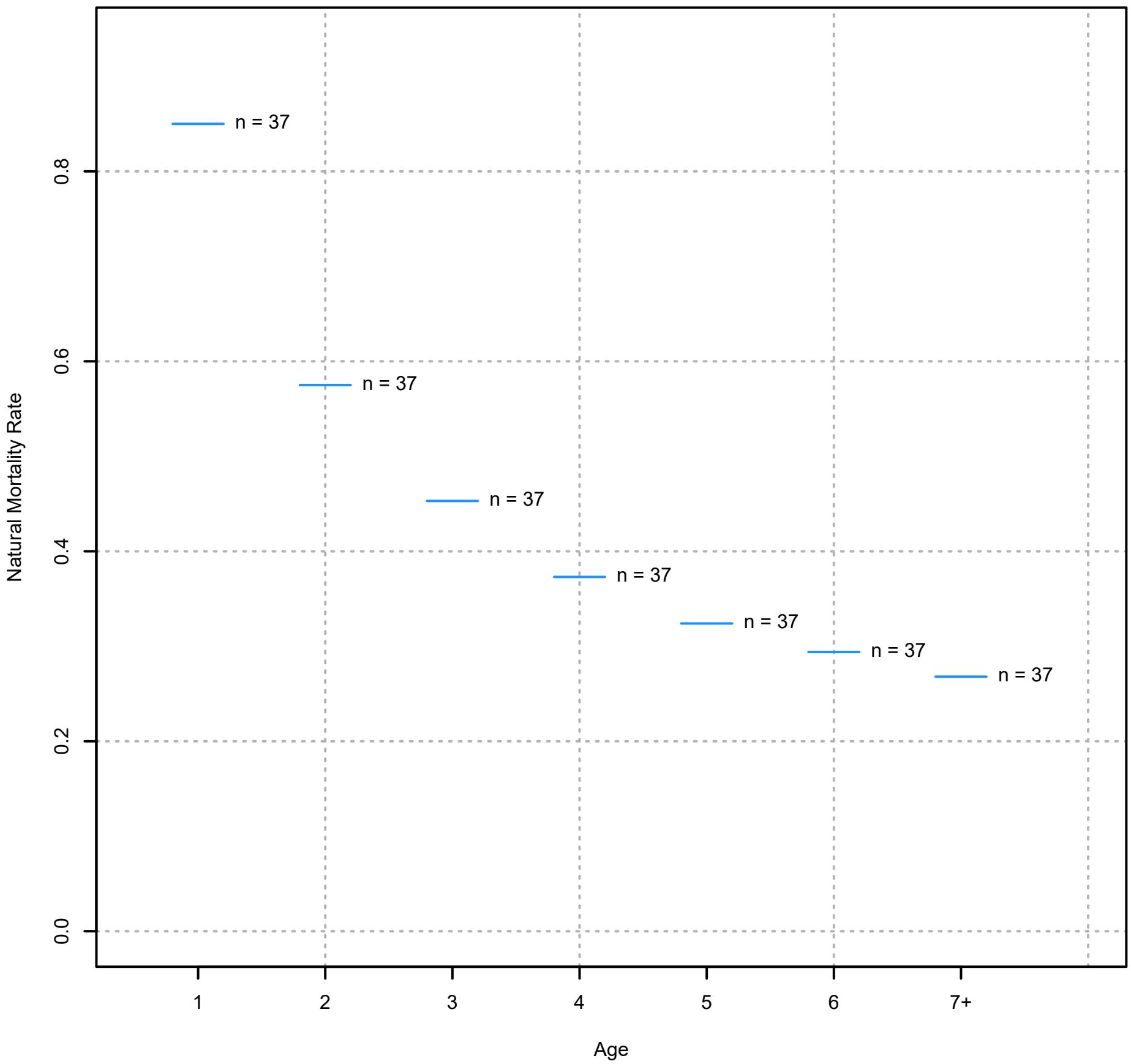


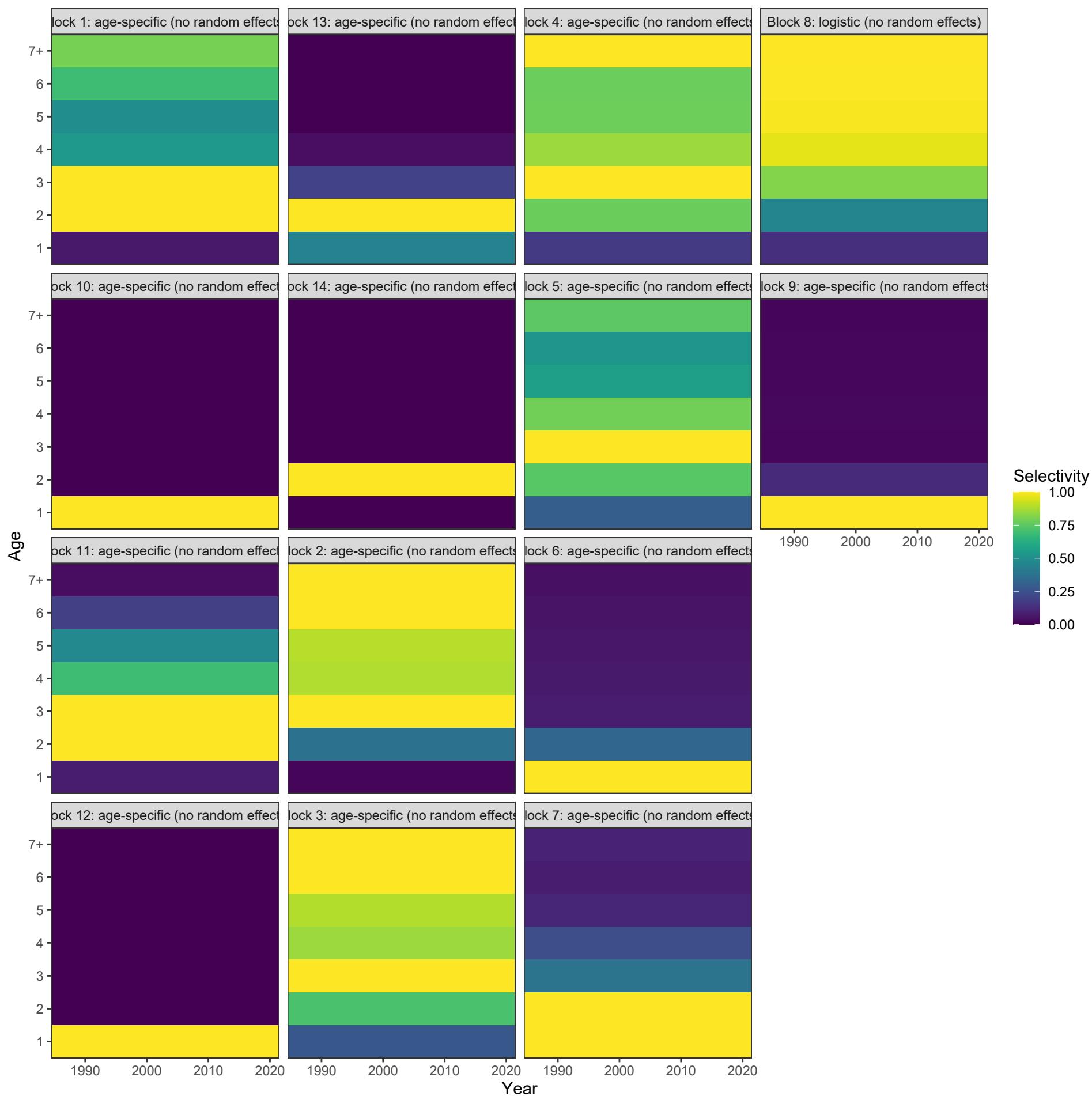


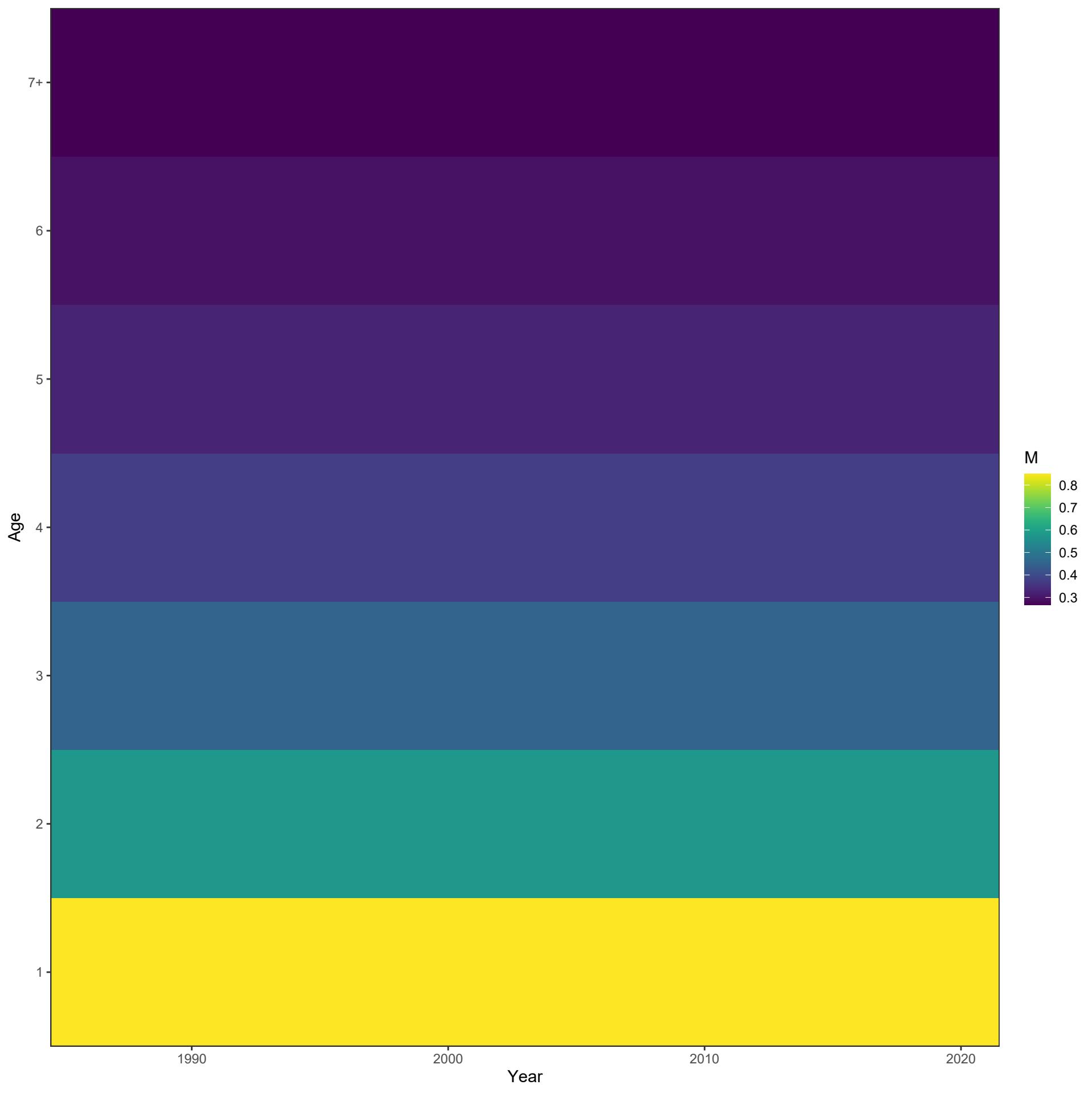


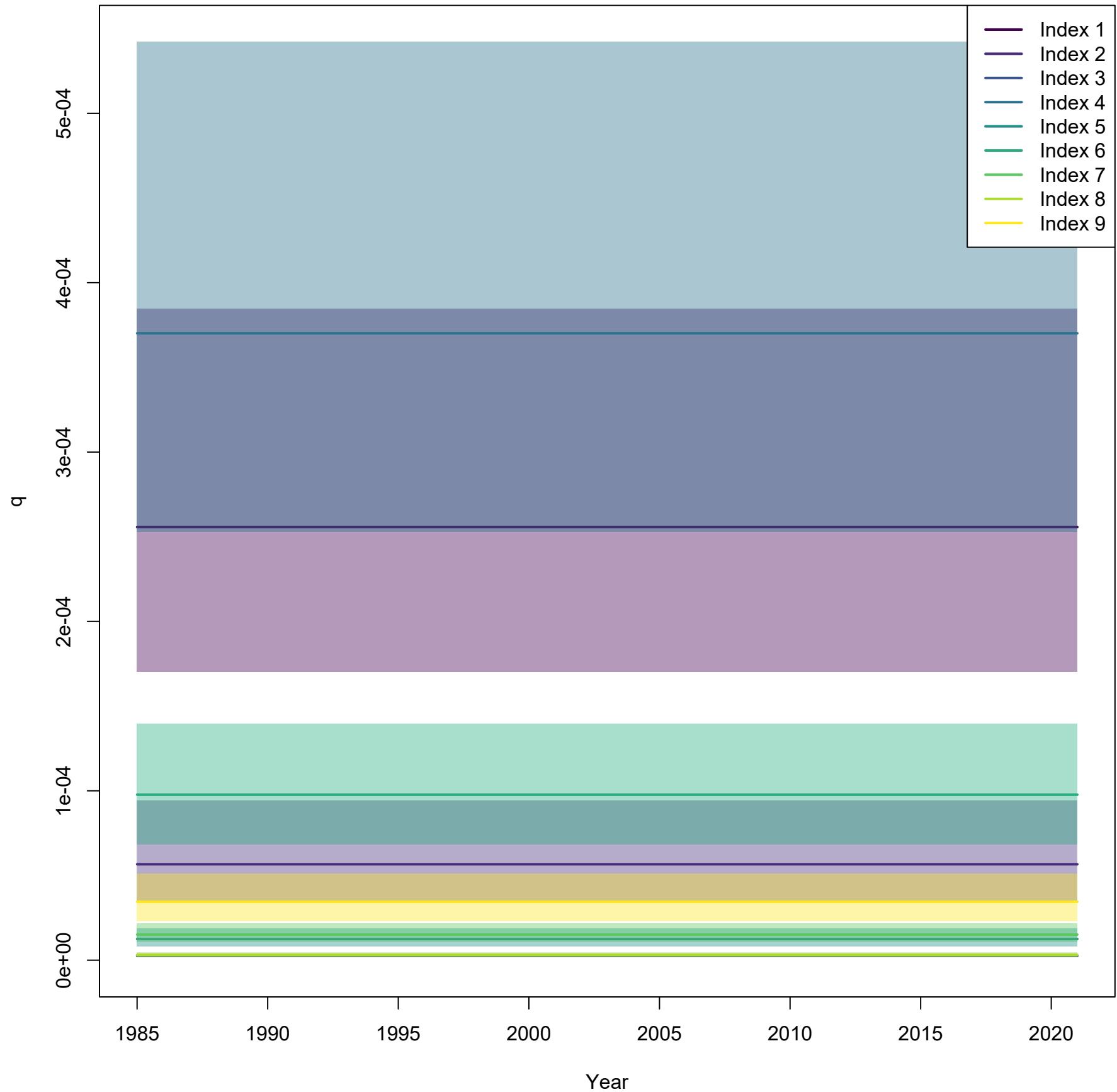




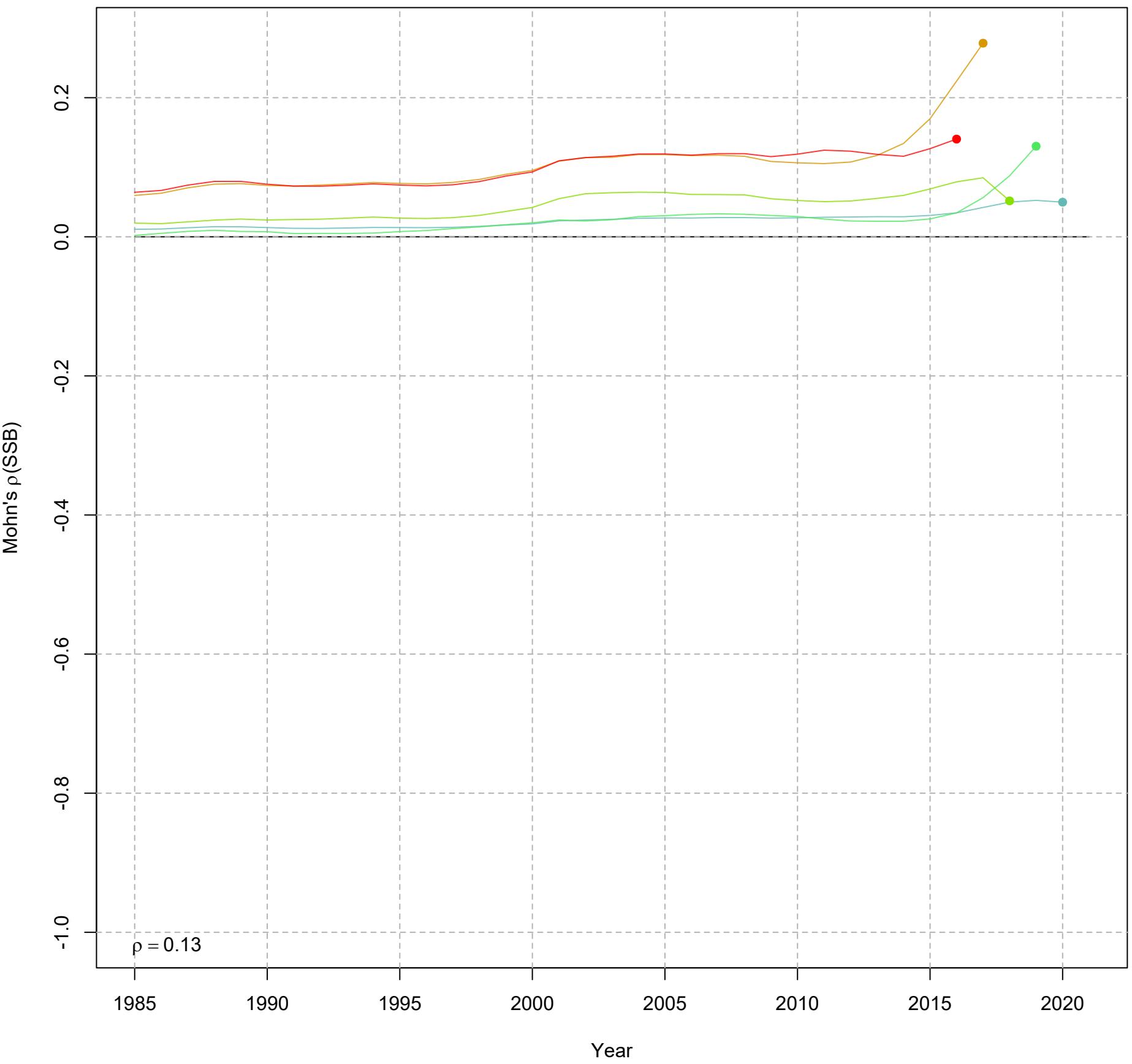


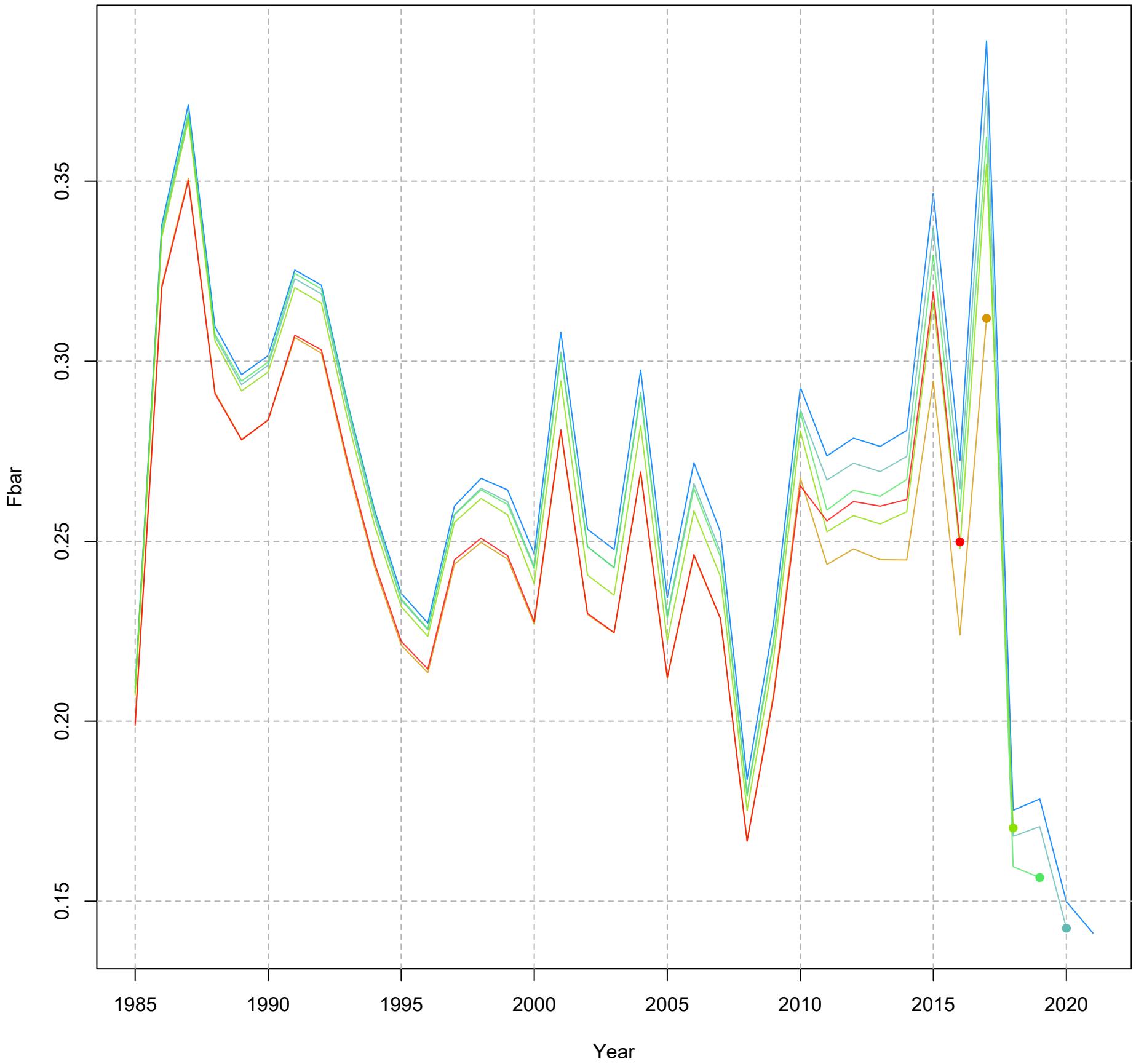


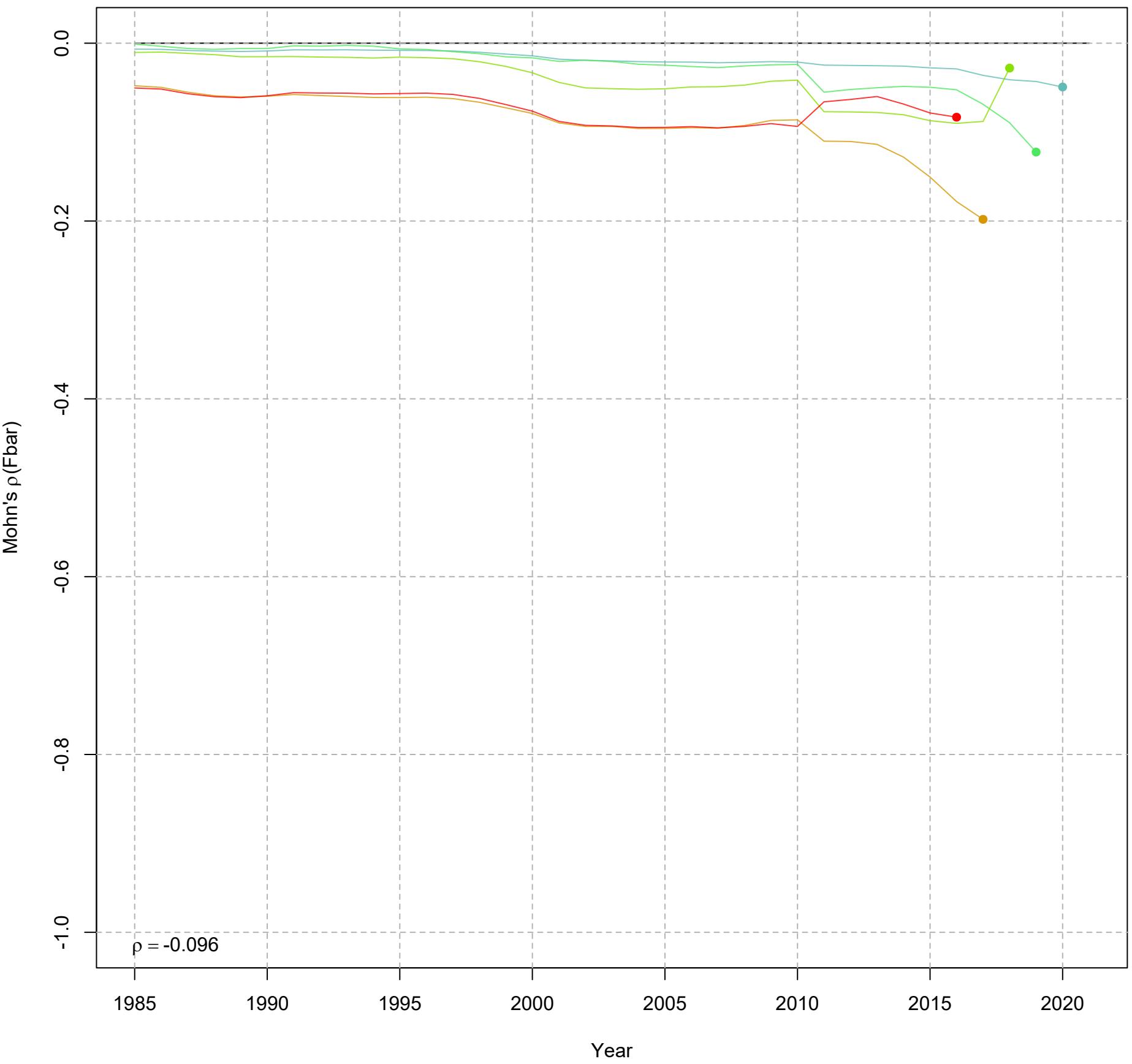


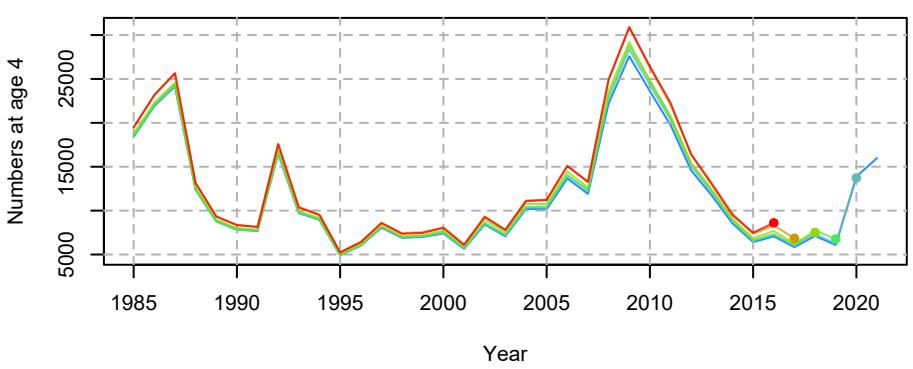
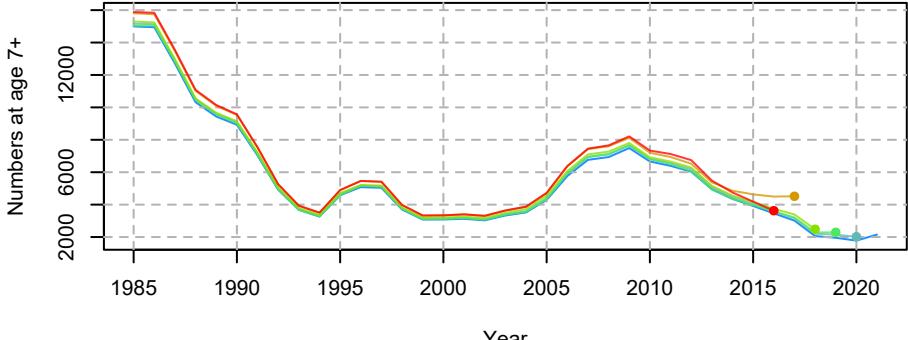
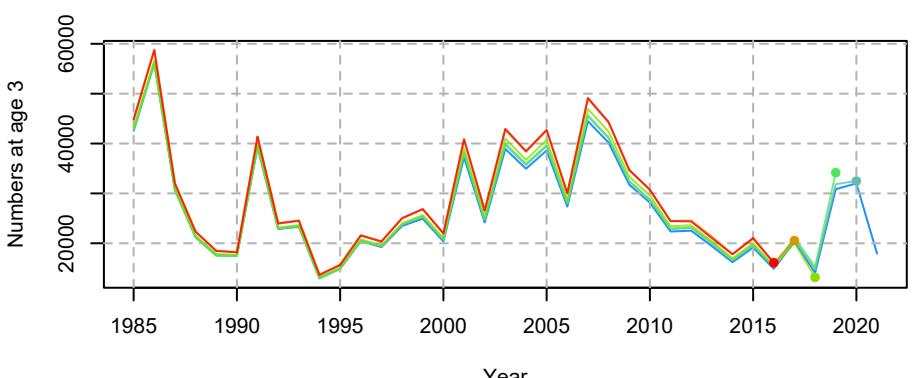
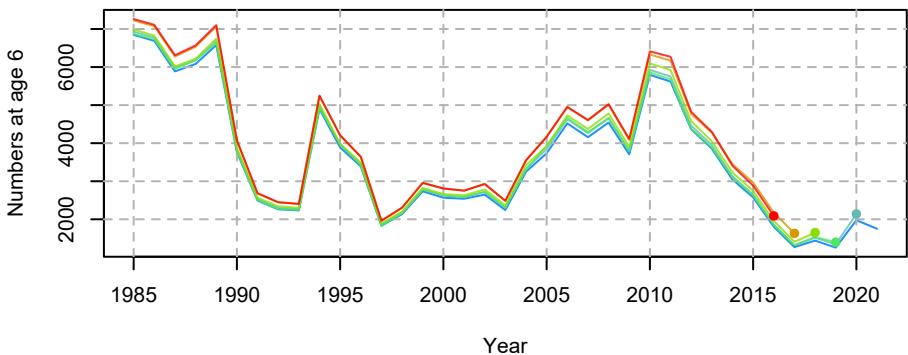
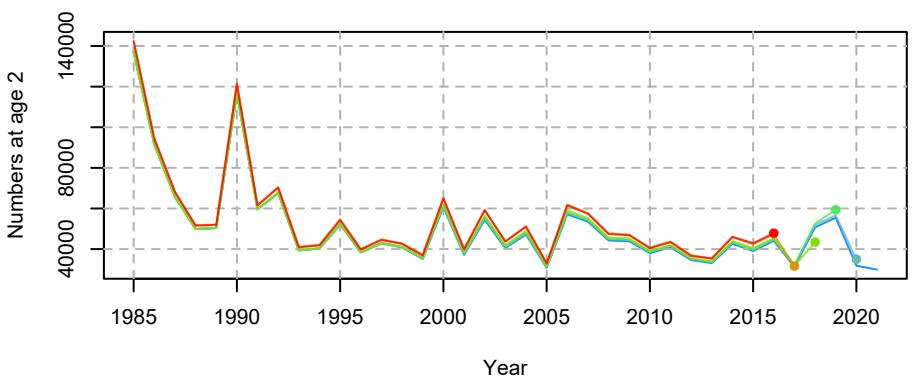
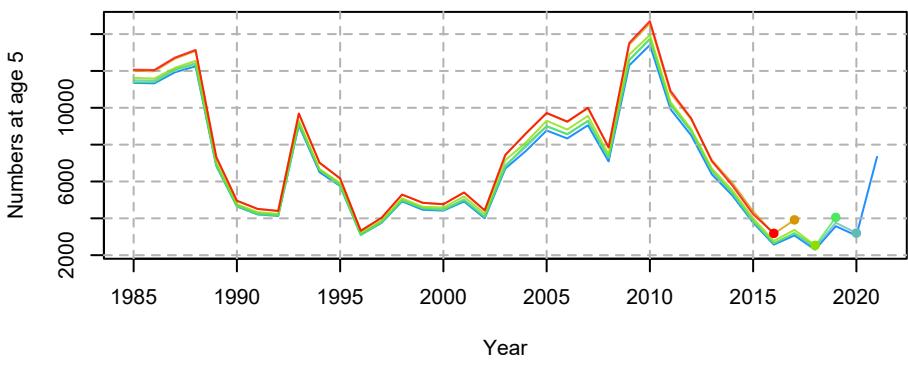
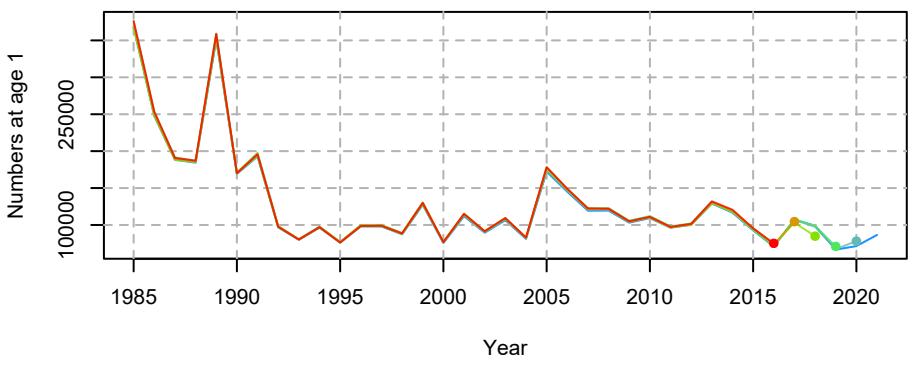


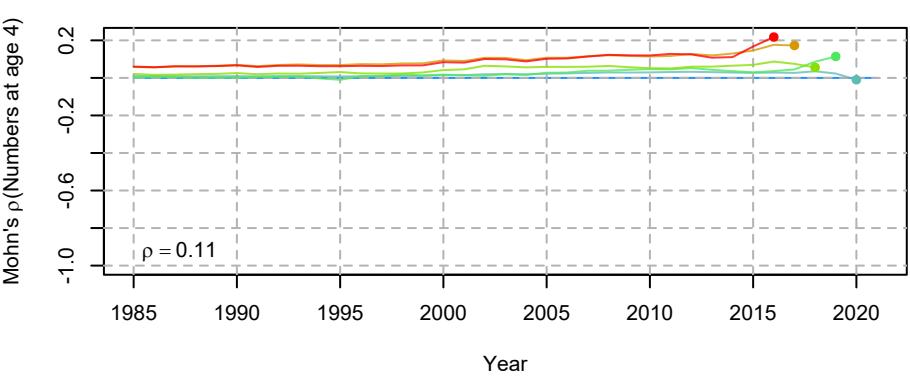
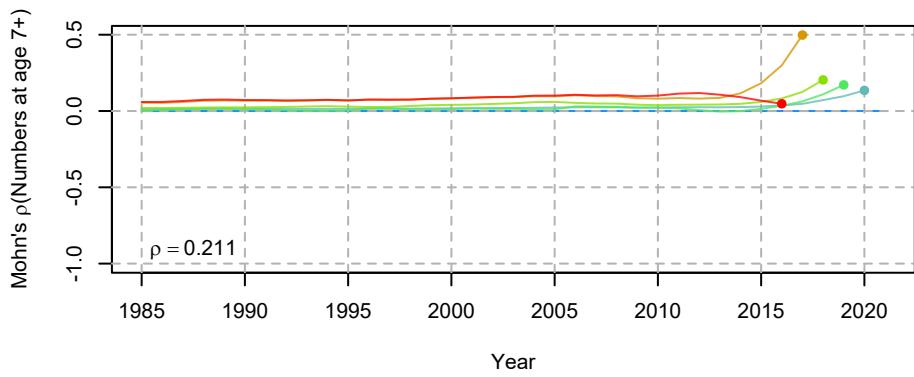
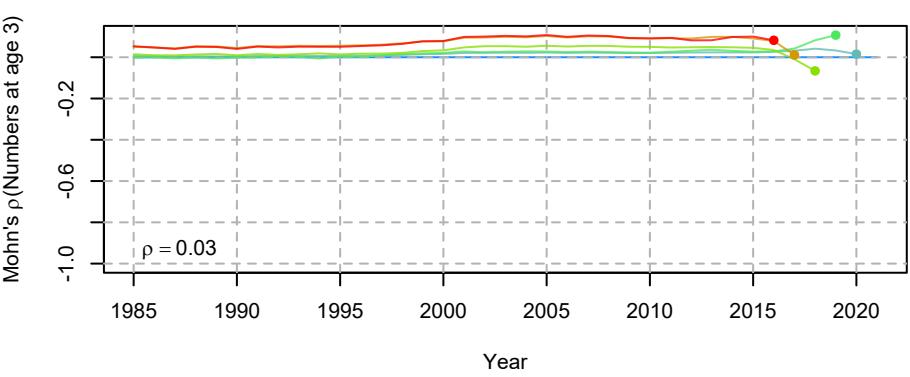
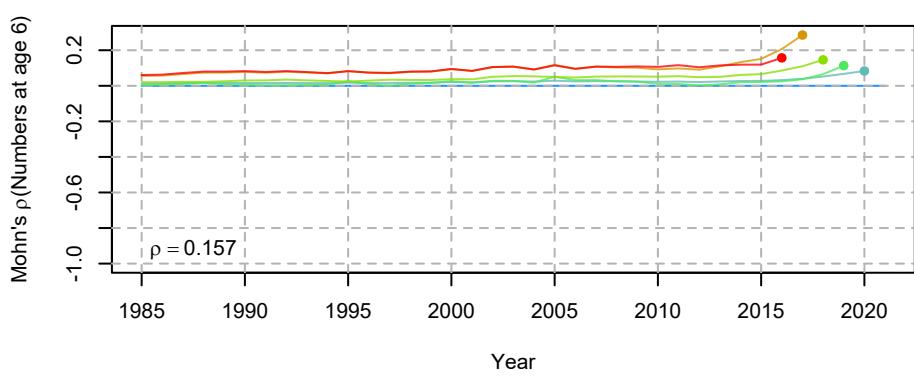
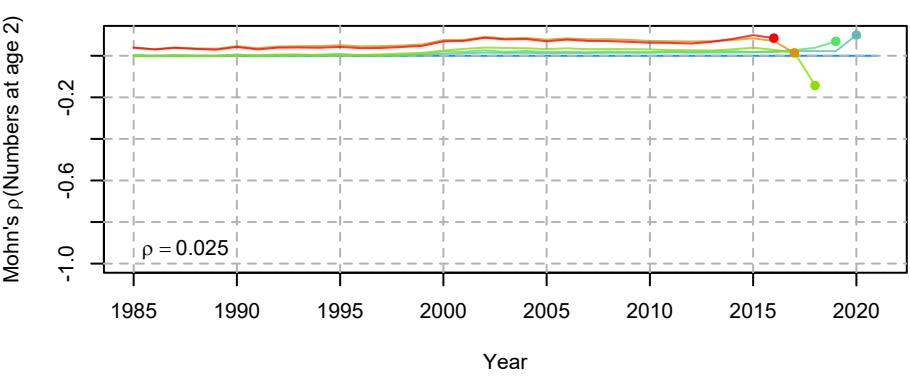
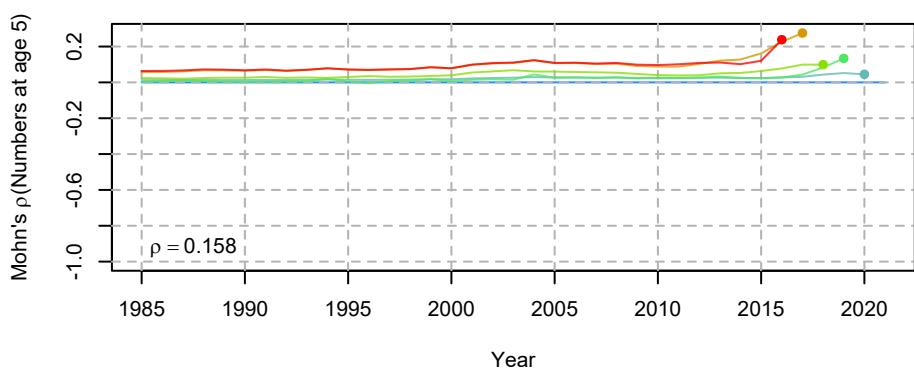
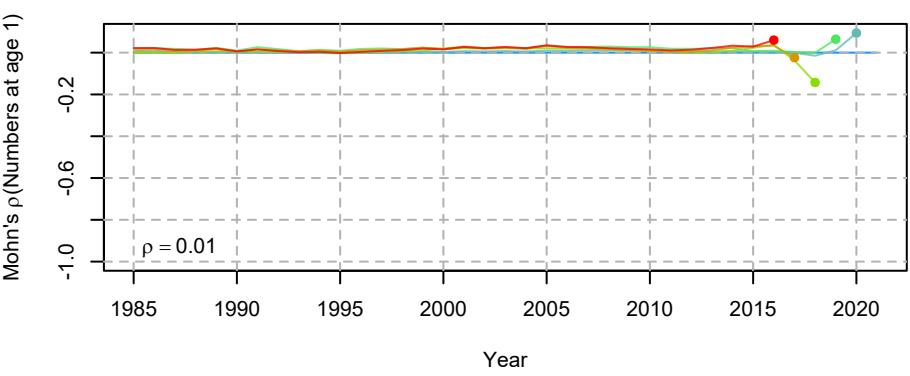


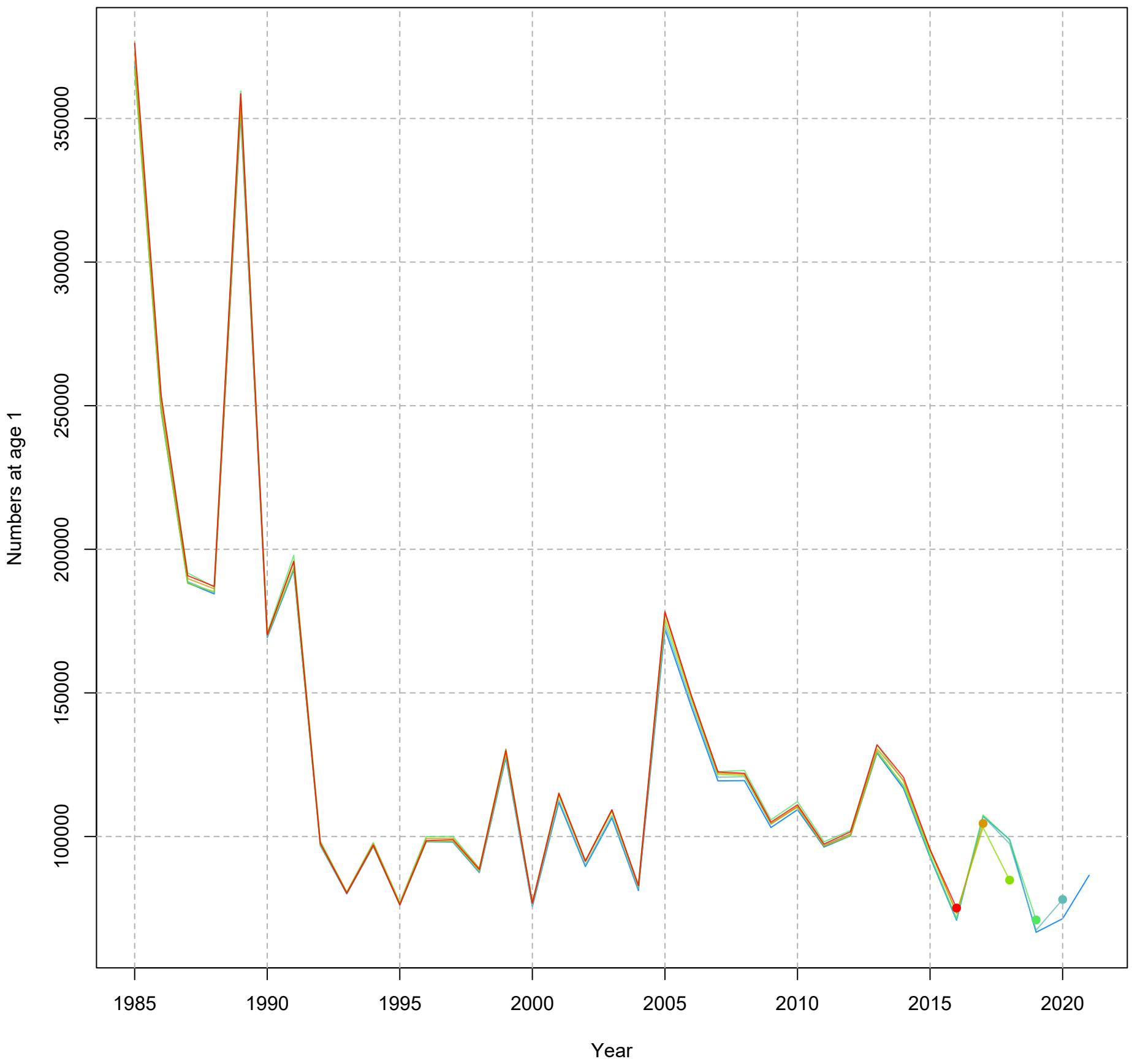


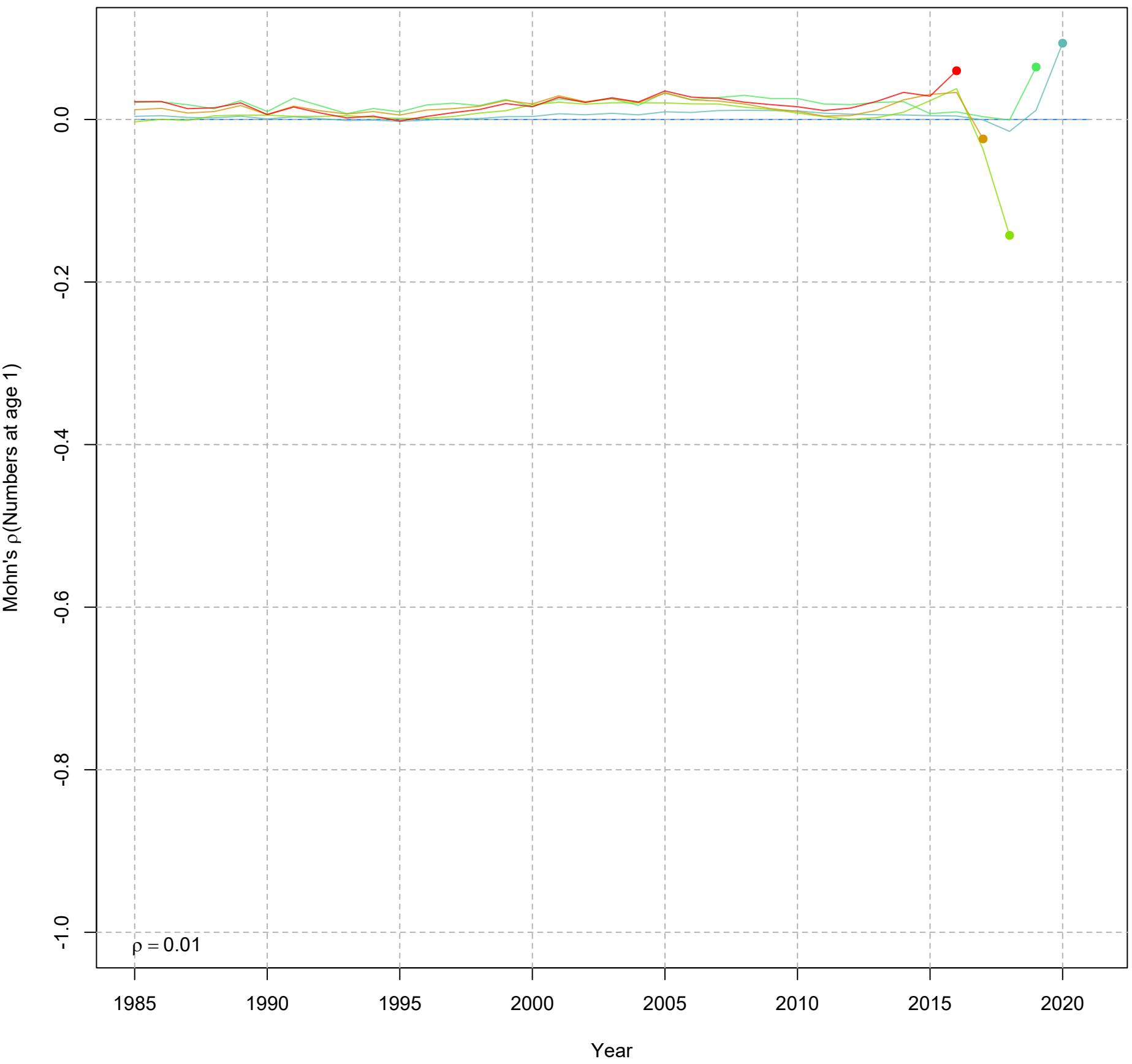










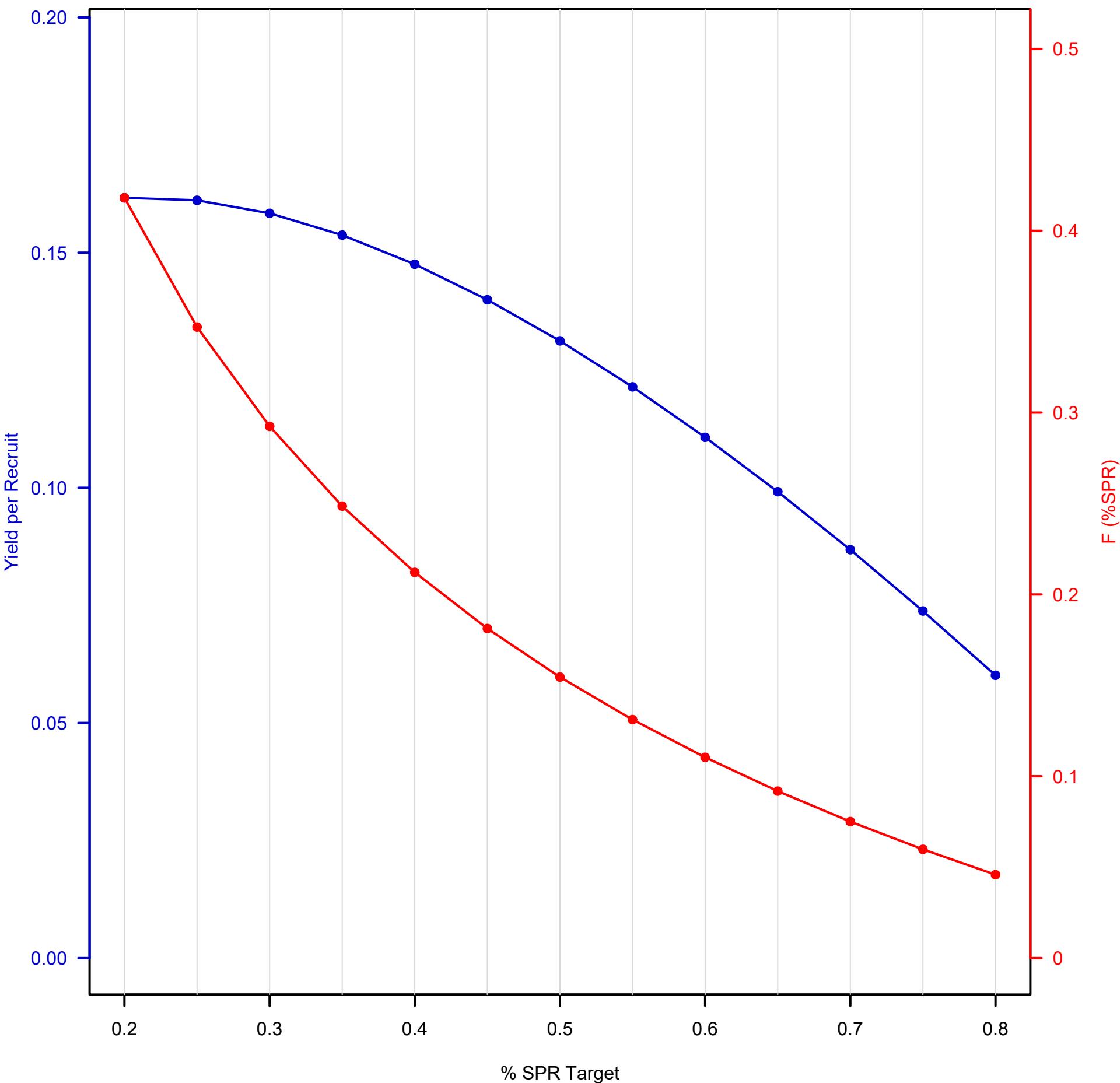


BF28W_M7: FINAL MODEL

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

REFERENCE POINT PLOTS

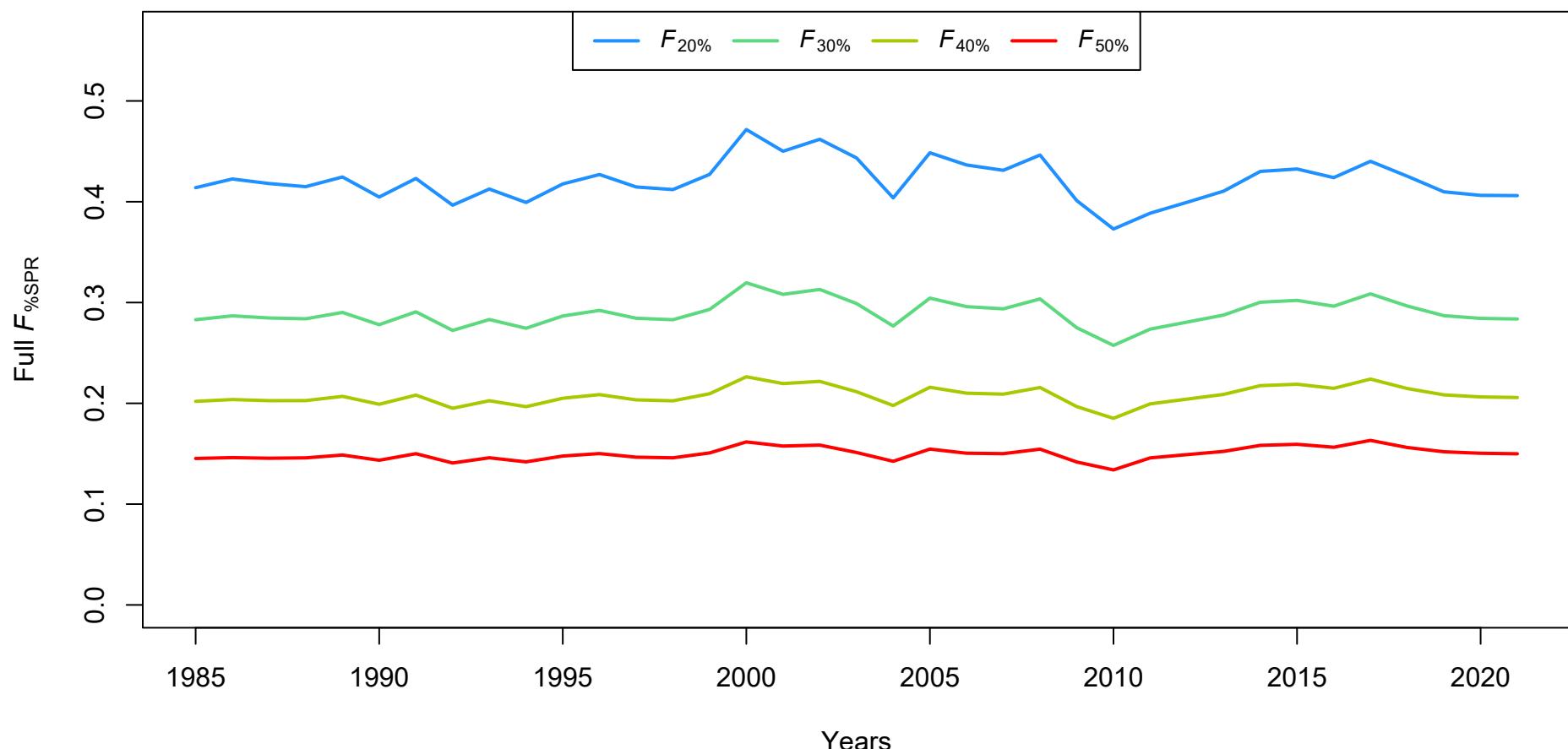
SPR Target Reference Points (Years Avg = 5)



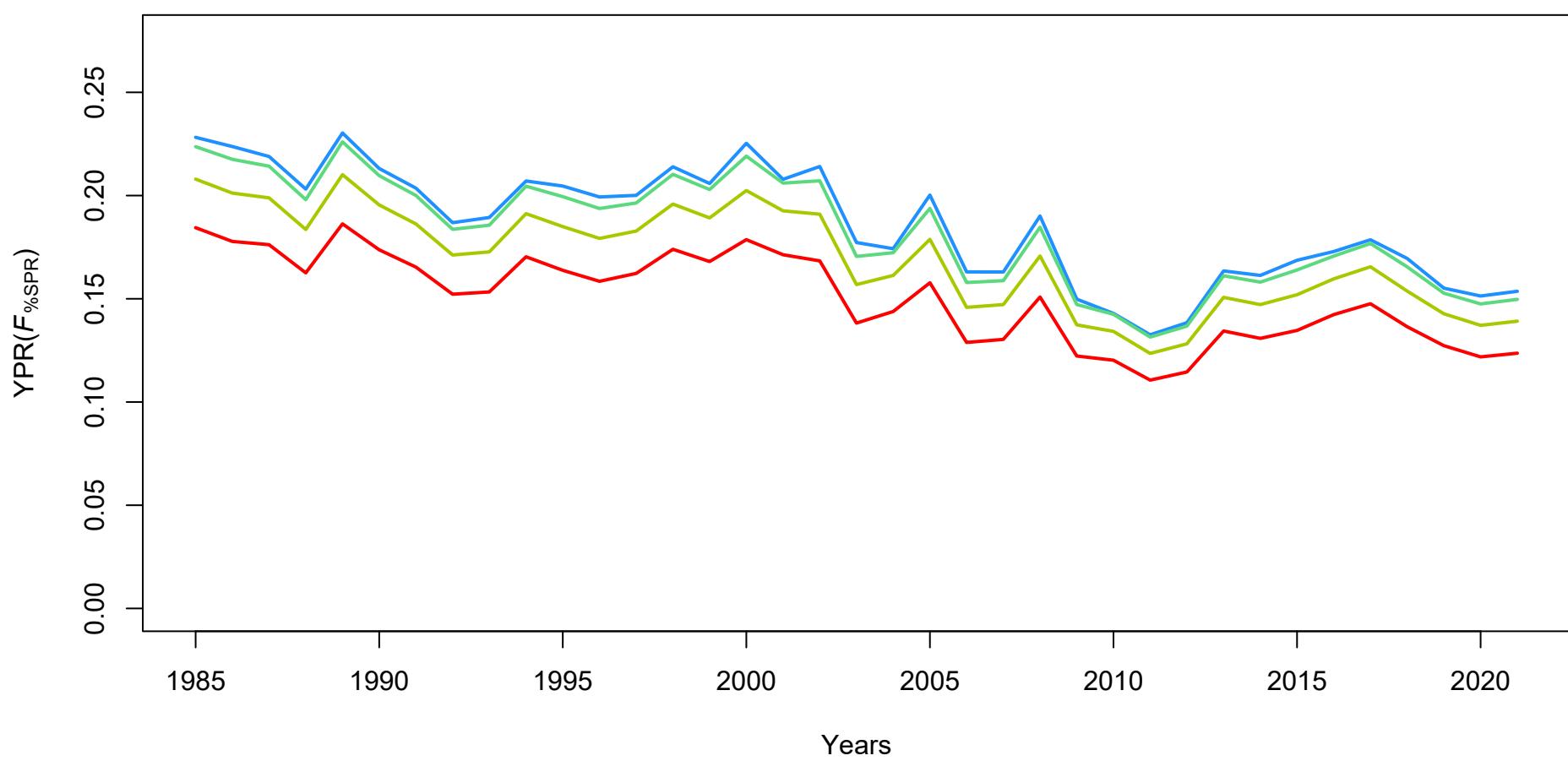
SPR Target Reference Points (Years Avg = 5)

% 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

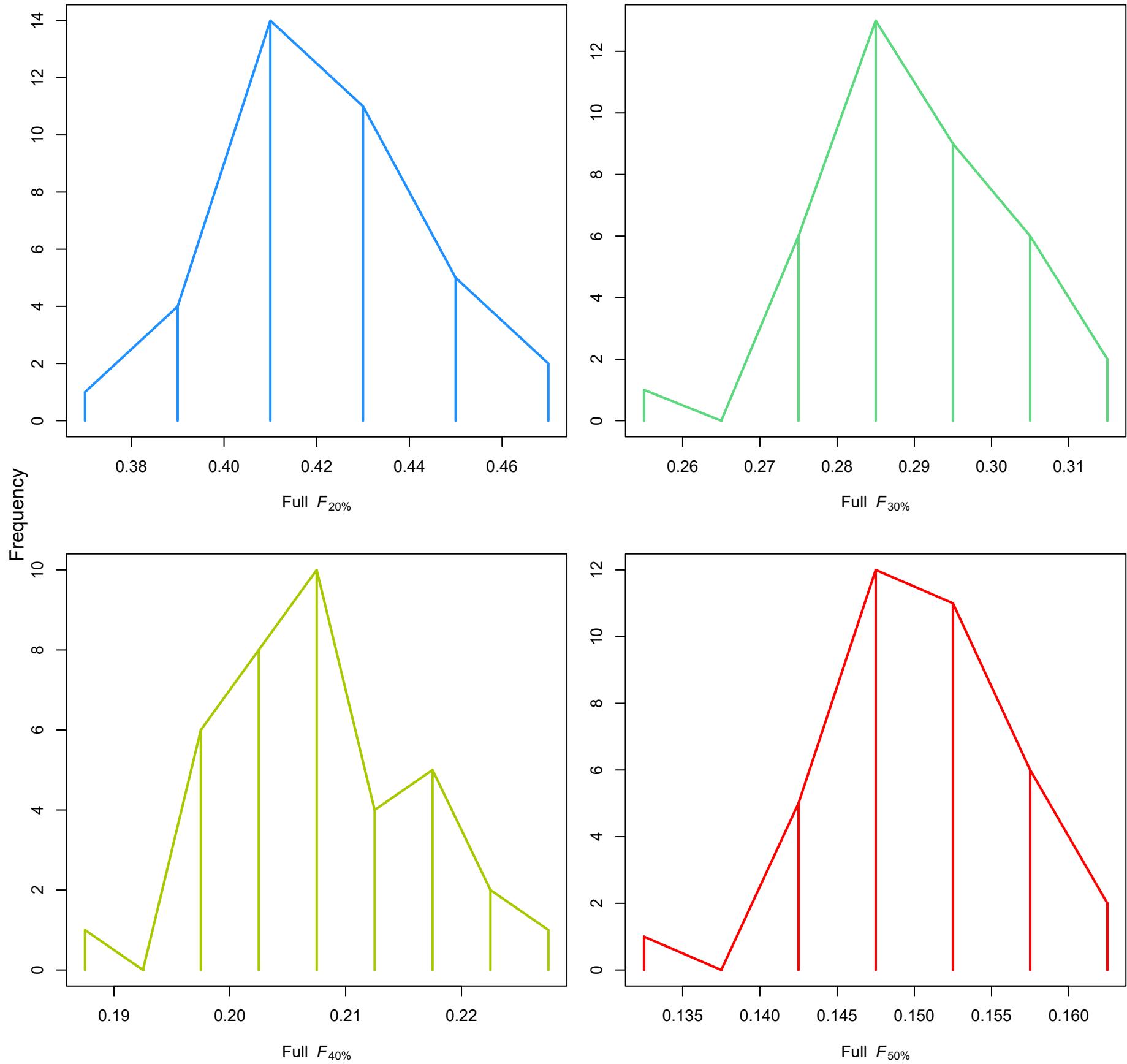
Annual $F_{\%SPR}$ Reference Points



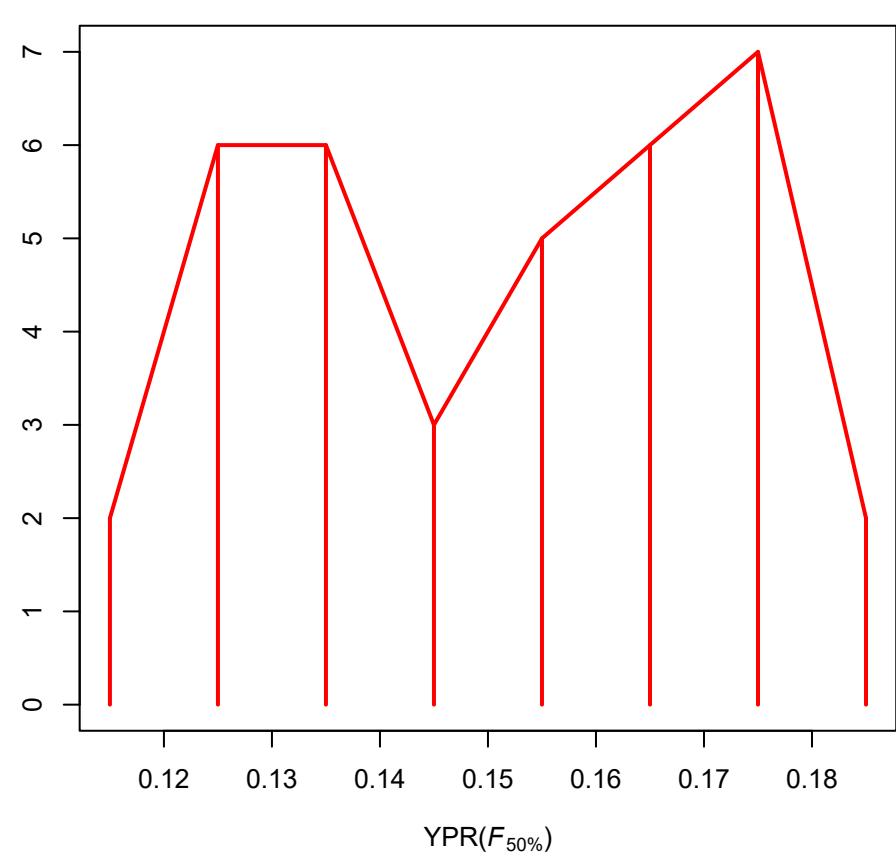
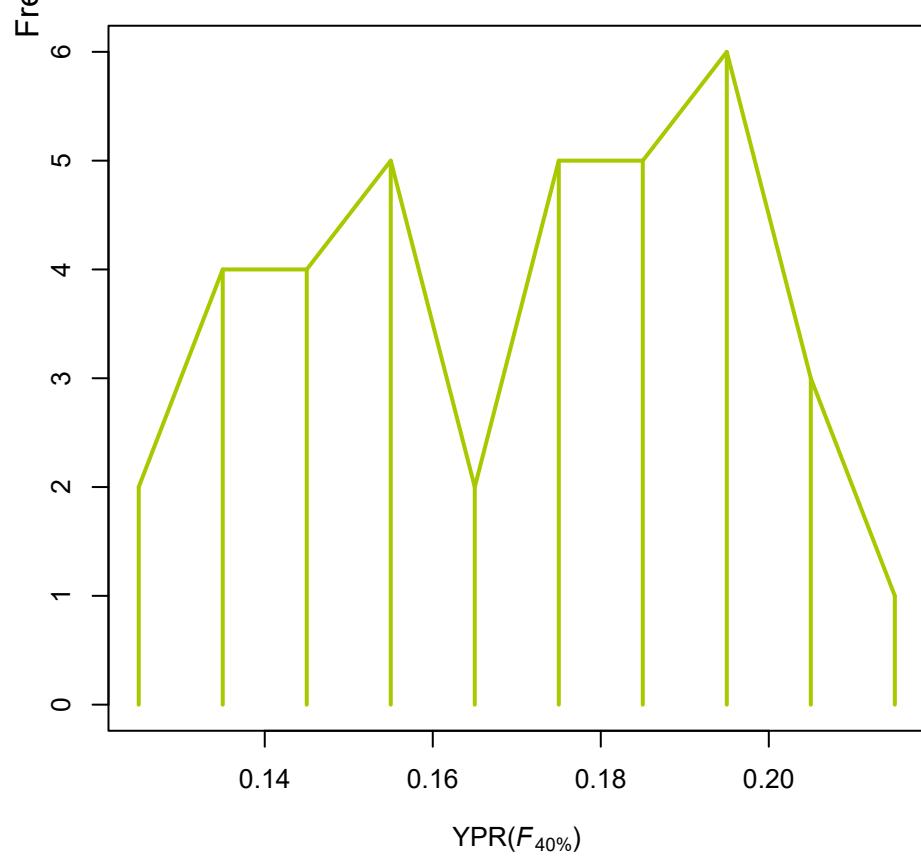
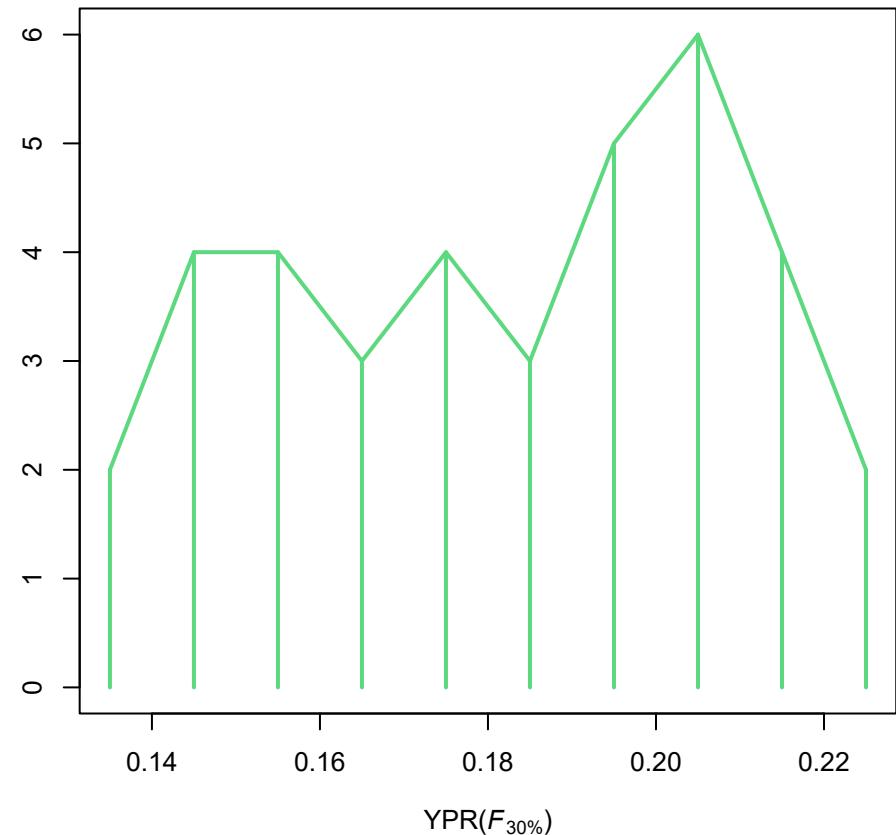
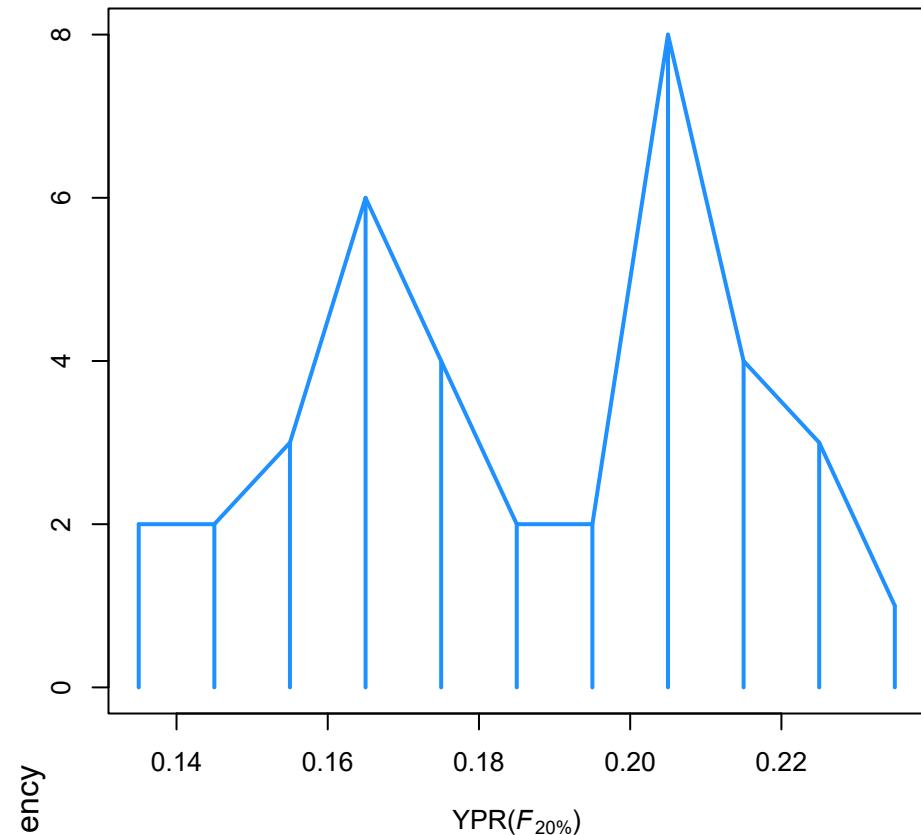
Annual YPR($F_{\%SPR}$) Reference Points

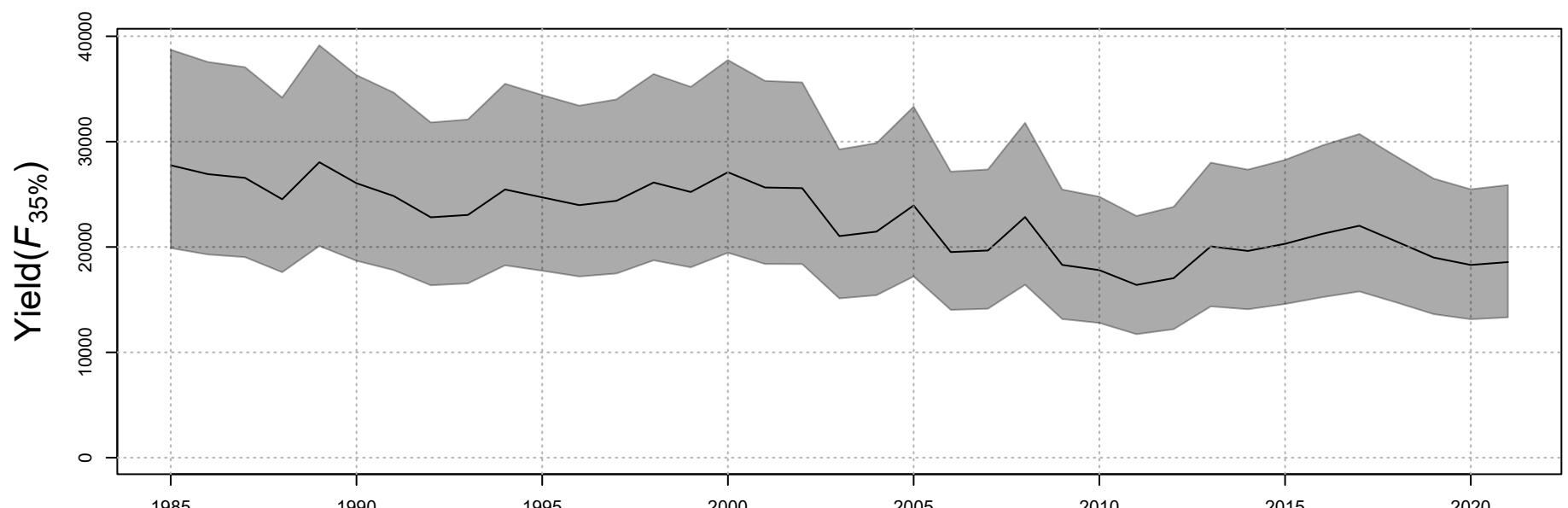


Frequencies of Annual $F_{\% \text{SPR}}$ Reference Points

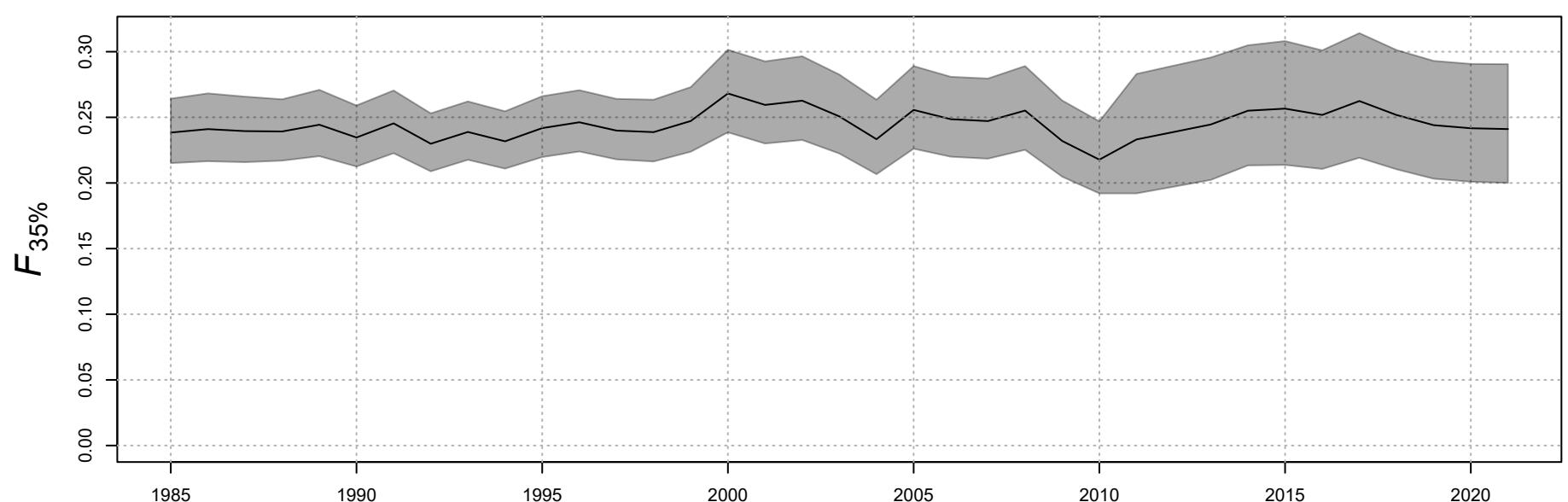


Frequencies of Annual YPR($F_{\%SPR}$) Reference Points

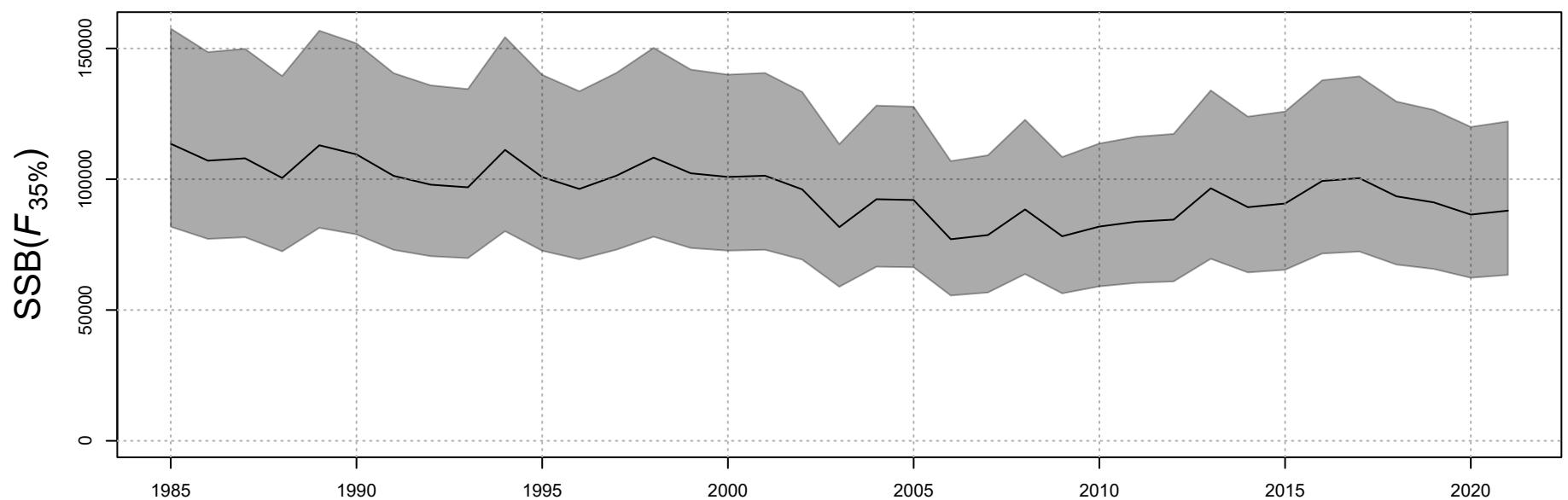




1985 1990 1995 2000 2005 2010 2015 2020

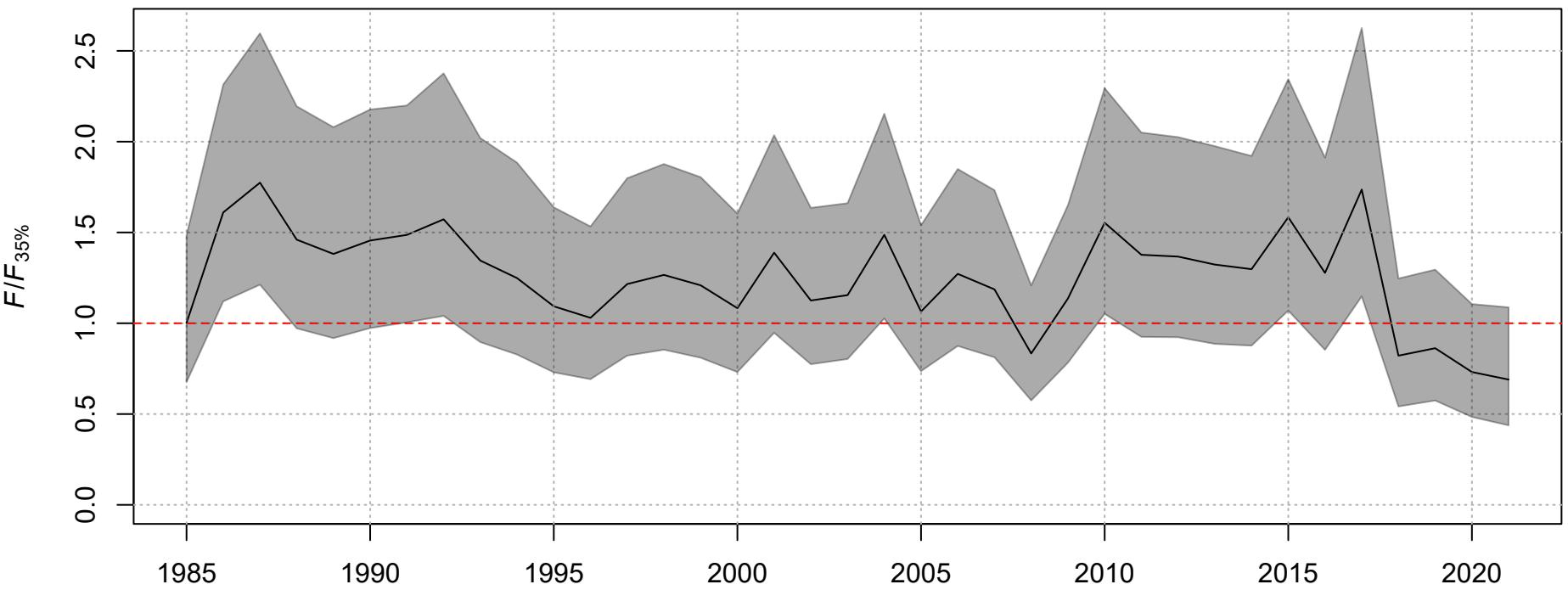
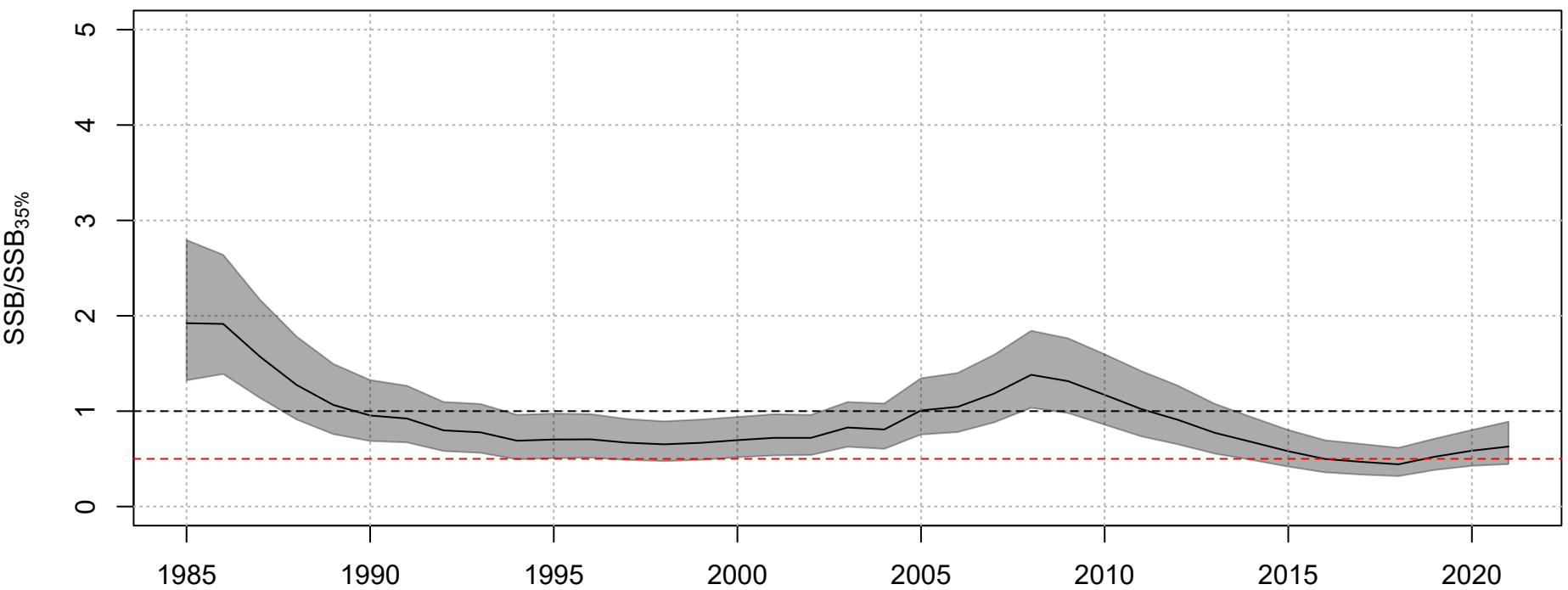


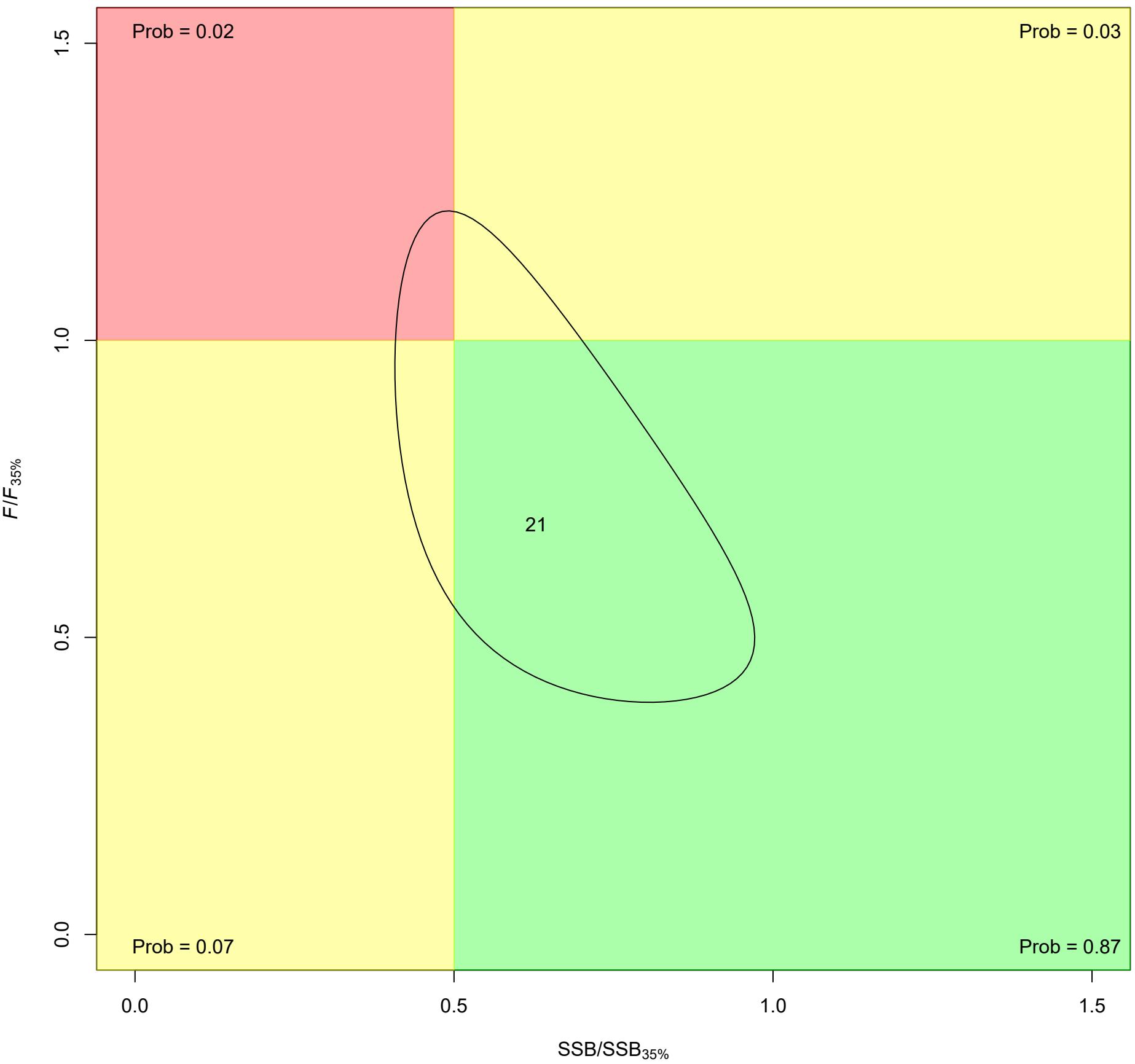
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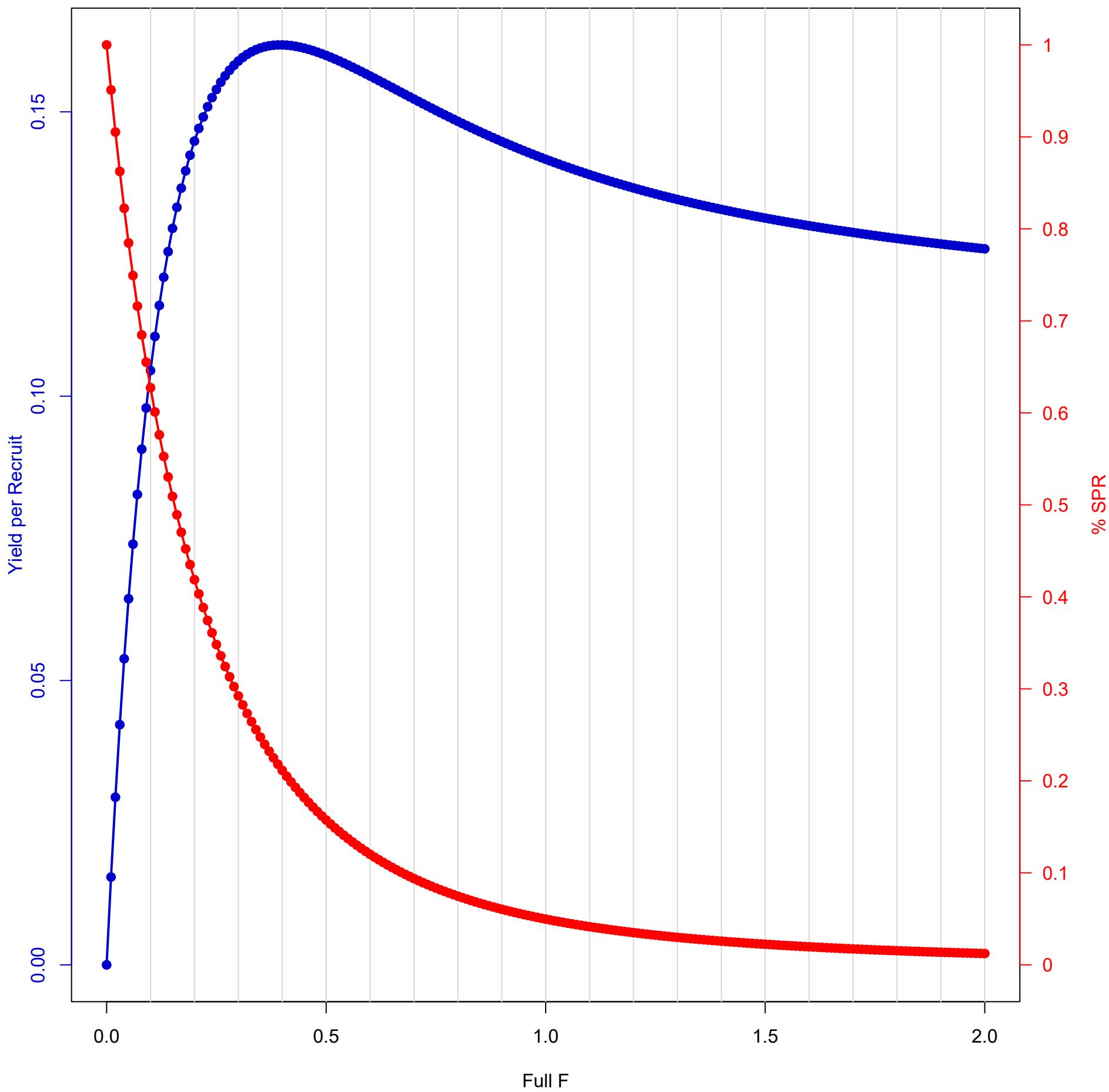
1985 1990 1995 2000 2005 2010 2015 2020

Year





YPR-SPR Reference Points (Years Avg = 5)



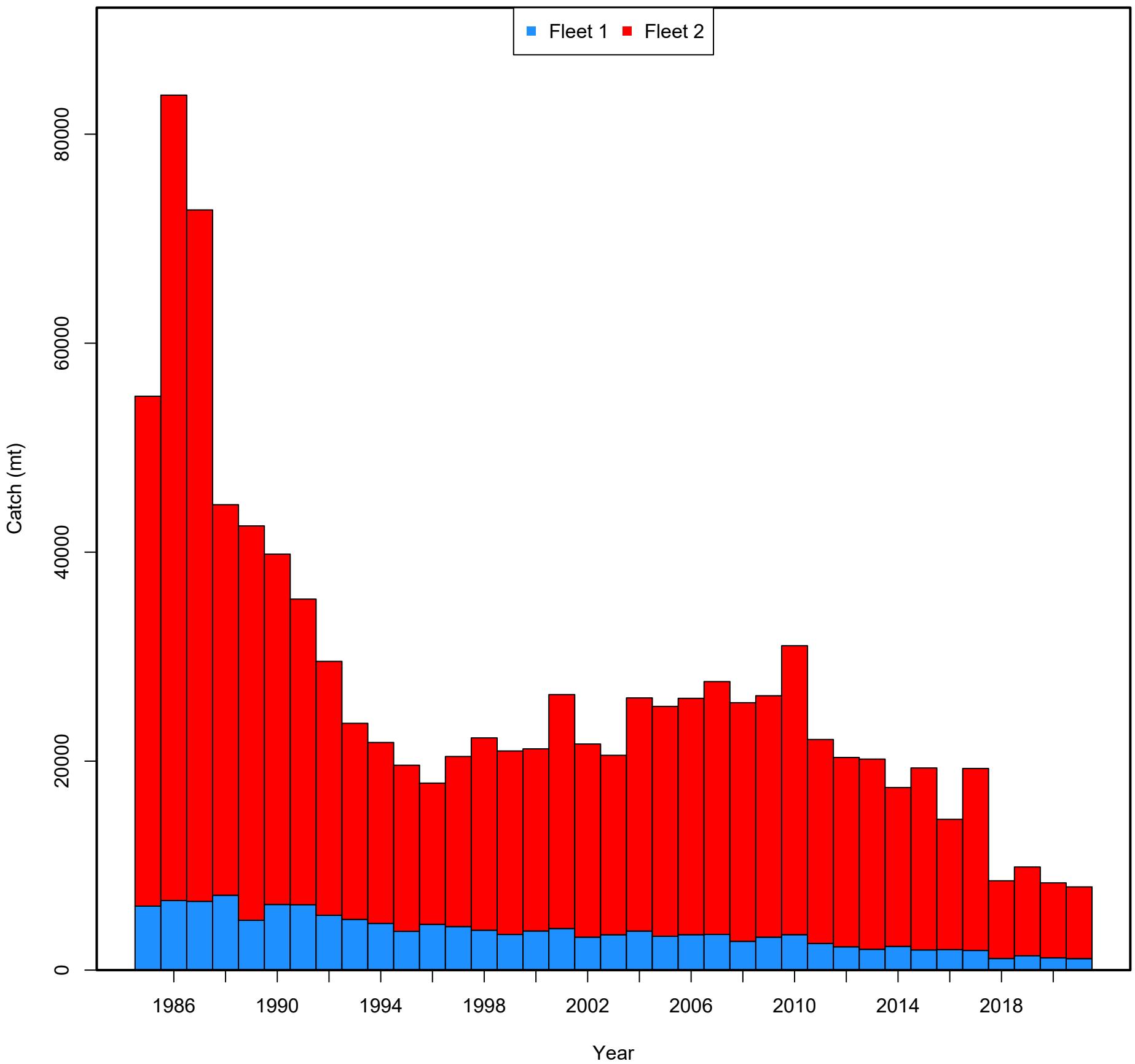
YPR-SPR Reference Points (Years Avg = 5)

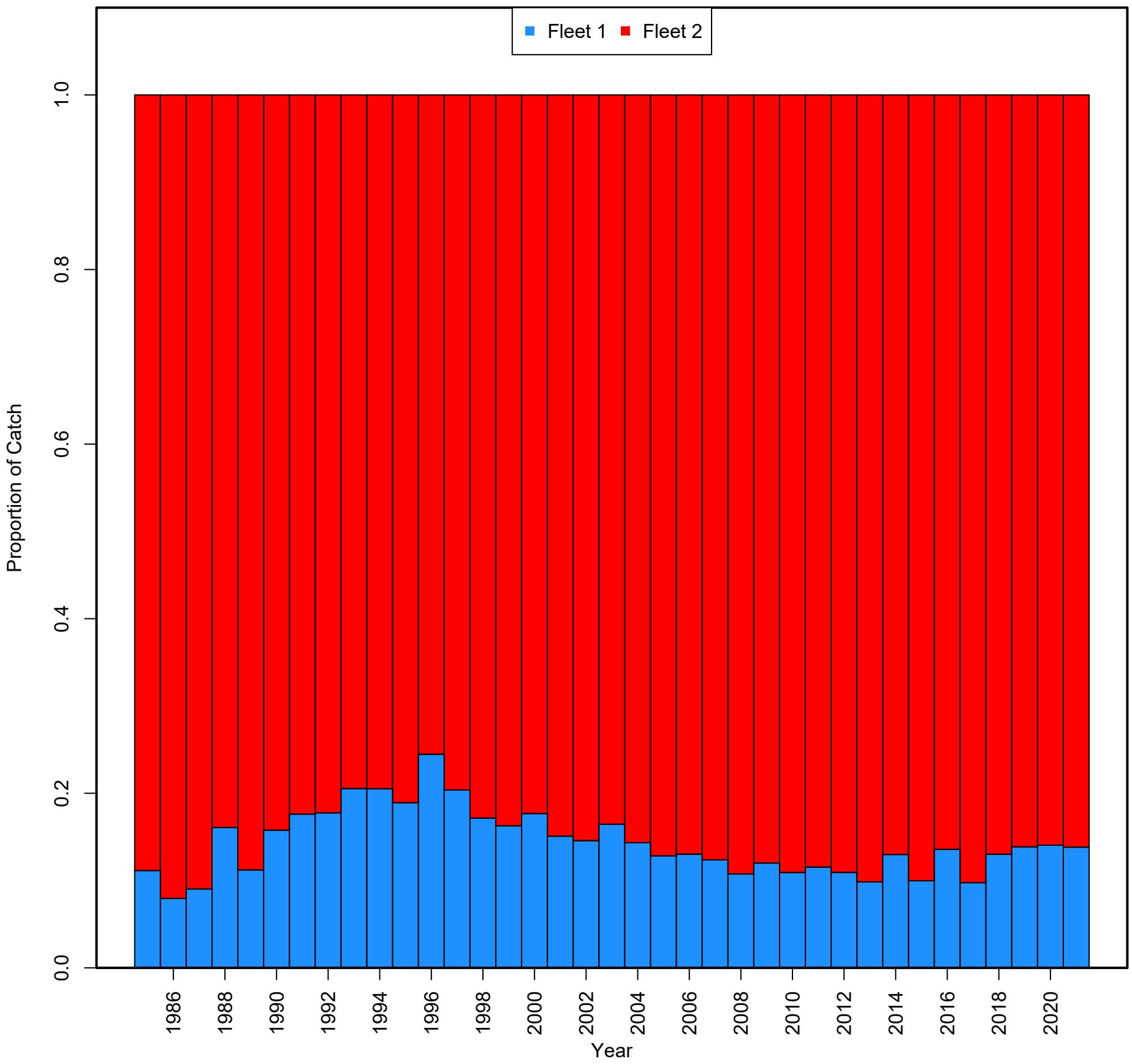
F	YPR	SPR	F	YPR	SPR	F	YPR	SPR
0	0	1	0.35	0.1612	0.2476	0.7	0.1522	0.0938
0.01	0.0154	0.951	0.36	0.1614	0.2398	0.71	0.1518	0.0916
0.02	0.0295	0.9053	0.37	0.1616	0.2322	0.72	0.1514	0.0895
0.03	0.0422	0.8625	0.38	0.1617	0.225	0.73	0.151	0.0874
0.04	0.0538	0.8224	0.39	0.1618	0.2181	0.74	0.1506	0.0854
0.05	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

BF28W_M7ECOV

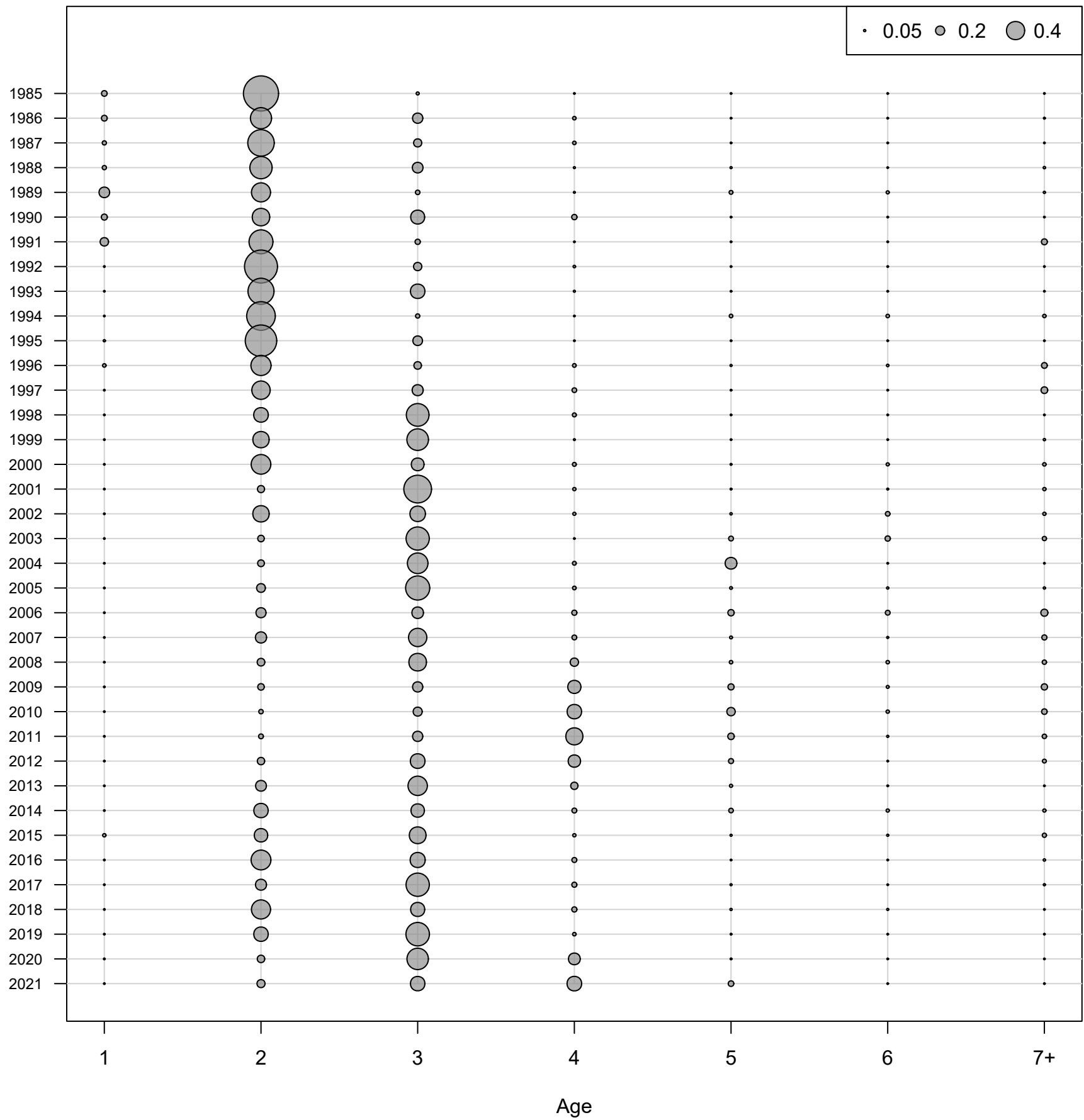
MRIP Forage Fish Index as an environmental covariate on
catchability

DATA PLOTS

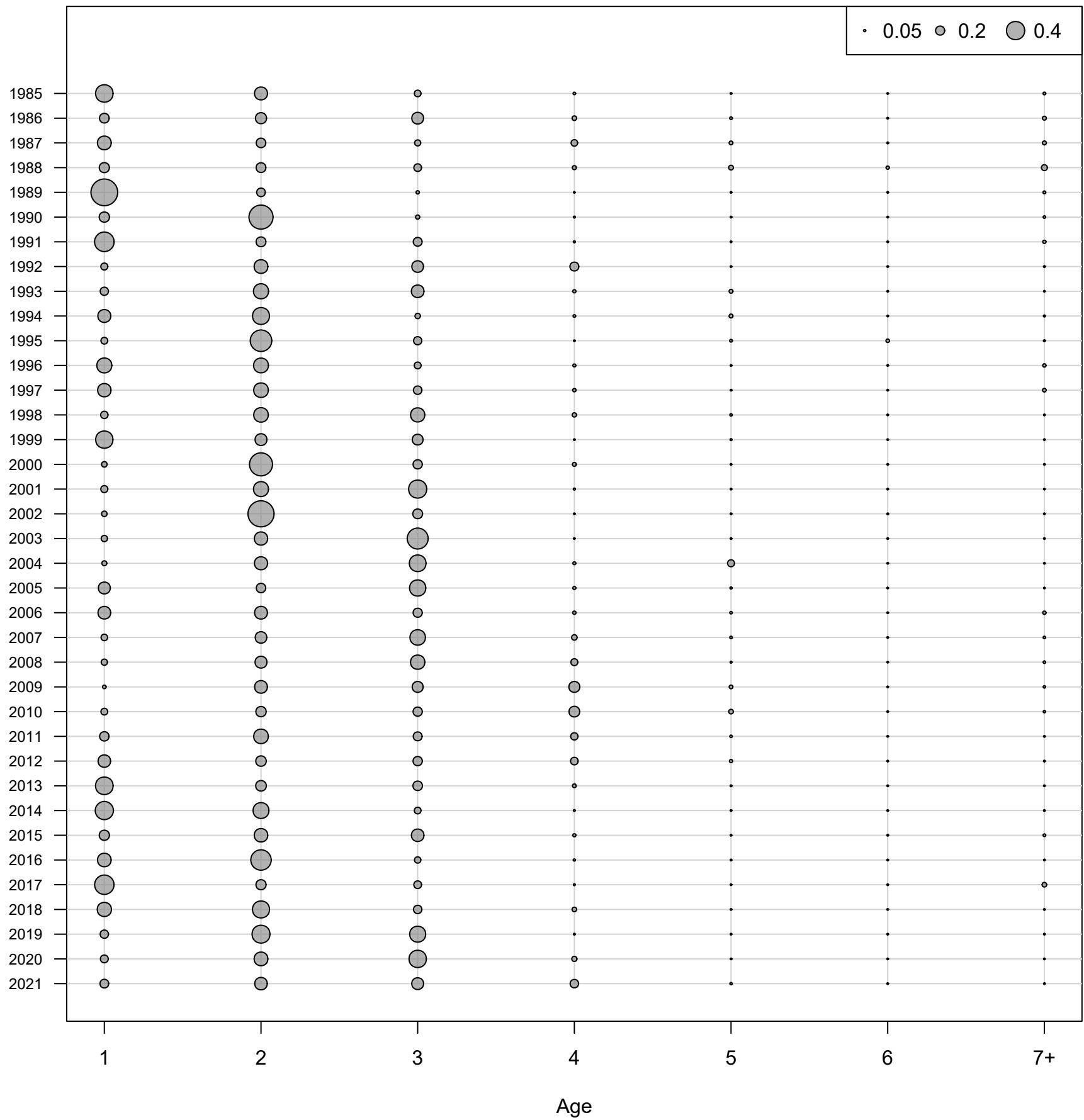


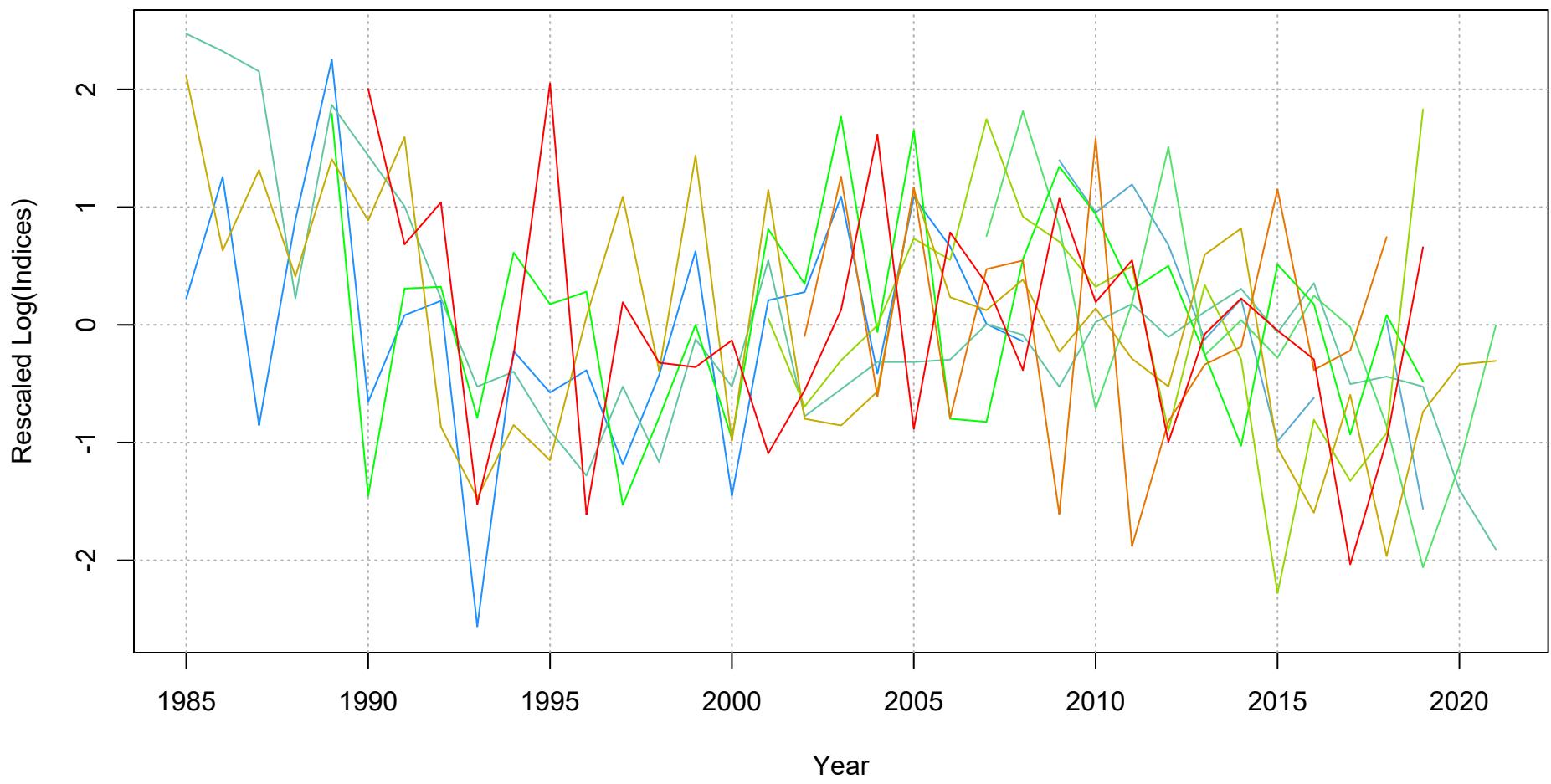
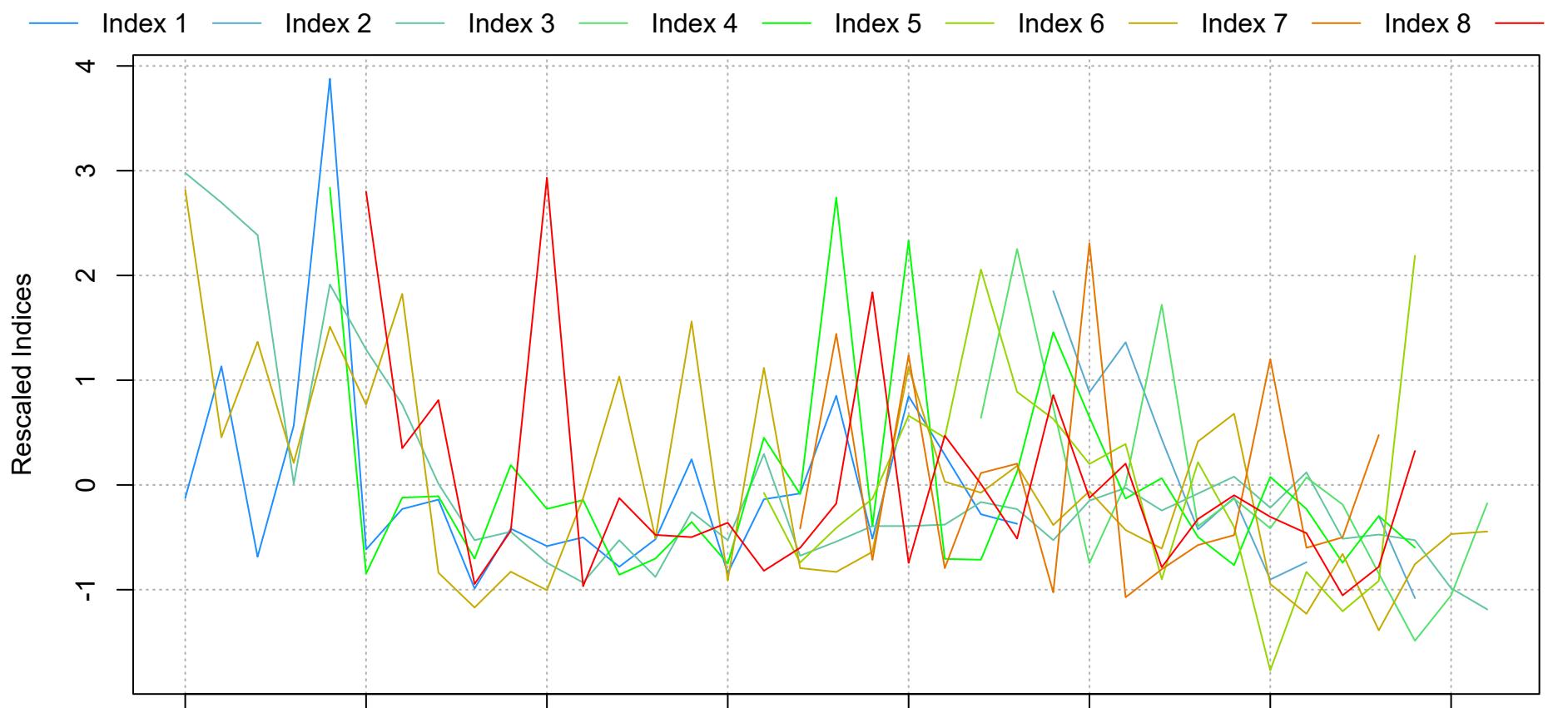


Age Comps for Catch for Fleet 1

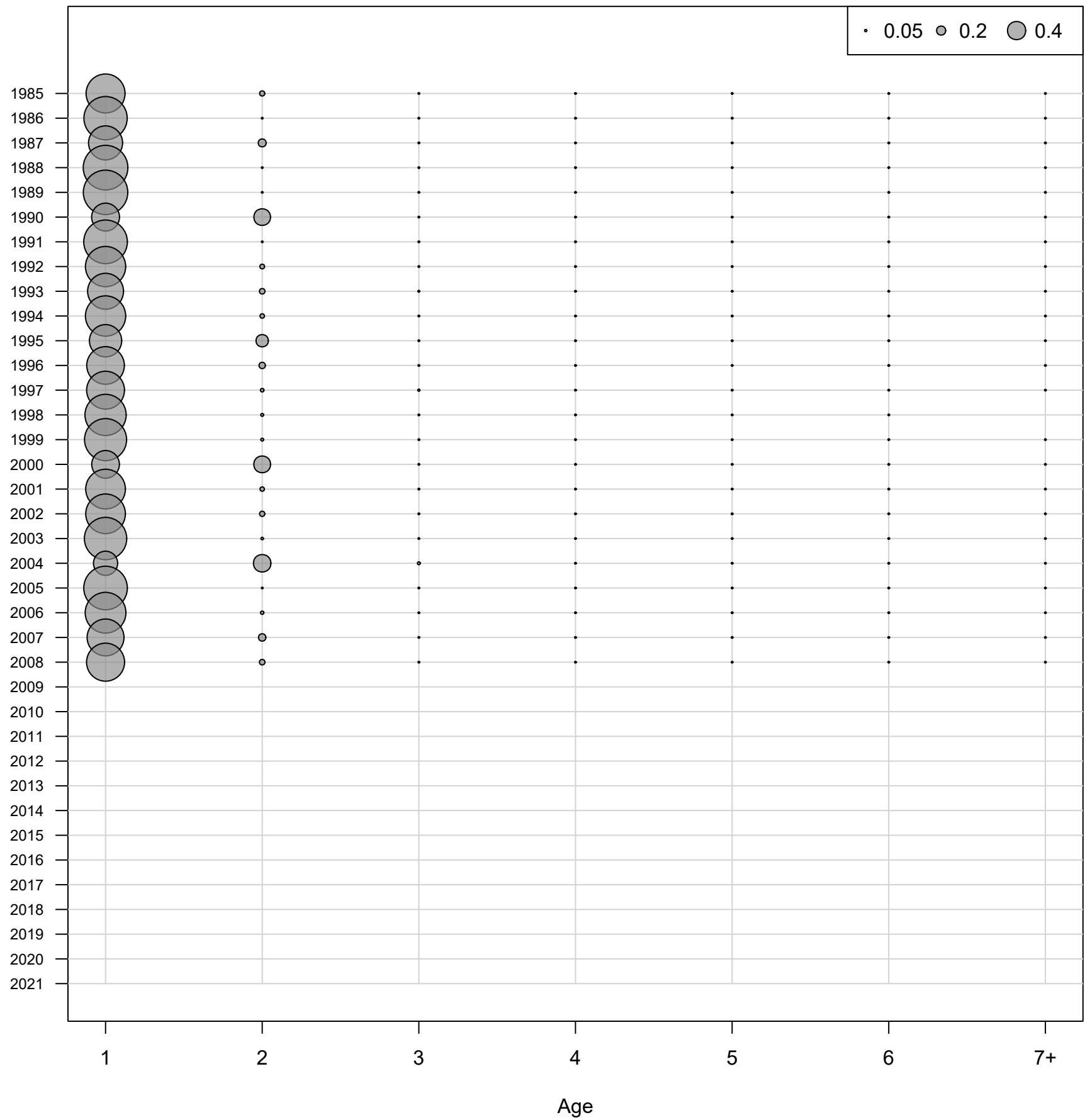


Age Comps for Catch for Fleet 2

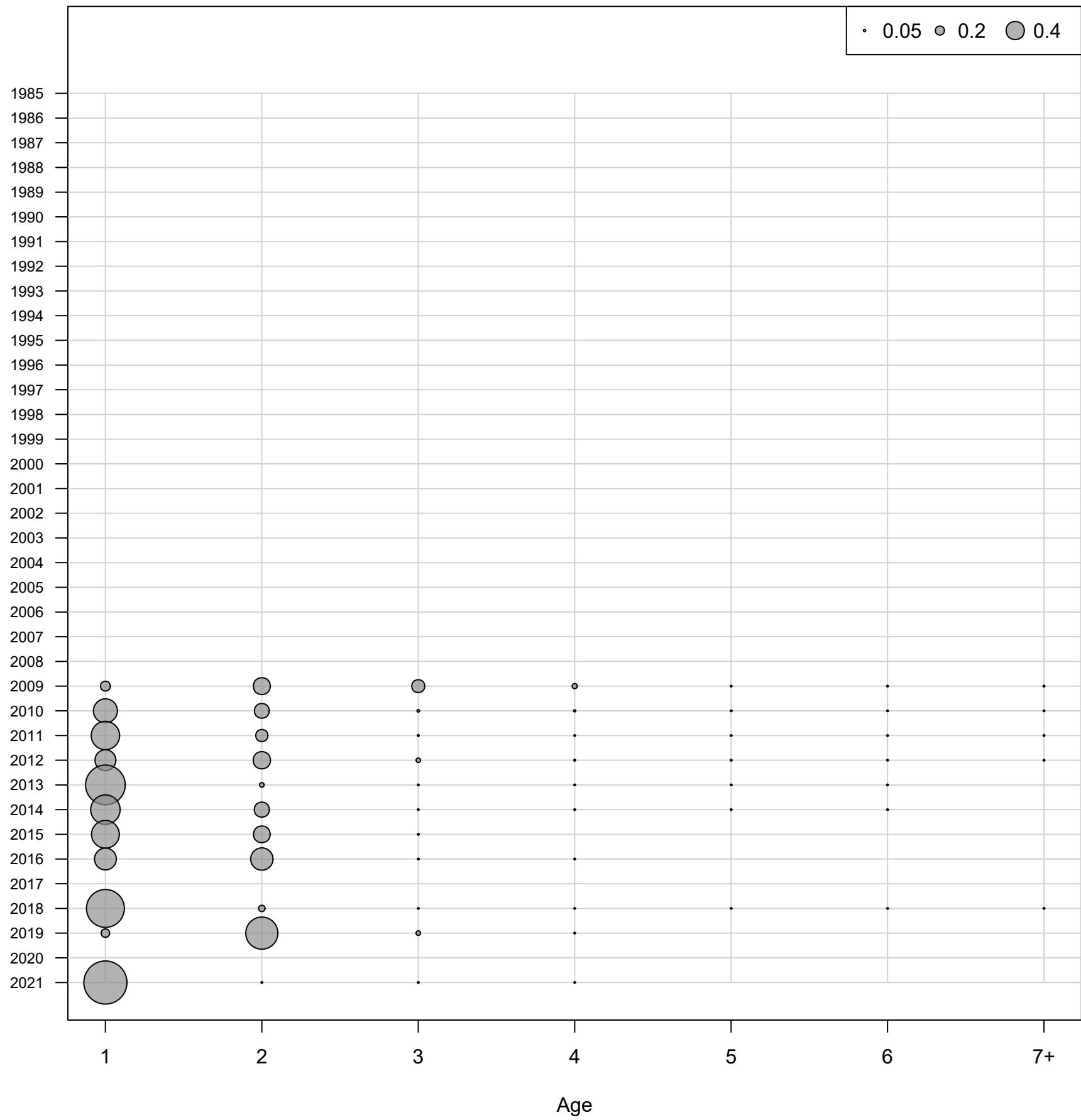




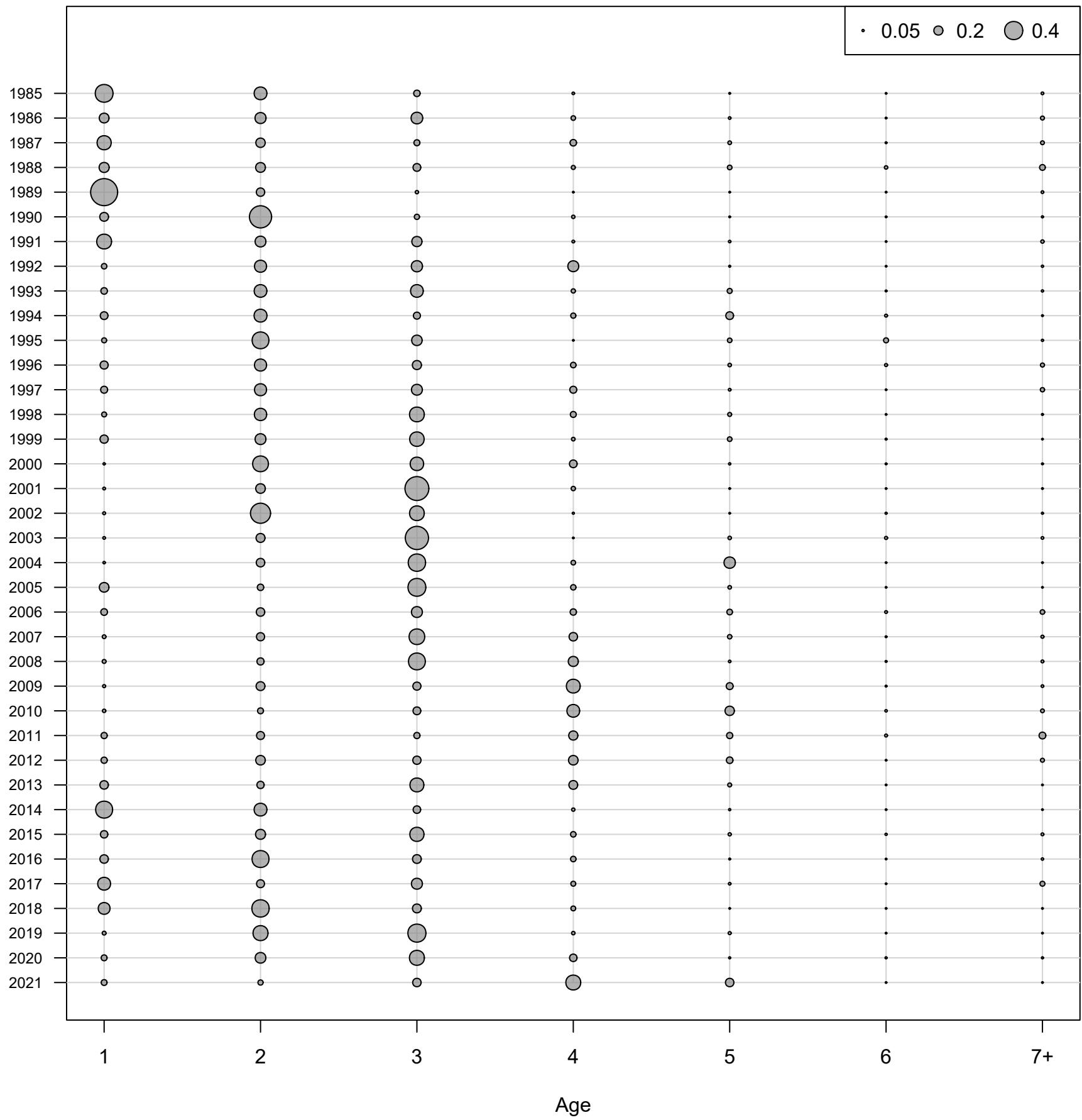
Age Comps for Index 1



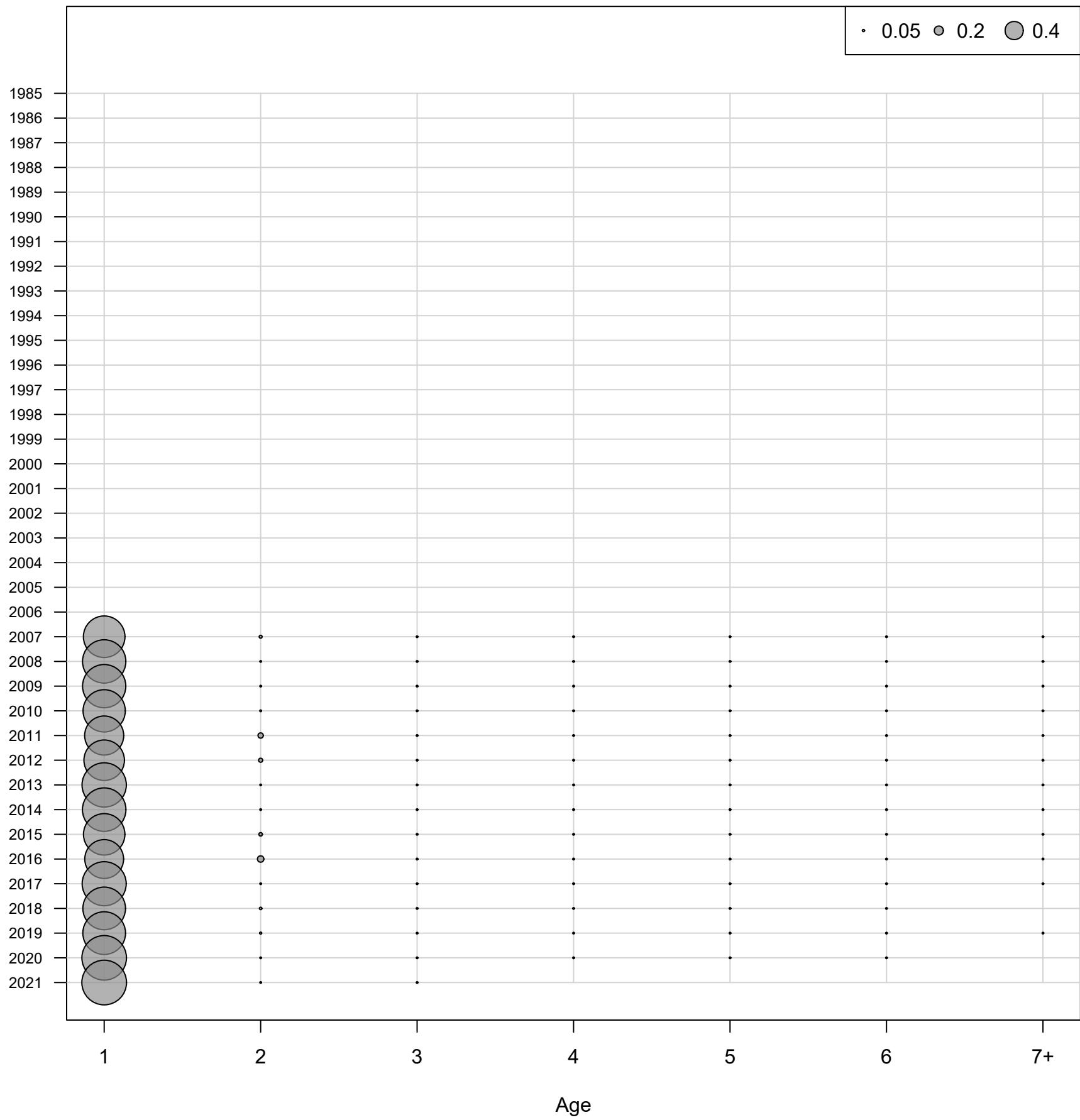
Age Comps for Index 2



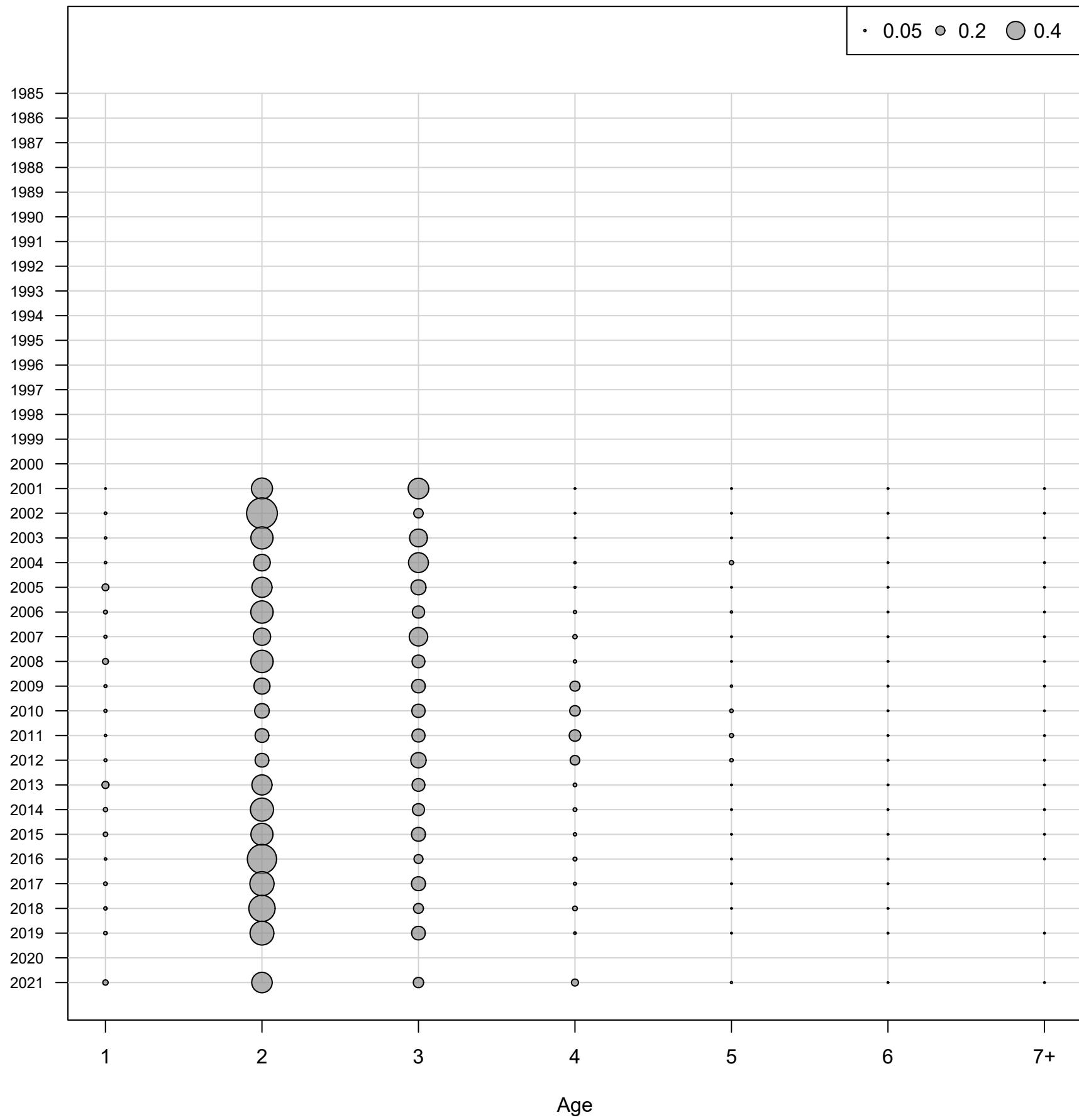
Age Comps for Index 3



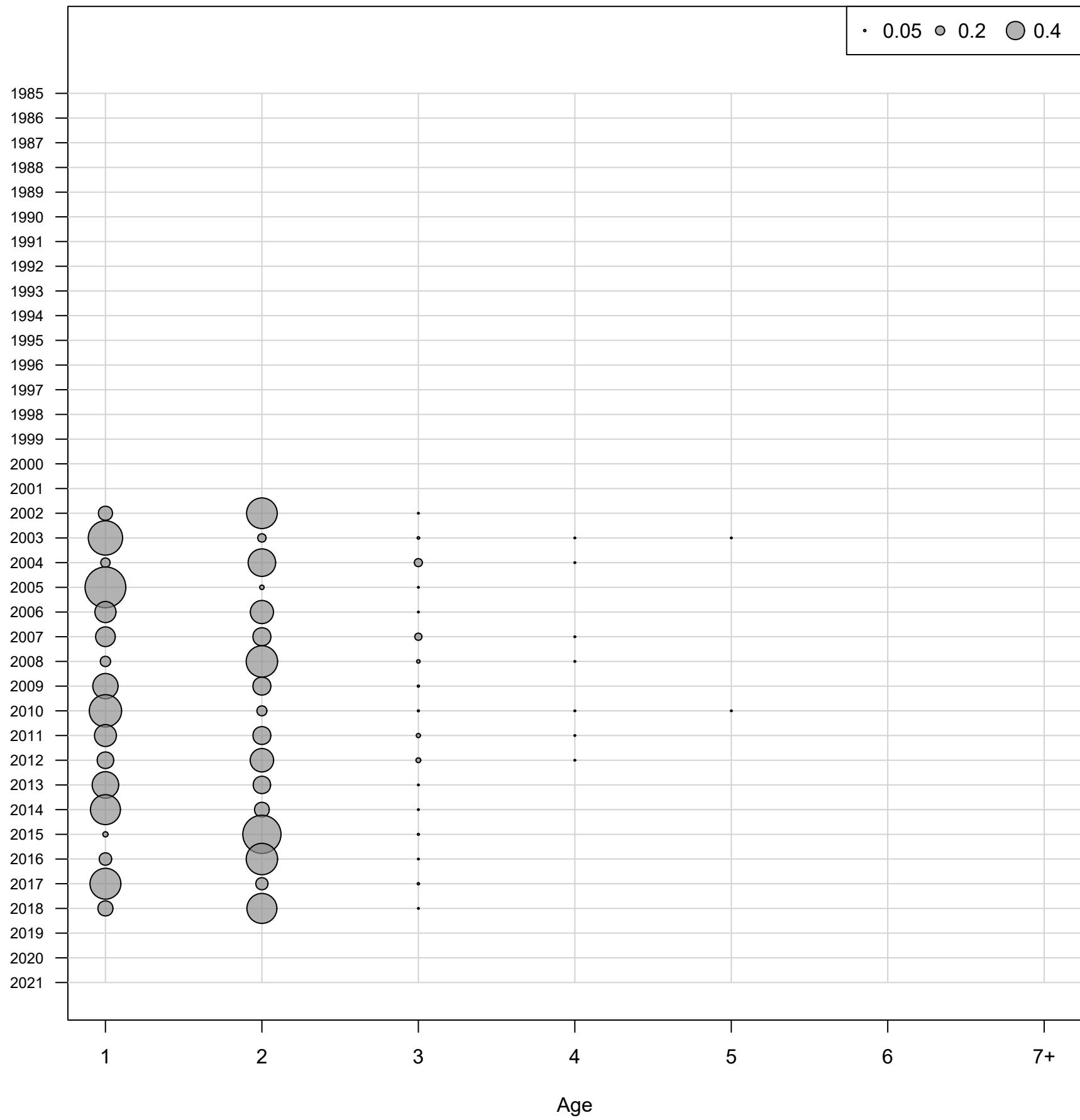
Age Comps for Index 4



Age Comps for Index 6



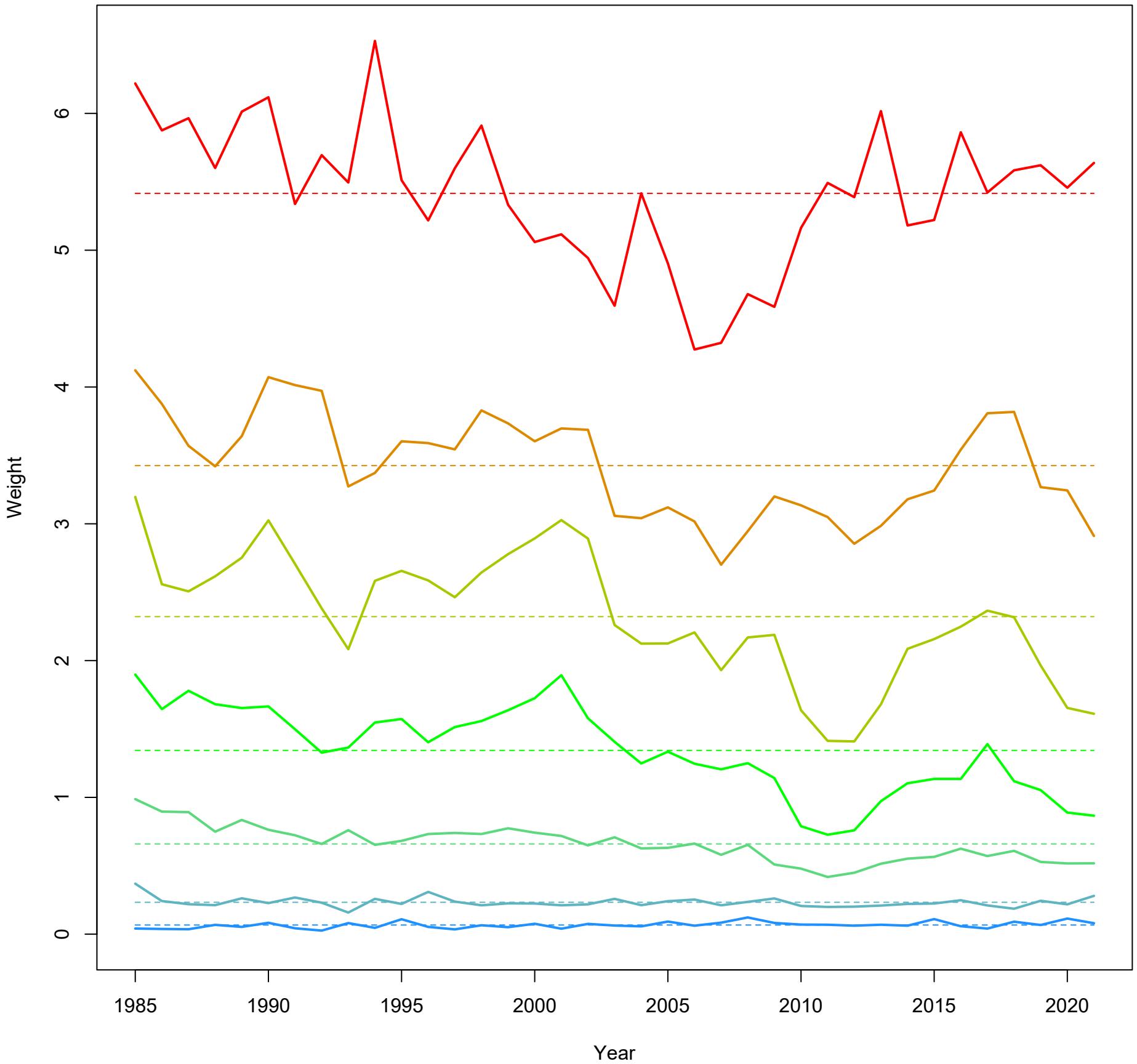
Age Comps for Index 8



Annual Weight-at-Age for SSB



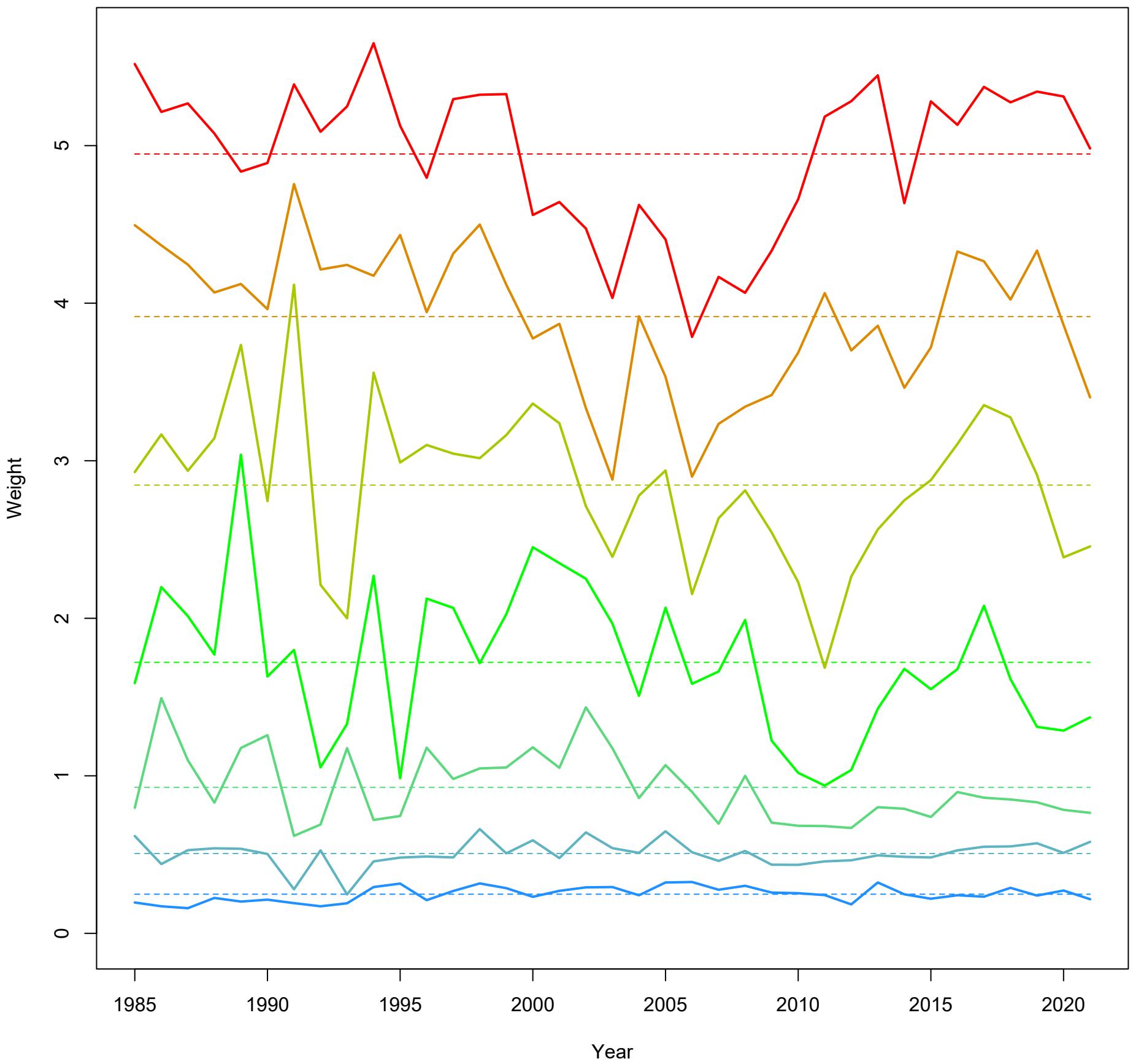
Annual Weight-at-Age for January 1 Biomass



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



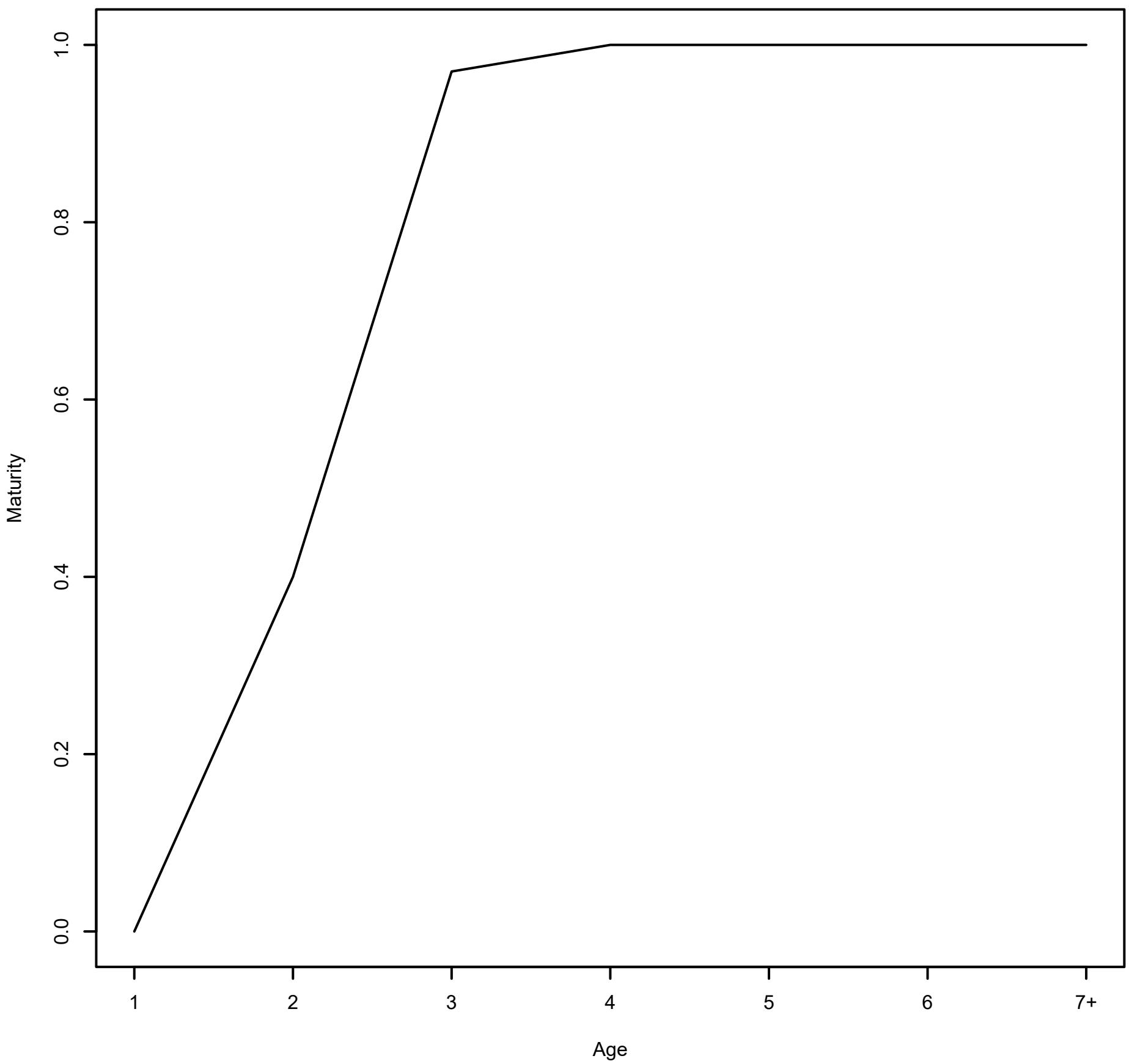
Annual Weight-at-Age for Index 8



Annual Weight-at-Age for Index 9



Maturity



BF28W_M7ECOV

MRIP Forage Fish Index as an environmental covariate on
catchability

DIAGNOSTIC PLOTS

m7EM1_ar

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

Environmental covariate 1: MRIPff modeled as AR1. Effects on q for index 3 estimated.

Number of Selectivity blocks: 14

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

Fleet 1 Selectivity Blocks: c(1, 2)

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

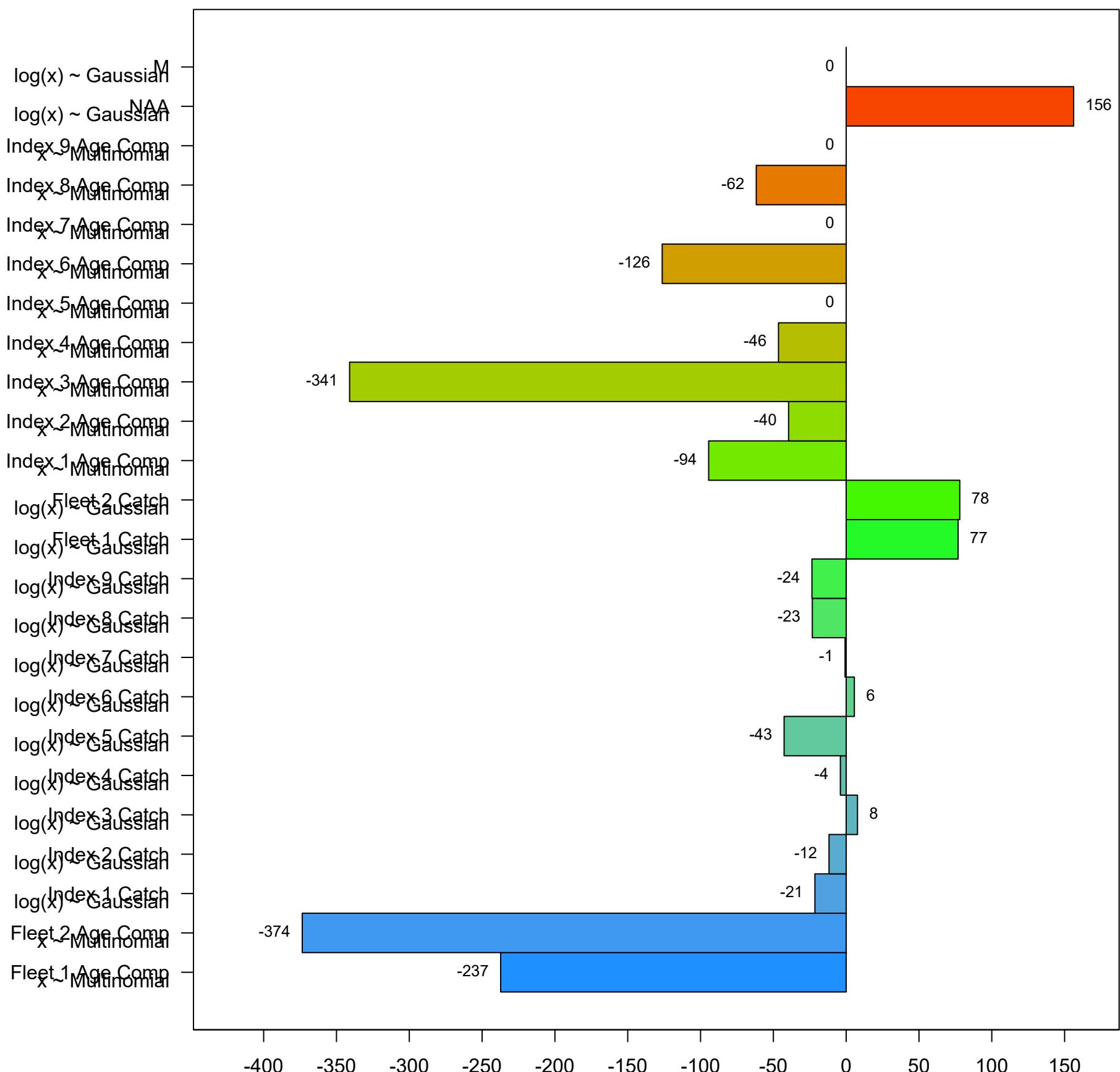
Index 1 Selectivity Blocks: 6

Index 2 Selectivity Blocks: 7

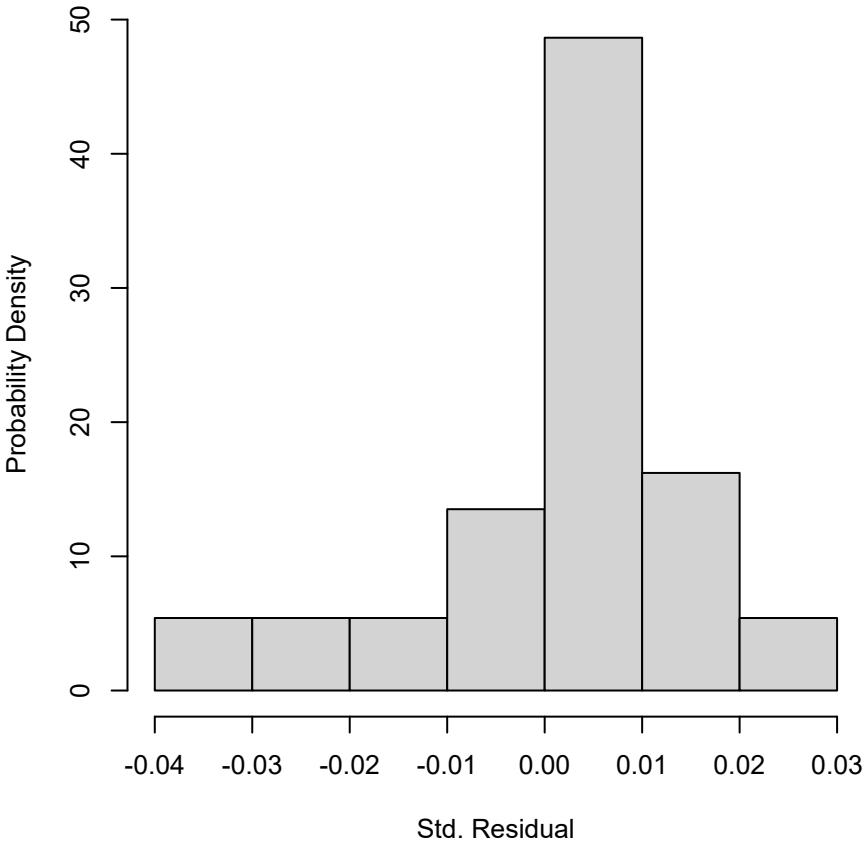
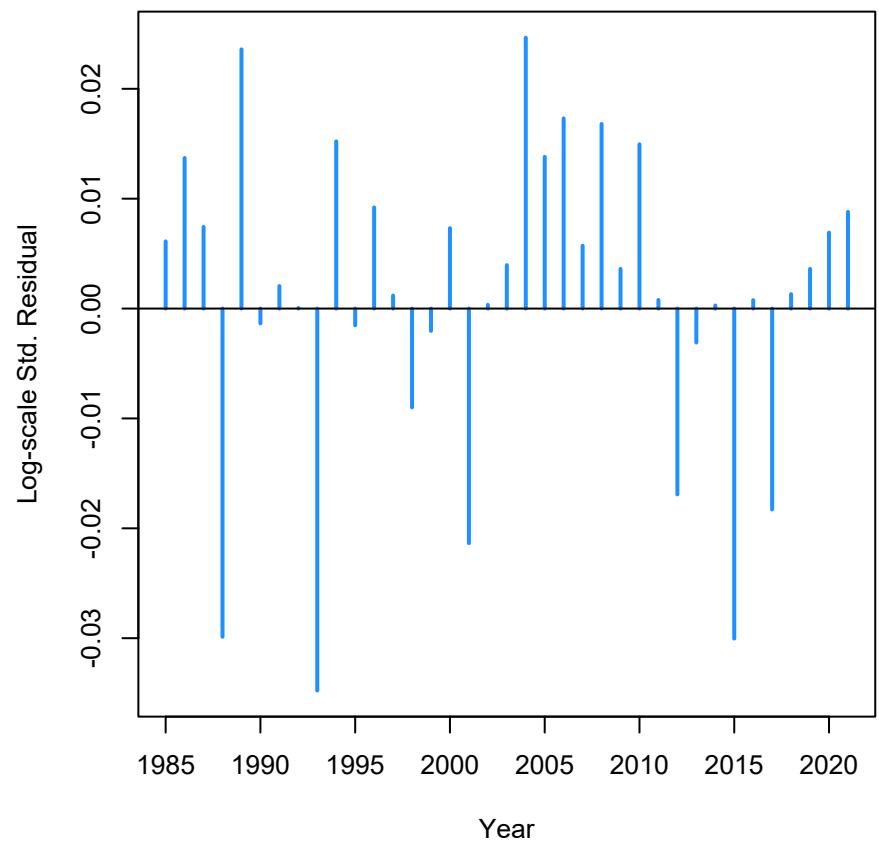
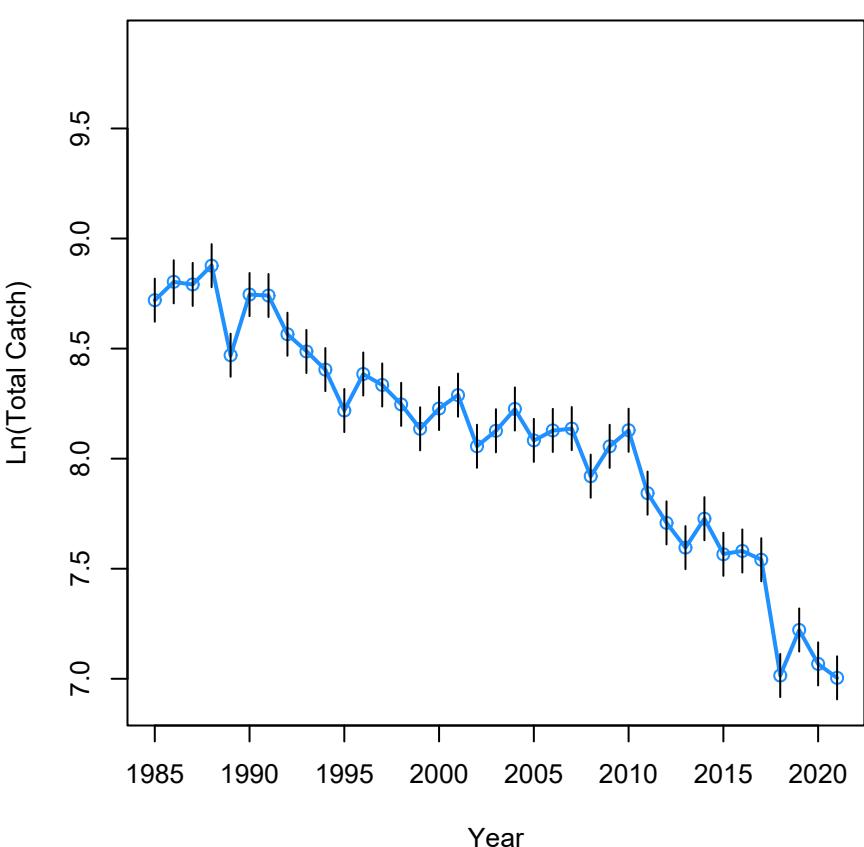
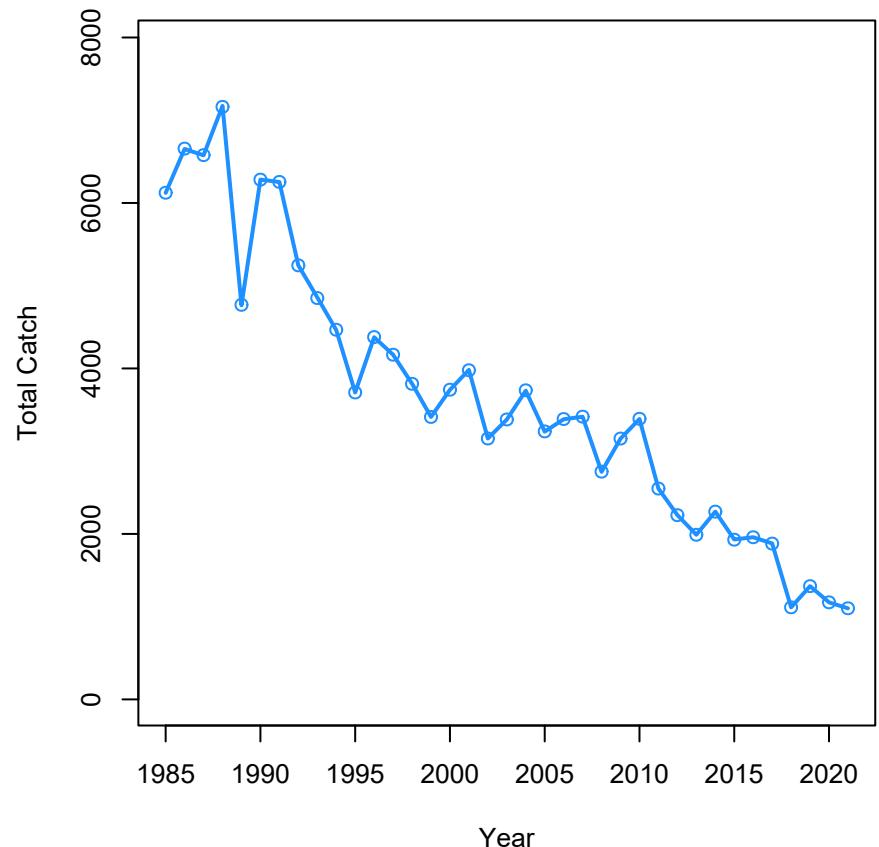
Index 3 Selectivity Blocks: 8

Index 4 Selectivity Blocks: 9

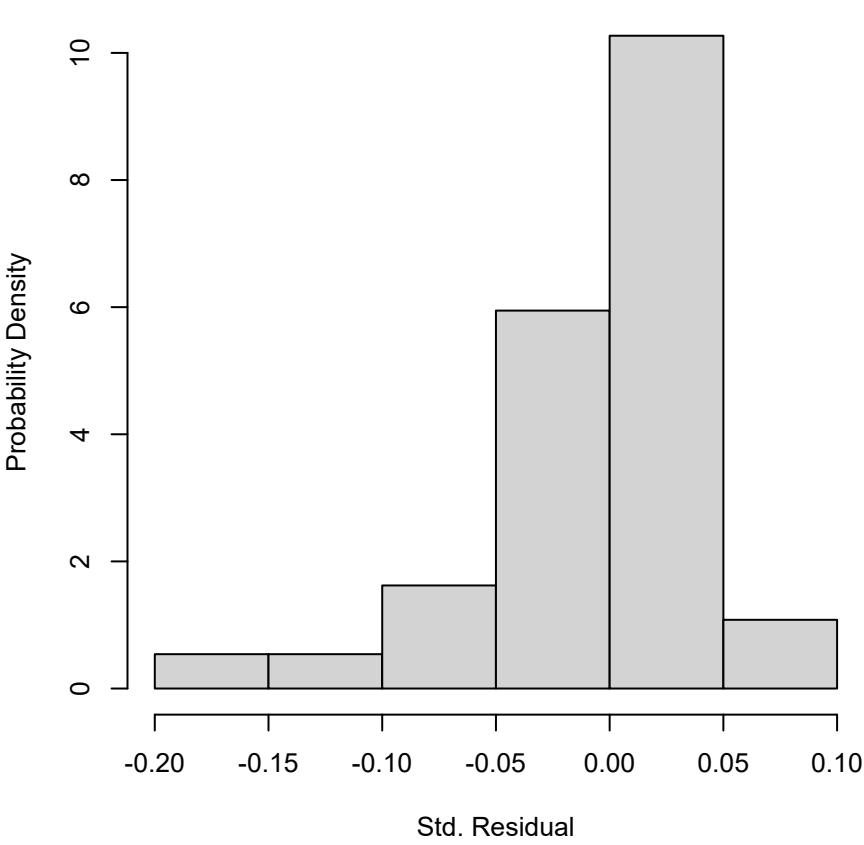
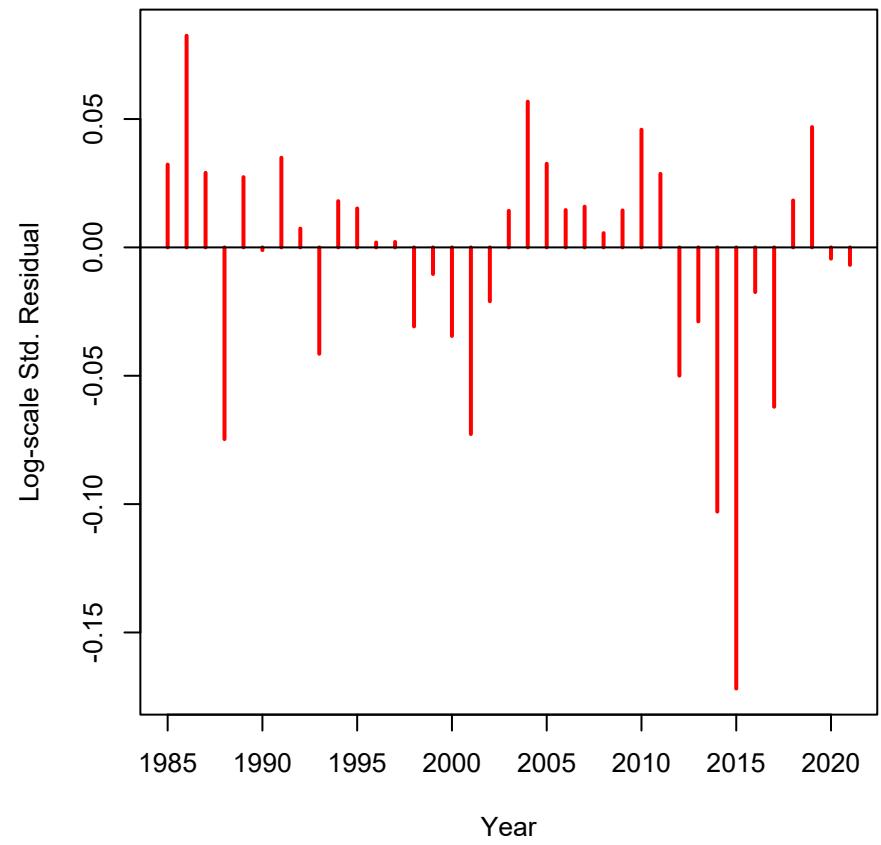
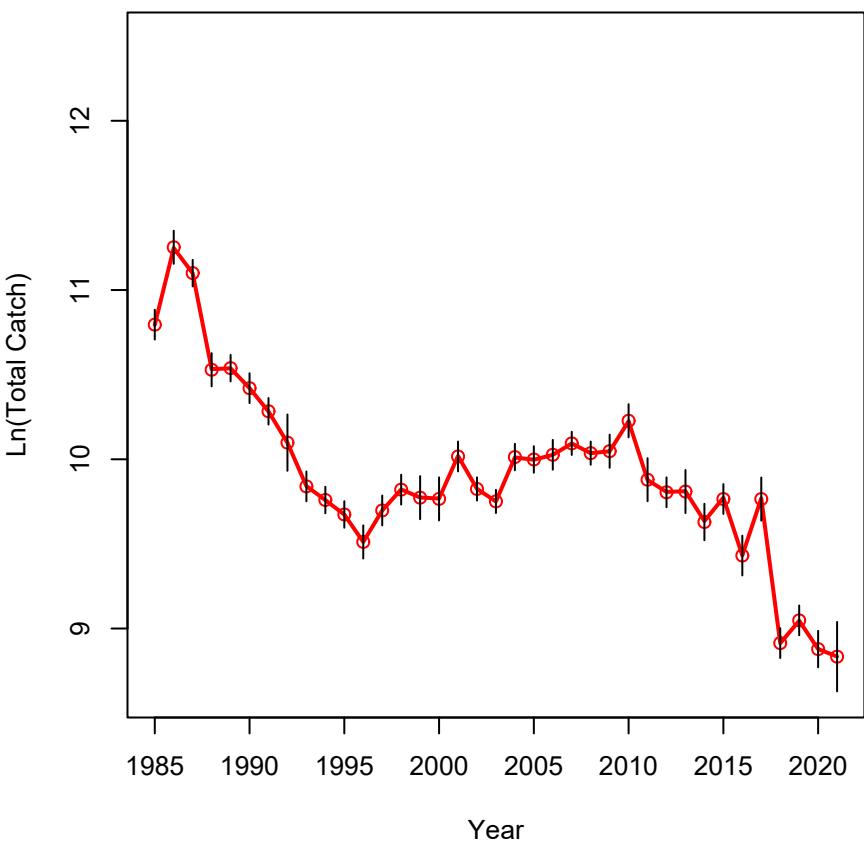
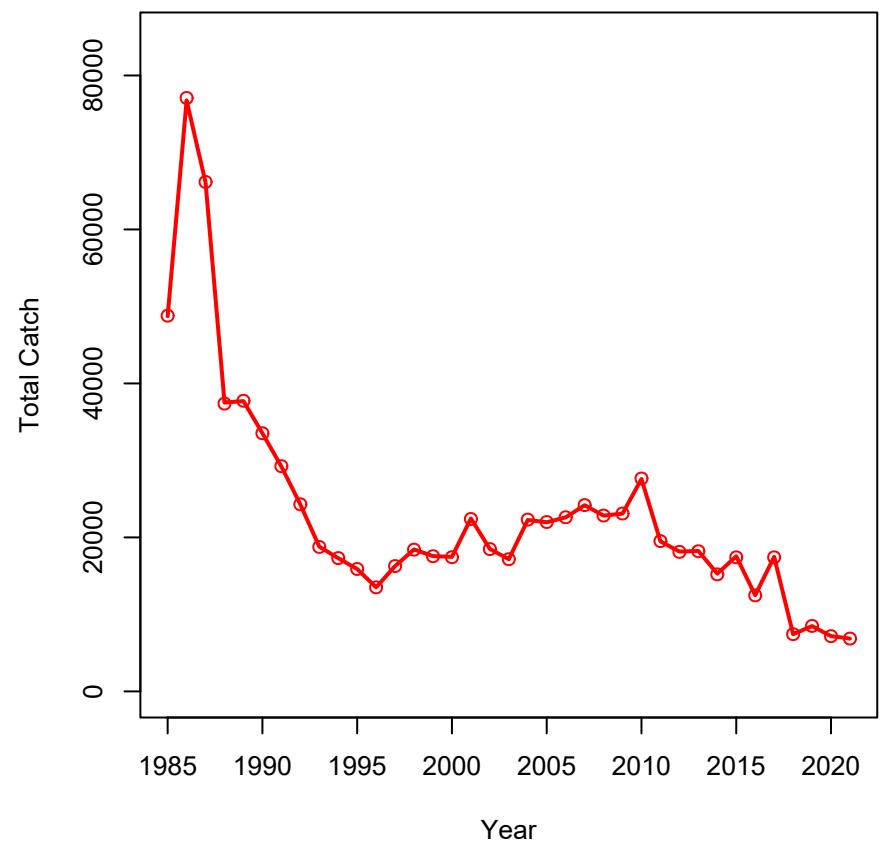
Index 5 Selectivity Blocks: 10



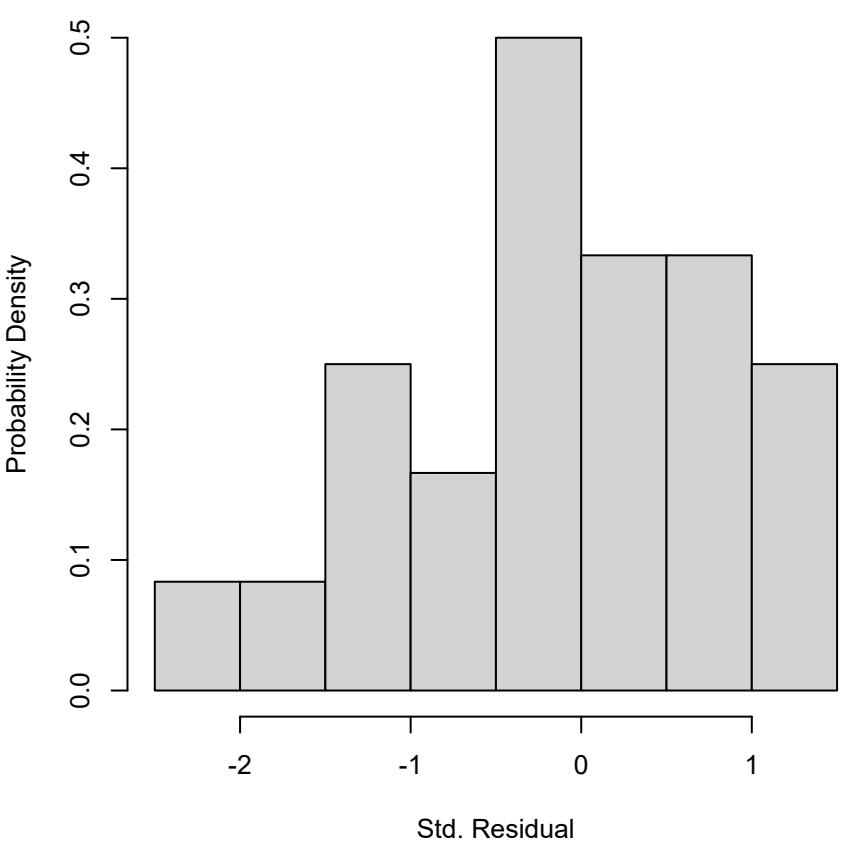
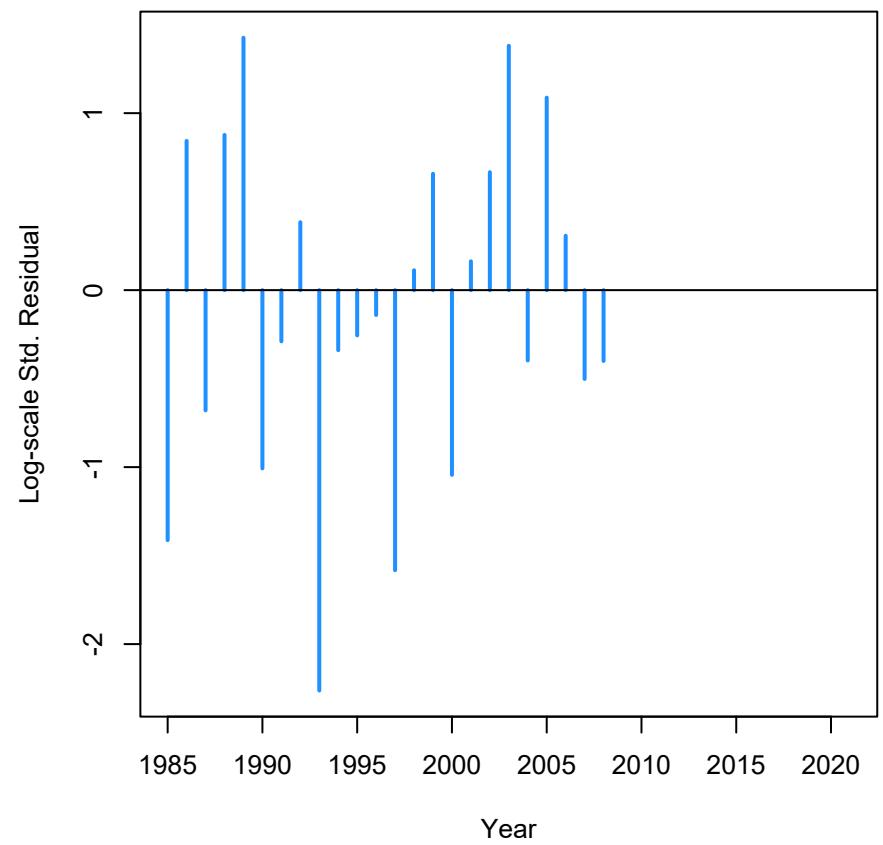
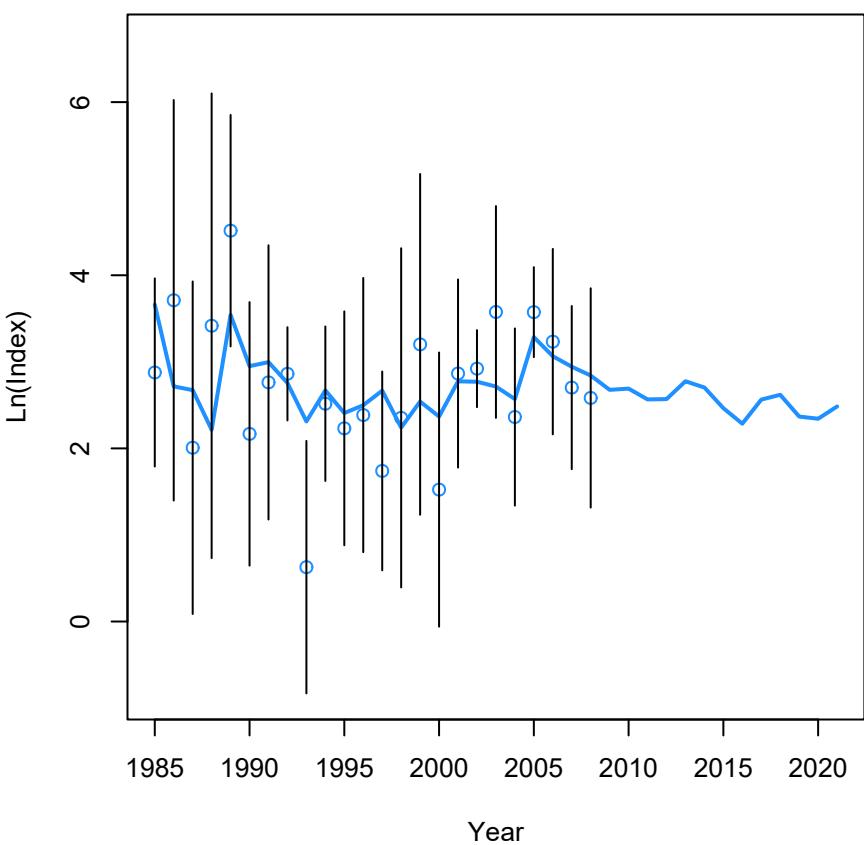
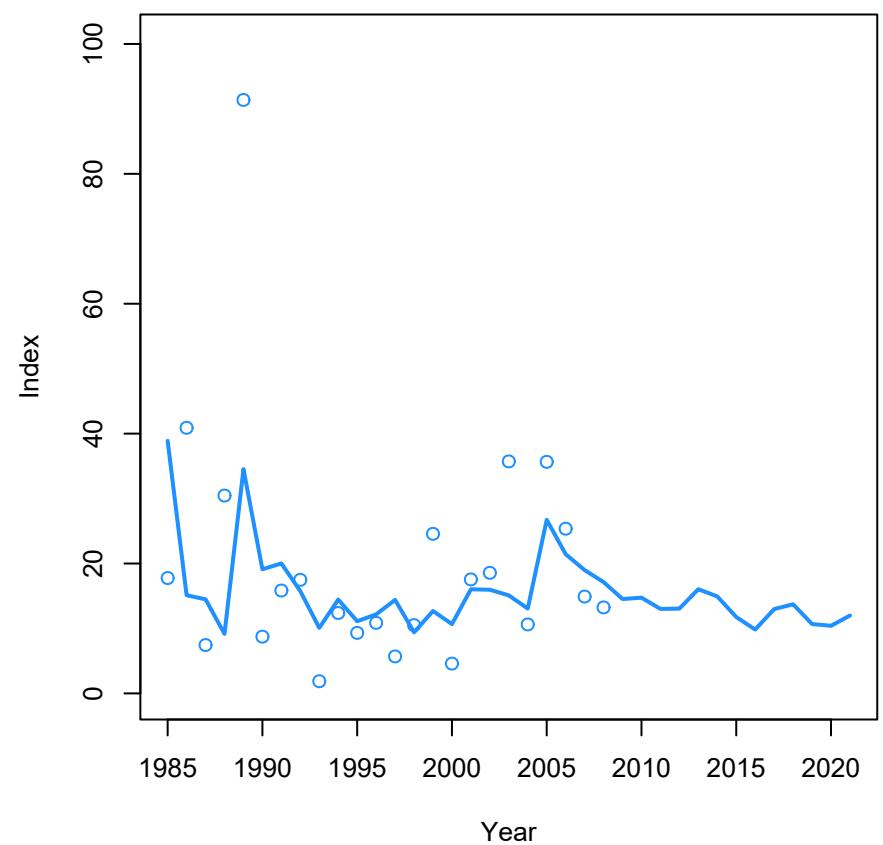
Fleet 1 Catch



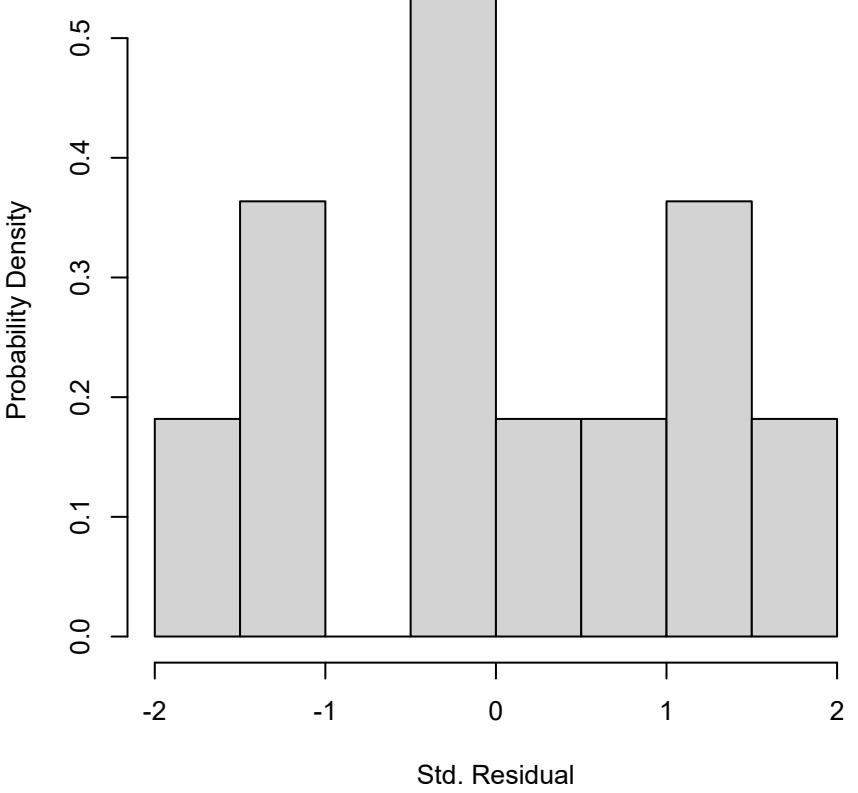
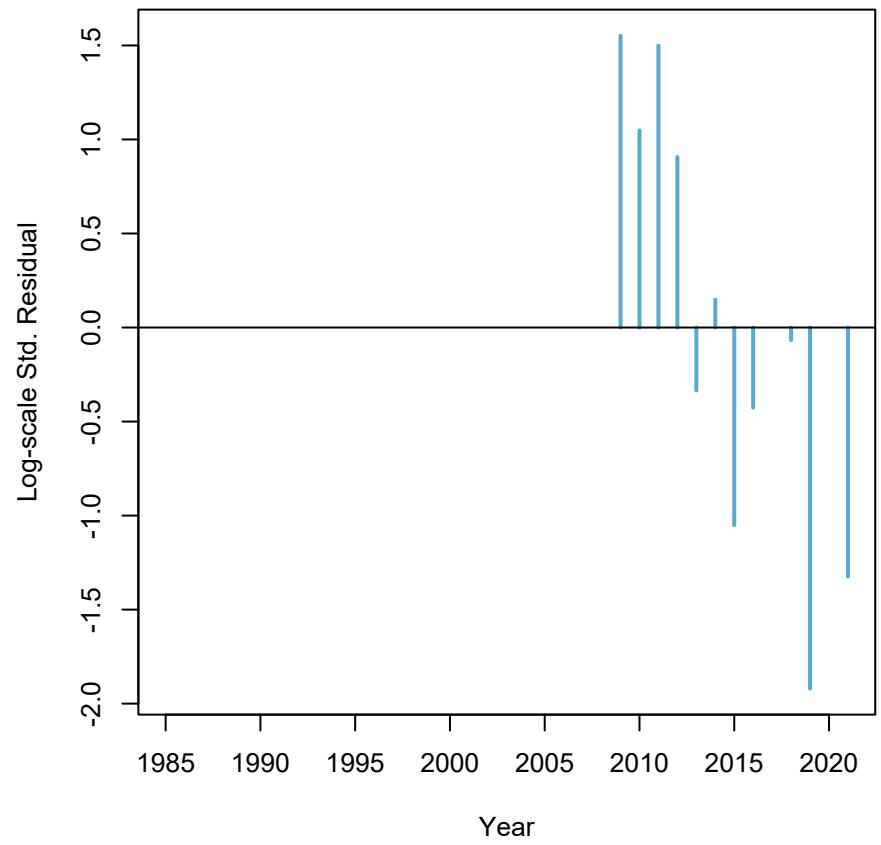
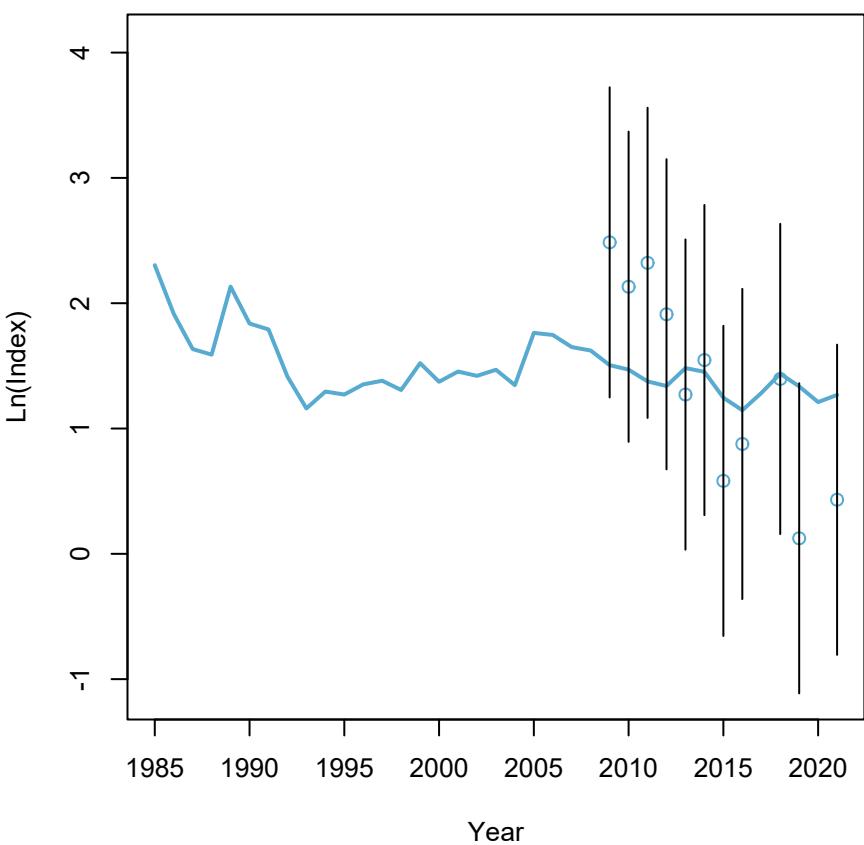
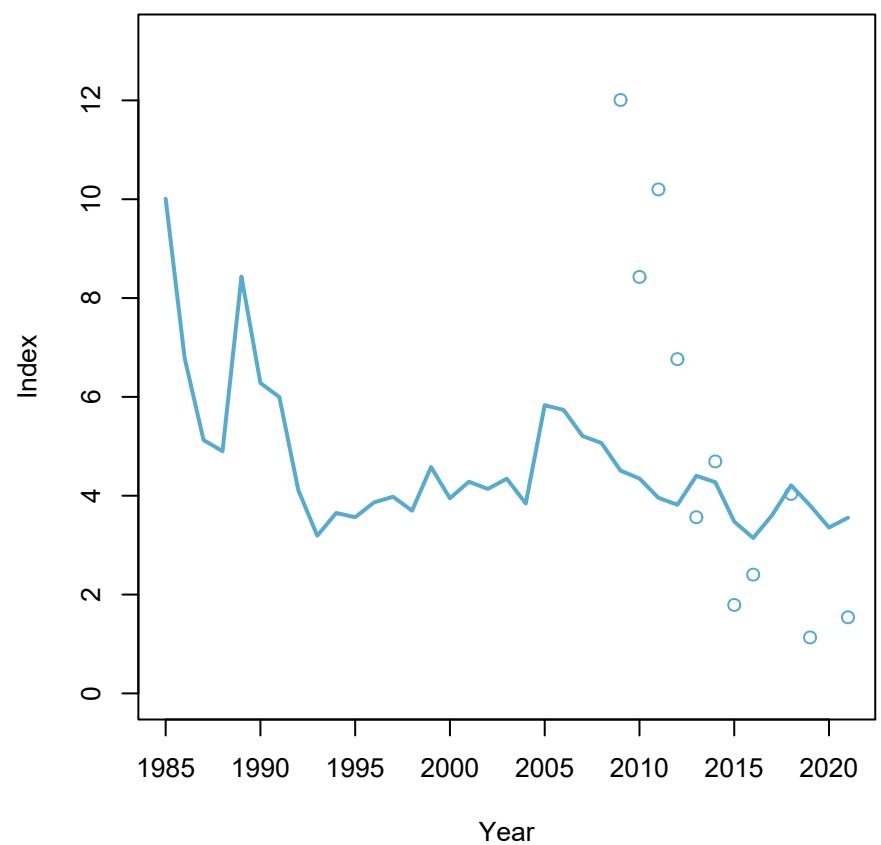
Fleet 2 Catch



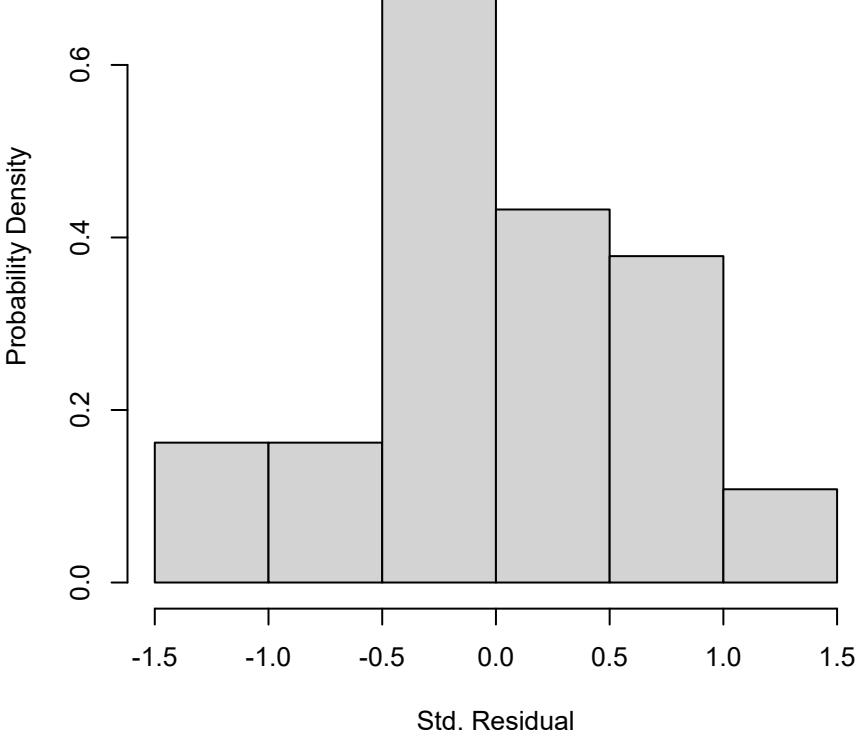
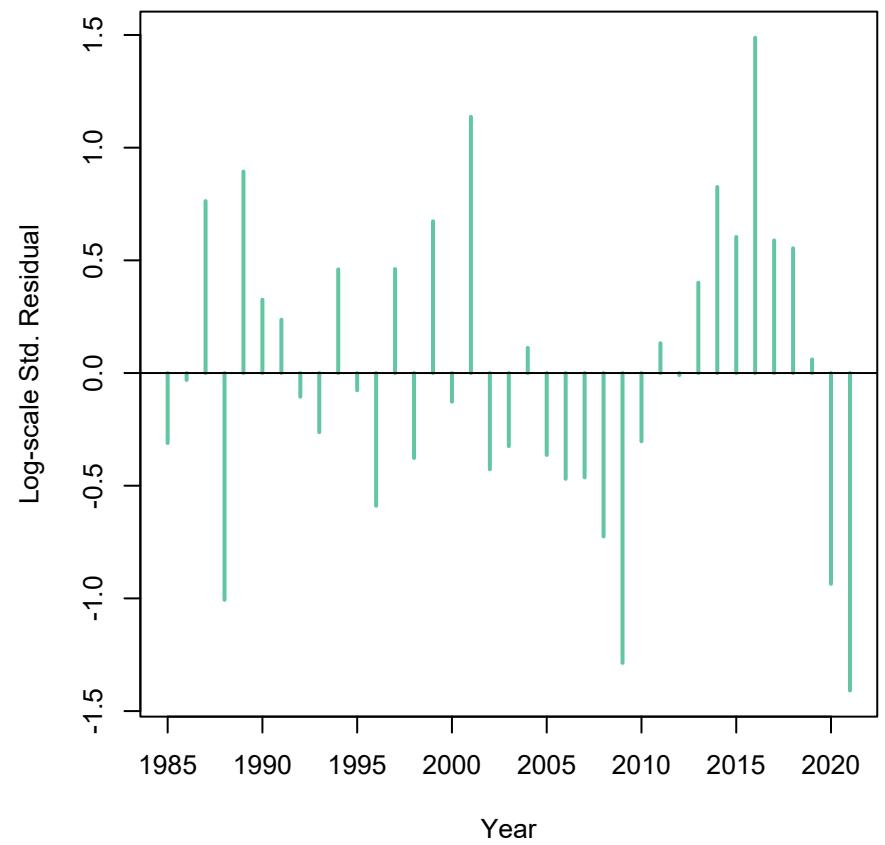
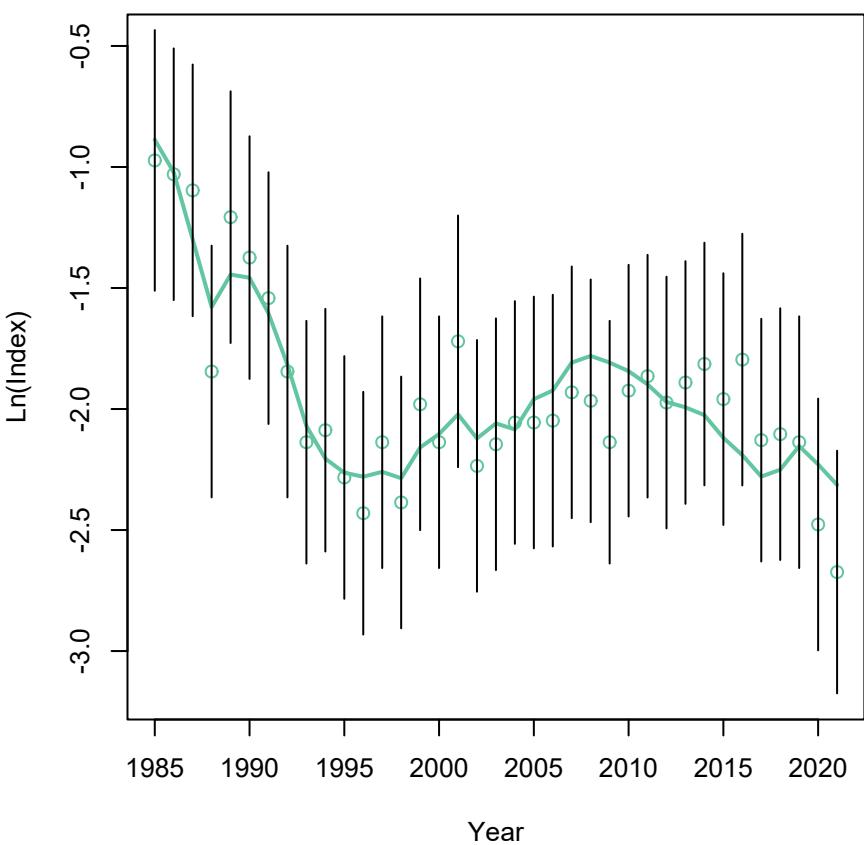
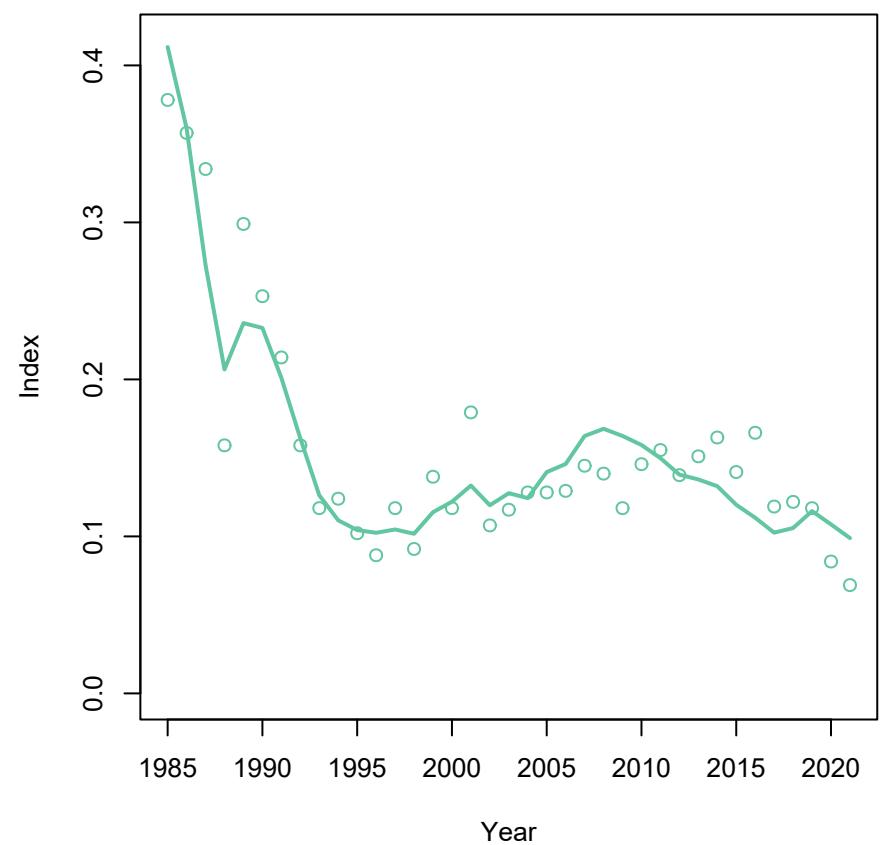
Index 1

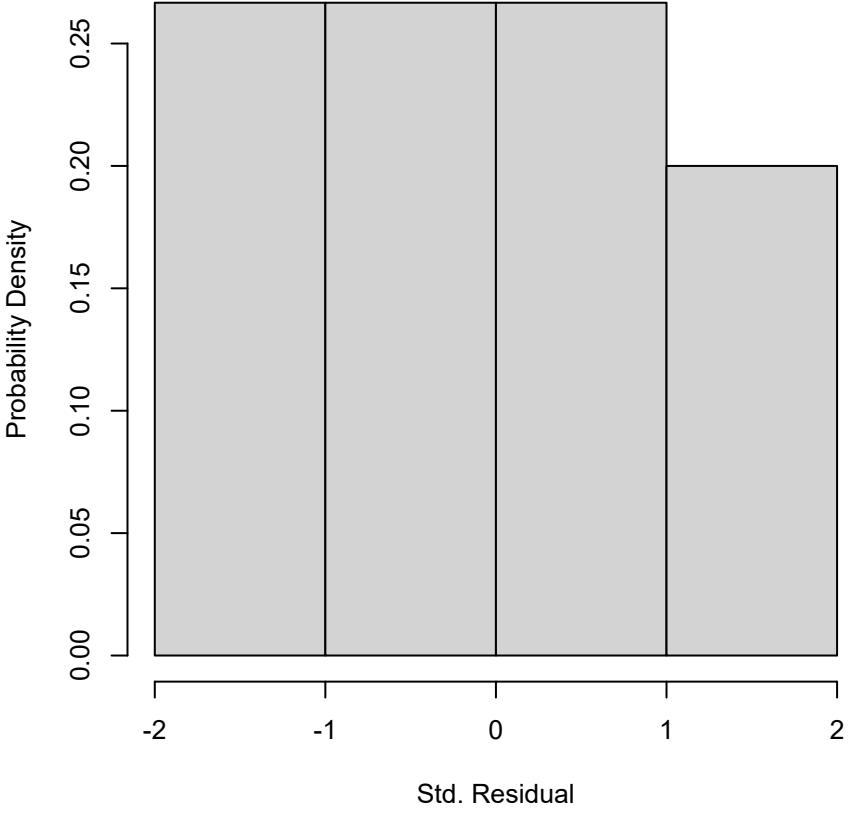
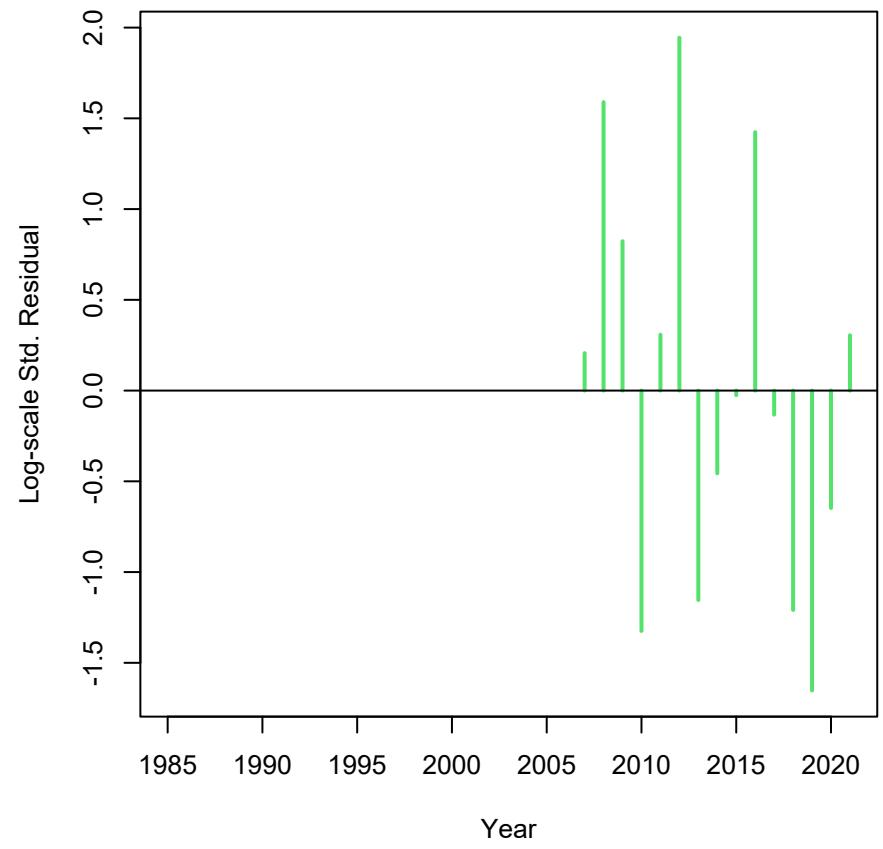
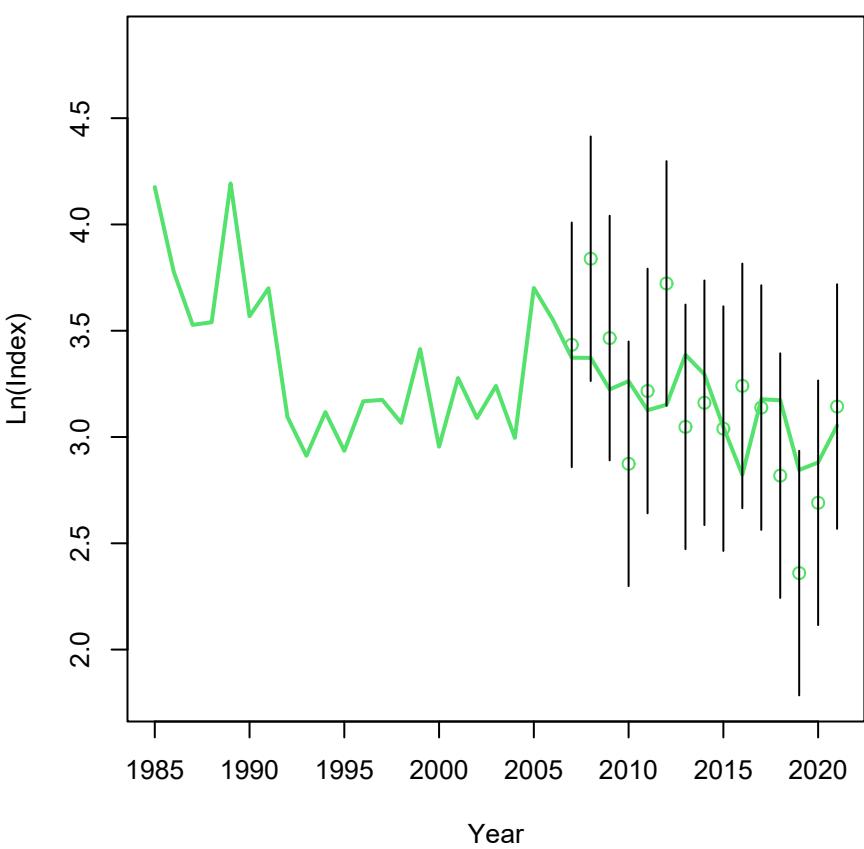
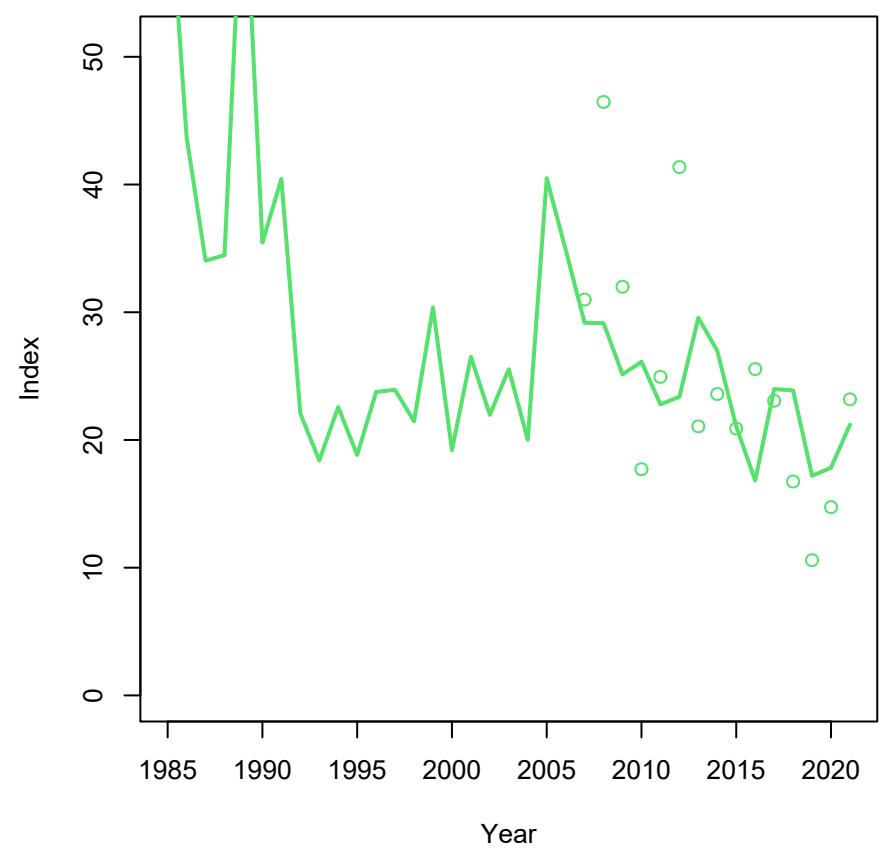


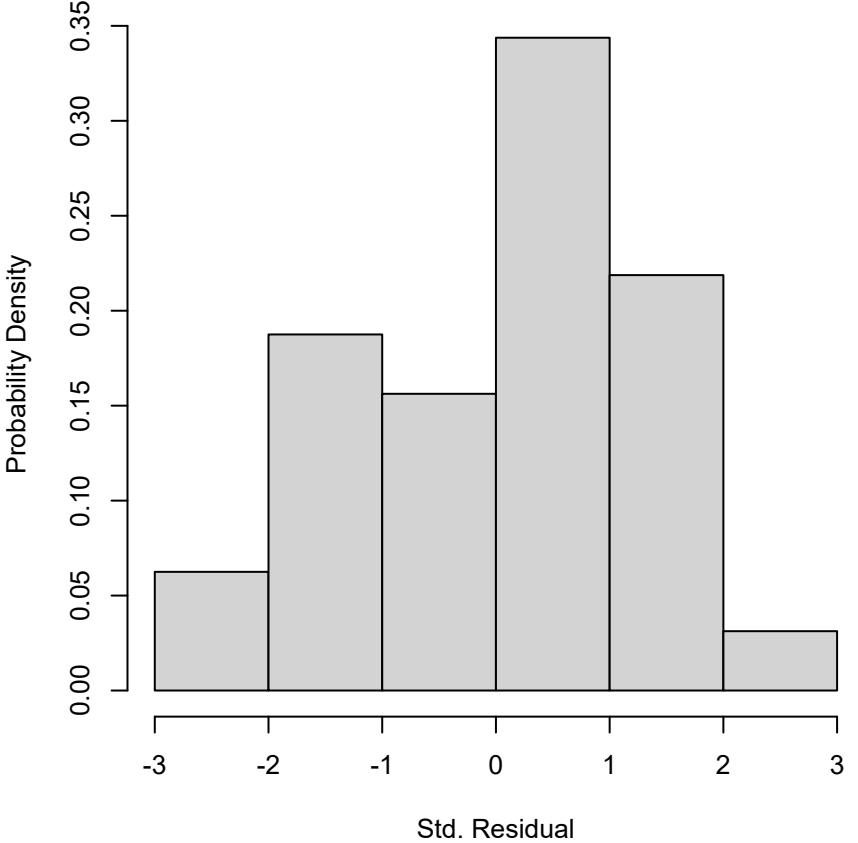
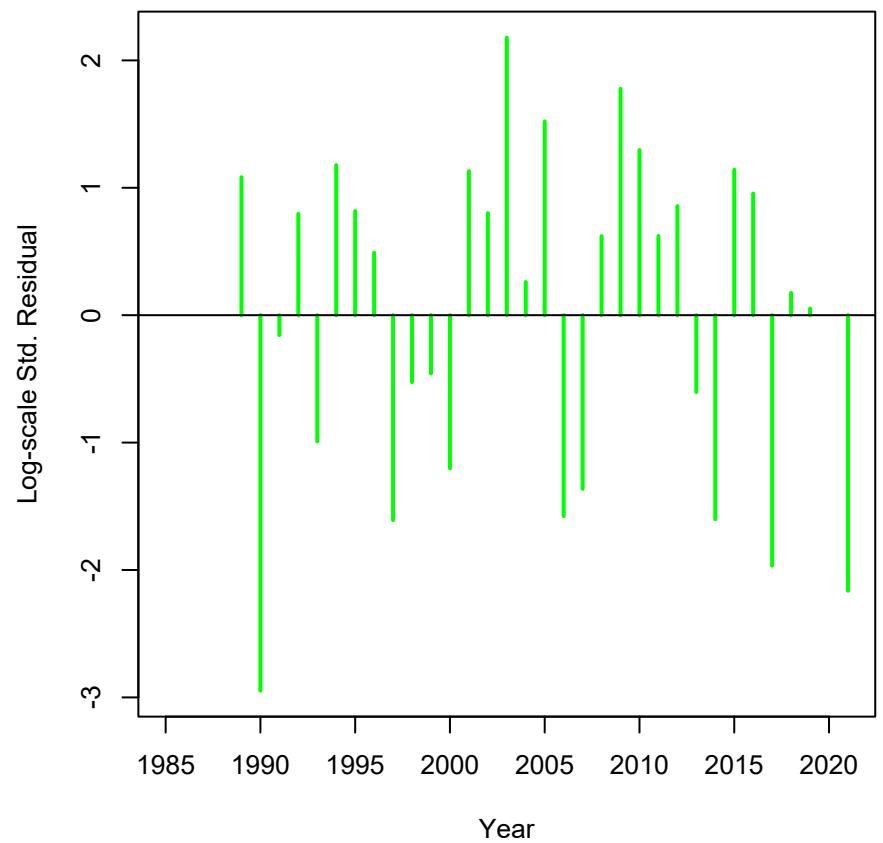
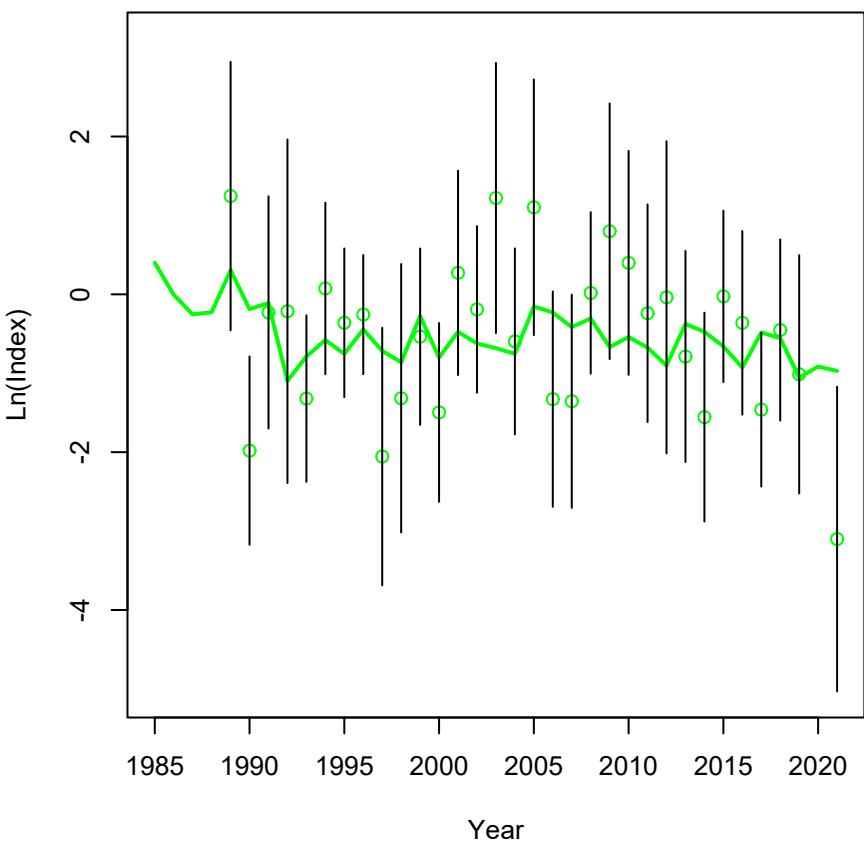
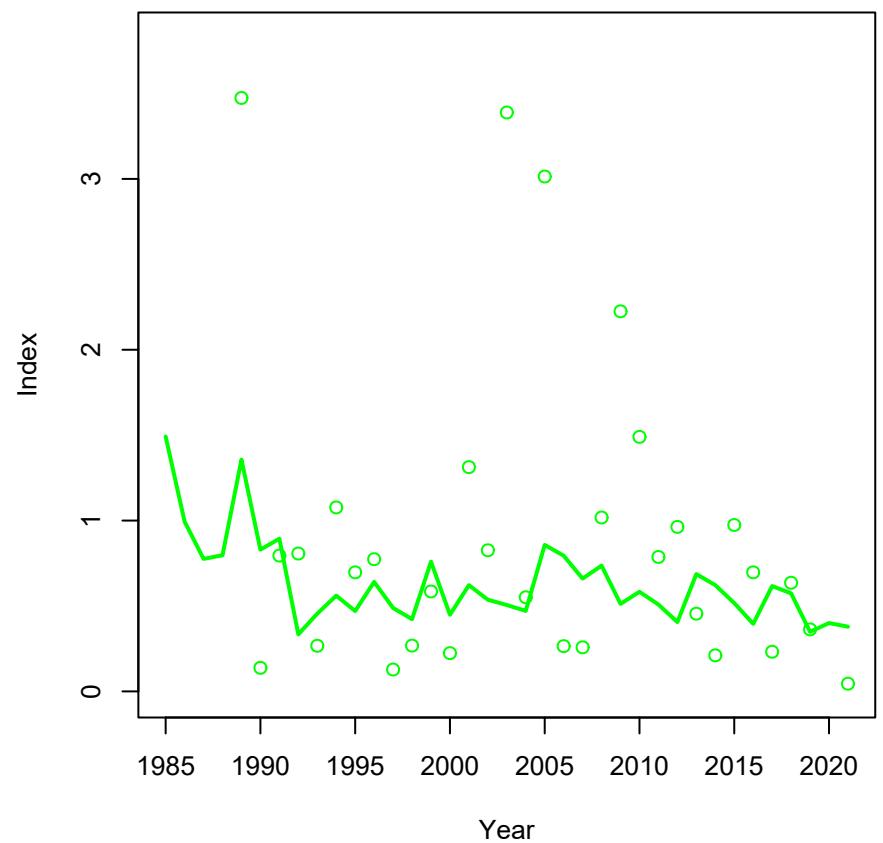
Index 2



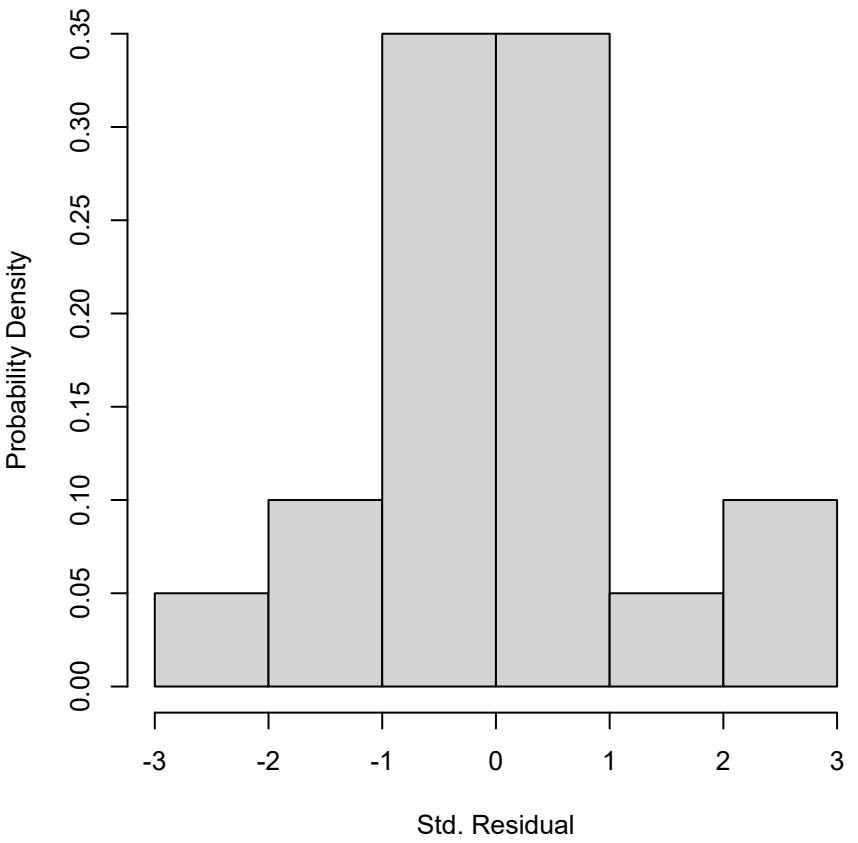
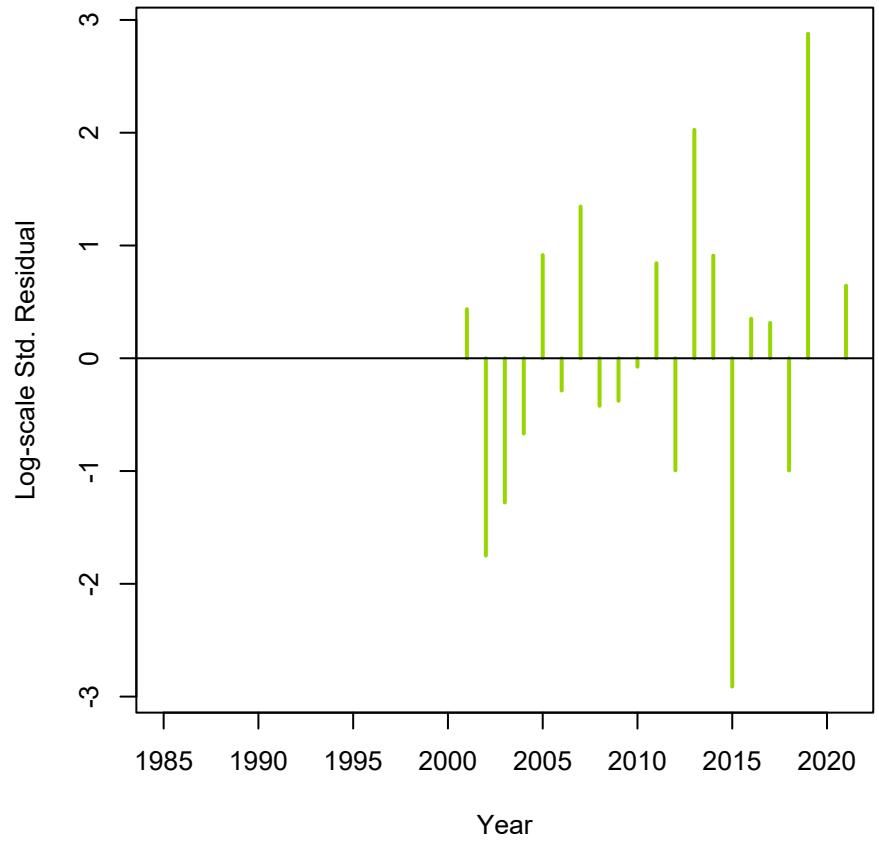
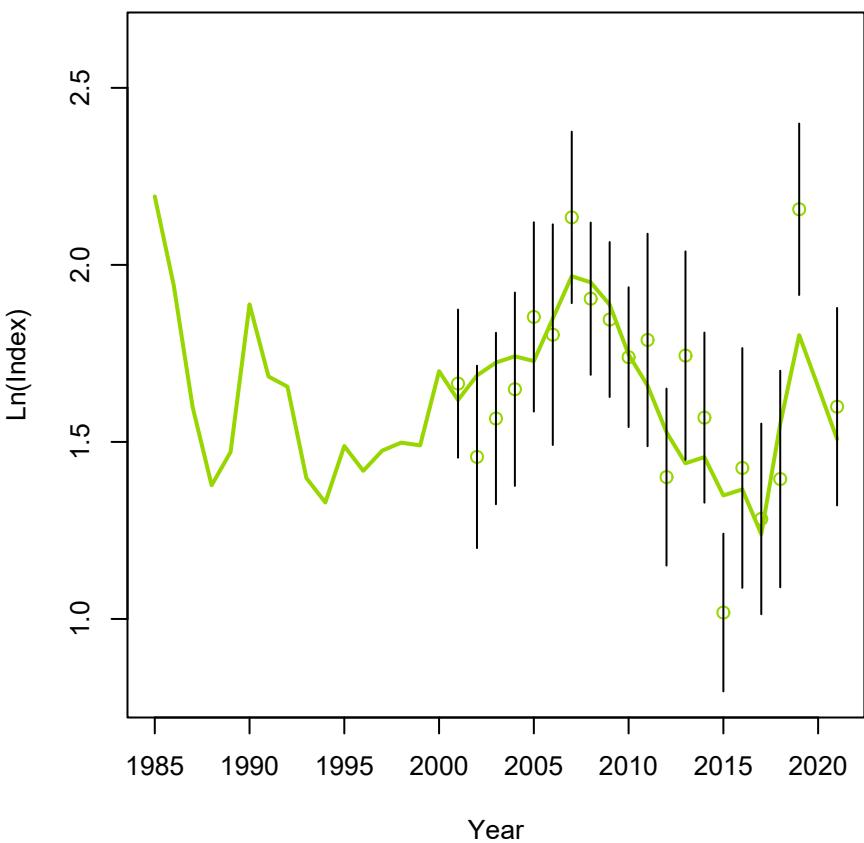
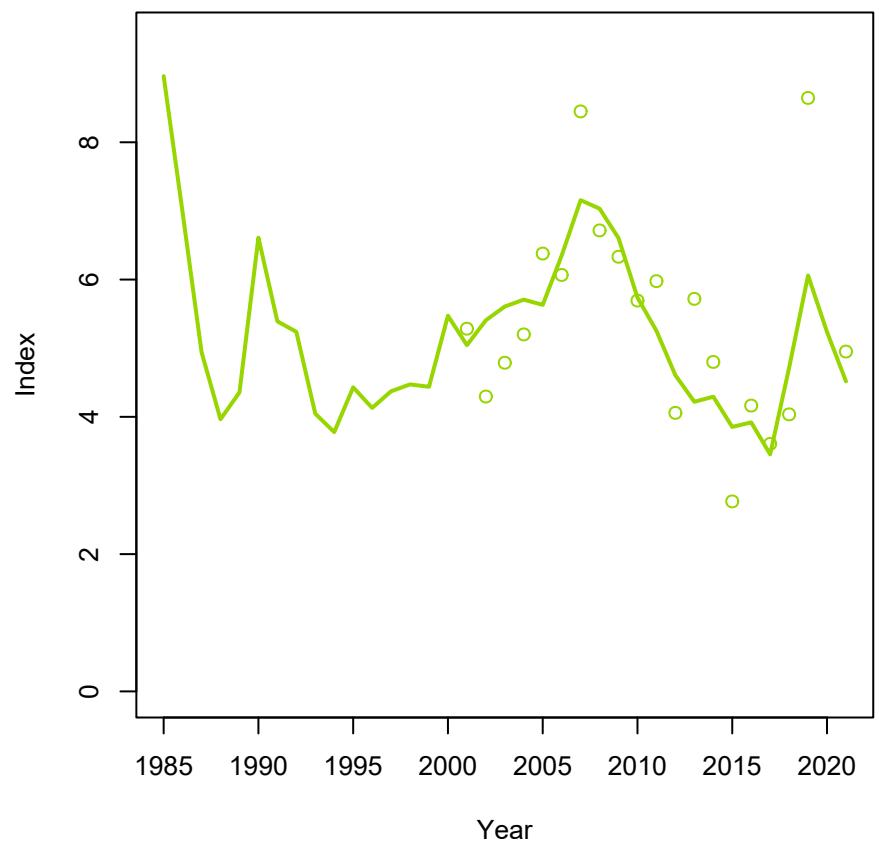
Index 3



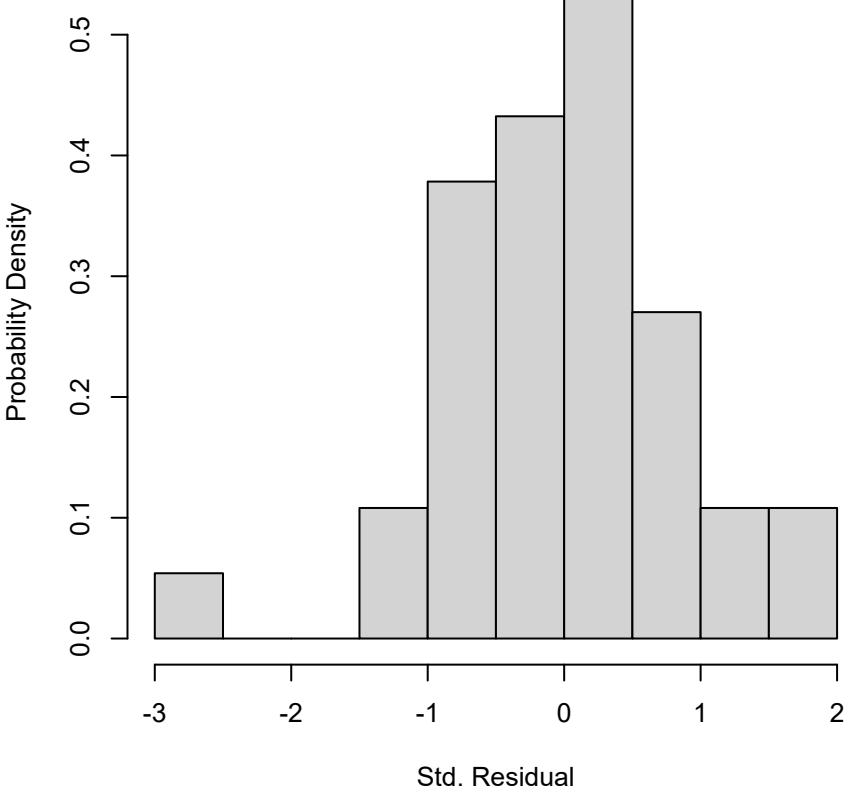
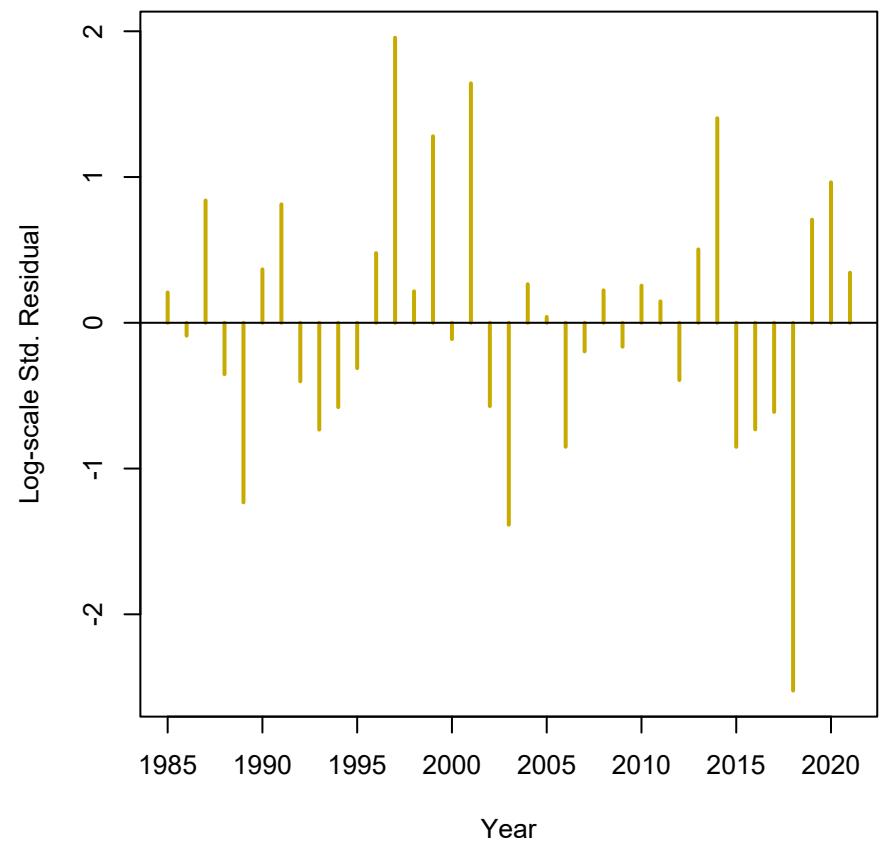
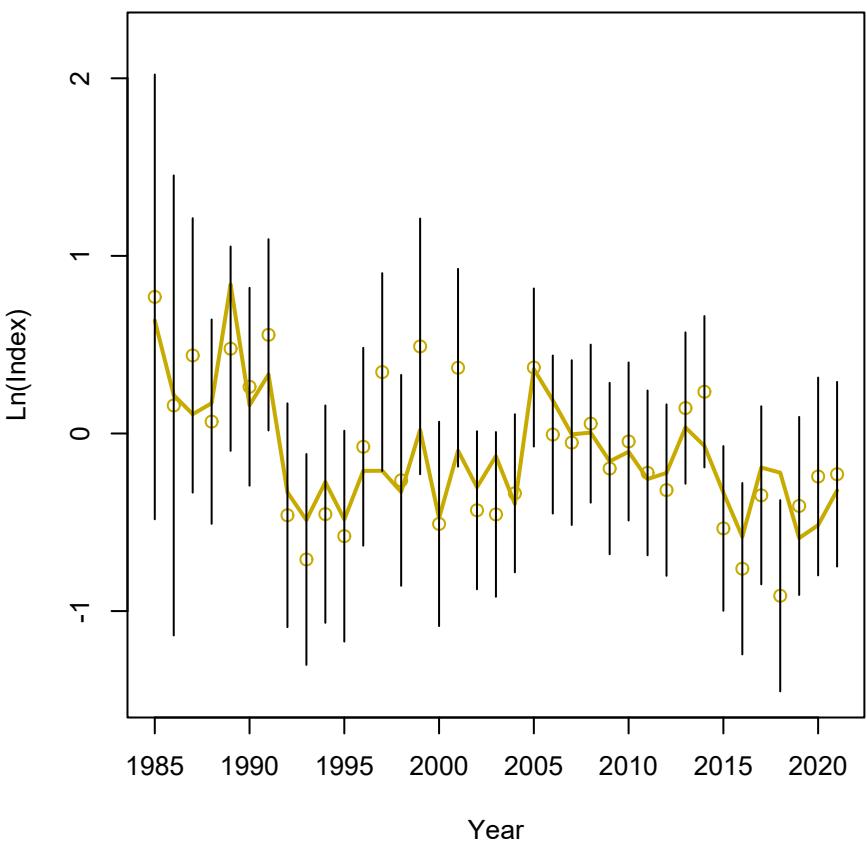
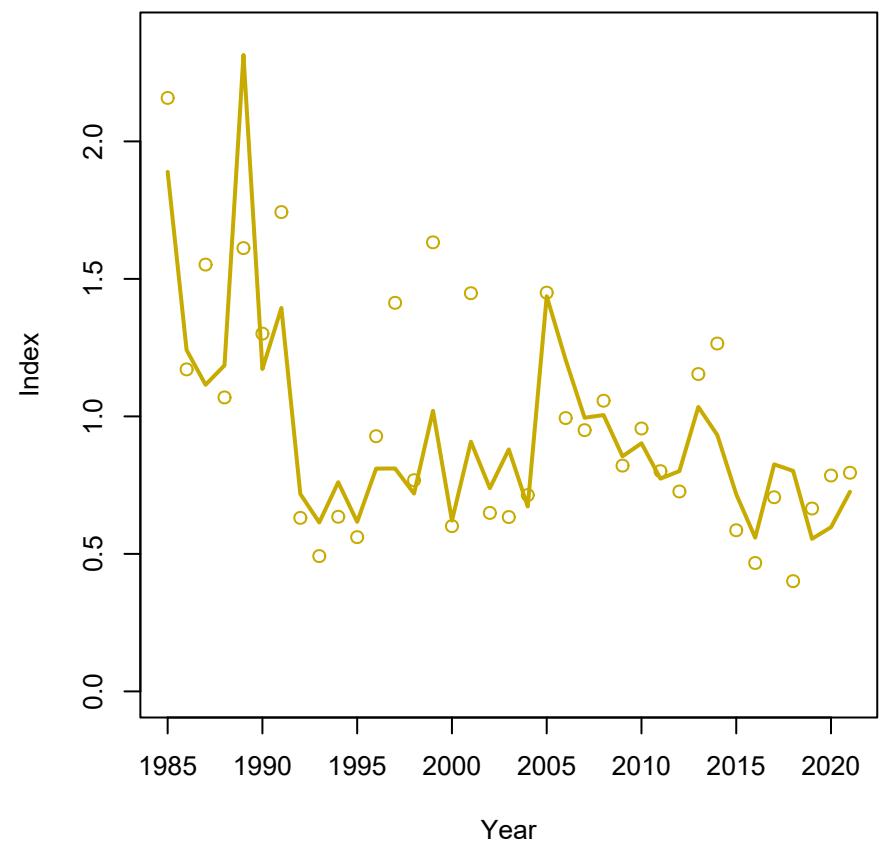
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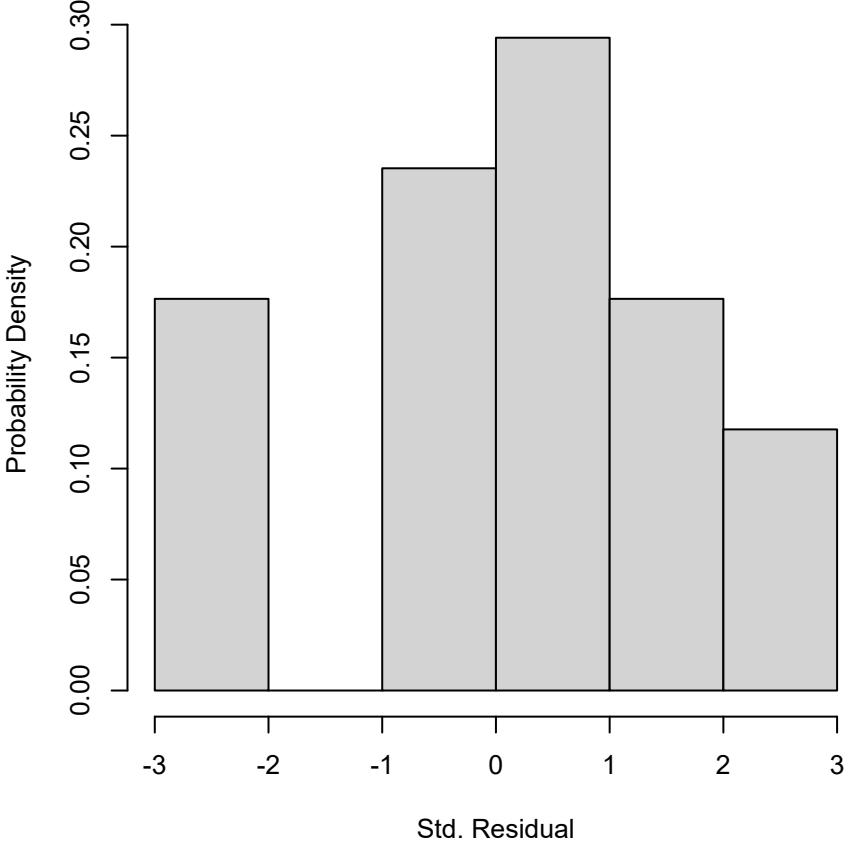
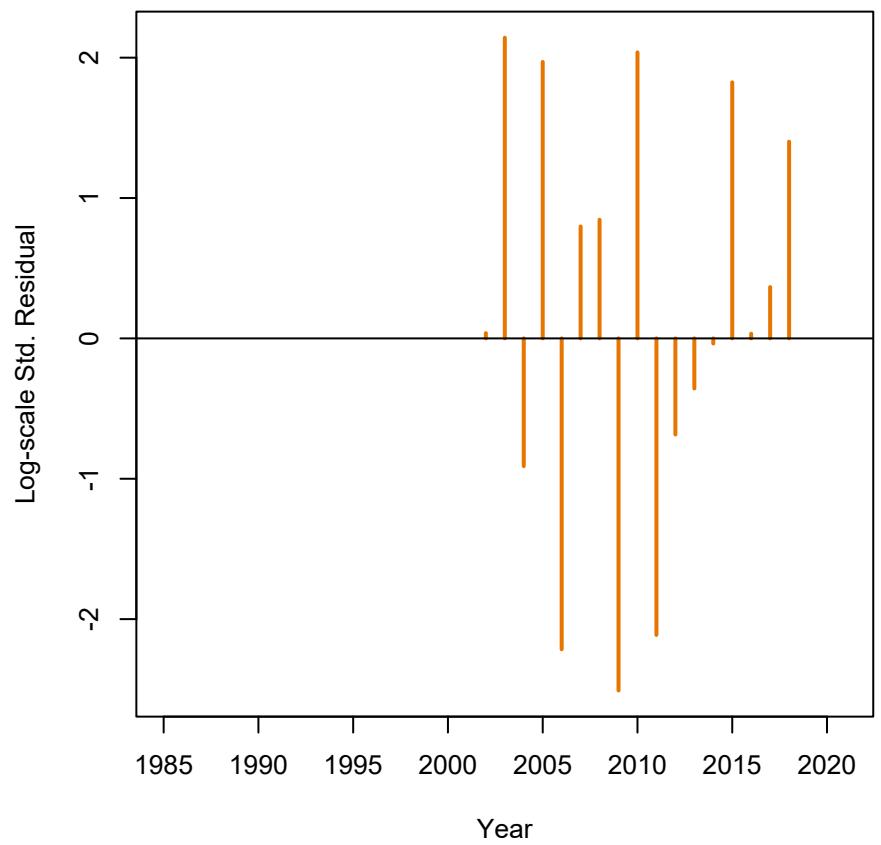
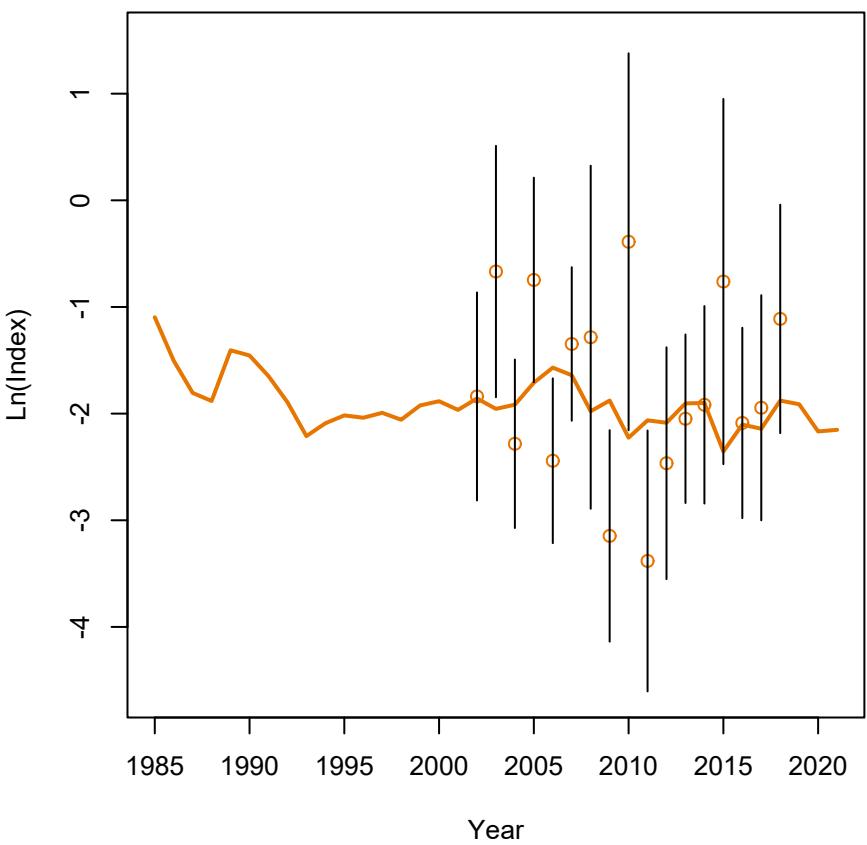
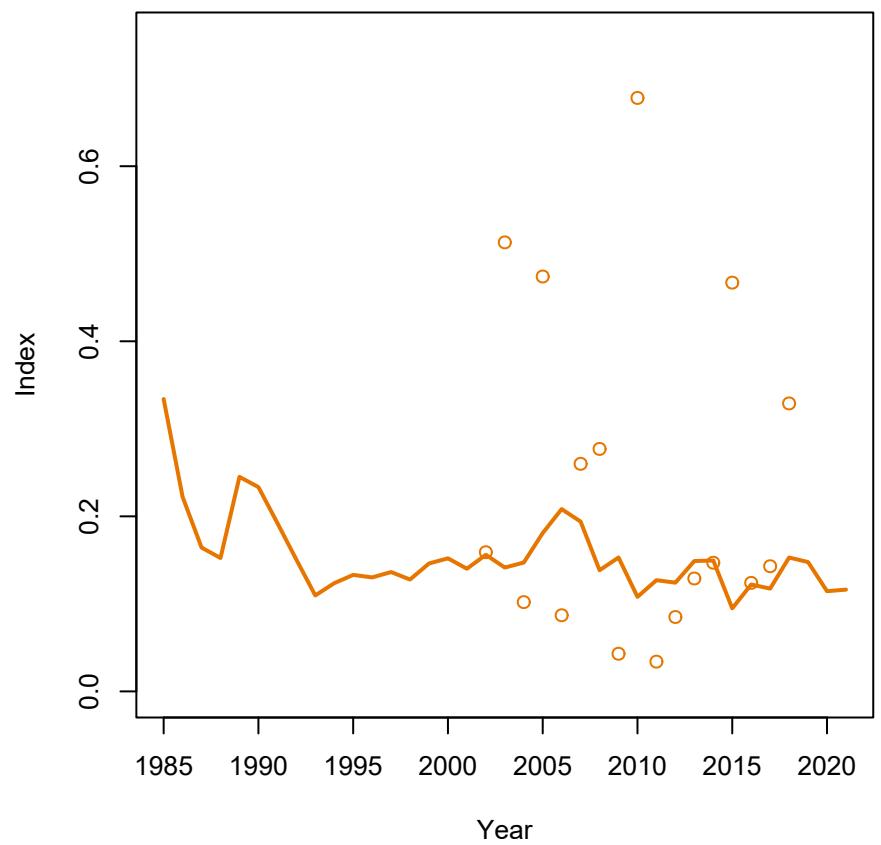
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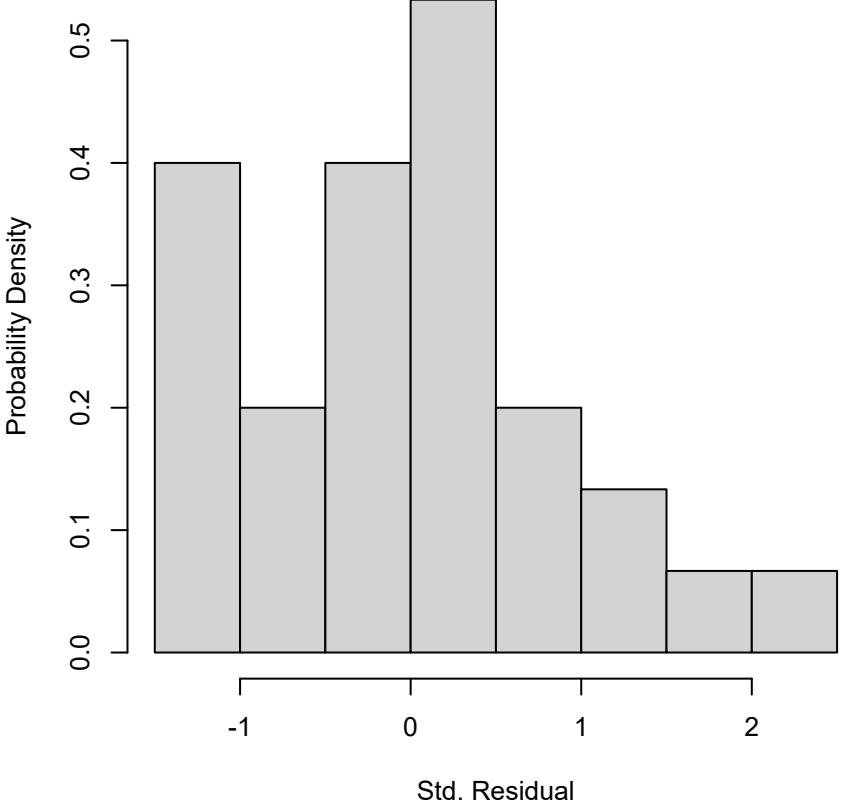
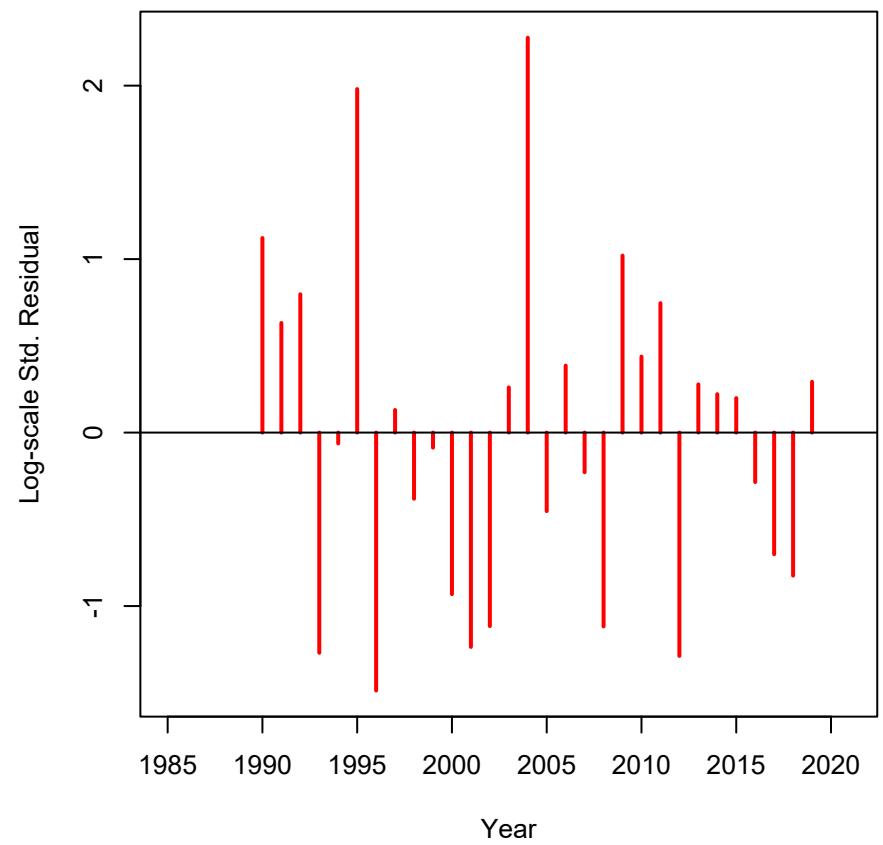
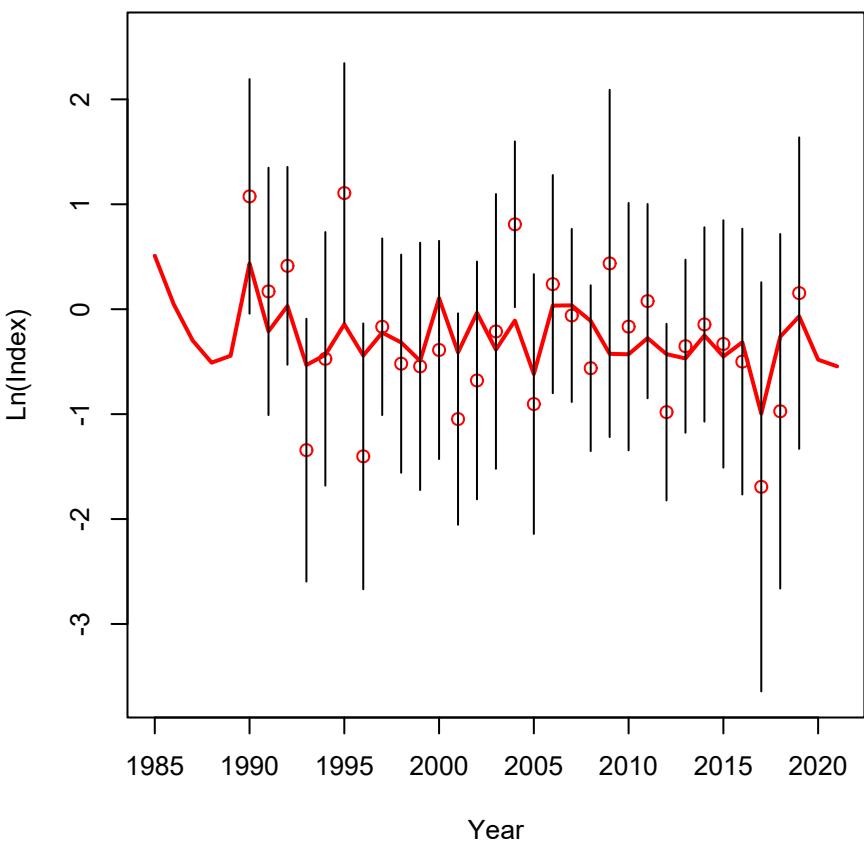
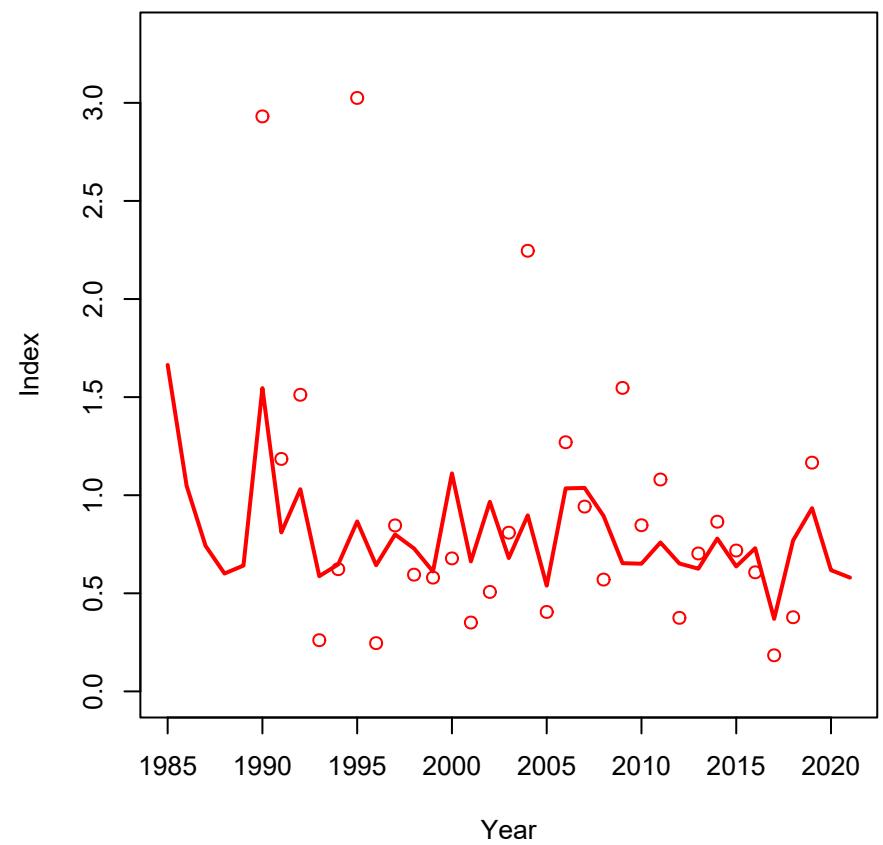
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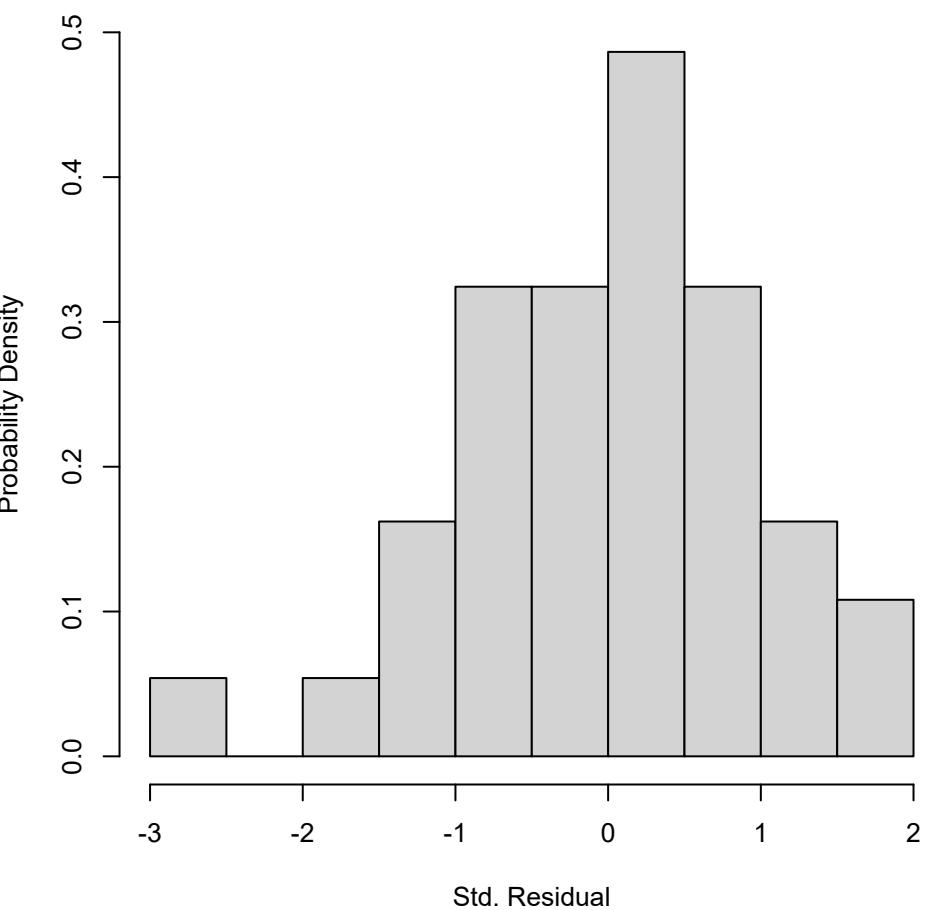
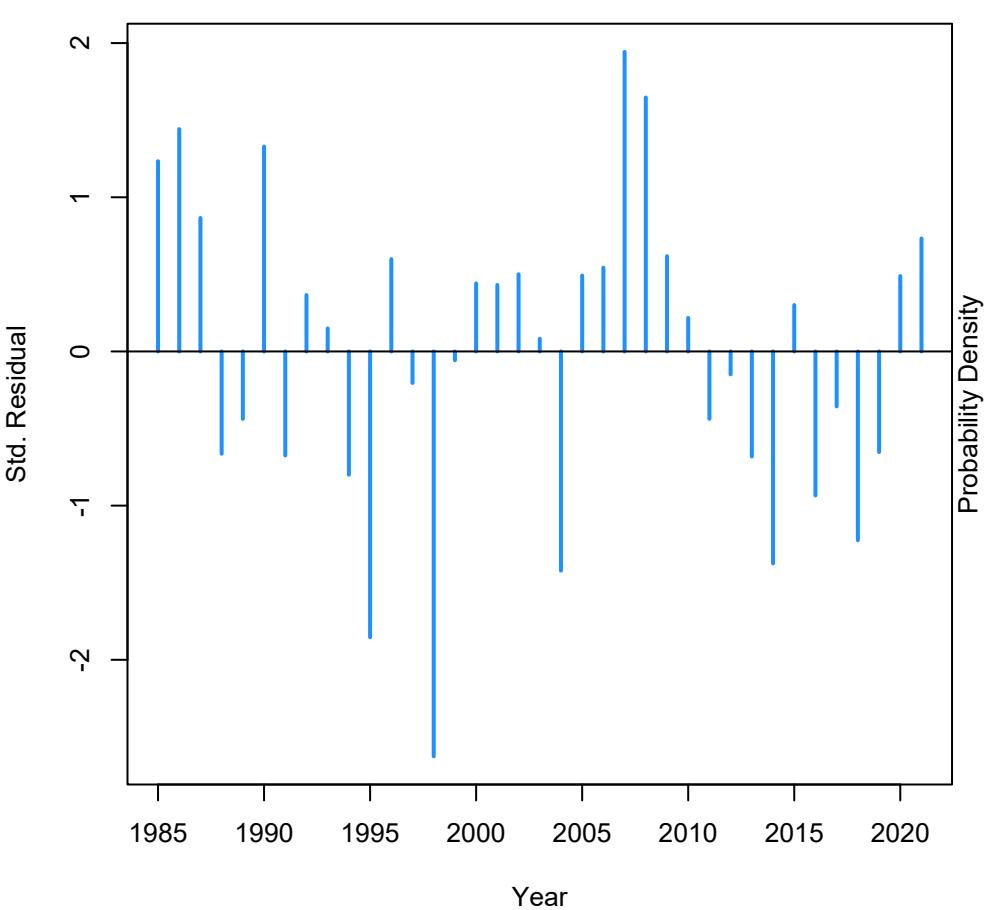
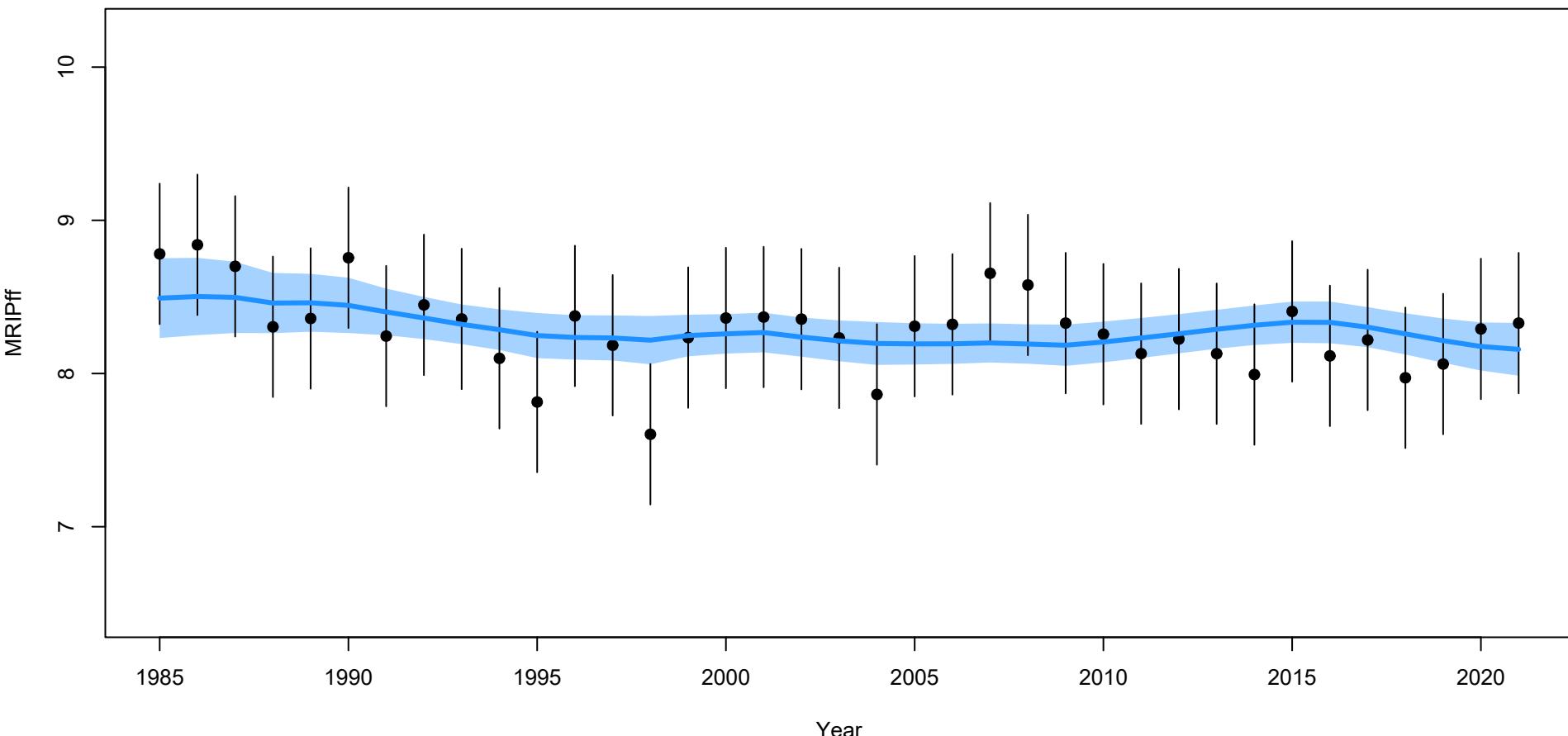
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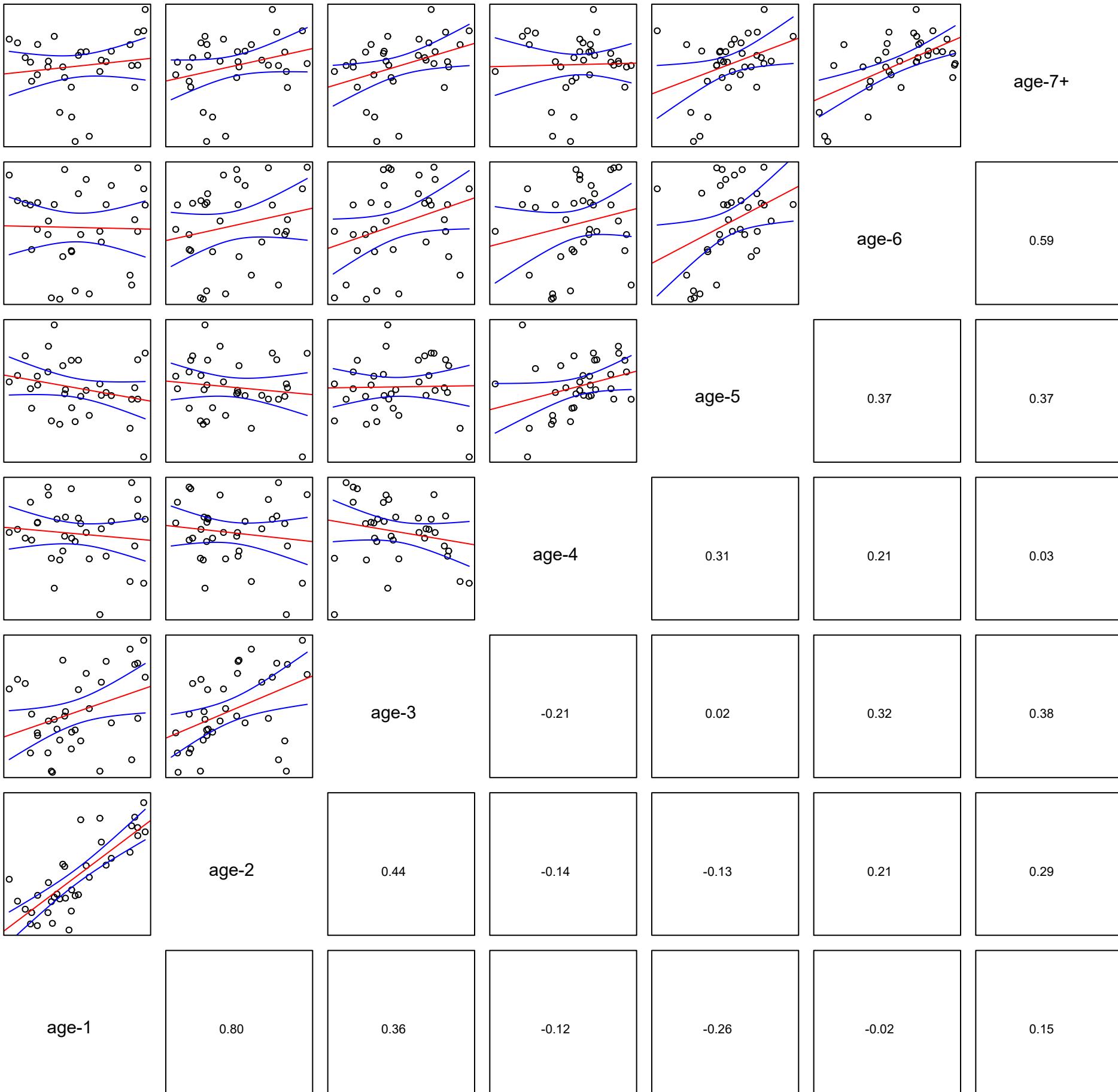
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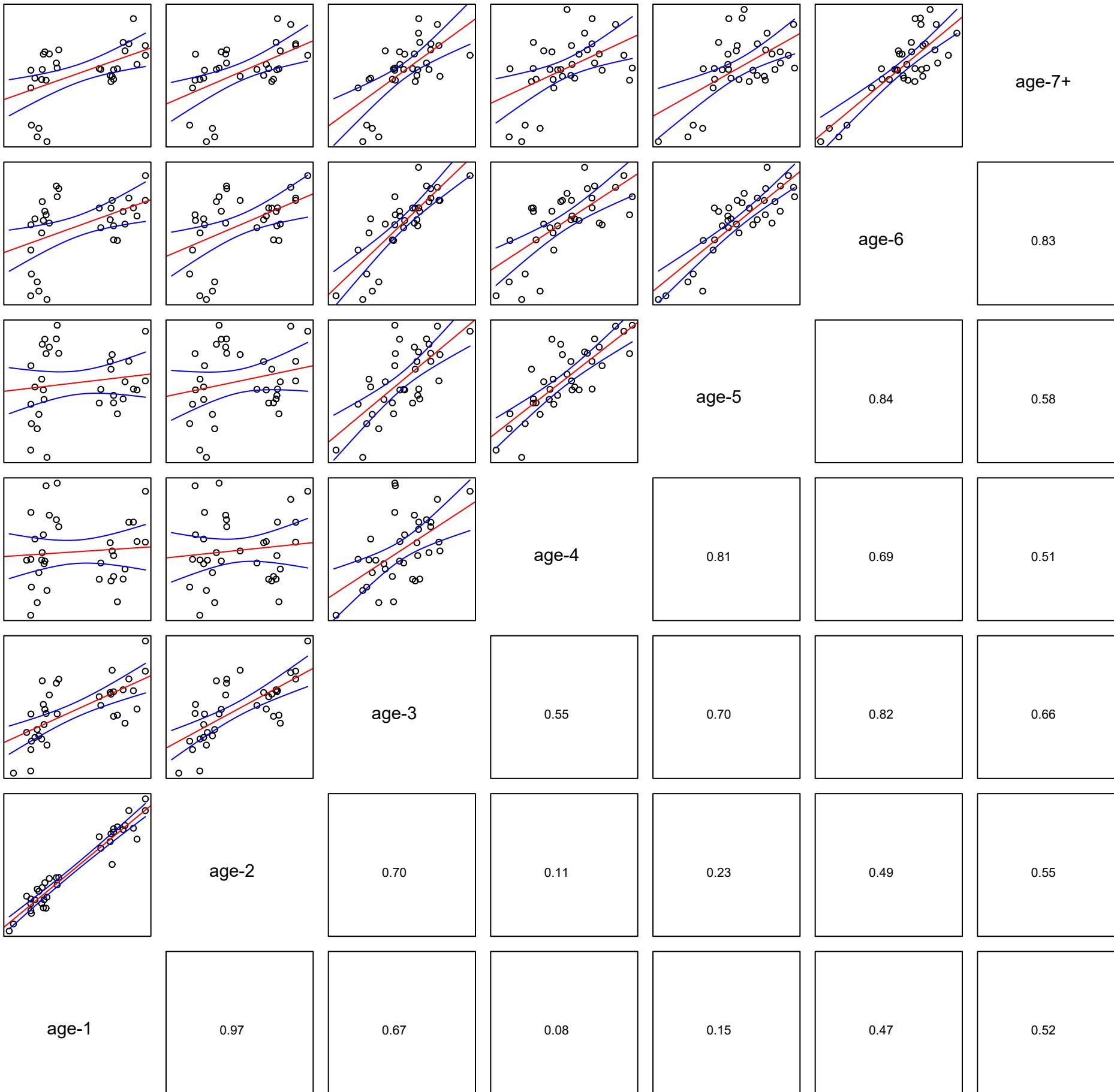
Ecov 1: MRIPff



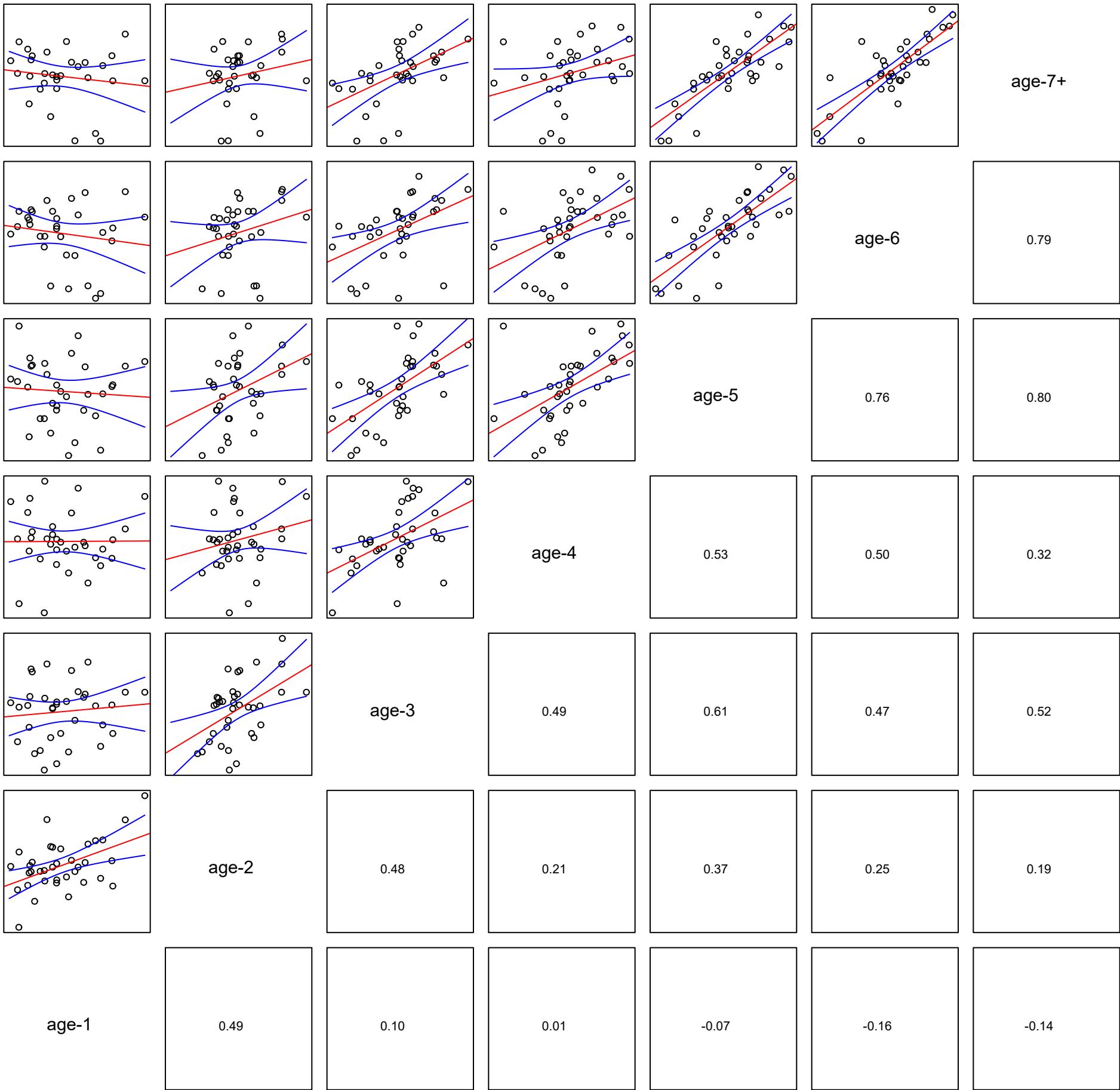
Catch for Fleet 1 Observed



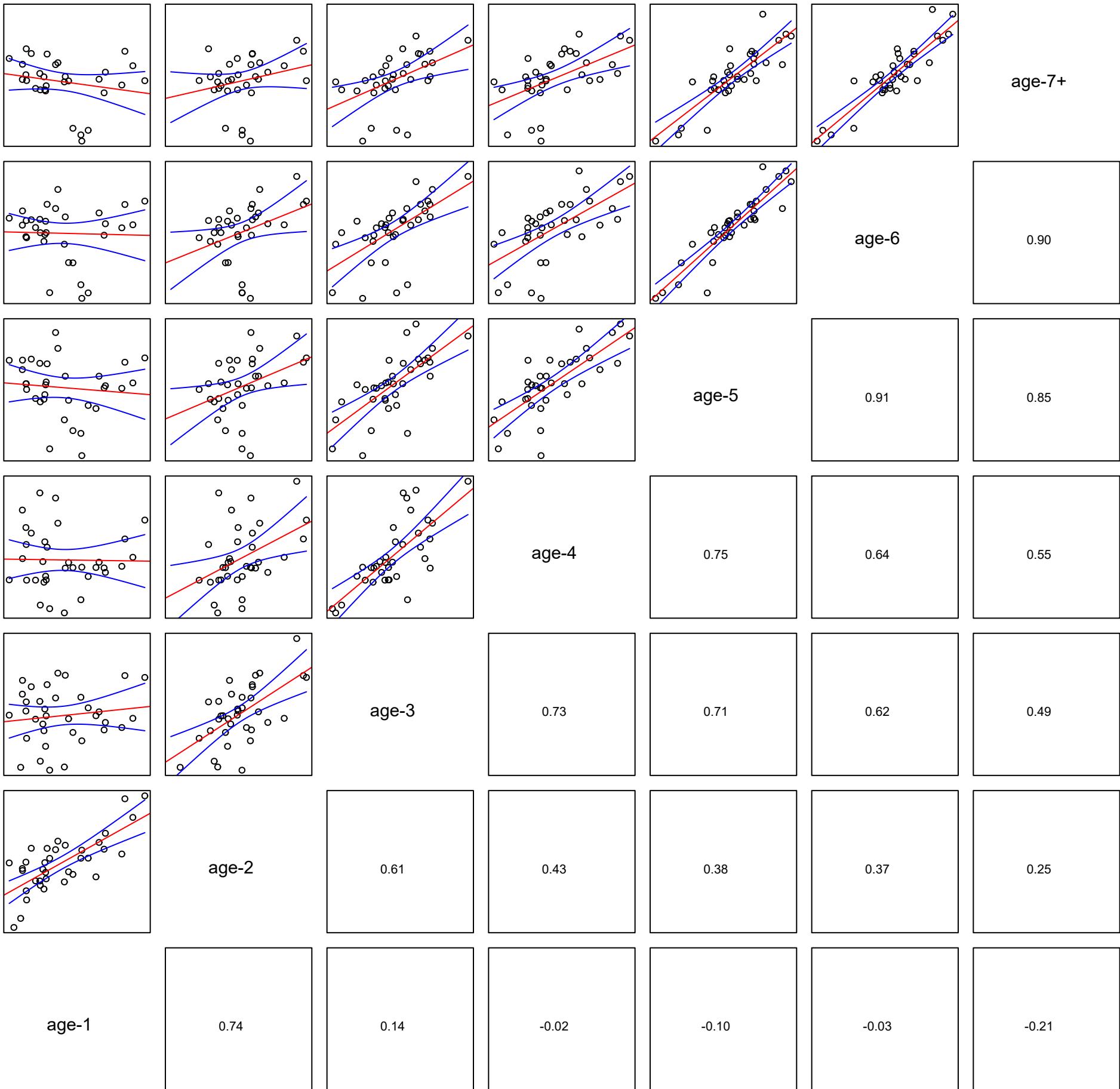
Catch for Fleet 1 Predicted



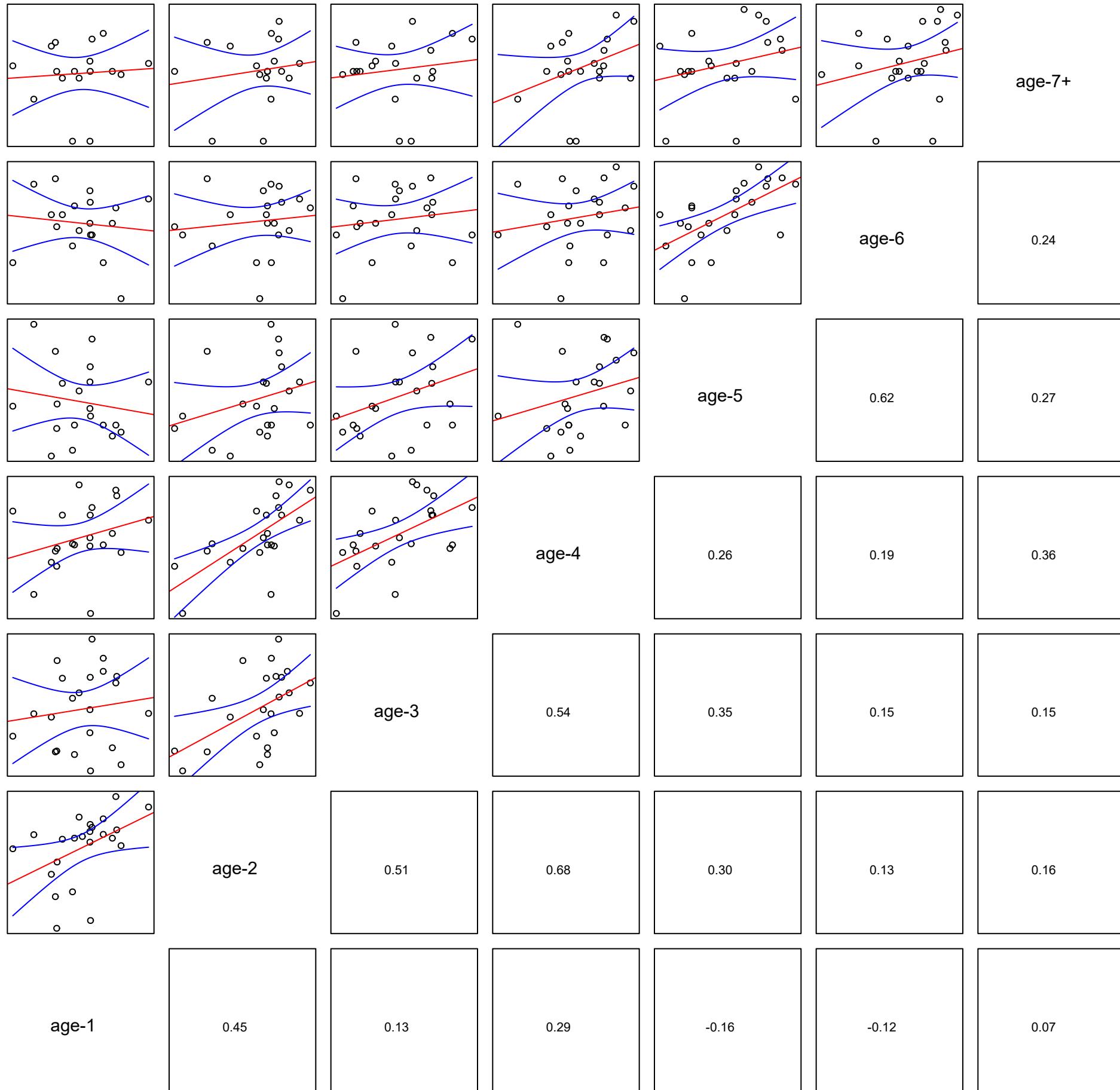
Catch for Fleet 2 Observed



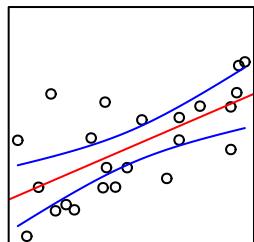
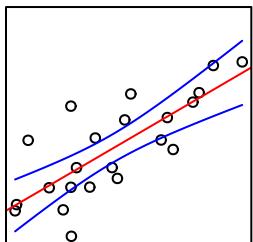
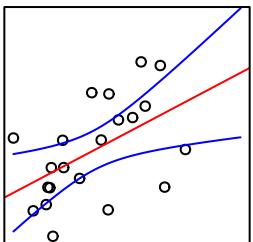
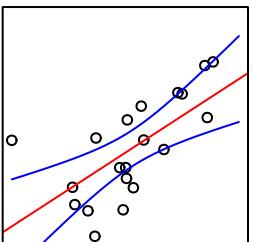
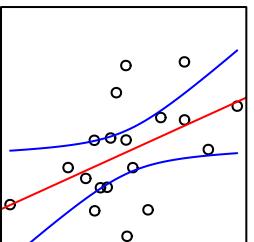
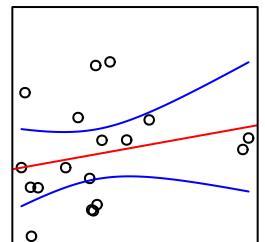
Catch for Fleet 2 Predicted



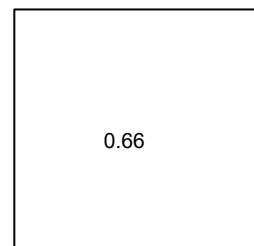
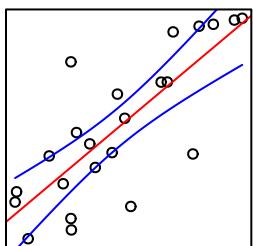
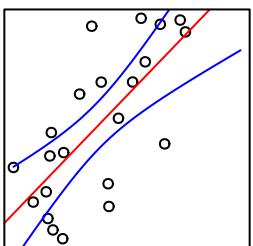
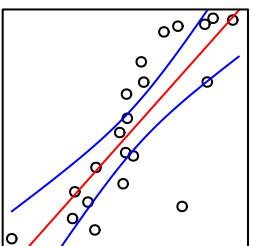
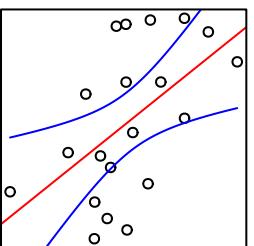
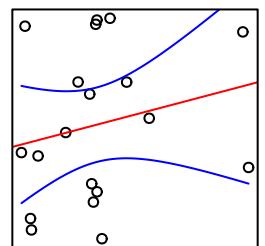
Index 1 Observed



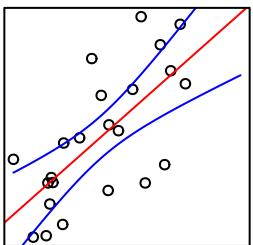
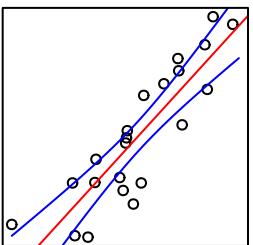
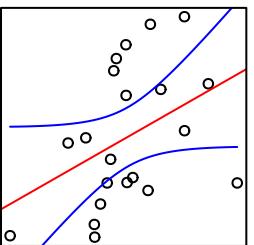
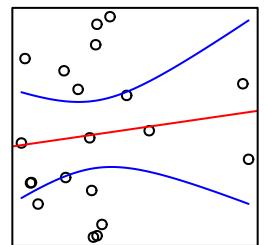
Index 1 Predicted



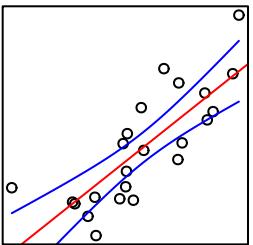
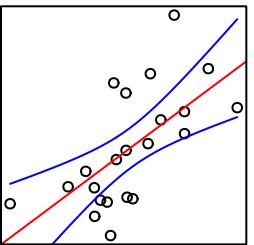
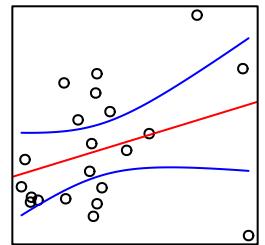
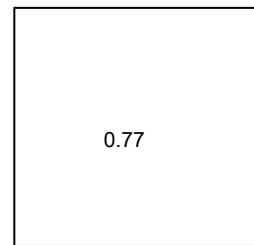
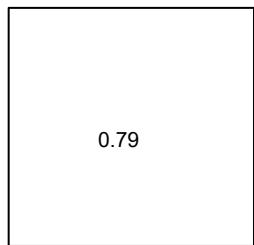
age-7+



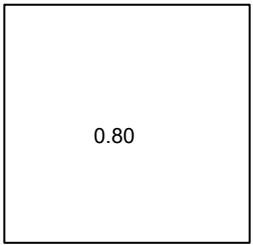
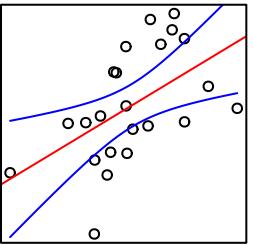
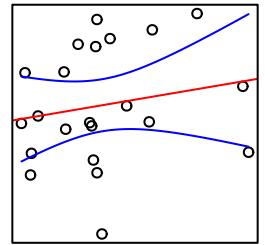
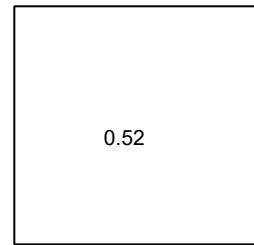
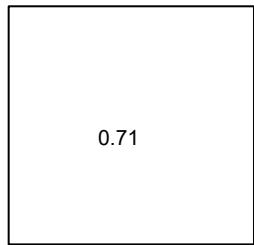
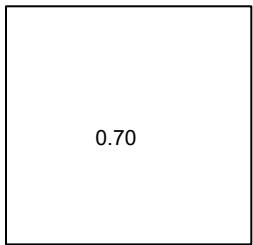
age-6



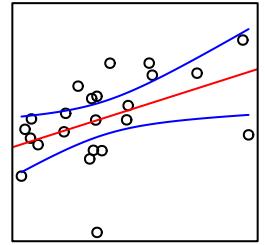
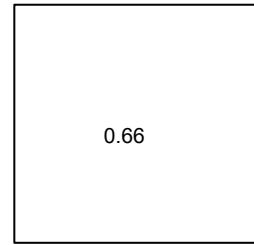
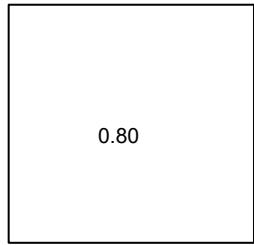
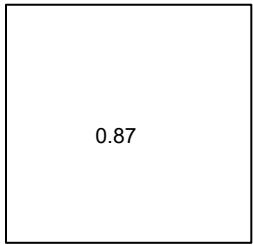
age-5



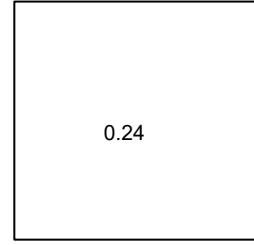
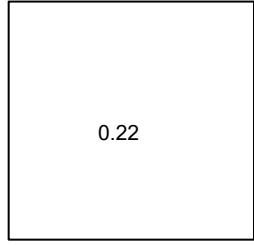
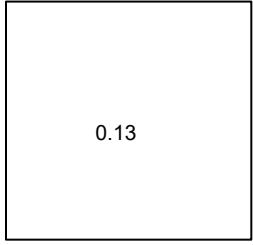
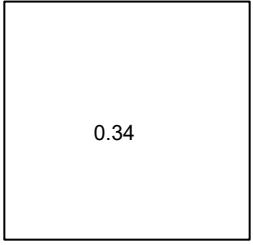
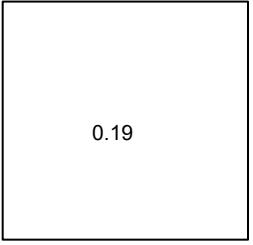
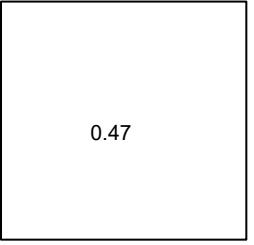
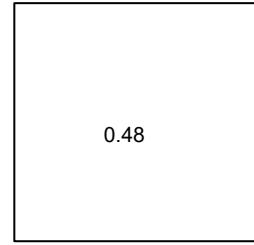
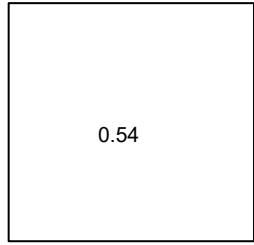
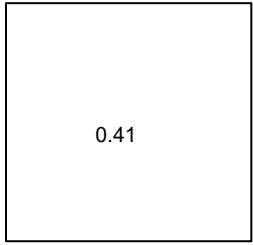
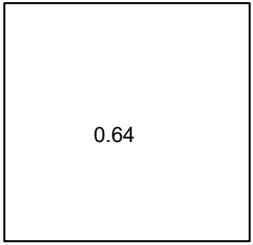
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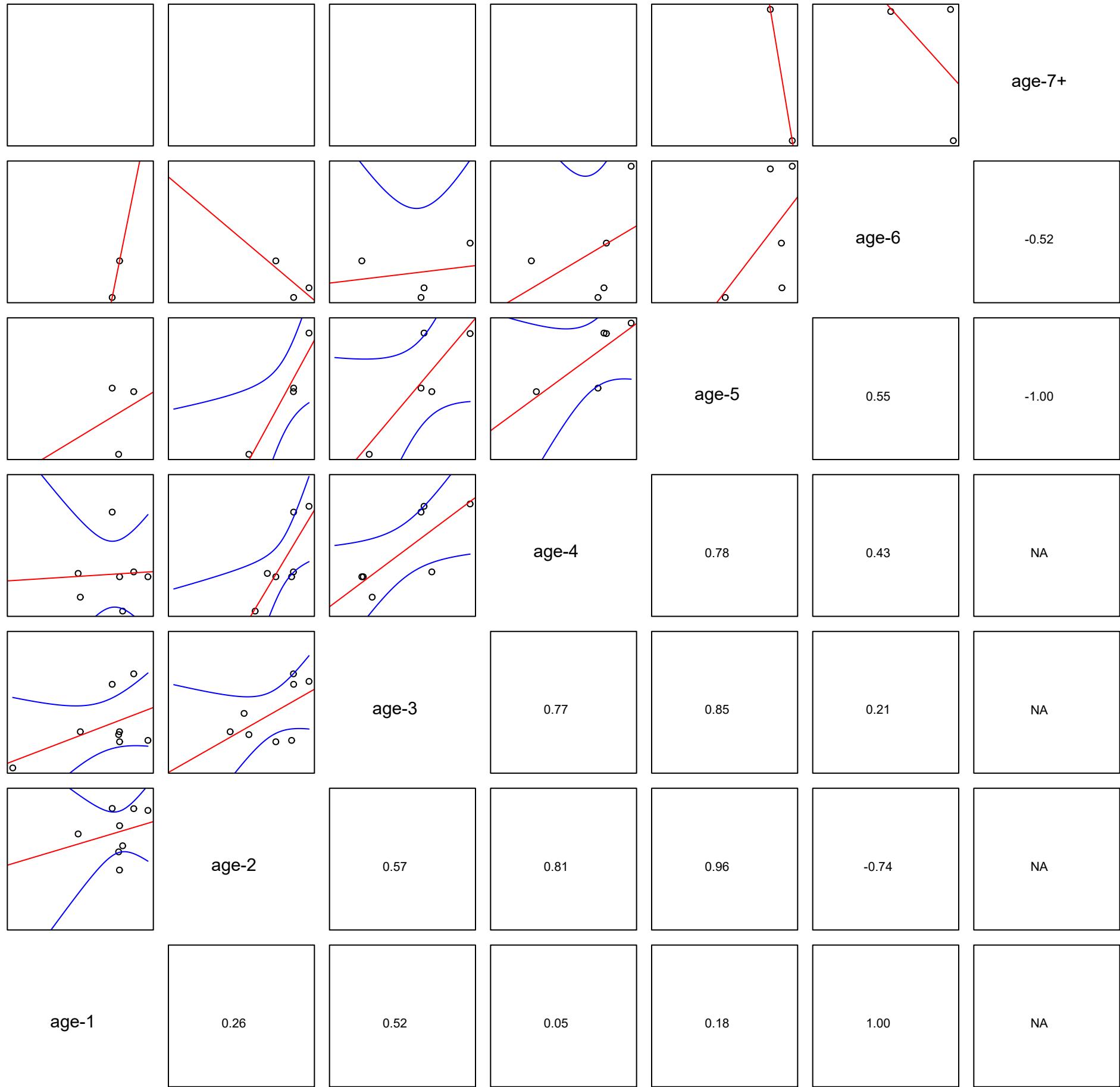
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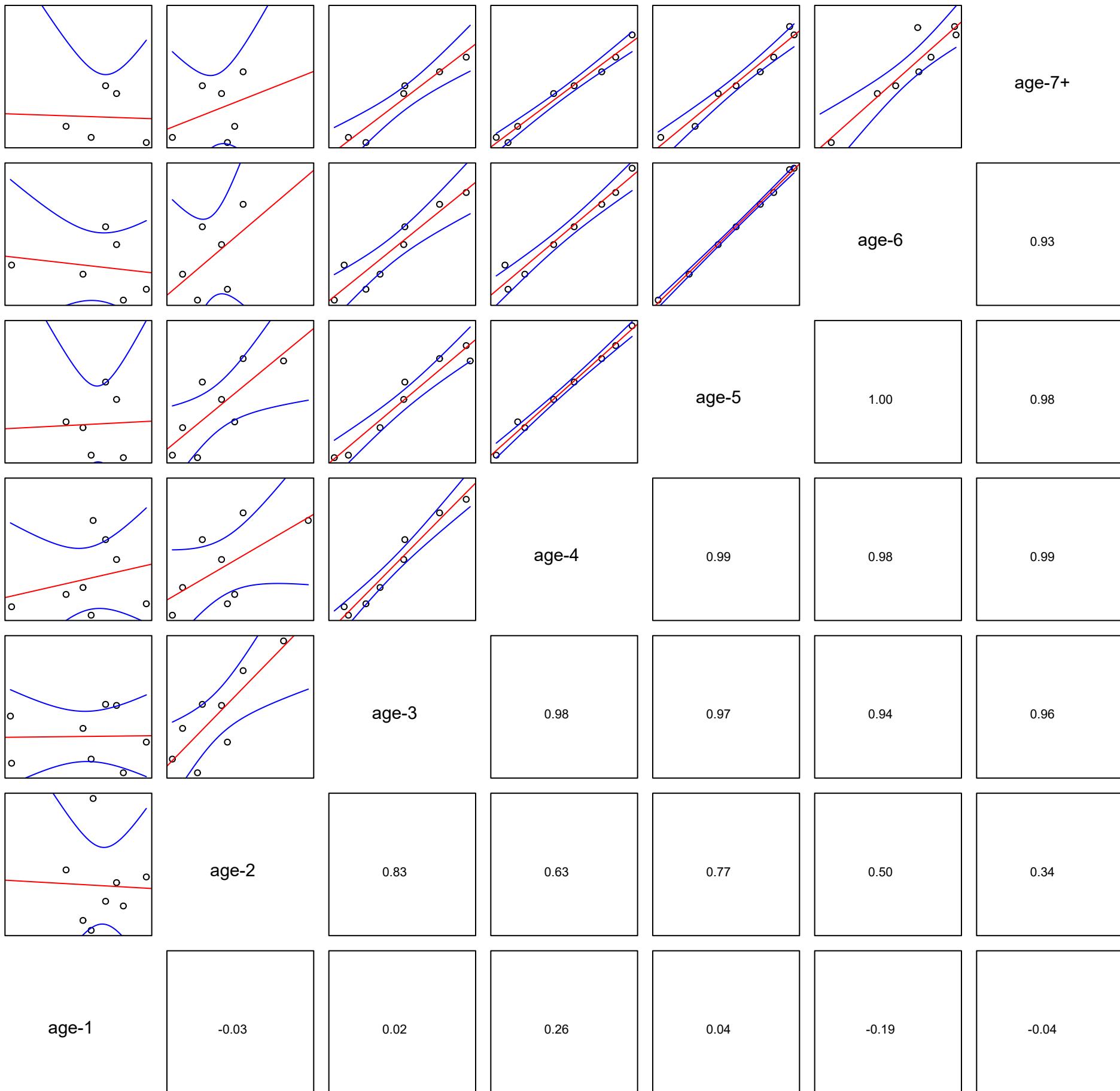
age-2



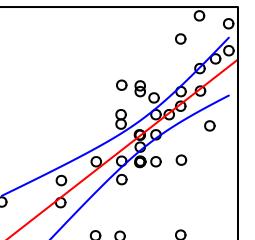
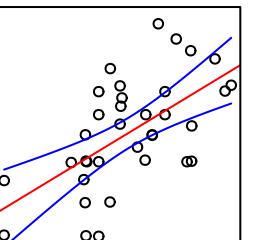
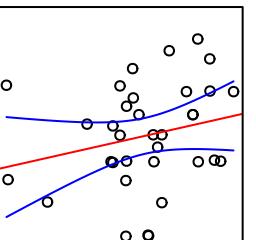
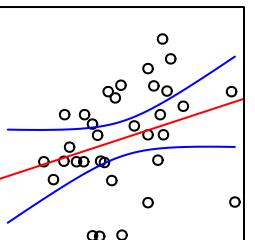
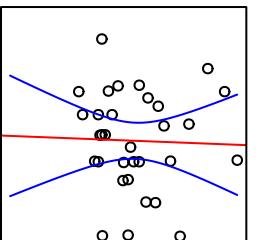
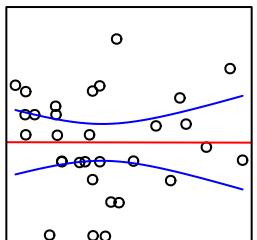
Index 2 Observed



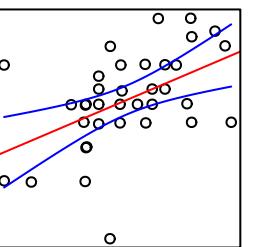
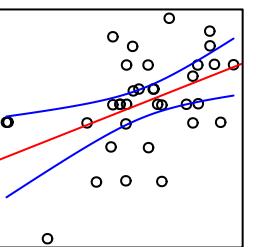
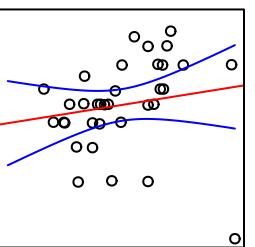
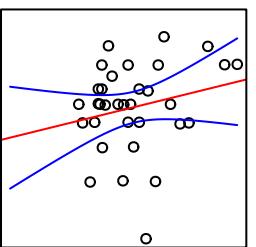
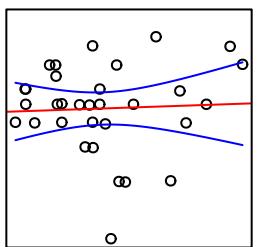
Index 2 Predicted



Index 3 Observed

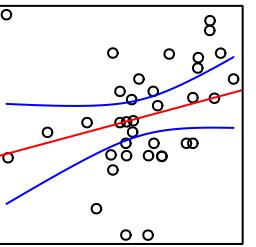
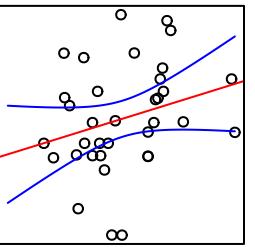
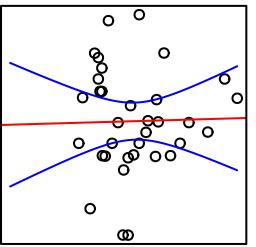
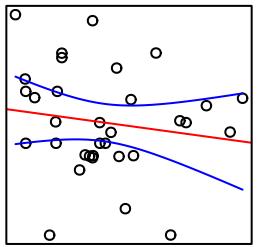


age-7+



age-6

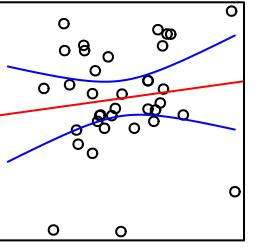
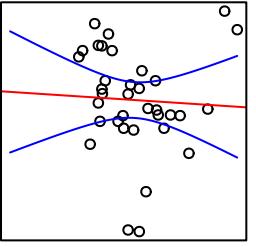
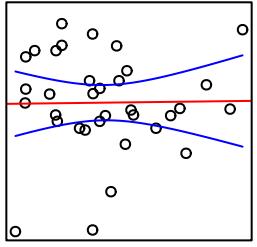
0.66



age-5

0.49

0.60

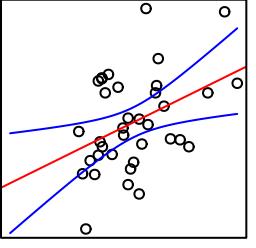
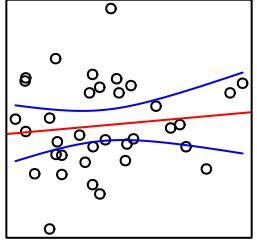


age-4

0.27

0.46

0.24



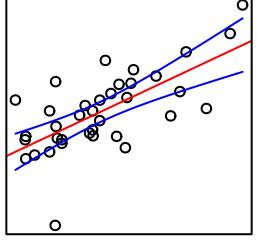
age-3

0.12

0.27

0.17

0.31



age-2

0.41

-0.05

0.22

-0.03



age-1

0.68

0.12

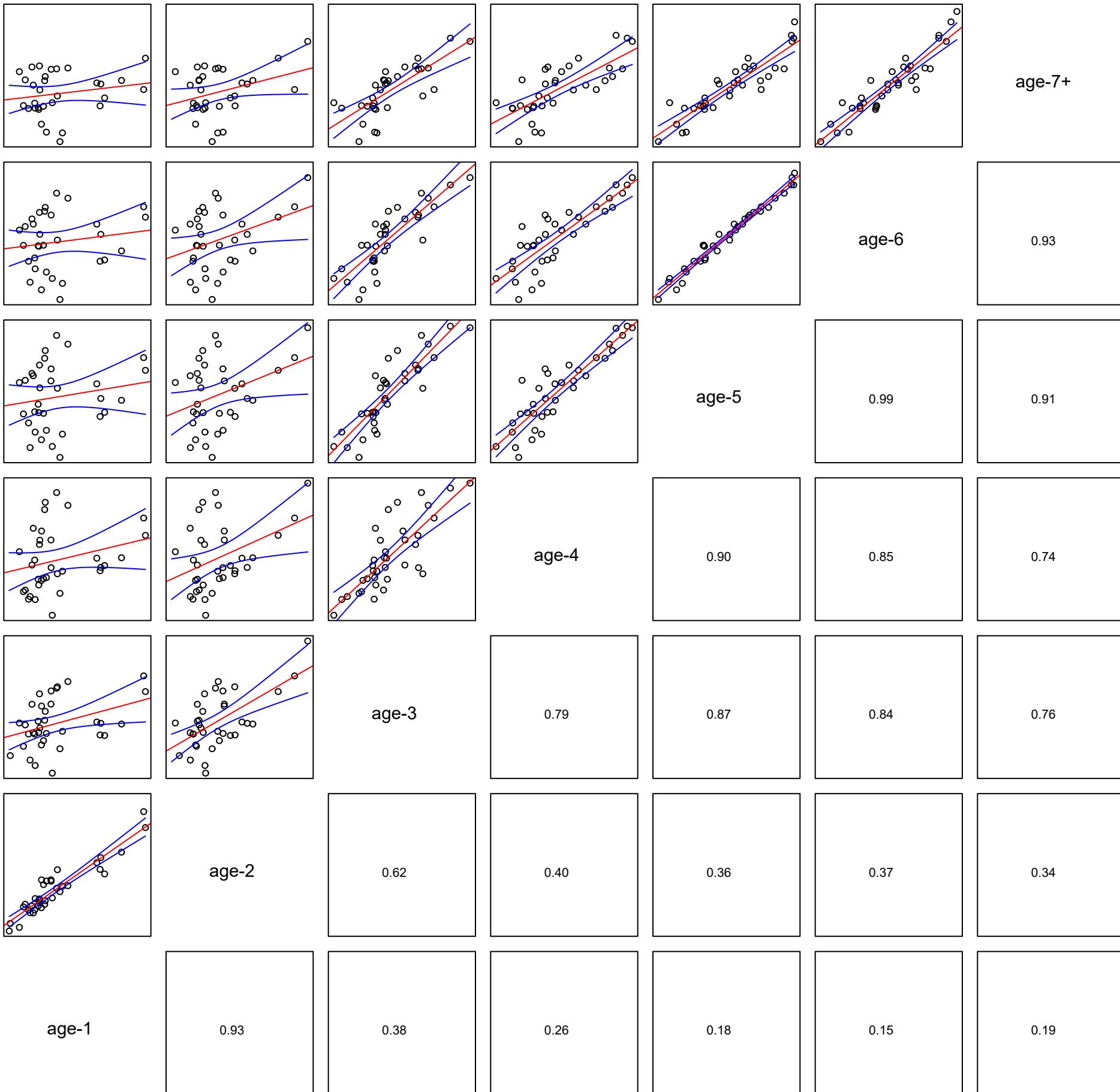
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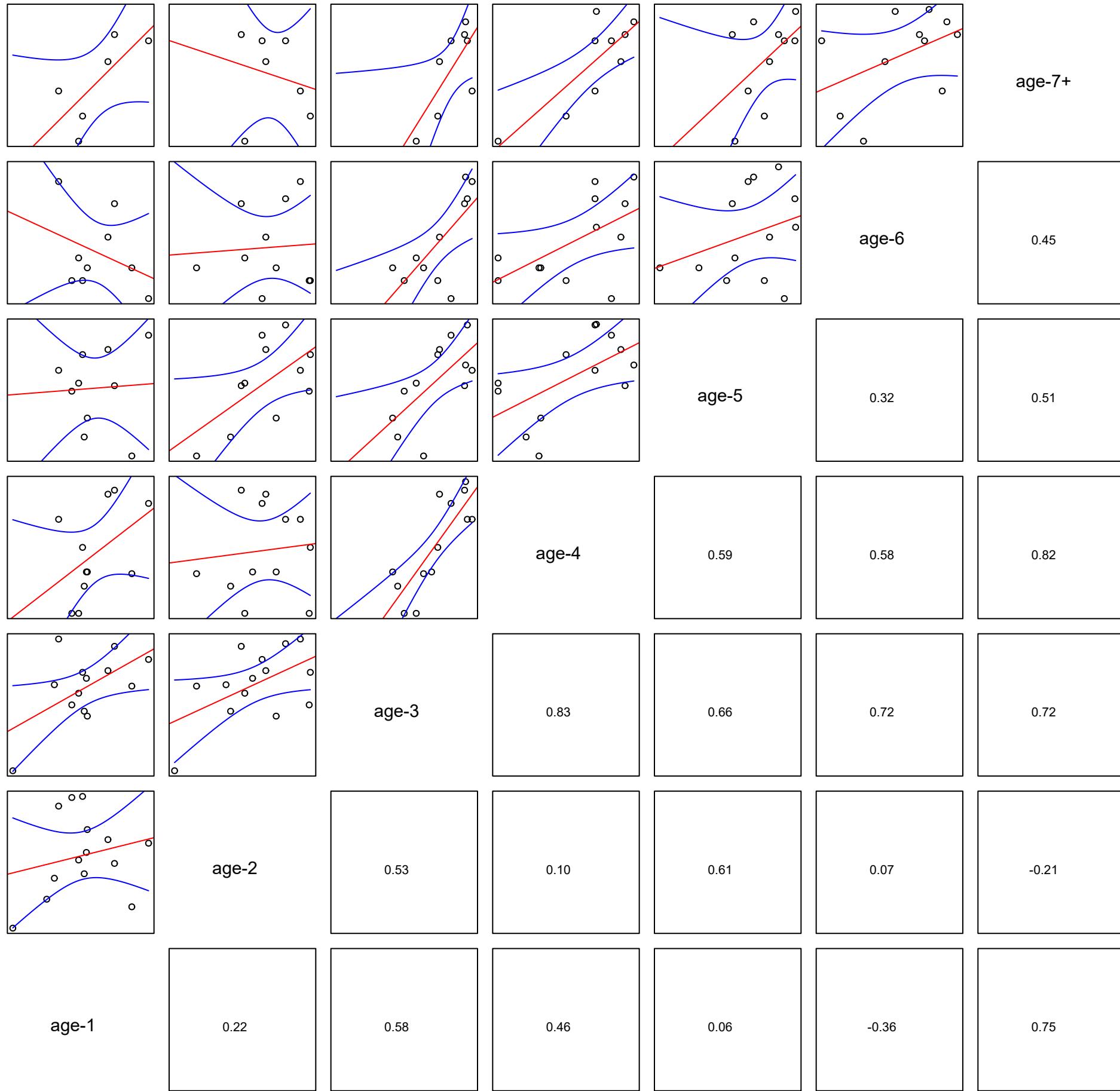
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0.00

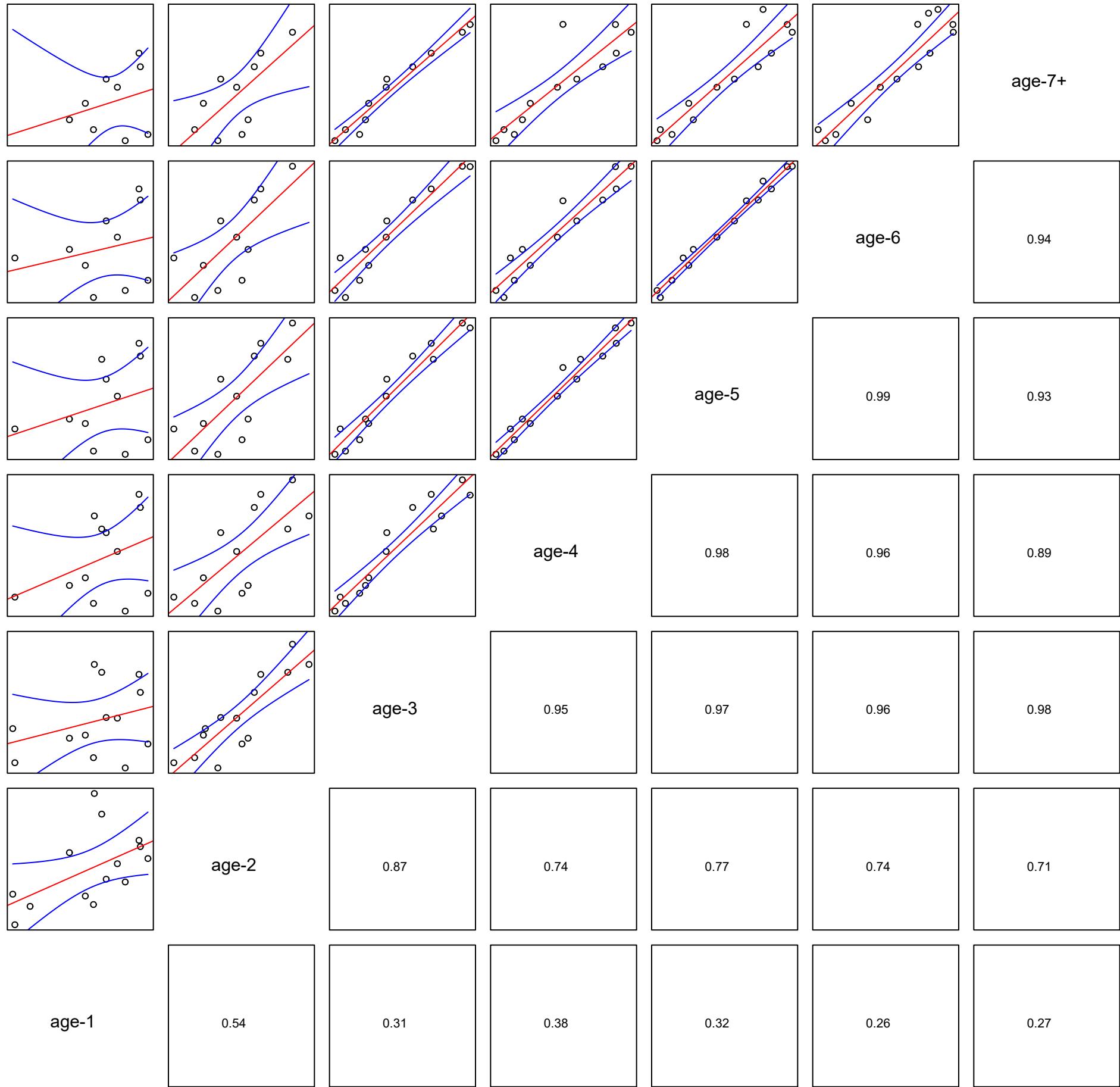
Index 3 Predicted



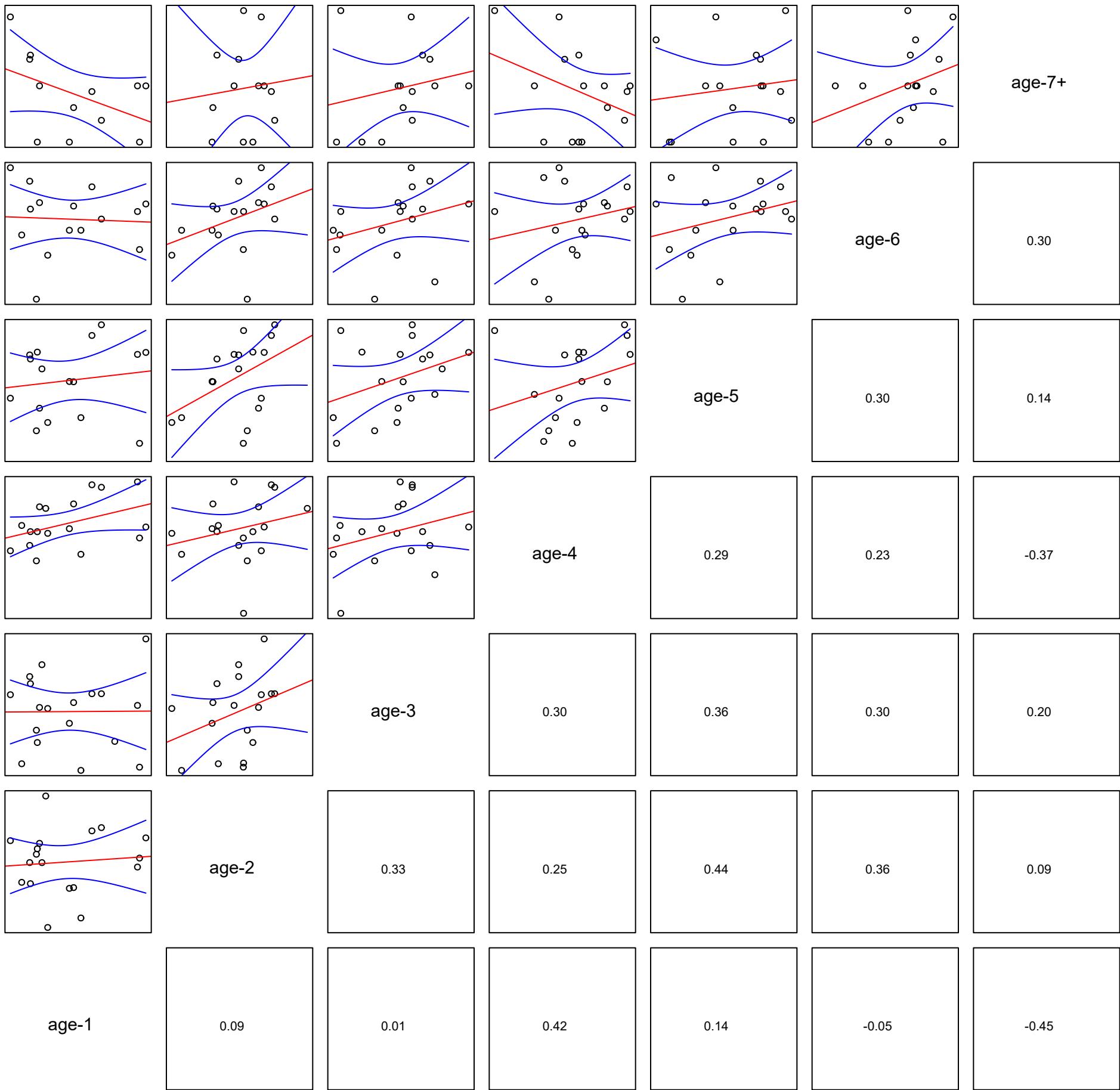
Index 4 Observed



Index 4 Predicted



Index 6 Observed



Index 8 Observed

age-1

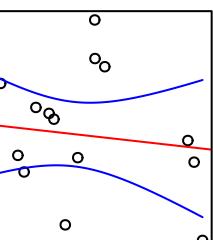
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0.20

0.01

NA

NA



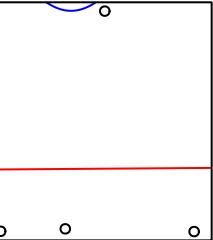
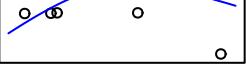
age-2

-0.20

0.46

NA

NA

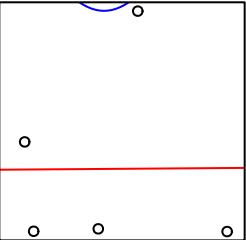


age-3

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NA

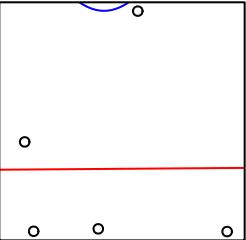
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age-4

NA

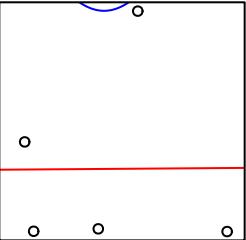
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age-5

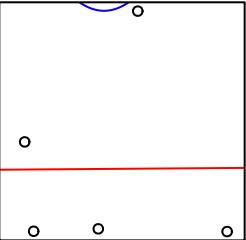
NA

NA



age-6

NA



age-7+

Index 8 Predicted

age-1

0.51

0.45

0.45

NA

NA

age-2

0.65

0.51

NA

NA

age-3

0.69

NA

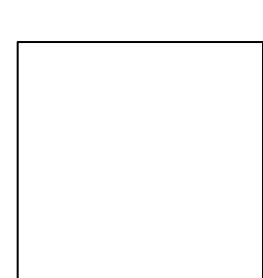
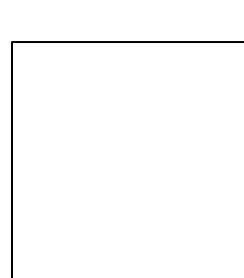
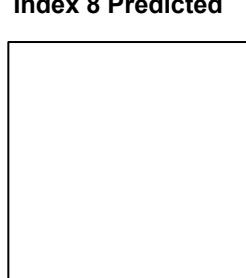
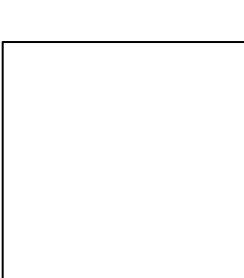
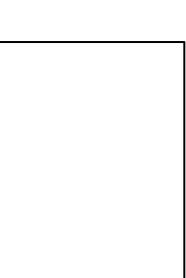
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age-4

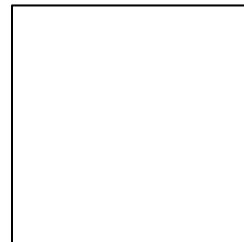
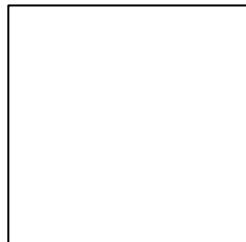
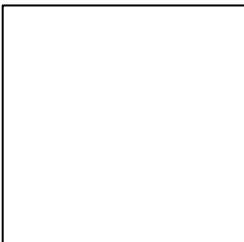
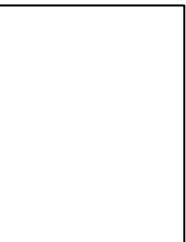
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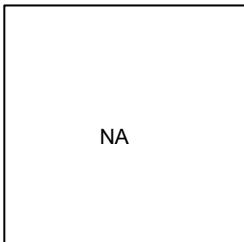
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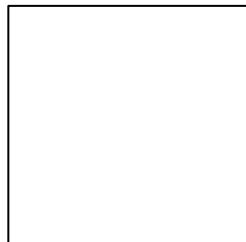
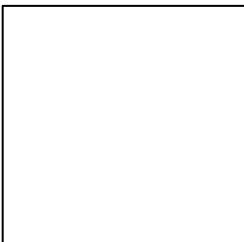
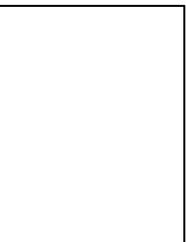
age-7+



age-6

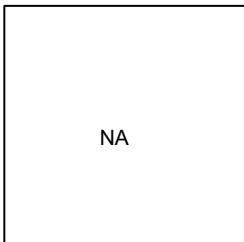


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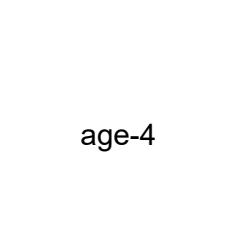
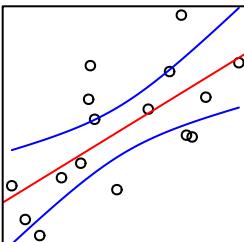
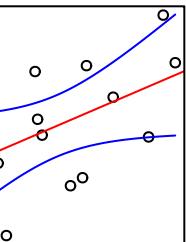


age-5

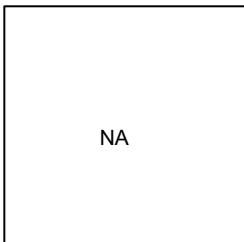
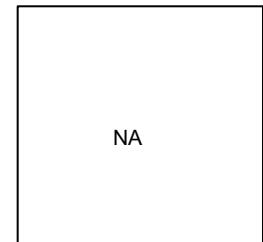
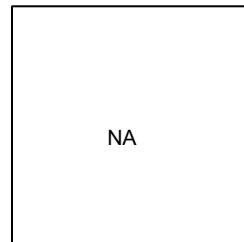
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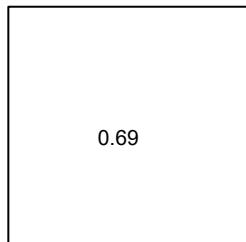
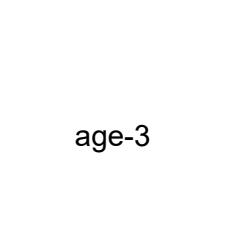
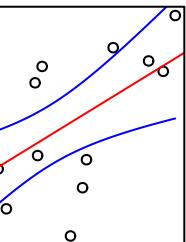
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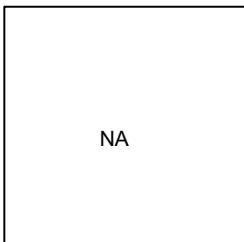
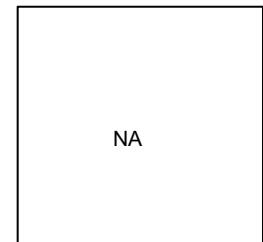
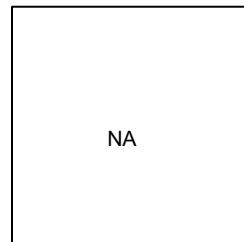
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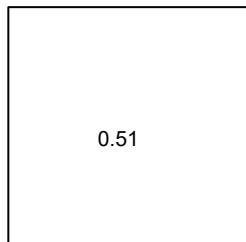
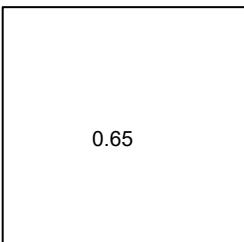
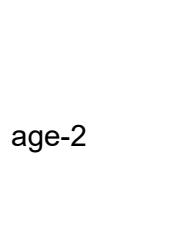
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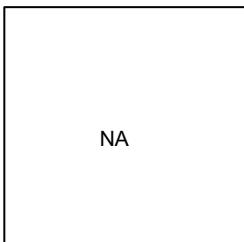
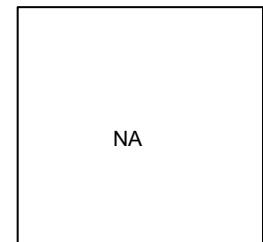
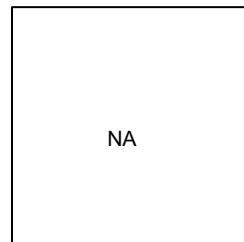
age-3



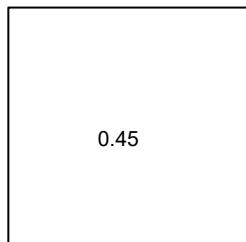
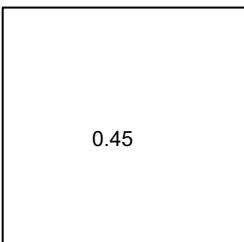
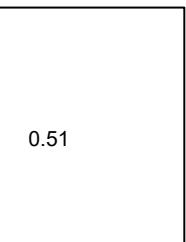
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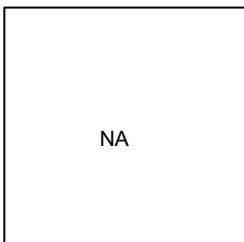
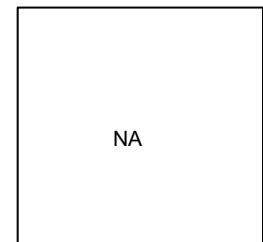
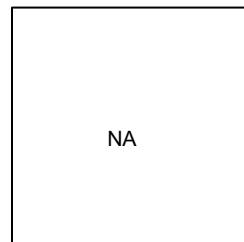
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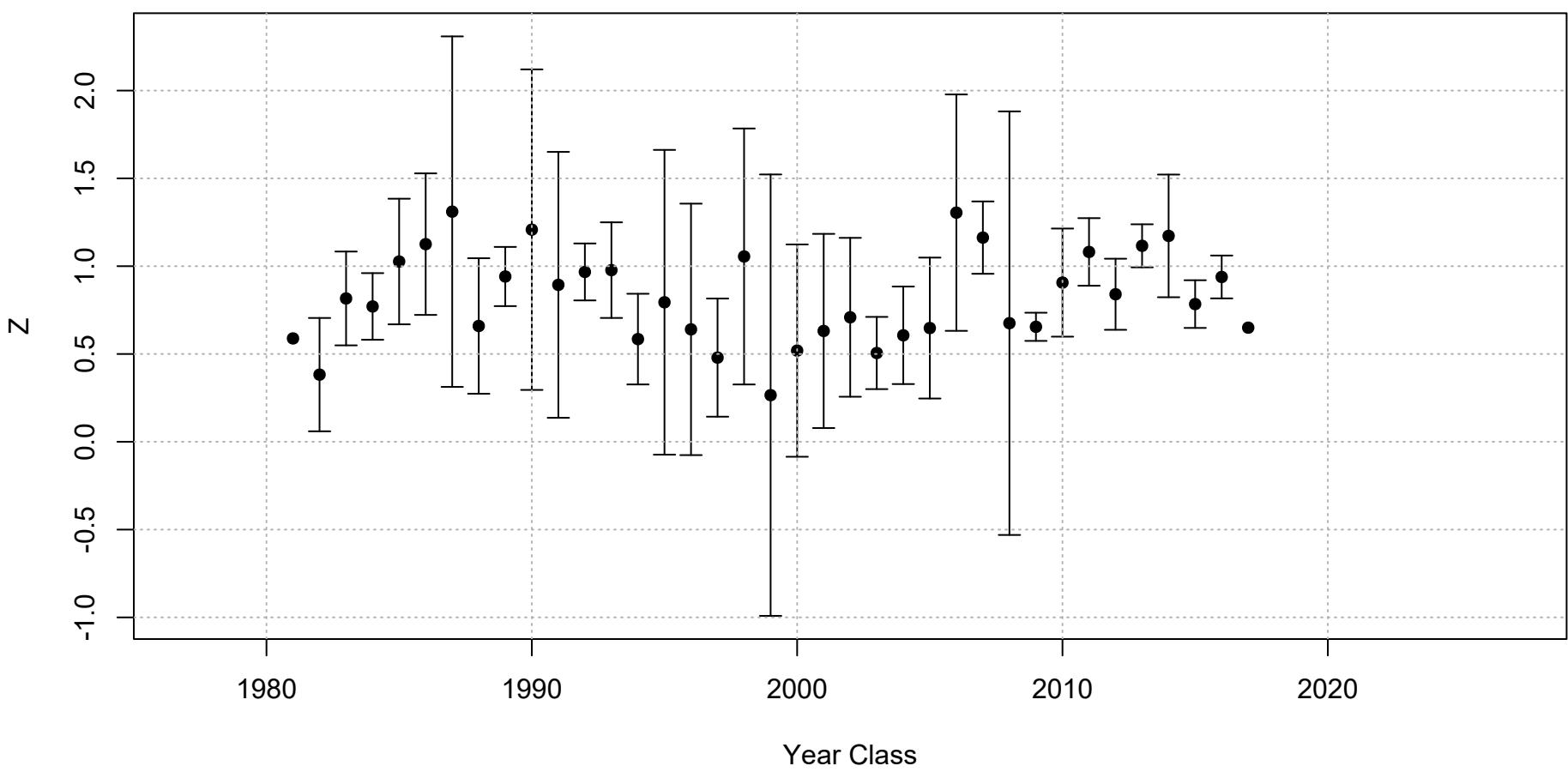
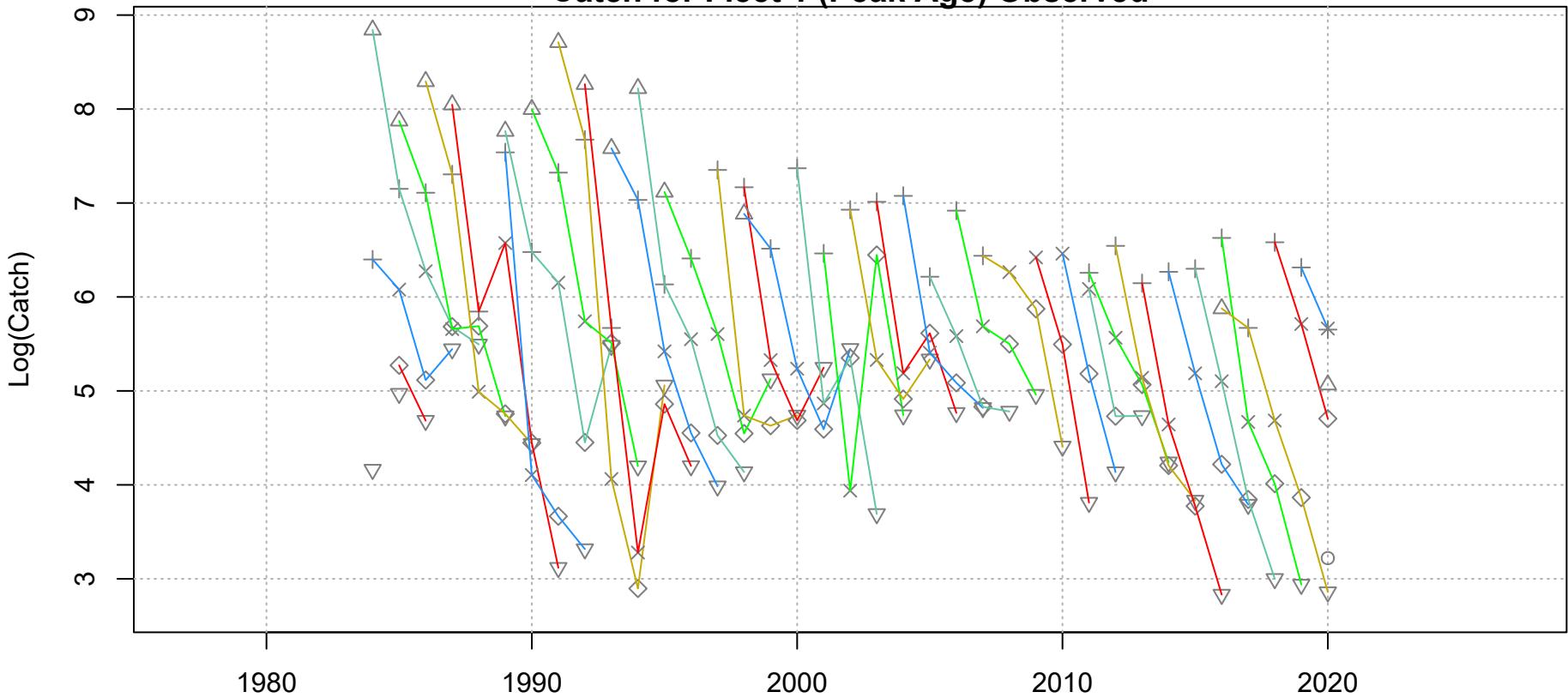


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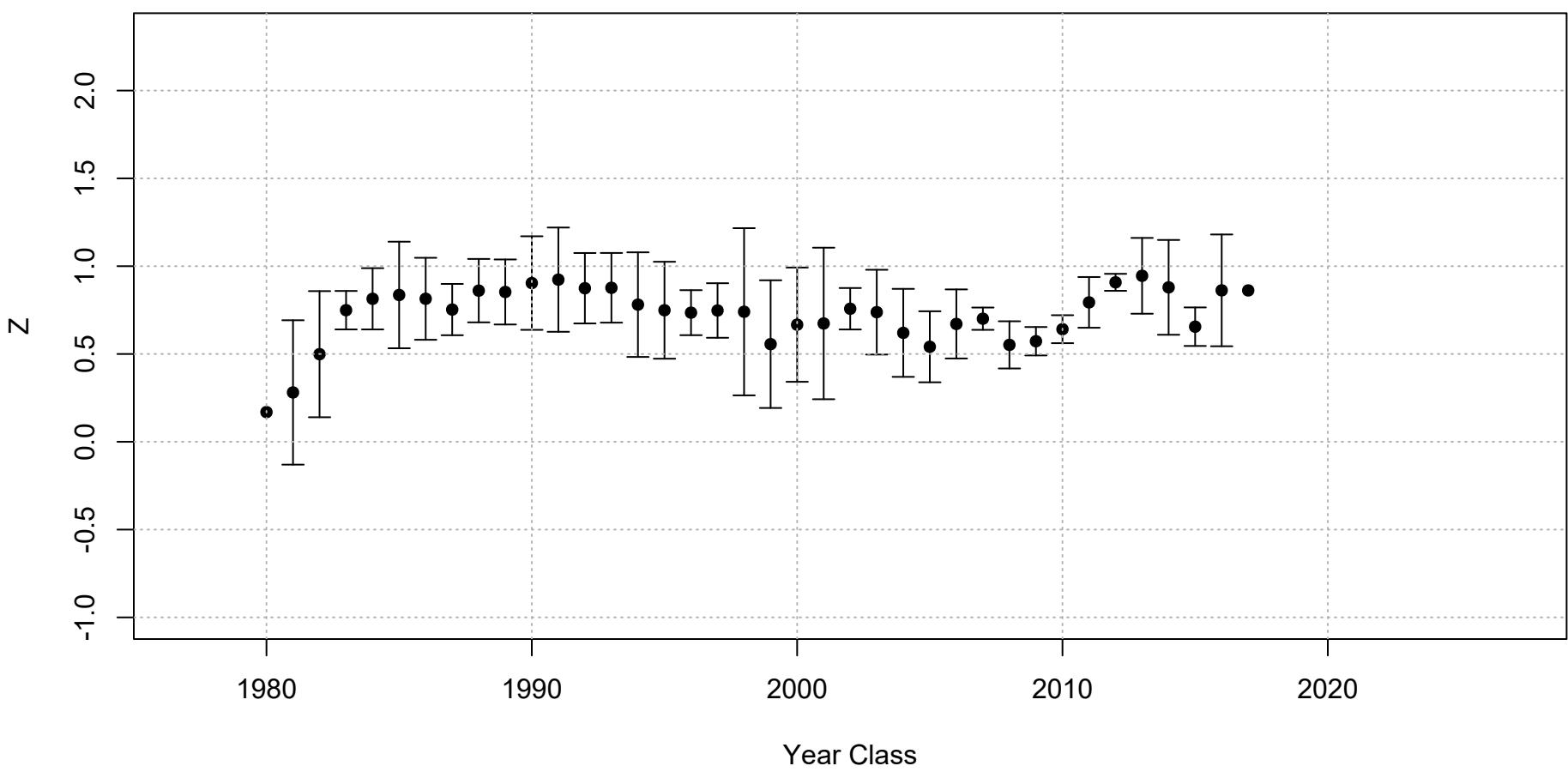
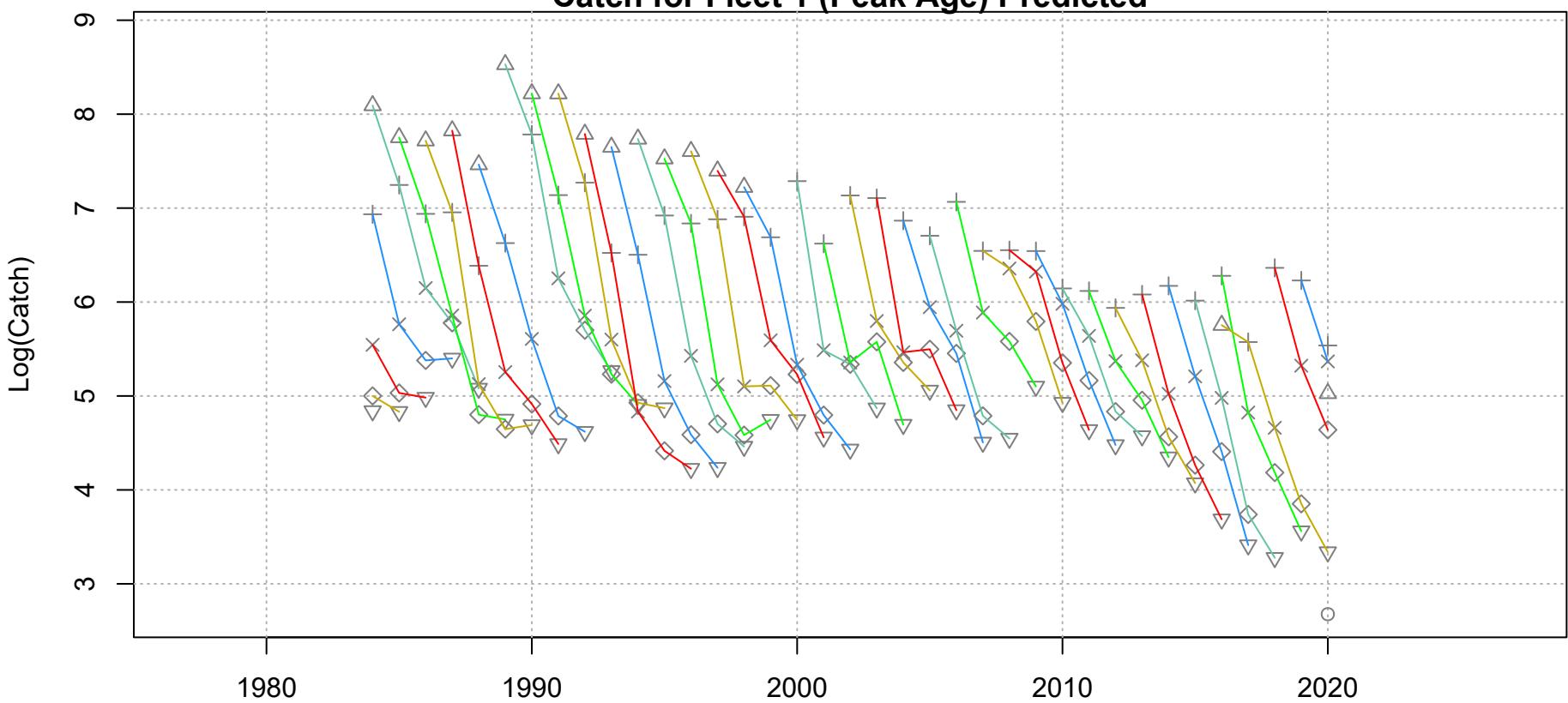


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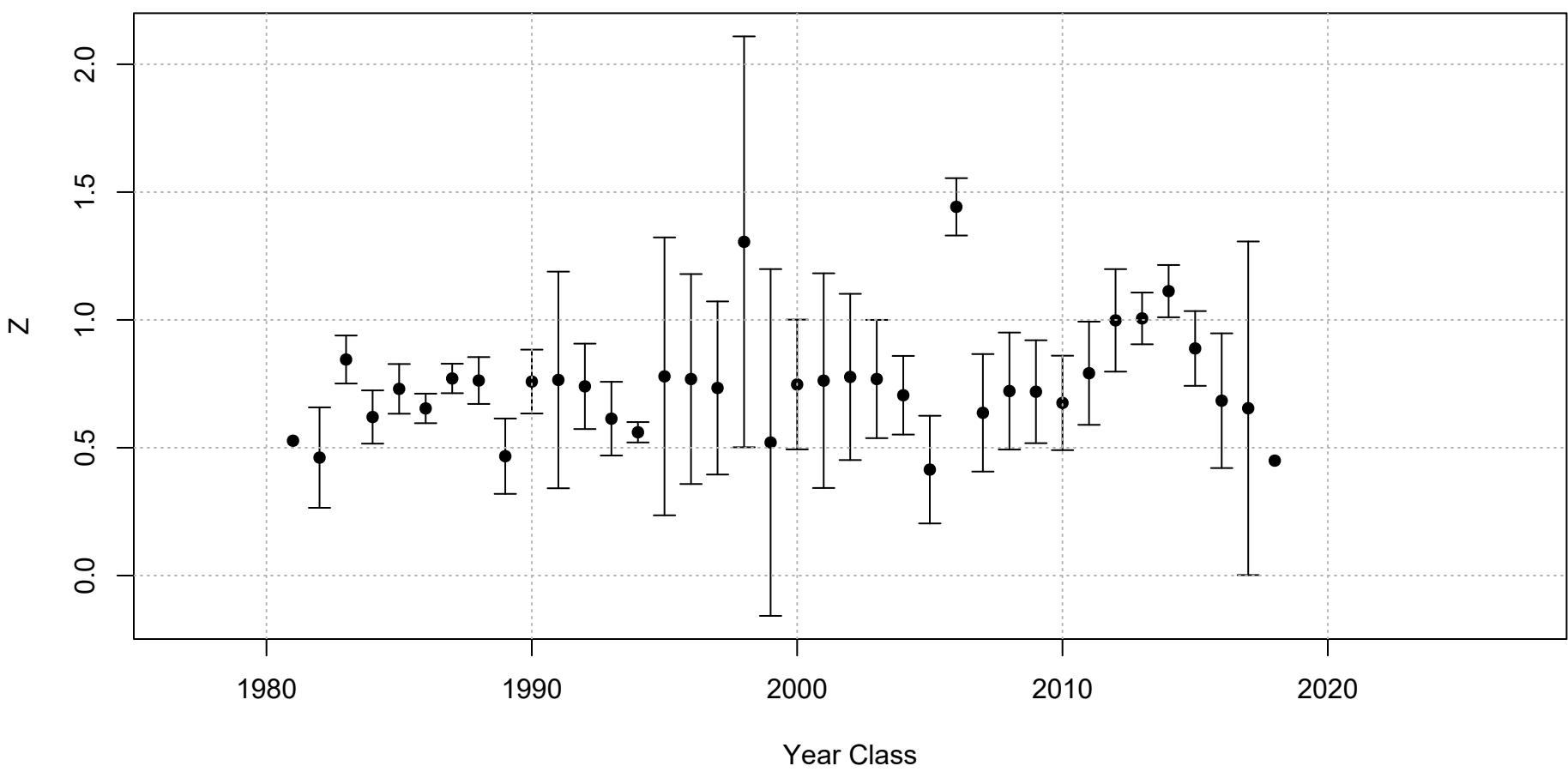
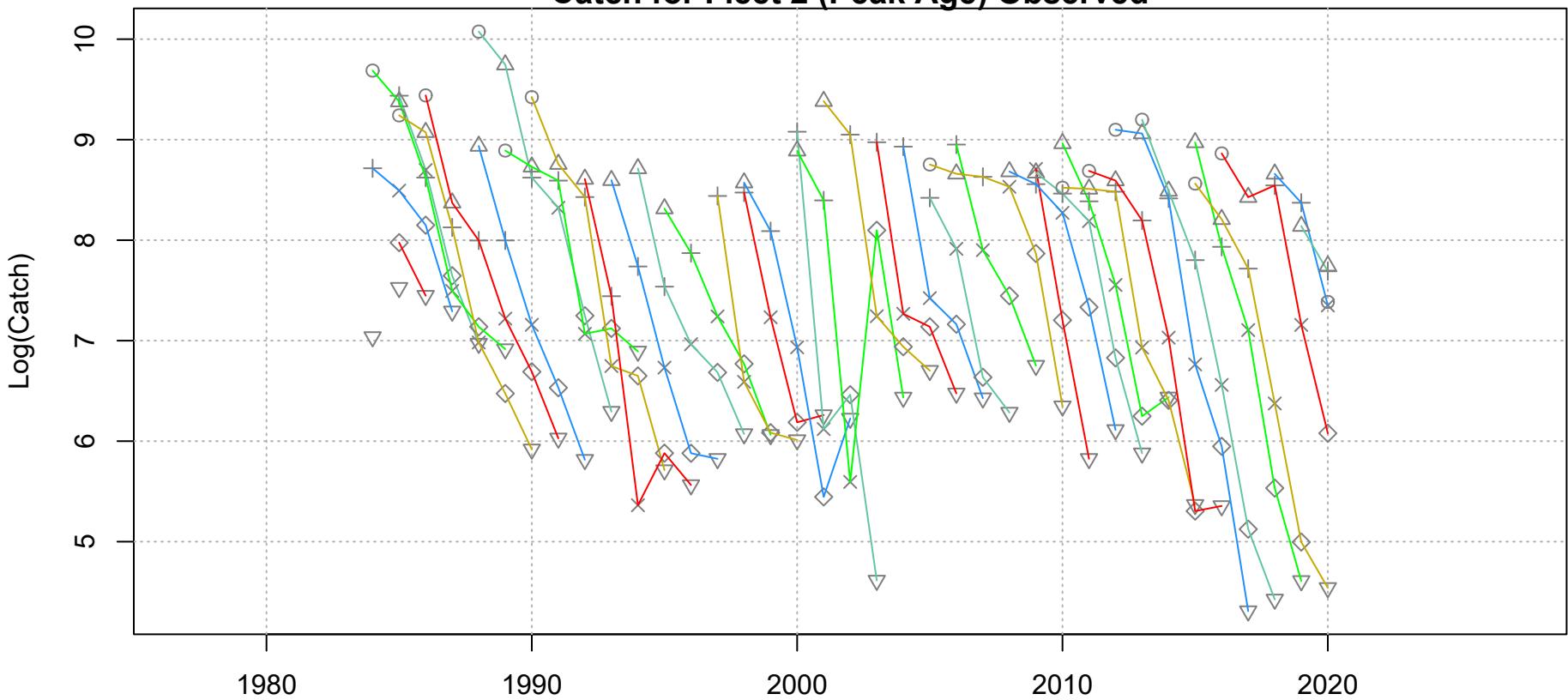
Catch for Fleet 1 (Peak Age) Observed



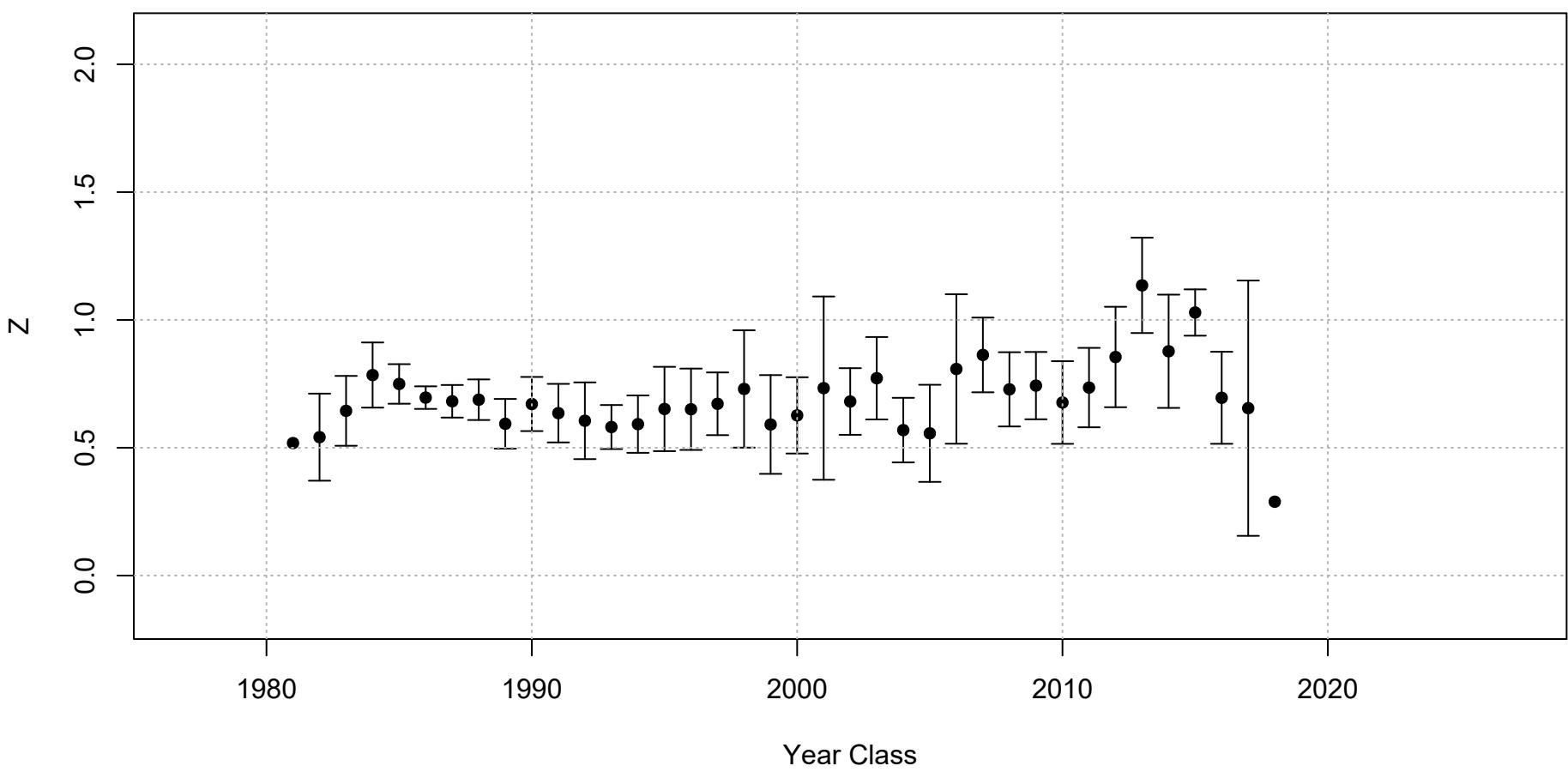
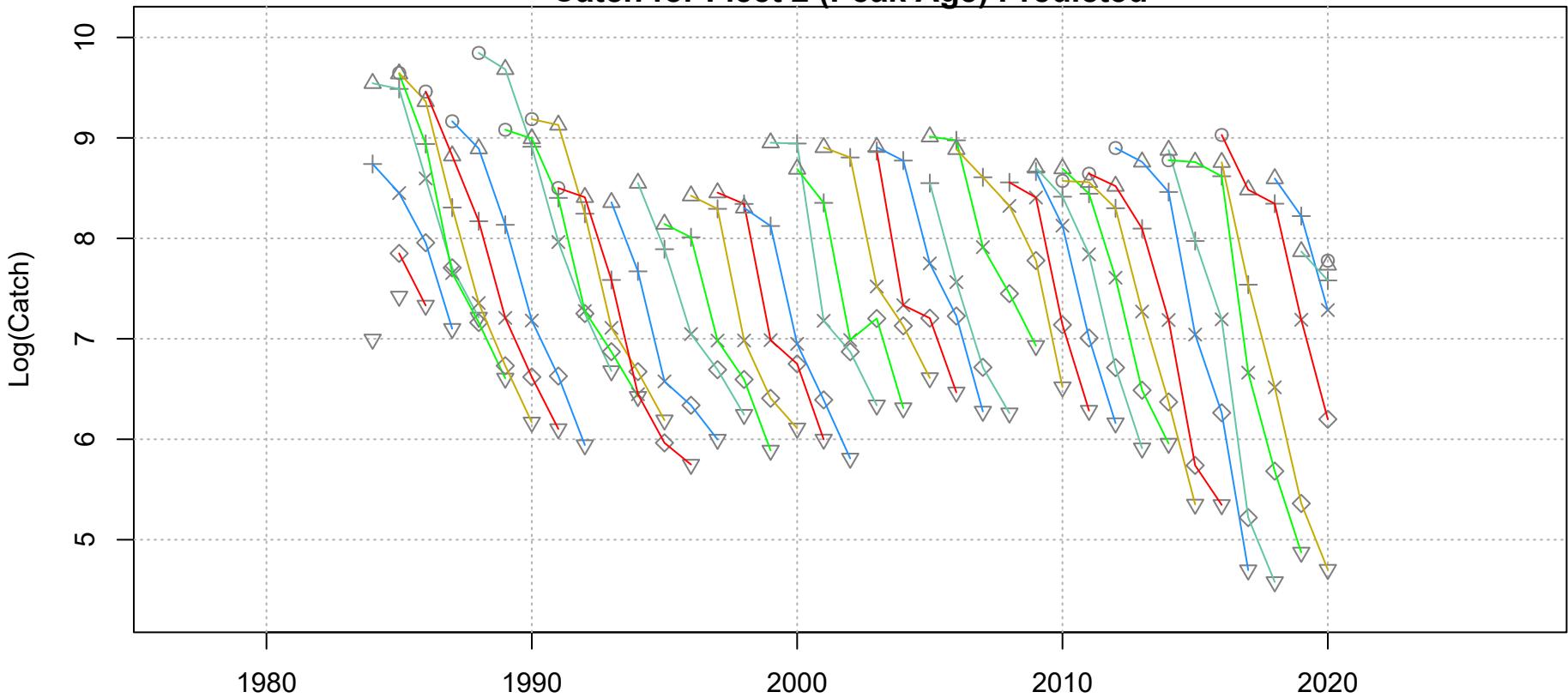
Catch for Fleet 1 (Peak Age) Predicted



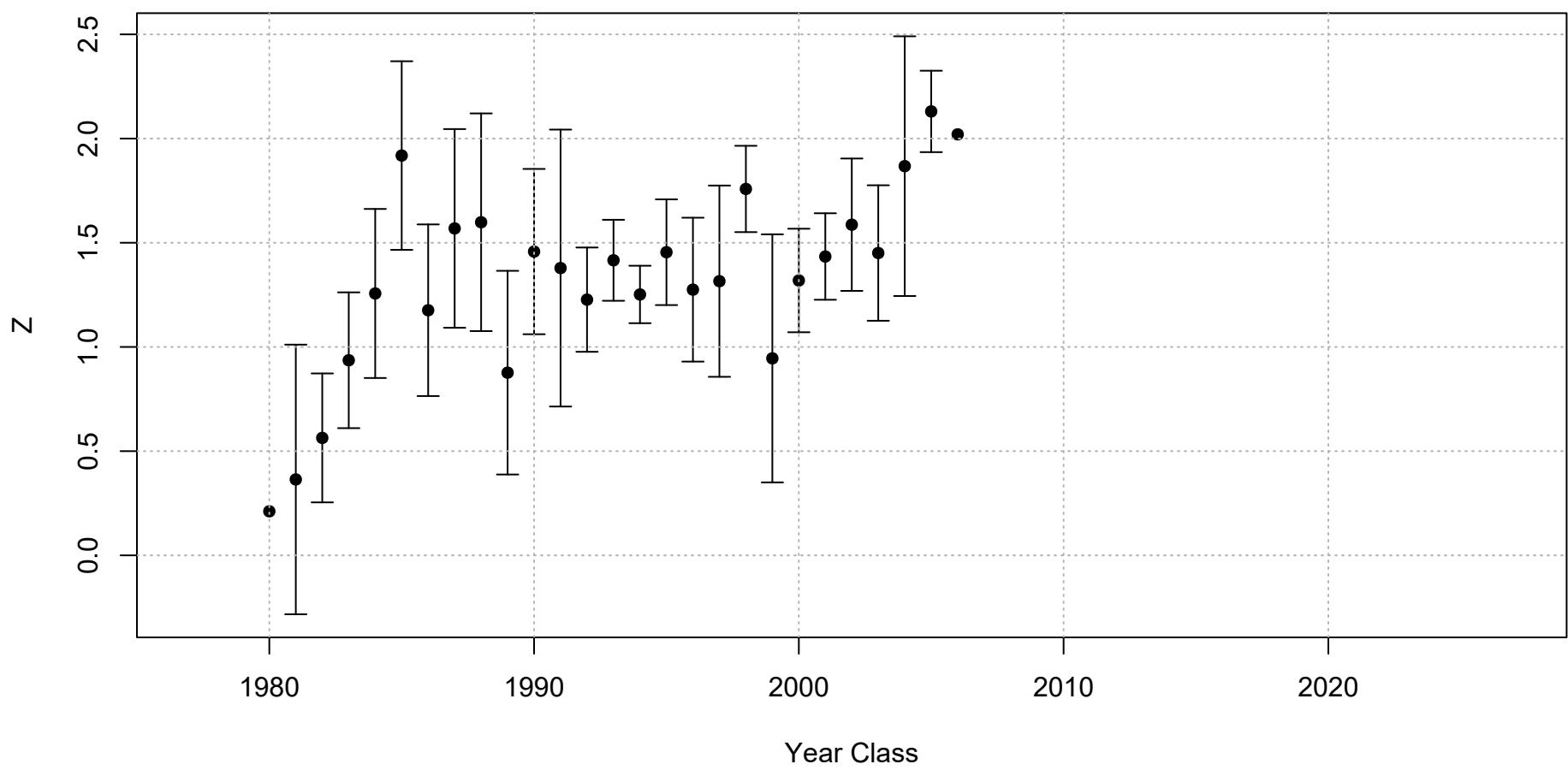
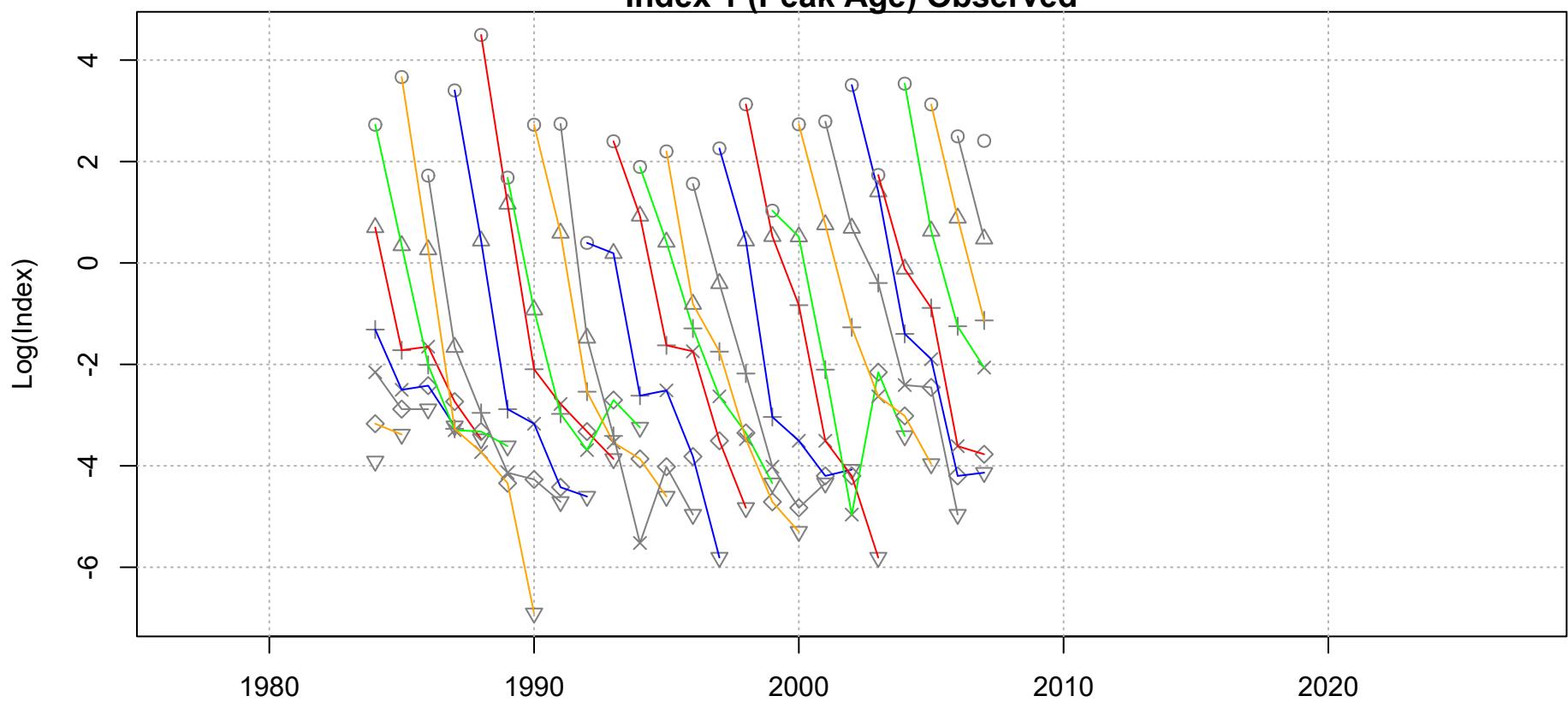
Catch for Fleet 2 (Peak Age) Observed



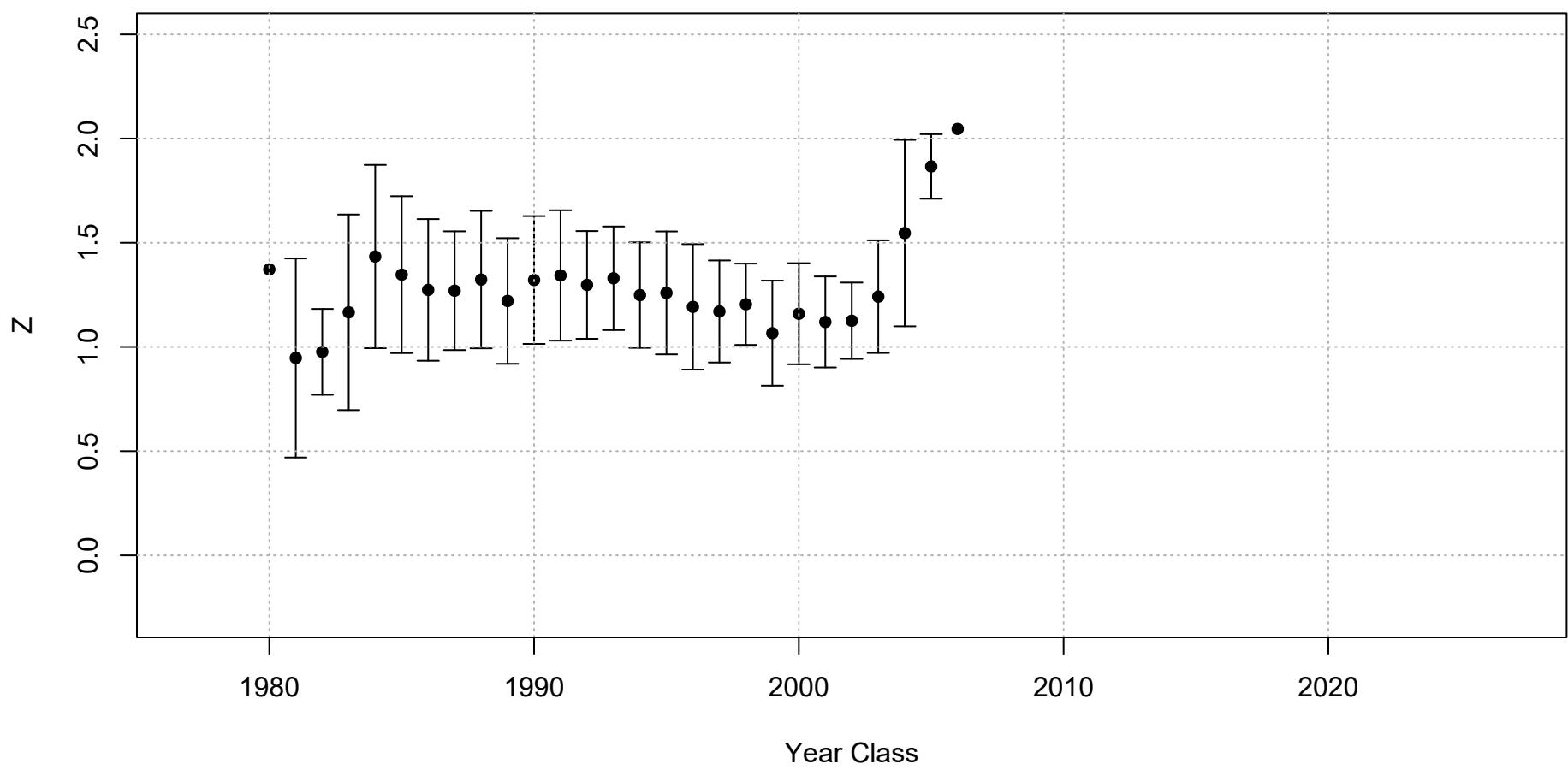
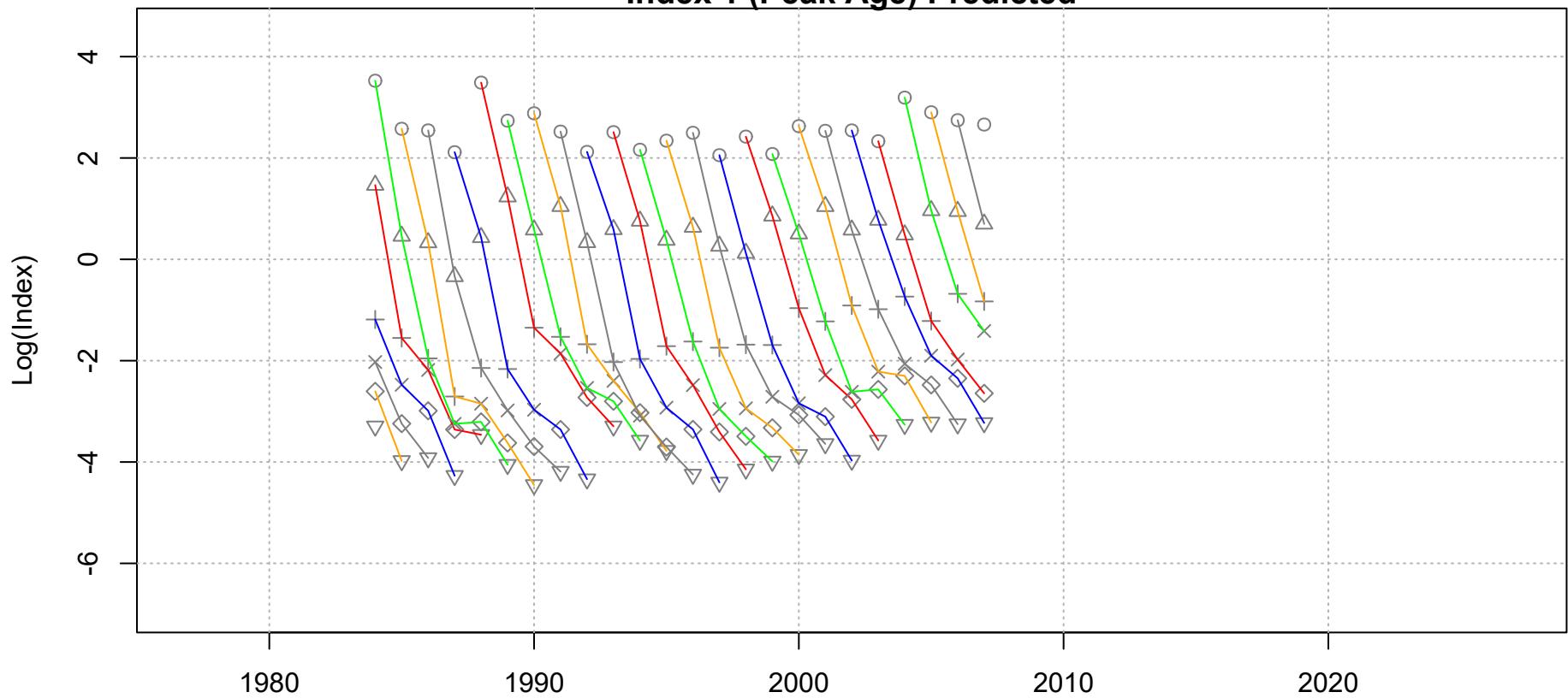
Catch for Fleet 2 (Peak Age) Predicted

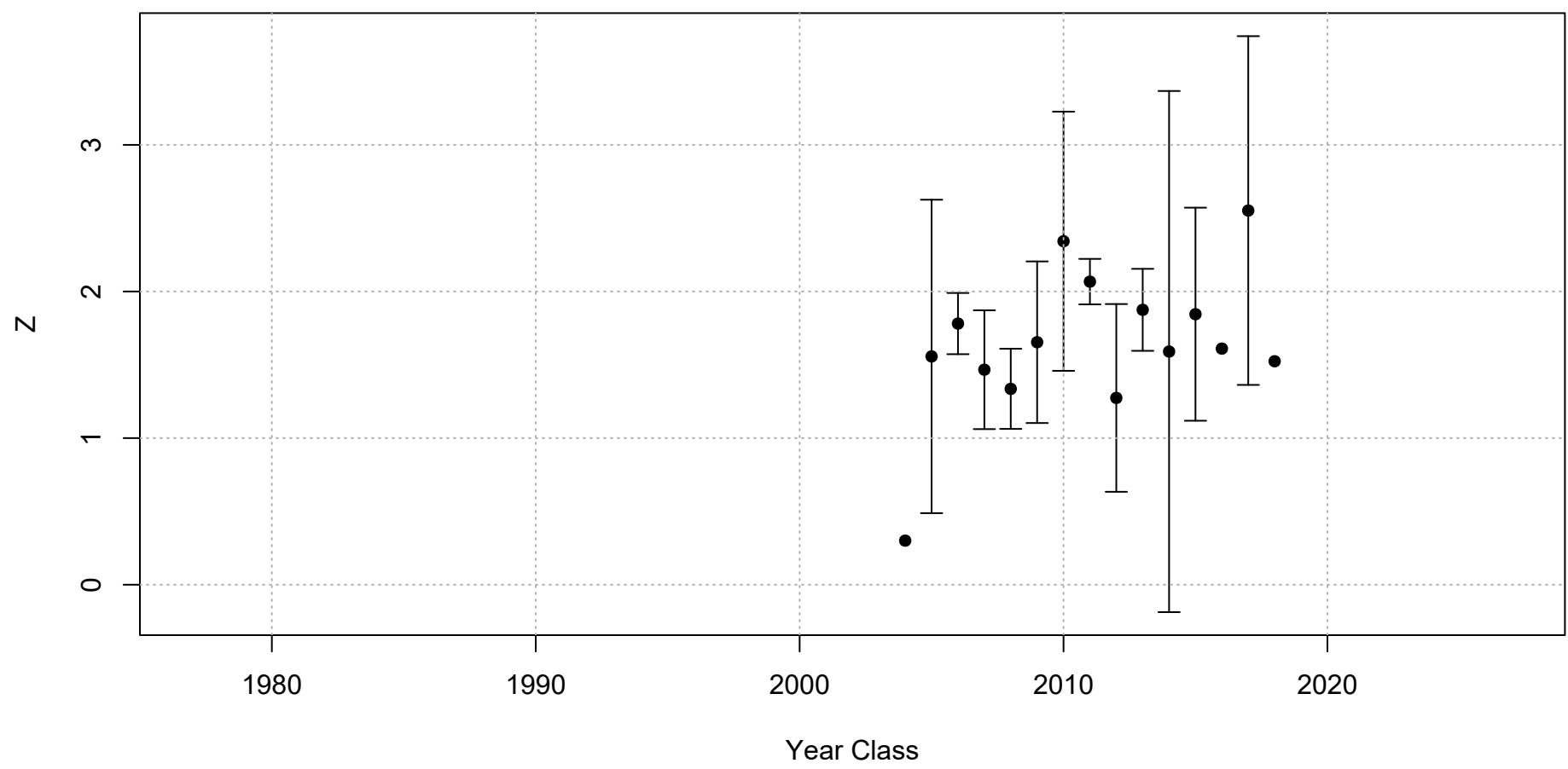
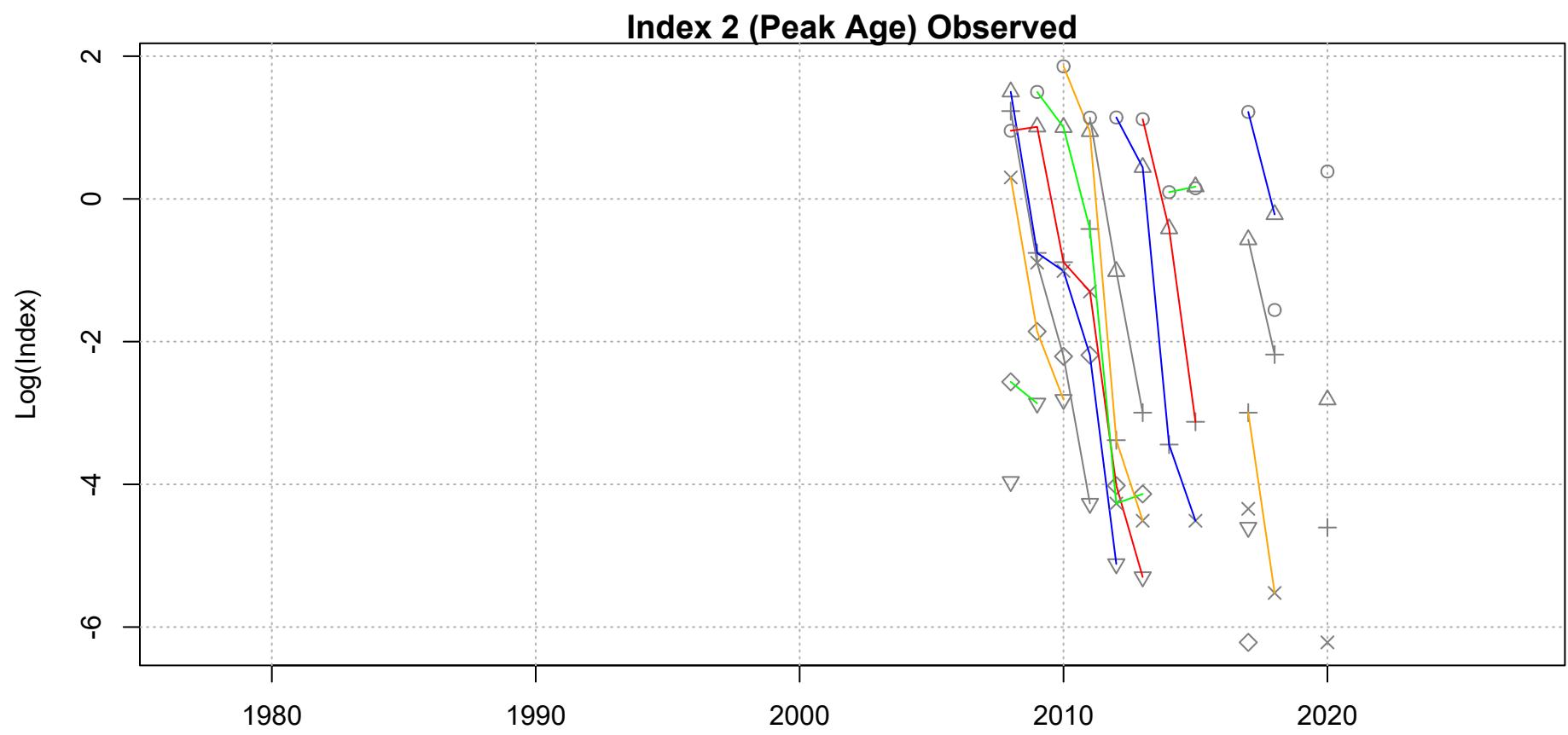


Index 1 (Peak Age) Observed

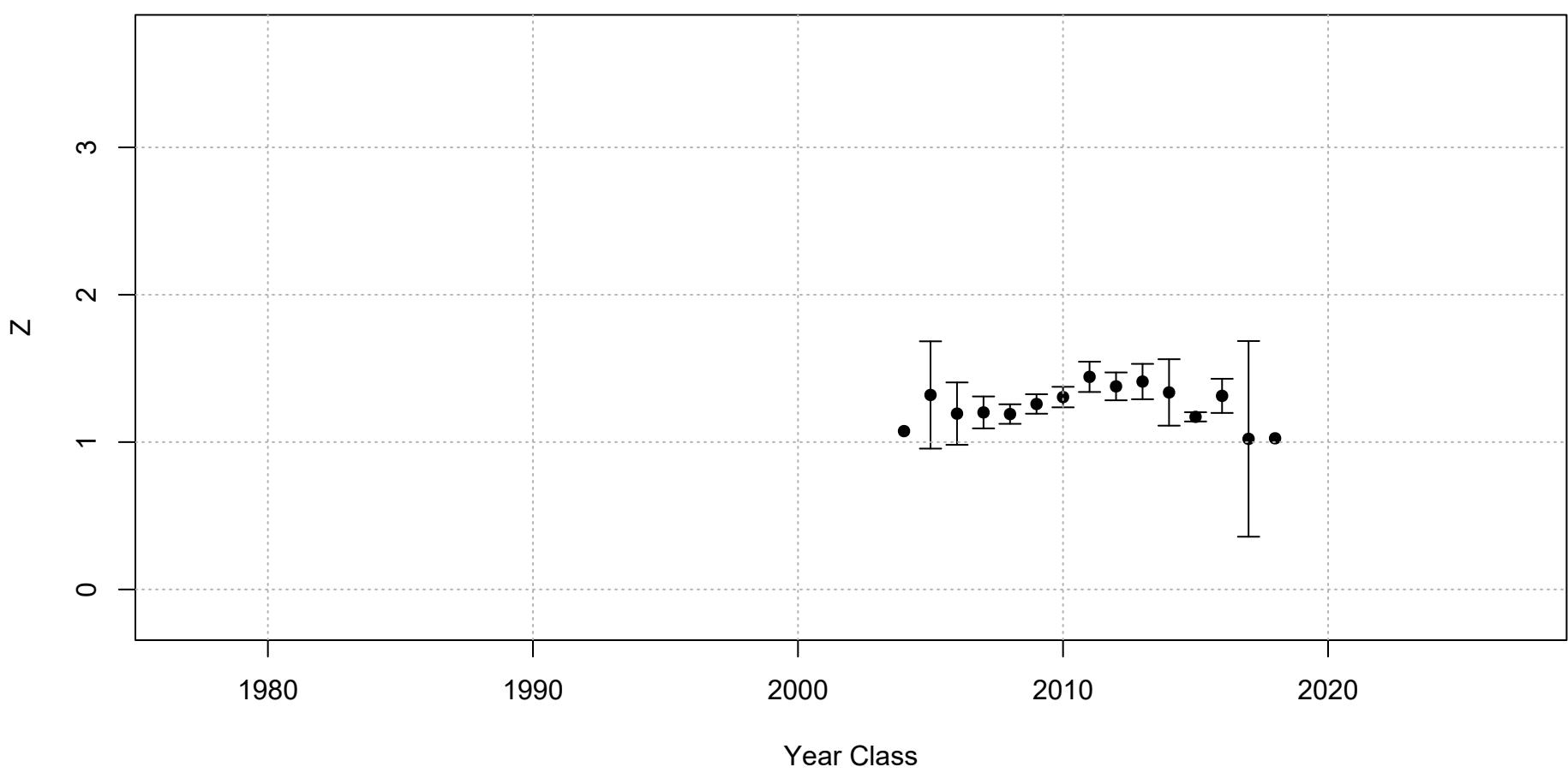
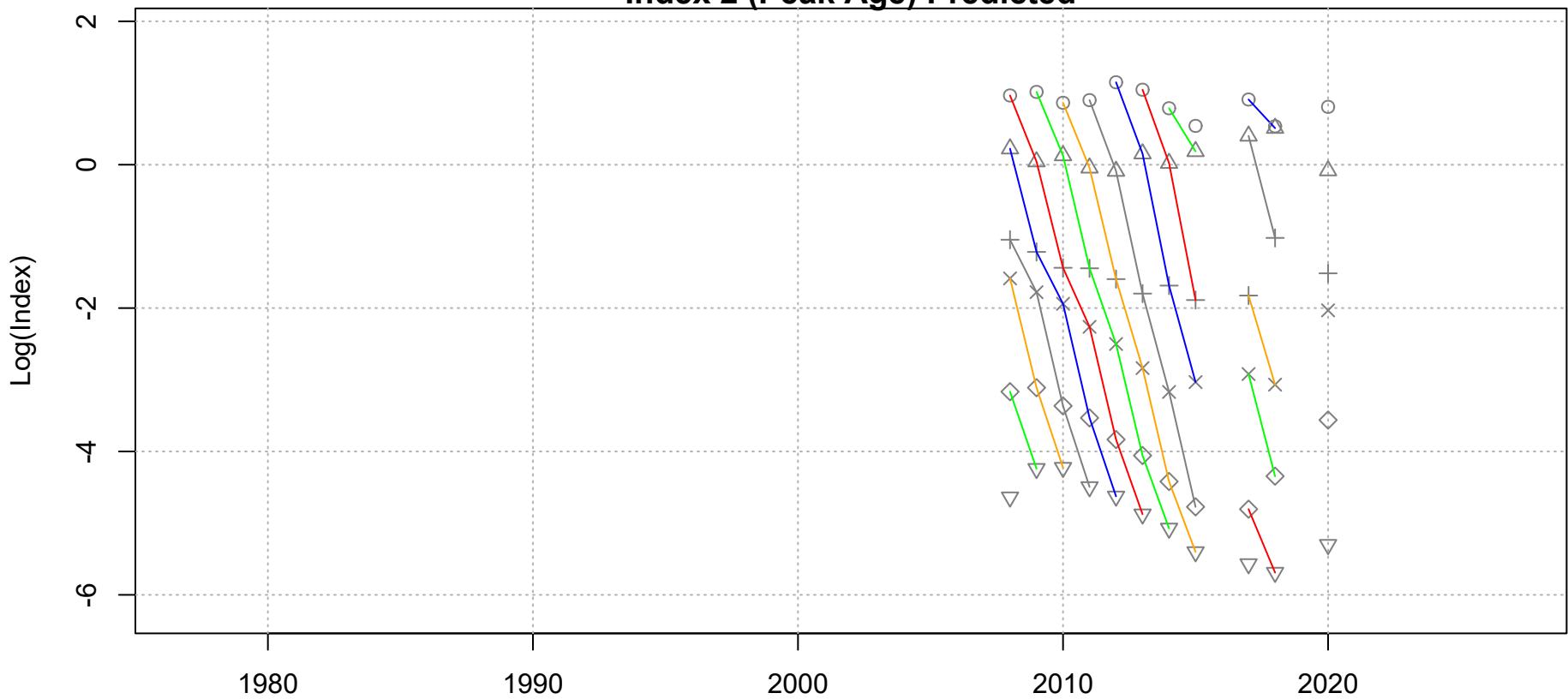


Index 1 (Peak Age) Predicted

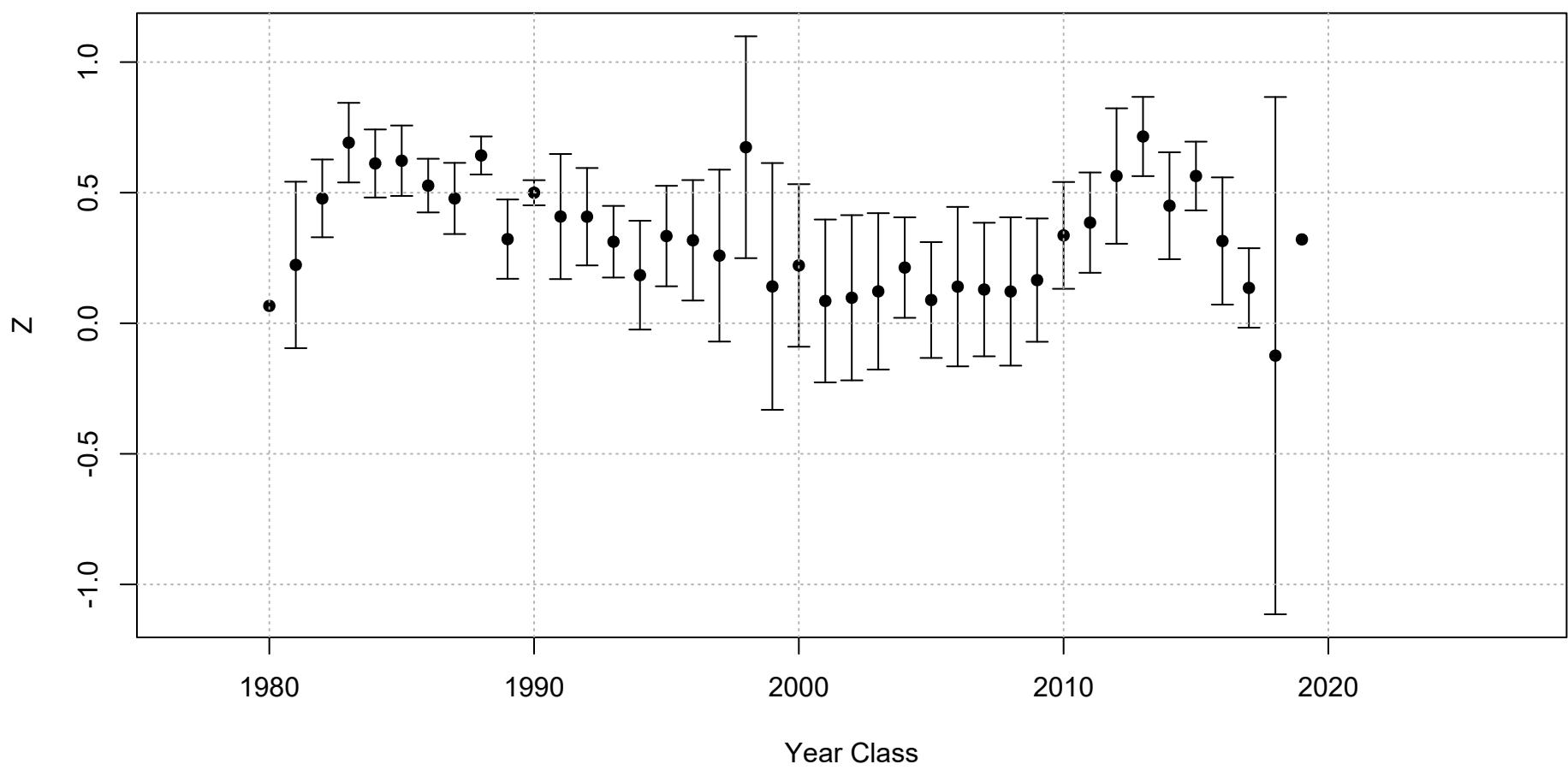
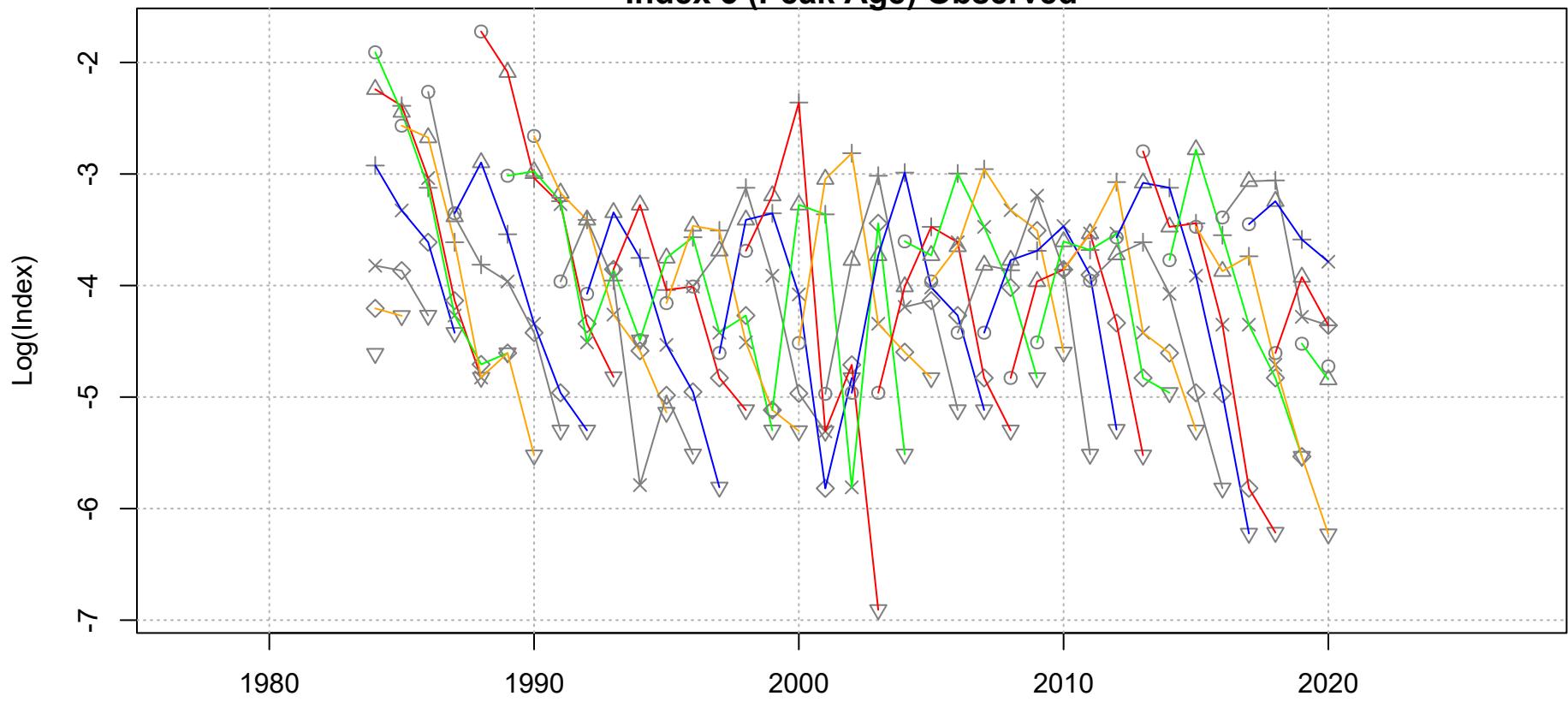




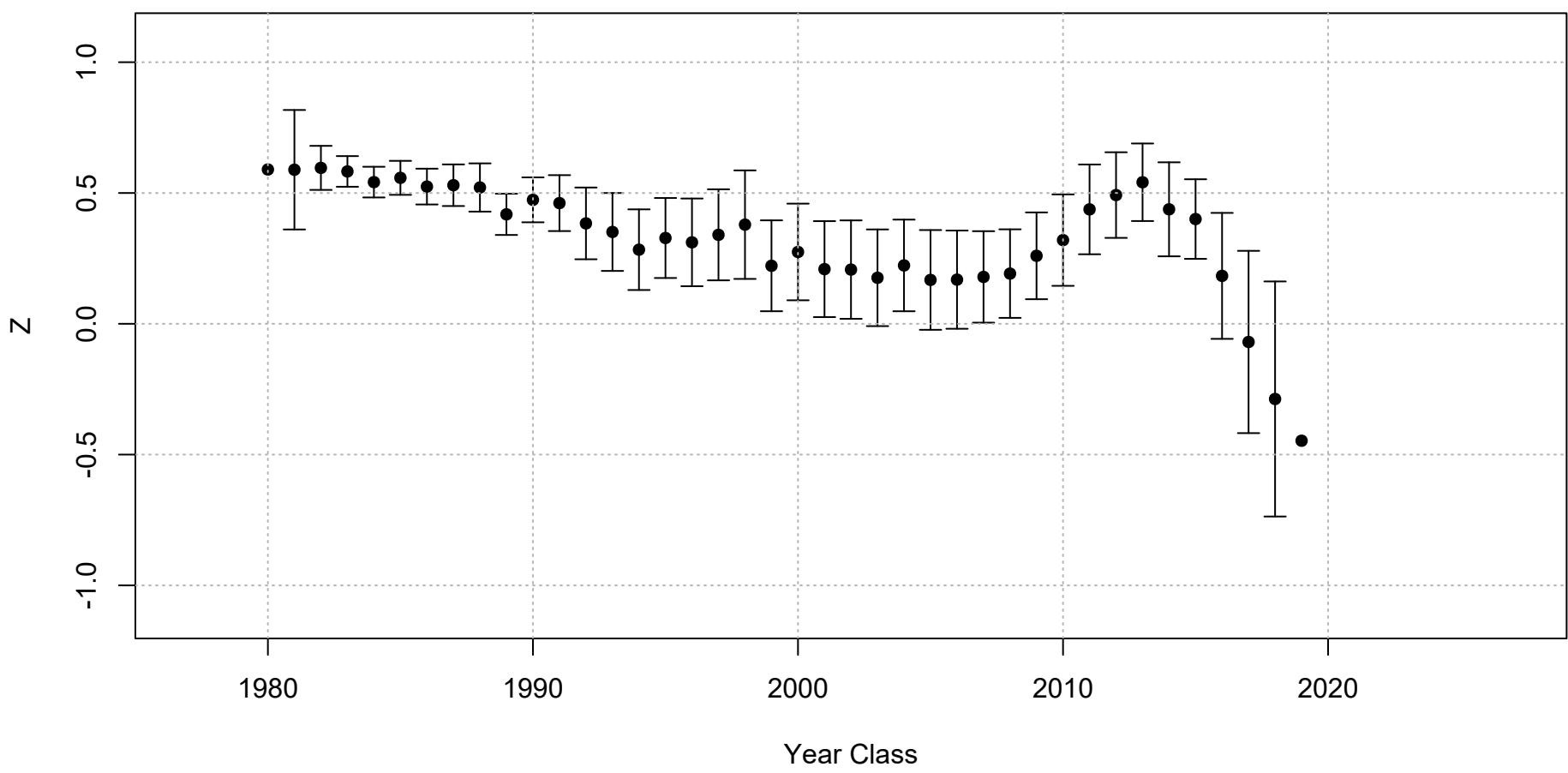
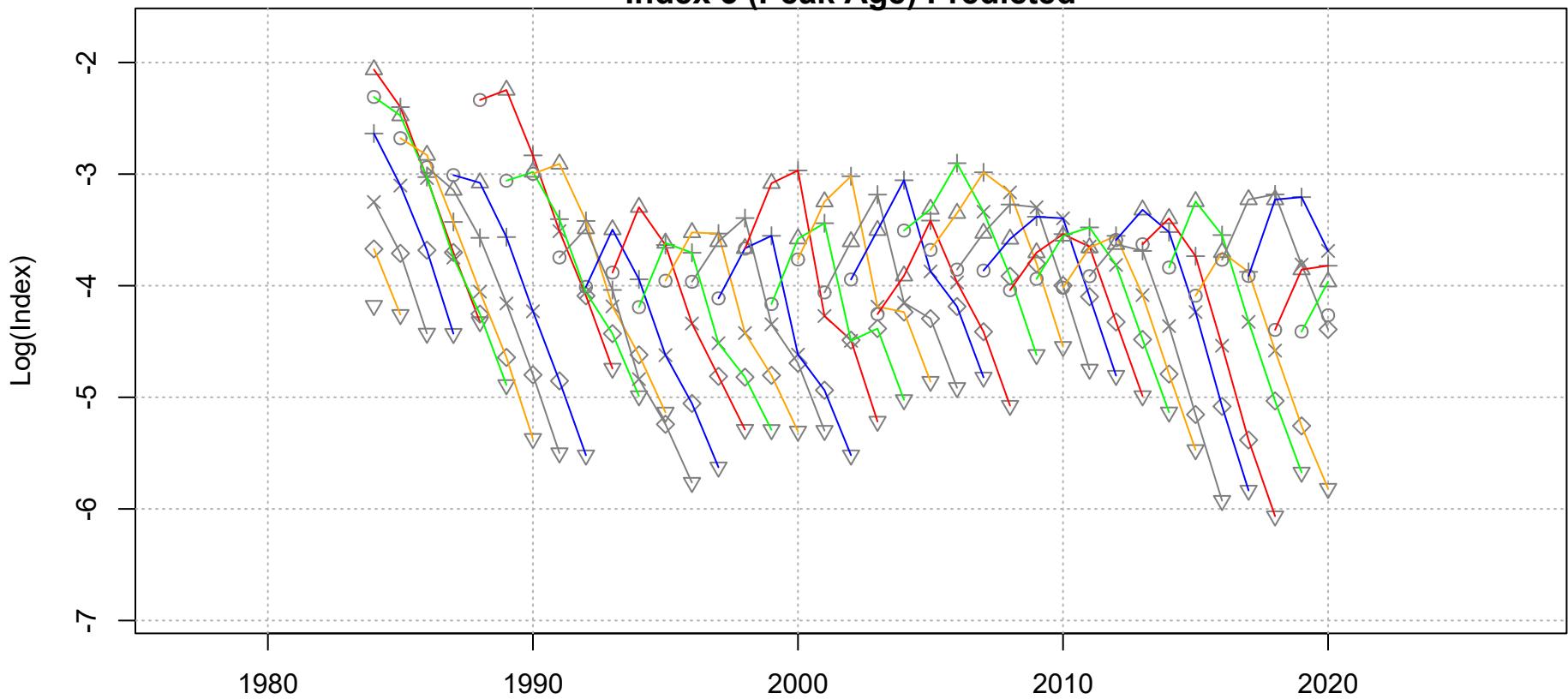
Index 2 (Peak Age) Predicted



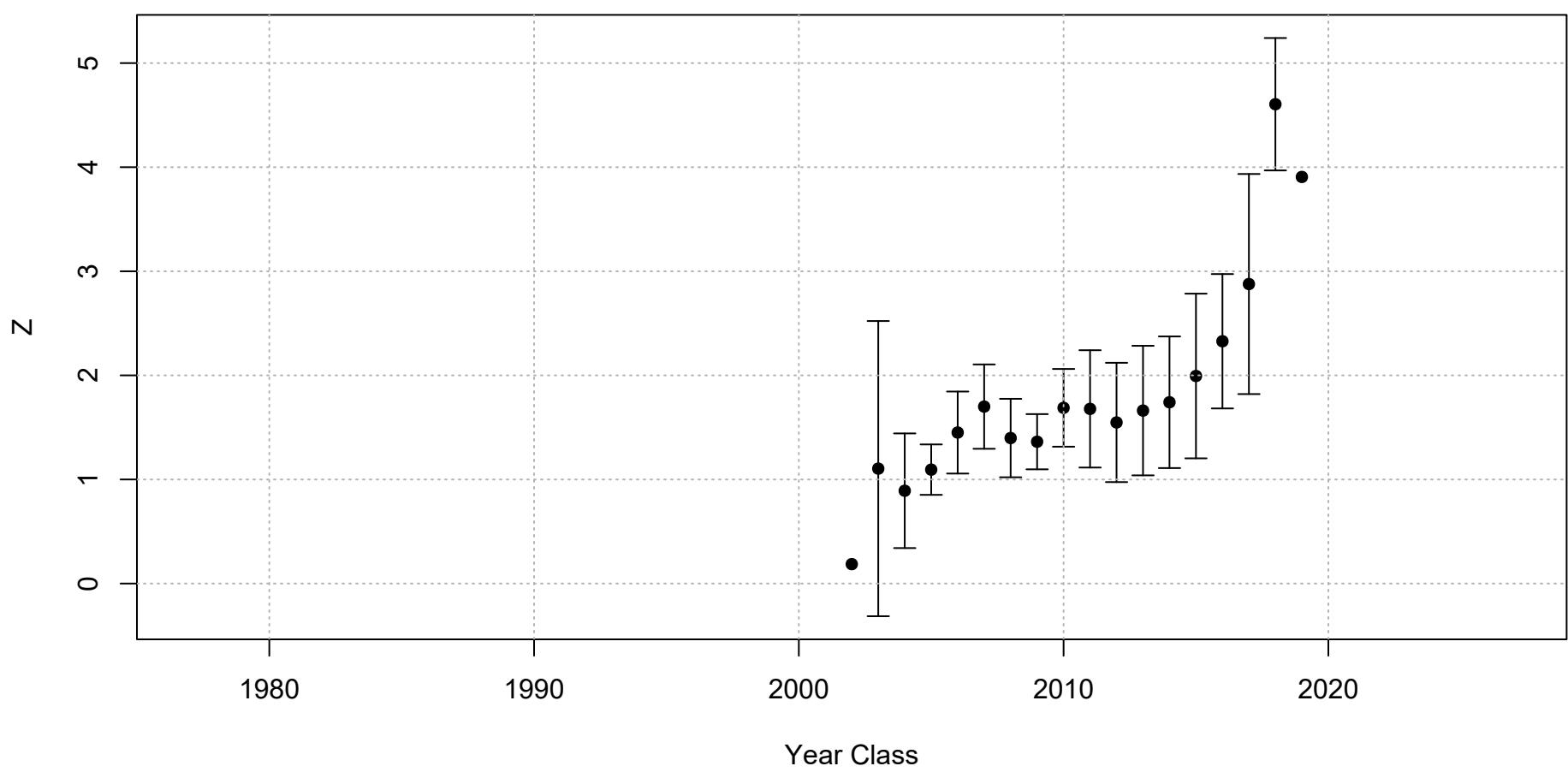
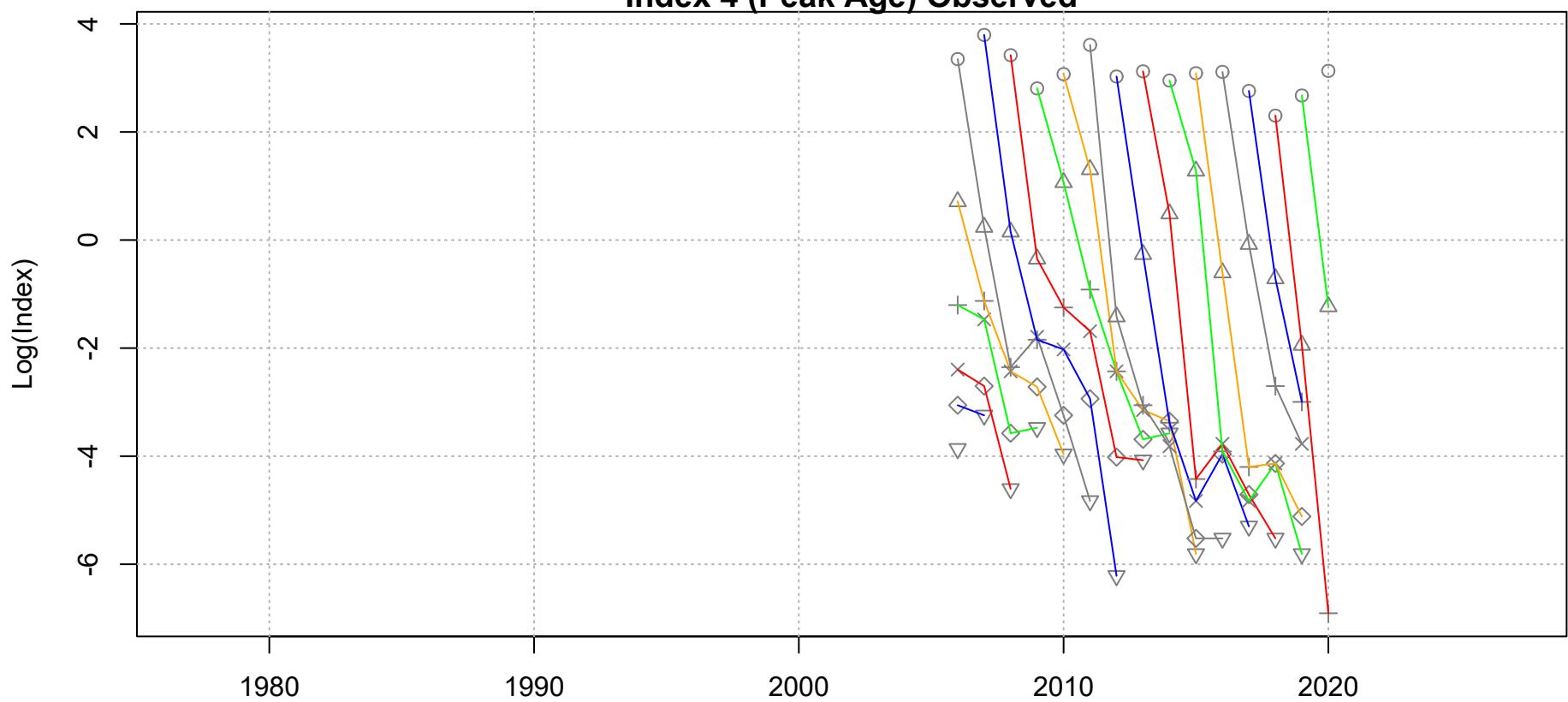
Index 3 (Peak Age) Observed



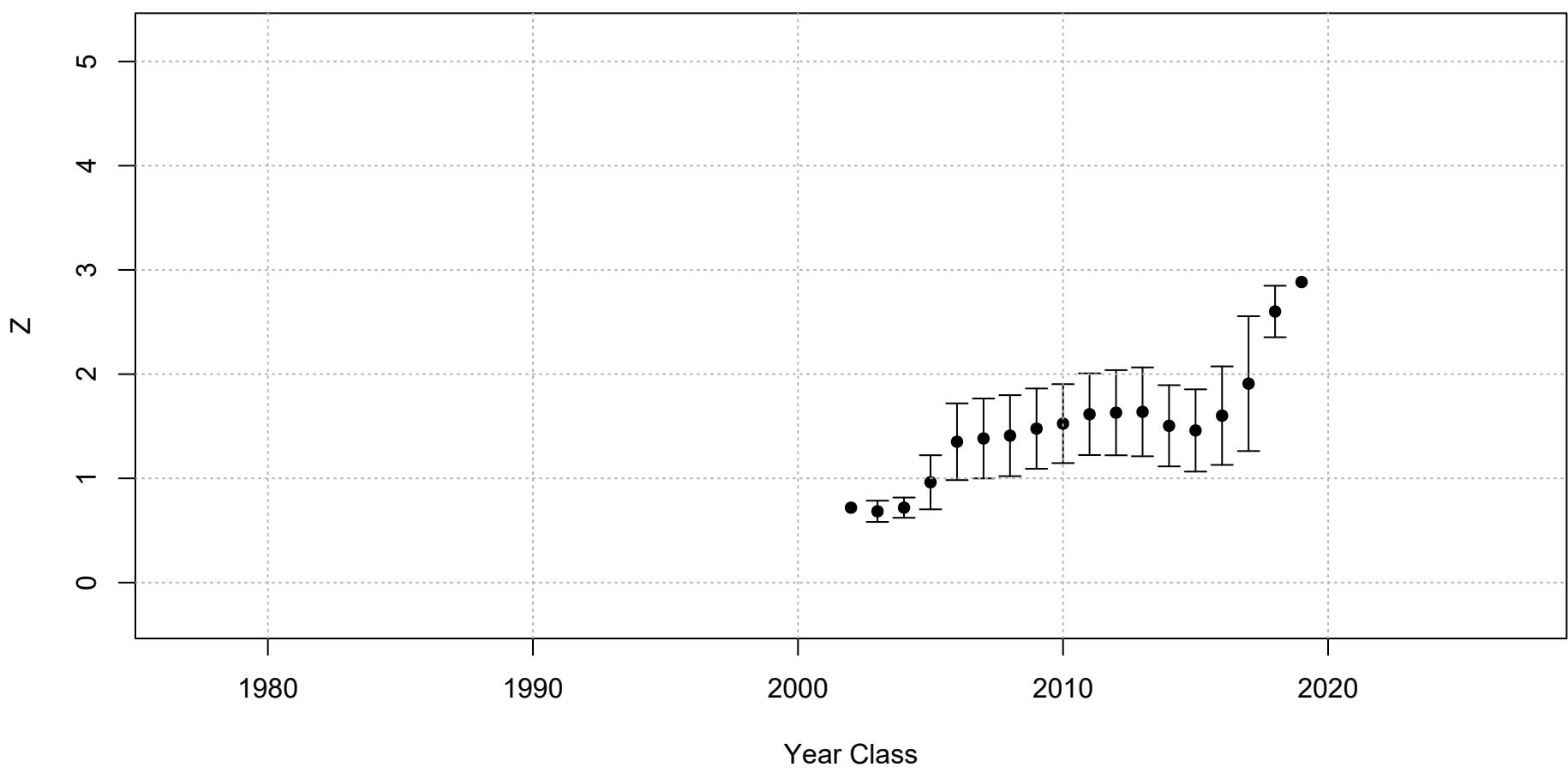
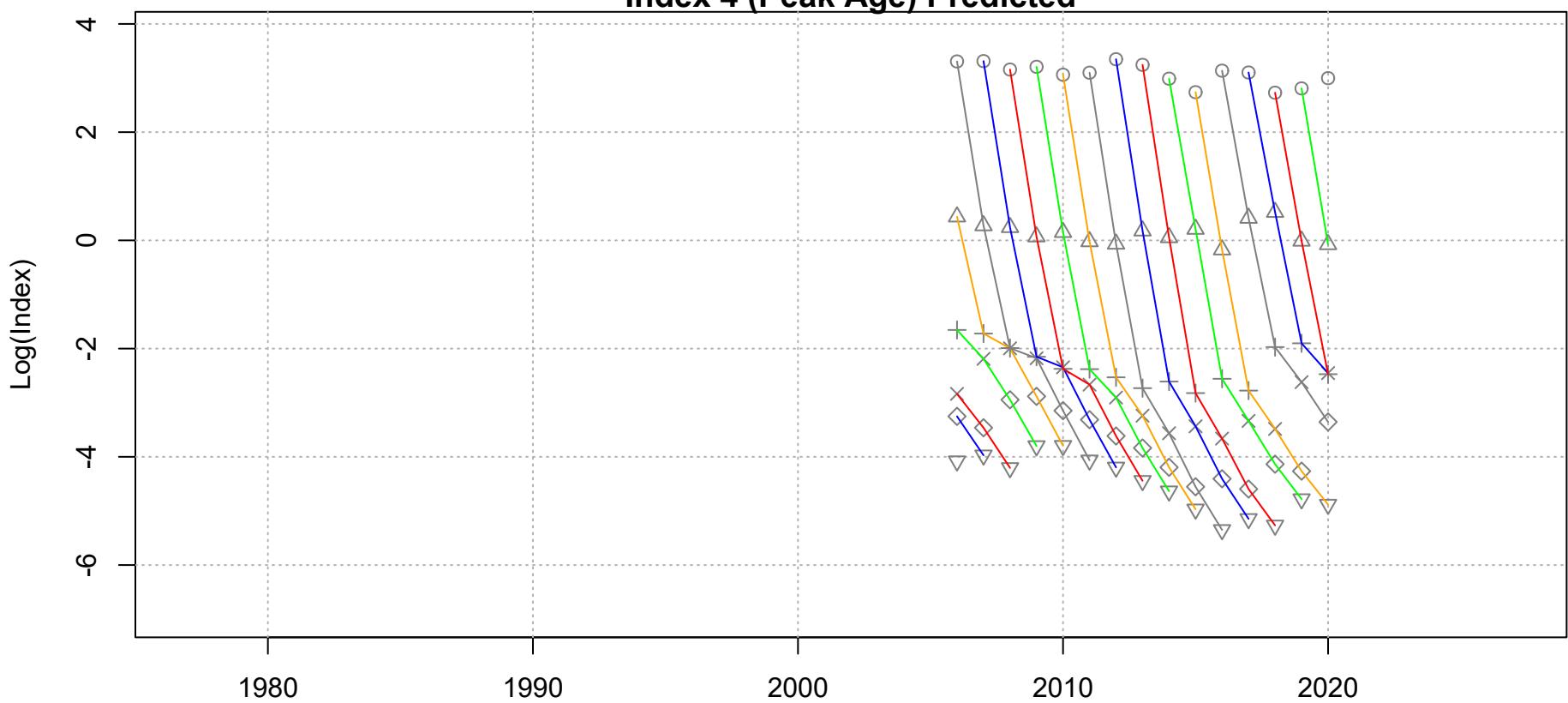
Index 3 (Peak Age) Predicted



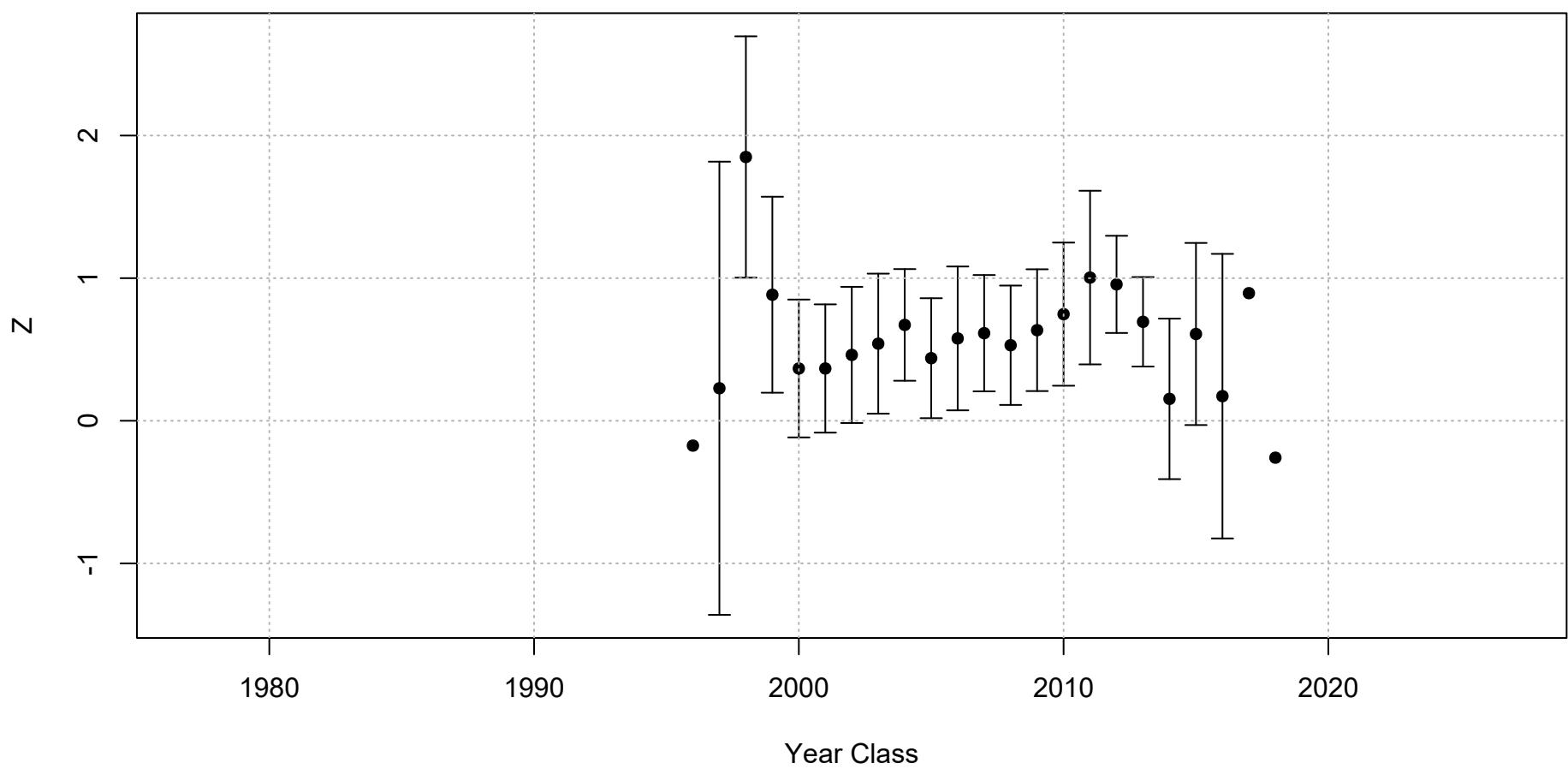
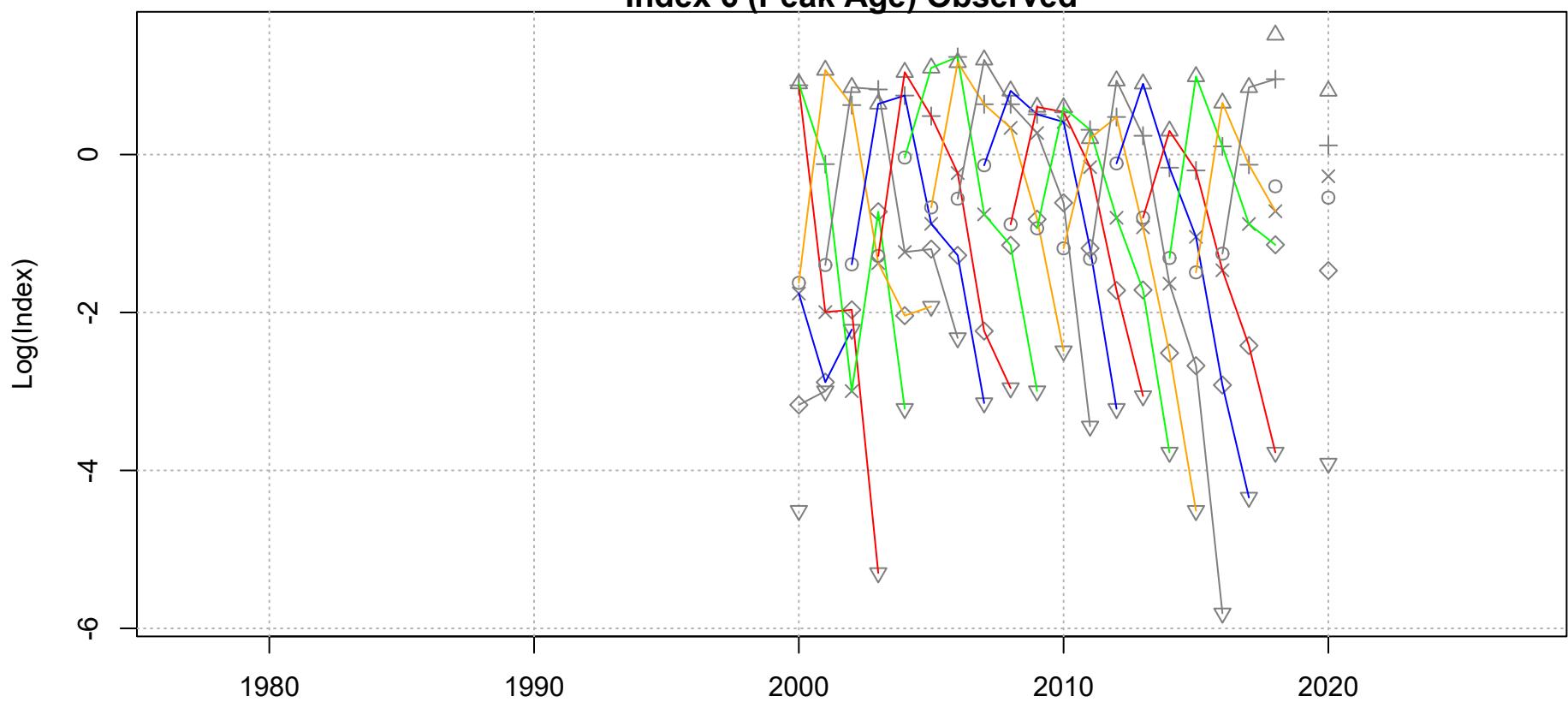
Index 4 (Peak Age) Observed



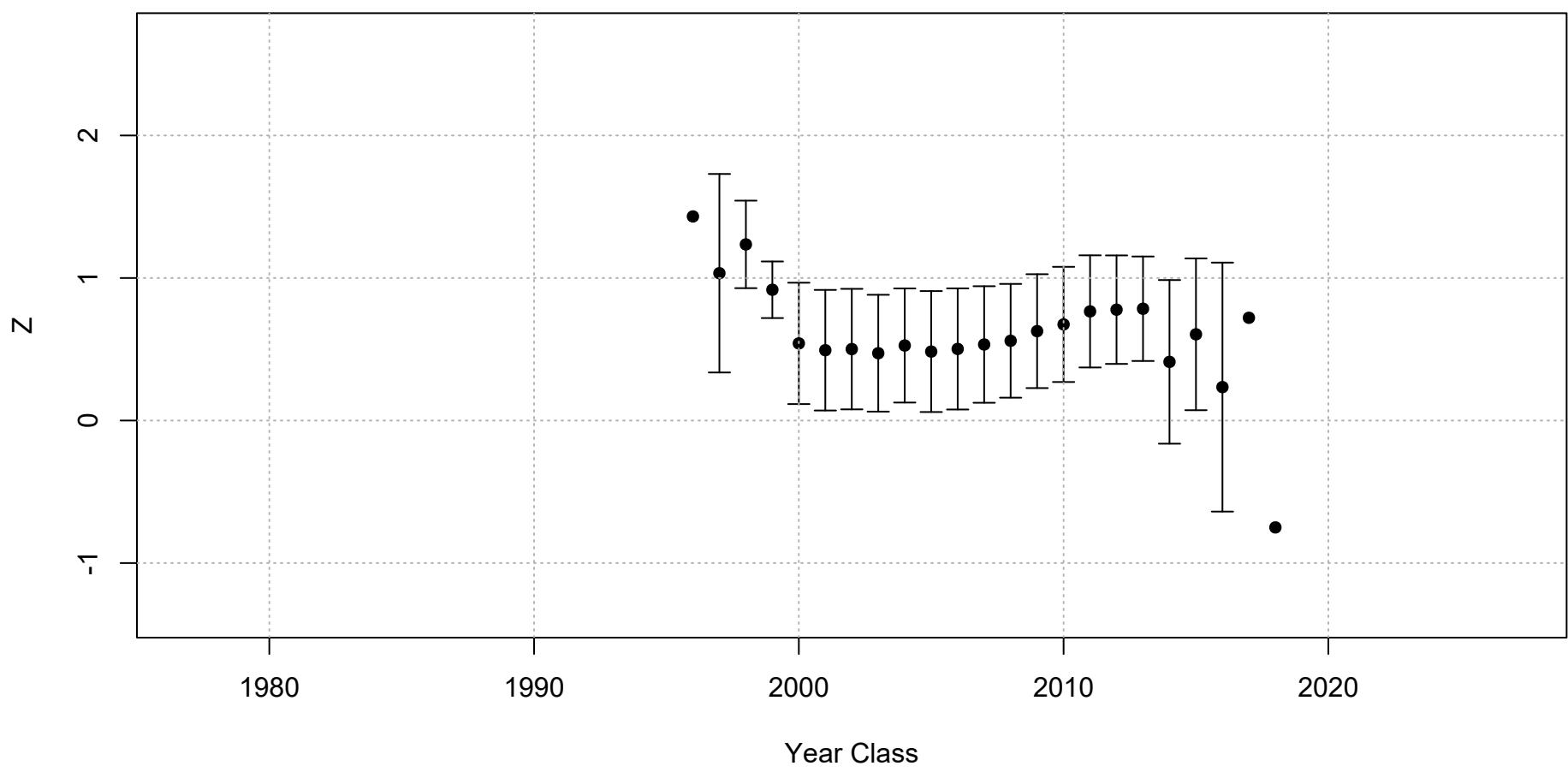
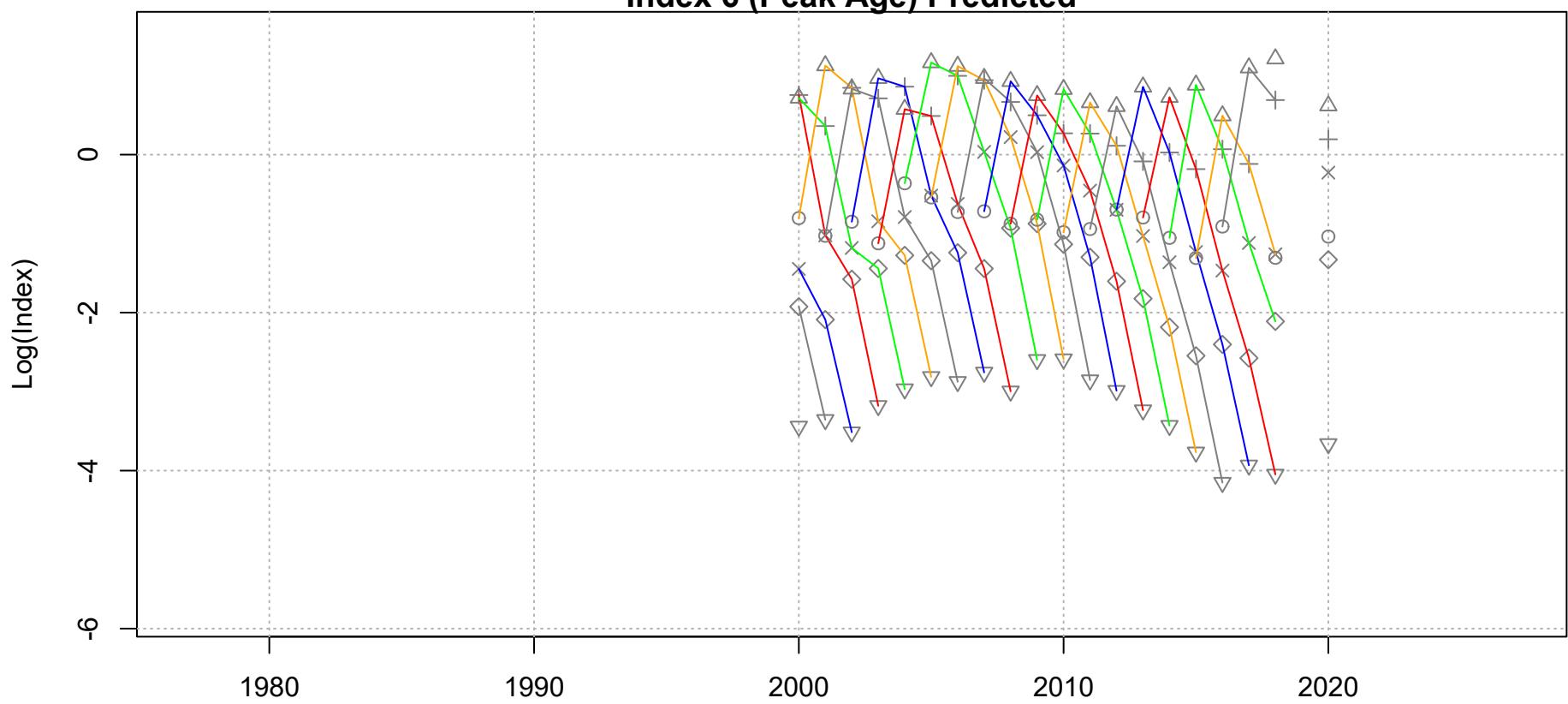
Index 4 (Peak Age) Predicted



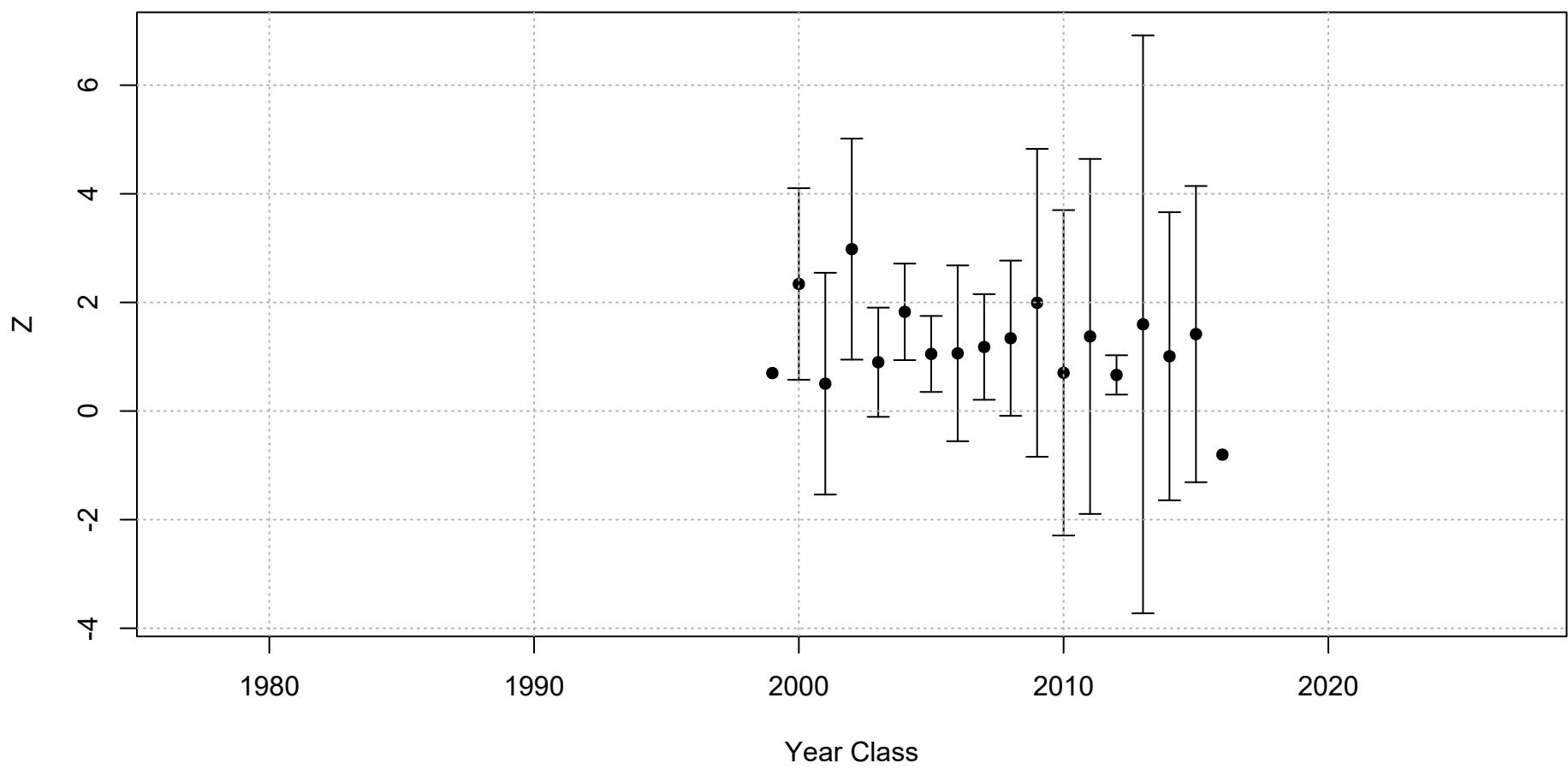
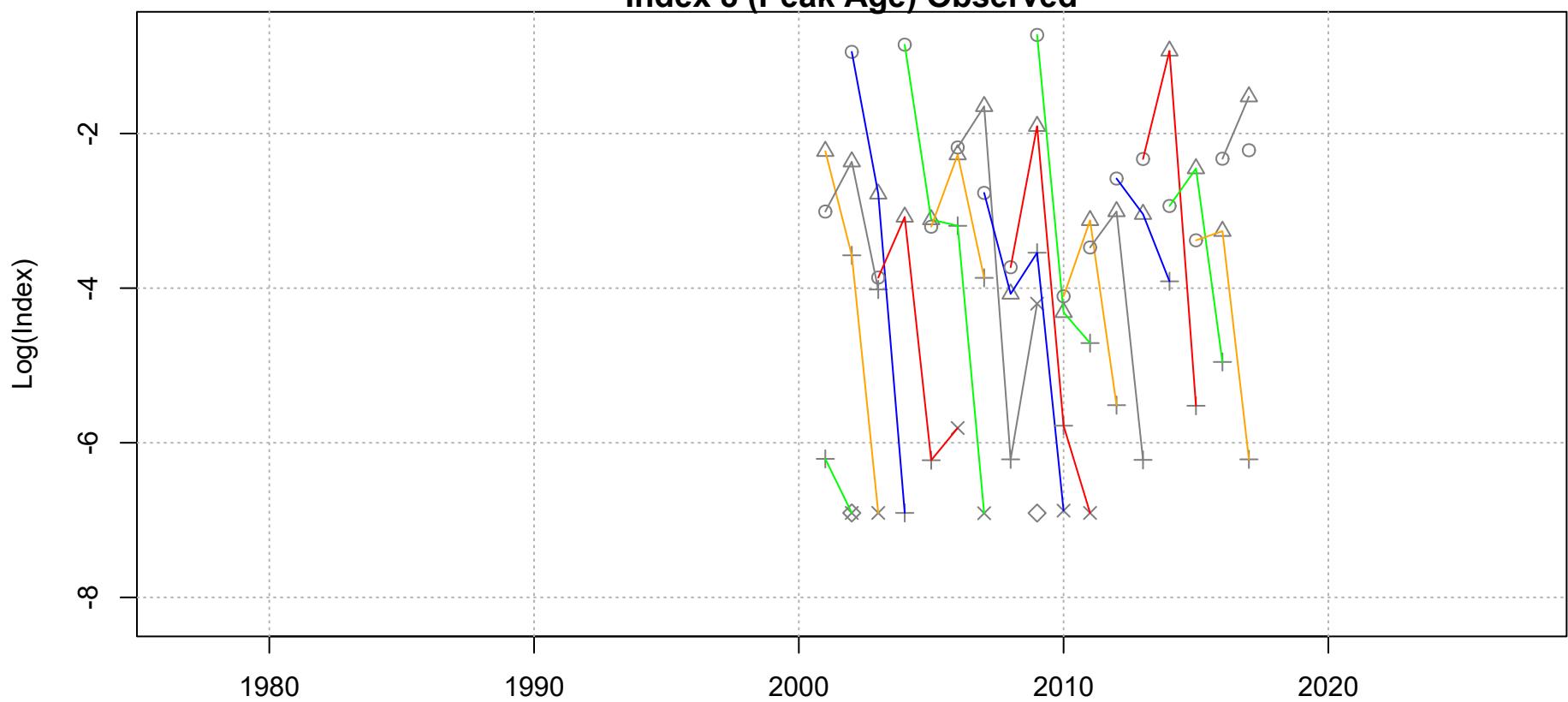
Index 6 (Peak Age) Observed



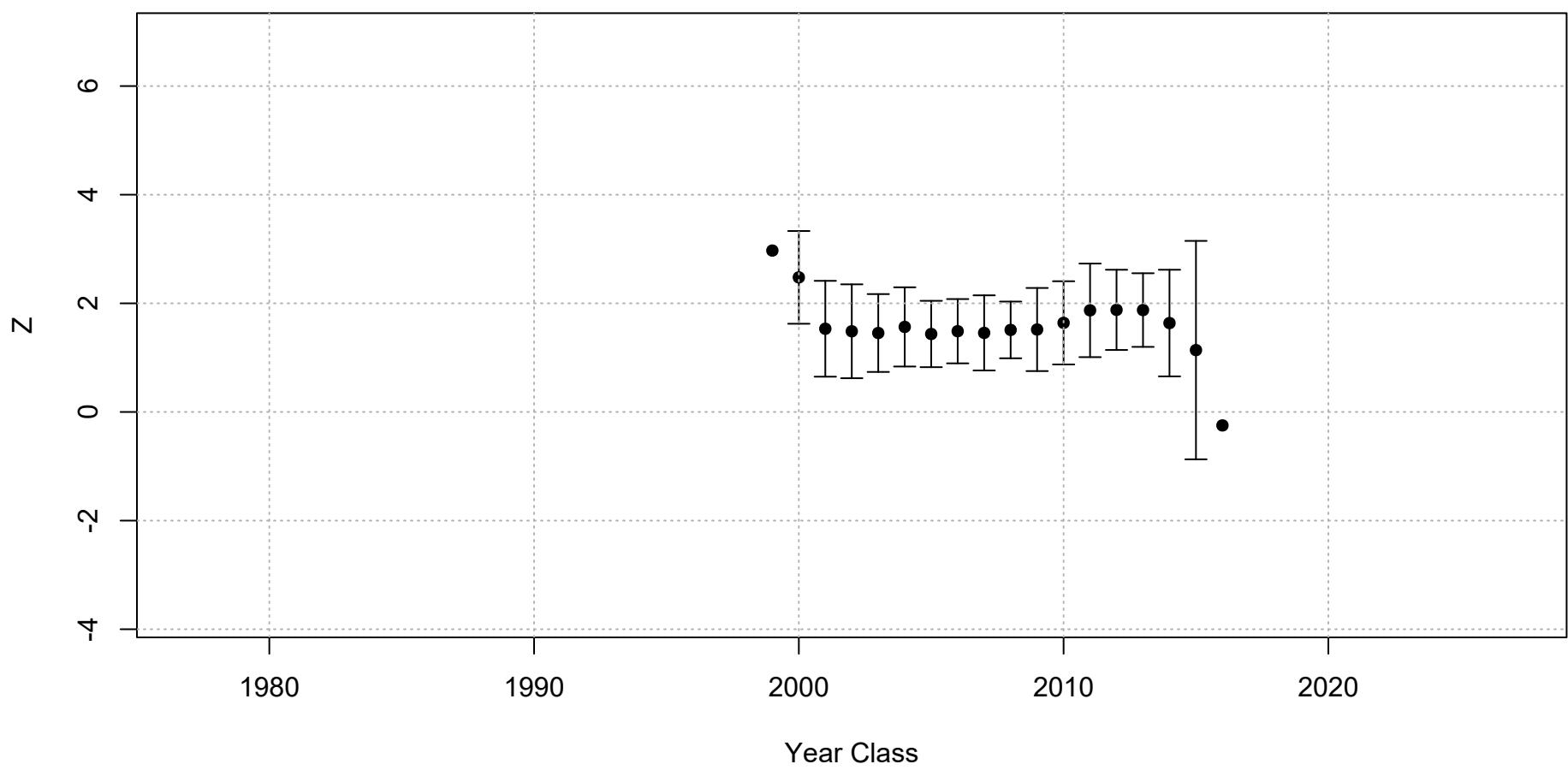
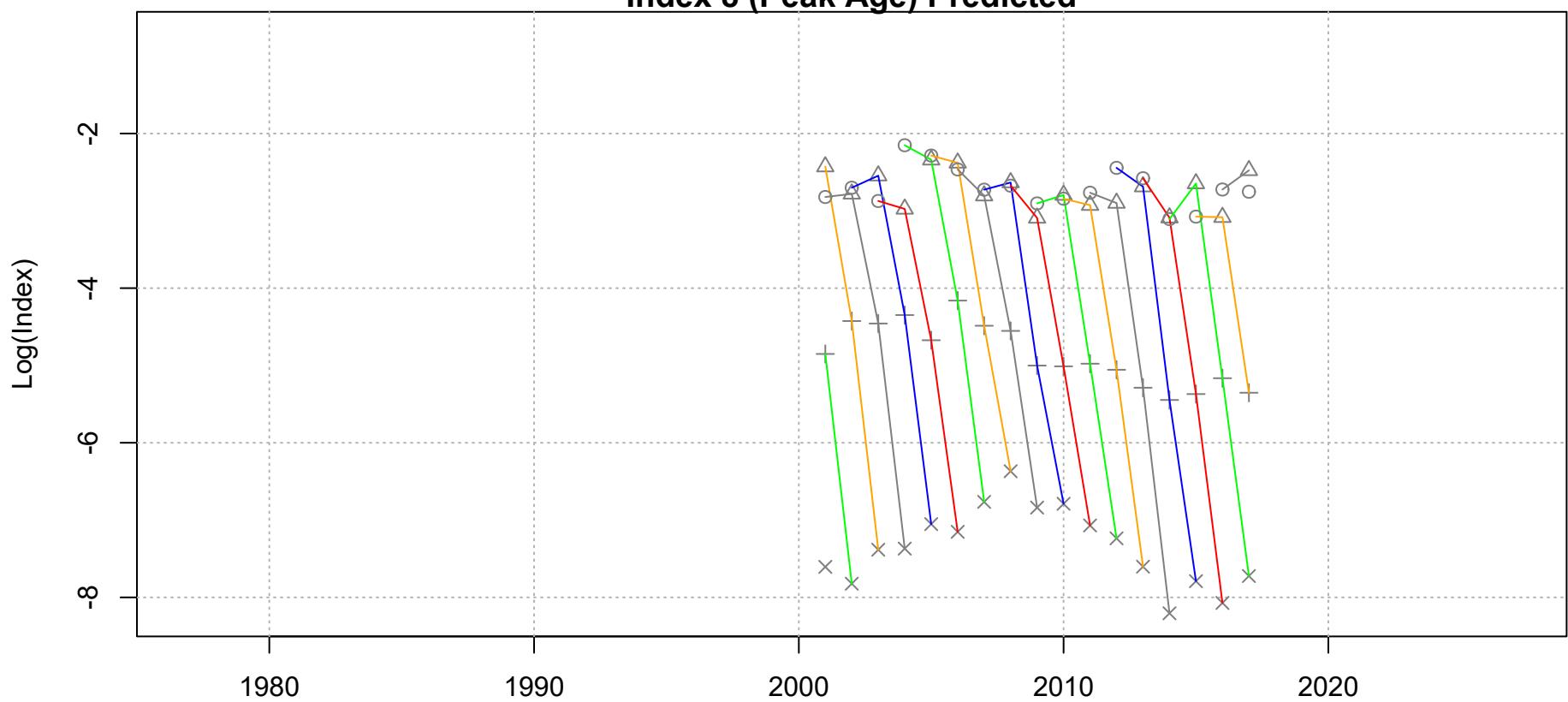
Index 6 (Peak Age) Predicted



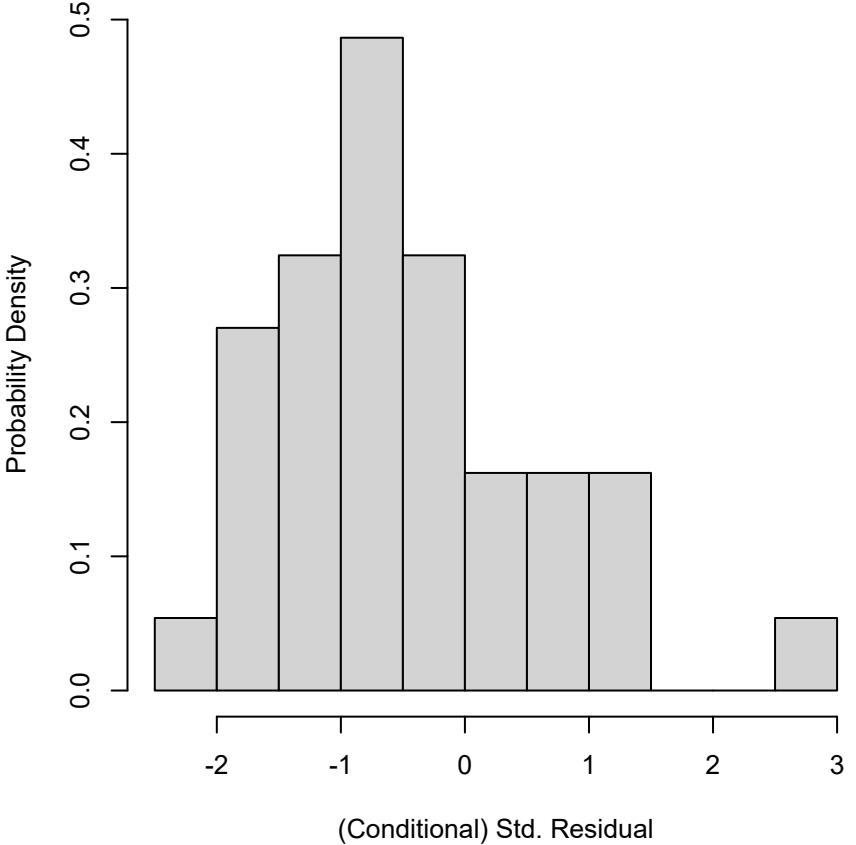
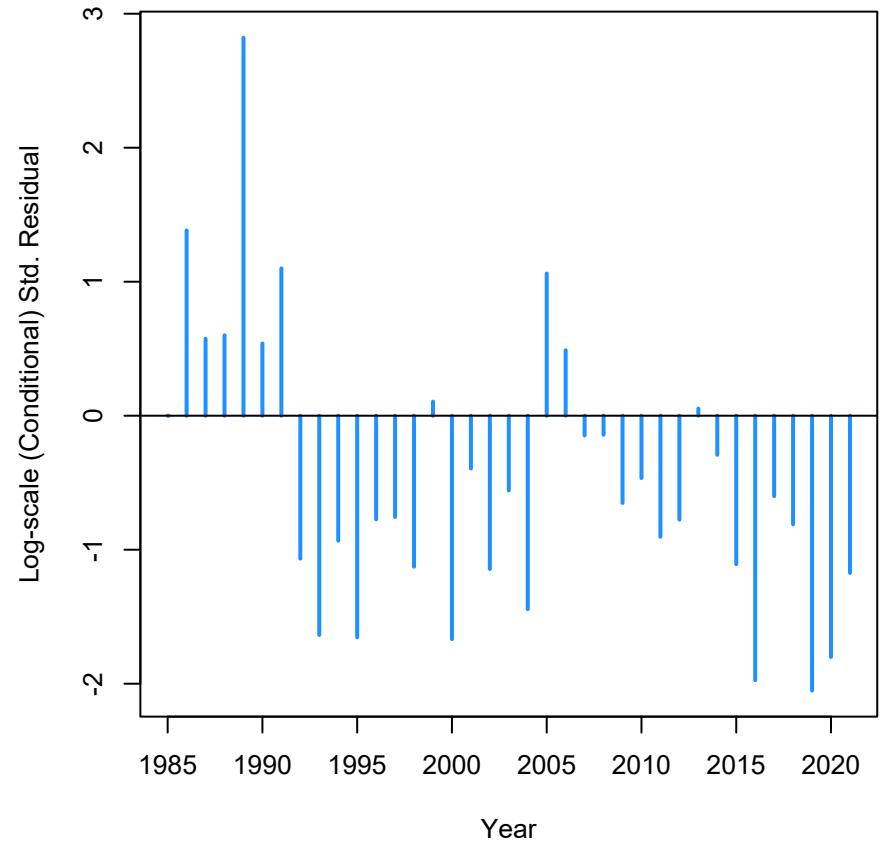
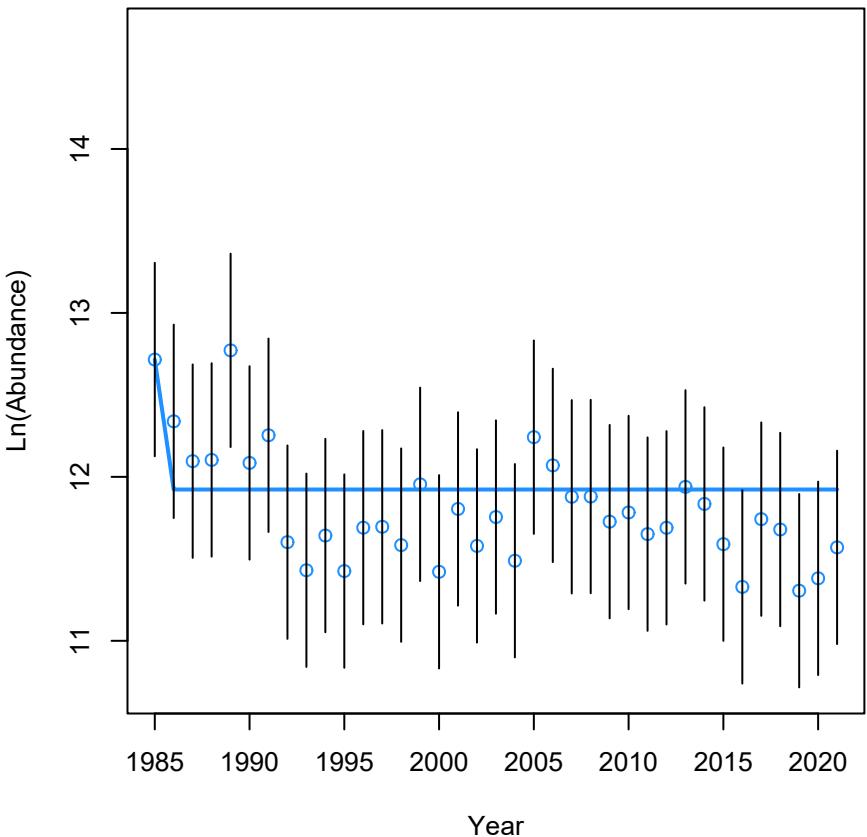
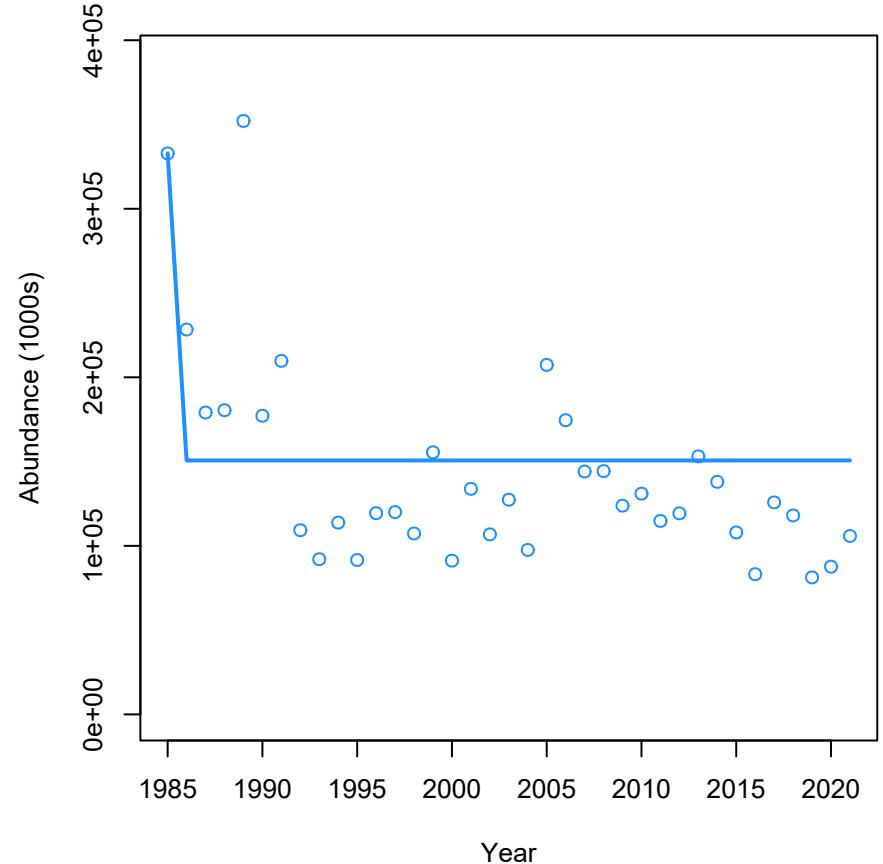
Index 8 (Peak Age) Observed



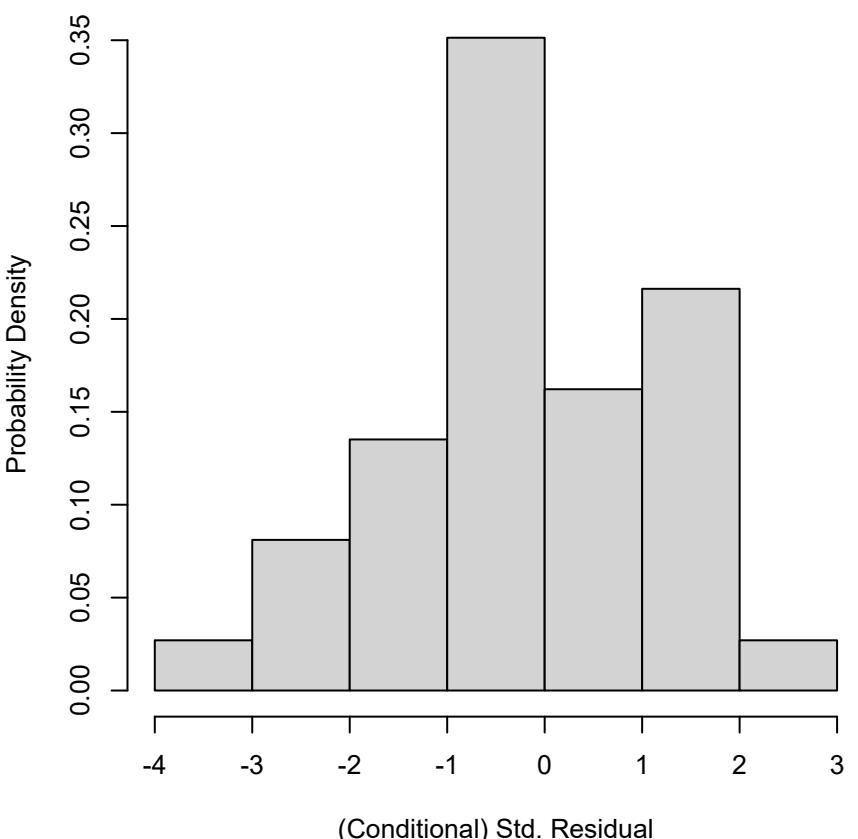
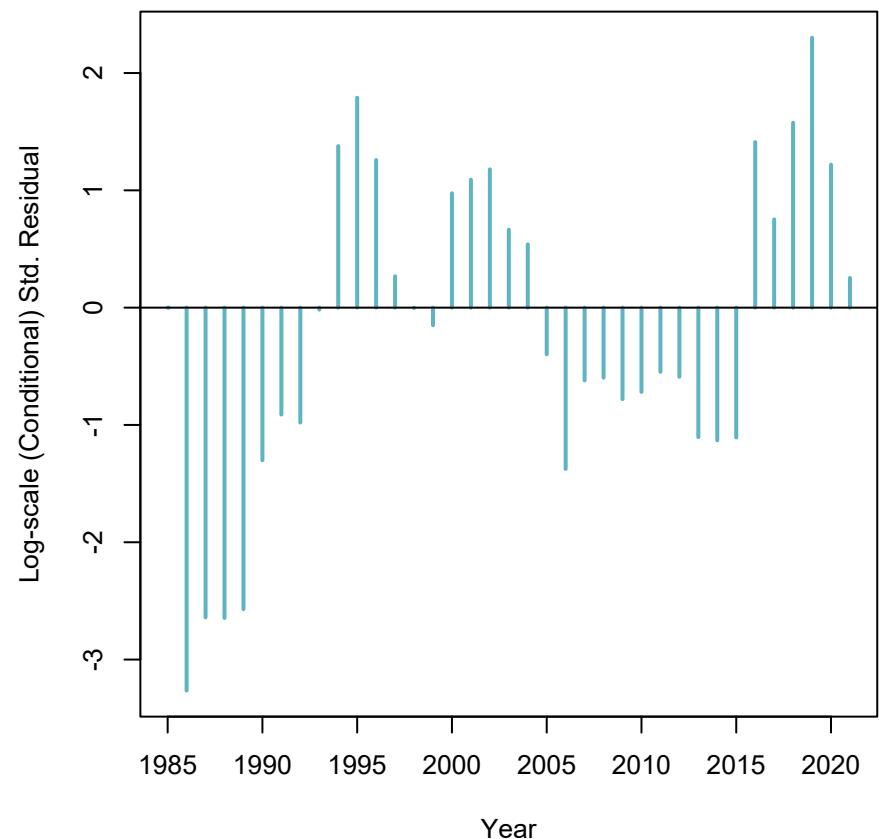
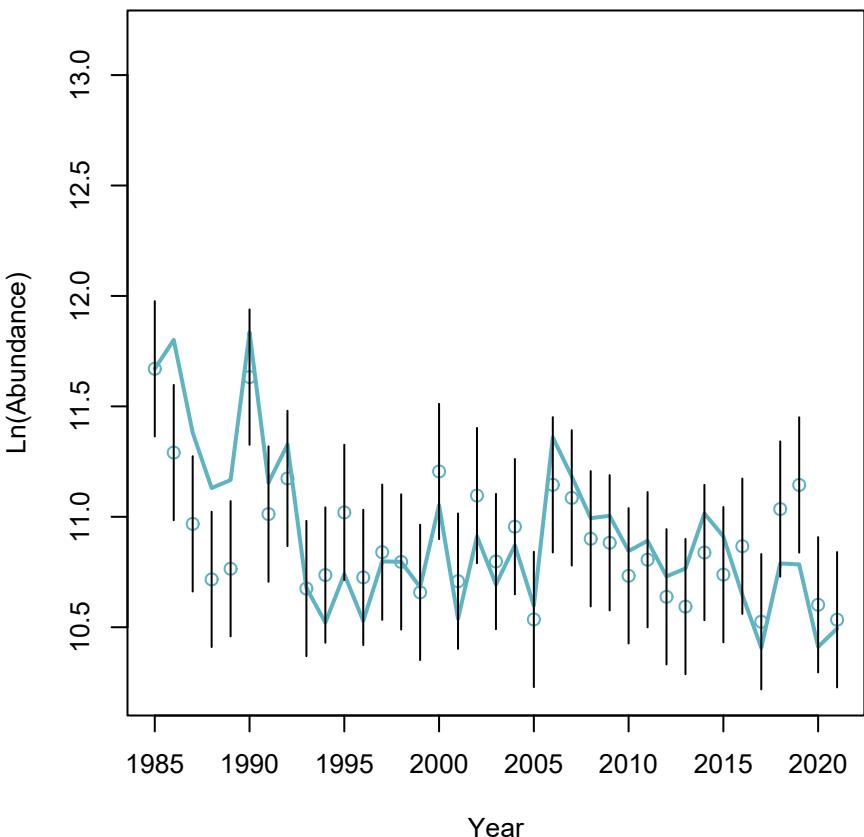
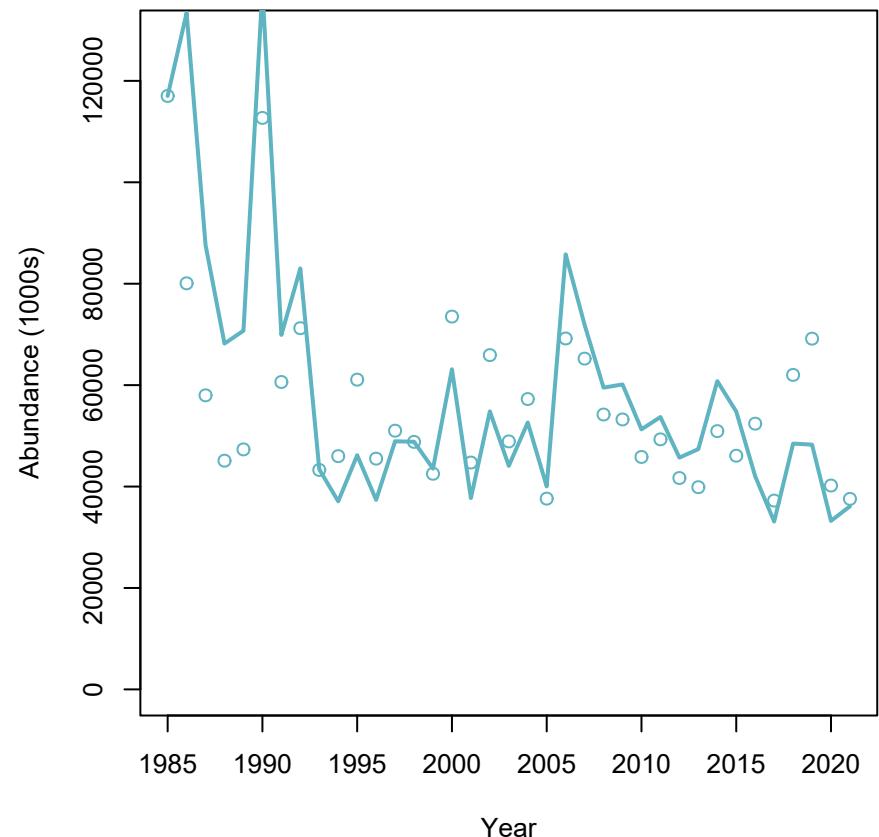
Index 8 (Peak Age) Predicted



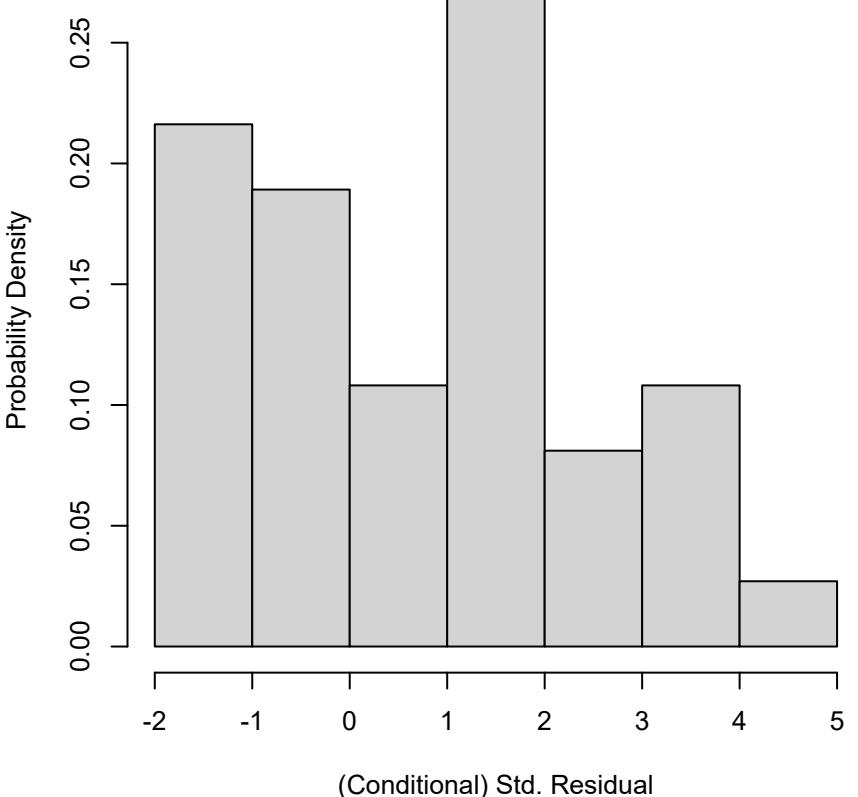
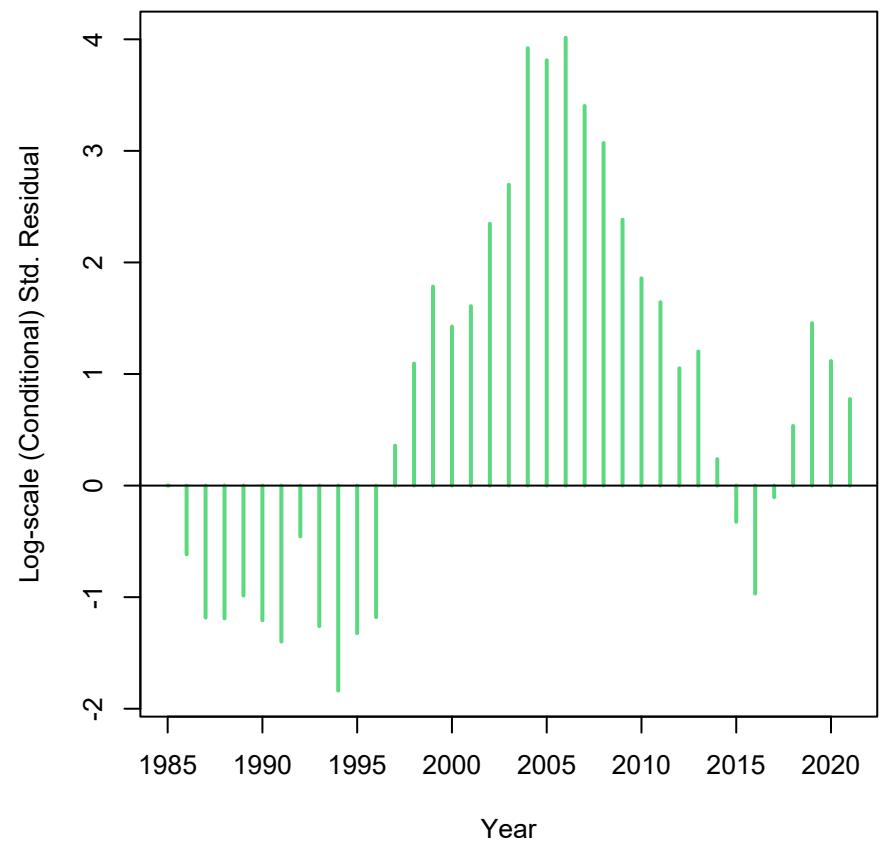
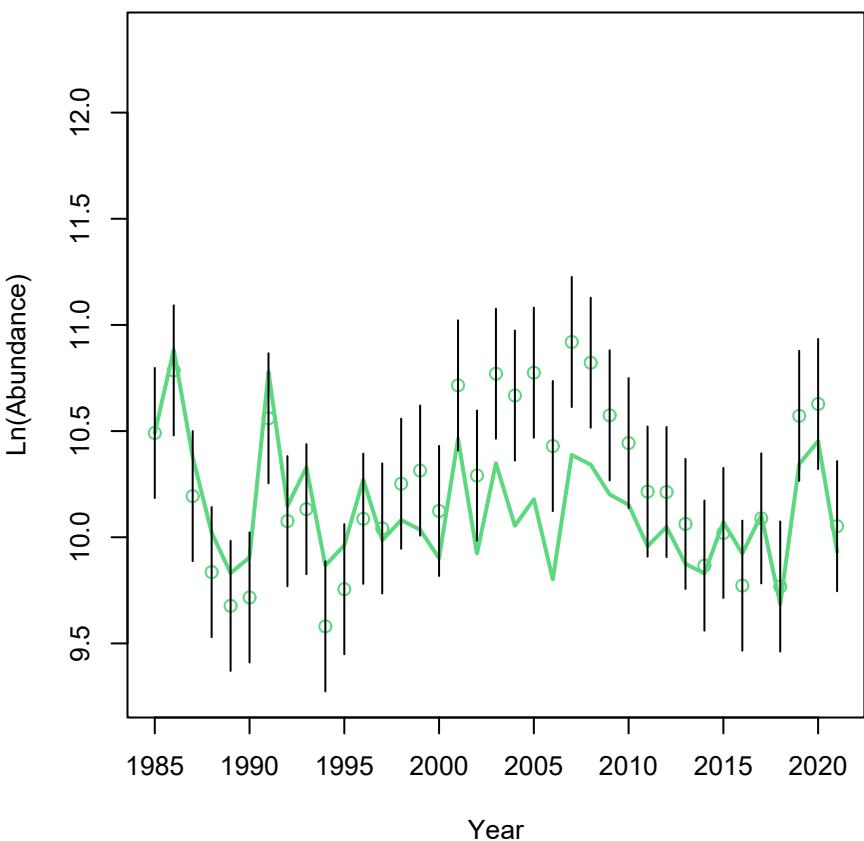
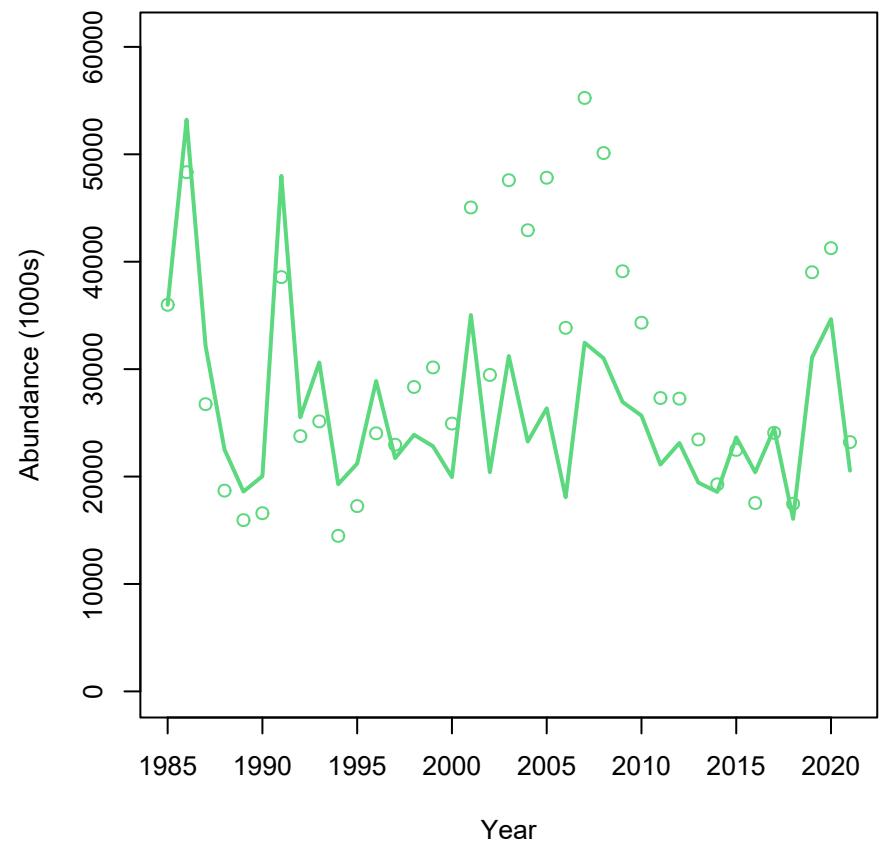
Conditional Expected and Posterior Estimates of Age 1 Abundance



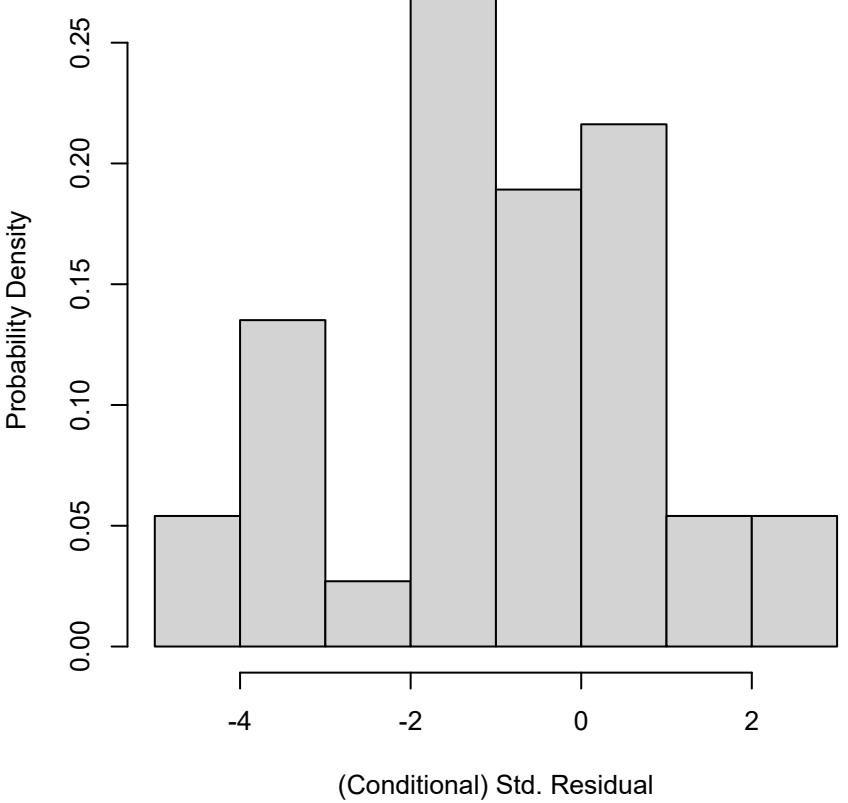
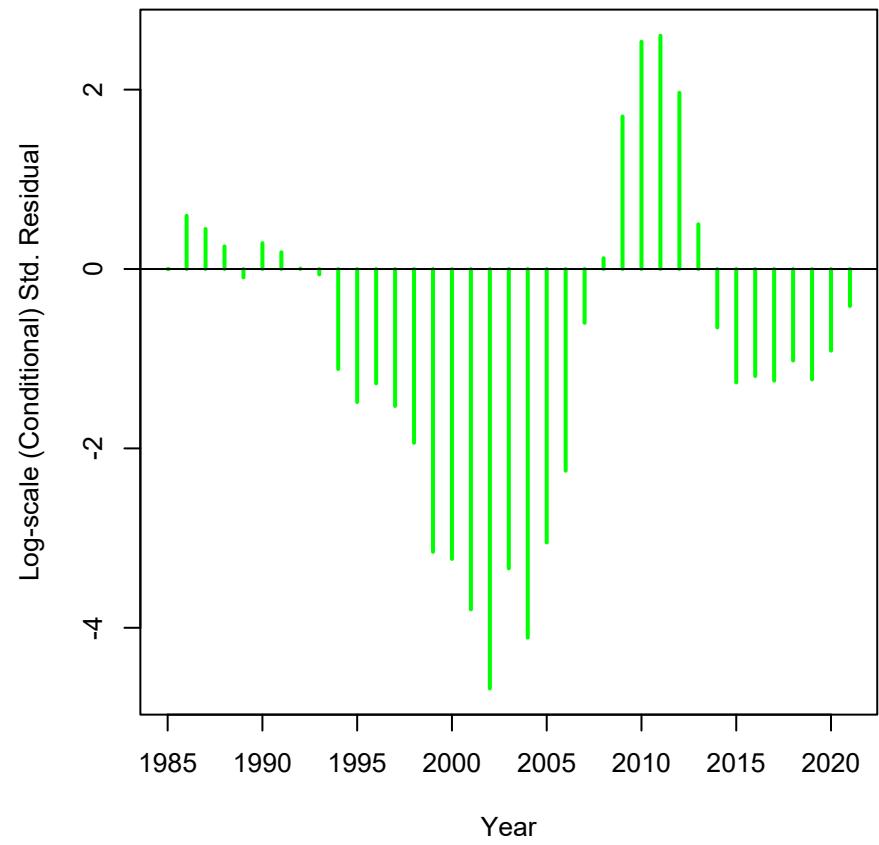
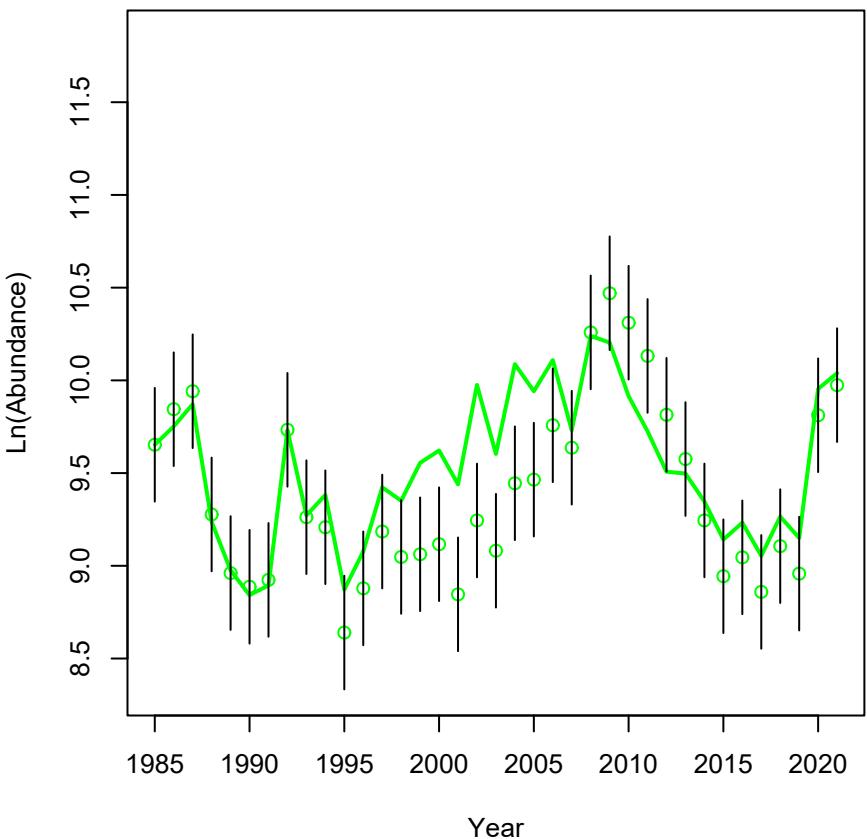
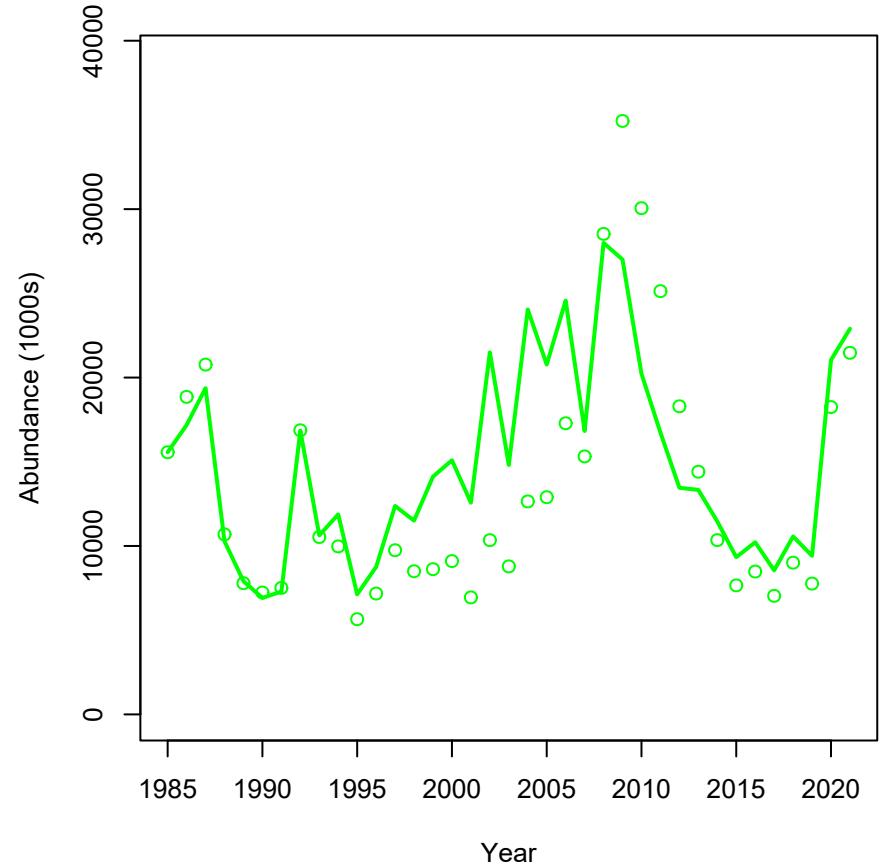
Conditional Expected and Posterior Estimates of Age 2 Abundance



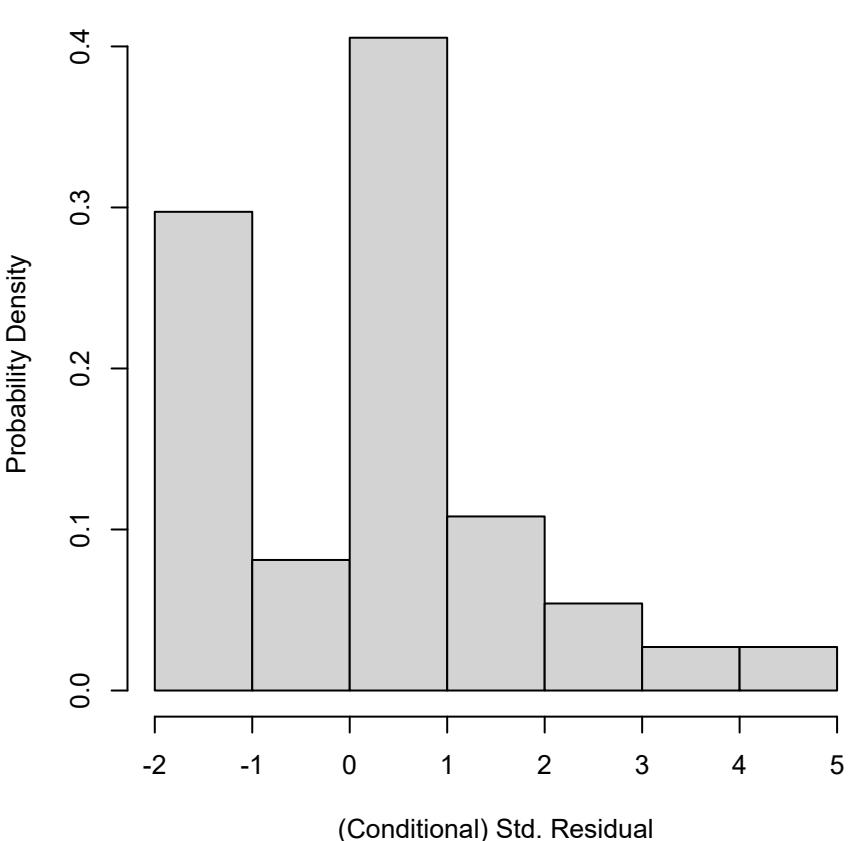
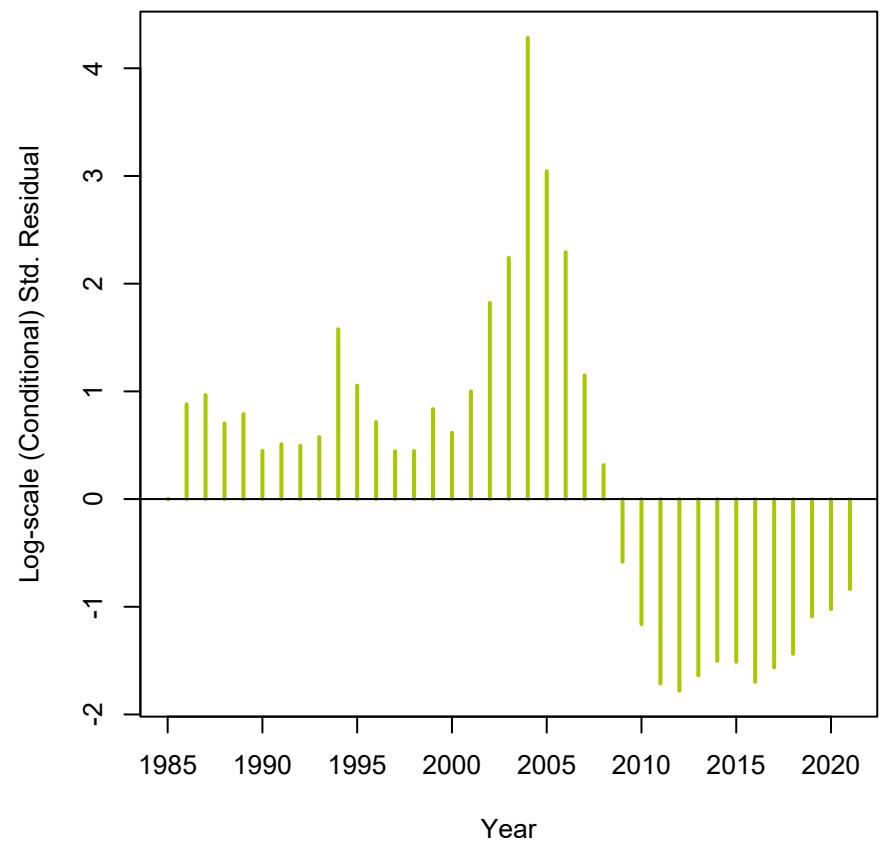
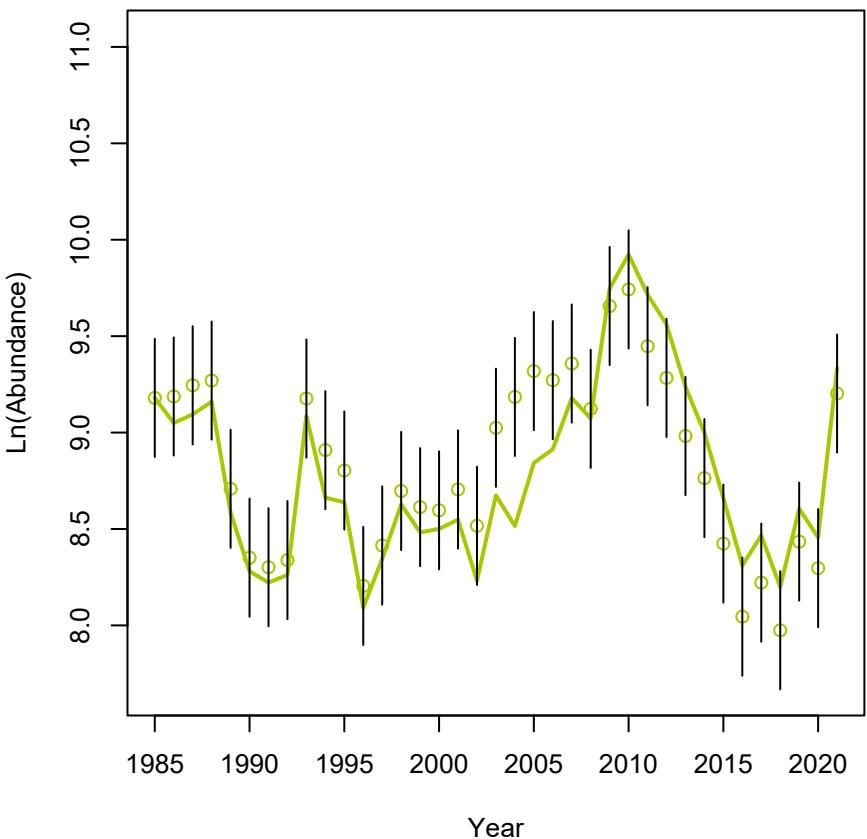
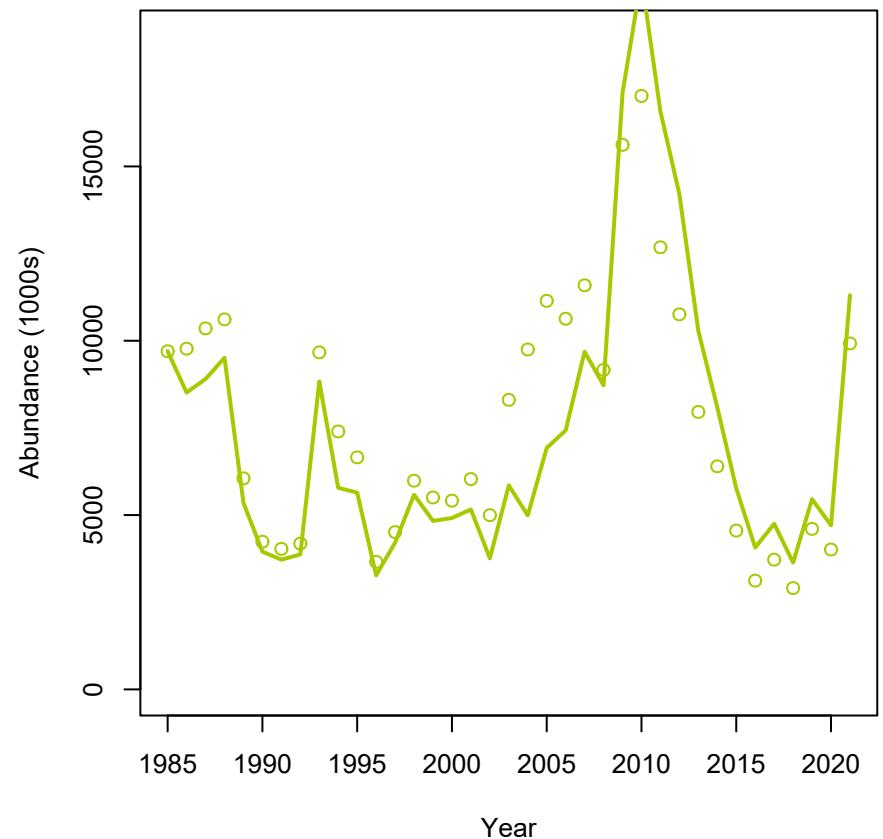
Conditional Expected and Posterior Estimates of Age 3 Abundance



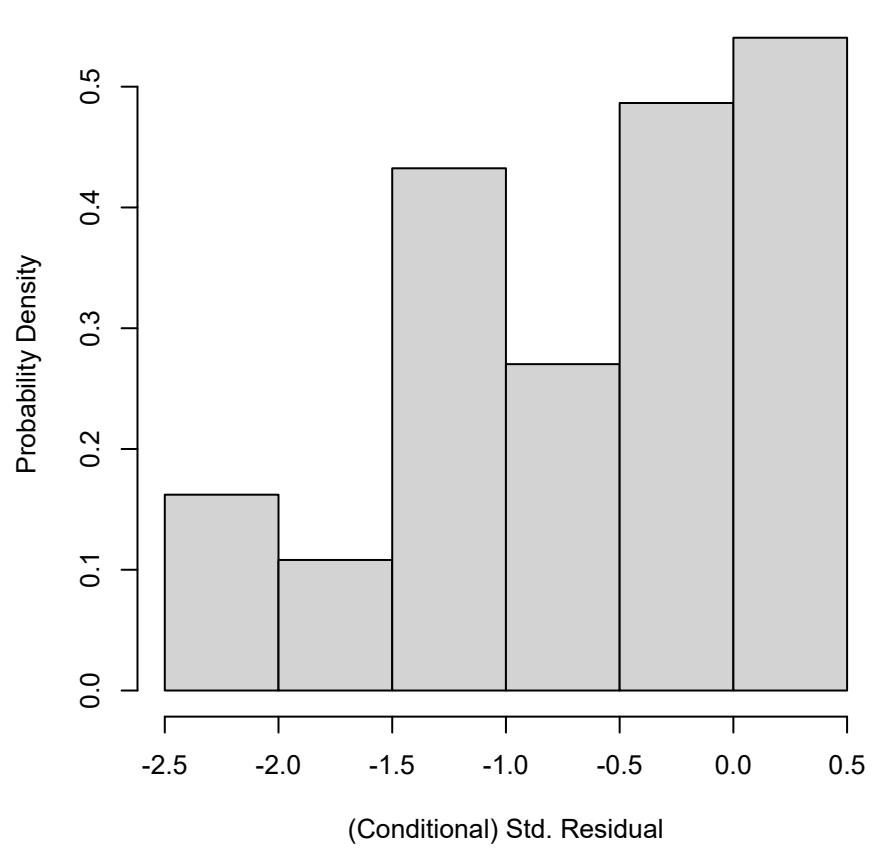
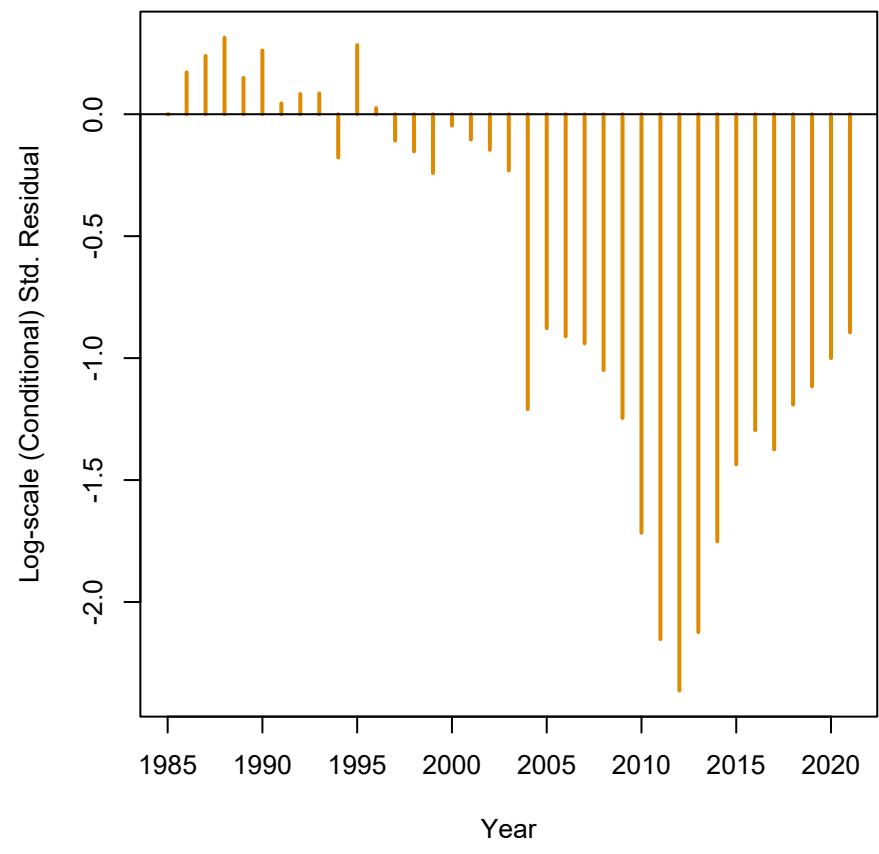
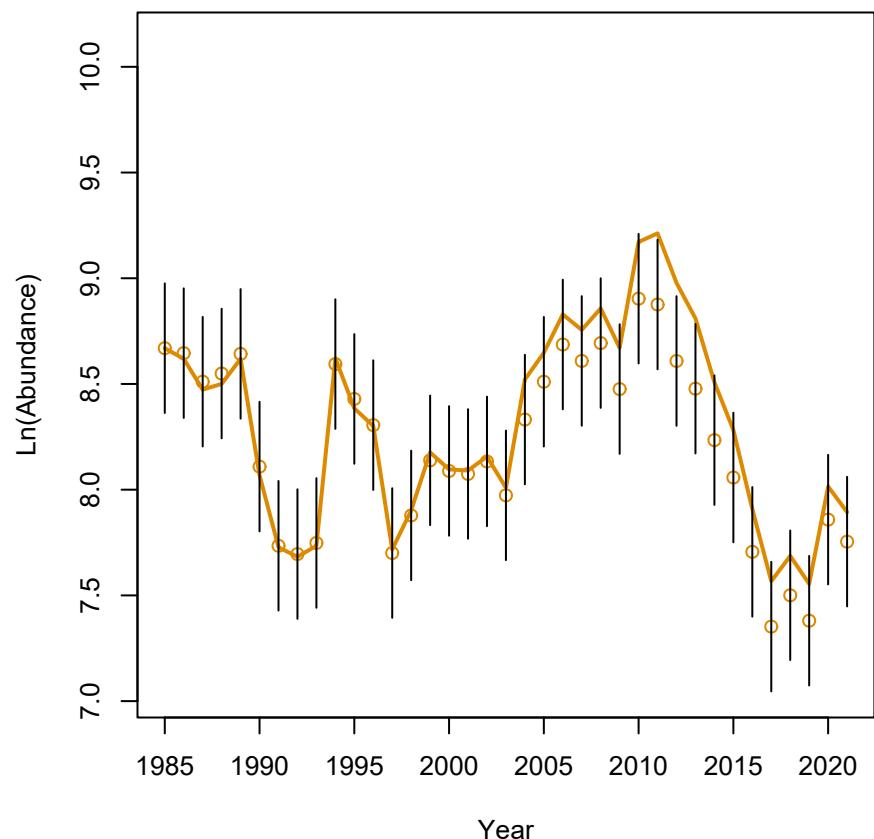
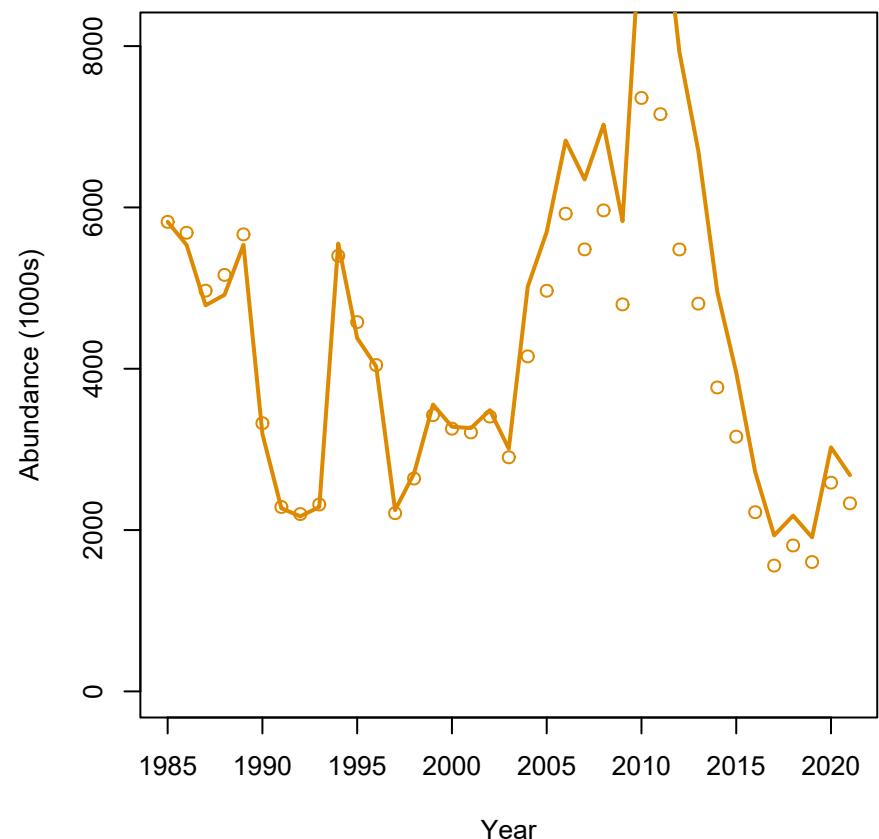
Conditional Expected and Posterior Estimates of Age 4 Abundance



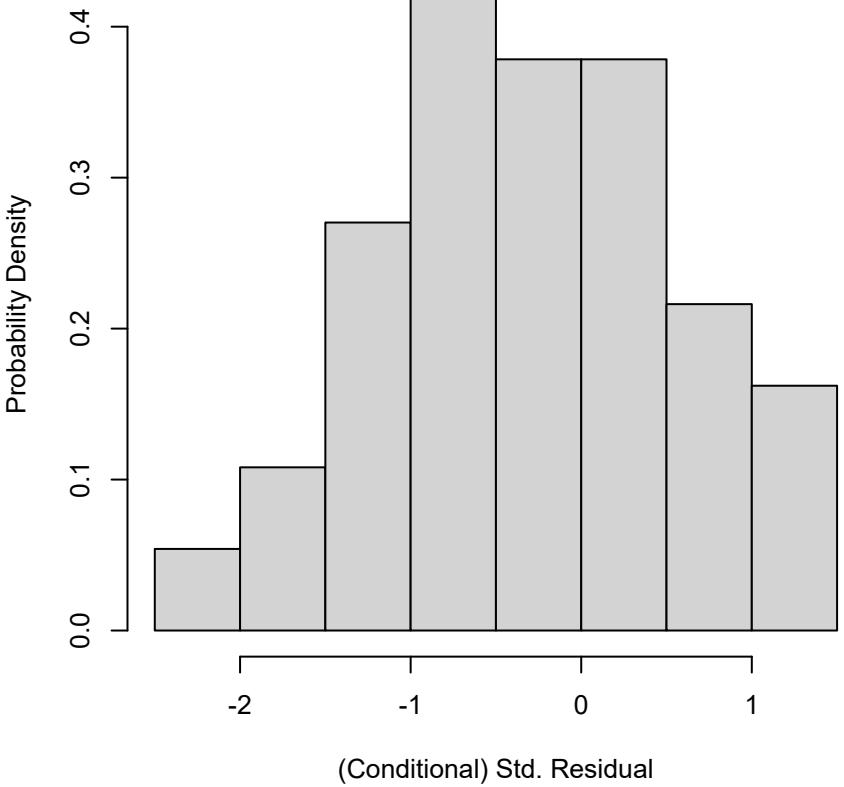
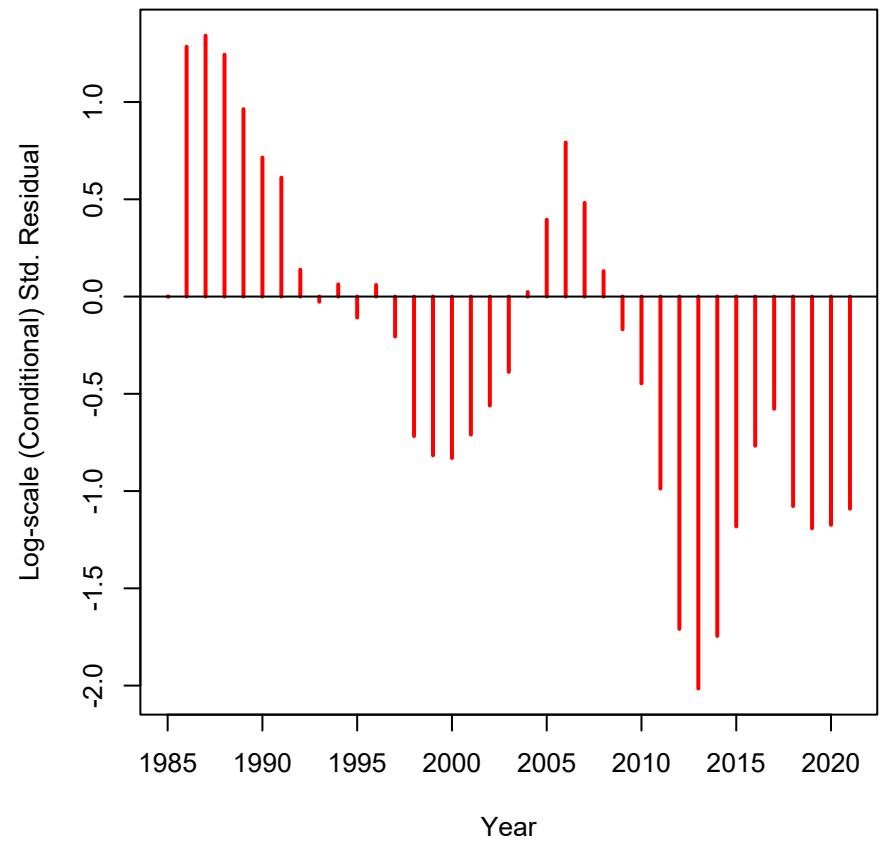
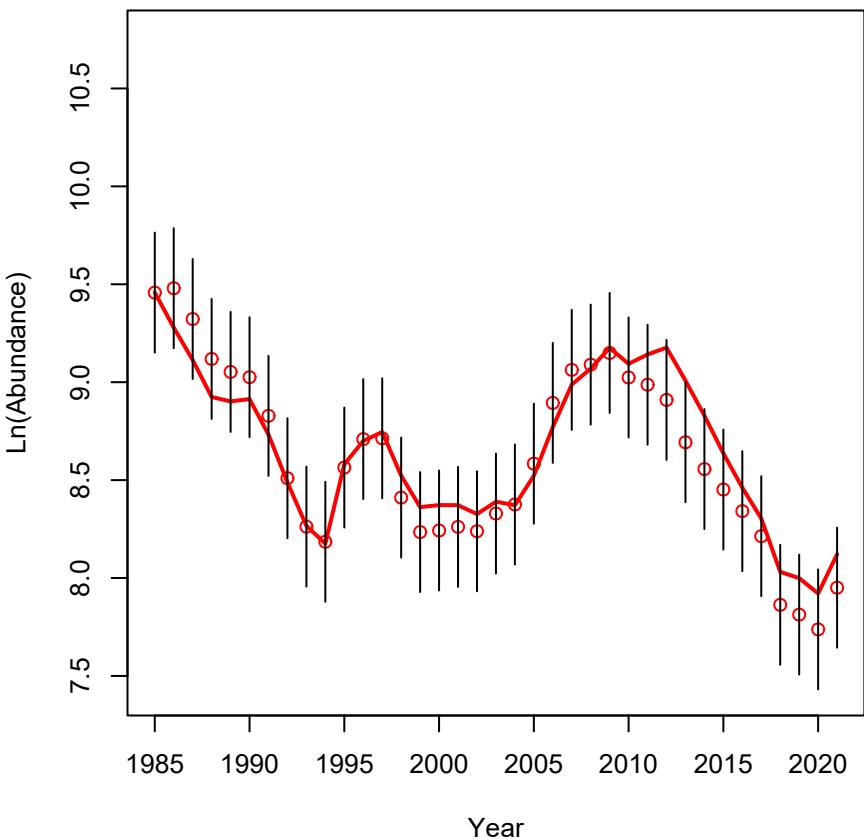
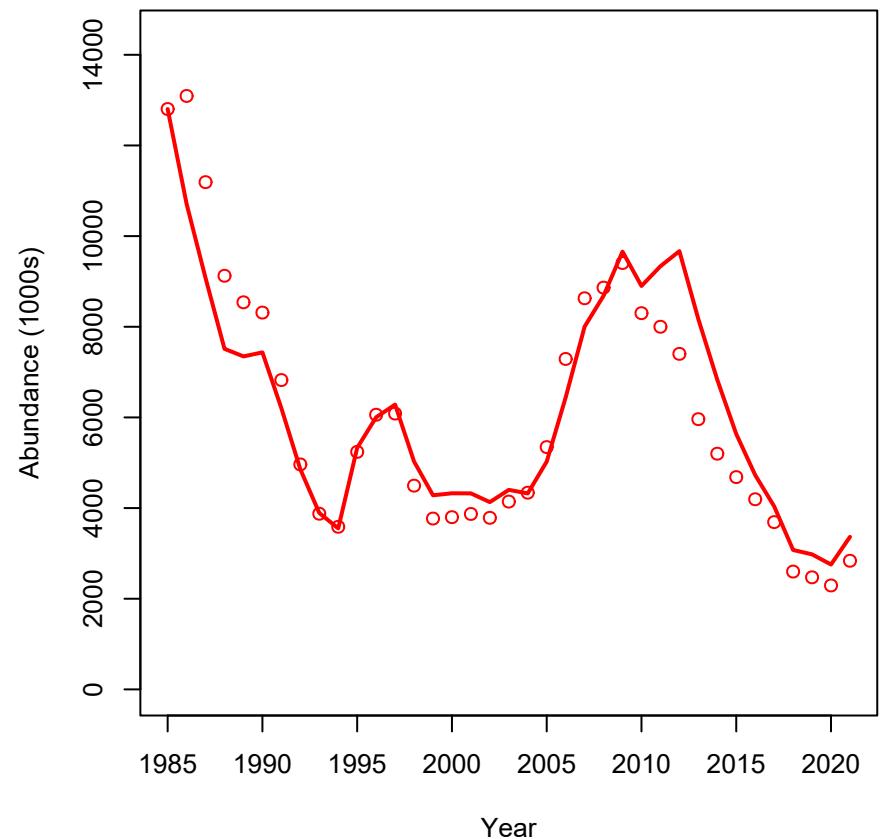
Conditional Expected and Posterior Estimates of Age 5 Abundance

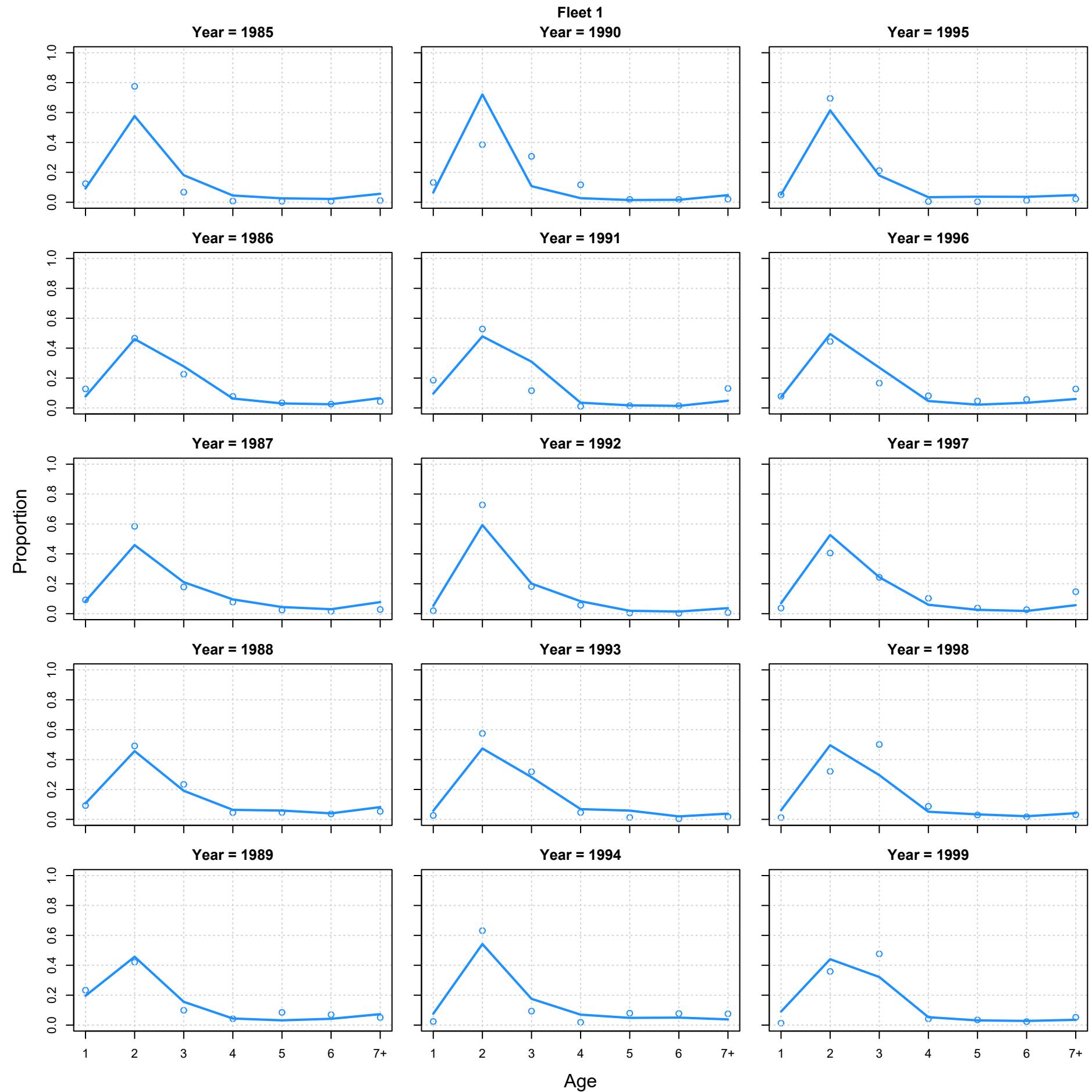


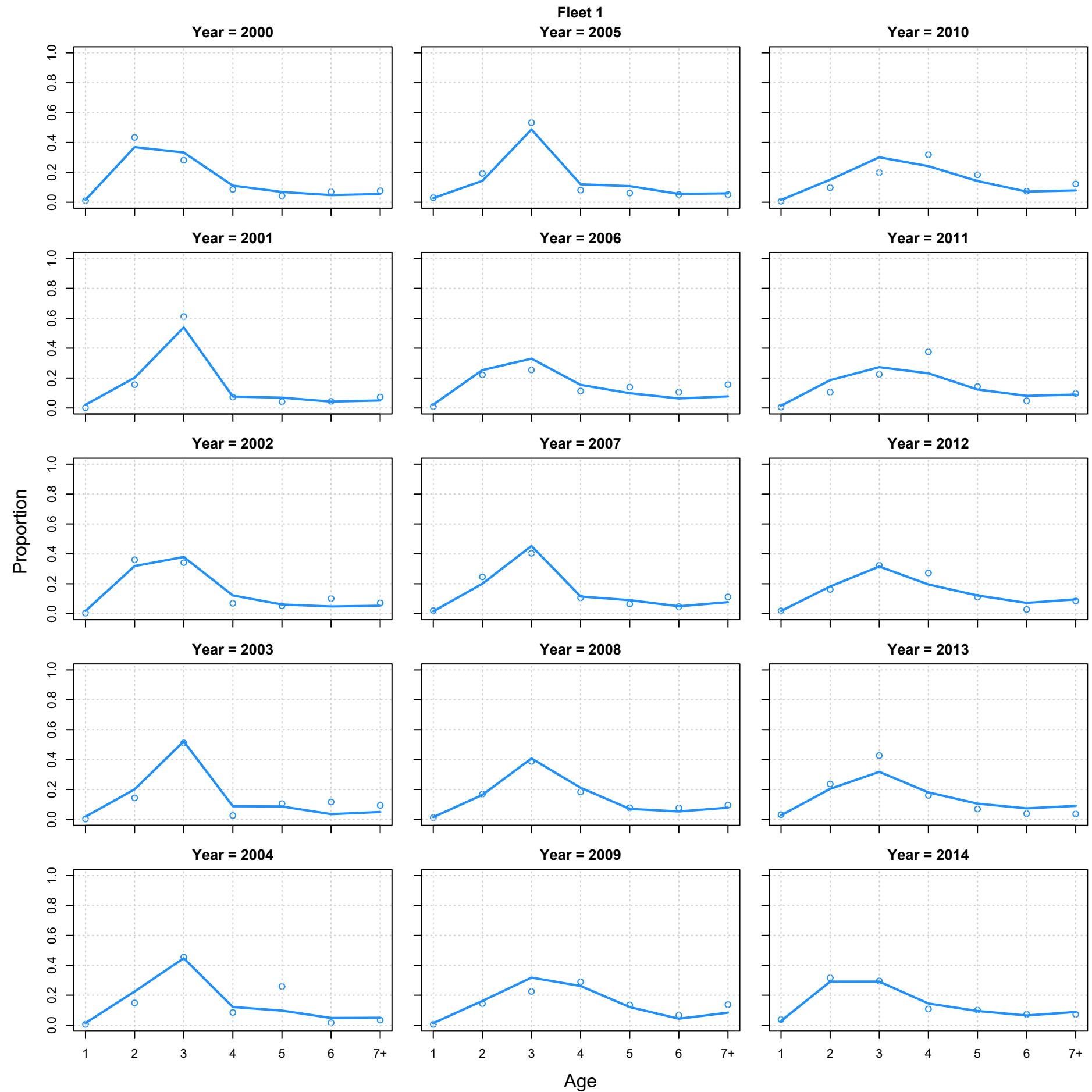
Conditional Expected and Posterior Estimates of Age 6 Abundance



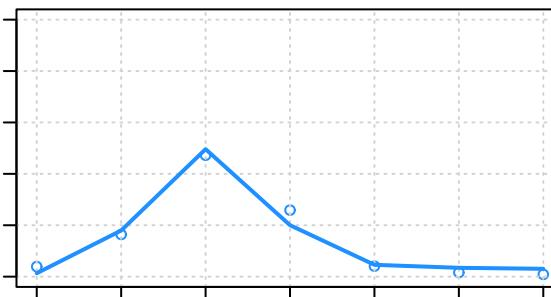
Conditional Expected and Posterior Estimates of Age 7 Abundance



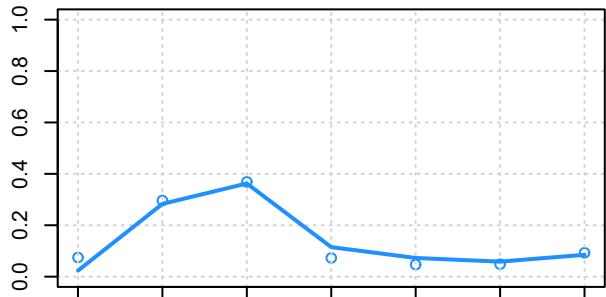




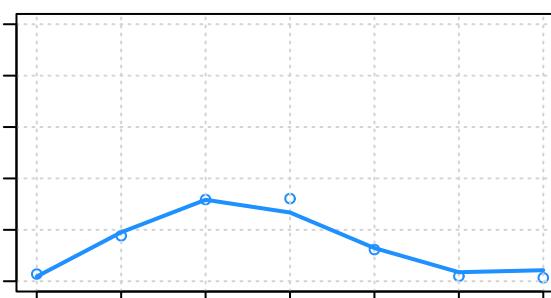
Fleet 1
Year = 2020



Year = 2015



Year = 2021



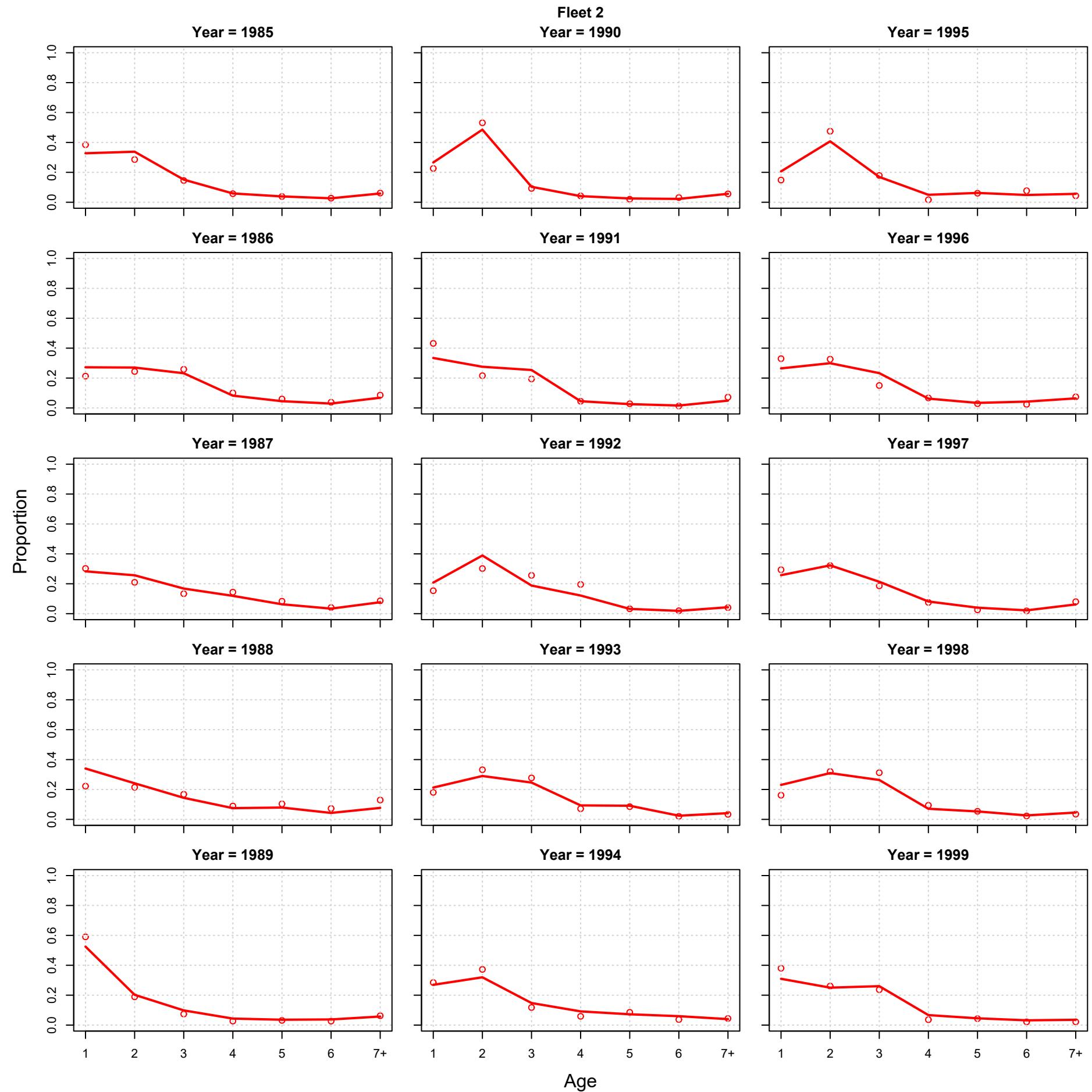
Year = 2016

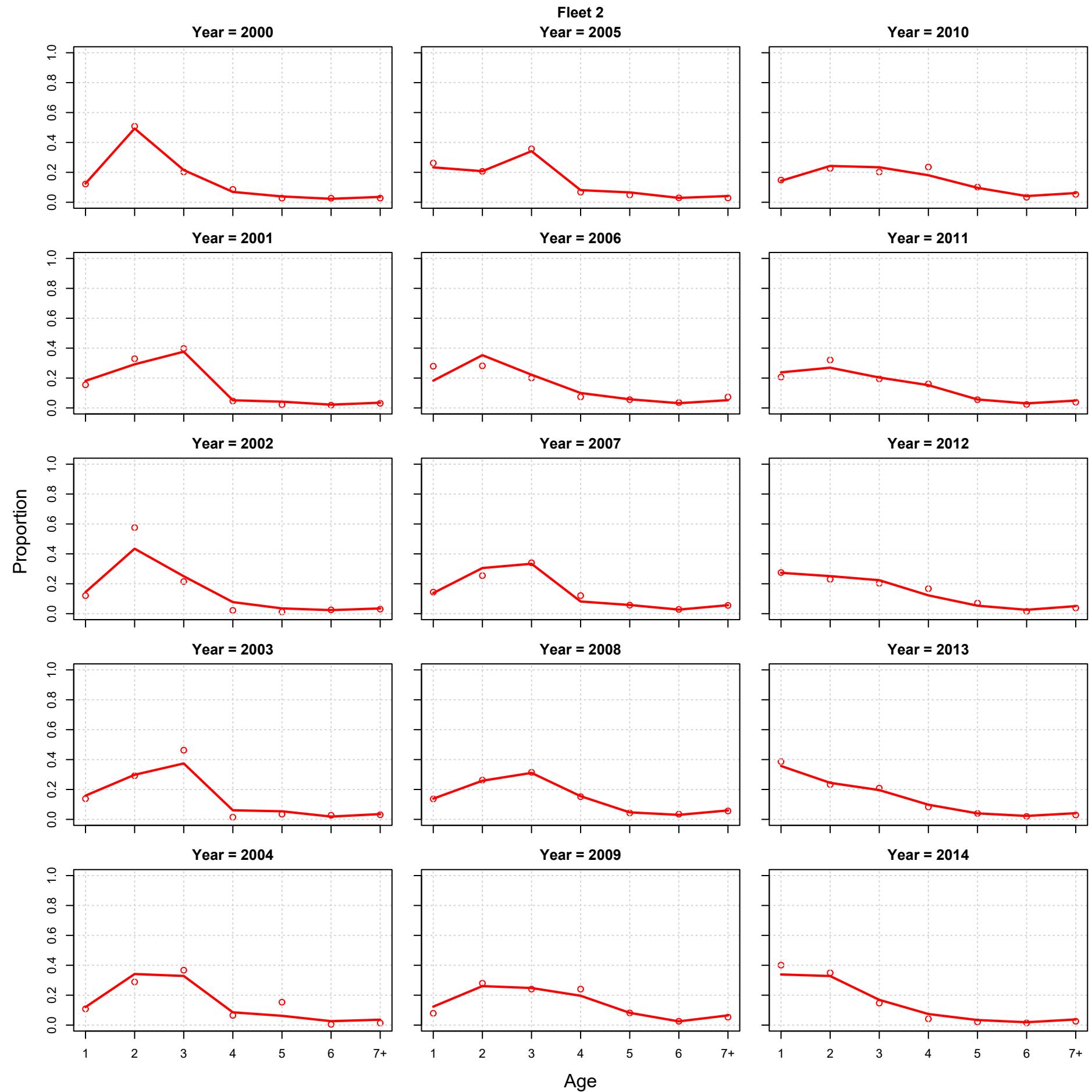
Year = 2017

Year = 2018

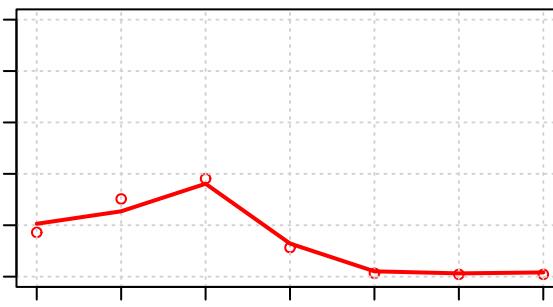
Year = 2019

Age

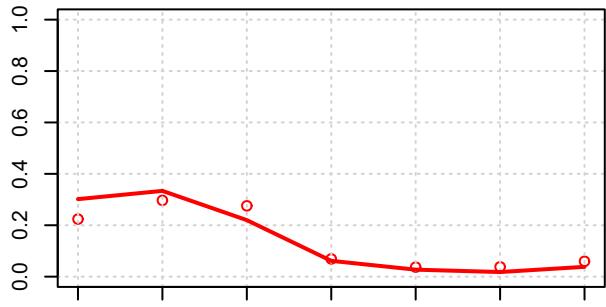




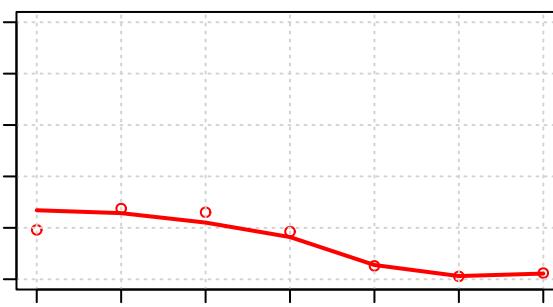
Fleet 2
Year = 2020



Year = 2015



Year = 2021



Year = 2016

Year = 2017

Year = 2018

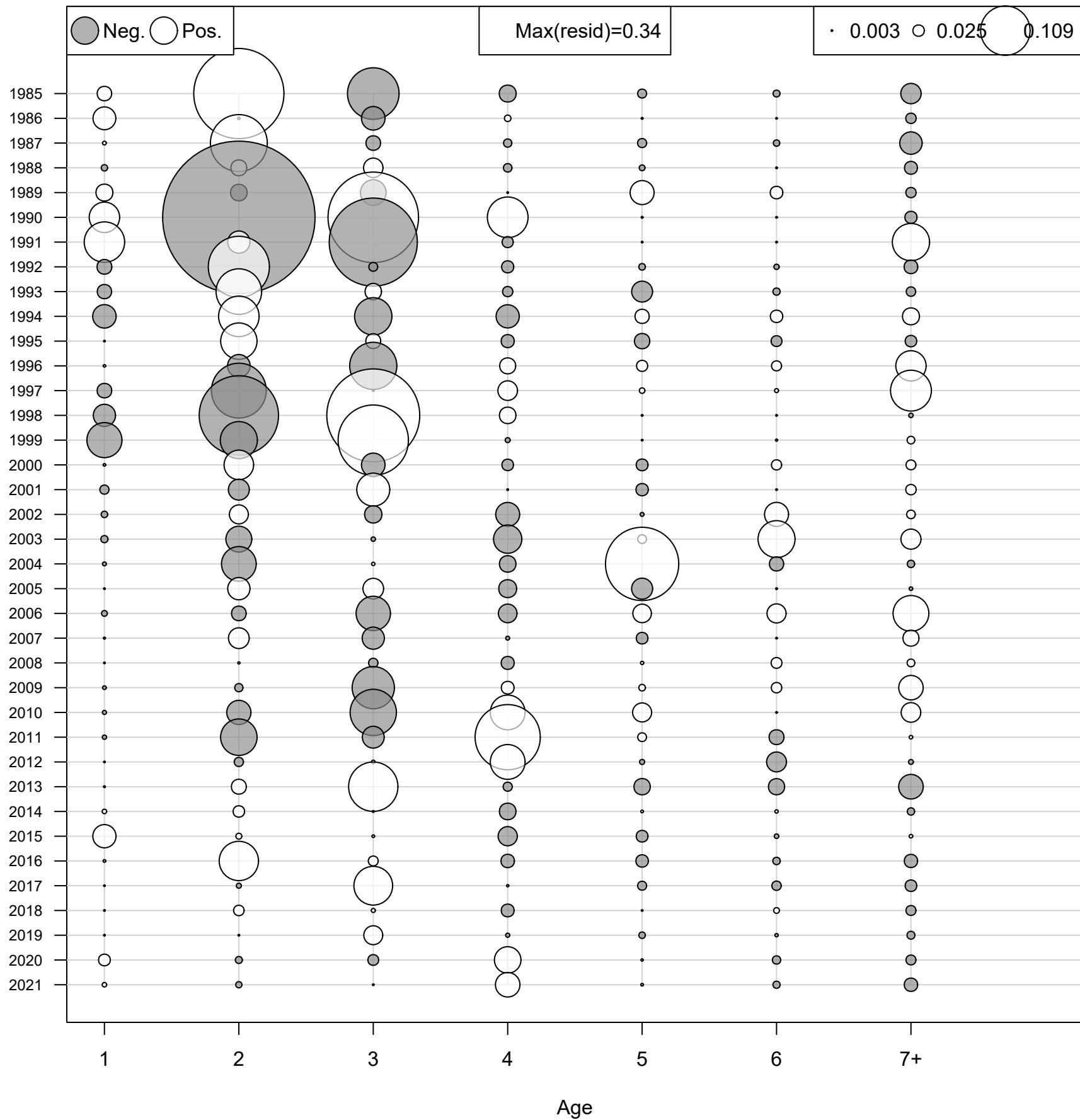
Year = 2019

Age

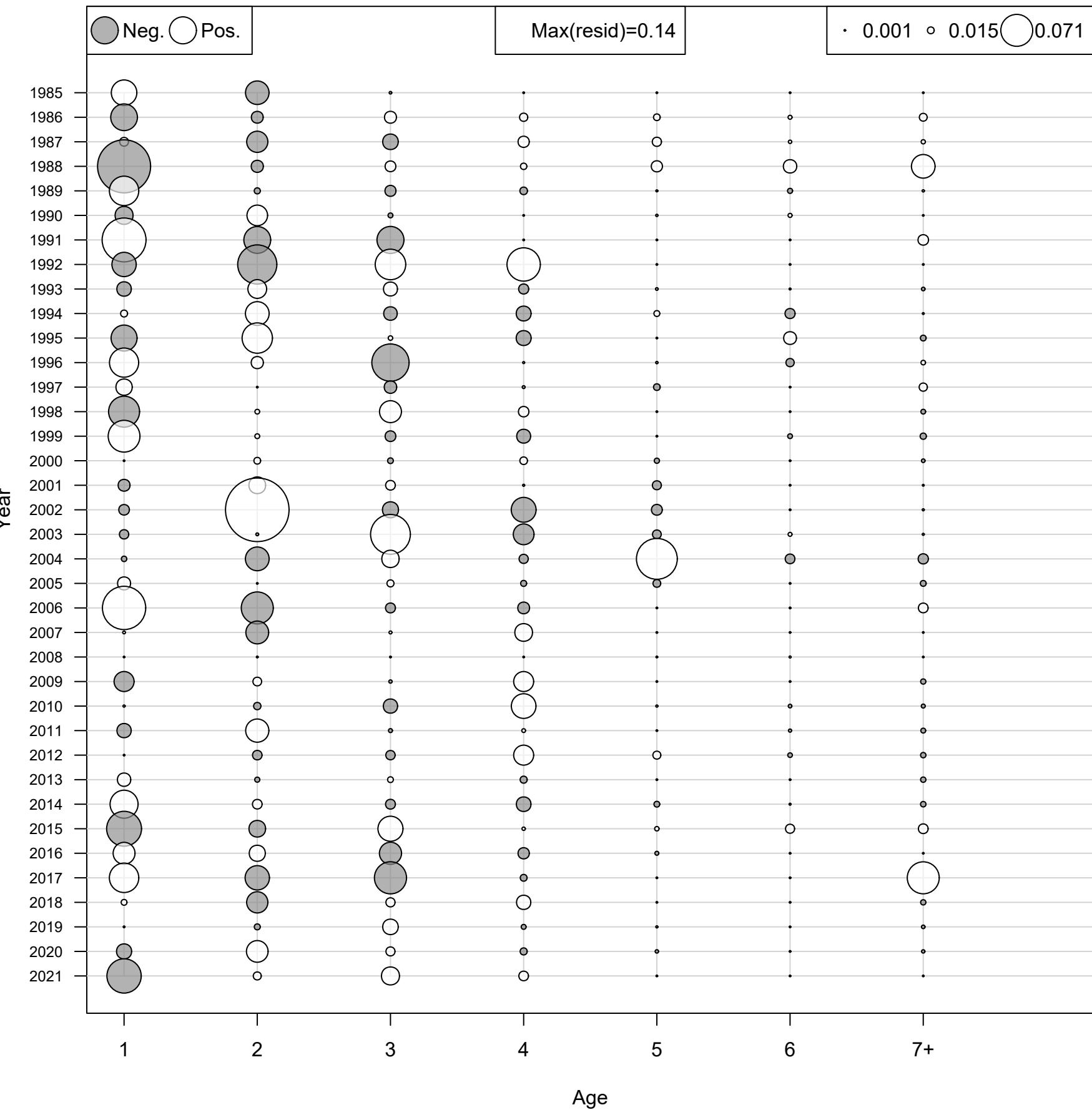
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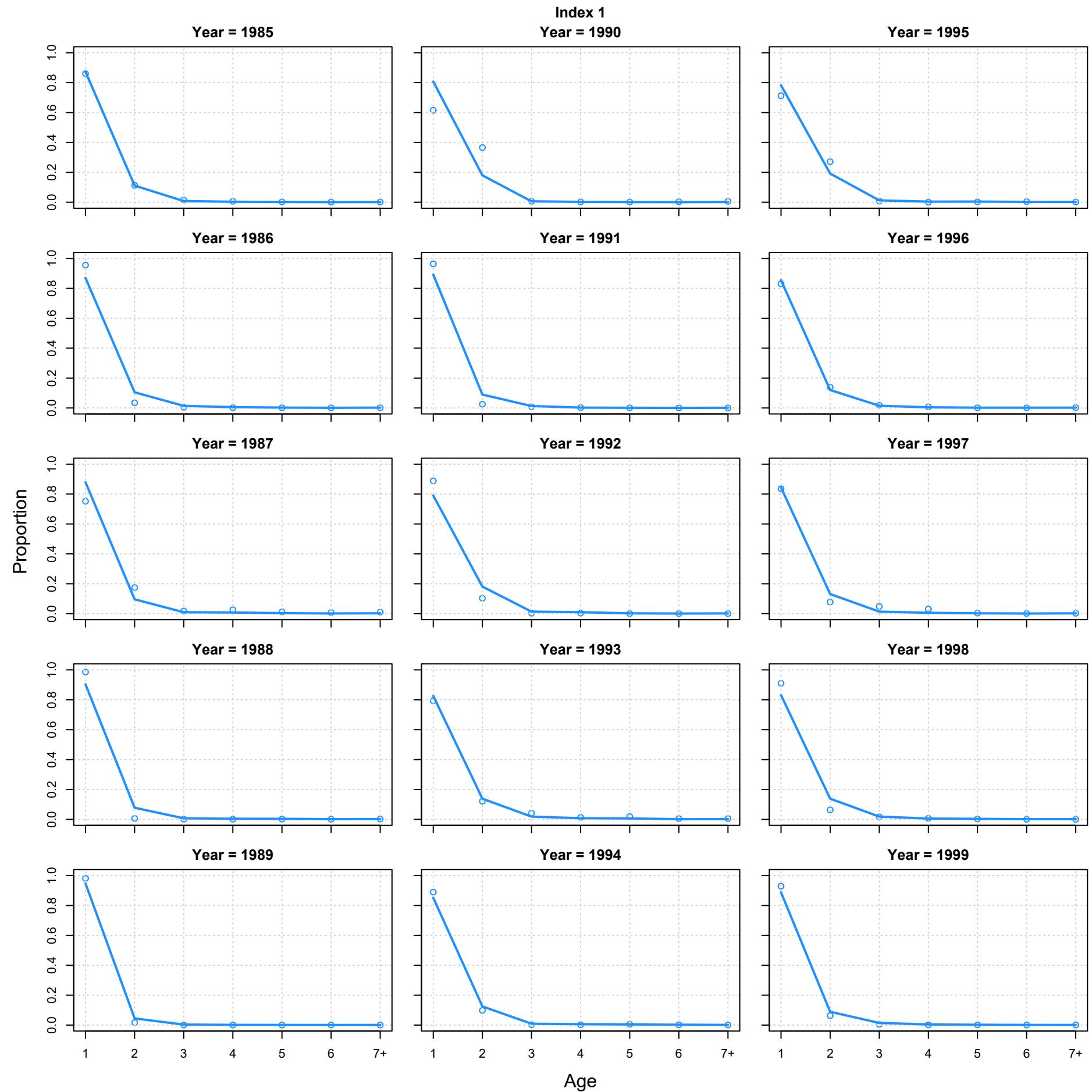
Proportion

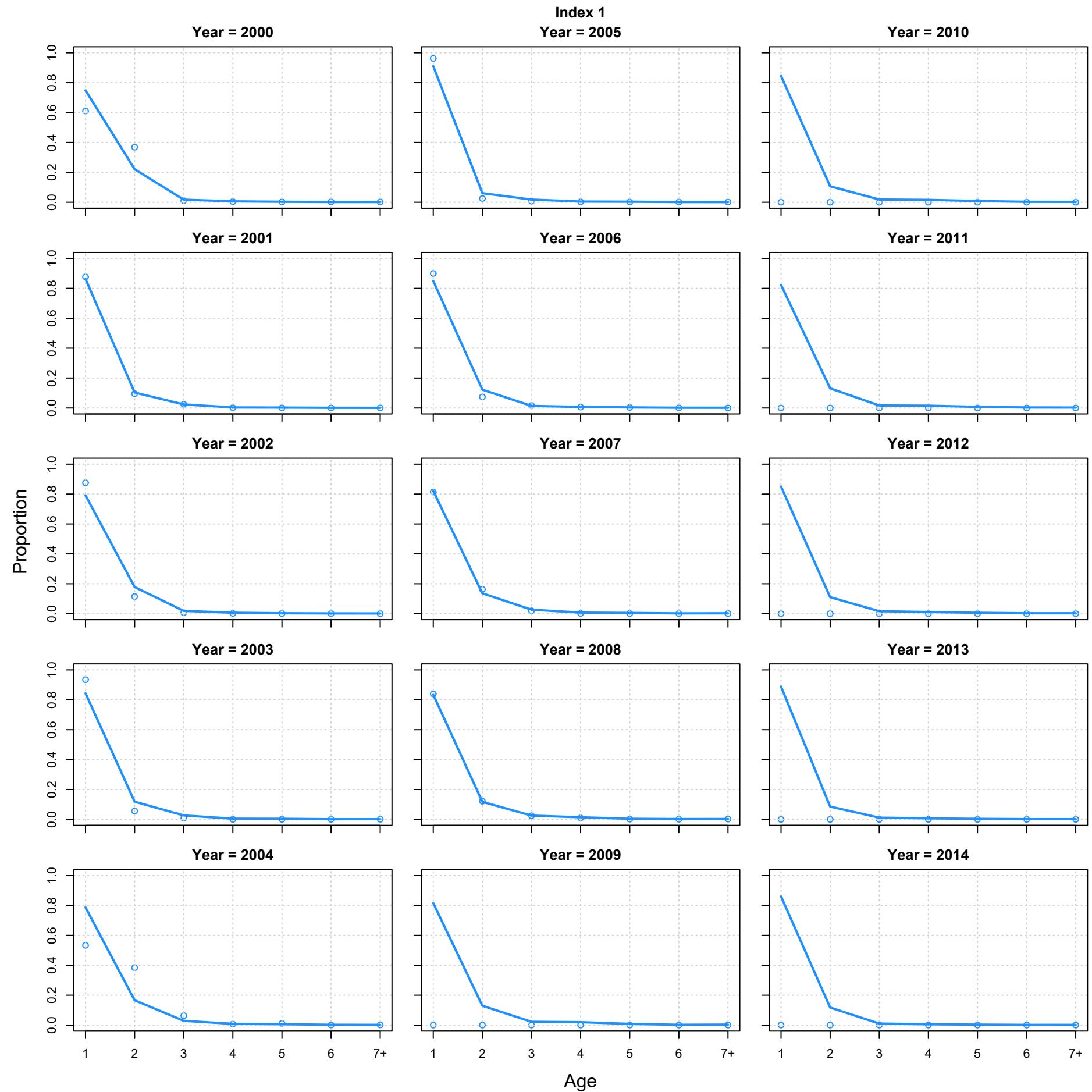
Age Comp Residuals (Observed-Predicted) for Fleet 1

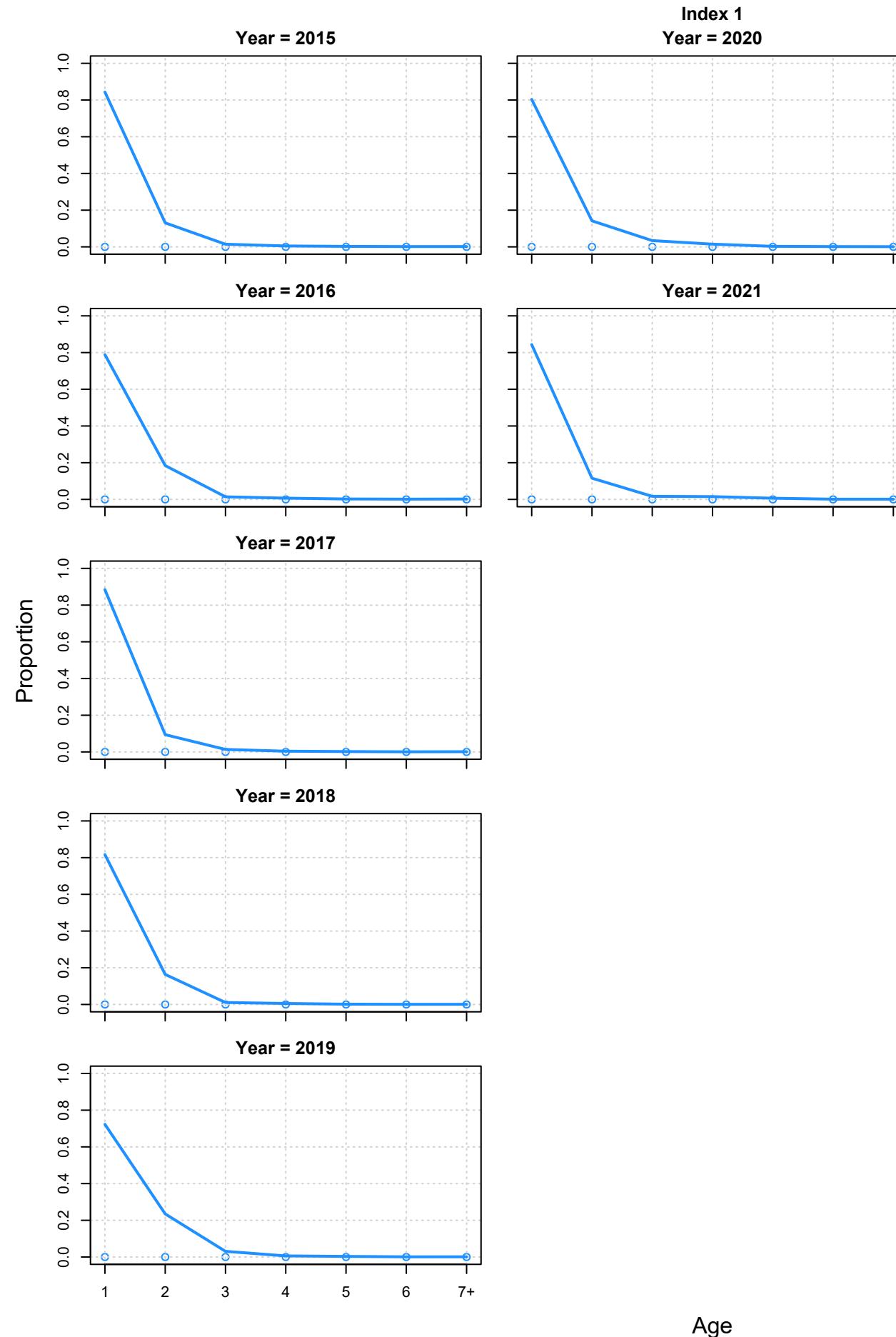


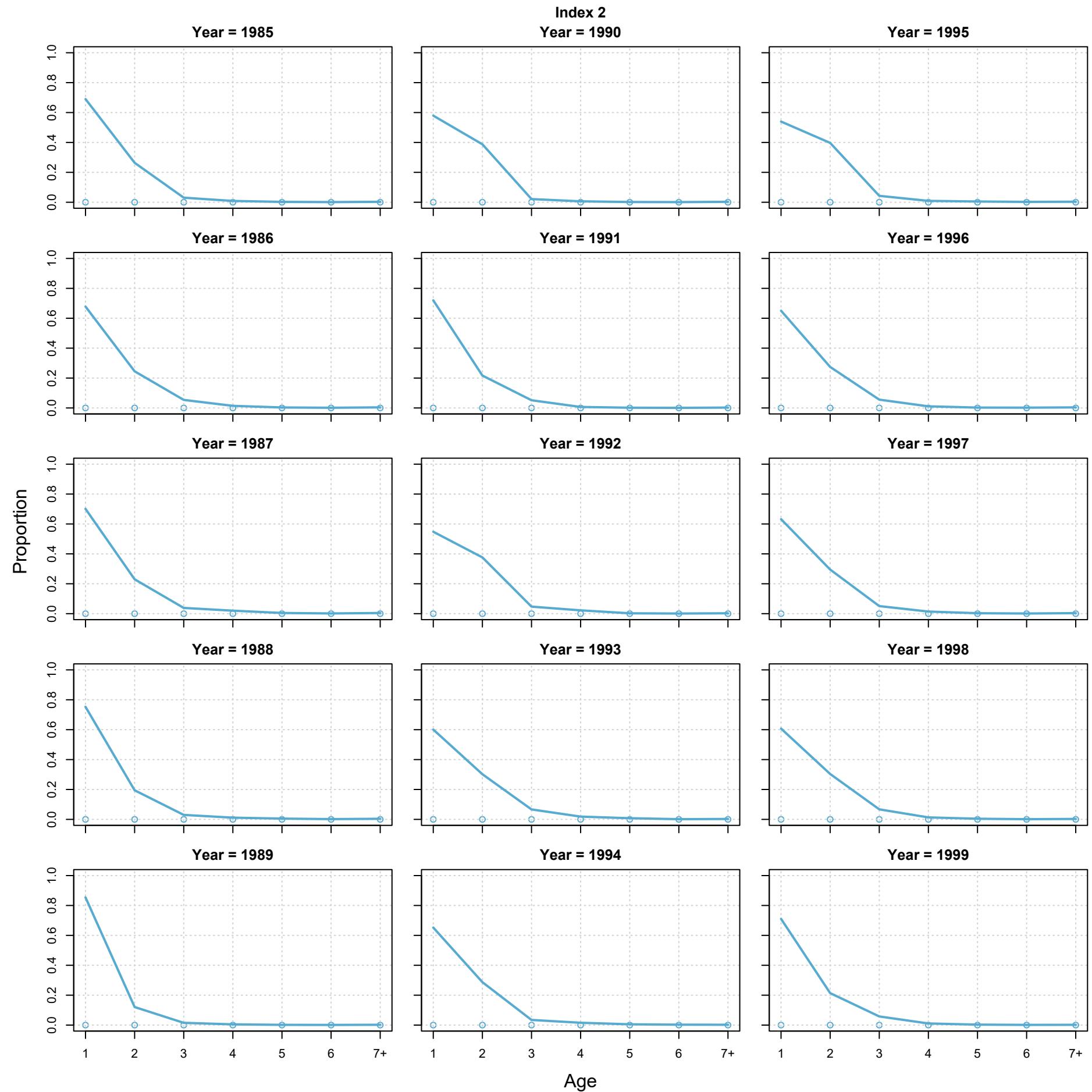
Age Comp Residuals (Observed-Predicted) for Fleet 2

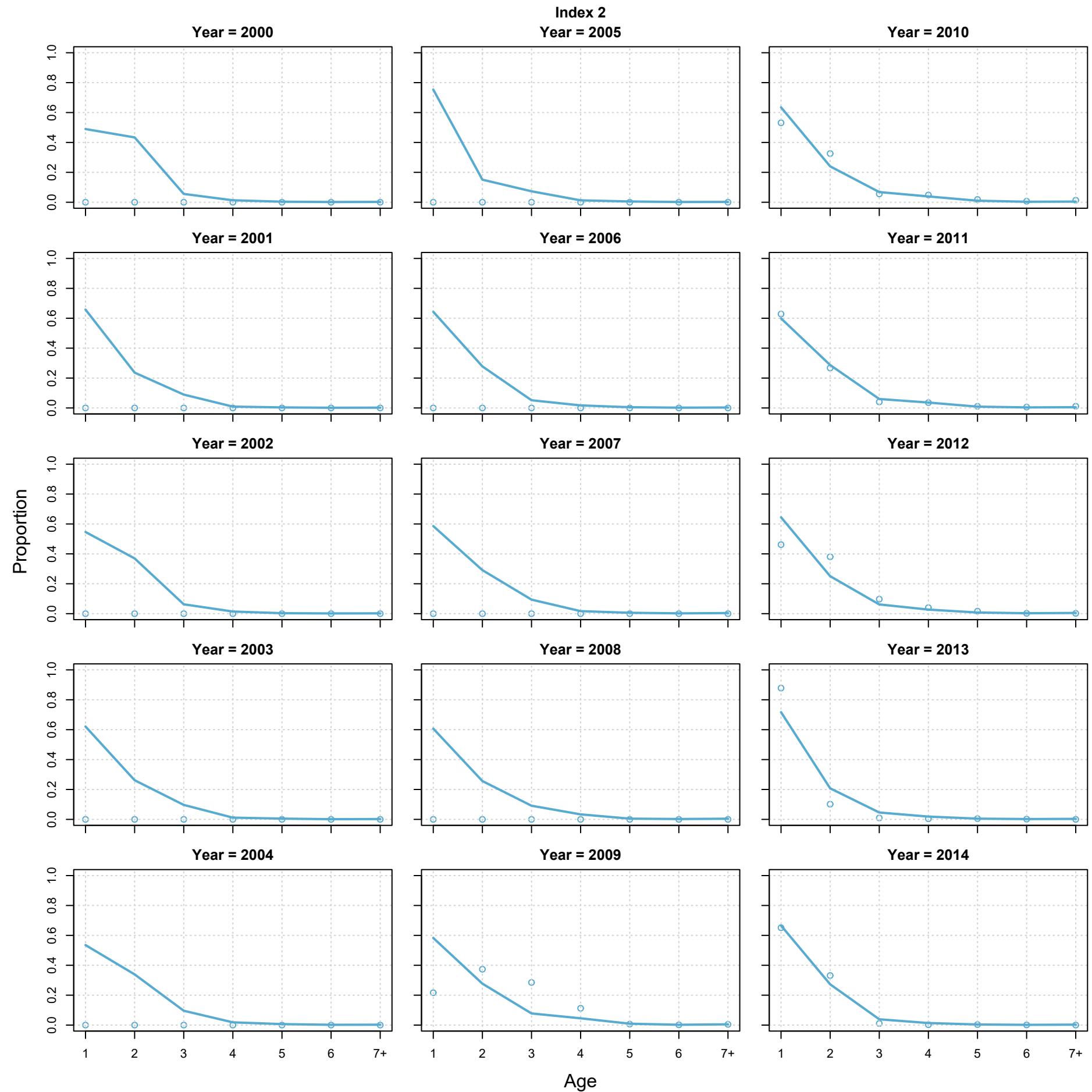






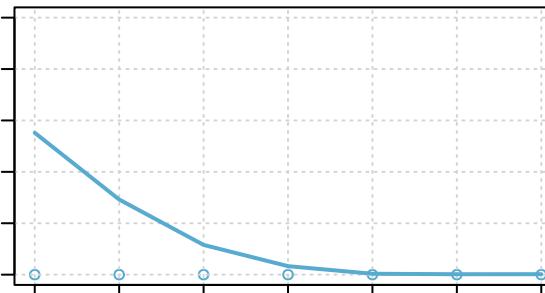
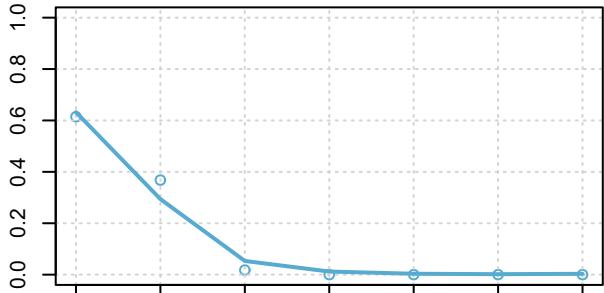






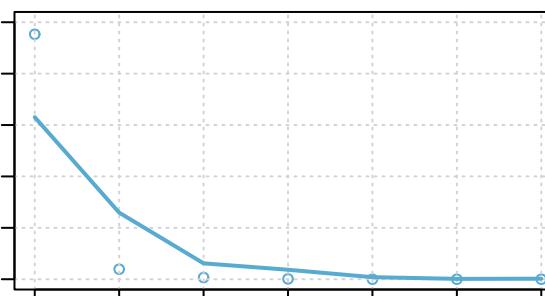
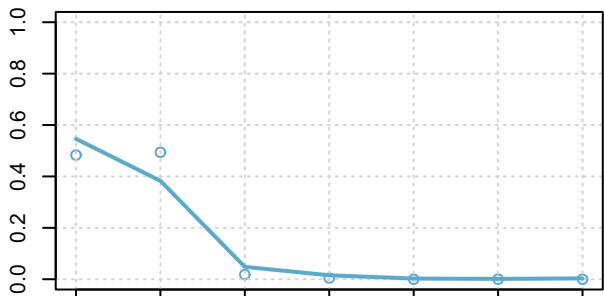
Year = 2015

Index 2
Year = 2020

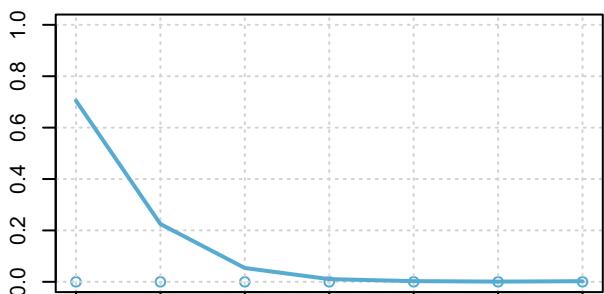


Year = 2016

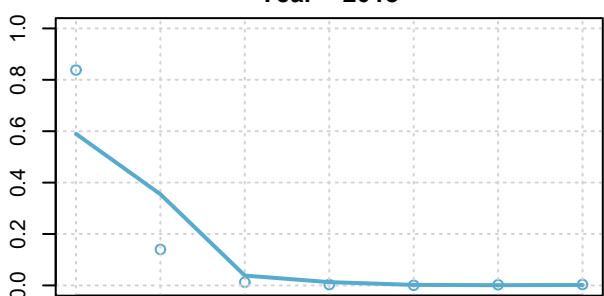
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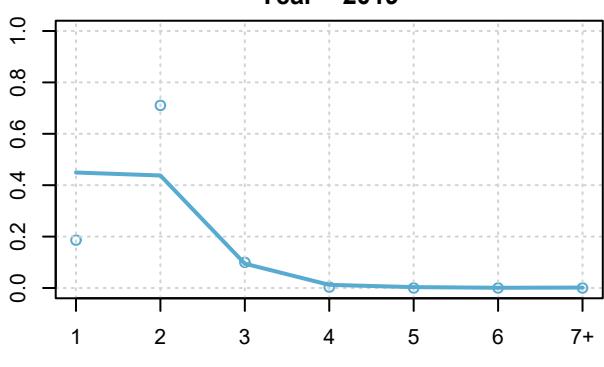
Year = 2017



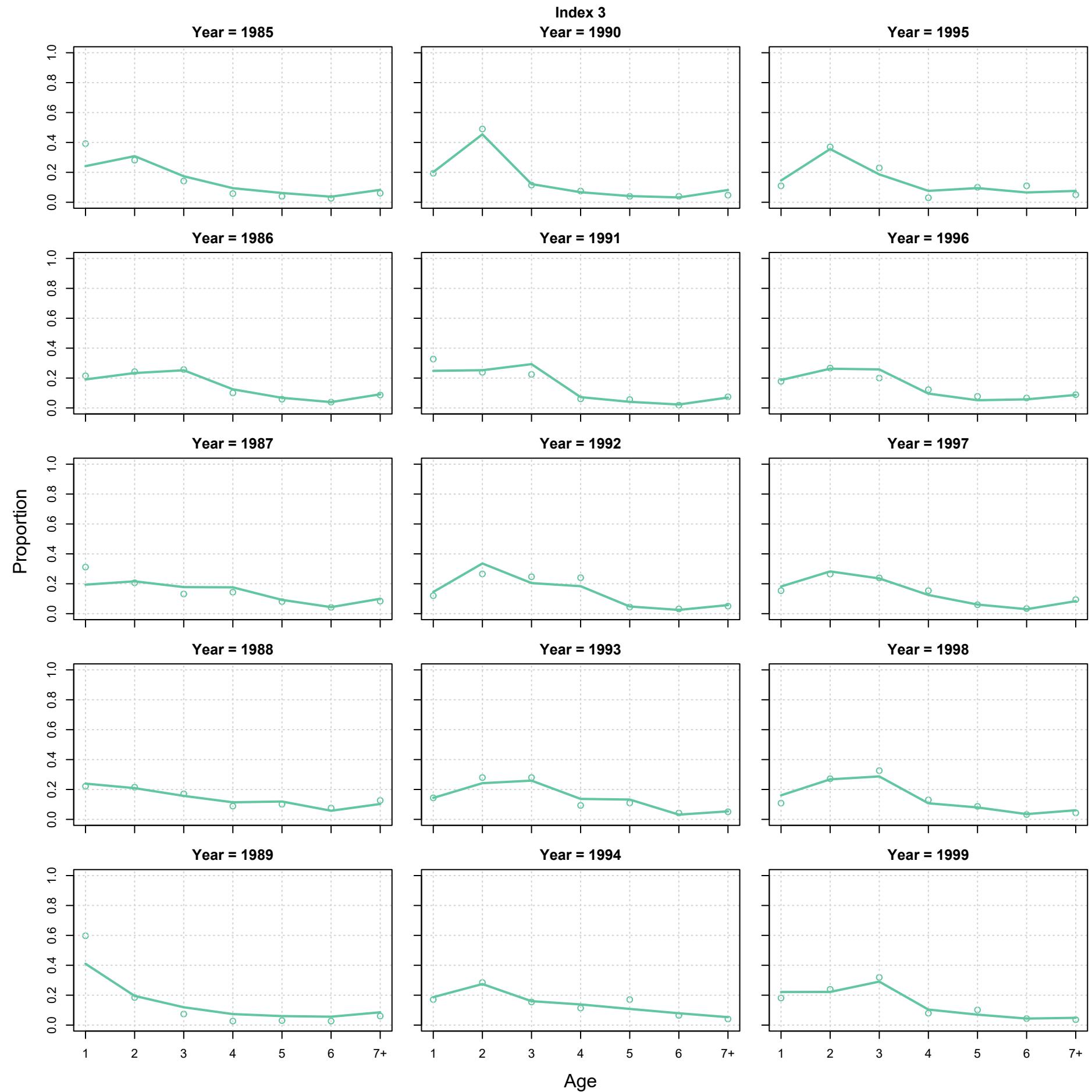
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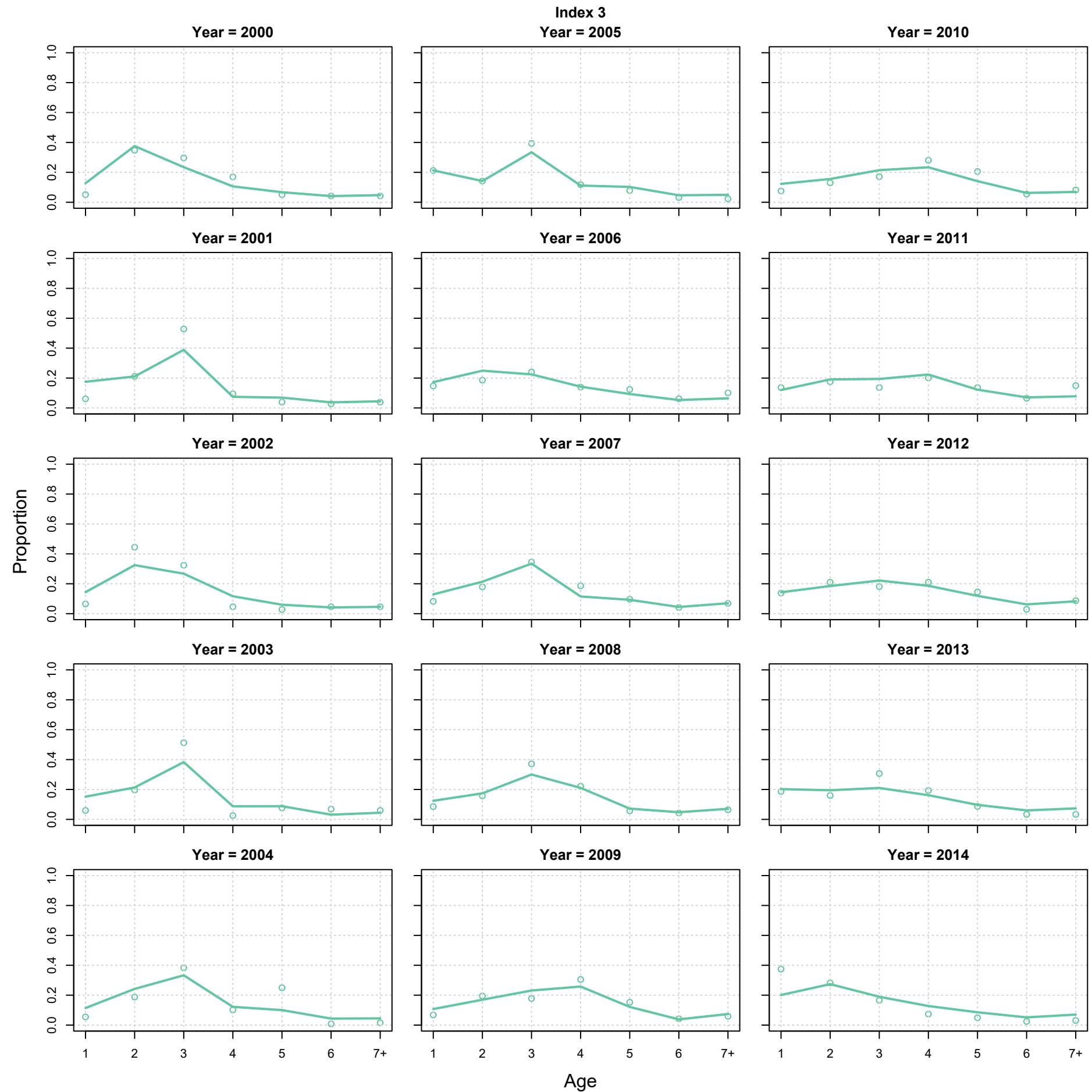


Year = 2019



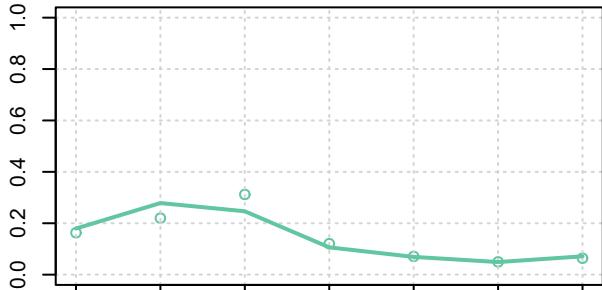
Age





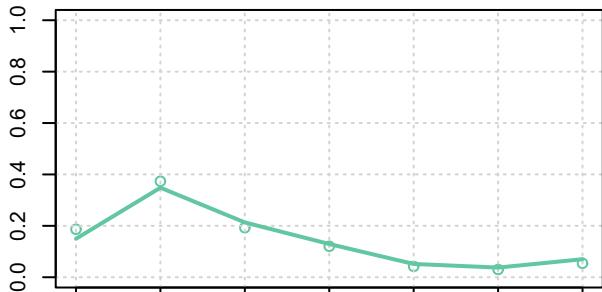
Year = 2015

Index 3
Year = 2020

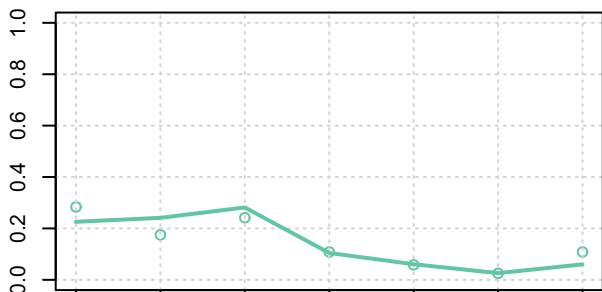


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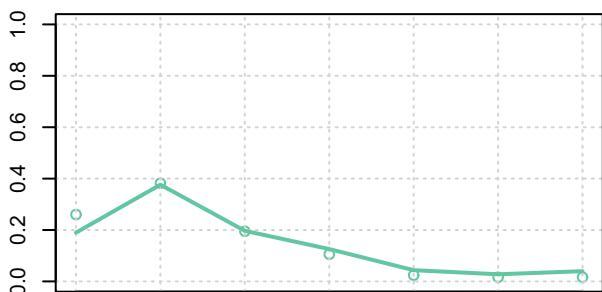
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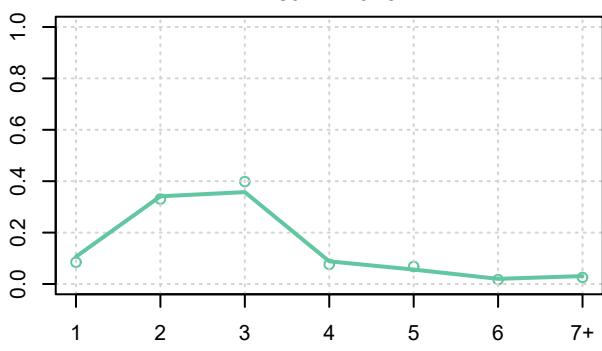
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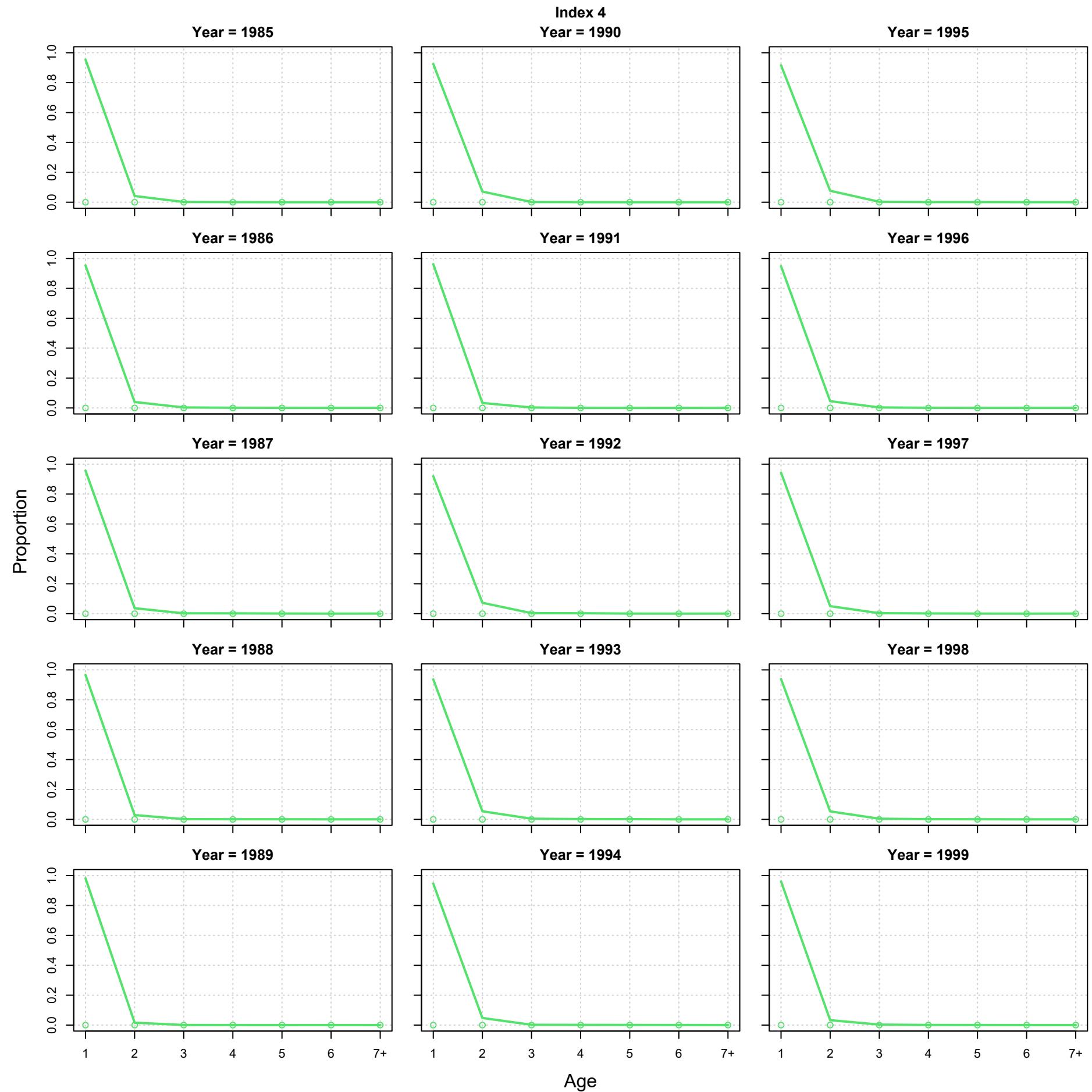
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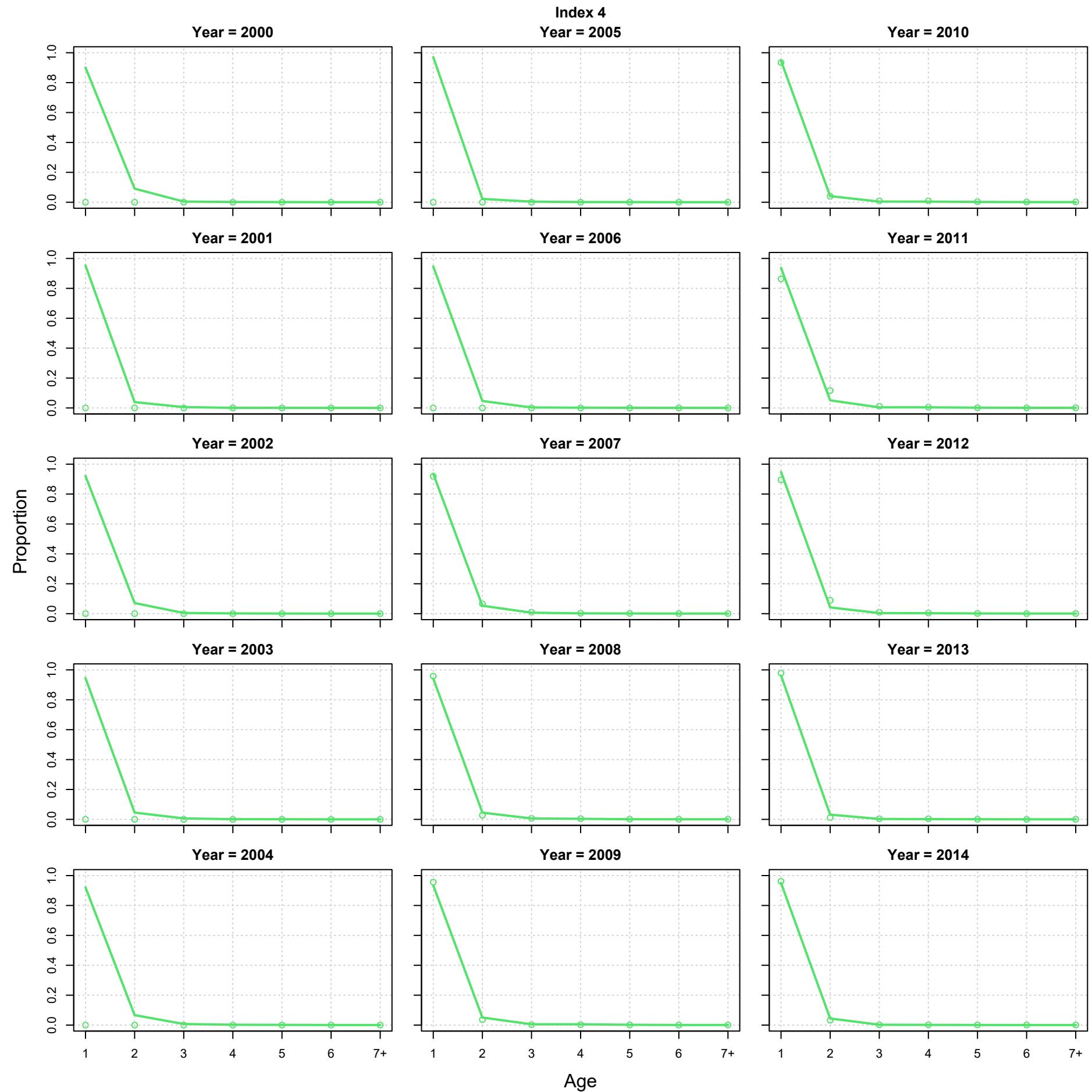


Year = 2019



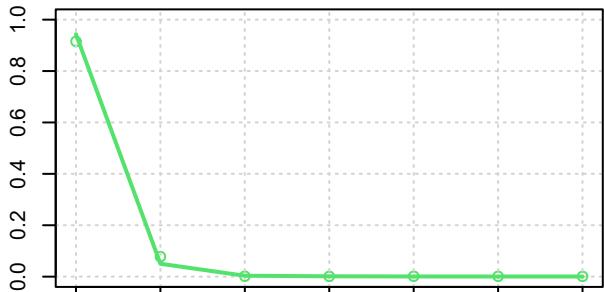
Age





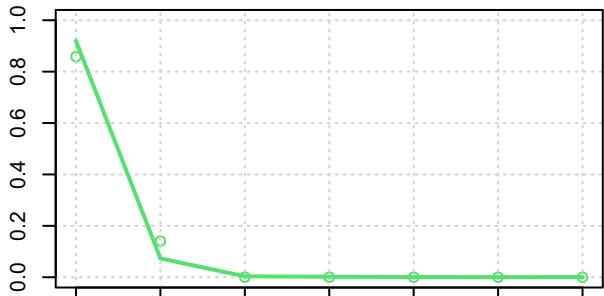
Year = 2015

Index 4
Year = 2020

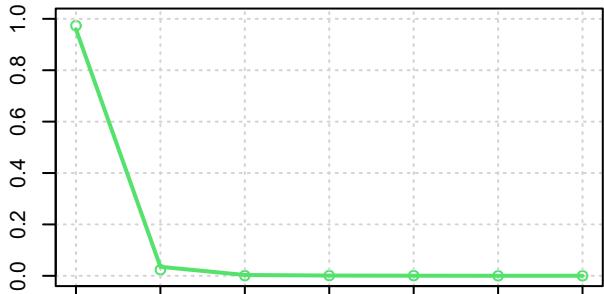


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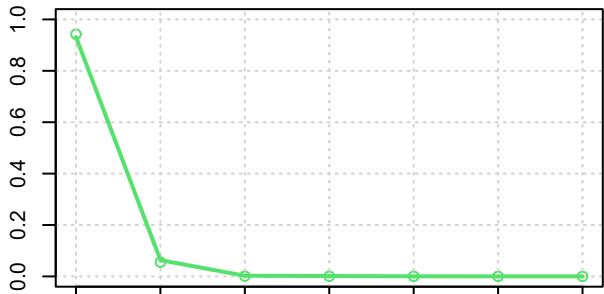
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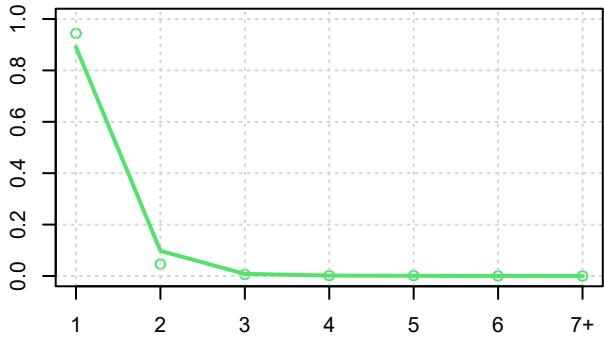
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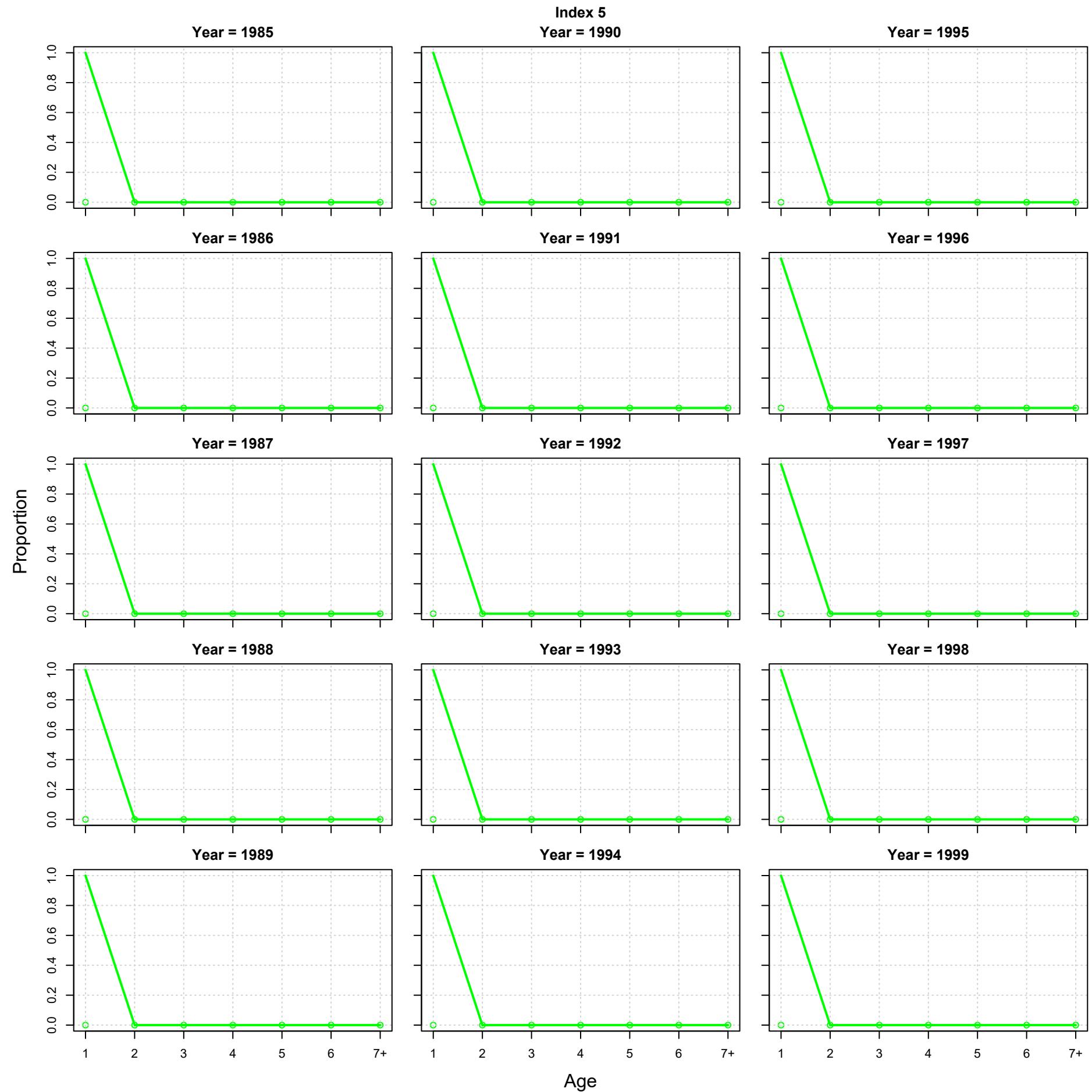
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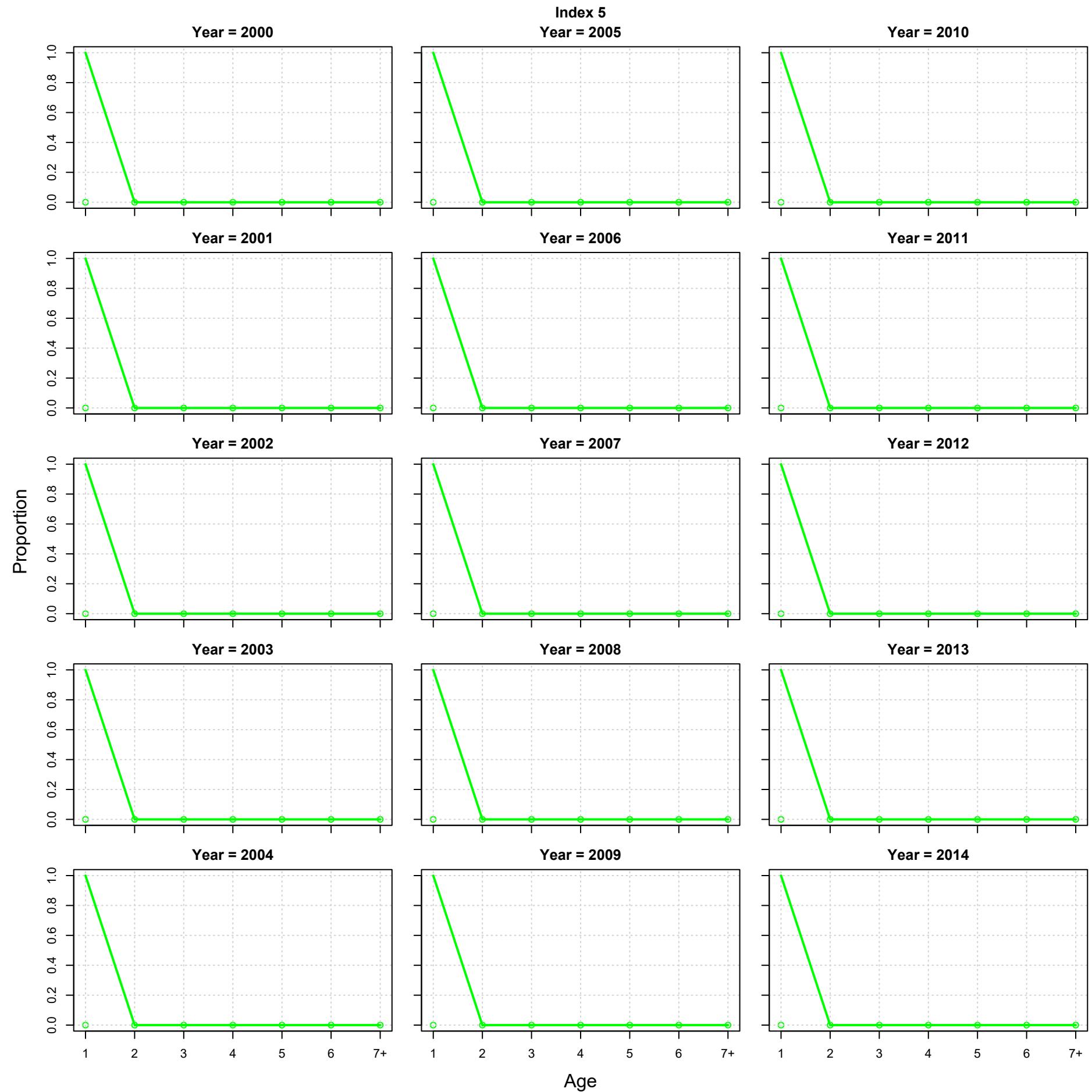


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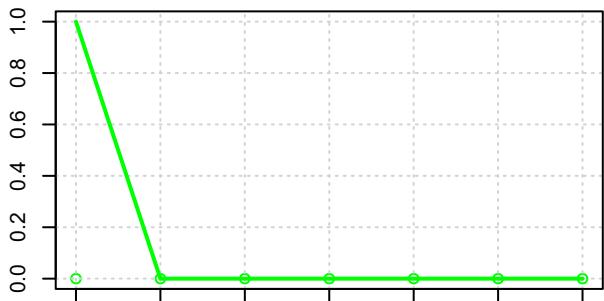
Age





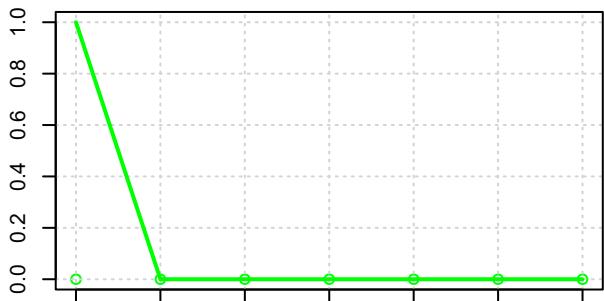
Year = 2015

Index 5
Year = 2020

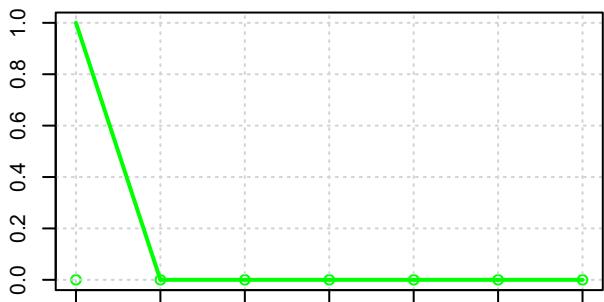


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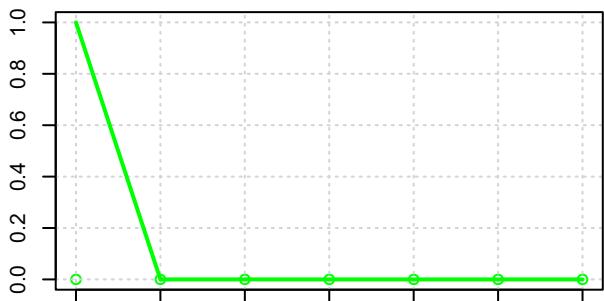
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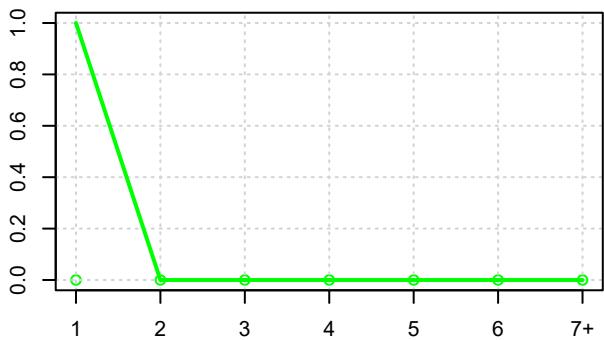
Year = 2017



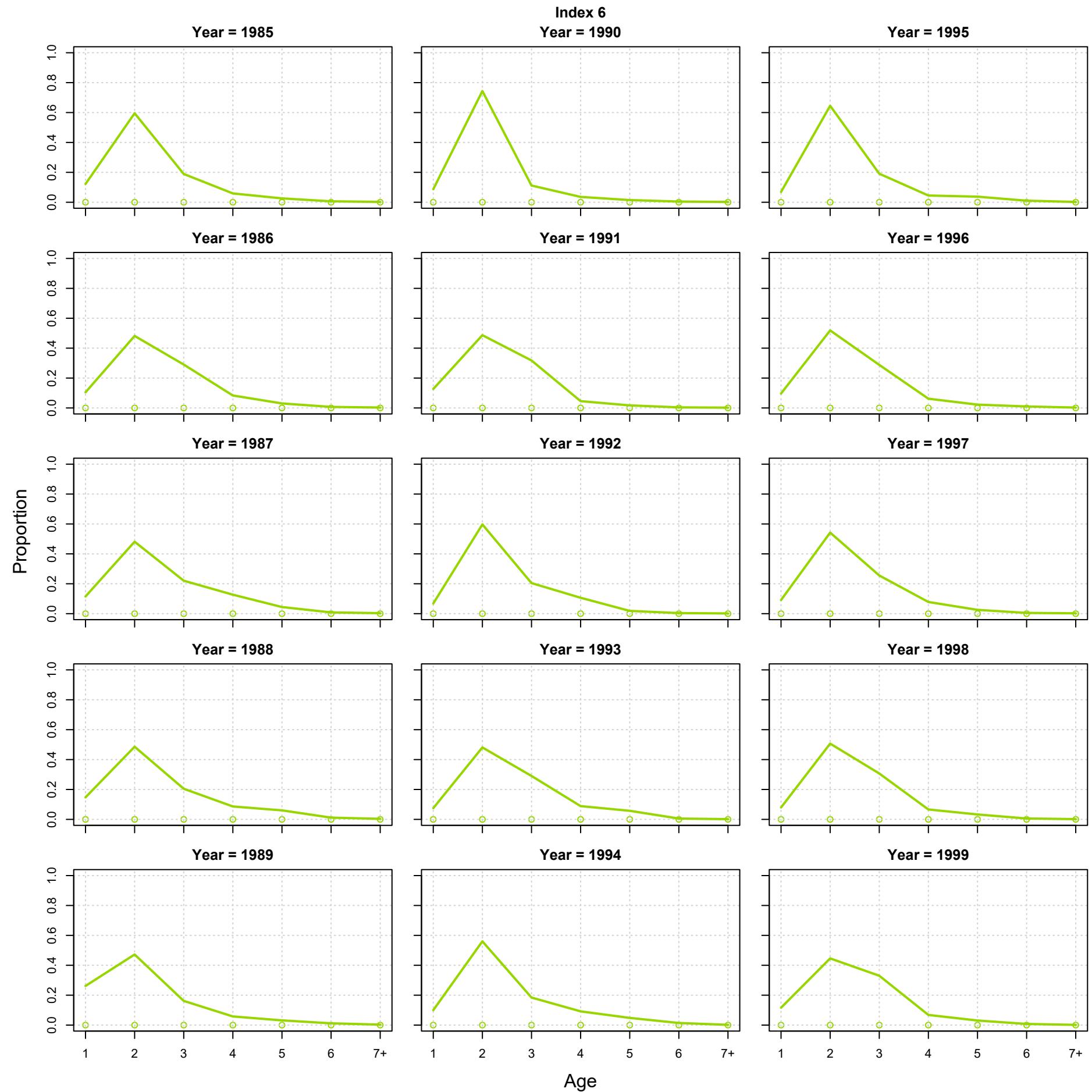
Year = 2018

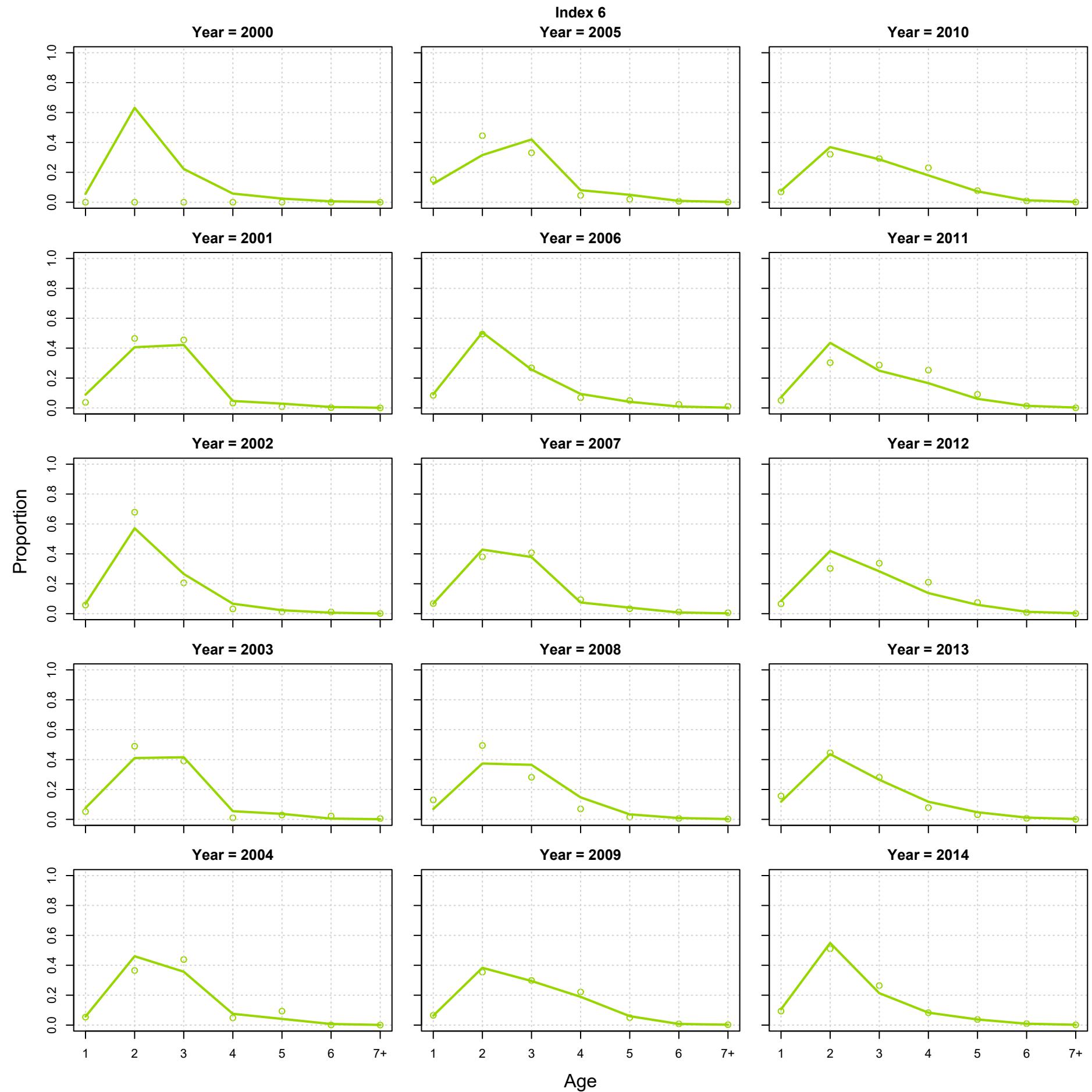


Year = 2019



Age

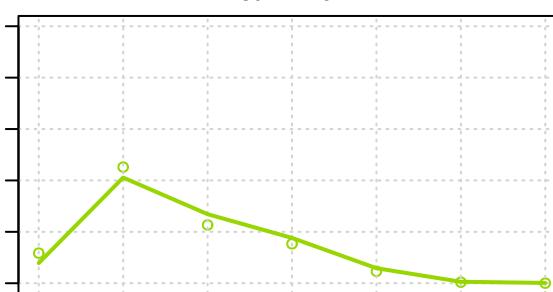




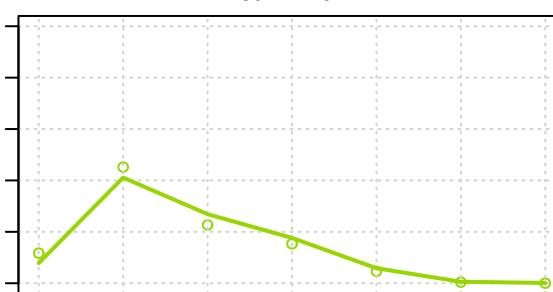
Index 6
Year = 2020



Year = 2016



Year = 2021



Year = 2017



Year = 2018

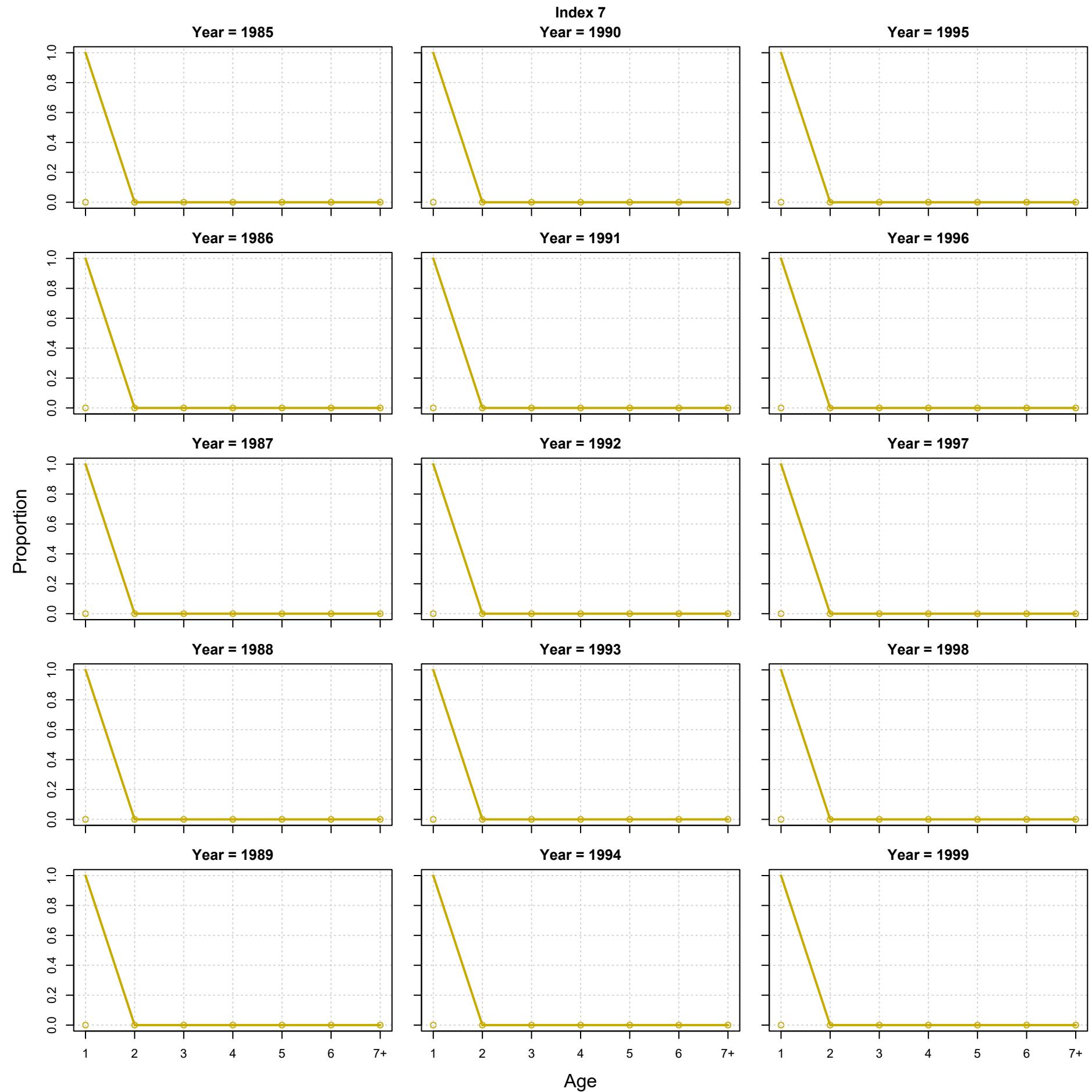


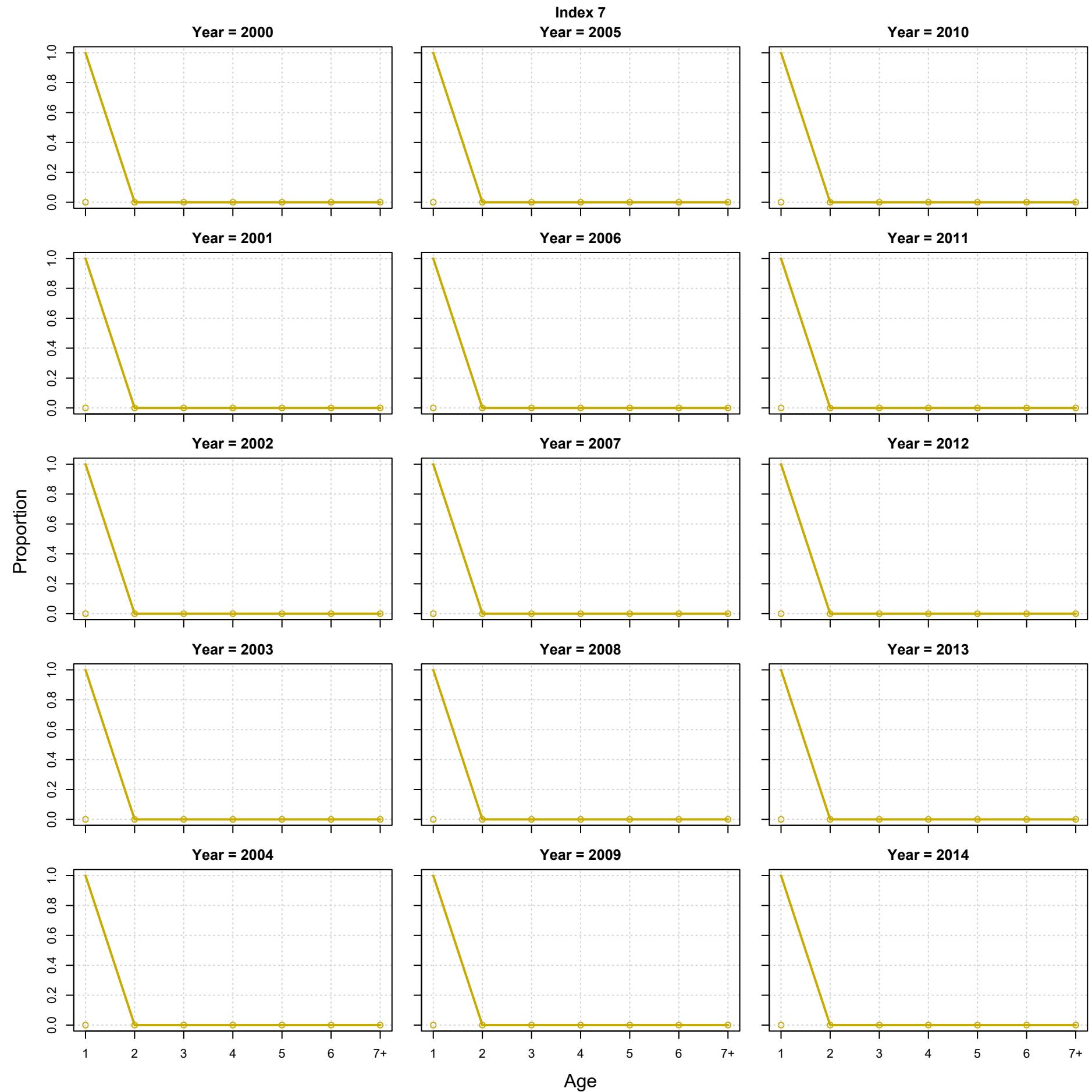
Year = 2019



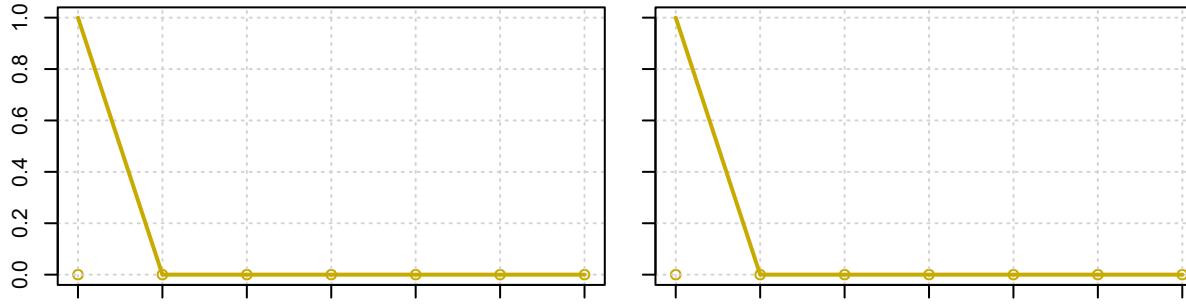
Age

Proportion

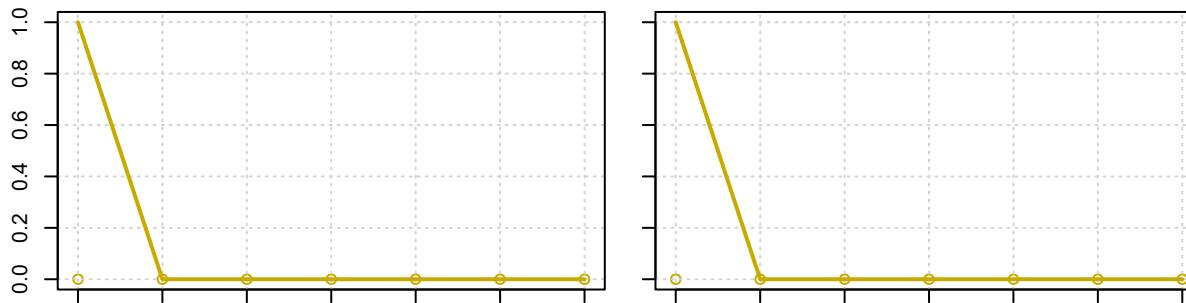




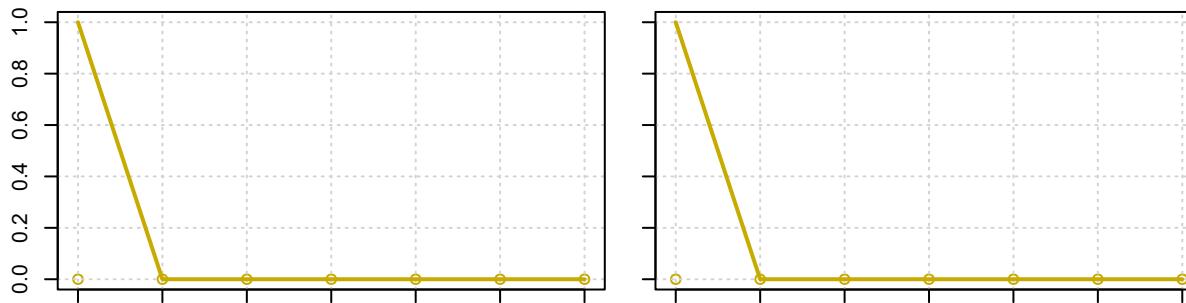
Index 7
Year = 2020



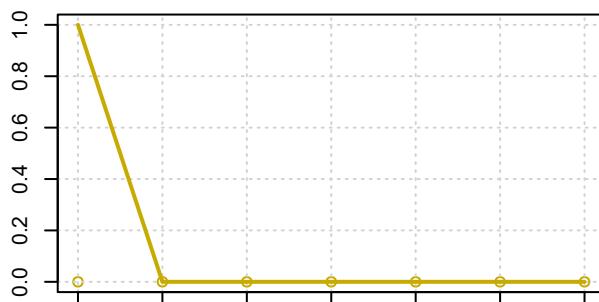
Year = 2016



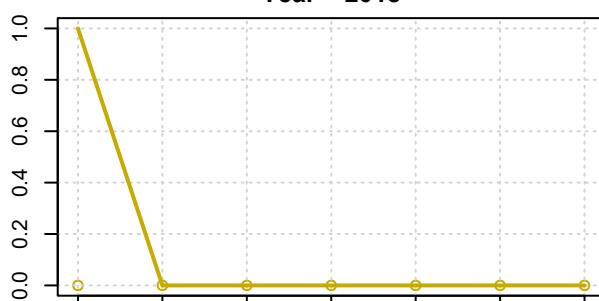
Year = 2021



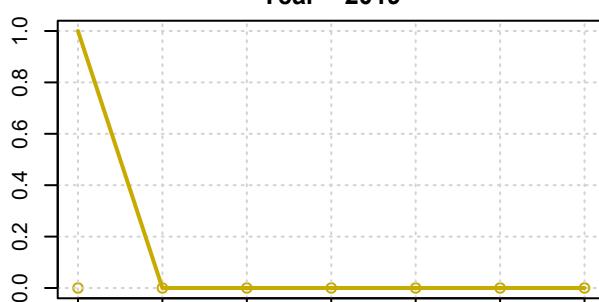
Year = 2017



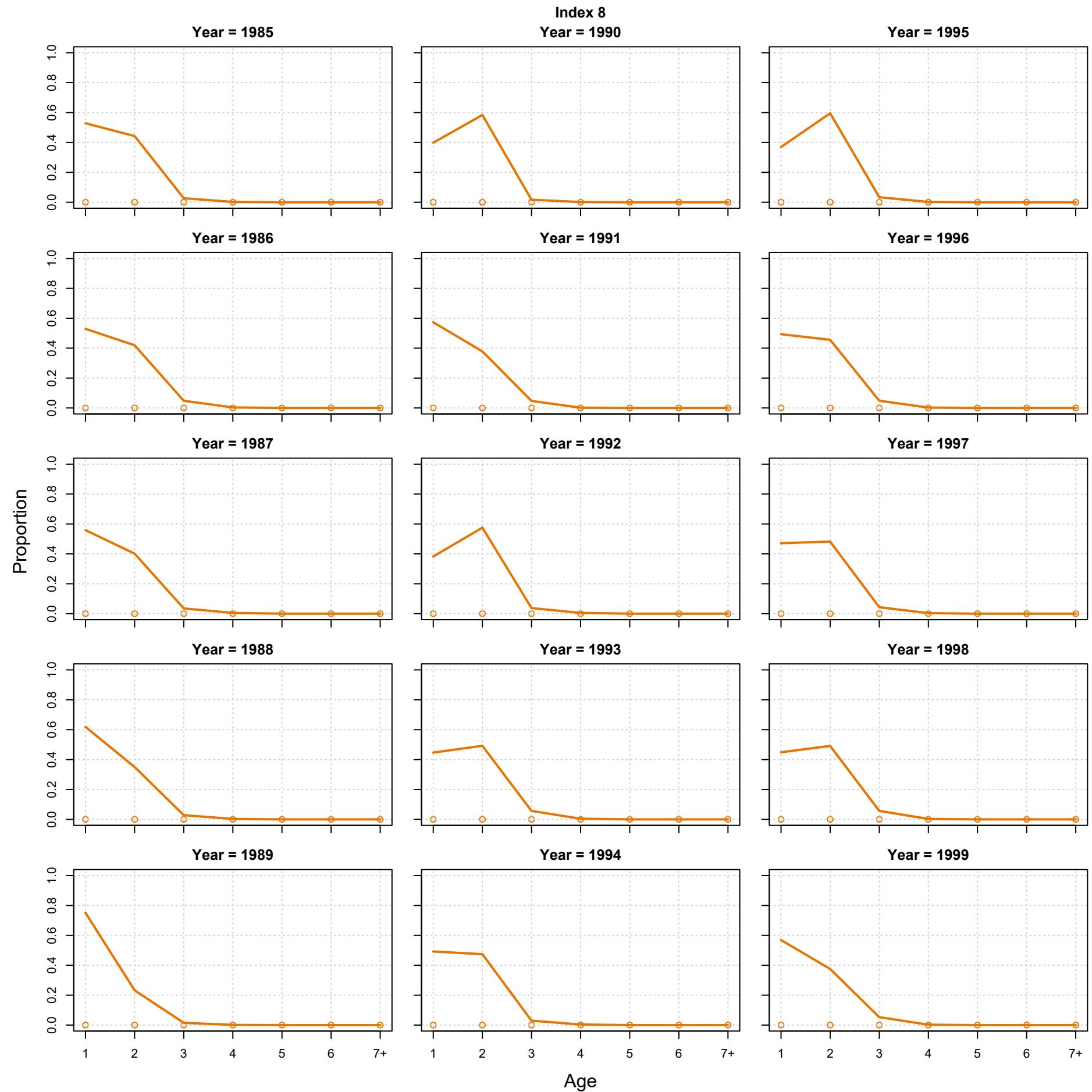
Year = 2018

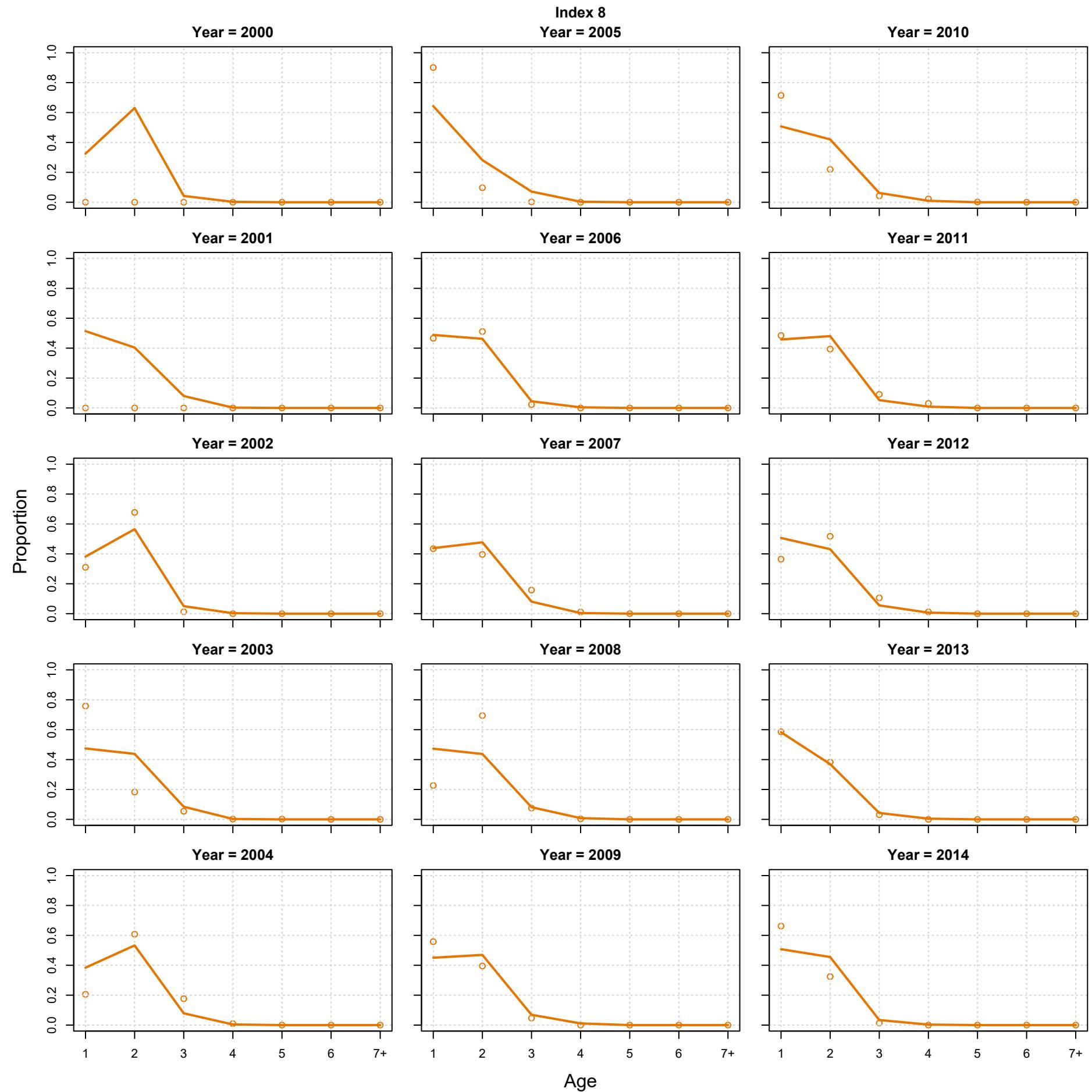


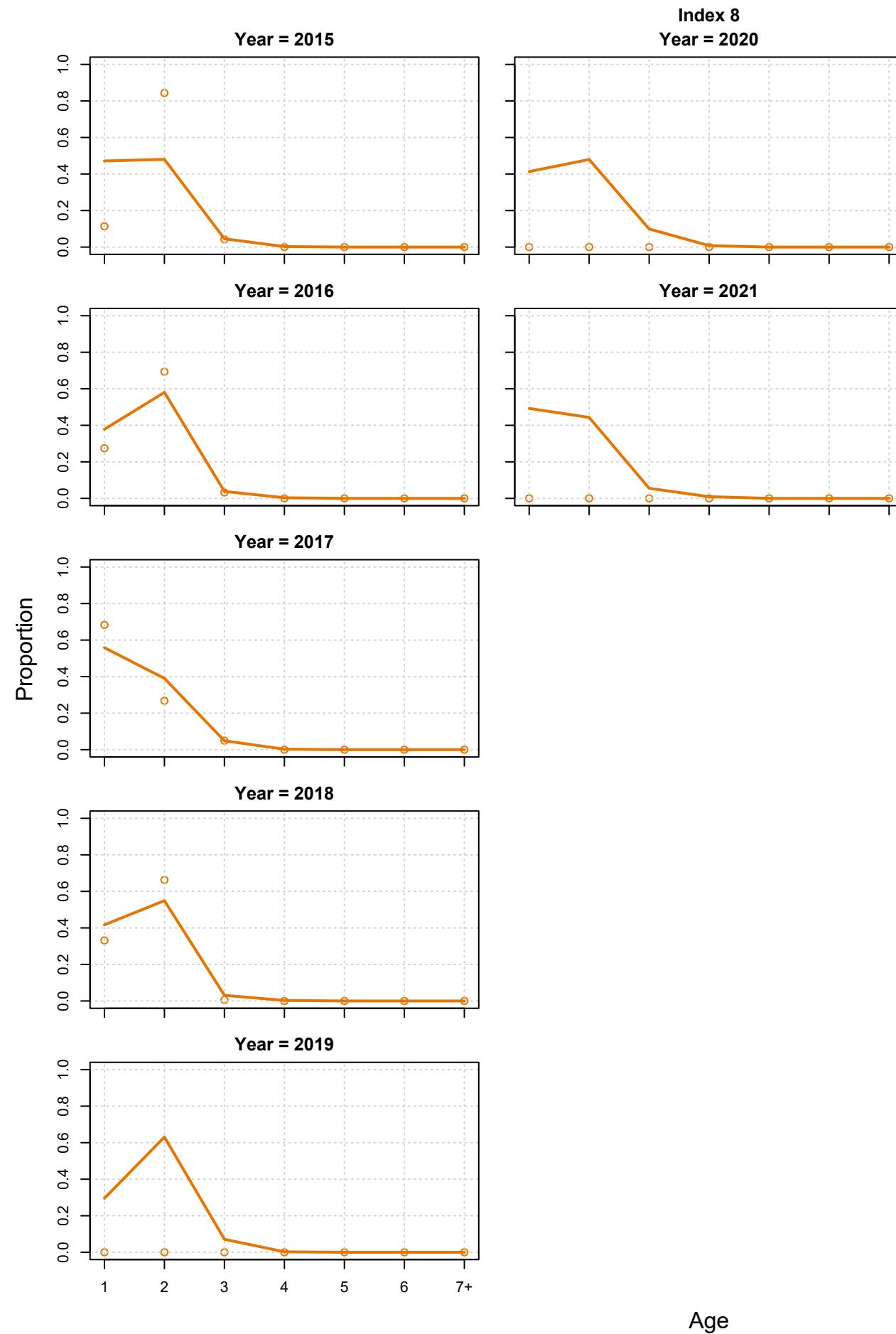
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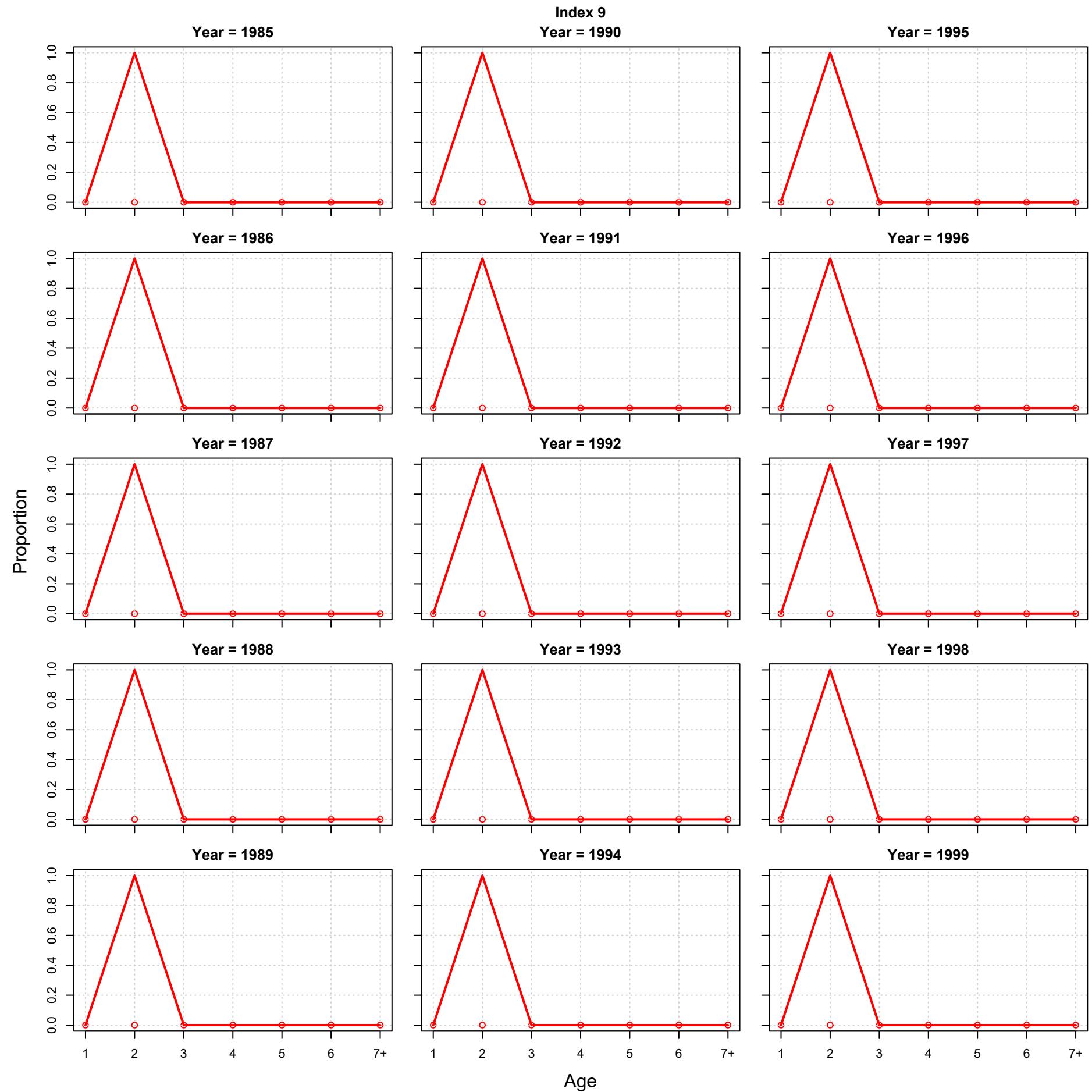


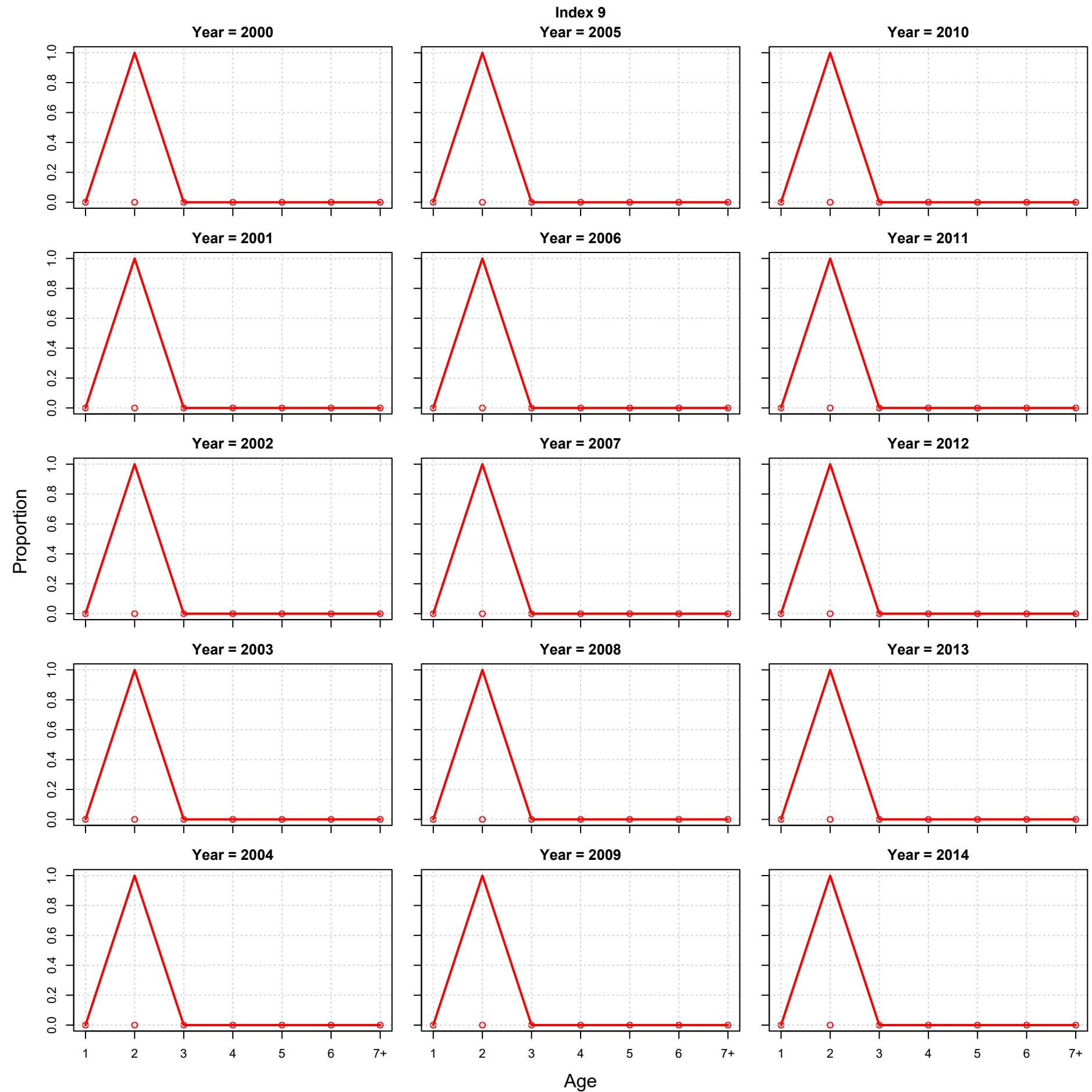
Age







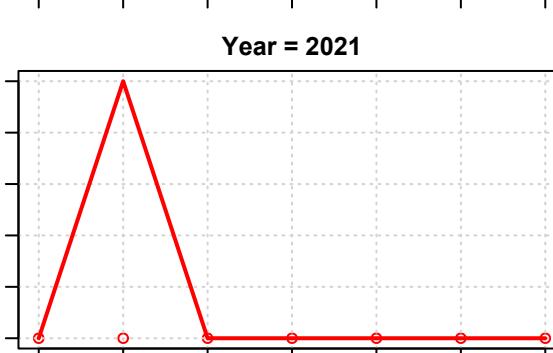




Index 9
Year = 2020



Year = 2016



Year = 2021



Year = 2017



Year = 2018



Year = 2019

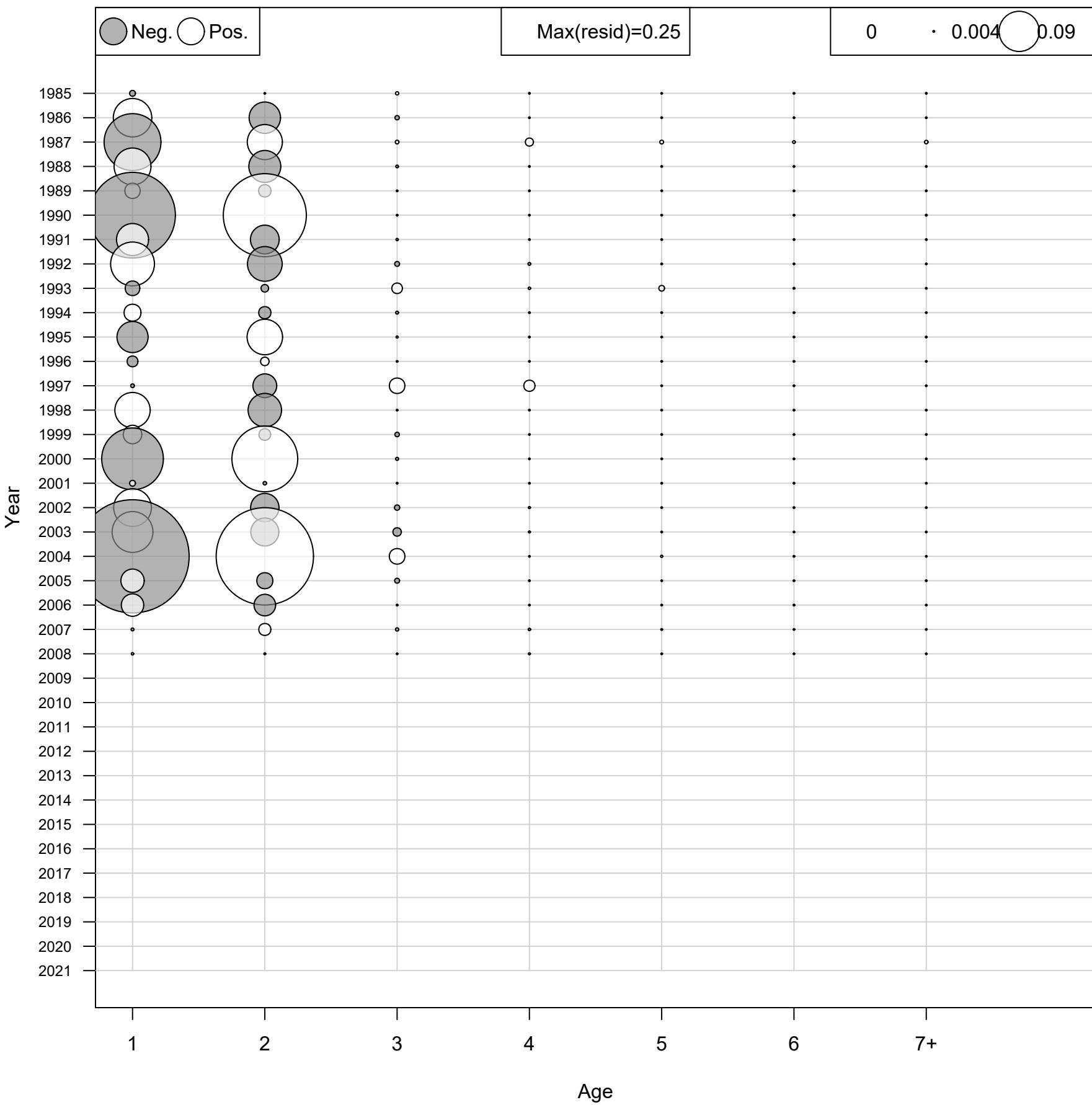


Age

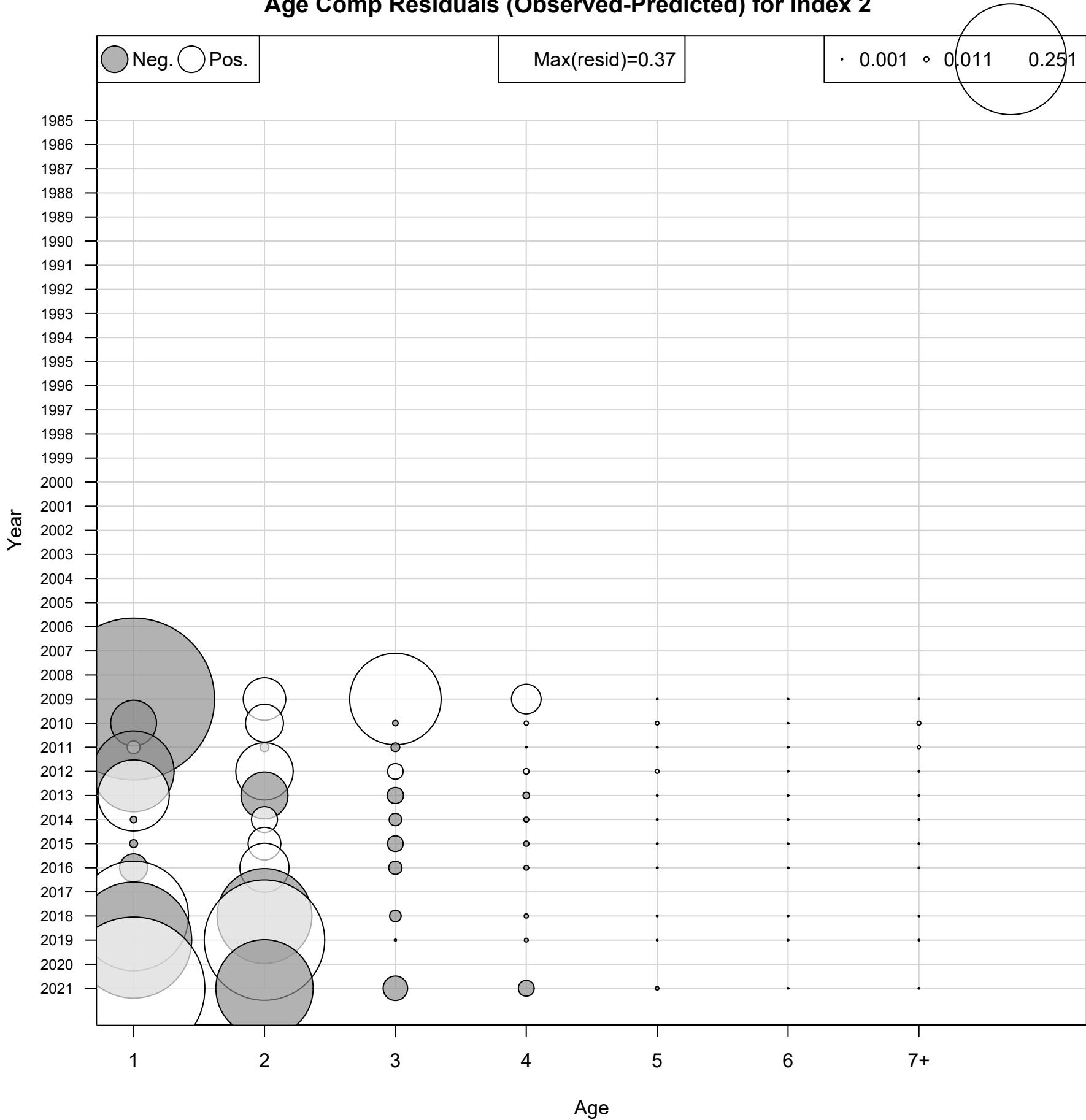
1 2 3 4 5 6 7+

Proportion

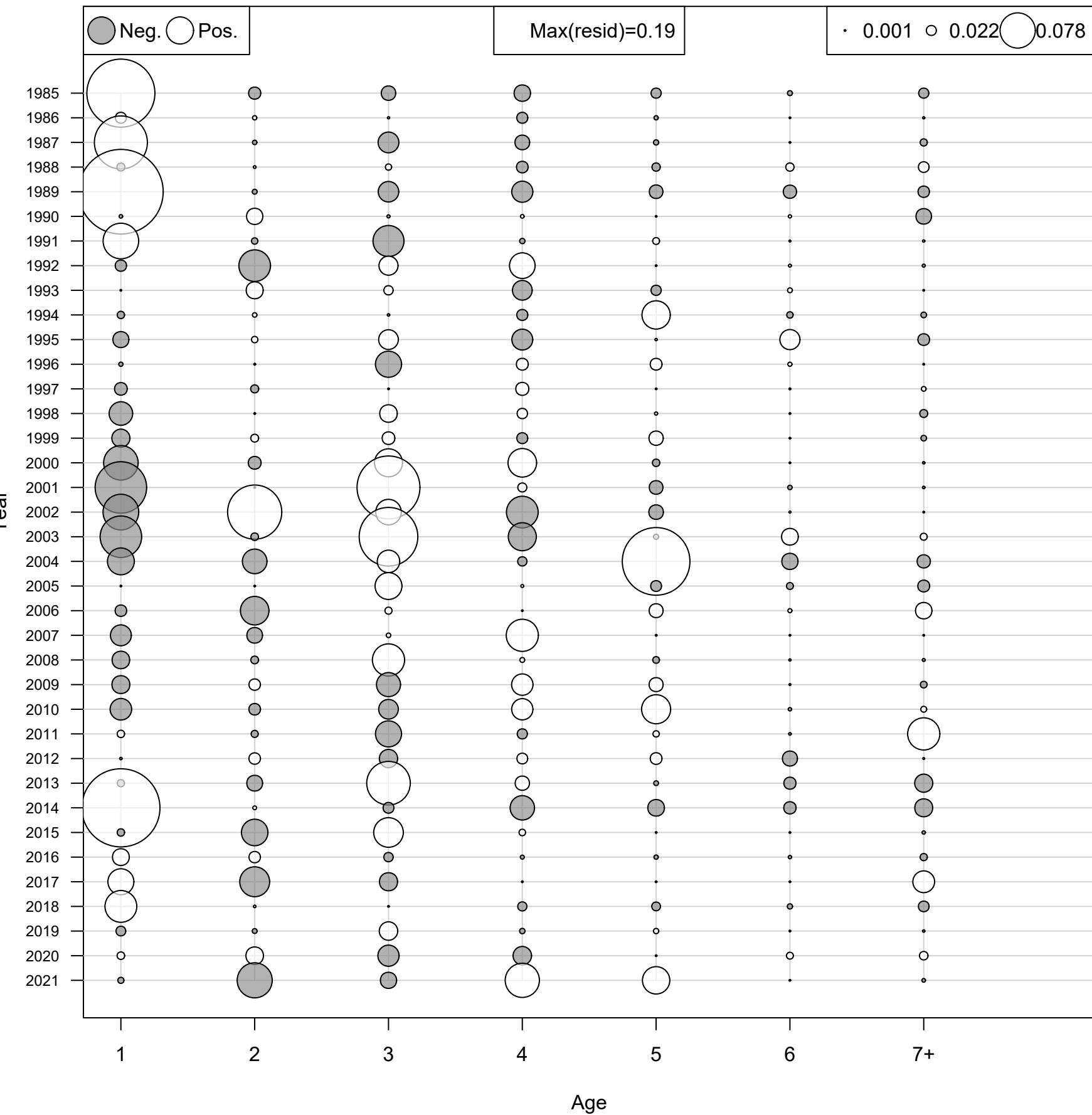
Age Comp Residuals (Observed-Predicted) for Index 1



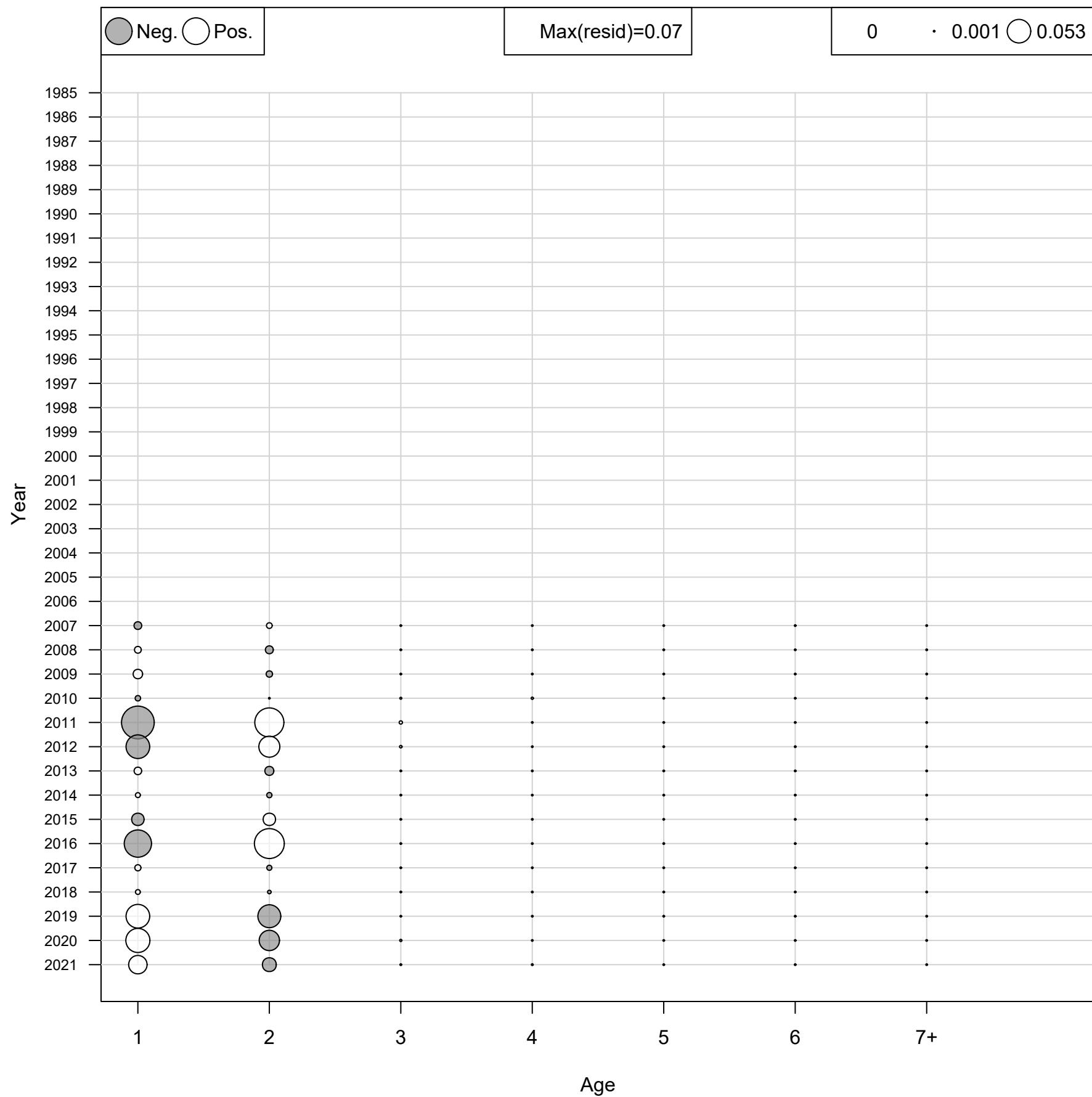
Age Comp Residuals (Observed-Predicted) for Index 2



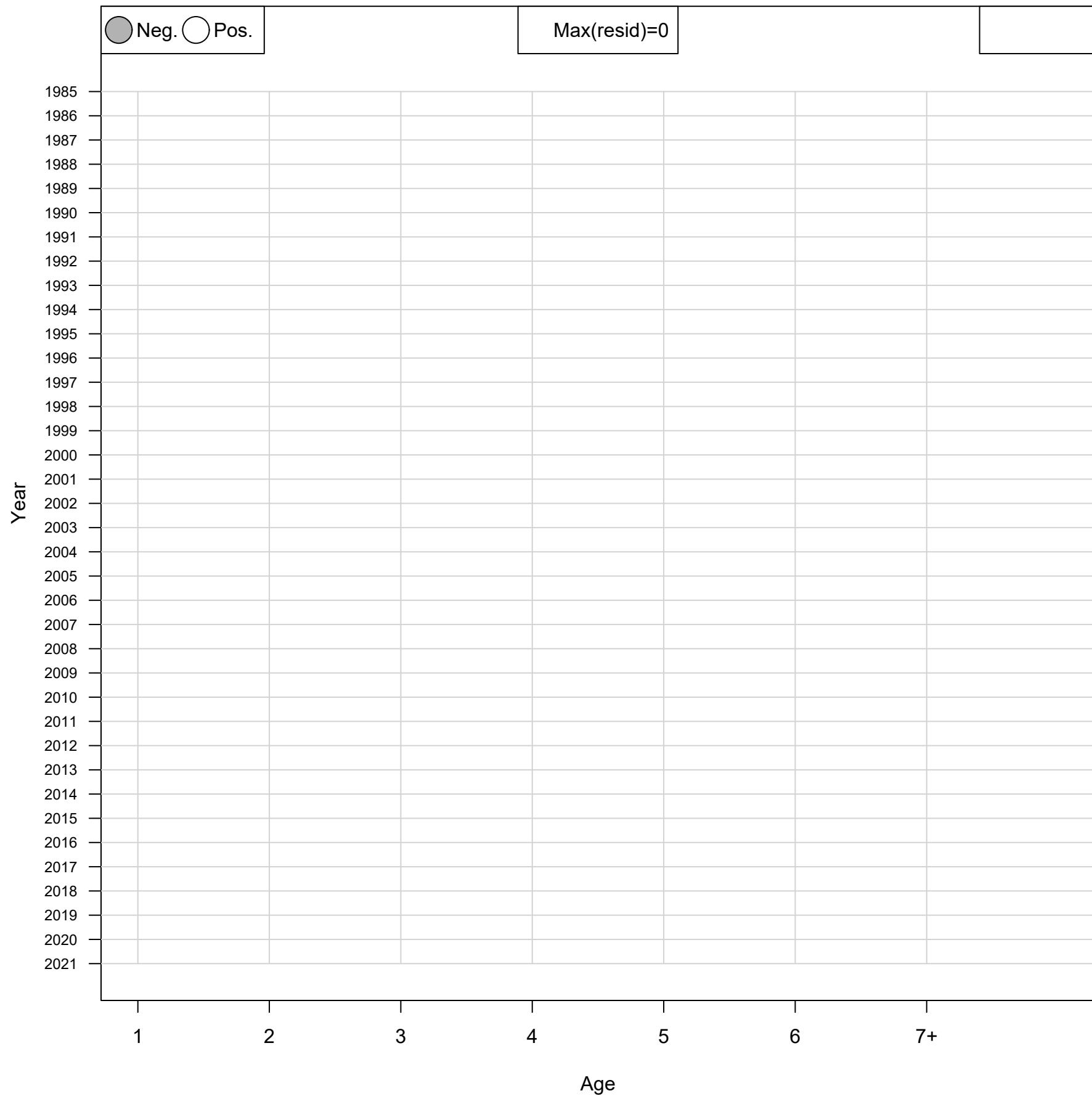
Age Comp Residuals (Observed-Predicted) for Index 3



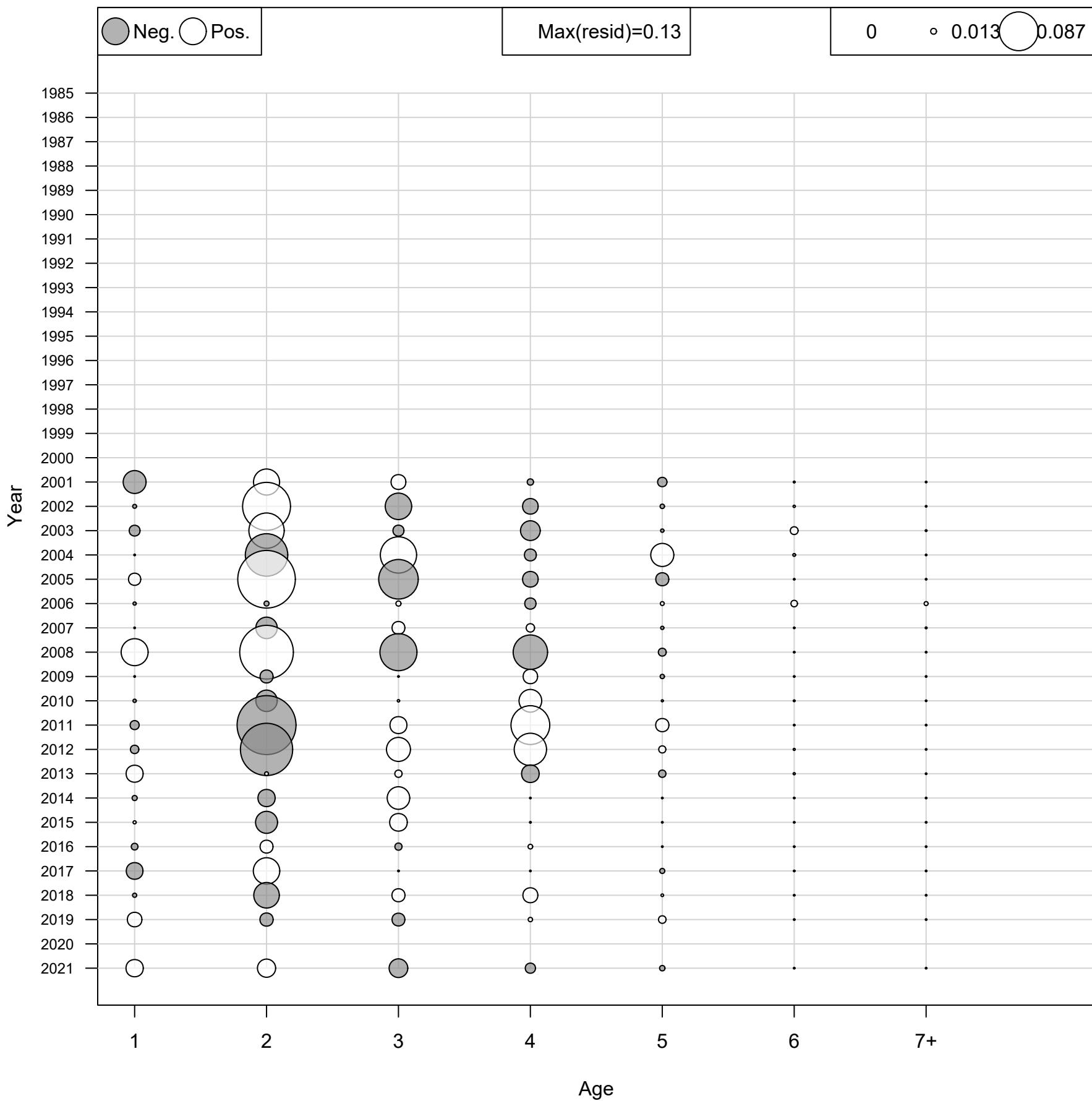
Age Comp Residuals (Observed-Predicted) for Index 4



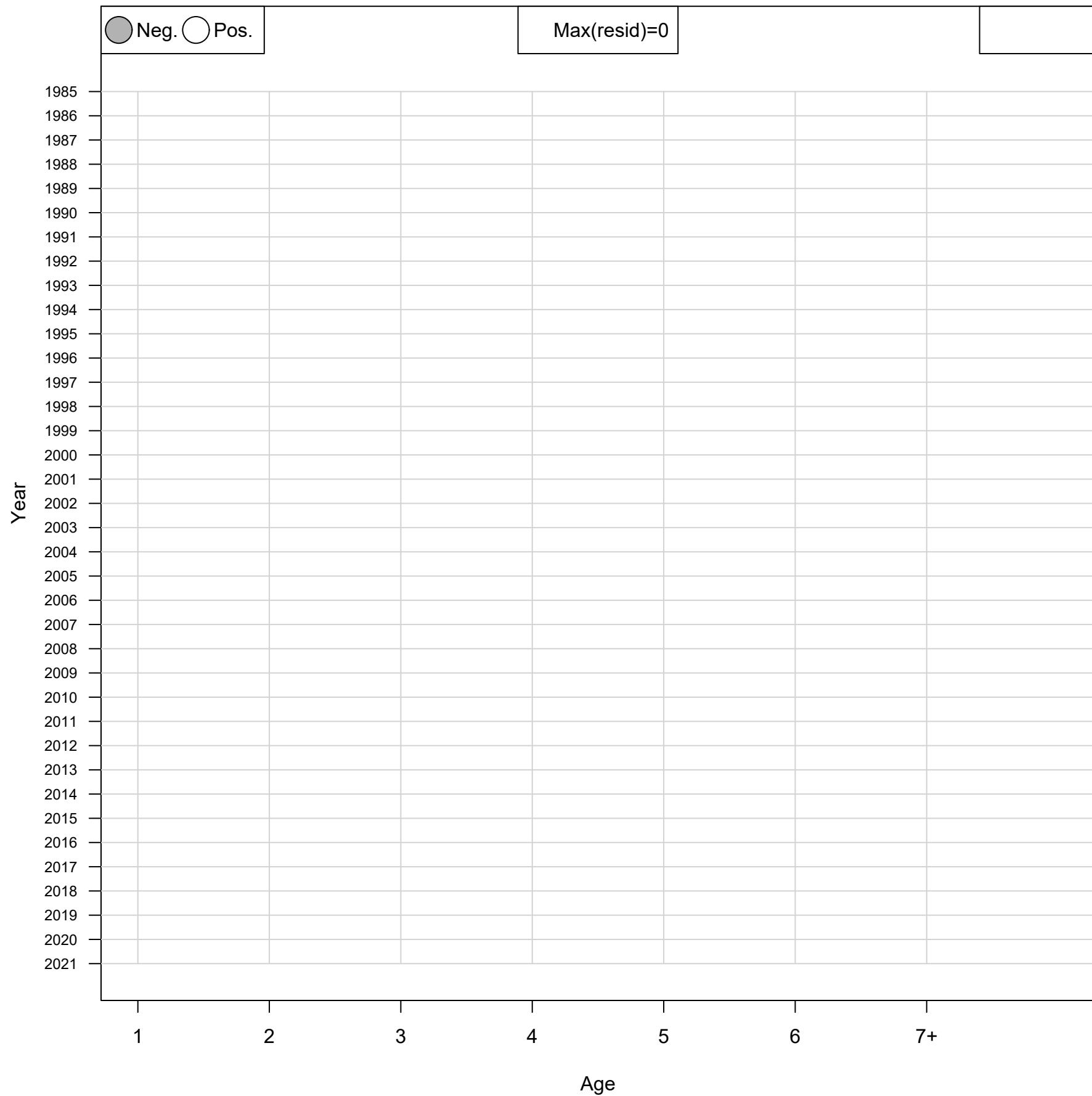
Age Comp Residuals (Observed-Predicted) for Index 5



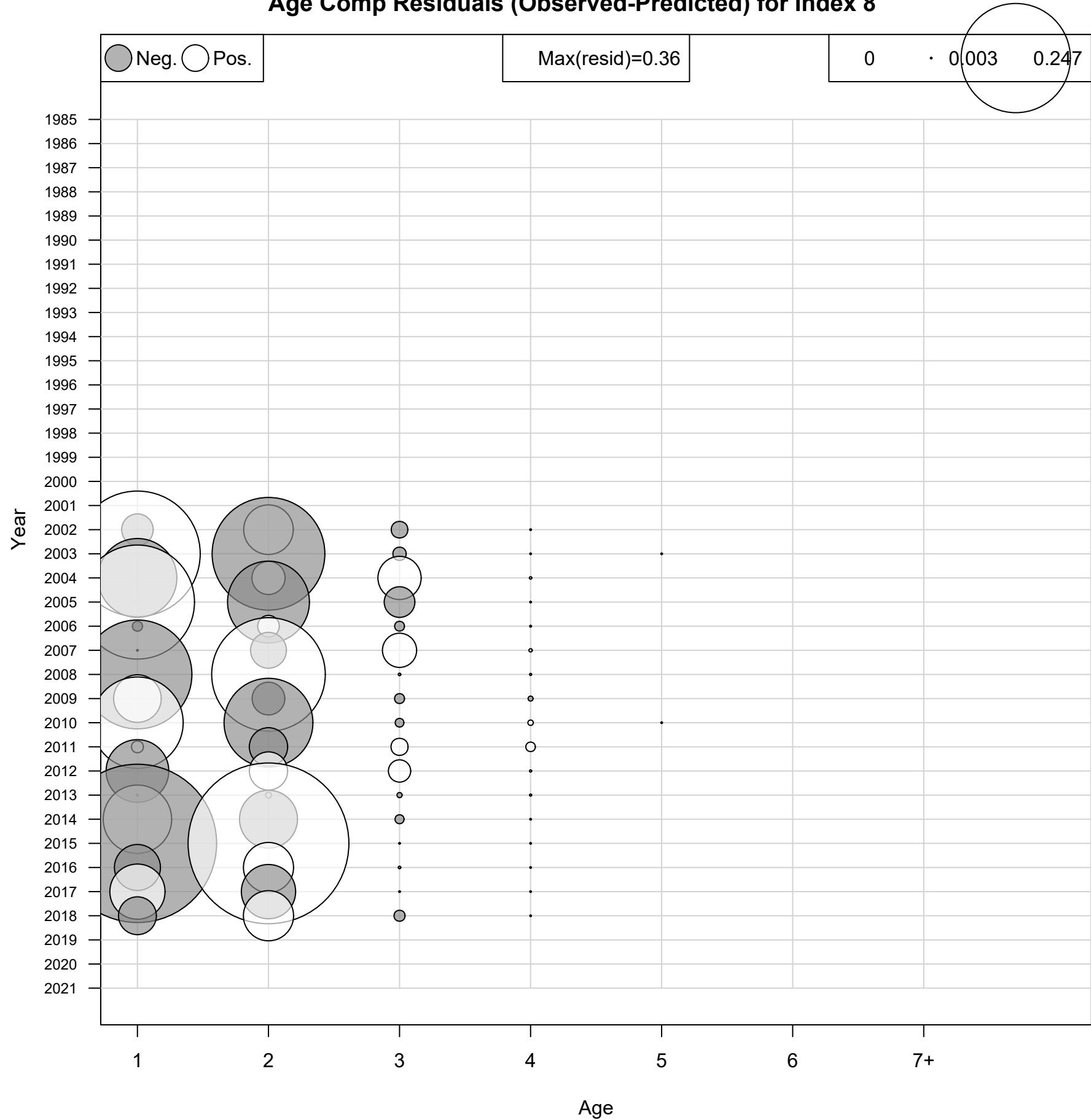
Age Comp Residuals (Observed-Predicted) for Index 6



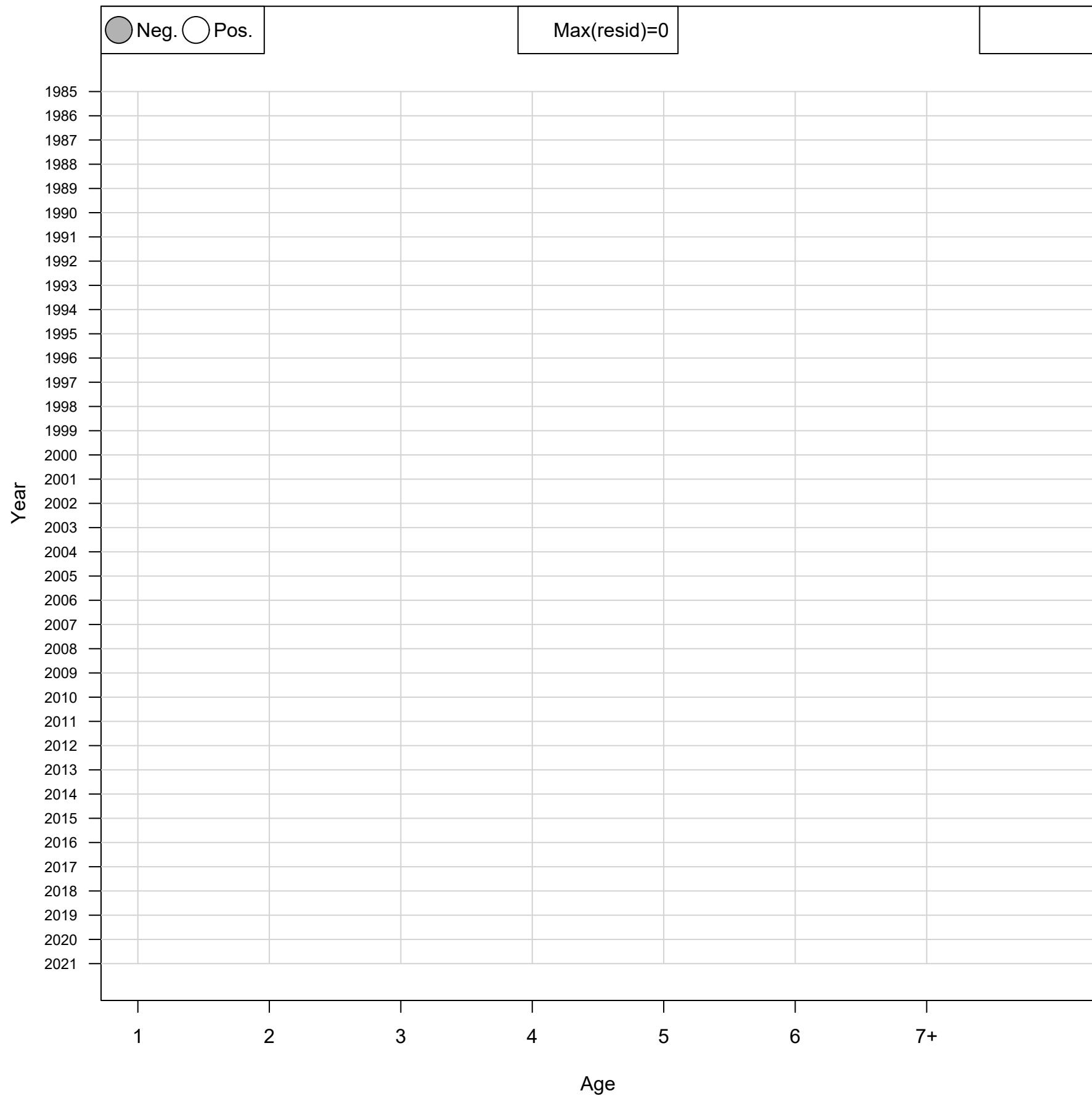
Age Comp Residuals (Observed-Predicted) for Index 7

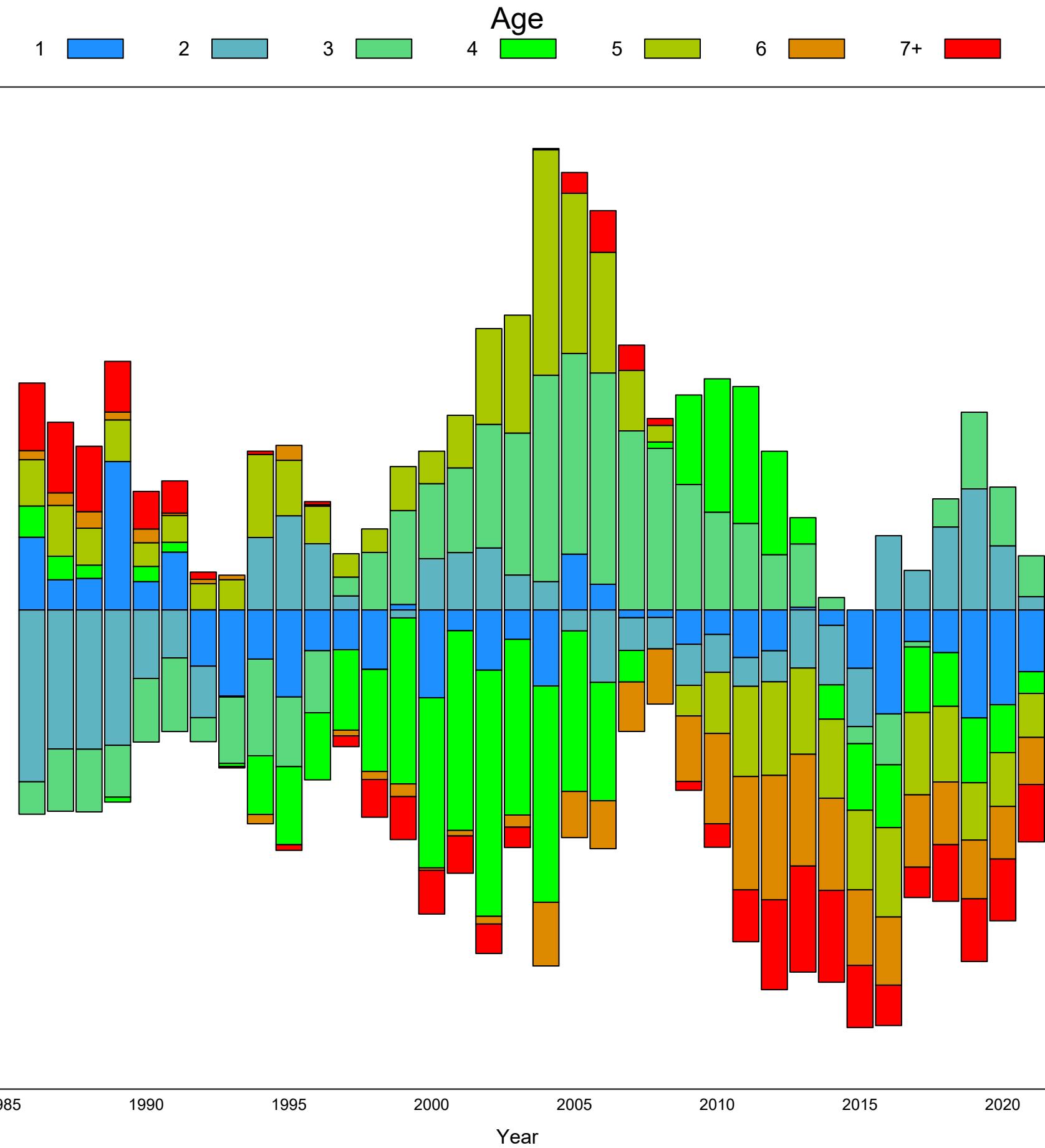


Age Comp Residuals (Observed-Predicted) for Index 8

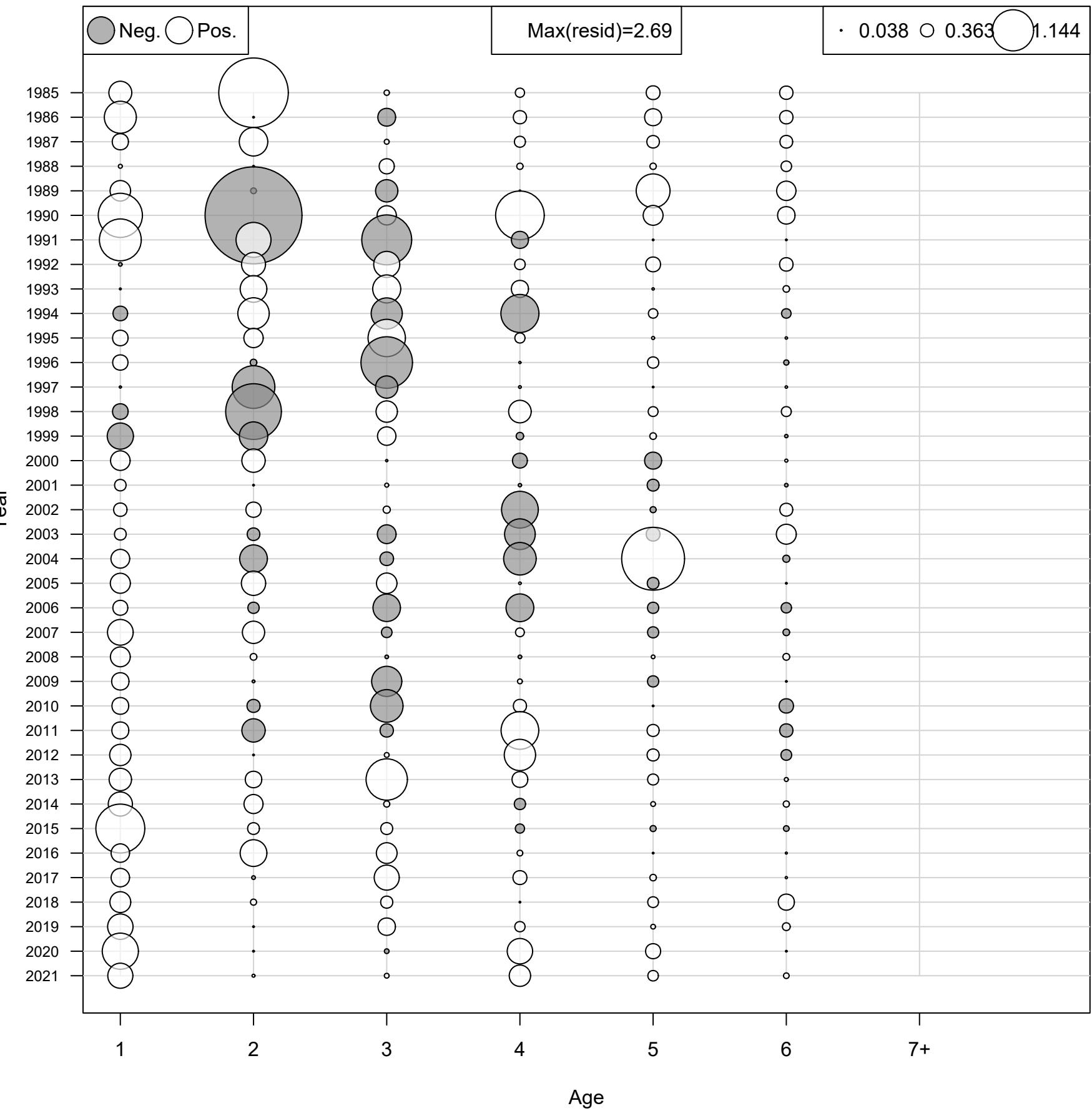


Age Comp Residuals (Observed-Predicted) for Index 9

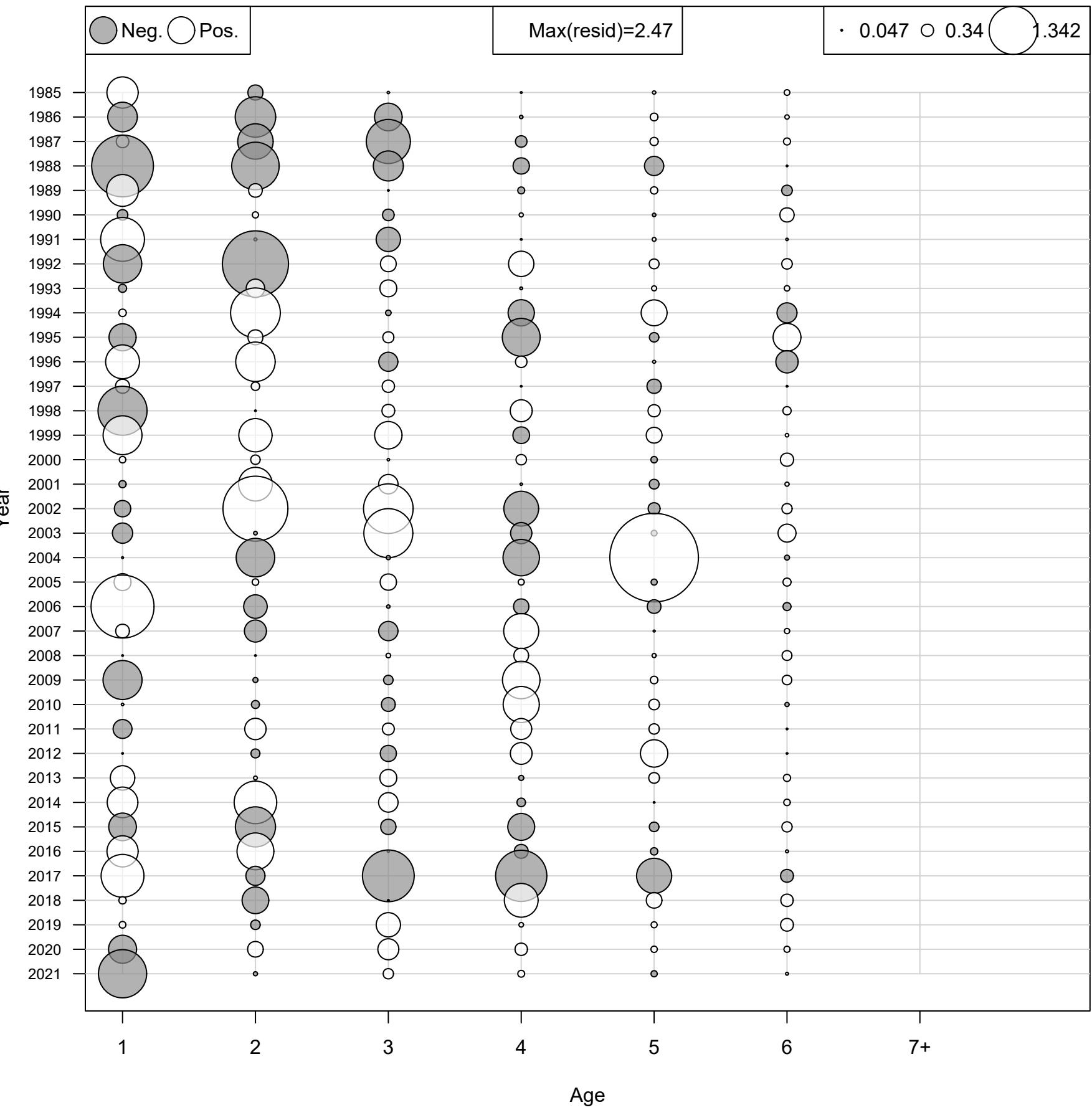




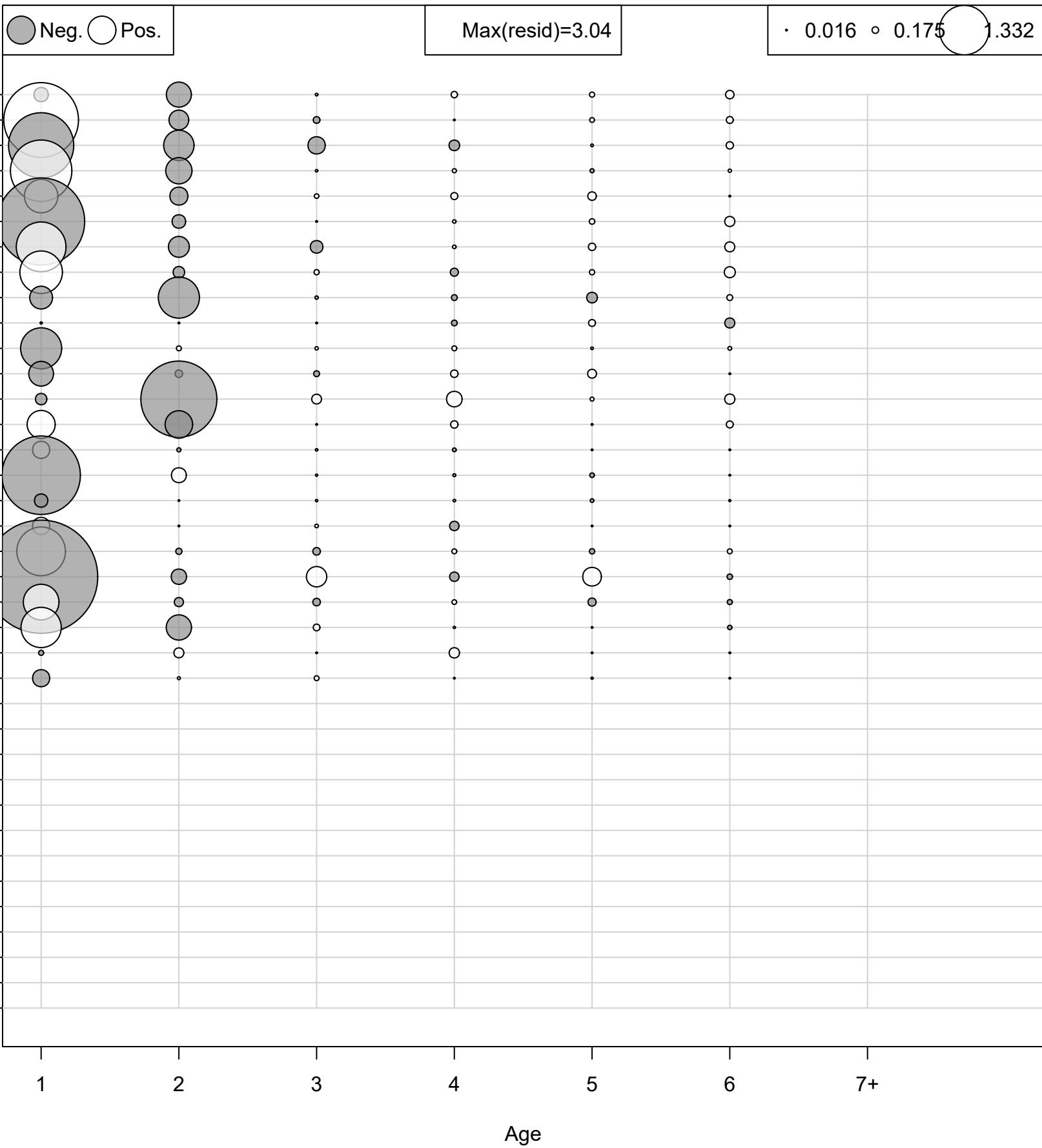
Age Comp OSA Quantile Residuals for Fleet 1



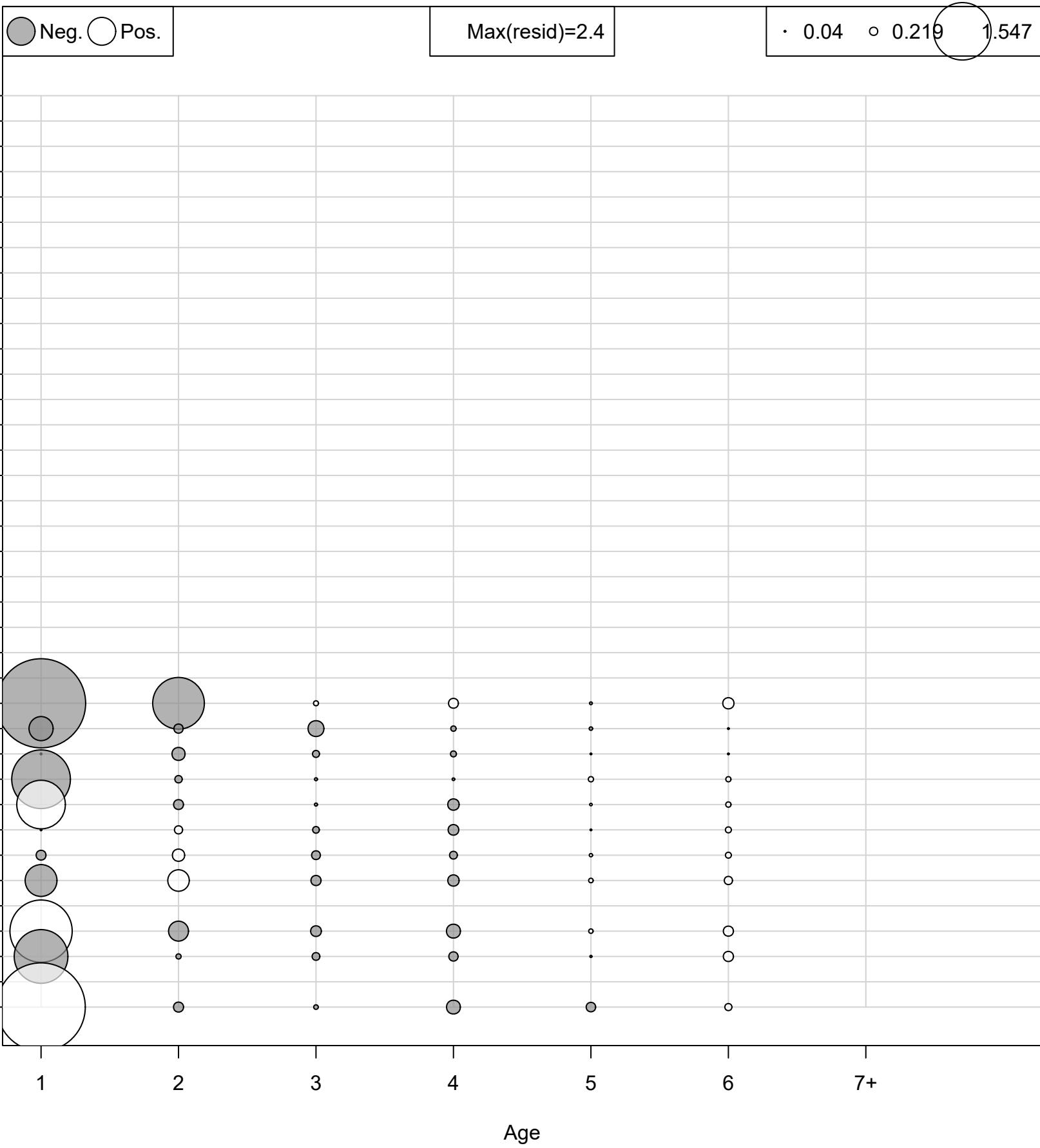
Age Comp OSA Quantile Residuals for Fleet 2



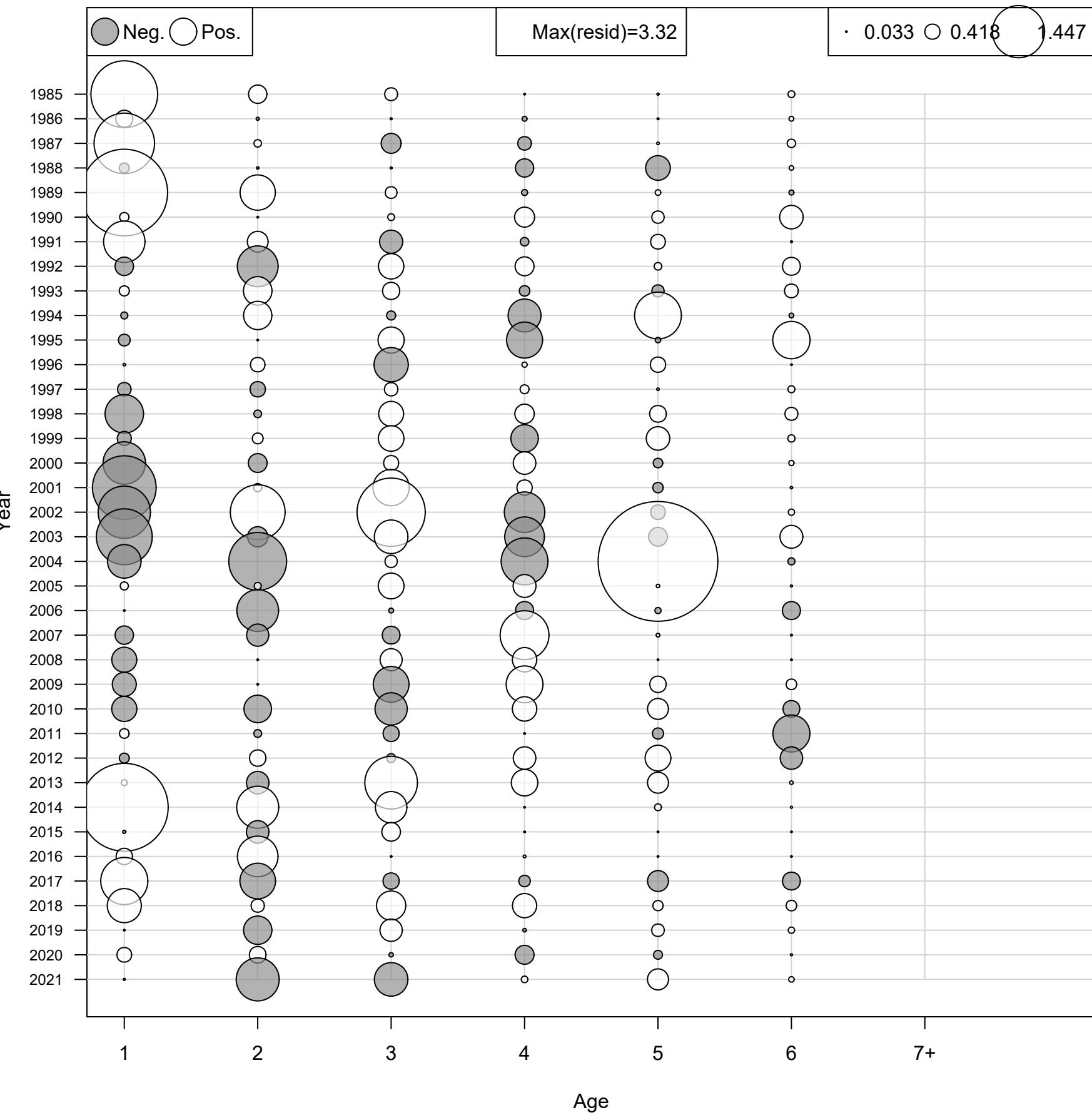
Age Comp OSA Quantile Residuals for Index 1



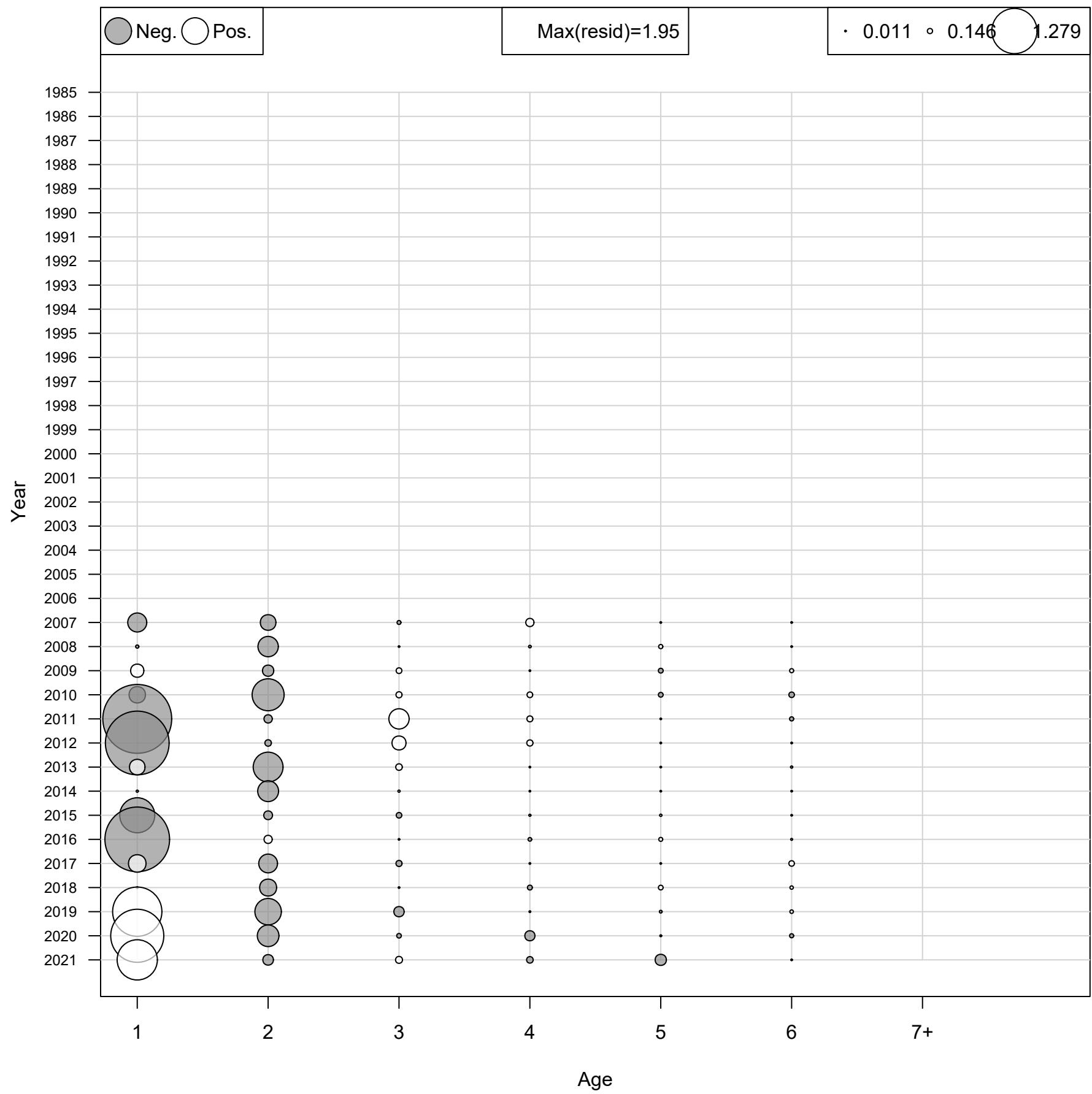
Age Comp OSA Quantile Residuals for Index 2



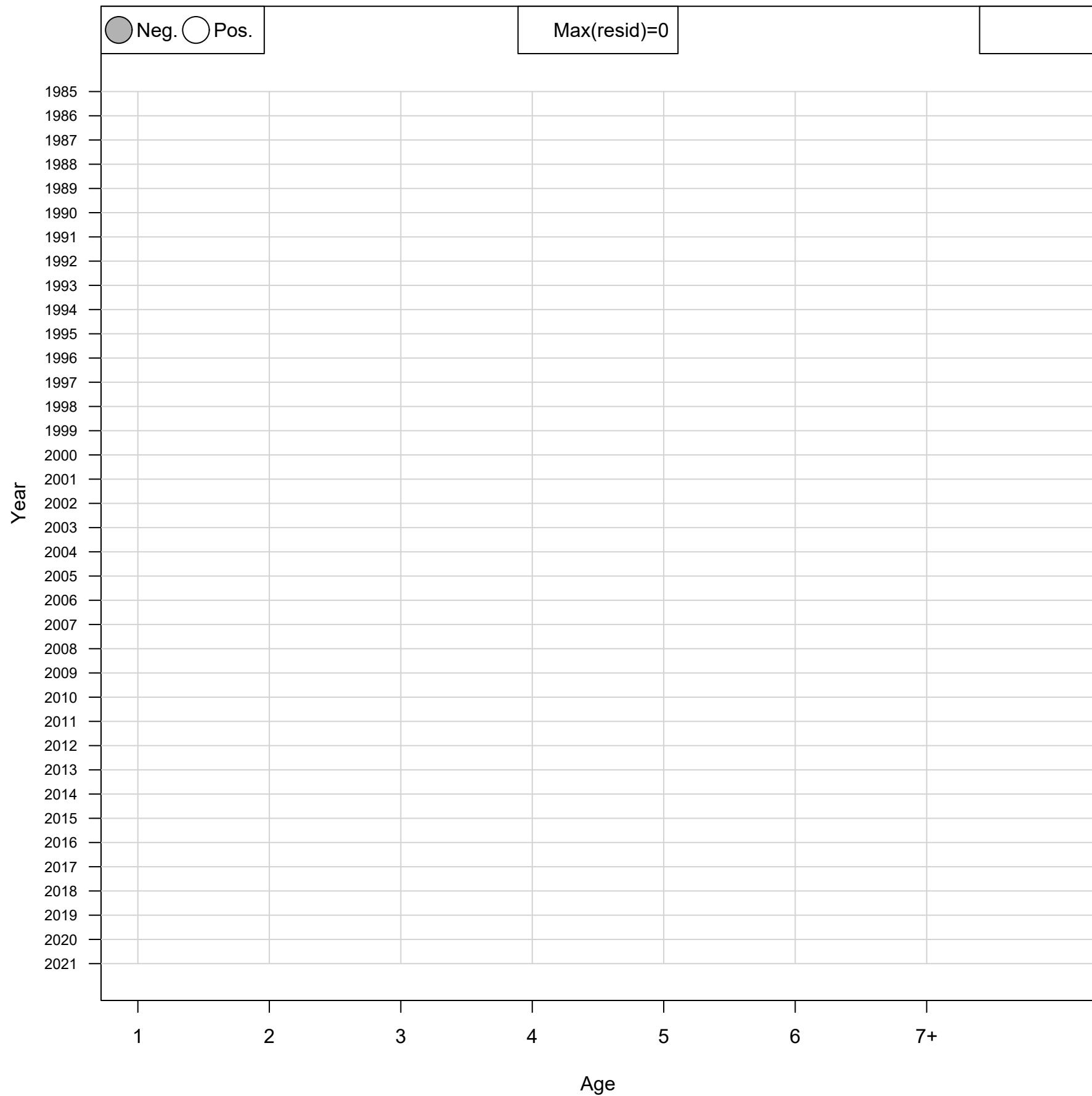
Age Comp OSA Quantile Residuals for Index 3



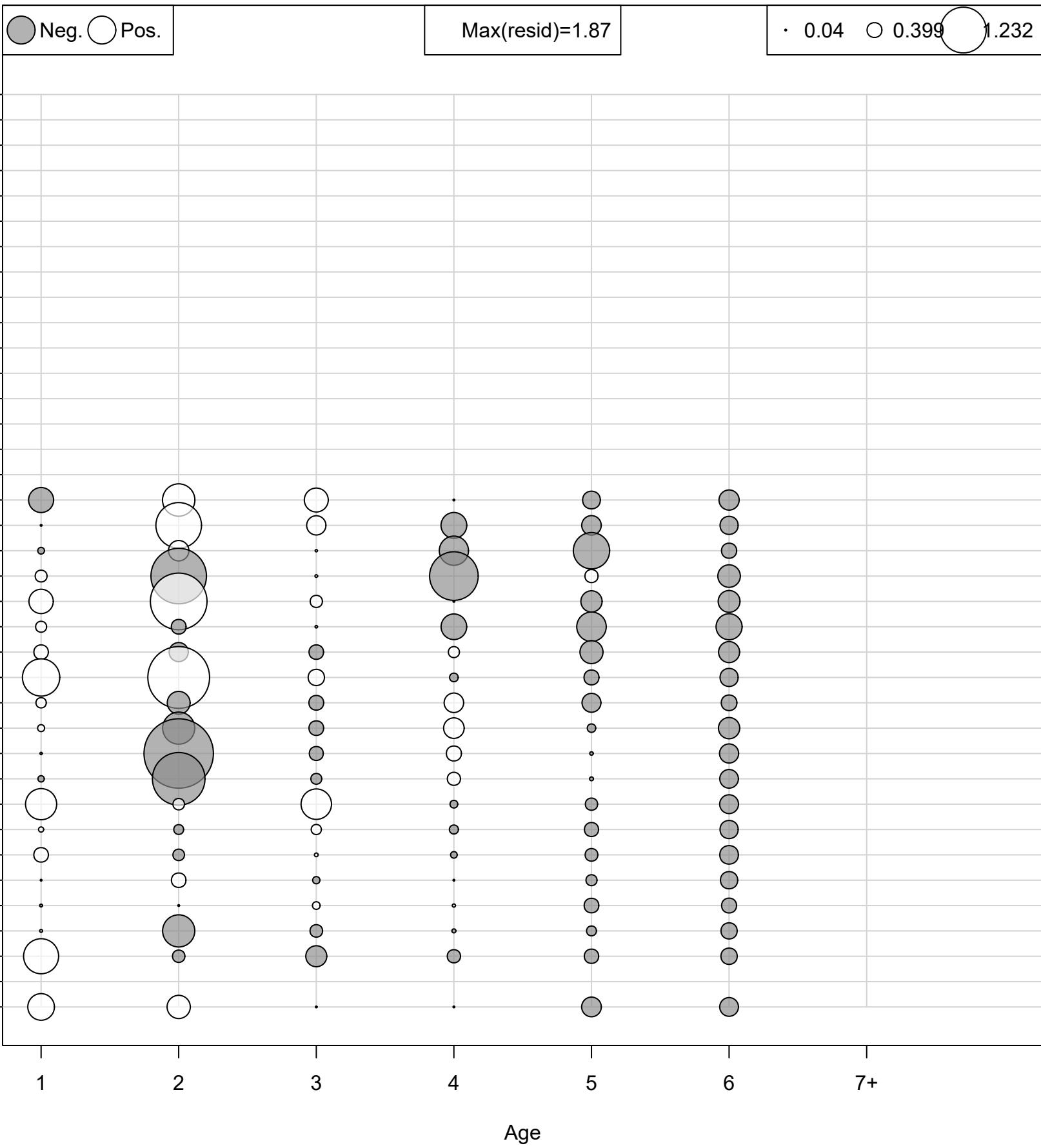
Age Comp OSA Quantile Residuals for Index 4



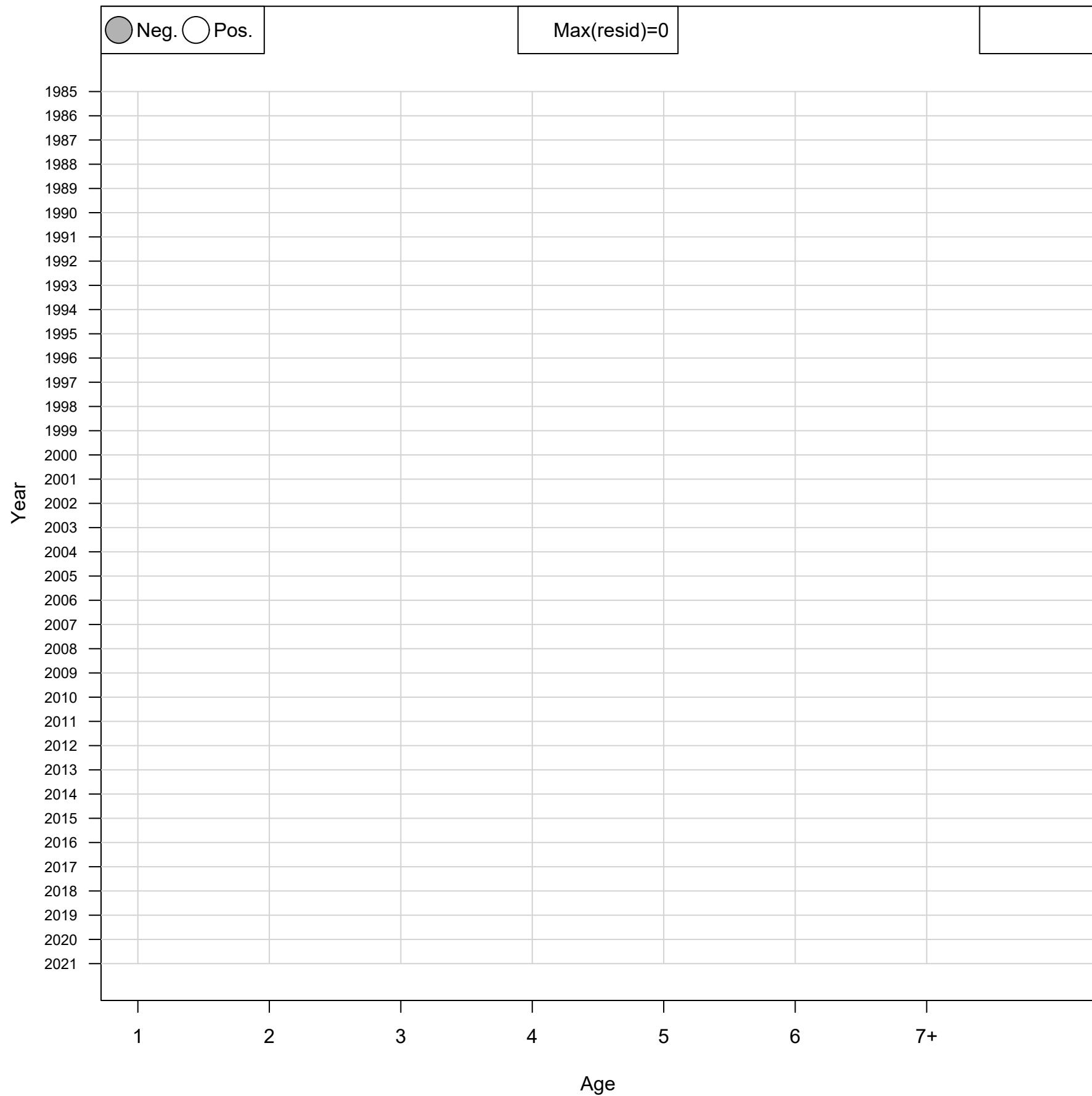
Age Comp OSA Quantile Residuals for Index 5



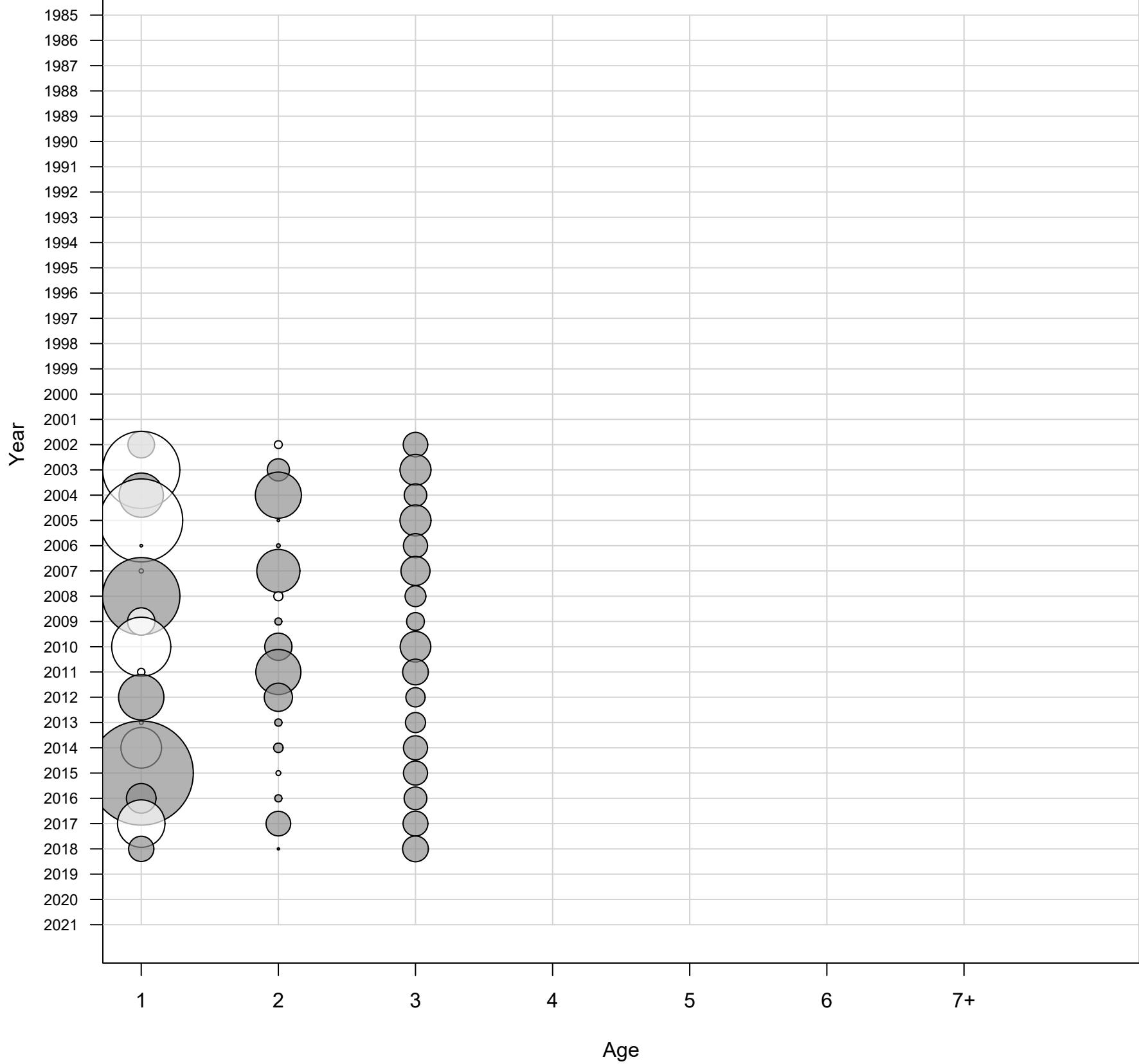
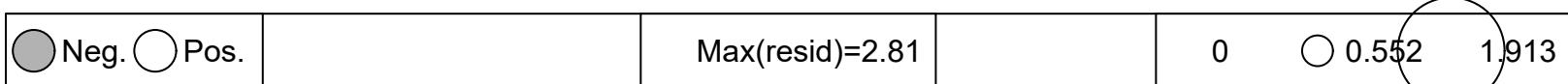
Age Comp OSA Quantile Residuals for Index 6



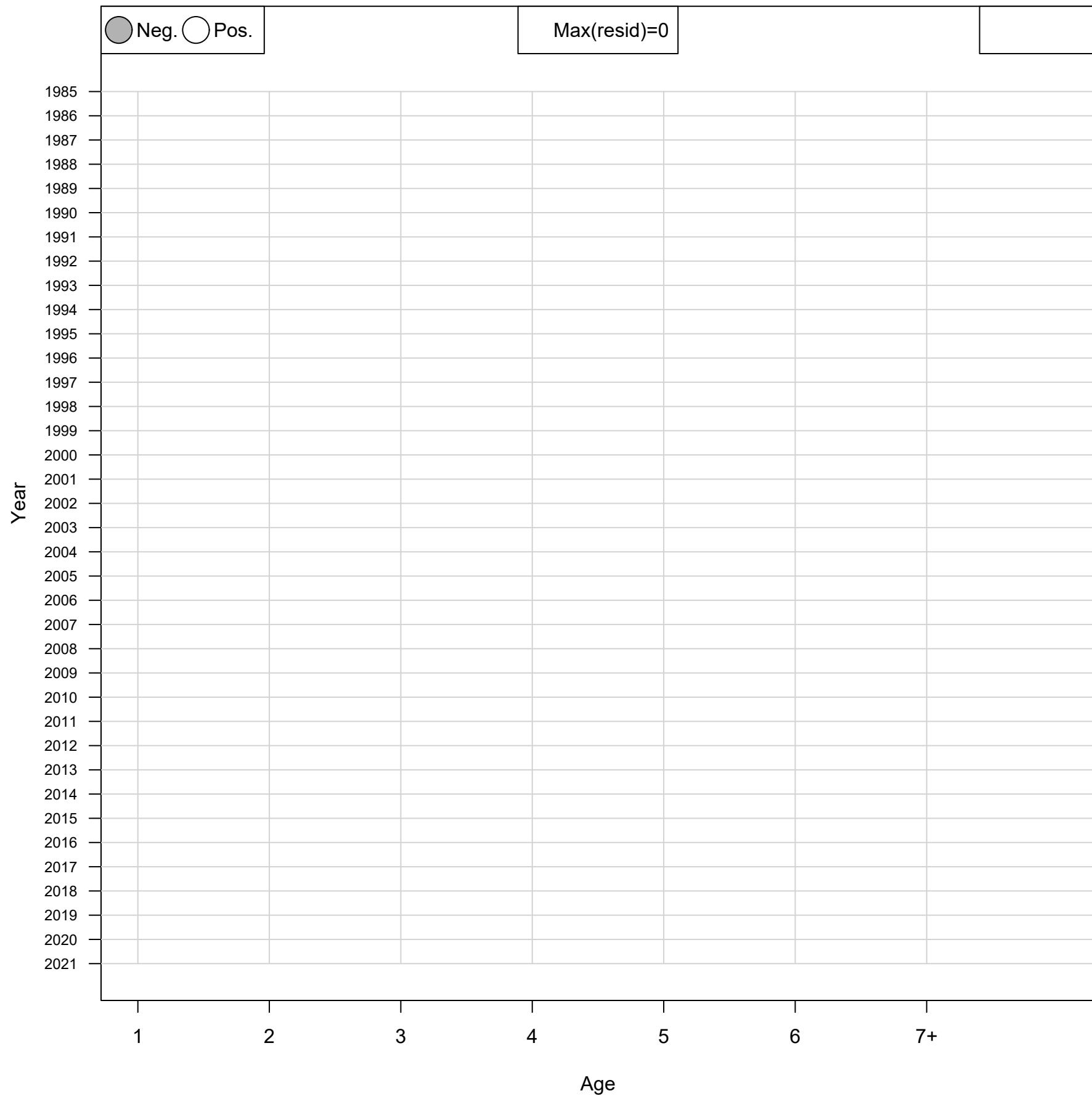
Age Comp OSA Quantile Residuals for Index 7



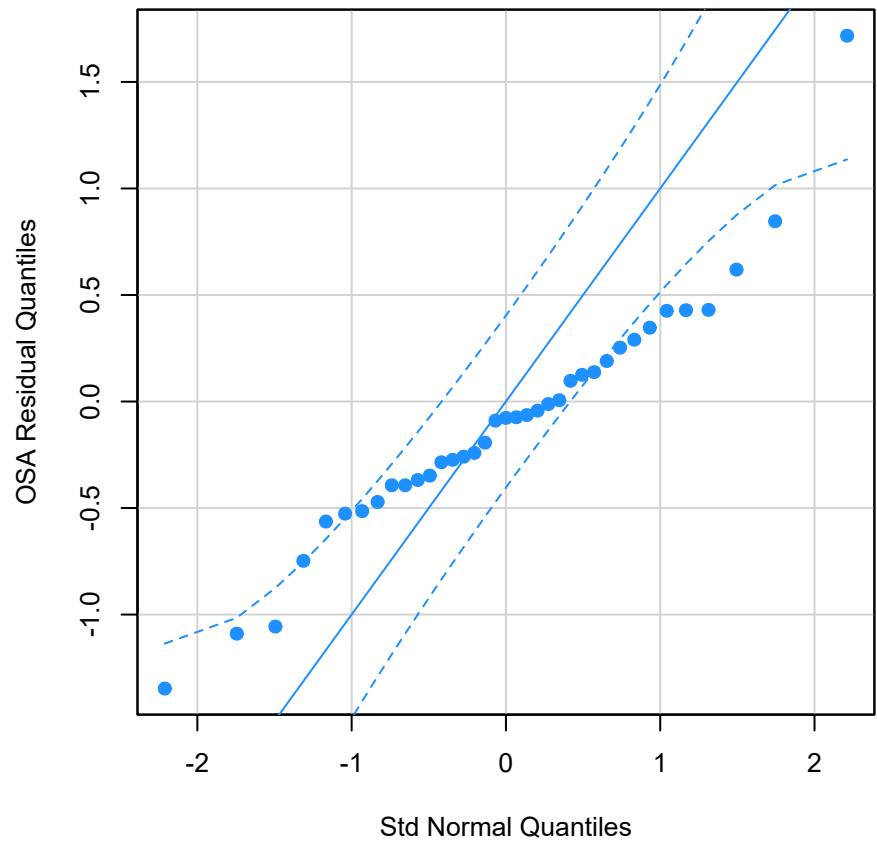
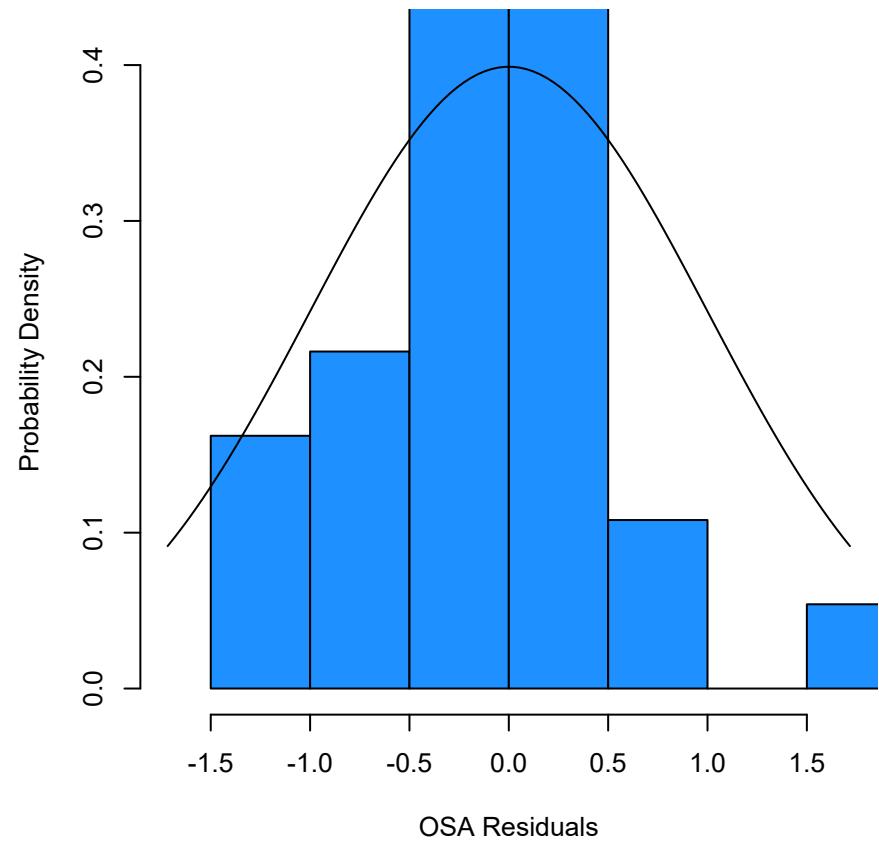
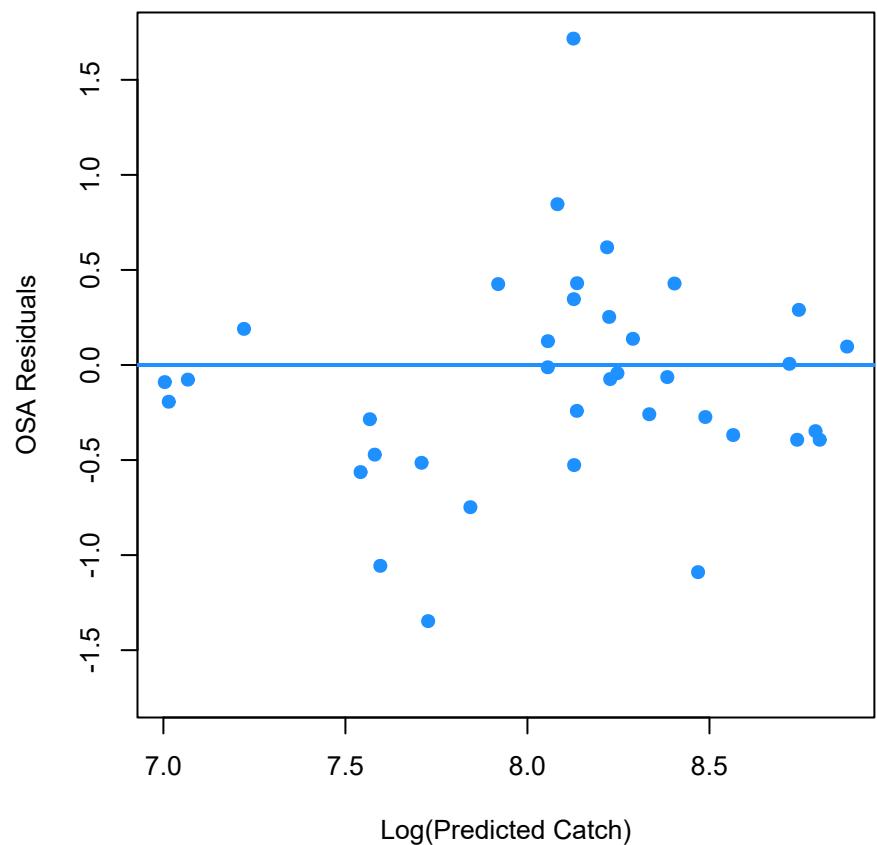
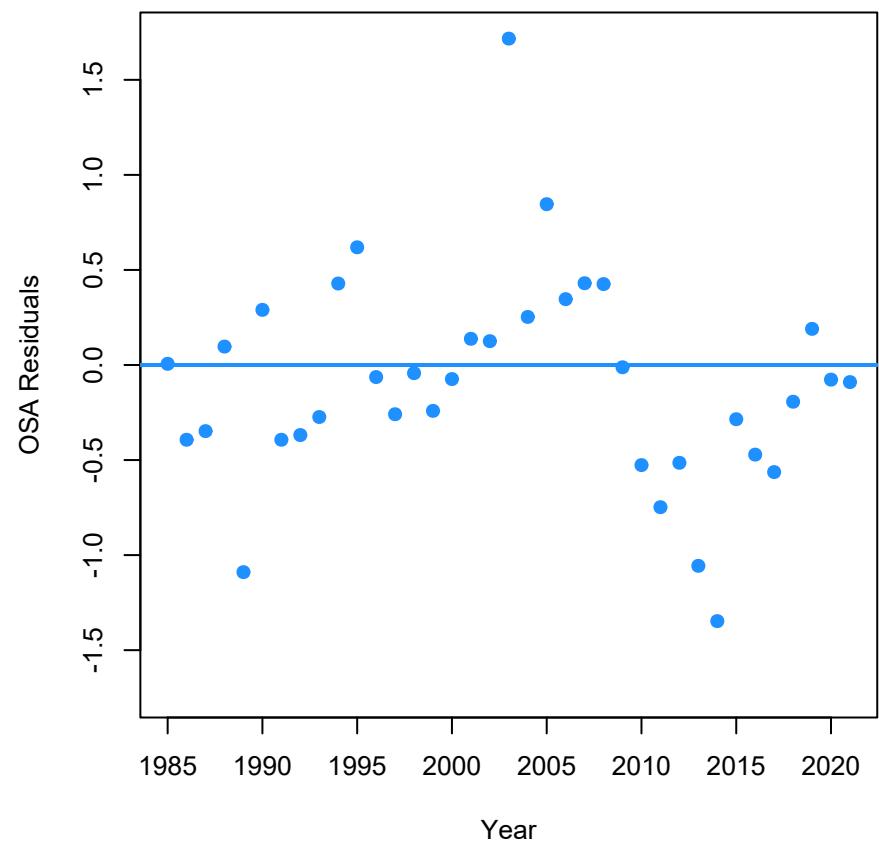
Age Comp OSA Quantile Residuals for Index 8



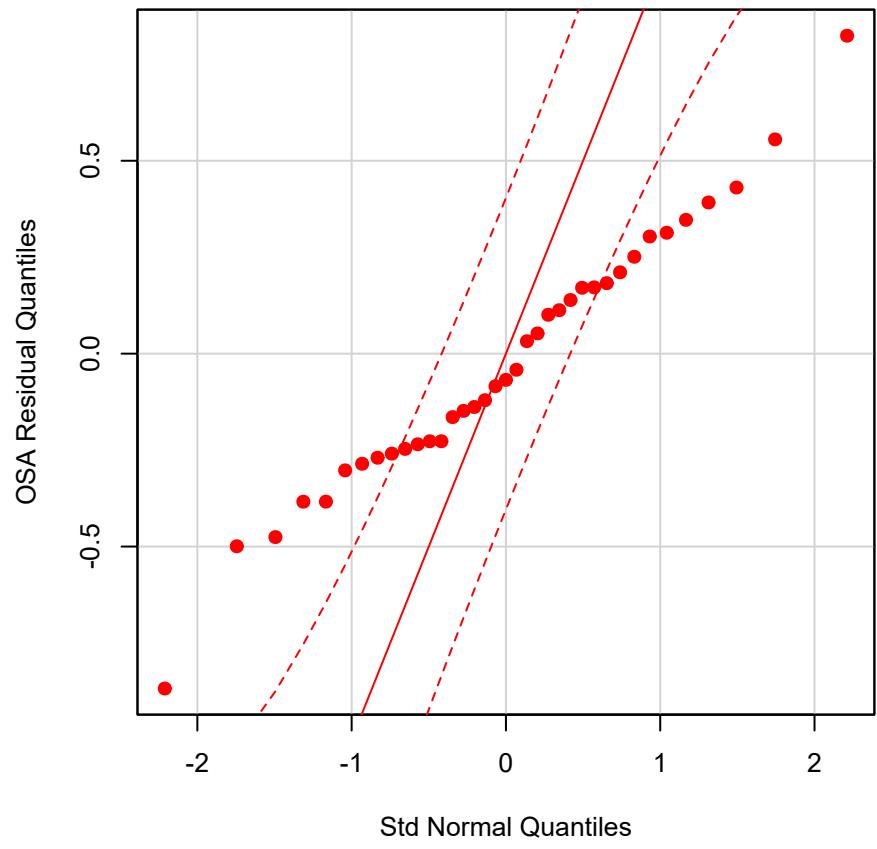
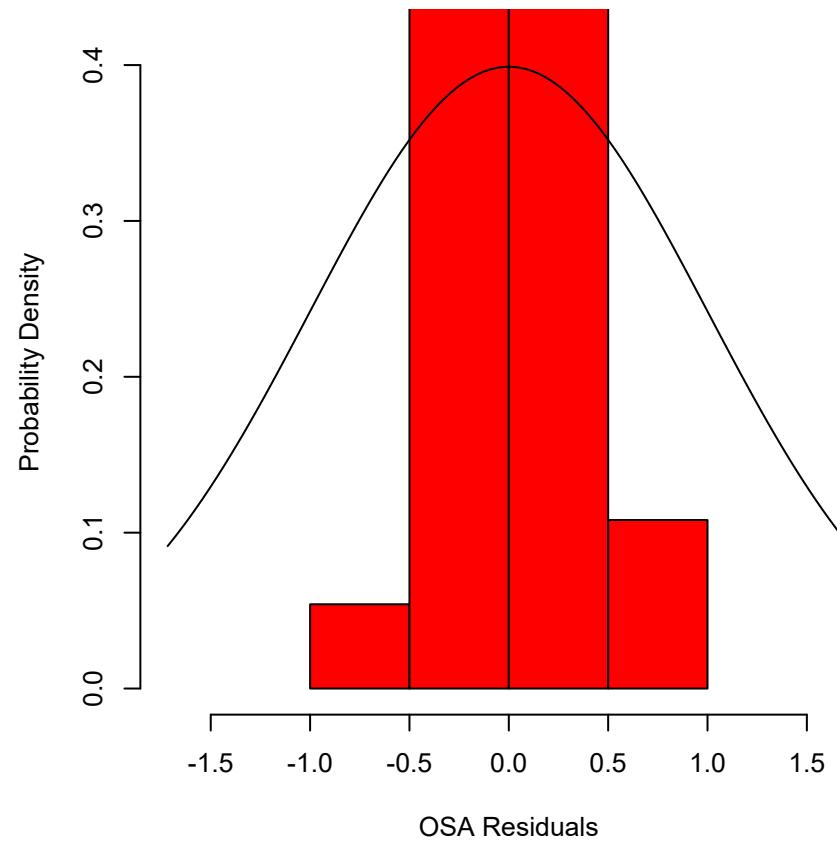
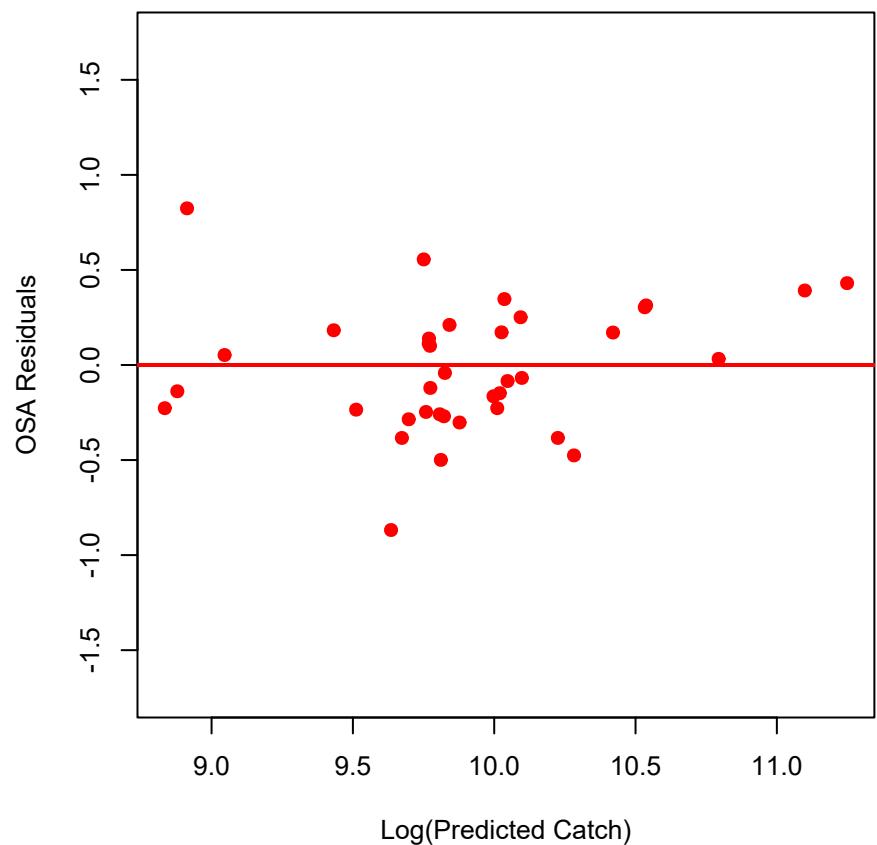
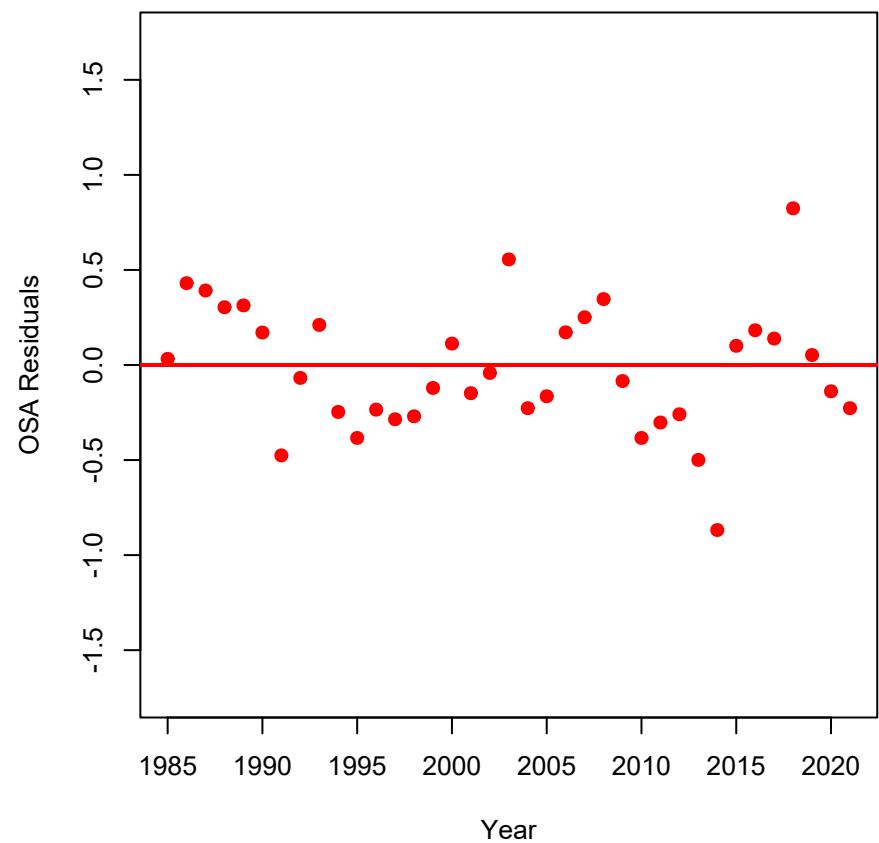
Age Comp OSA Quantile Residuals for Index 9



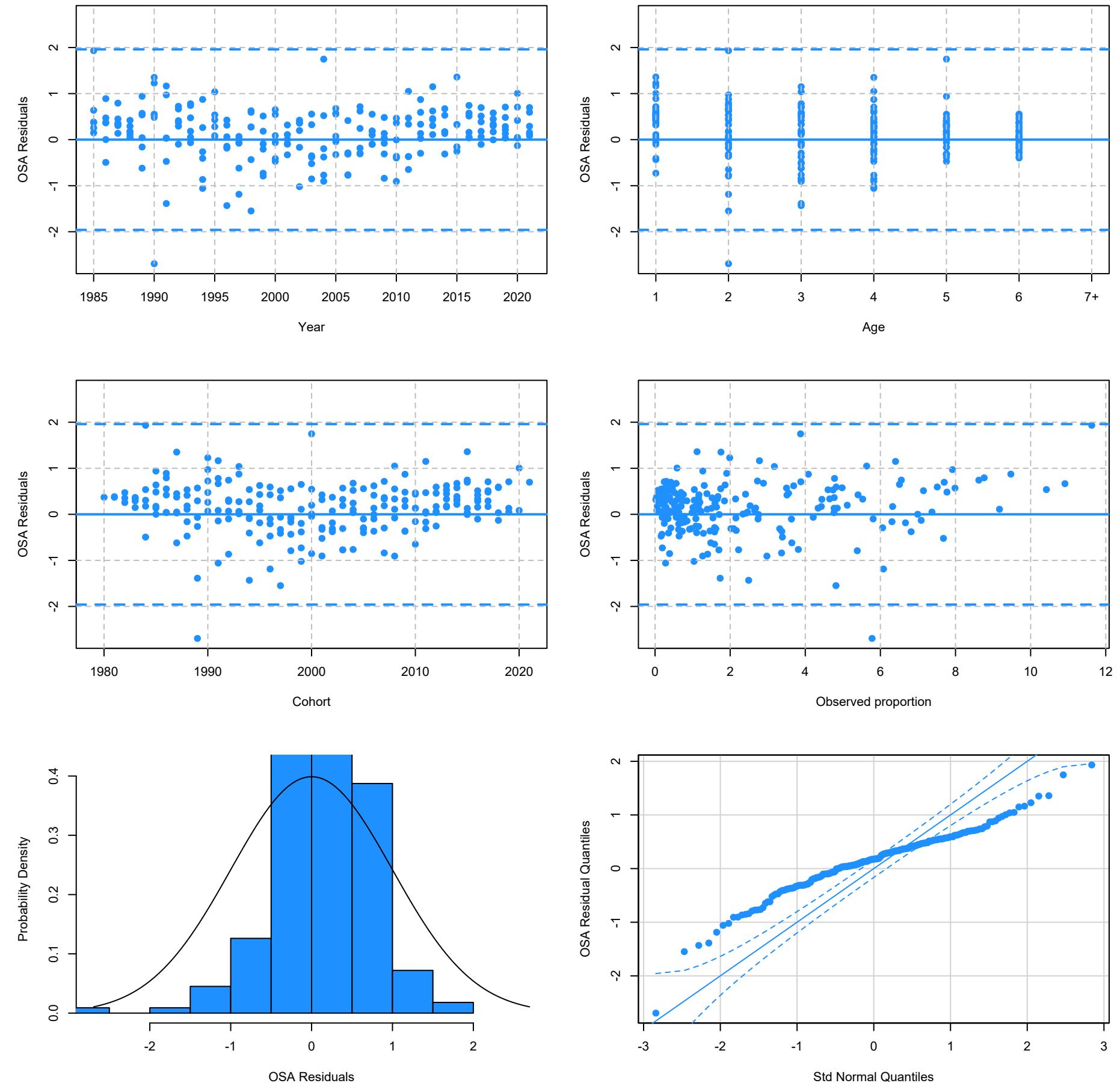
OSA residual diagnostics: Fleet 1



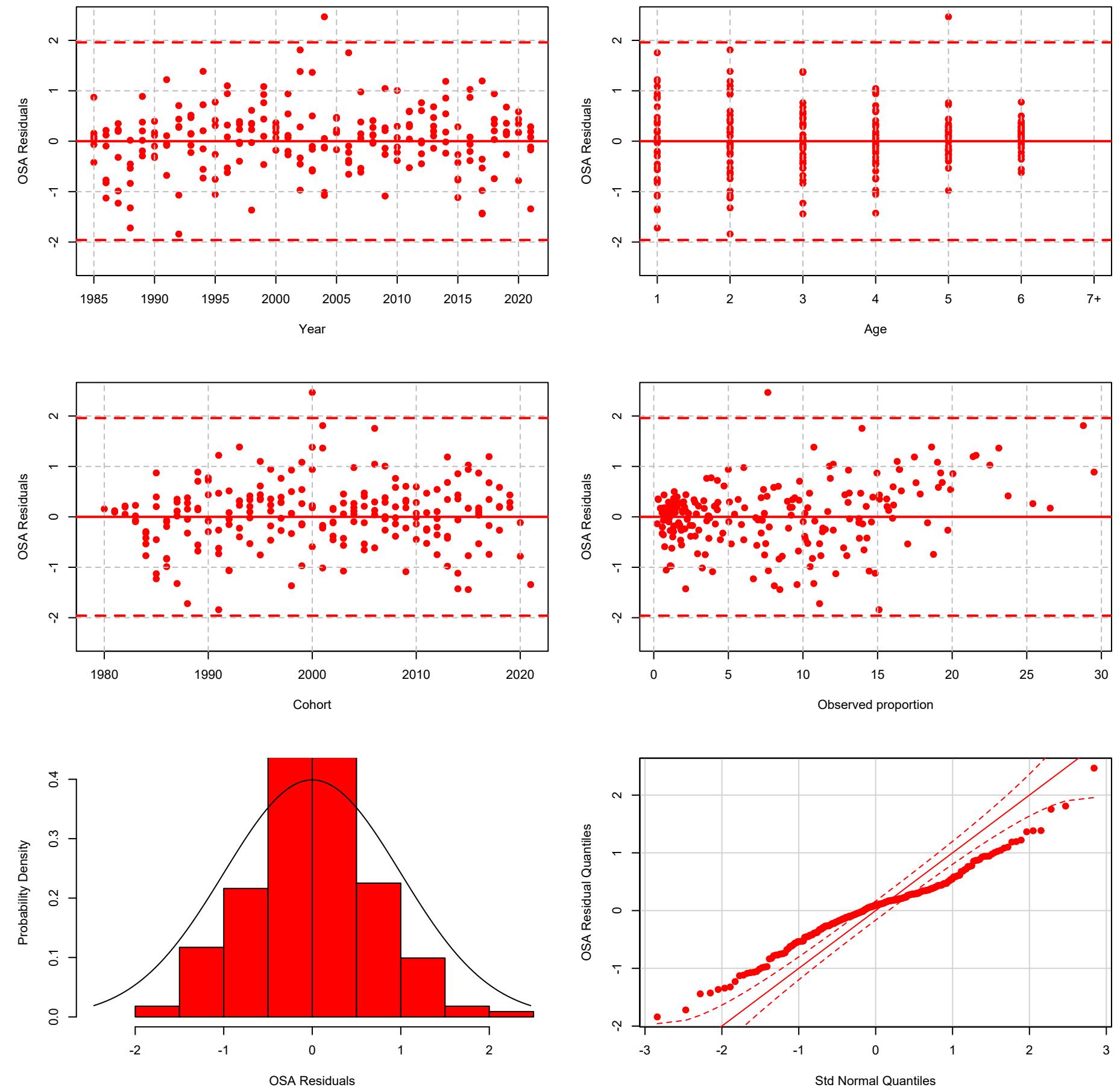
OSA residual diagnostics: Fleet 2



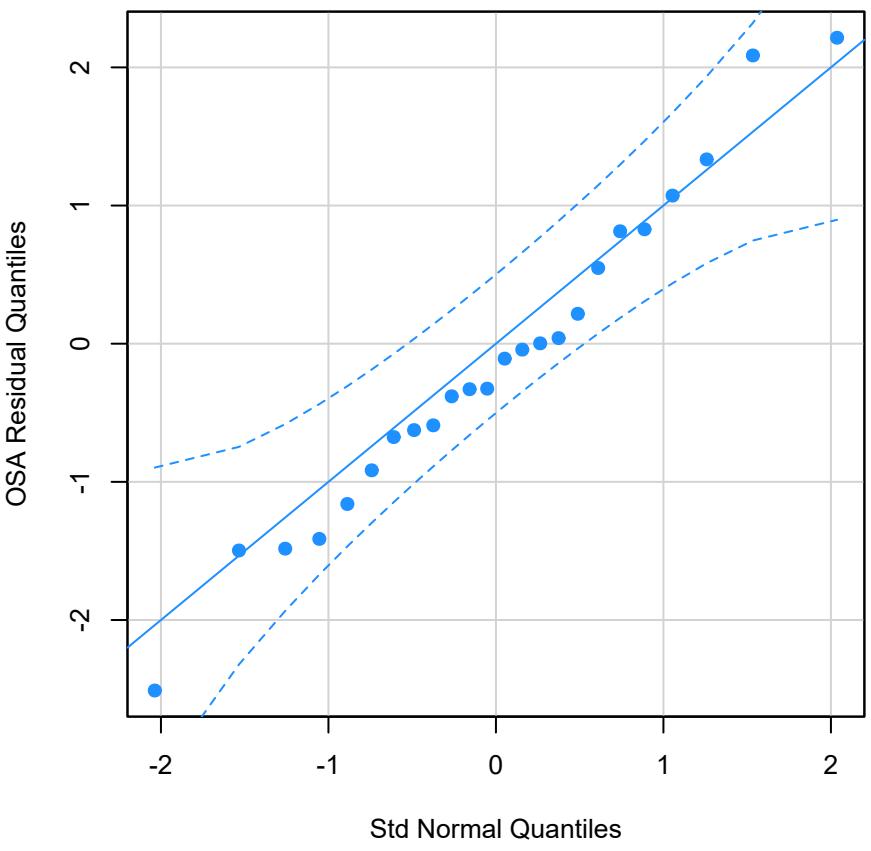
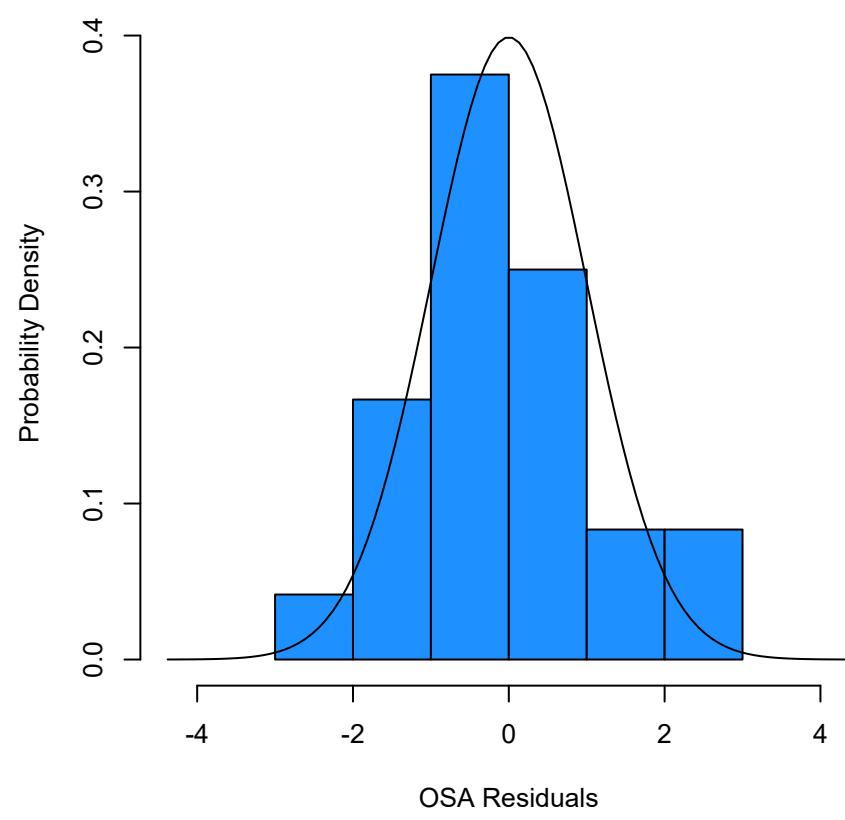
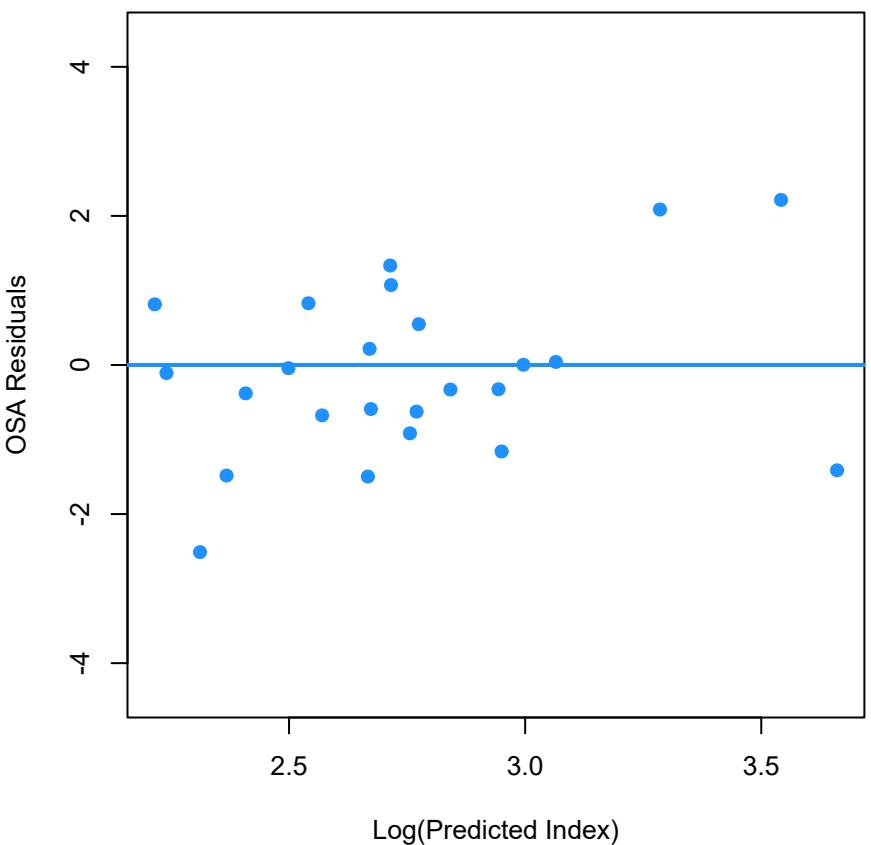
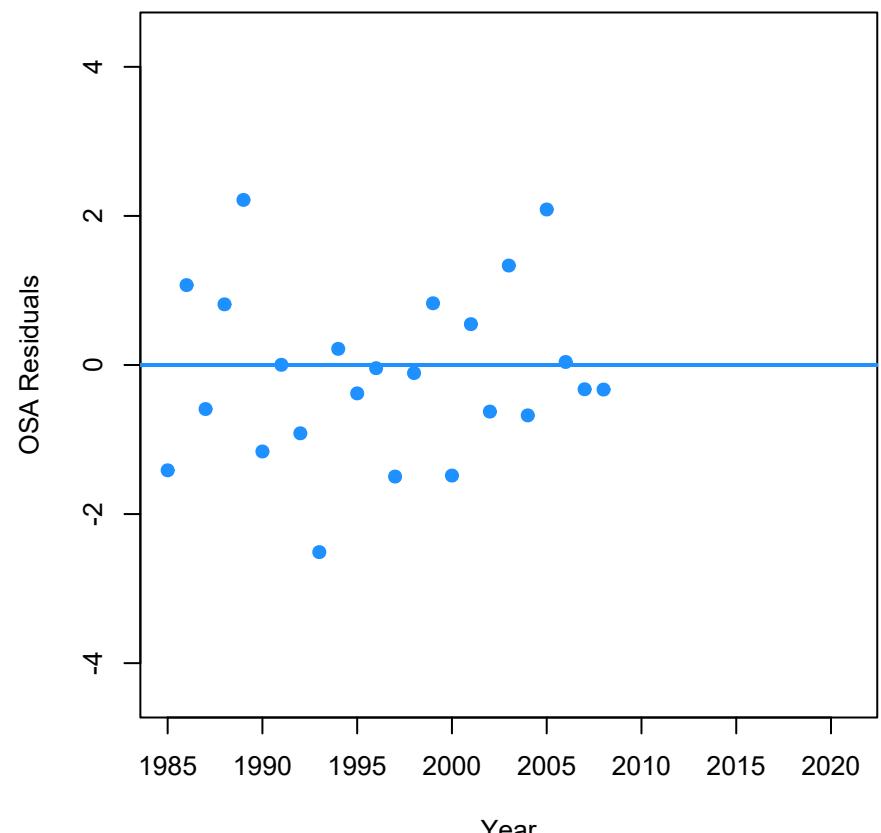
age composition OSA residual diagnostics: Fleet 1



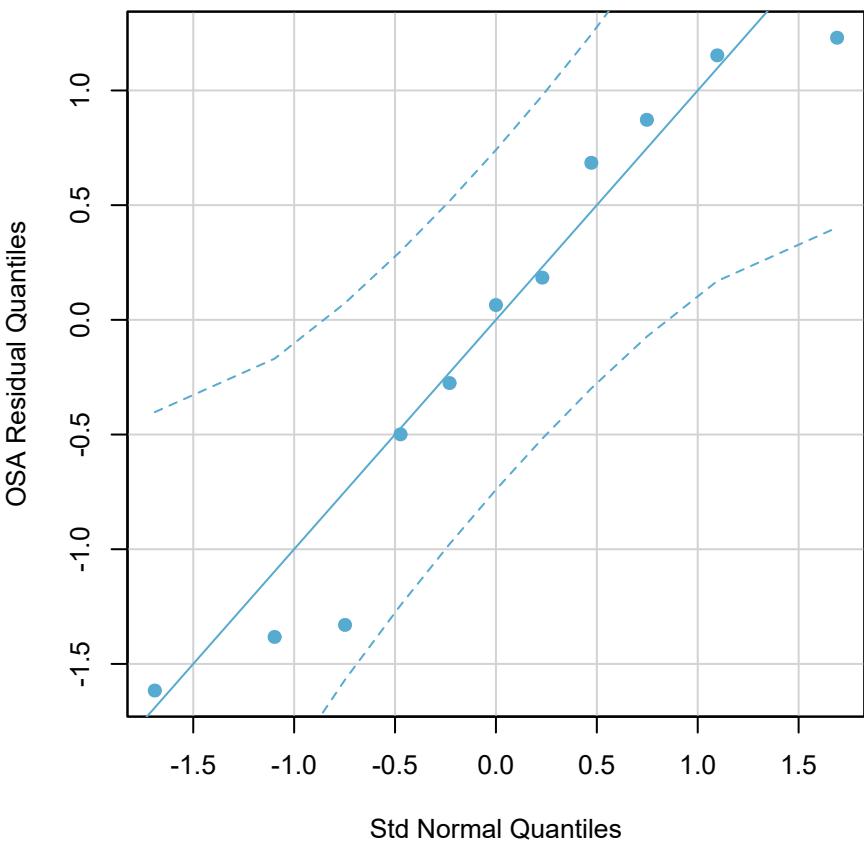
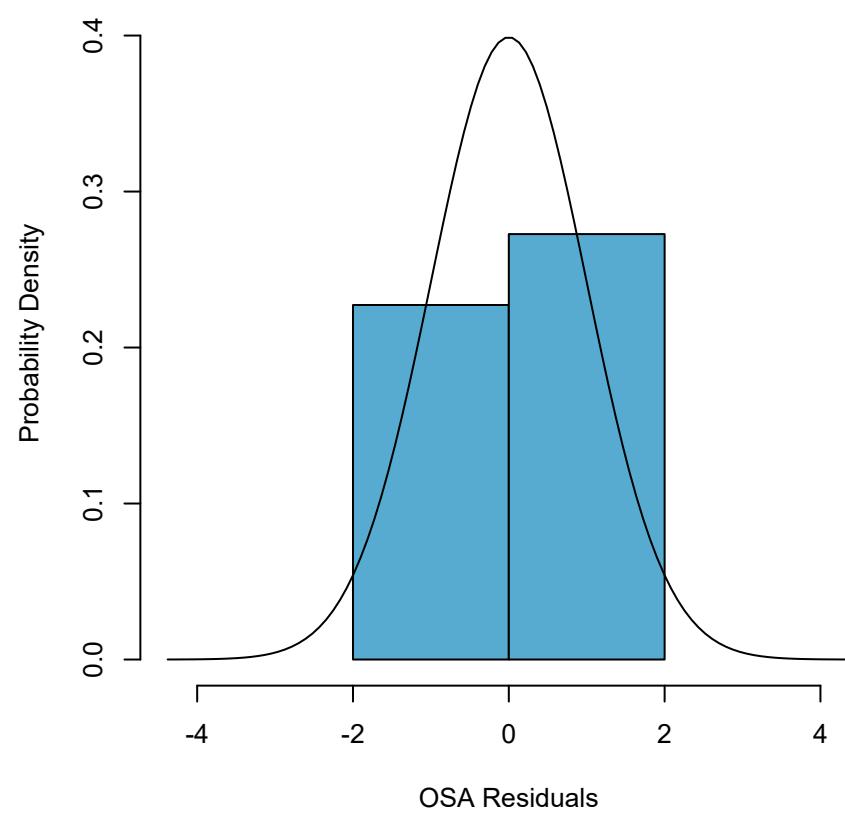
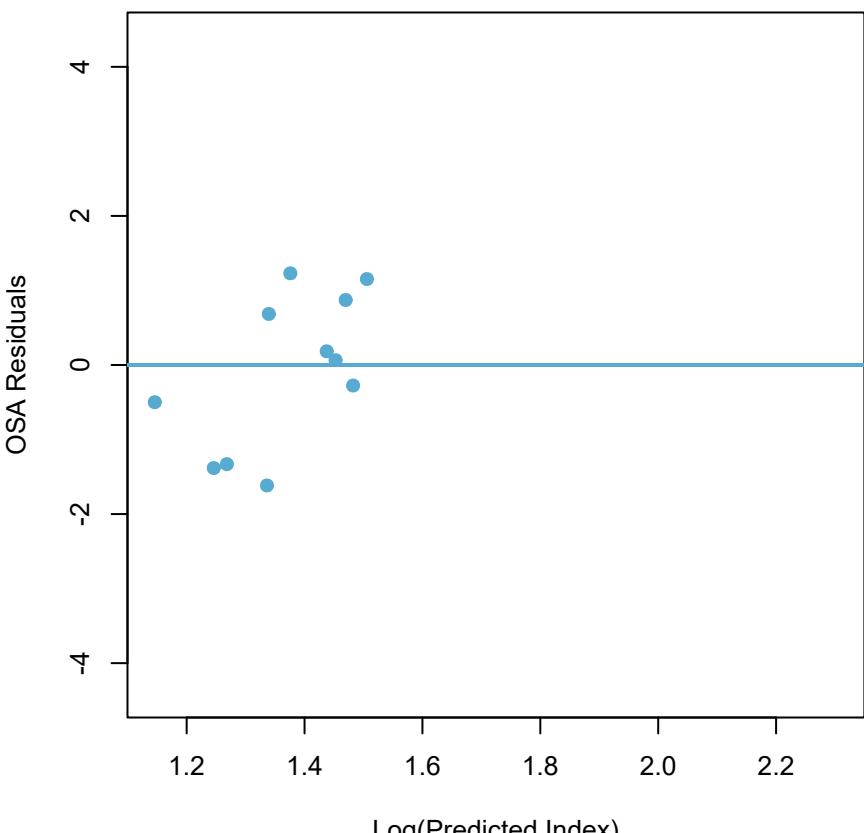
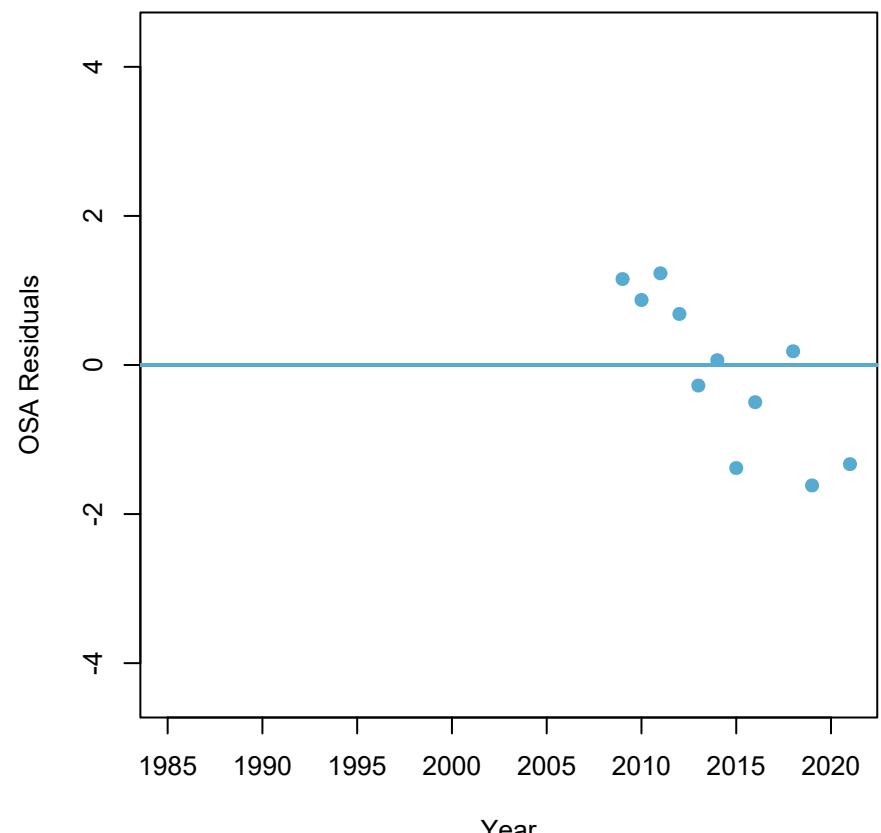
age composition OSA residual diagnostics: Fleet 2



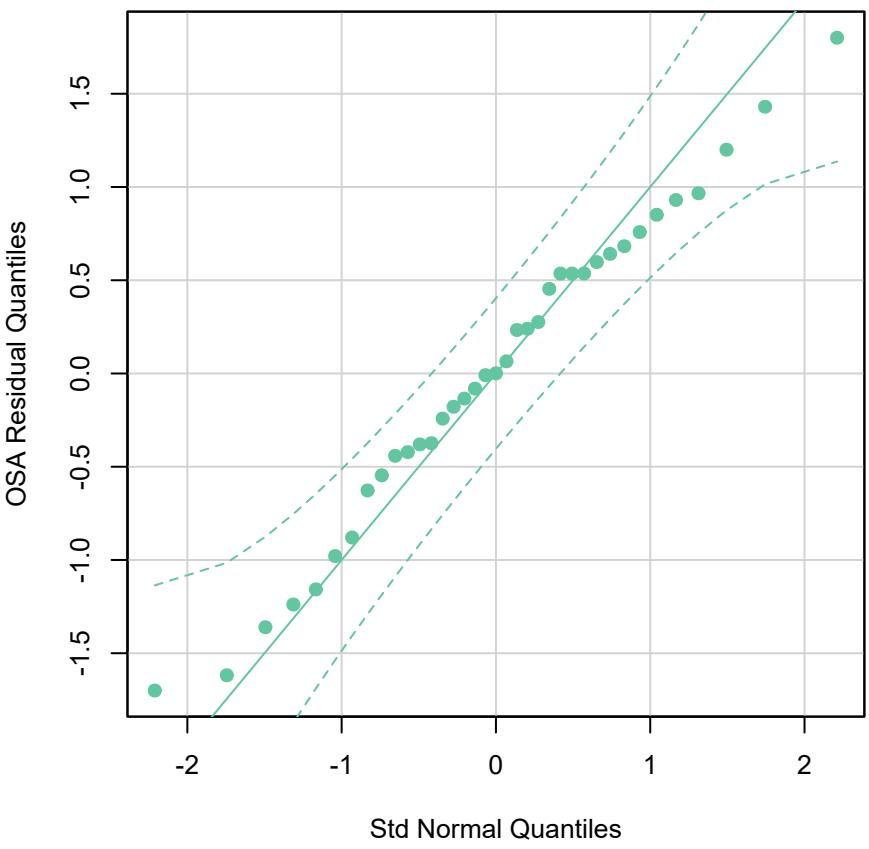
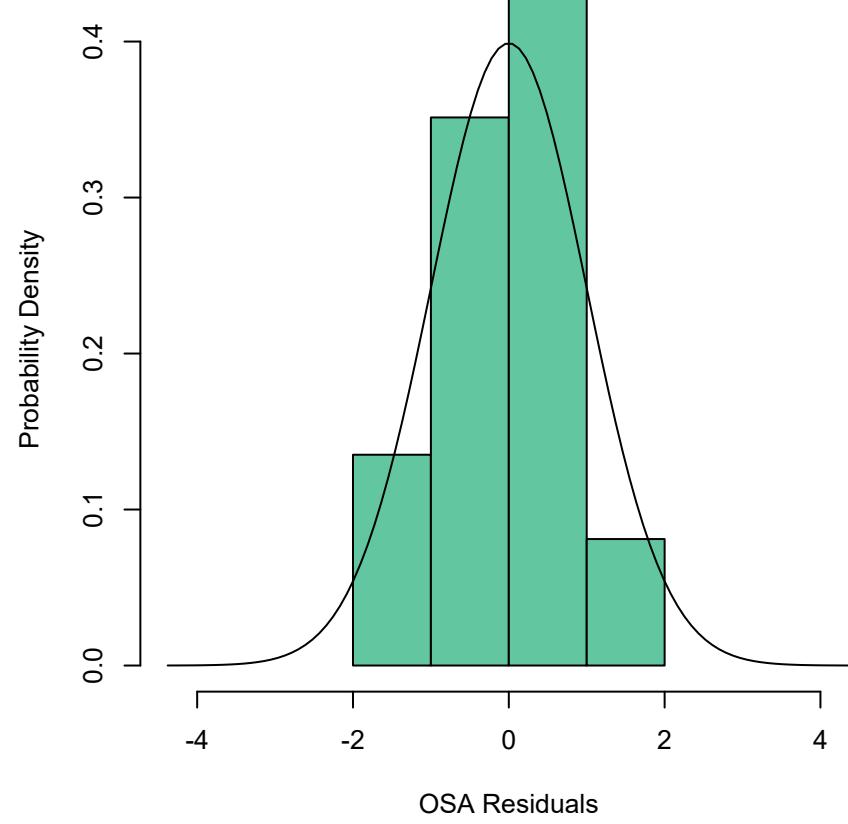
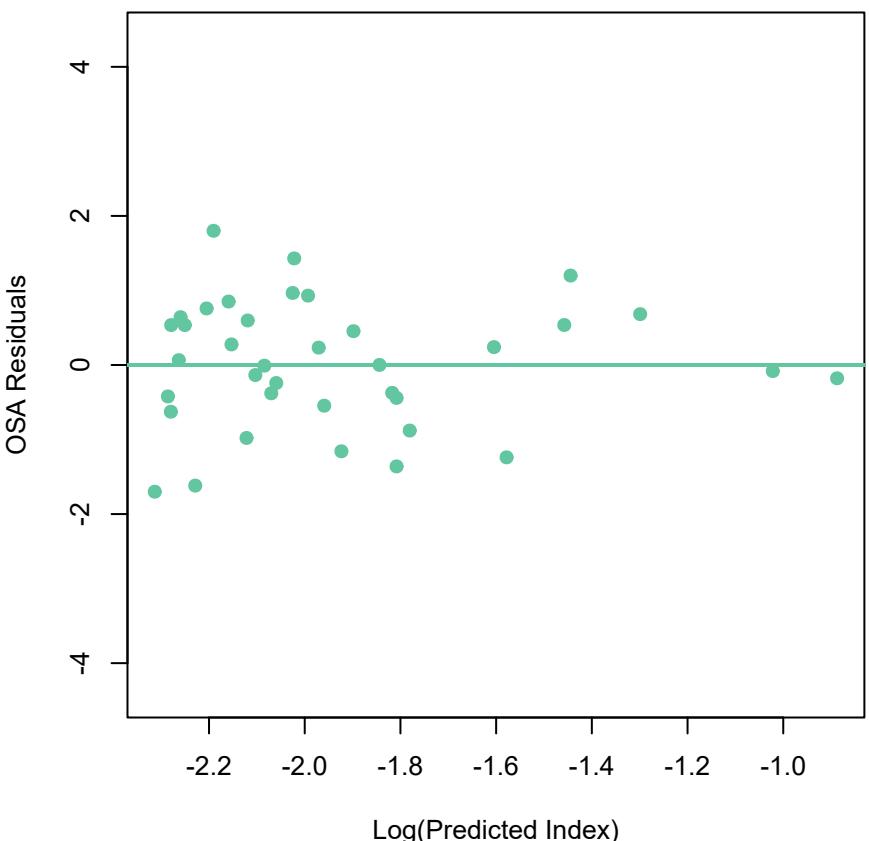
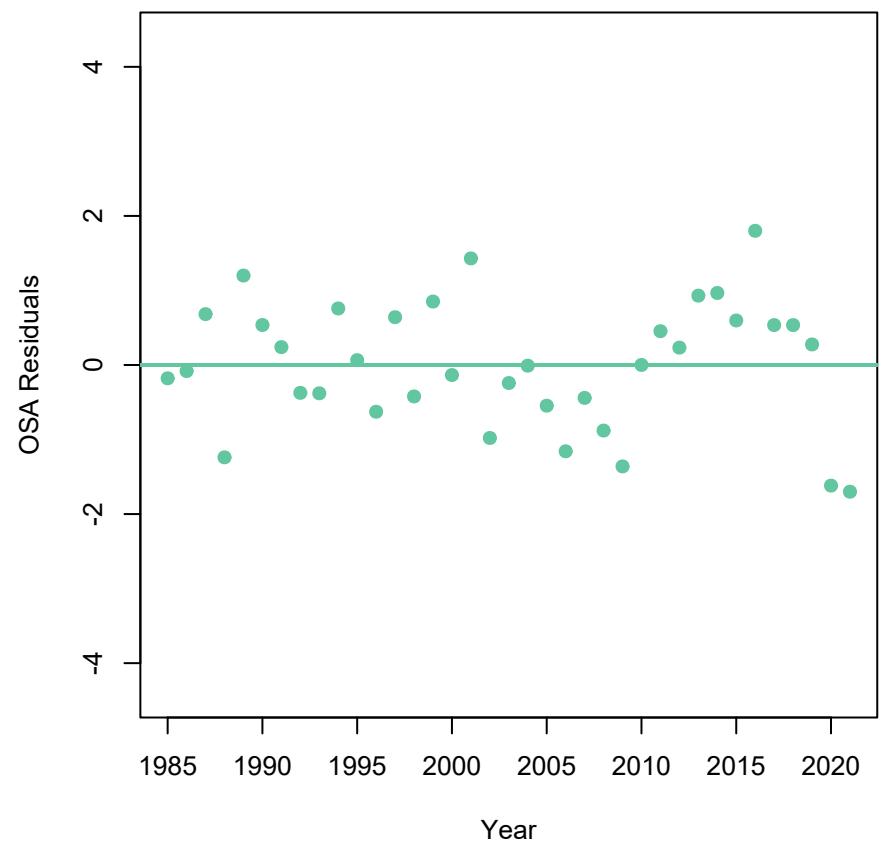
OSA residual diagnostics: Index 1



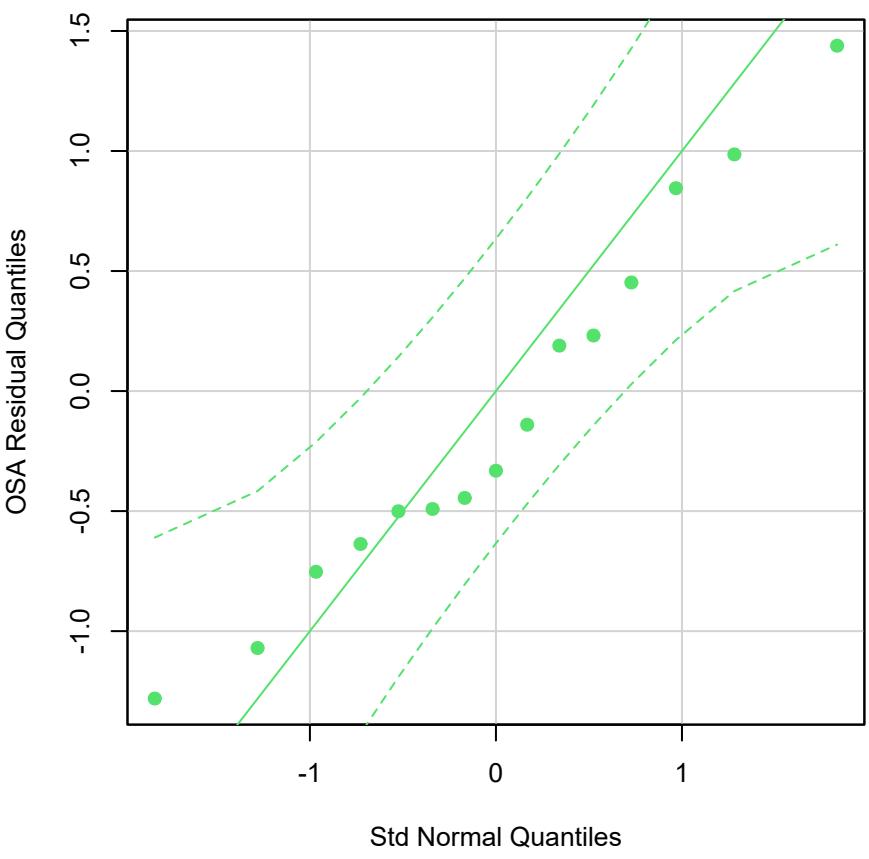
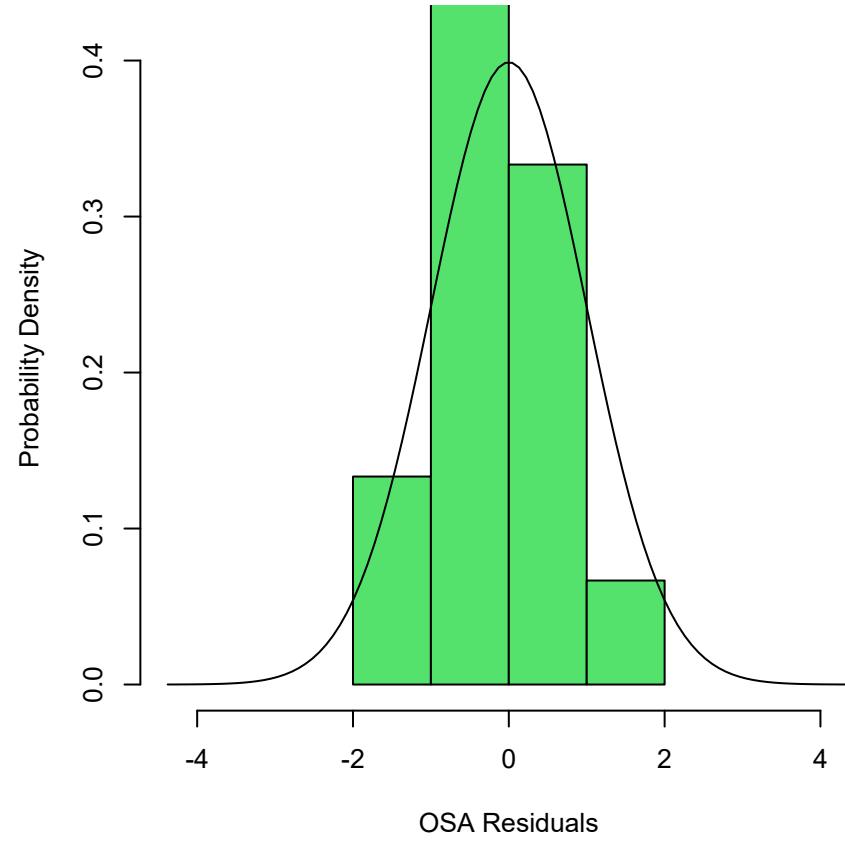
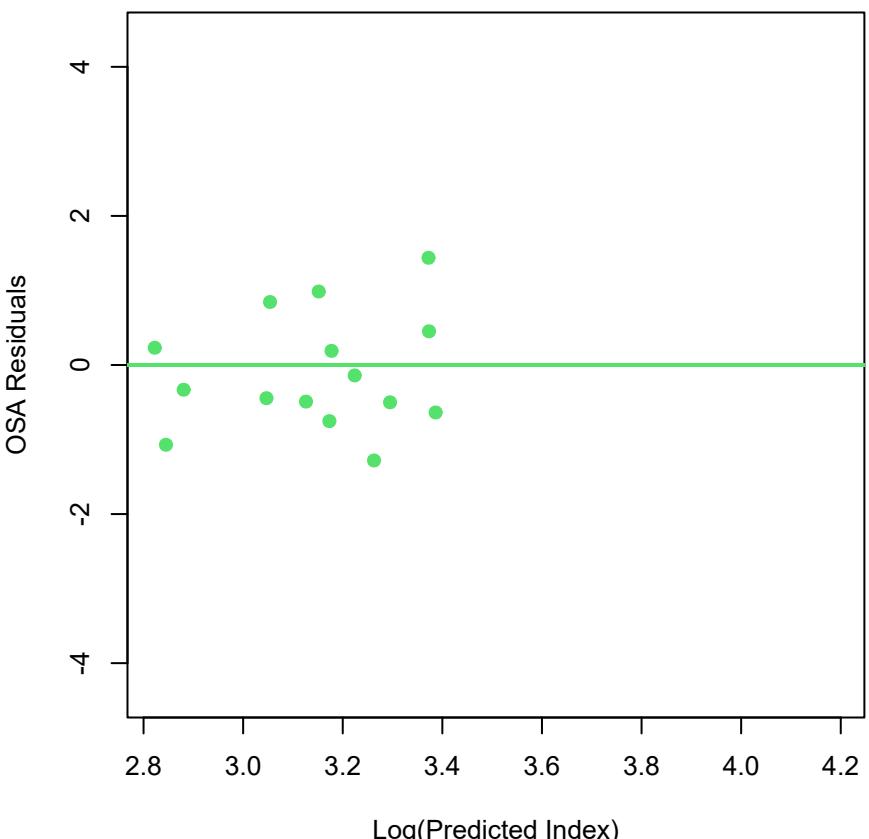
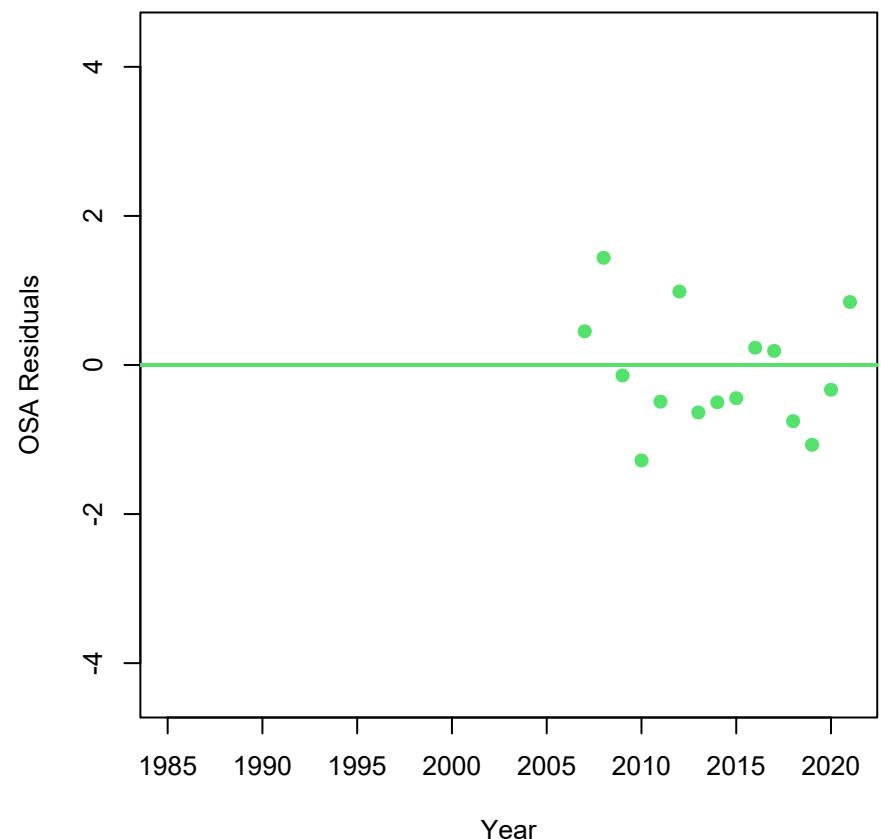
OSA residual diagnostics: Index 2



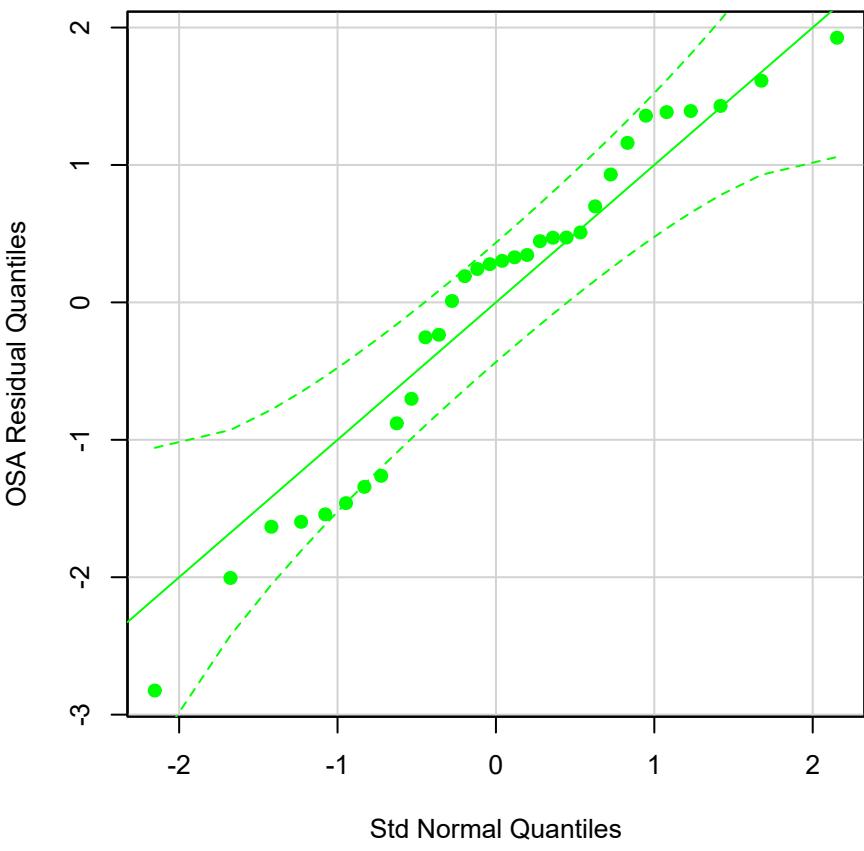
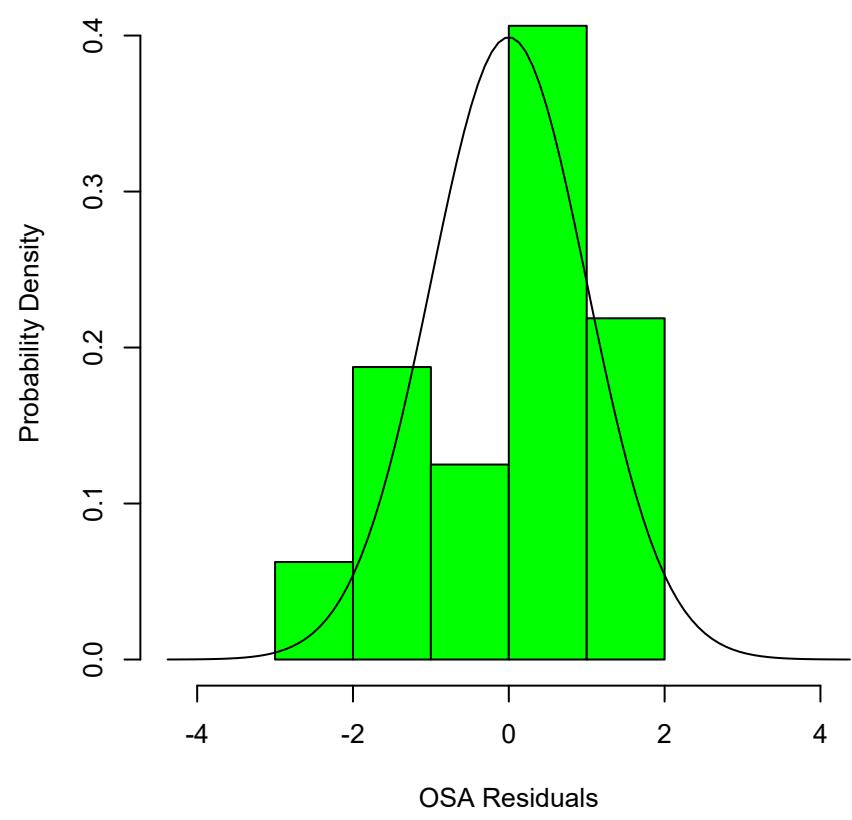
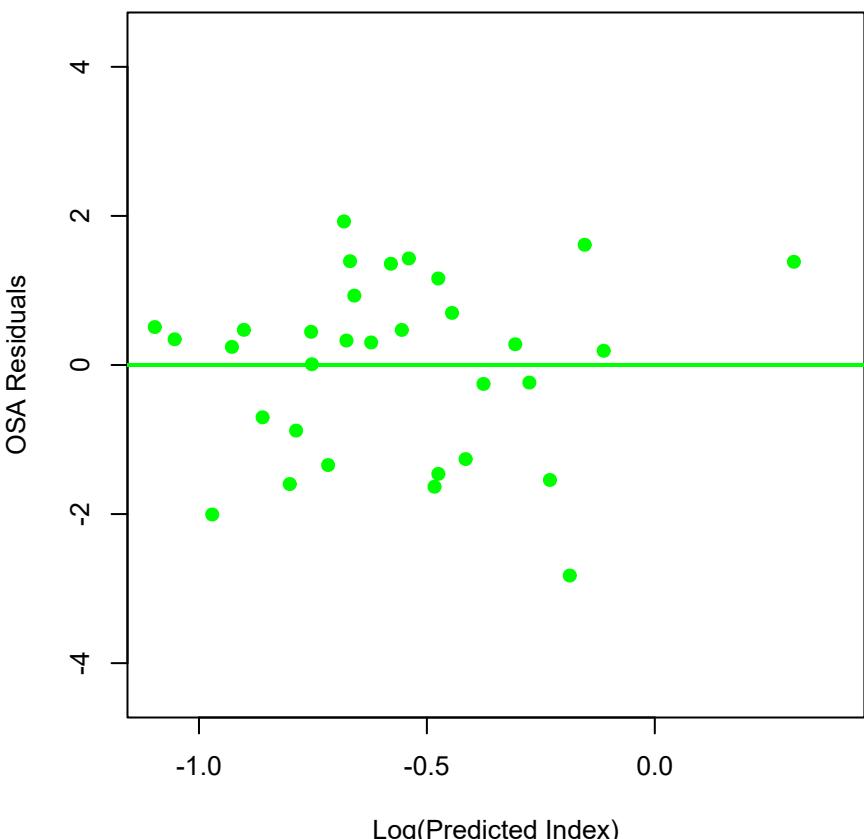
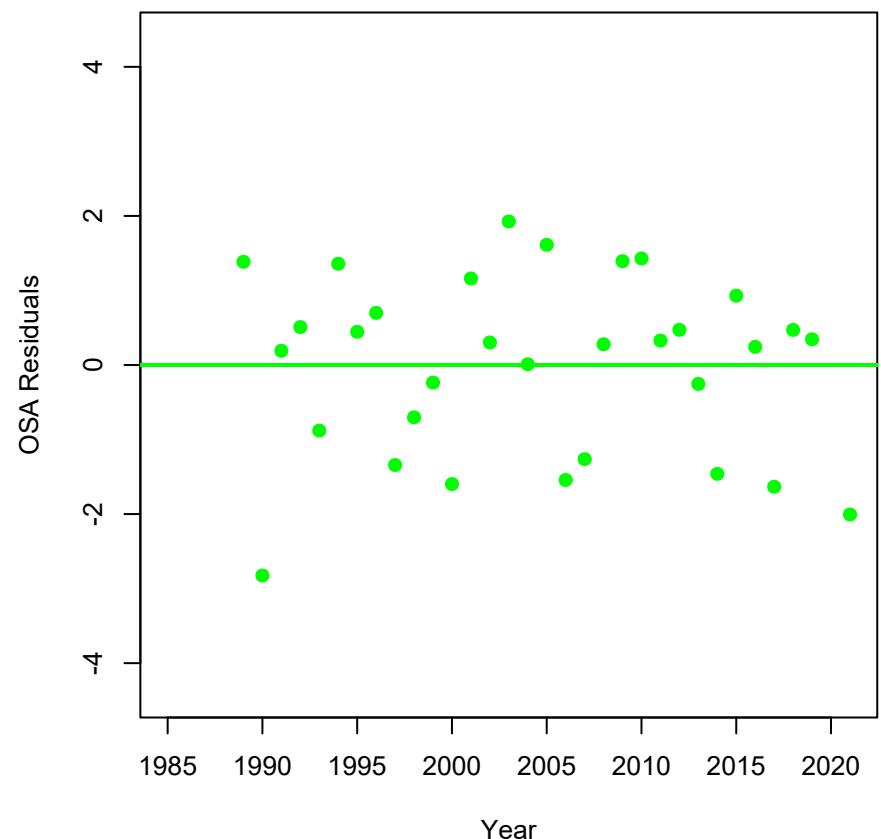
OSA residual diagnostics: Index 3



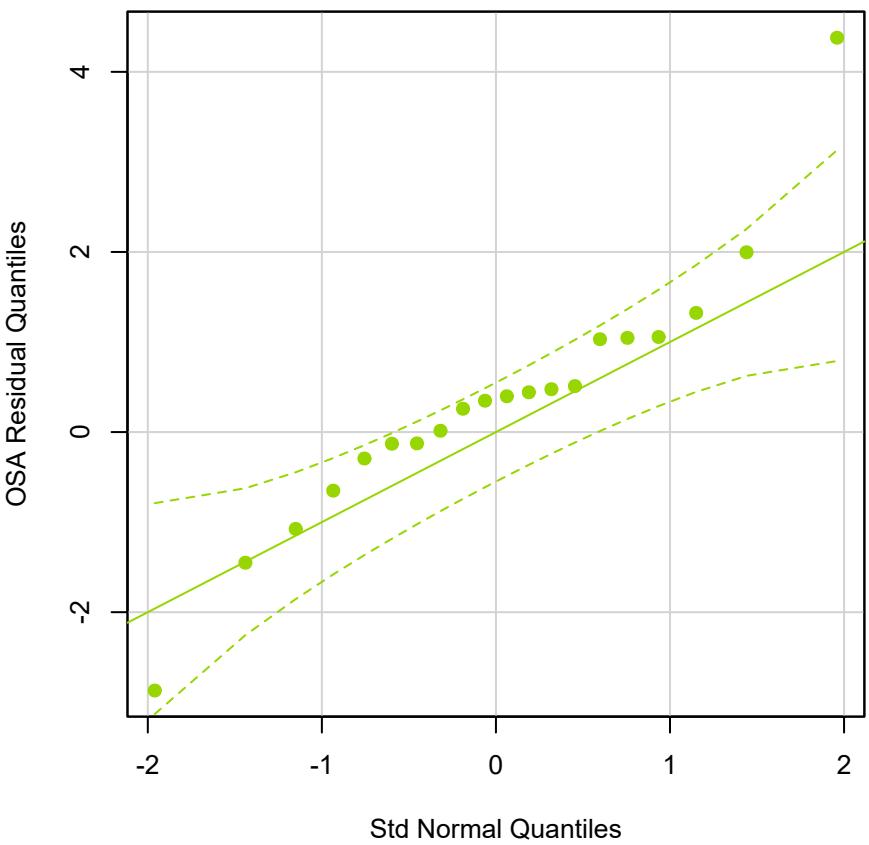
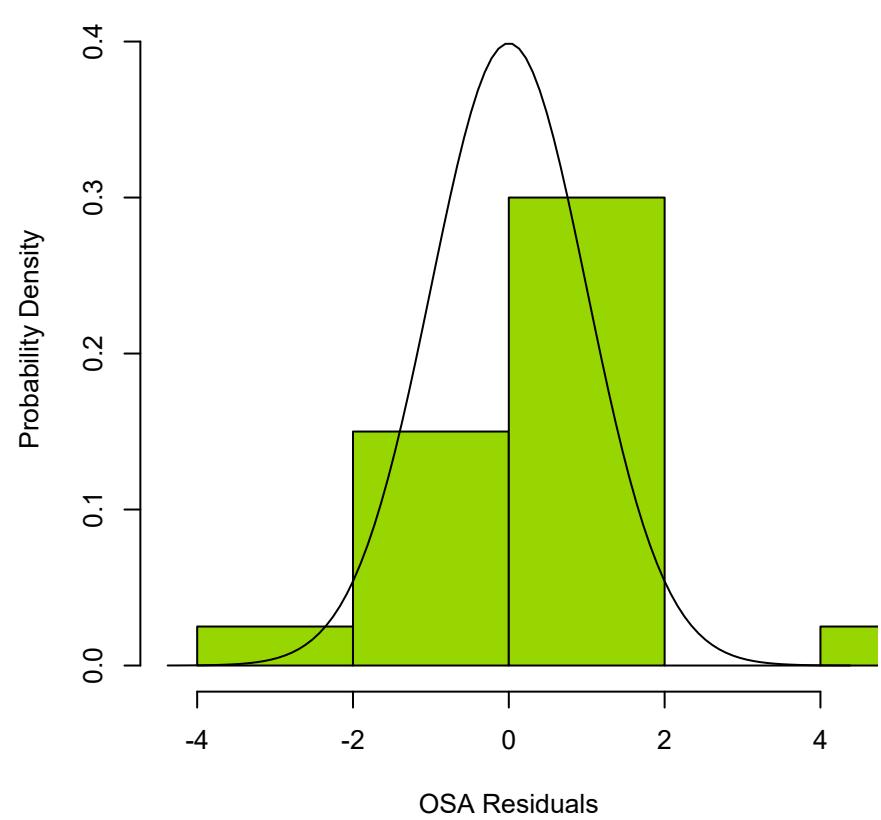
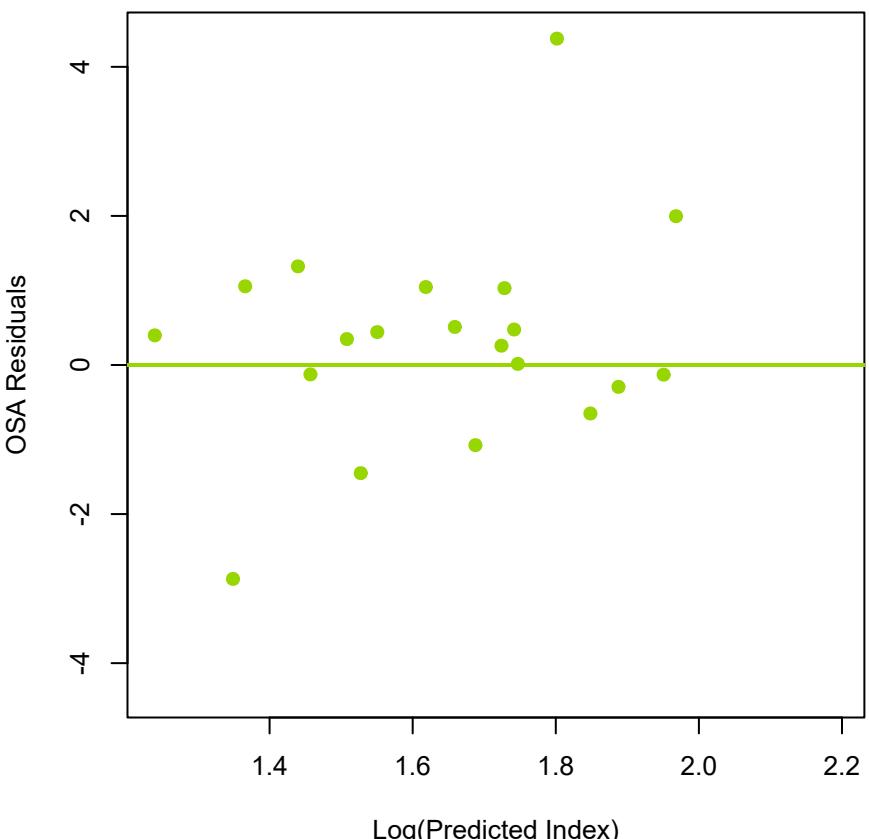
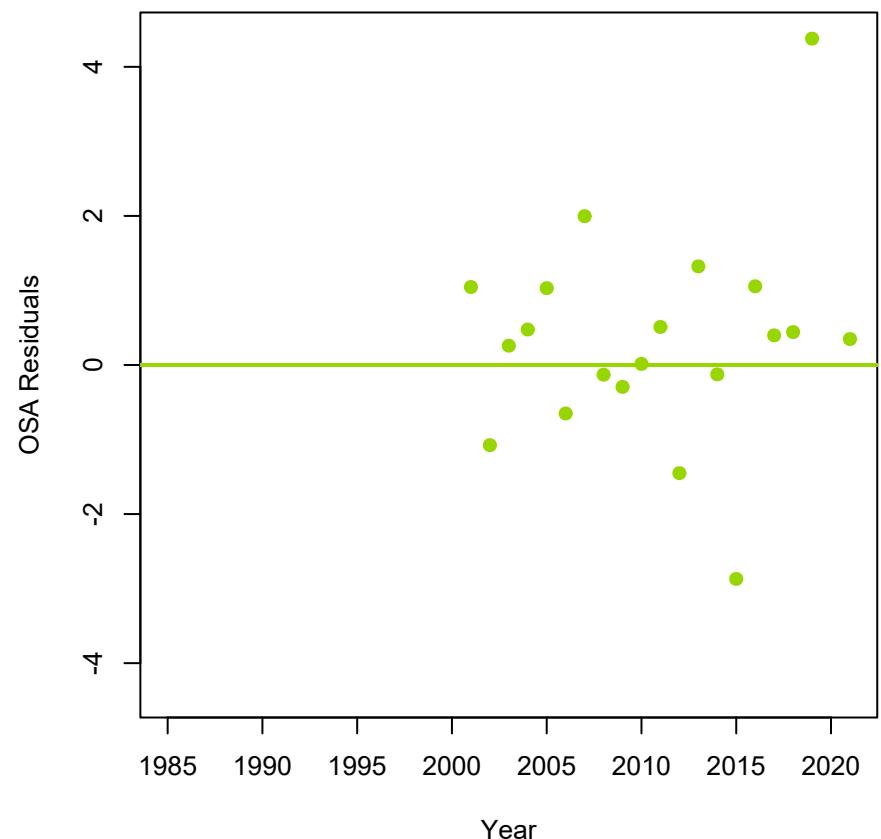
OSA residual diagnostics: Index 4



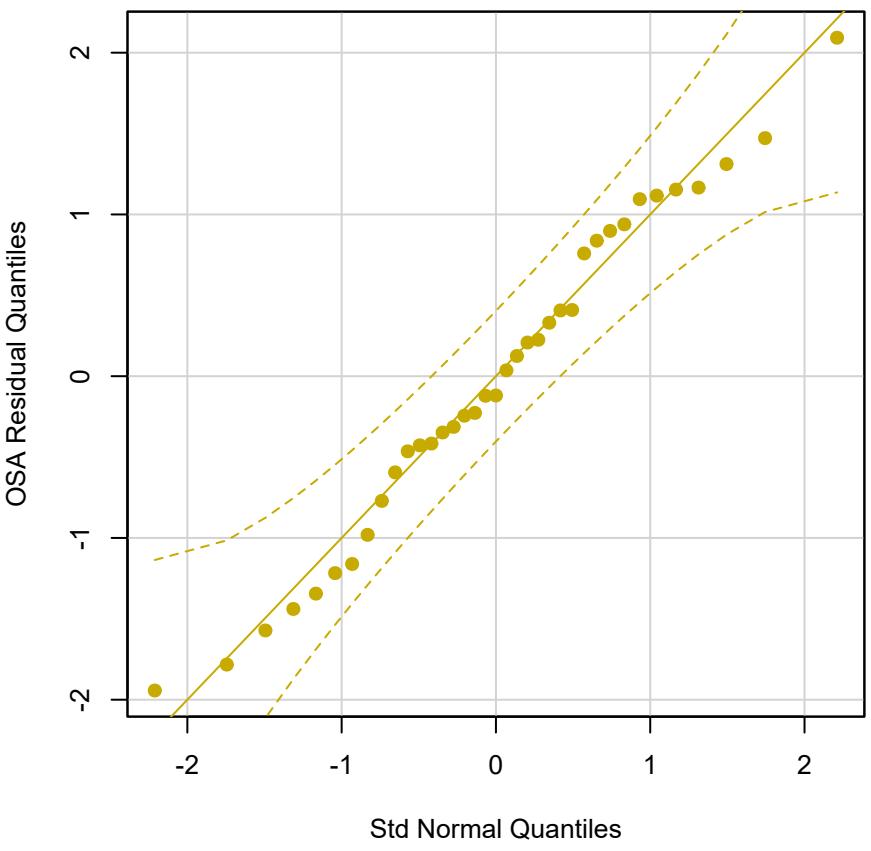
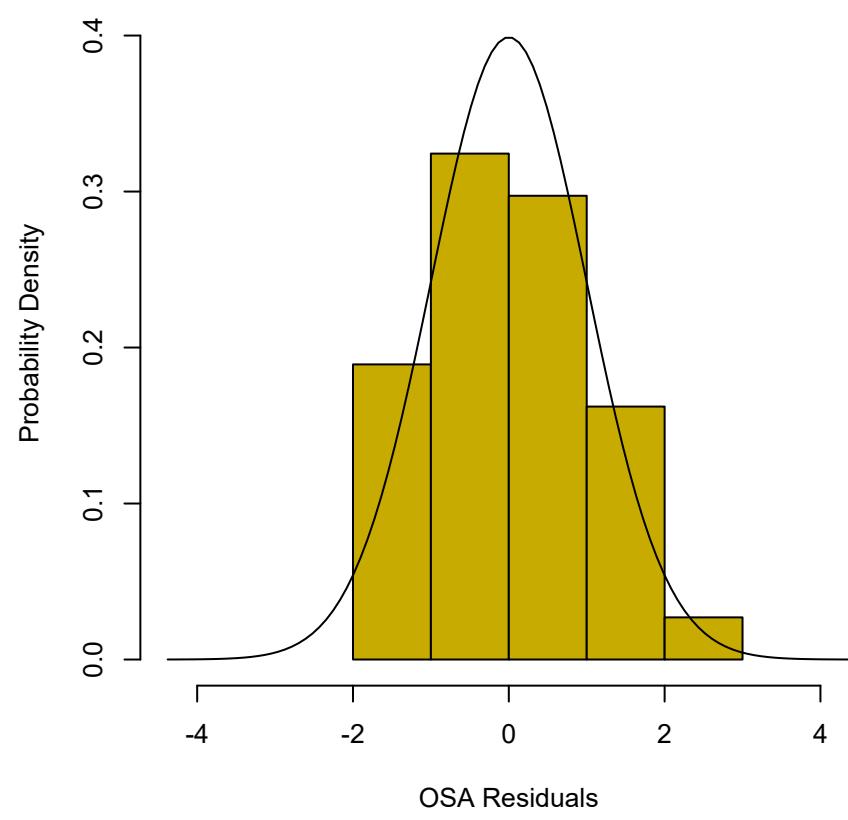
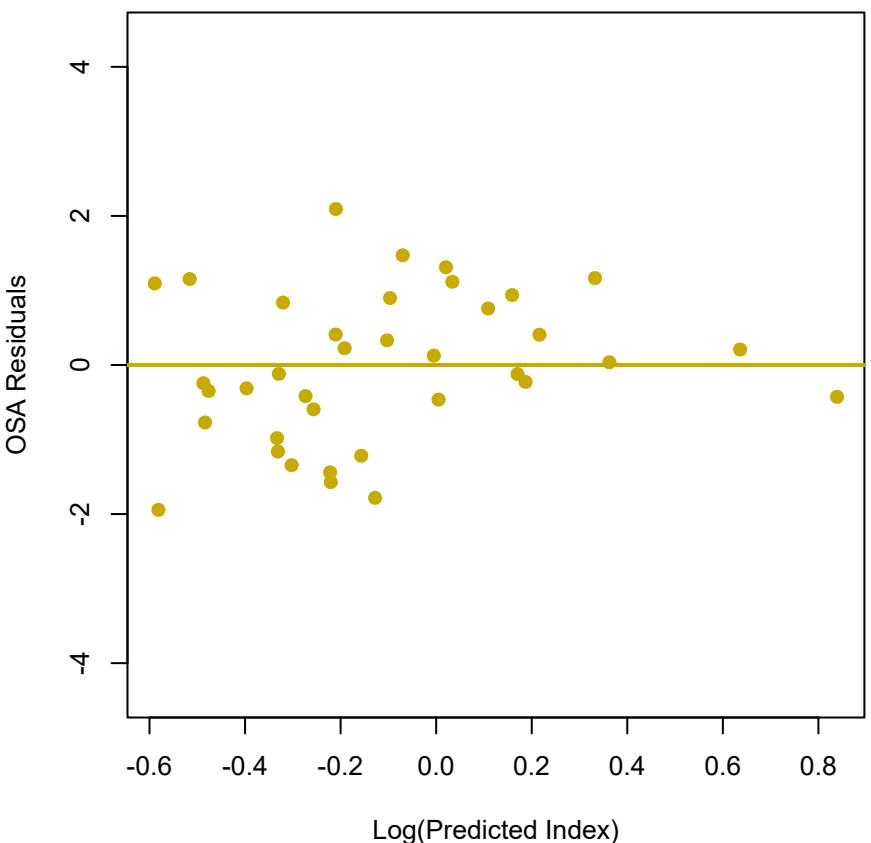
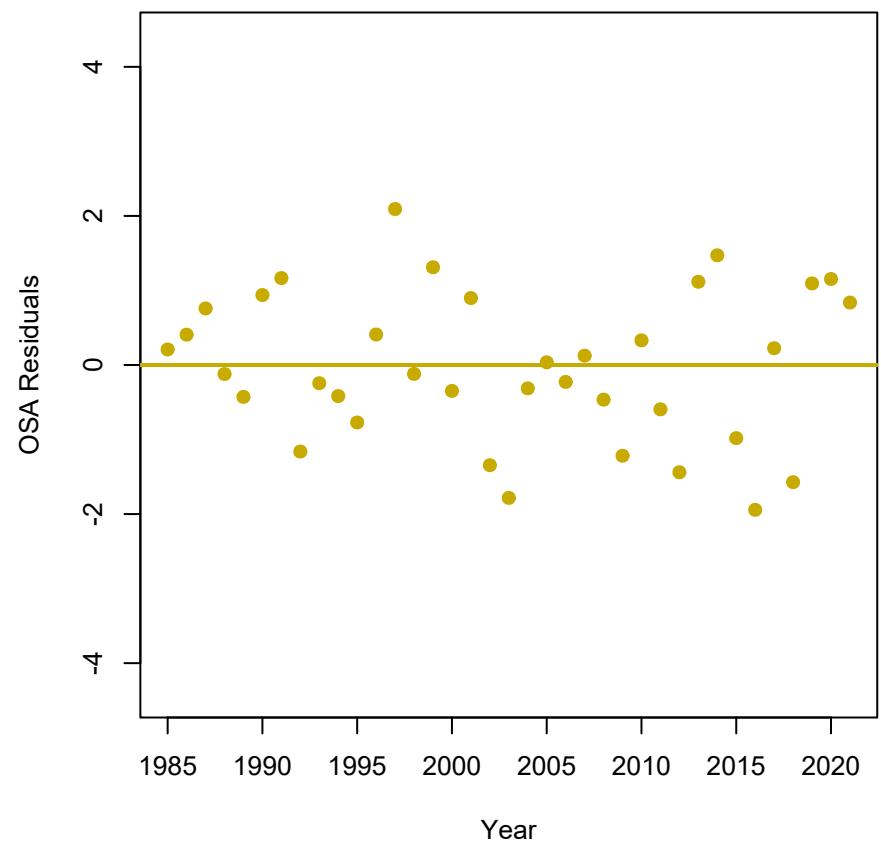
OSA residual diagnostics: Index 5



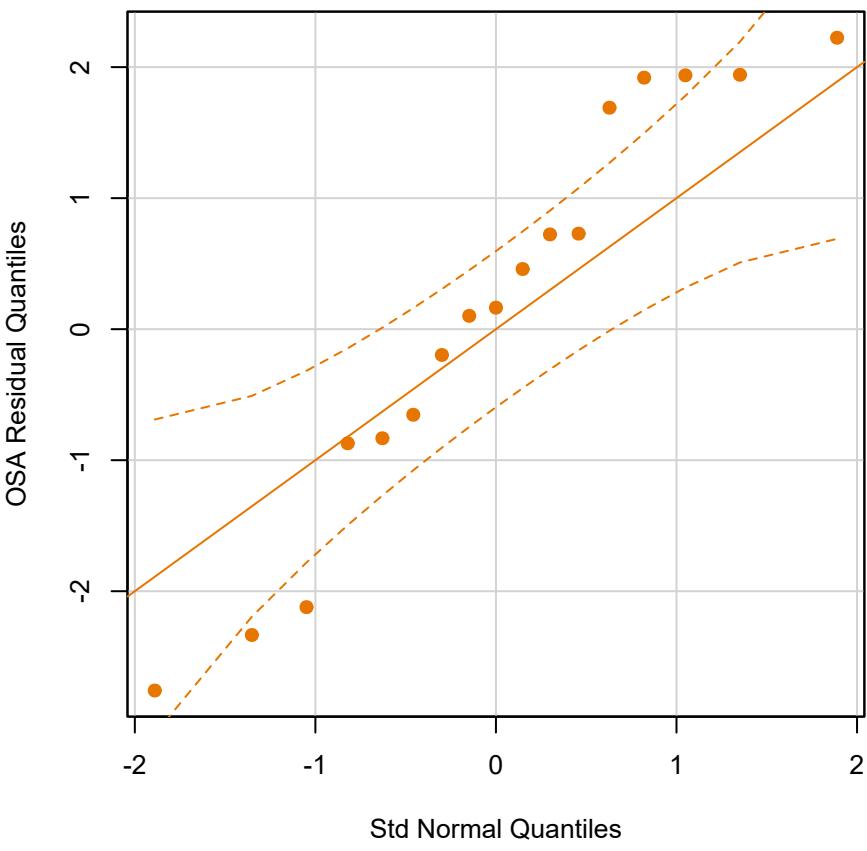
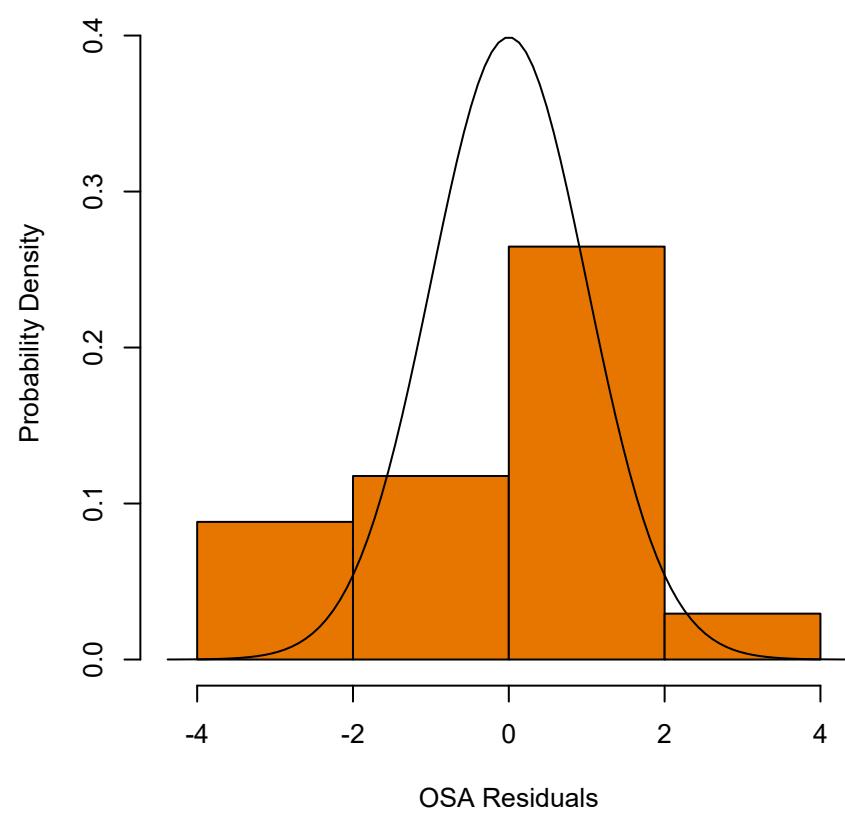
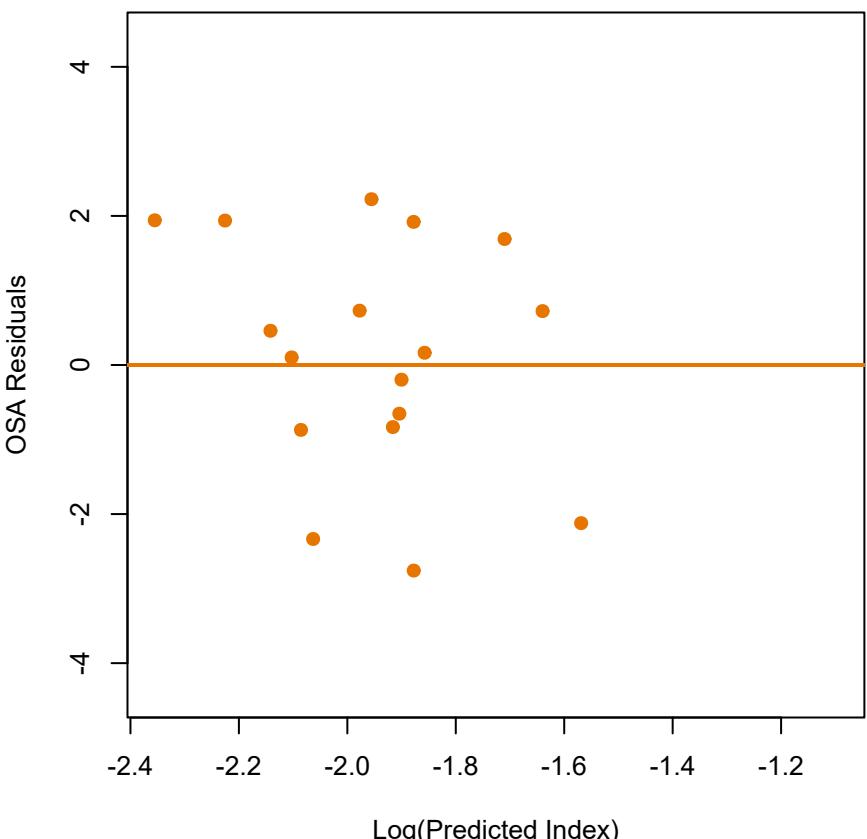
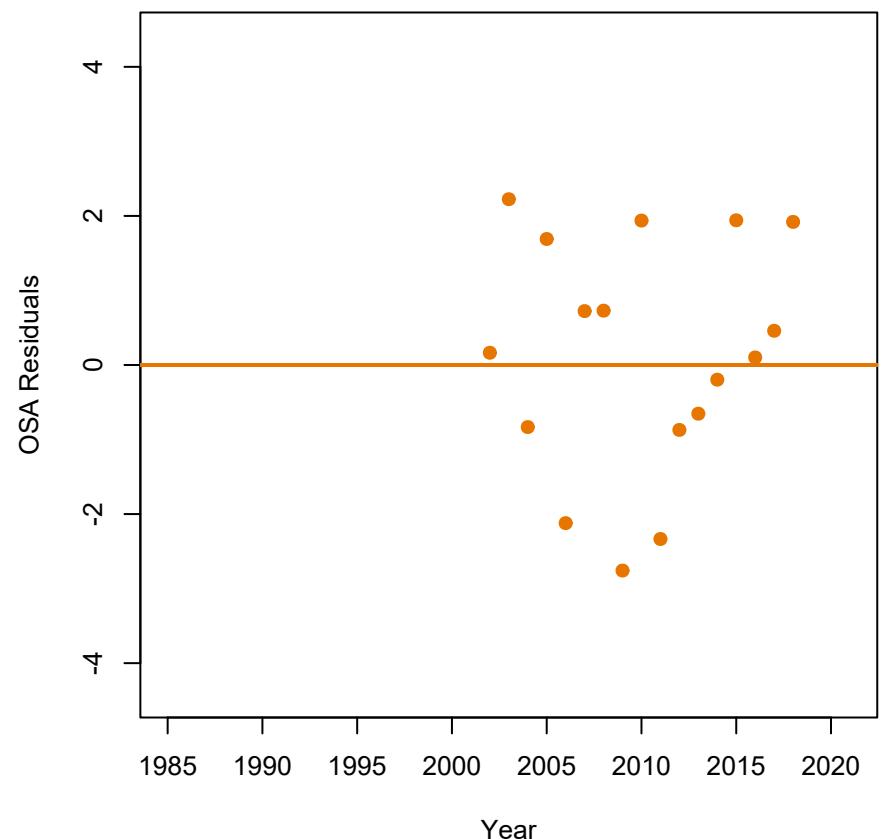
OSA residual diagnostics: Index 6



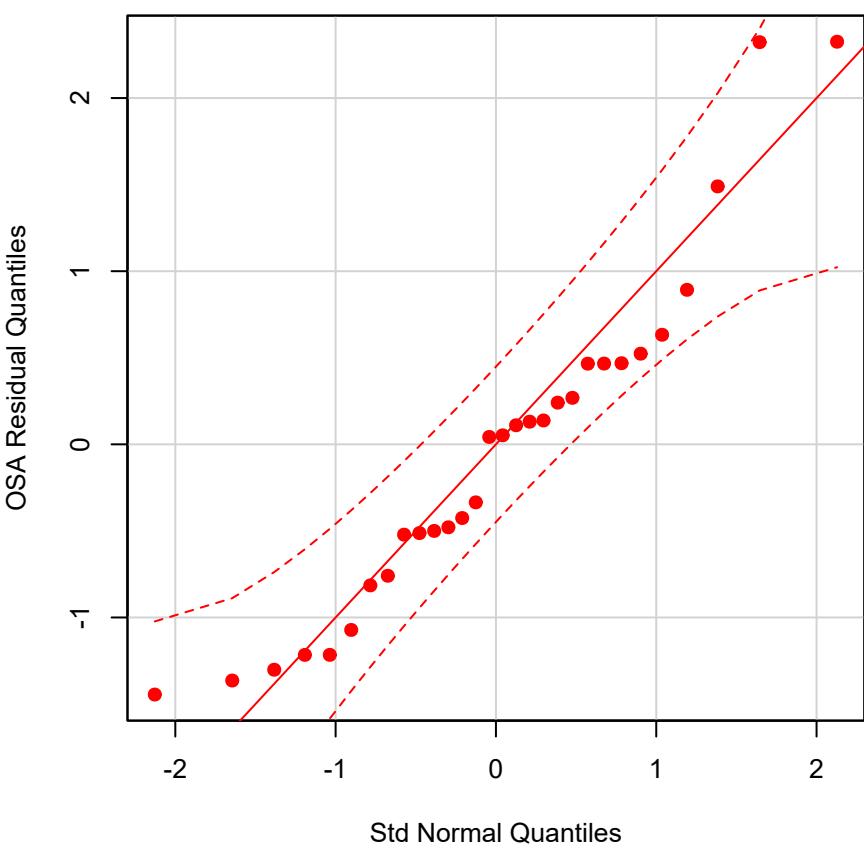
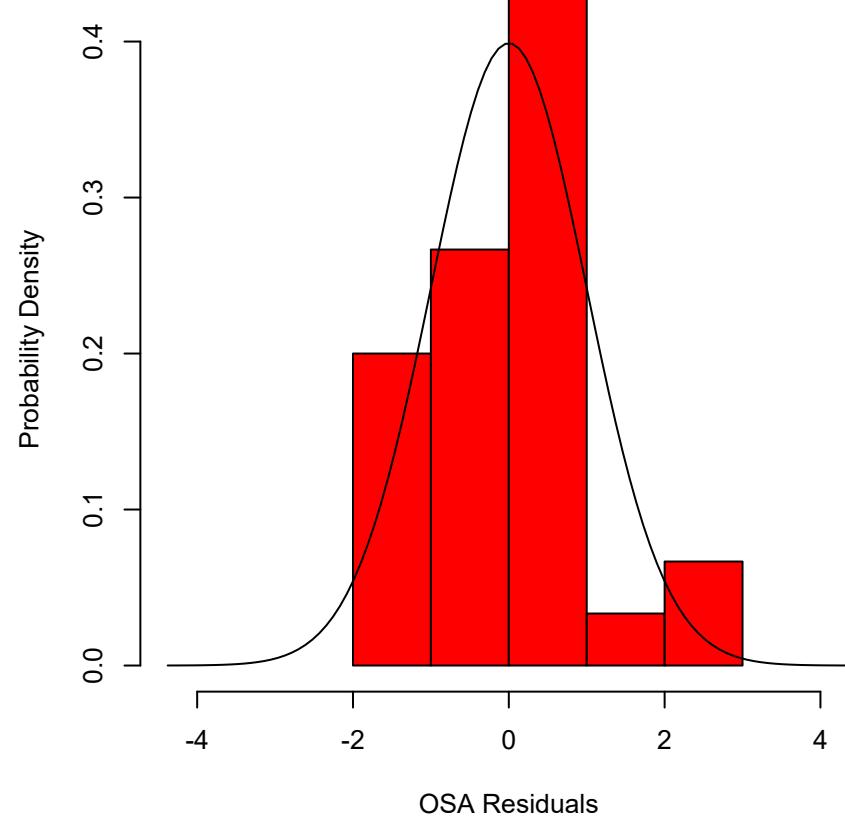
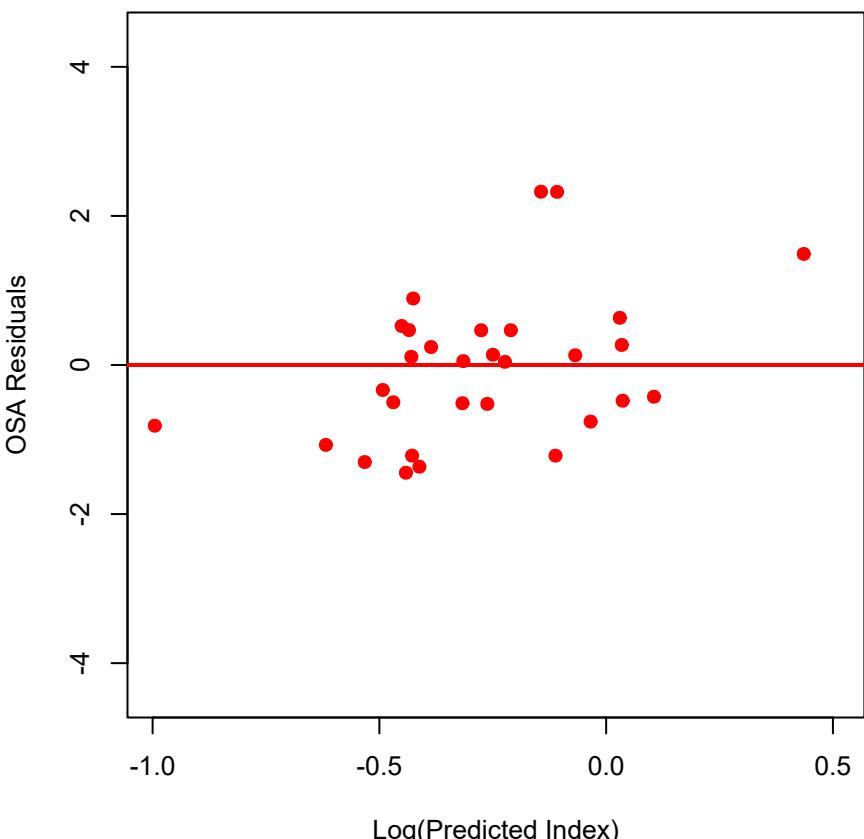
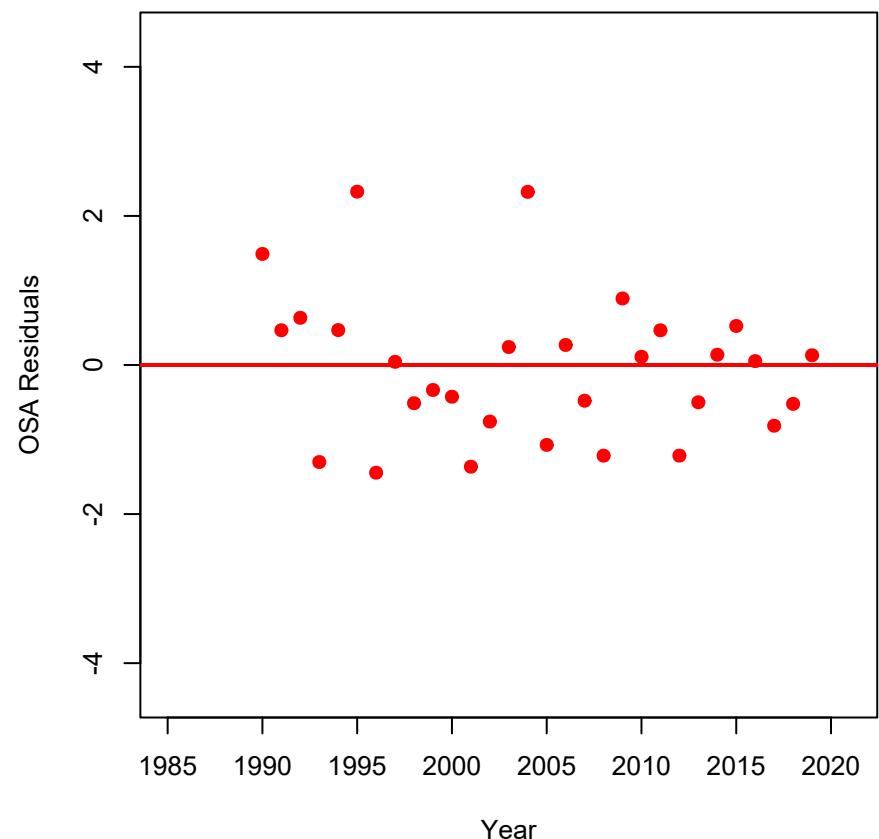
OSA residual diagnostics: Index 7



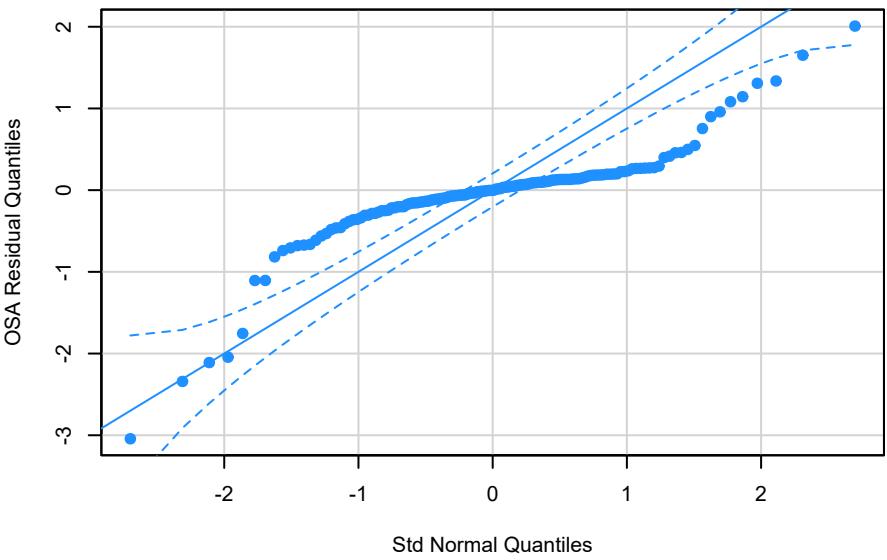
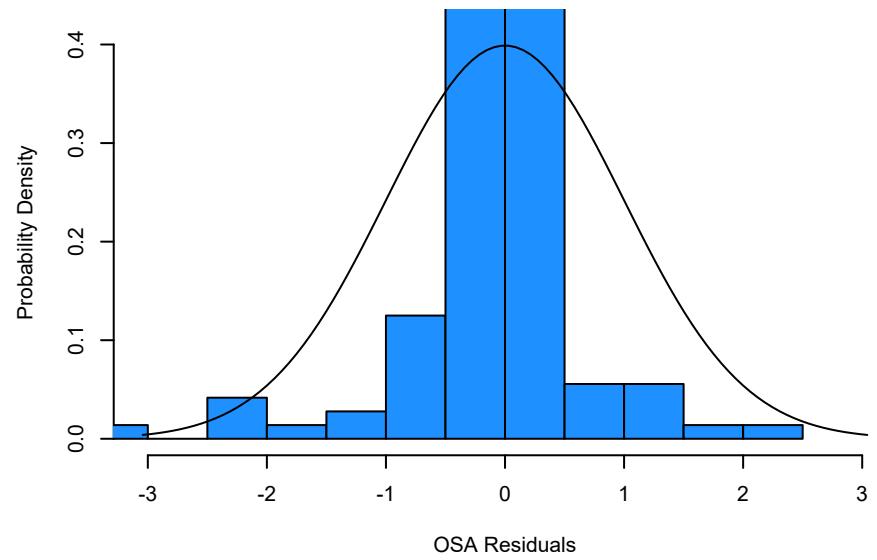
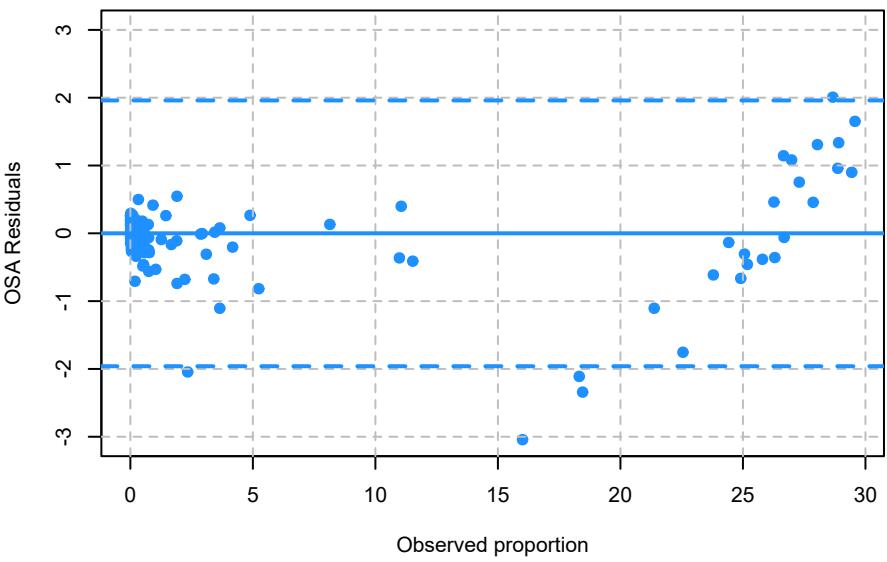
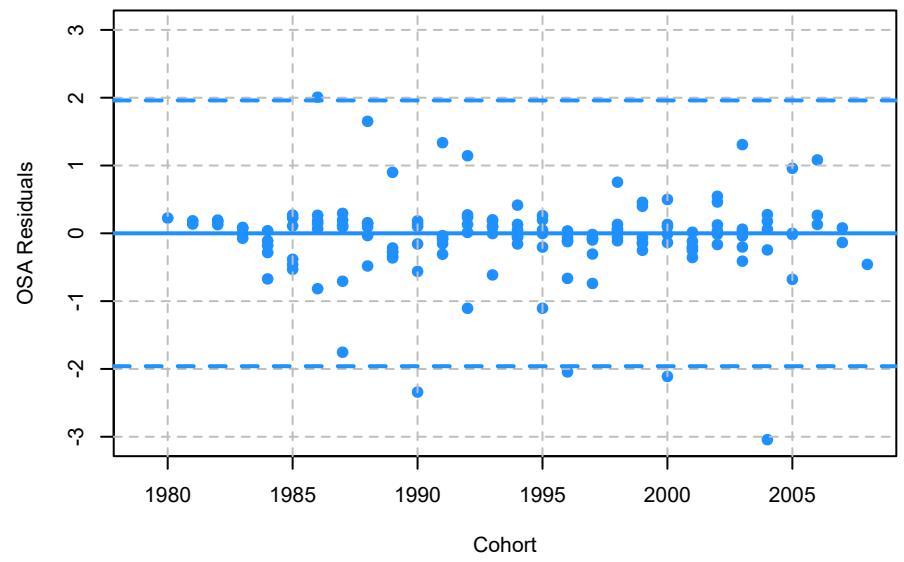
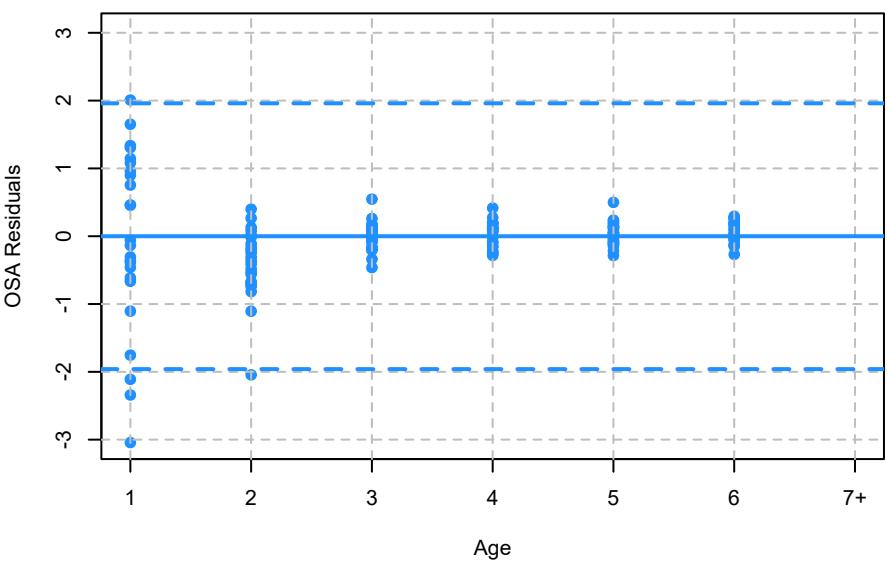
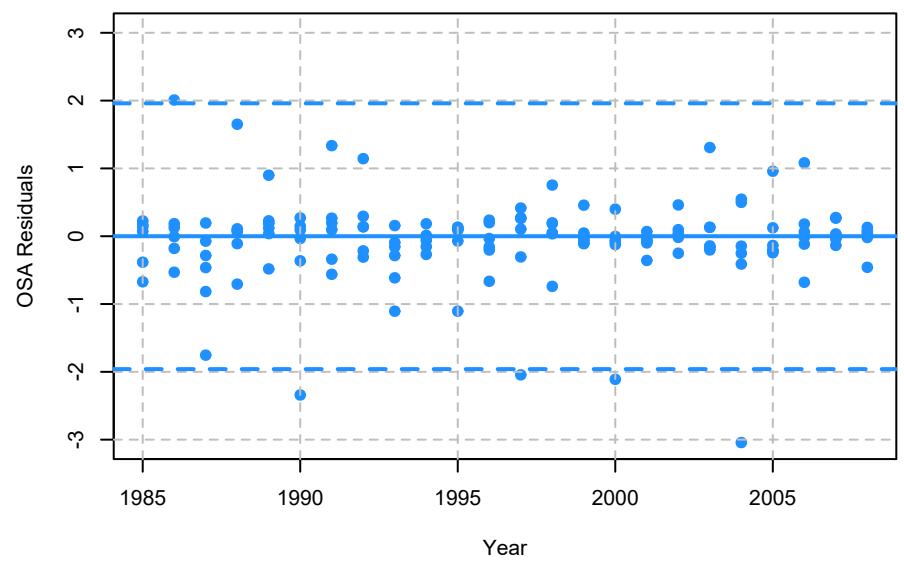
OSA residual diagnostics: Index 8



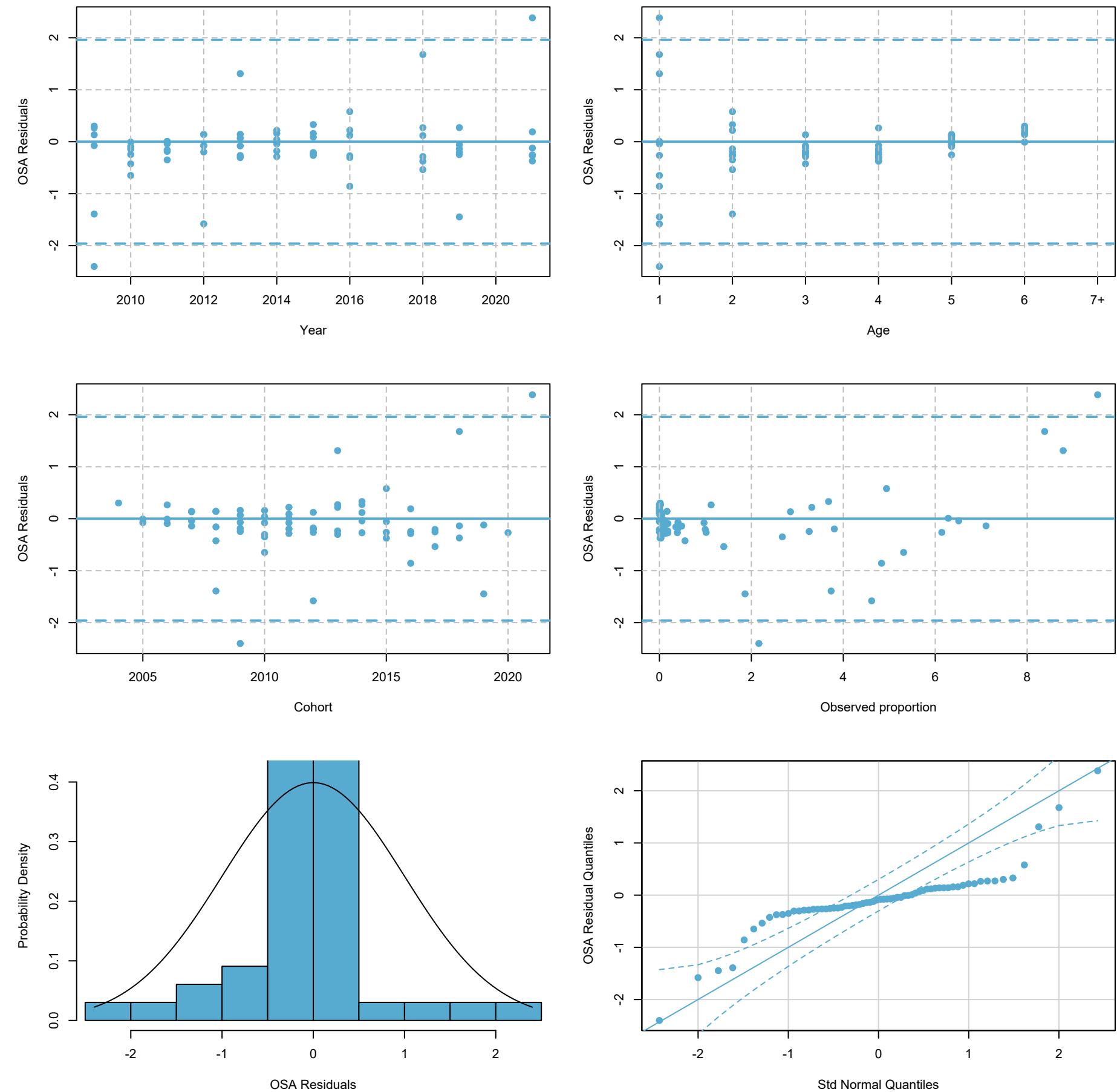
OSA residual diagnostics: Index 9



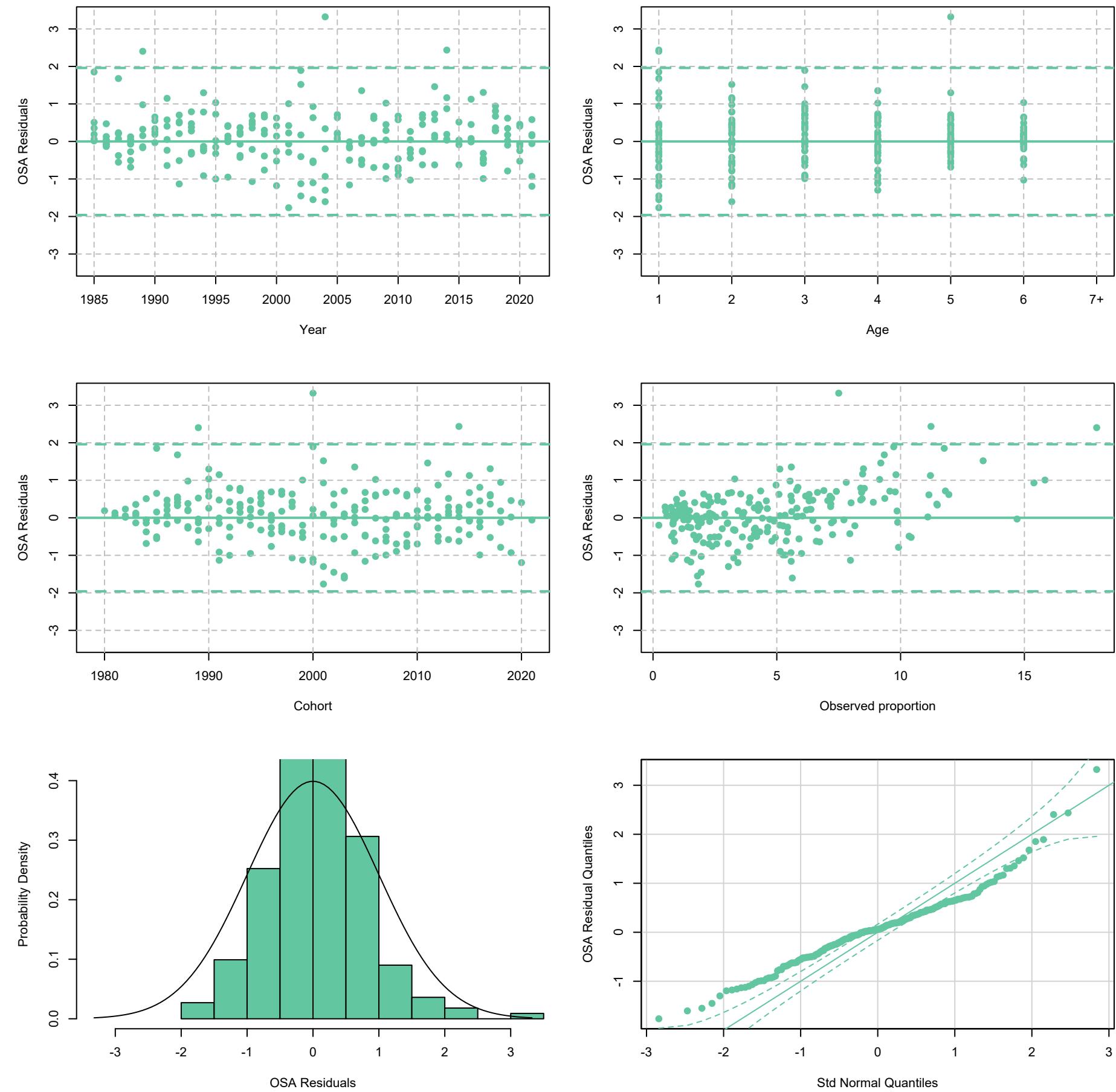
age composition OSA residual diagnostics: Index 1



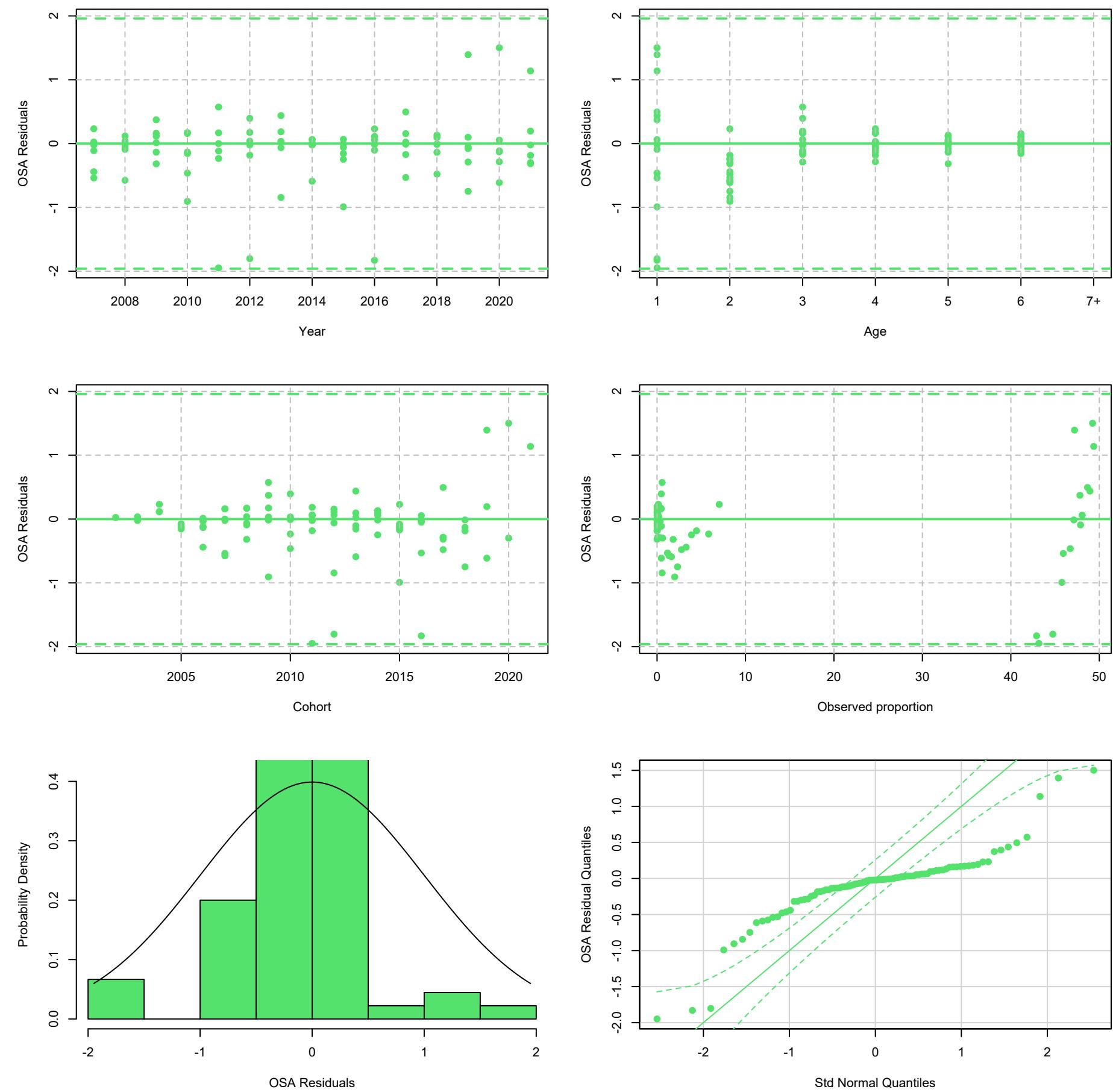
age composition OSA residual diagnostics: Index 2



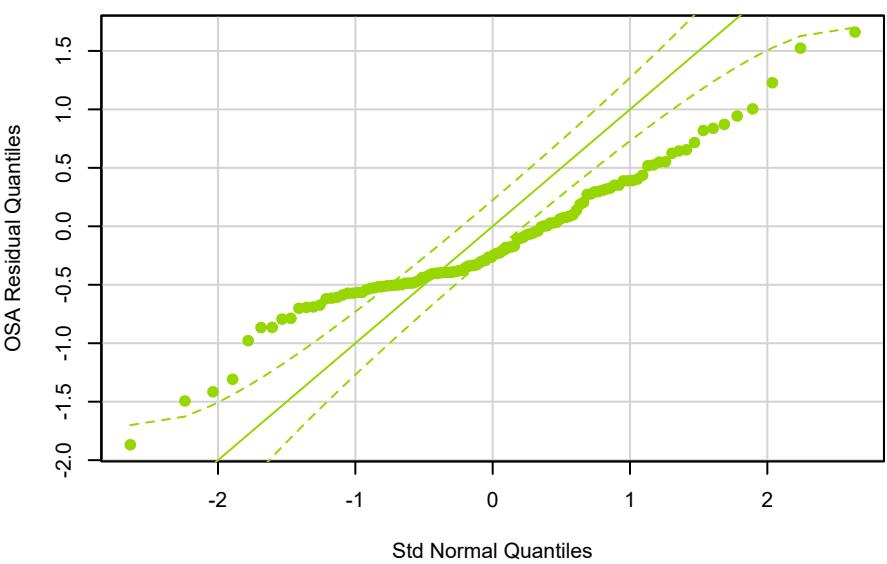
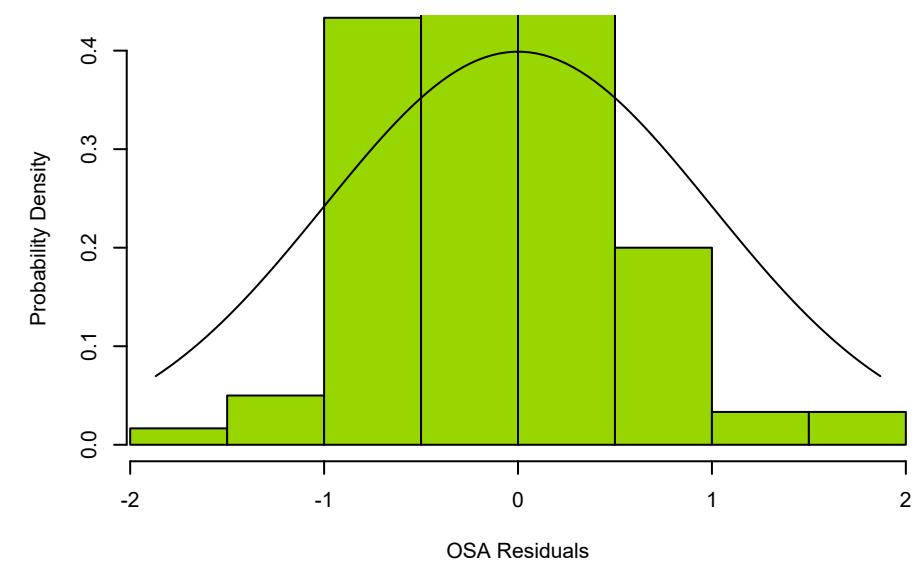
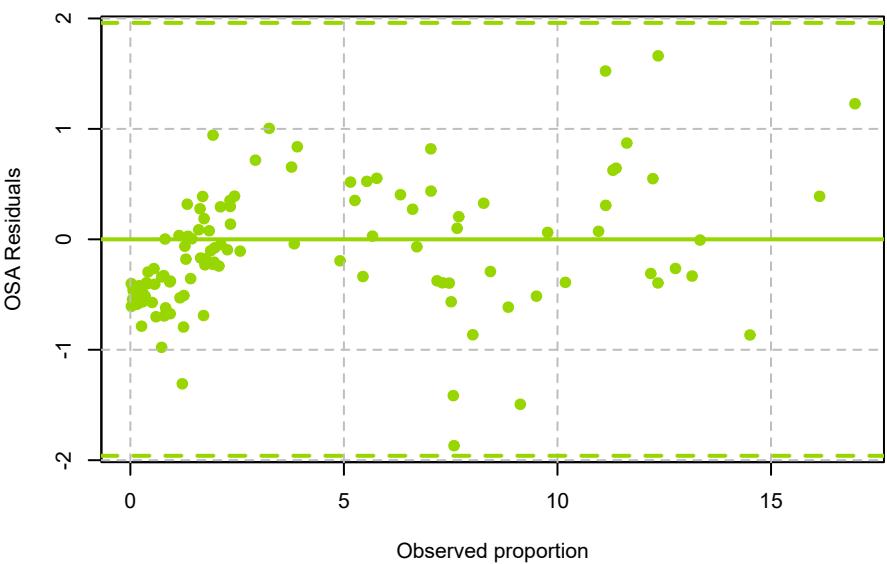
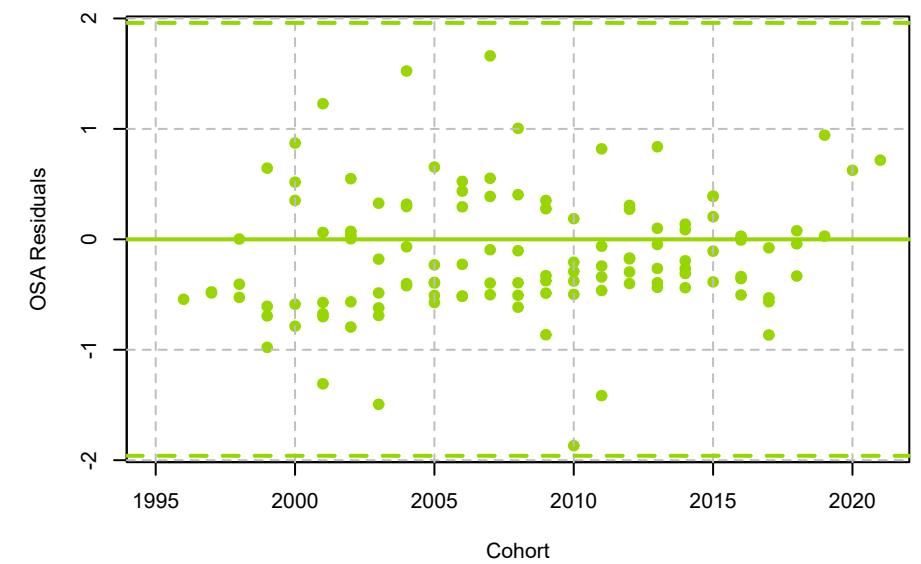
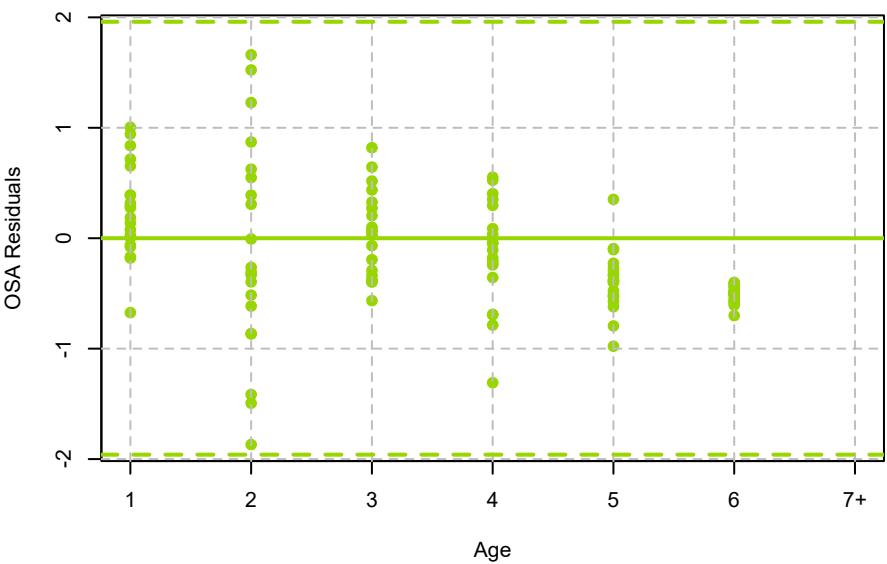
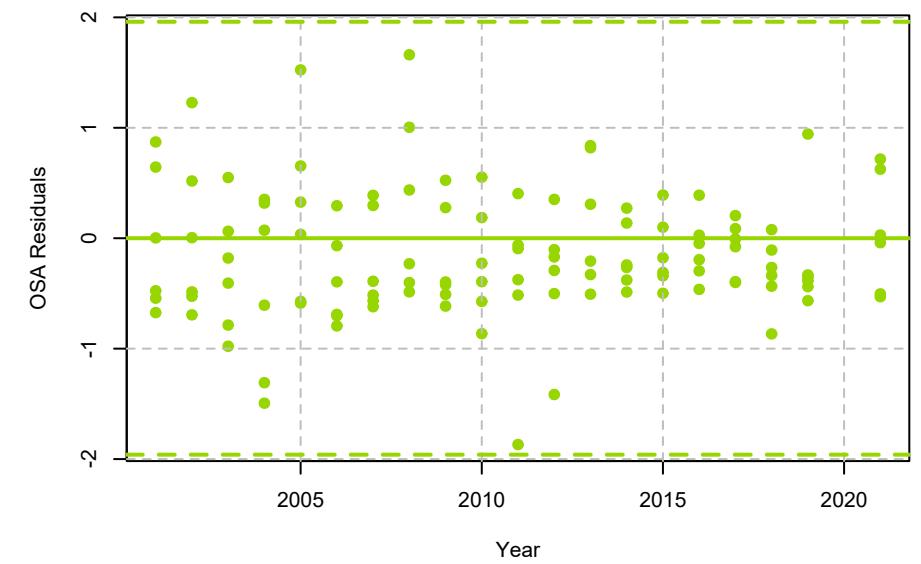
age composition OSA residual diagnostics: Index 3



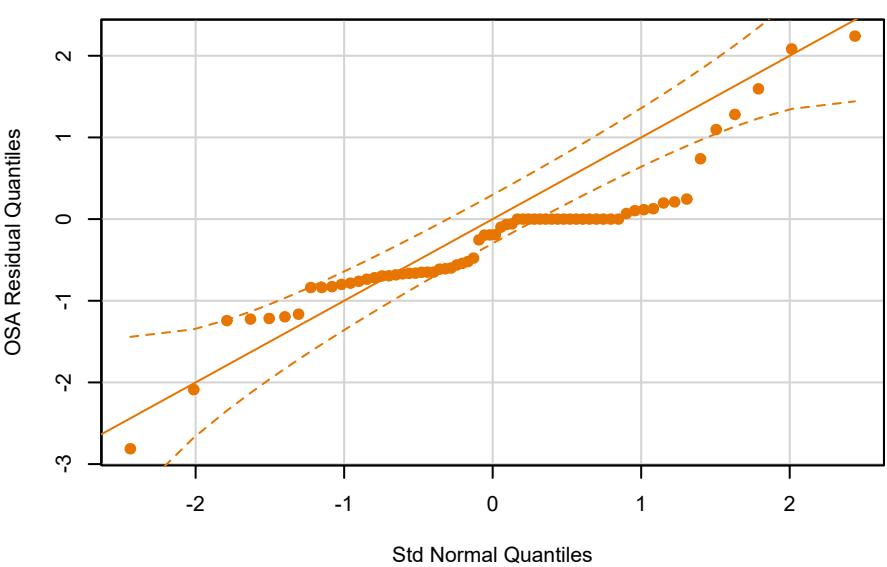
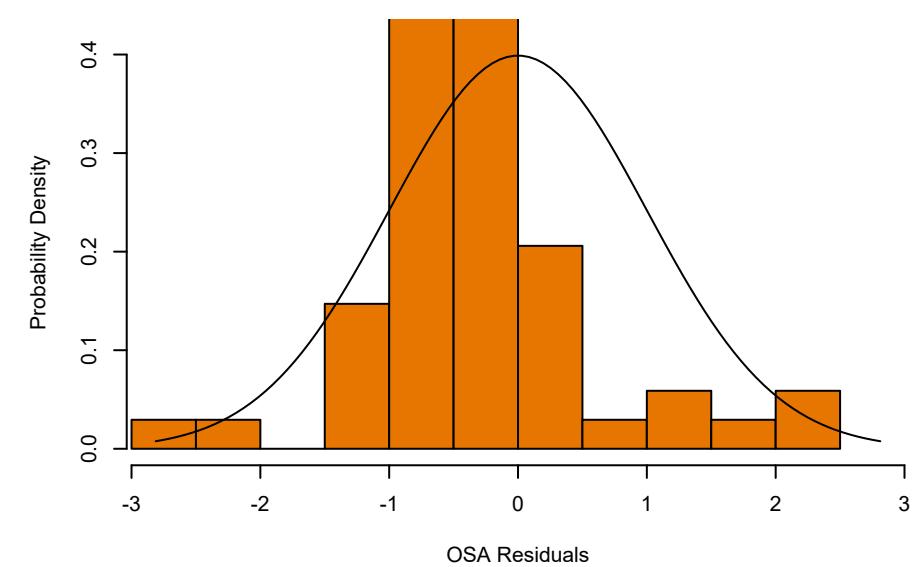
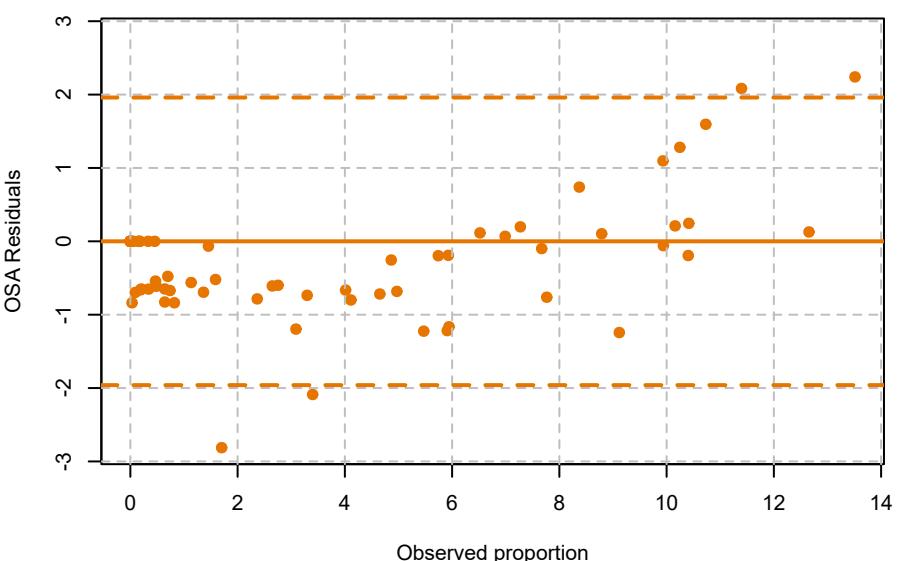
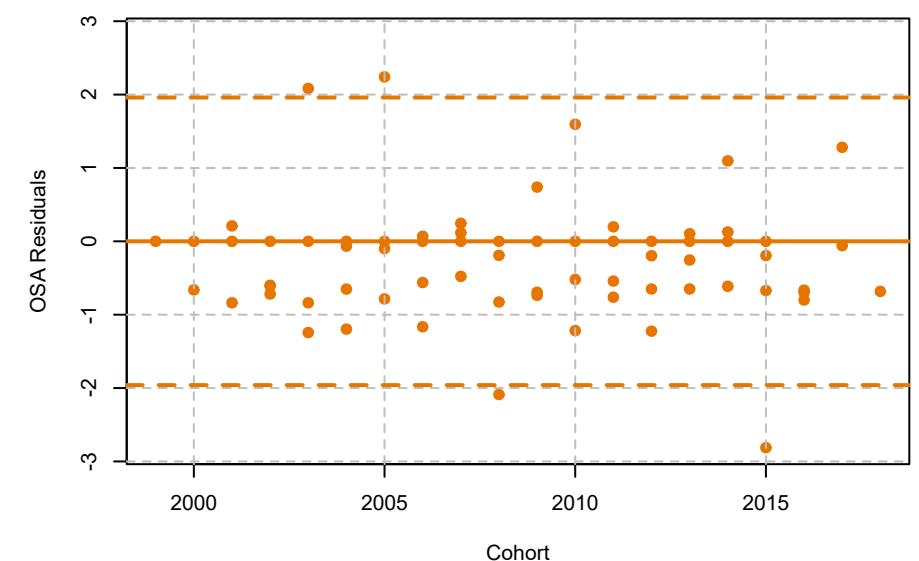
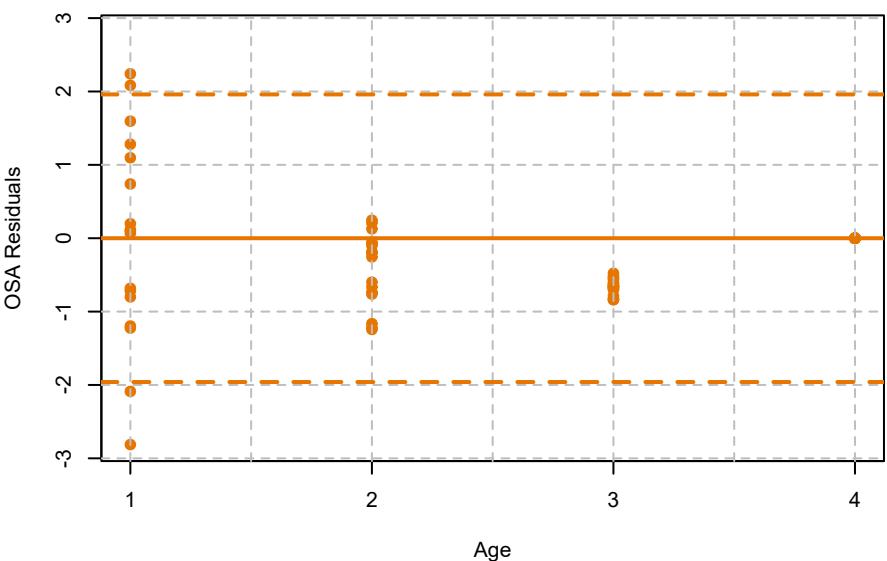
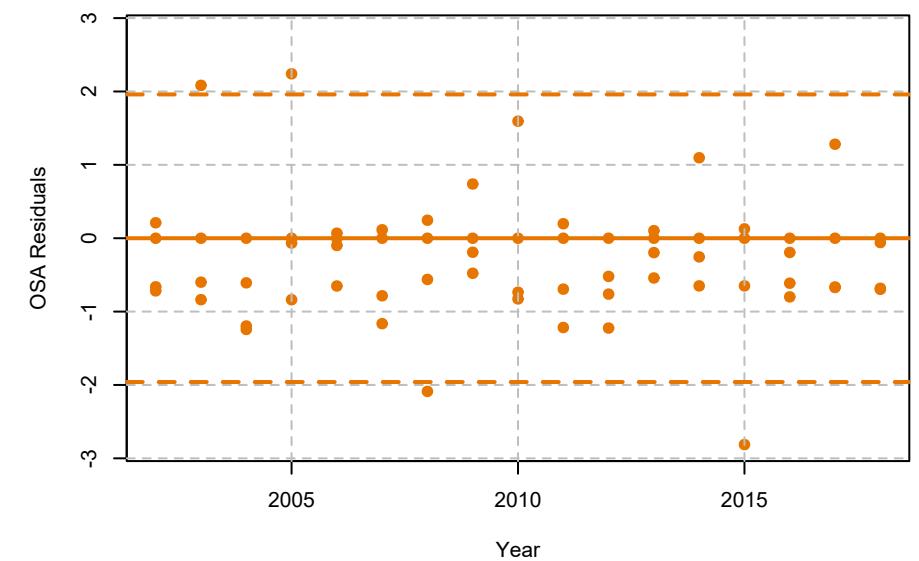
age composition OSA residual diagnostics: Index 4



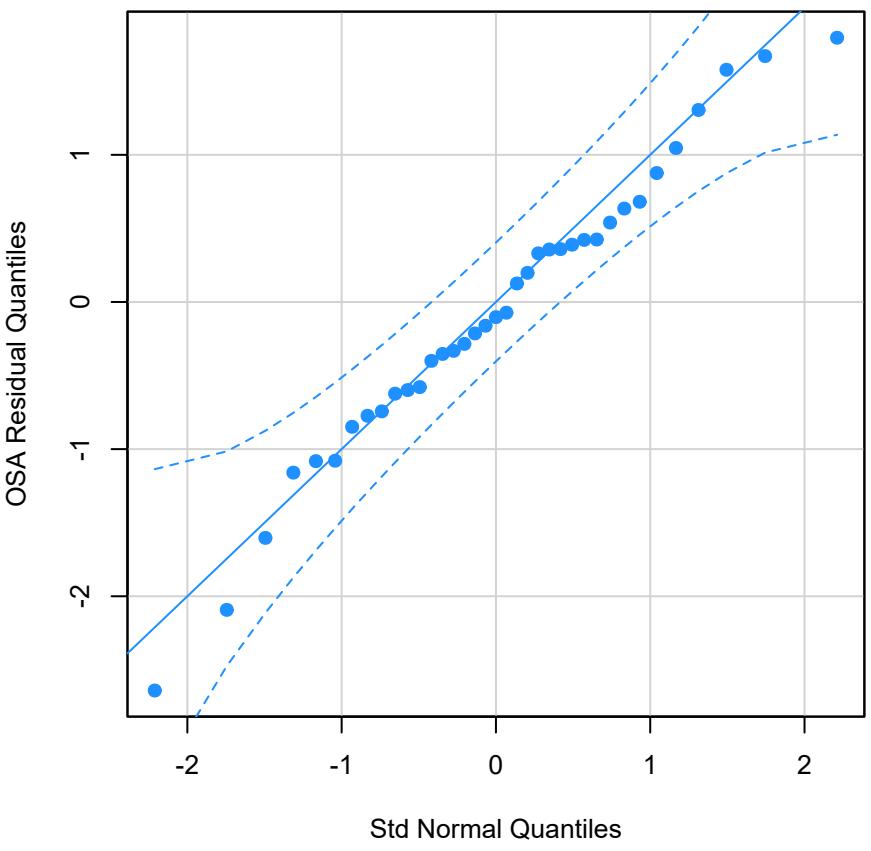
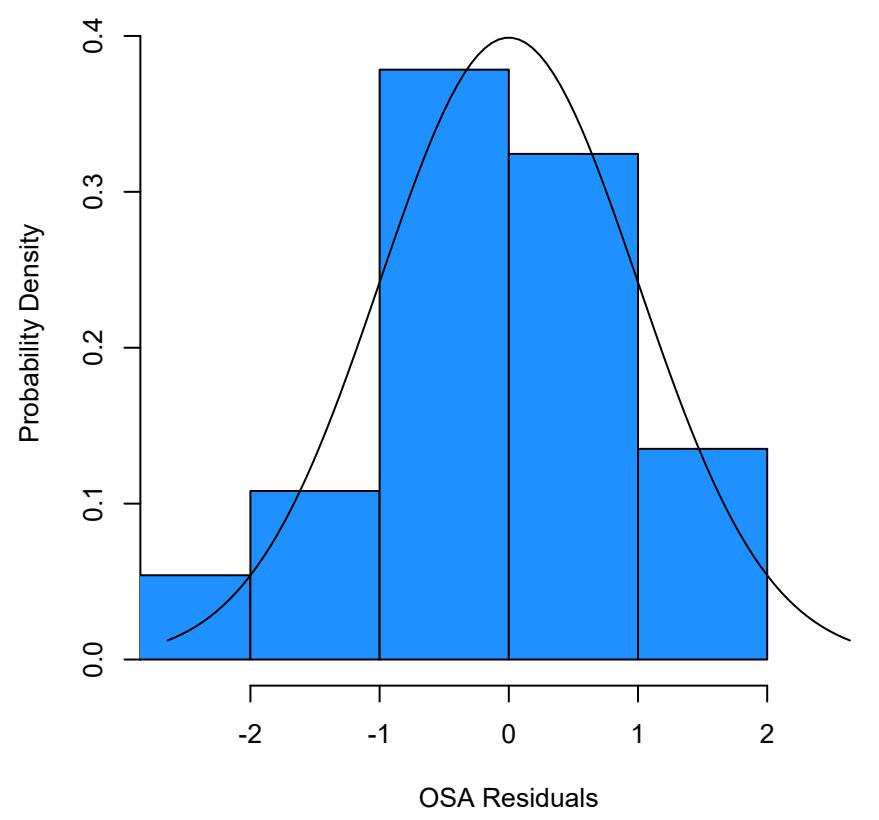
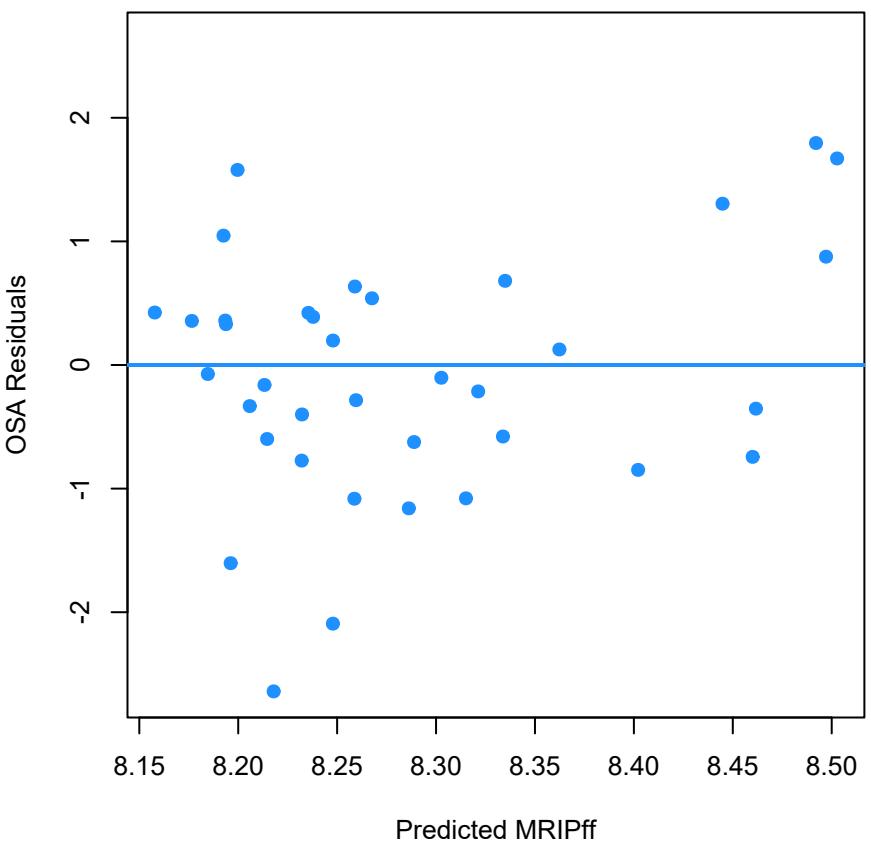
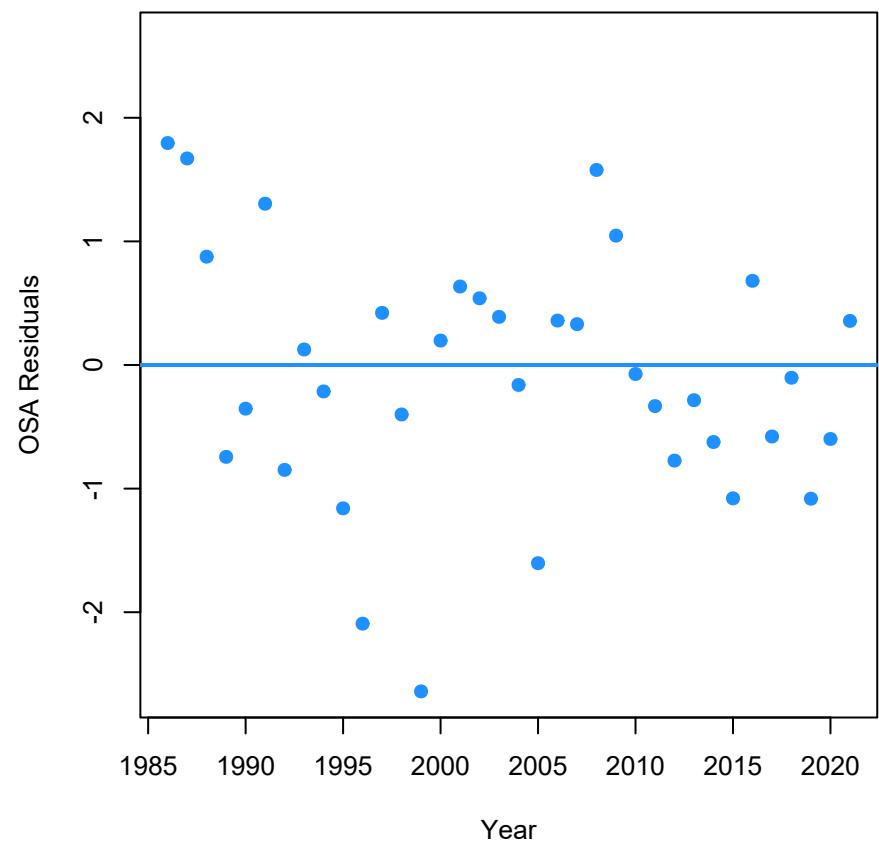
age composition OSA residual diagnostics: Index 6

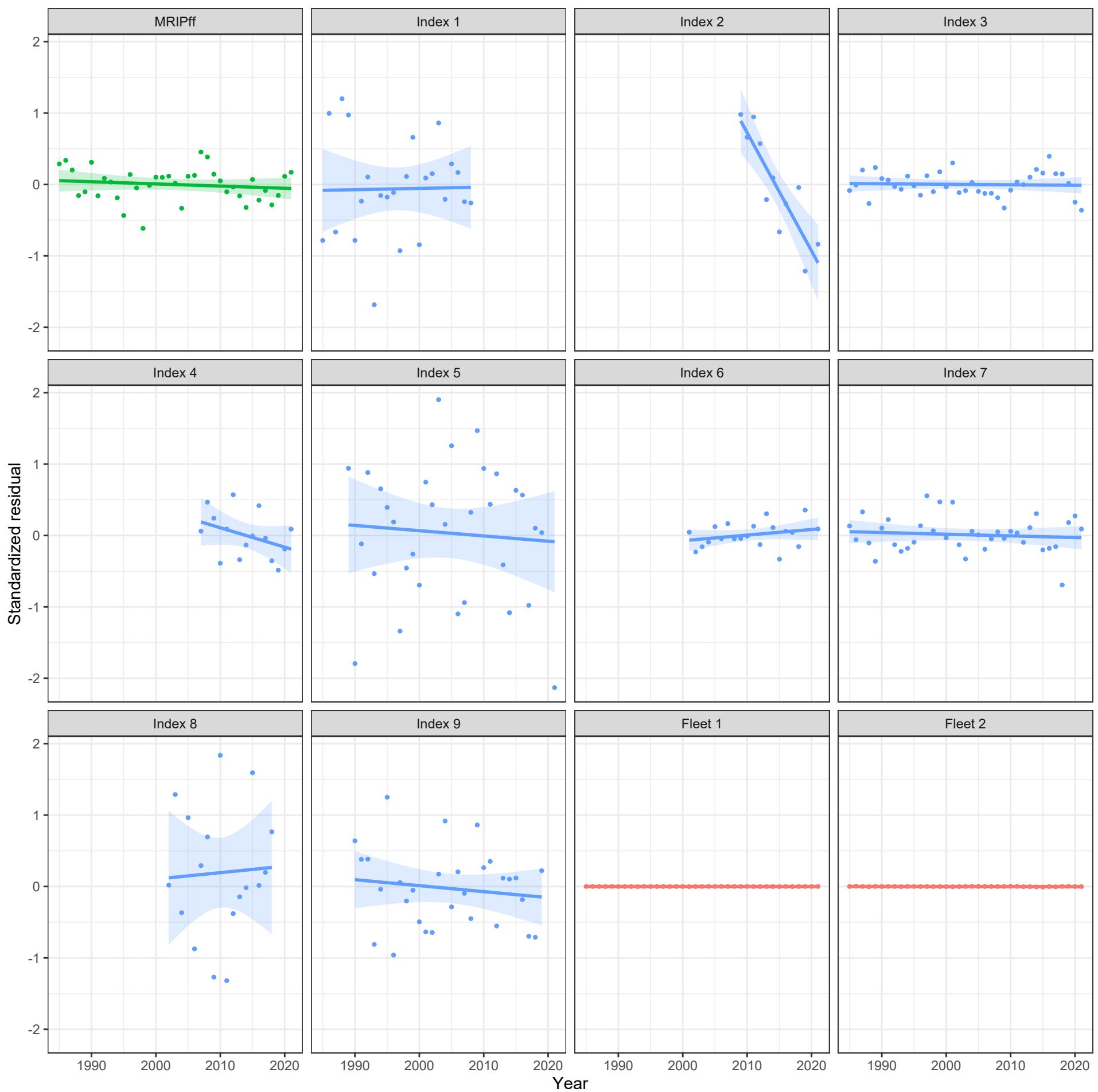


age composition OSA residual diagnostics: Index 8



OSA residual diagnostics: Ecov 1 (MRIPff)



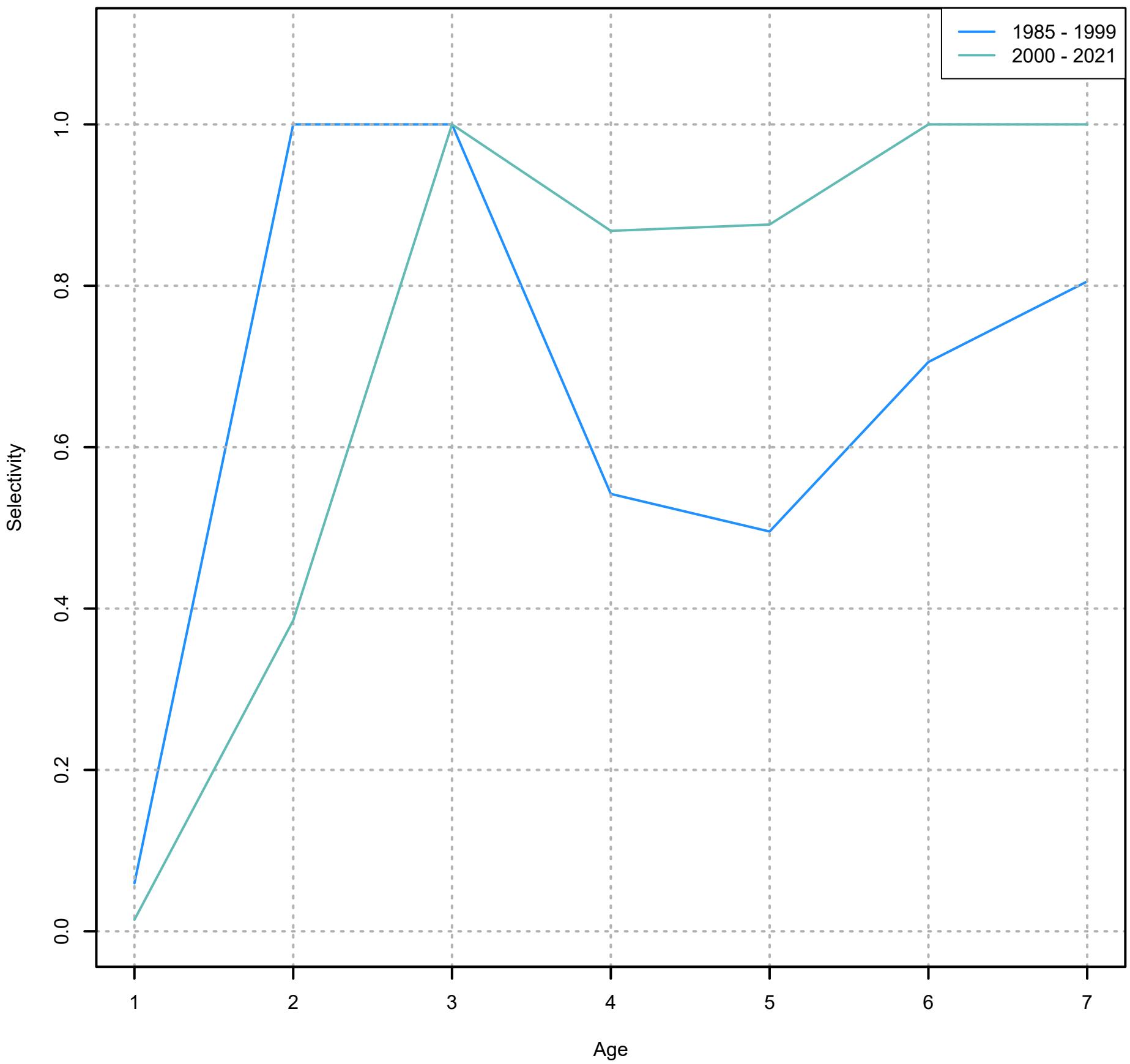


BF28W_M7ECOV

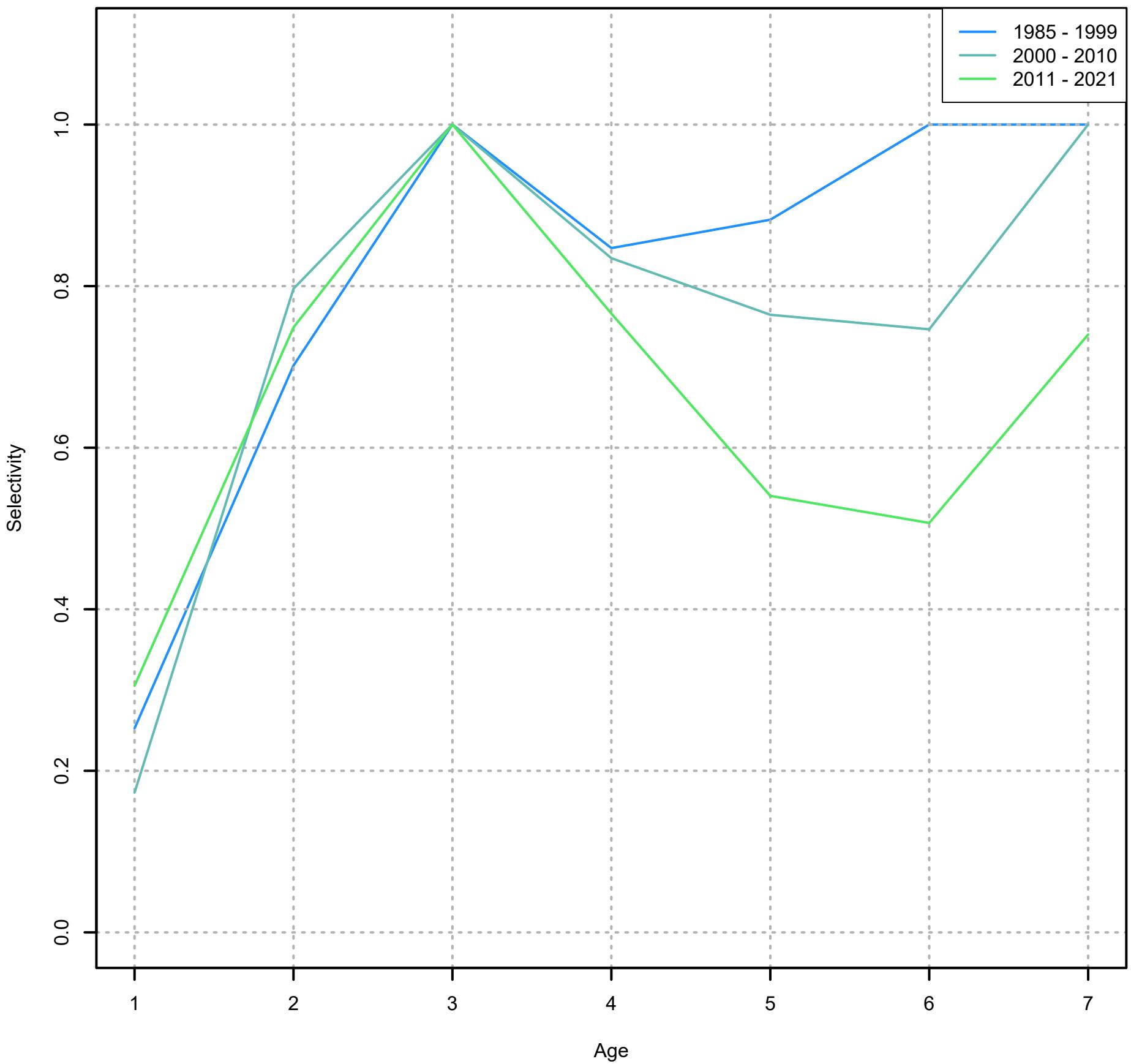
MRIP Forage Fish Index as an environmental covariate on
catchability

RESULTS PLOTS

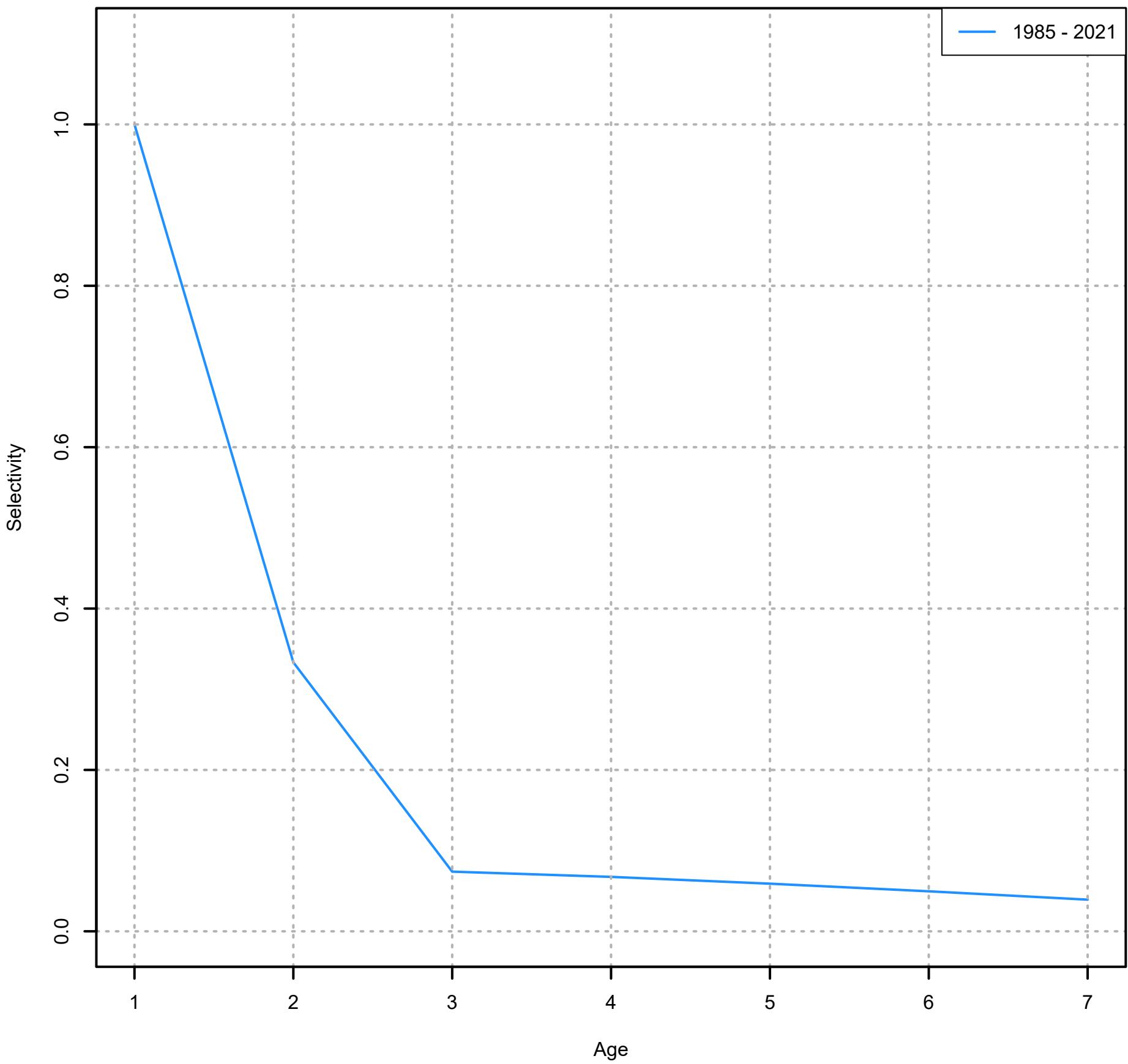
Fleet 1



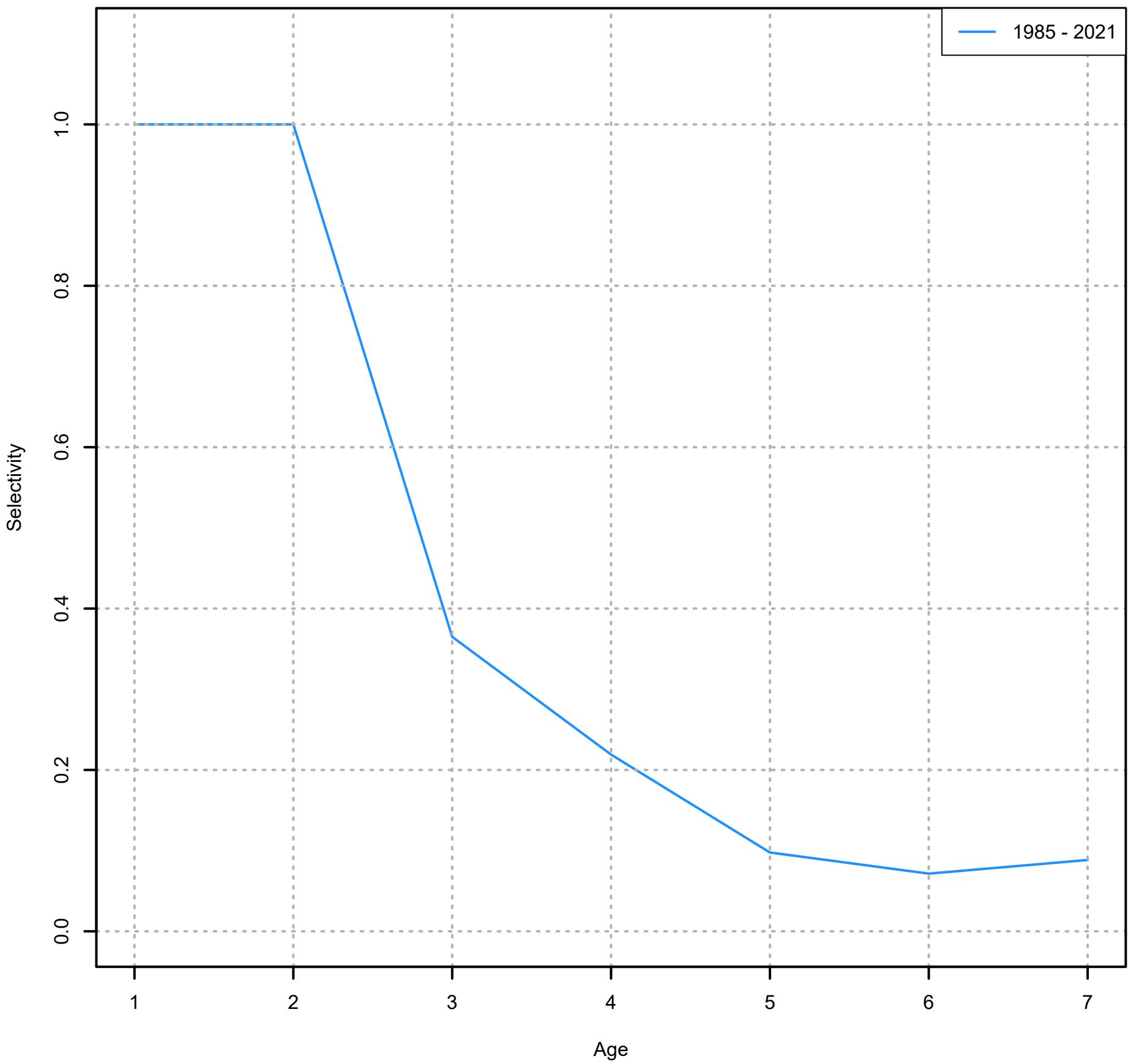
Fleet 2



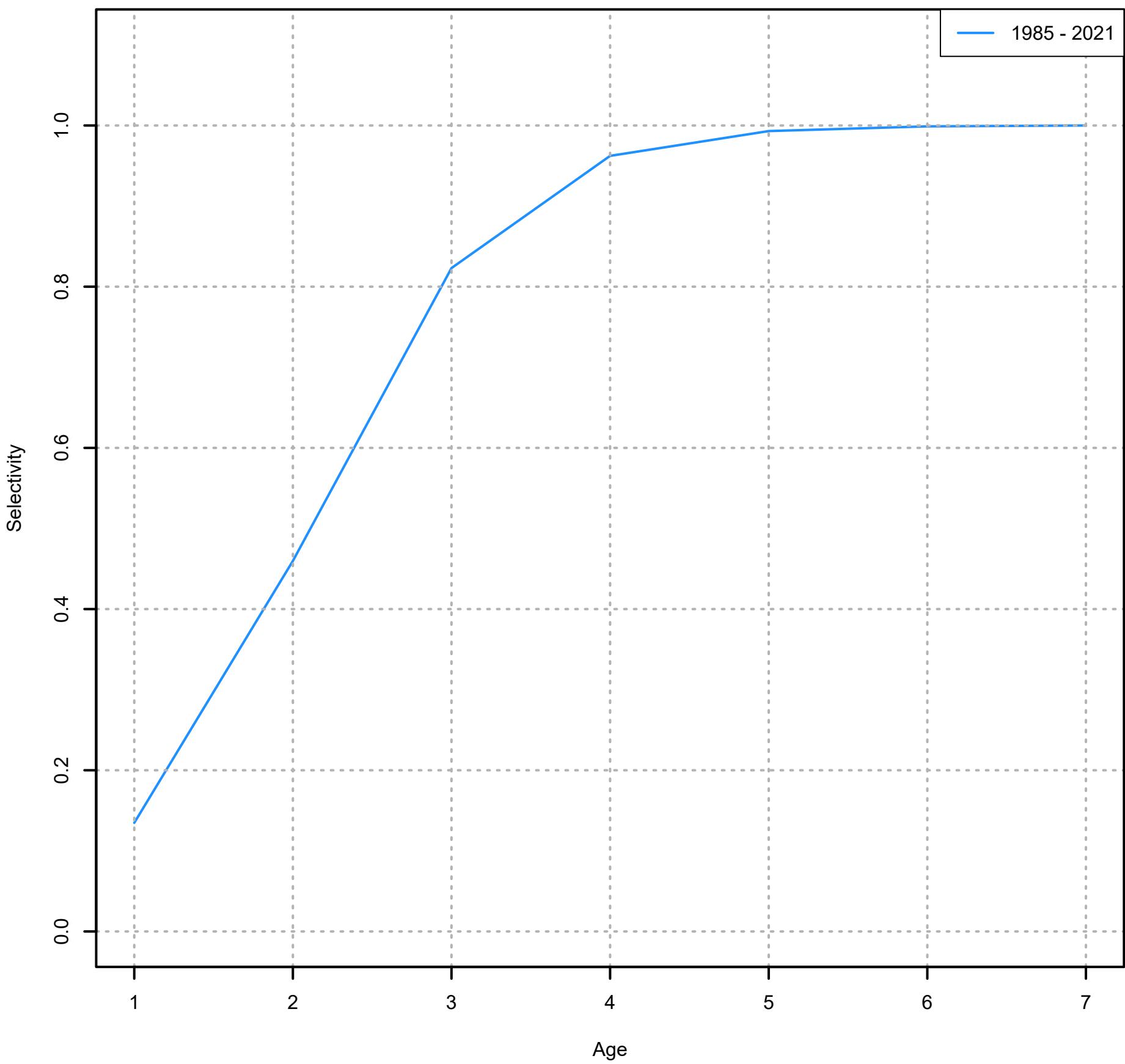
Index 1



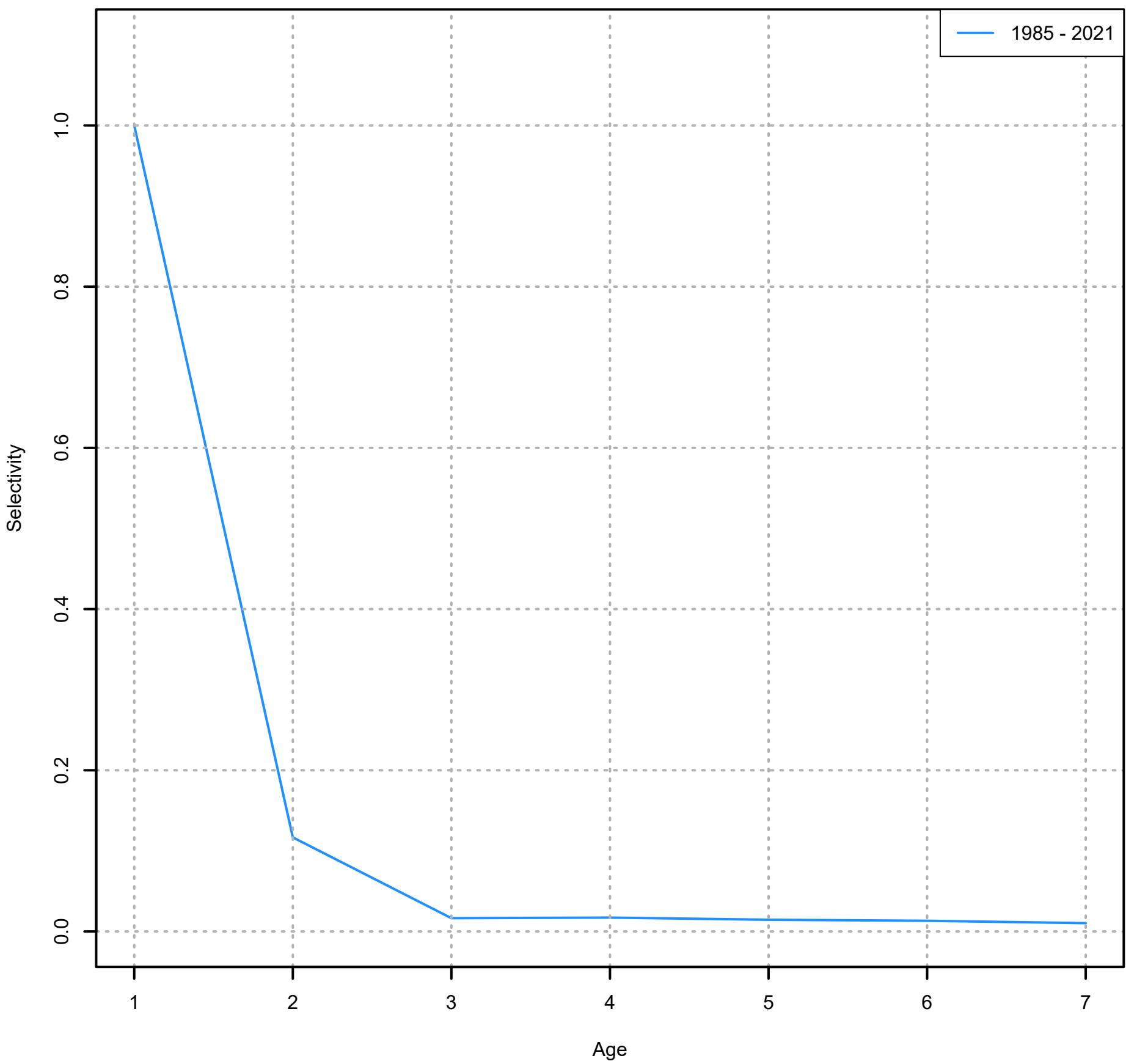
Index 2



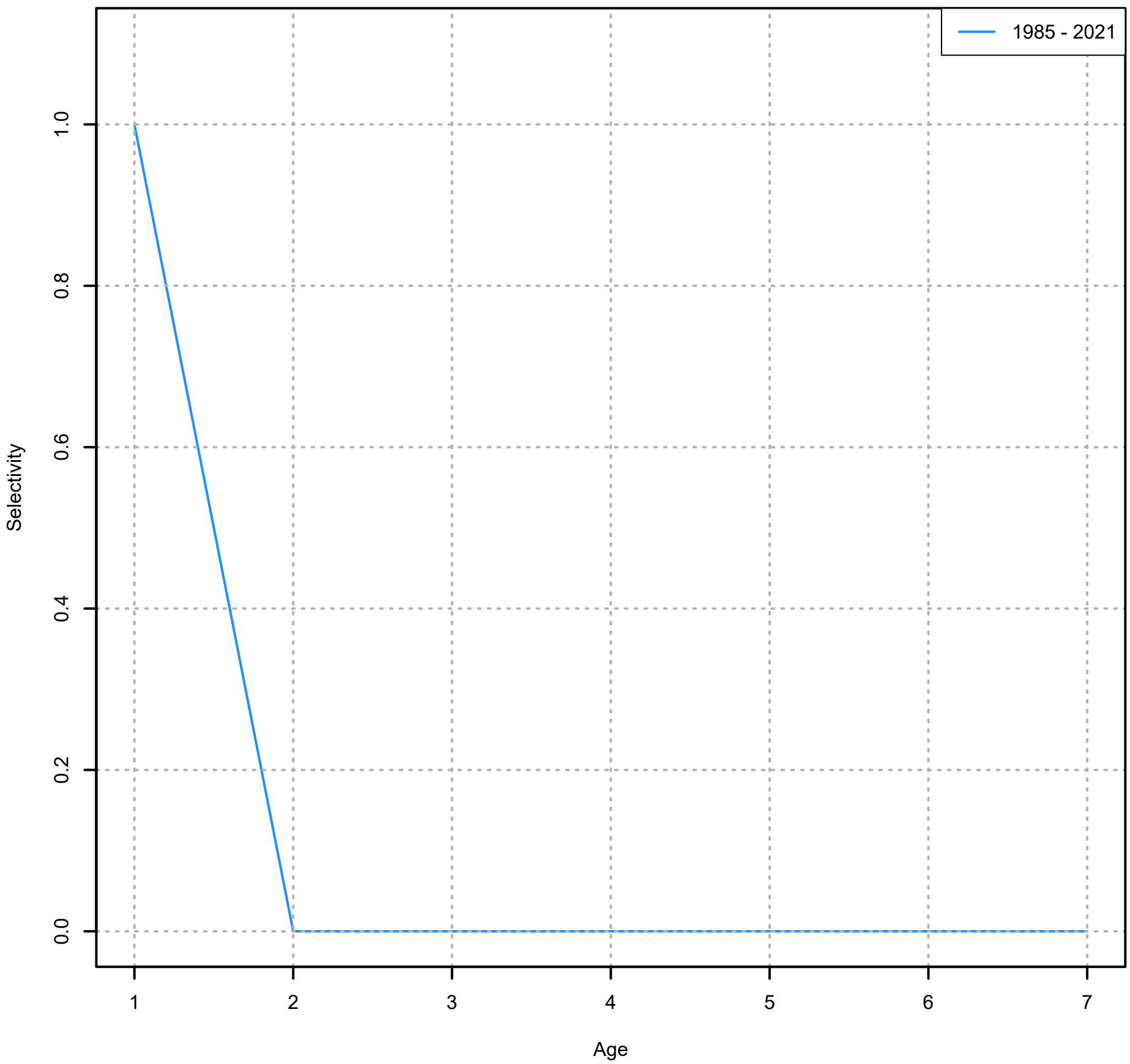
Index 3



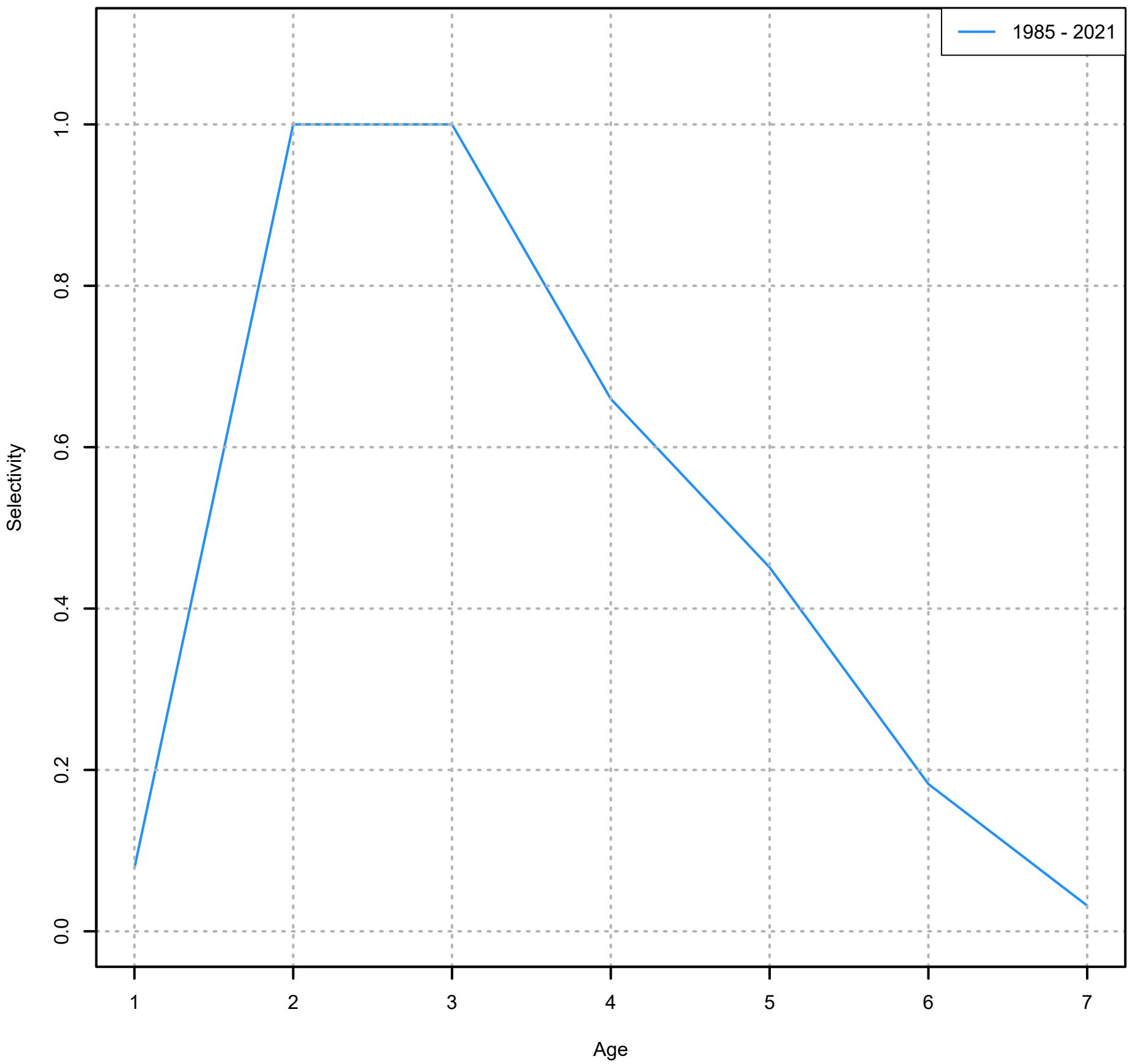
Index 4



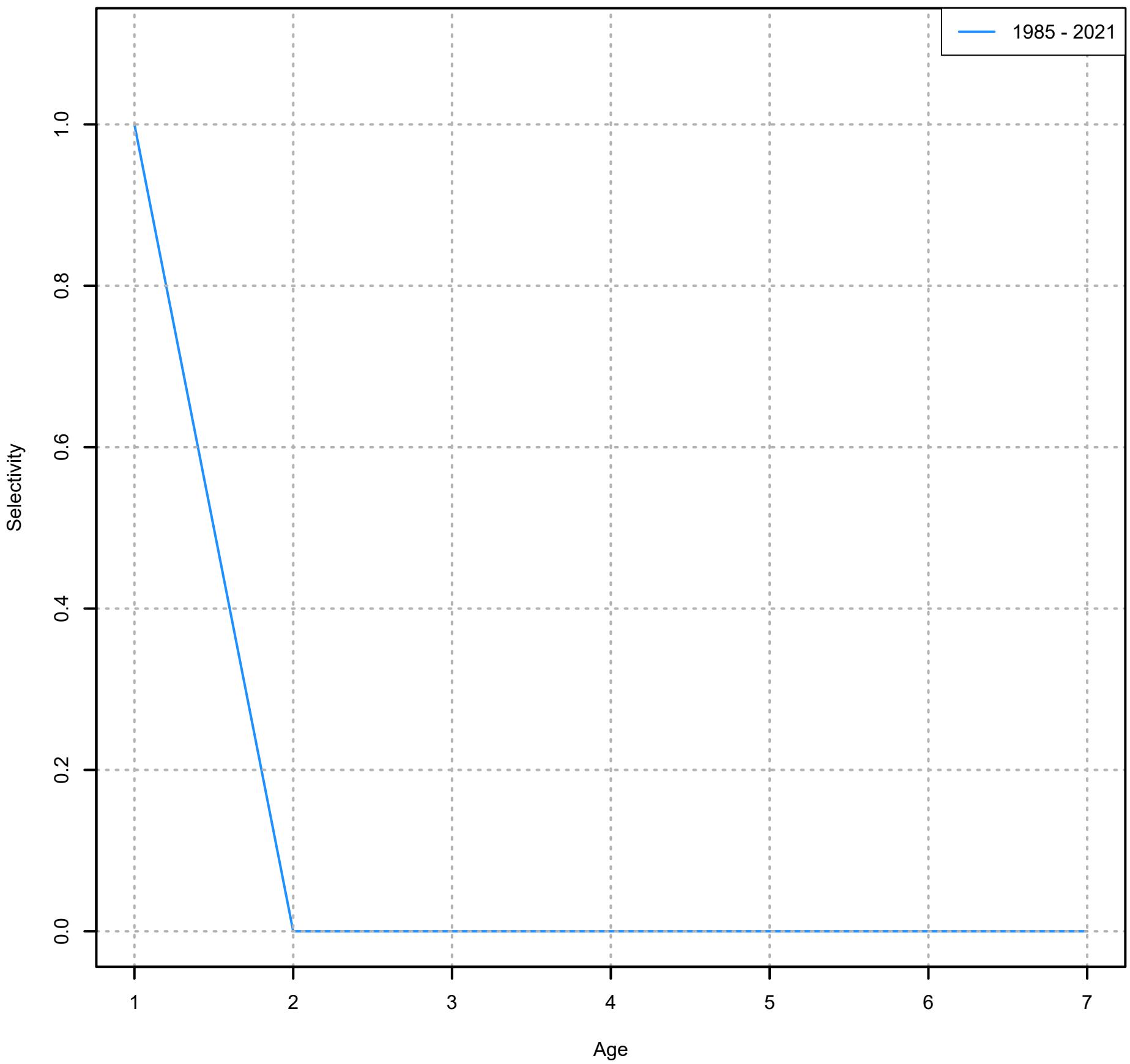
Index 5



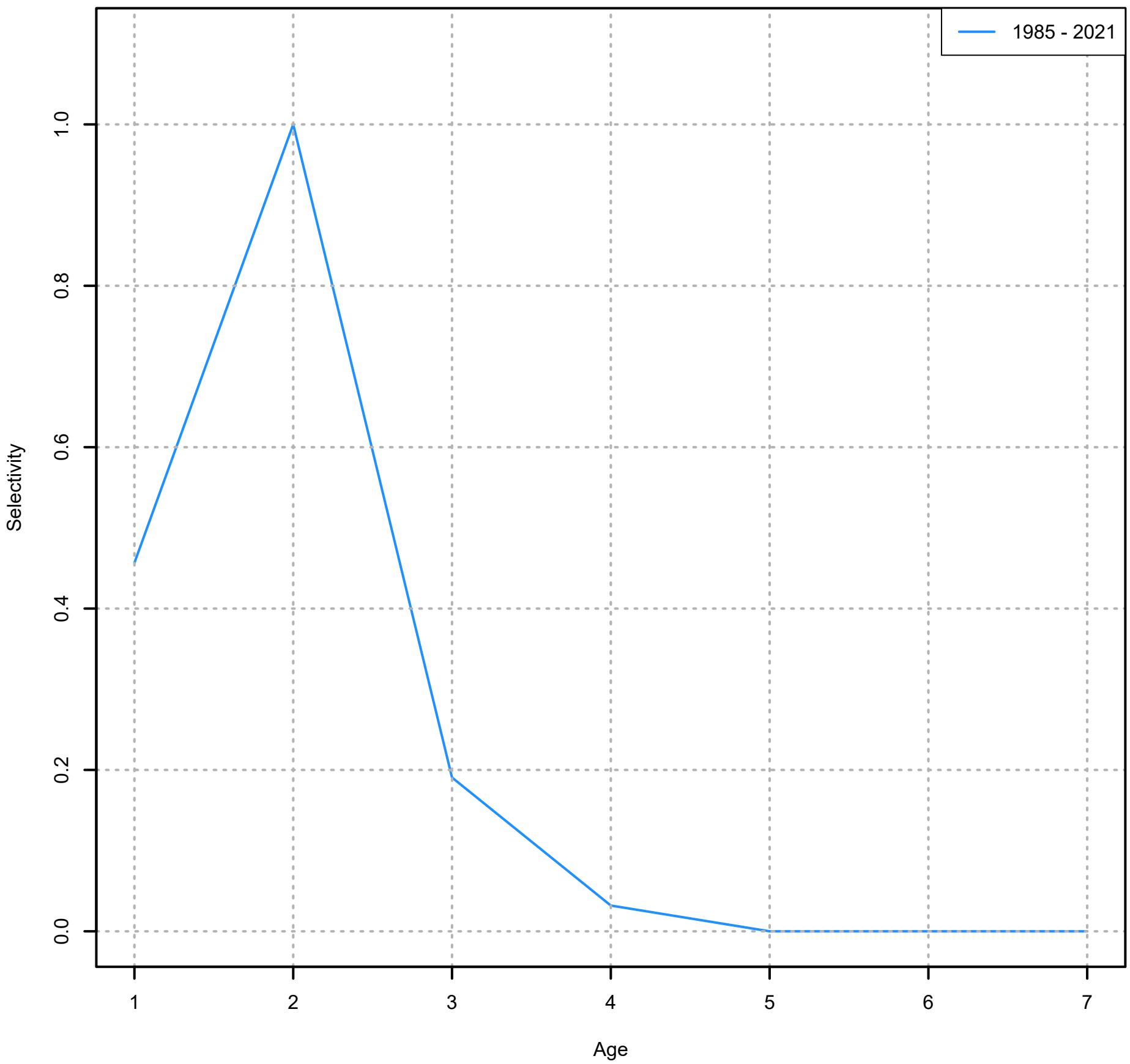
Index 6



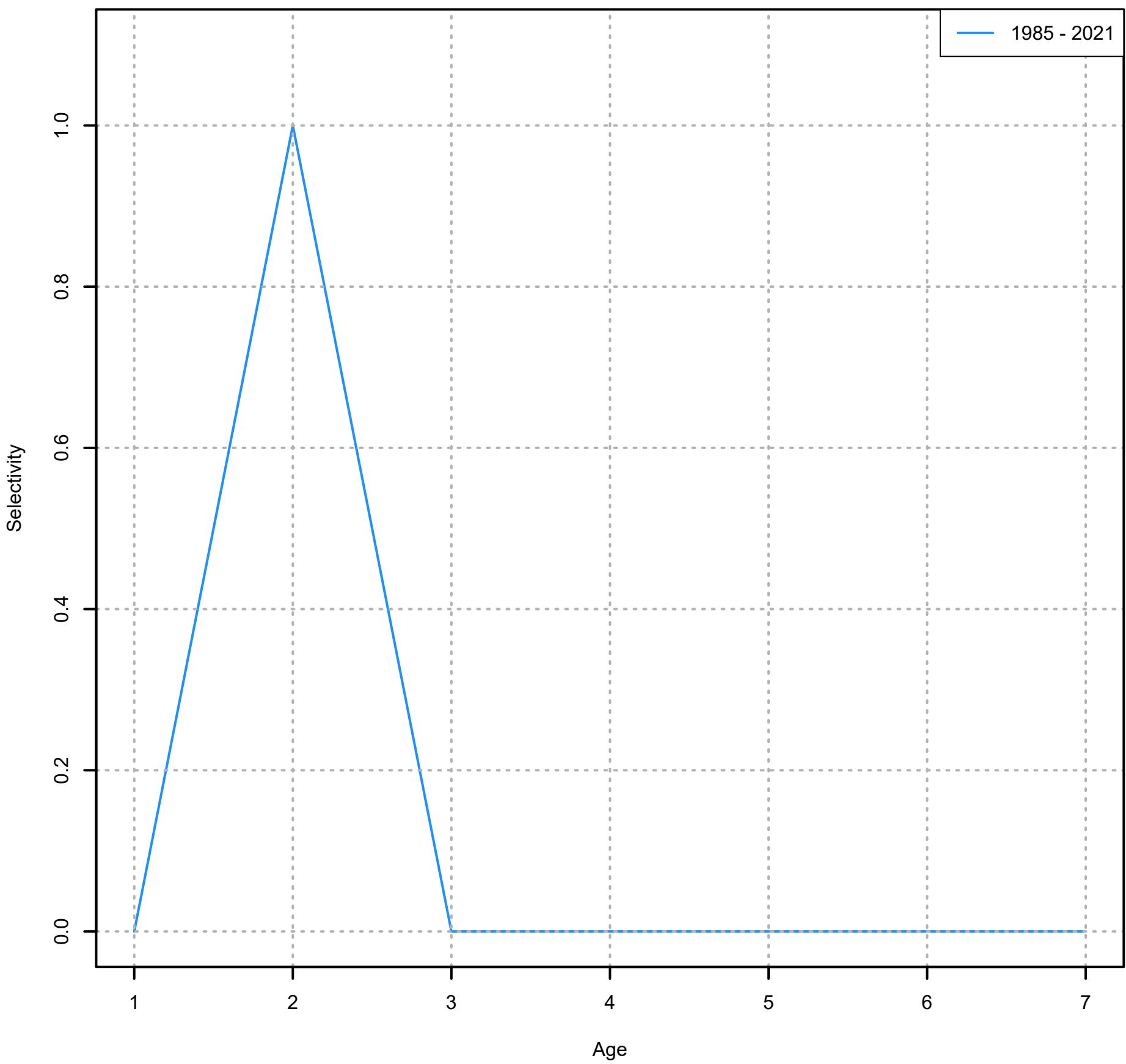
Index 7



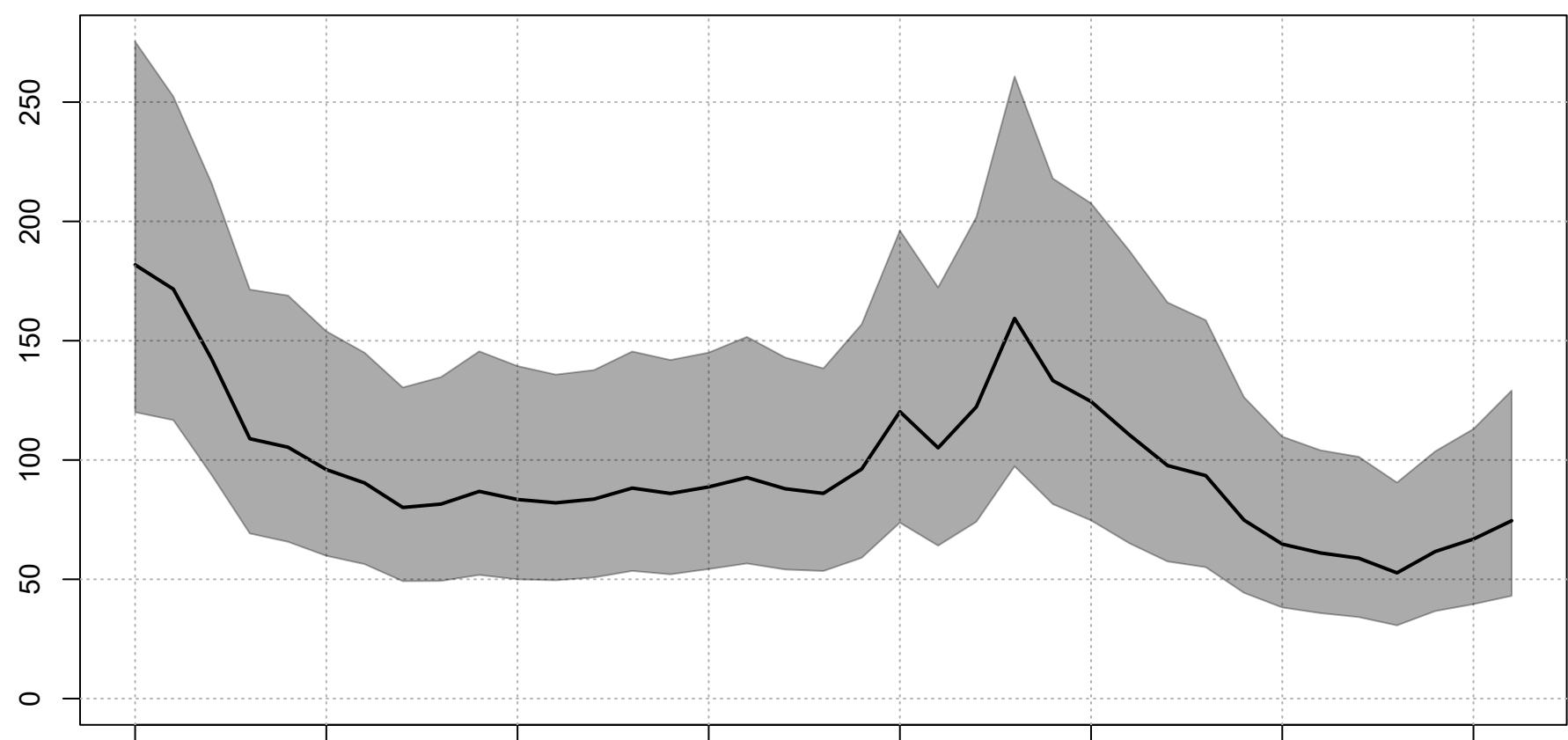
Index 8



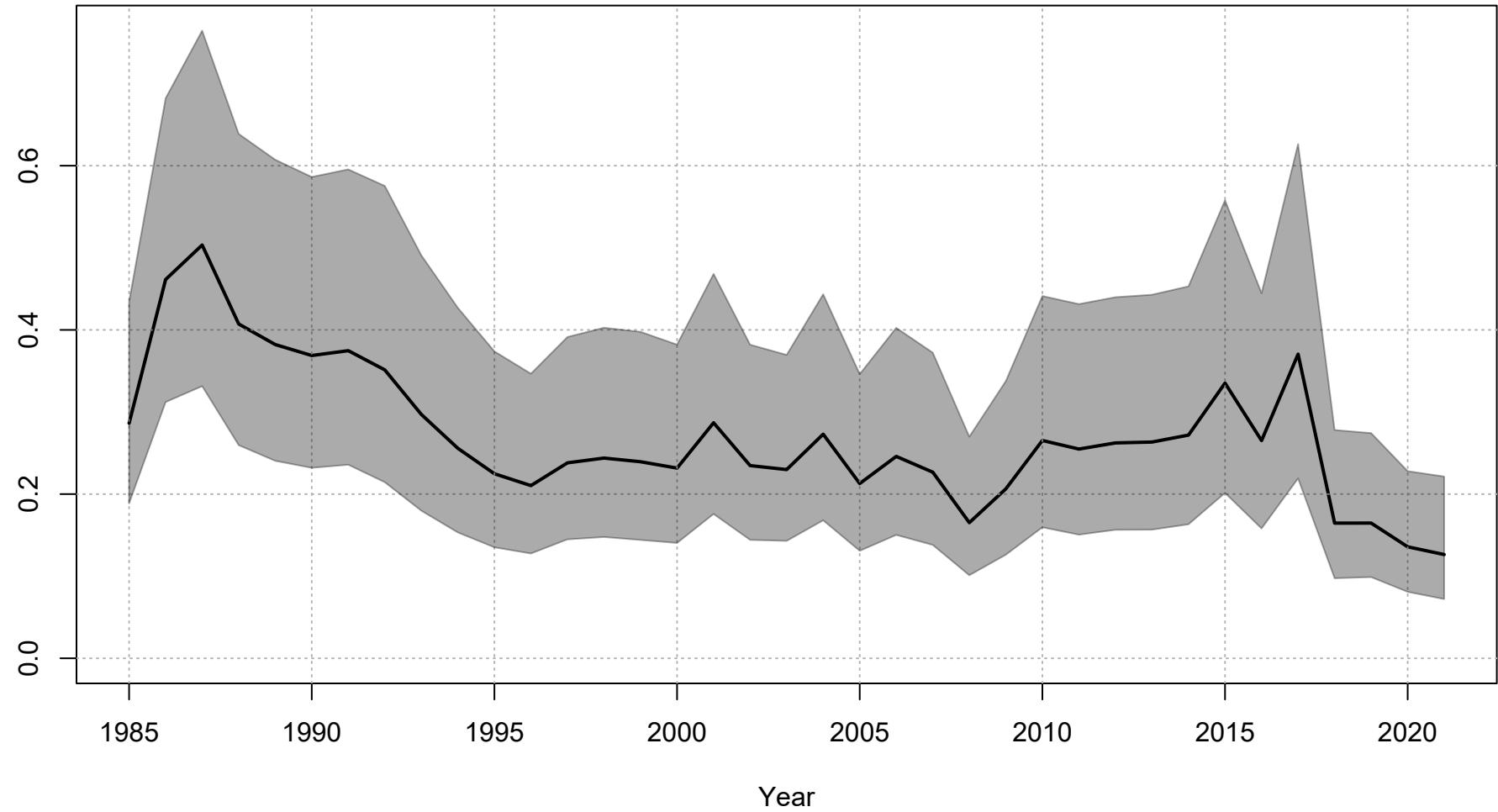
Index 9

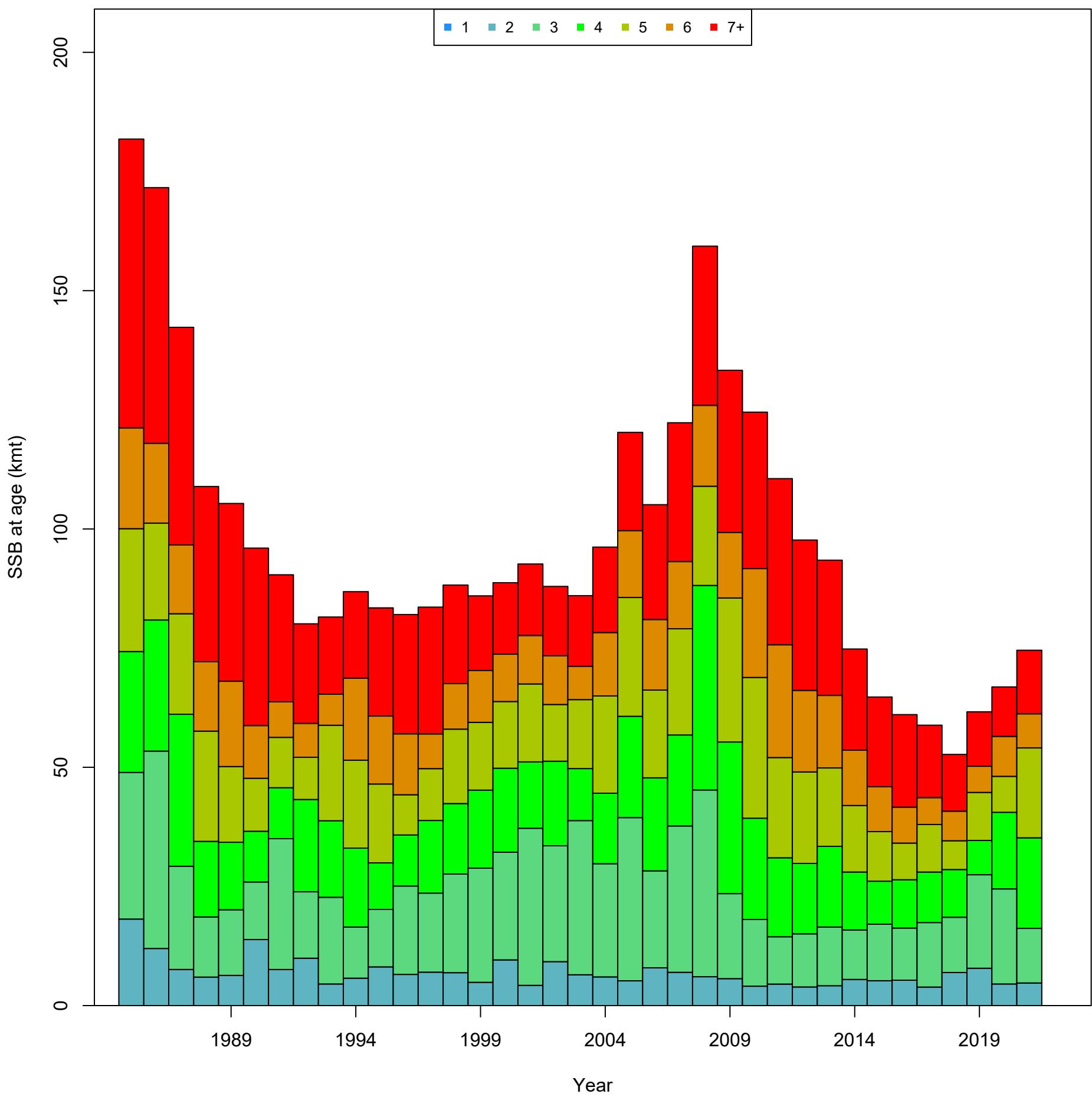


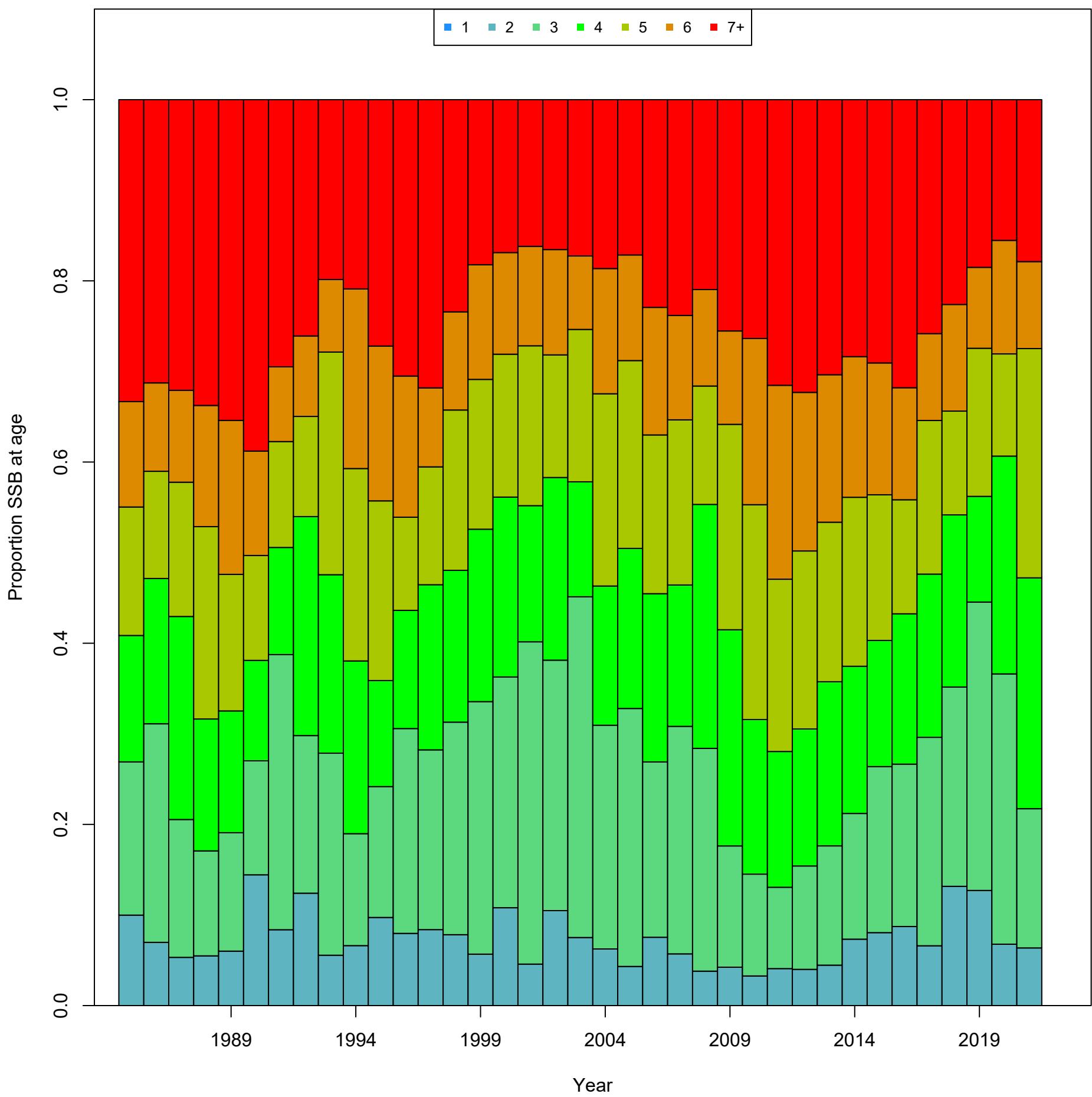
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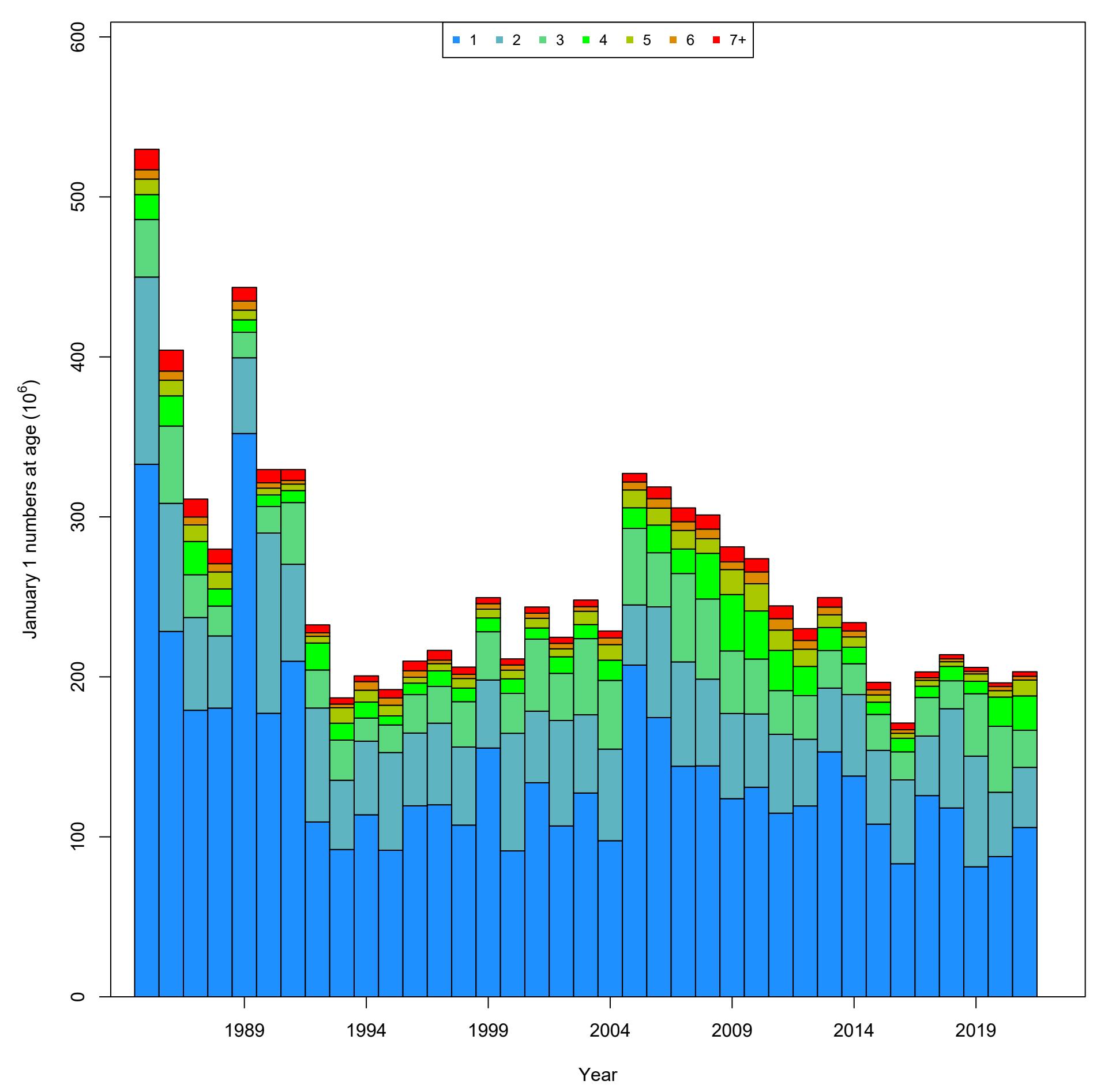


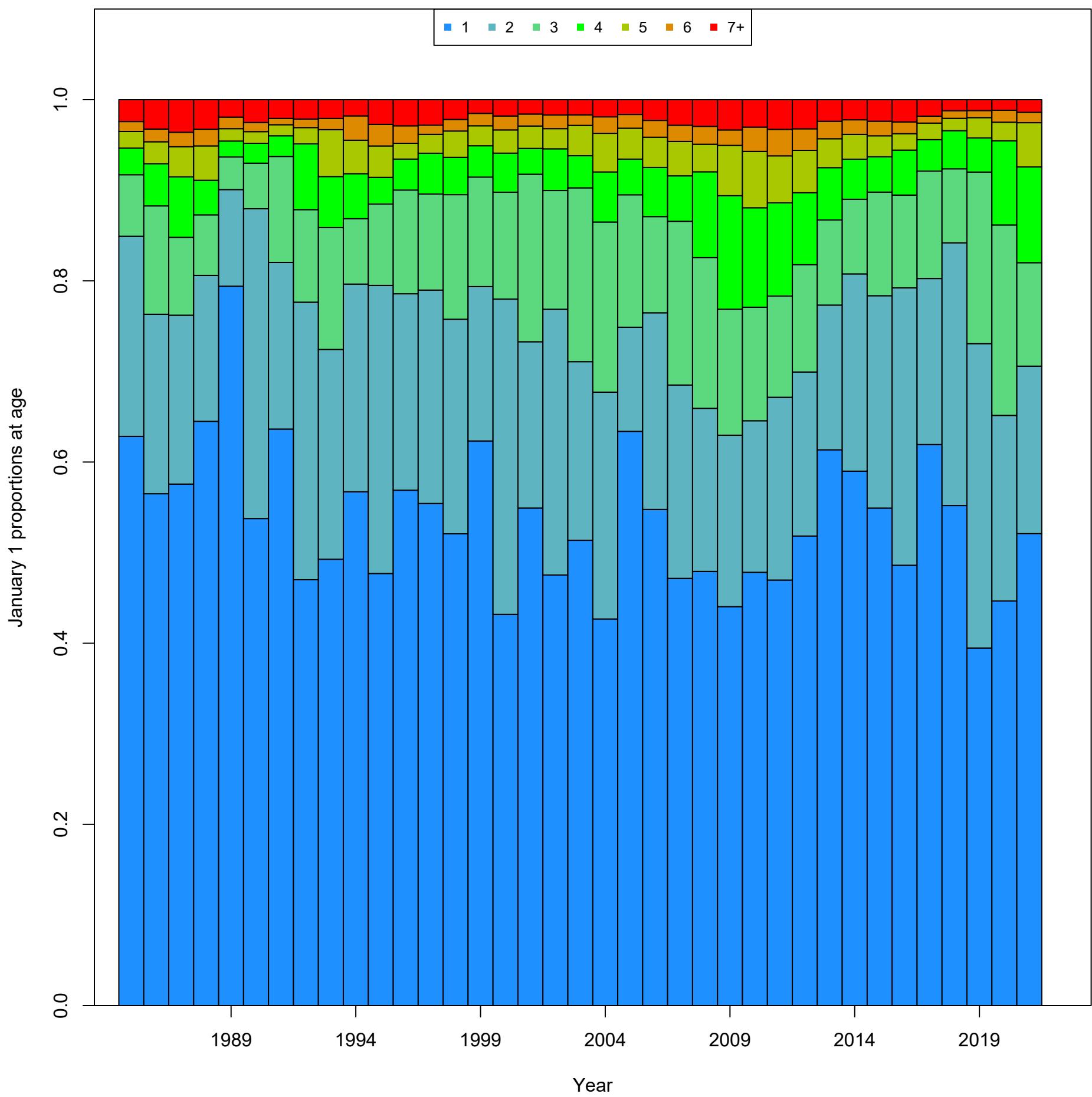
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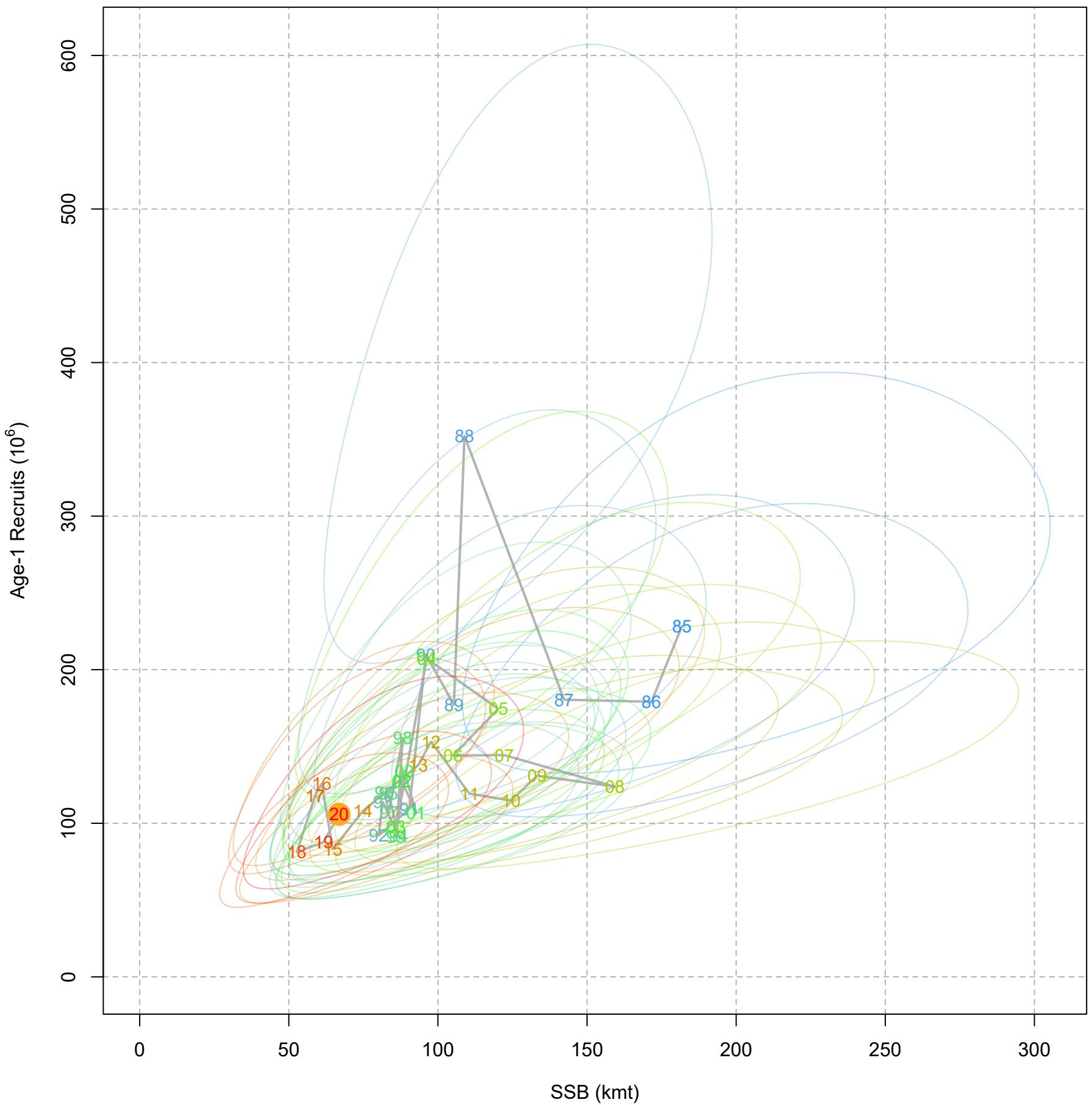


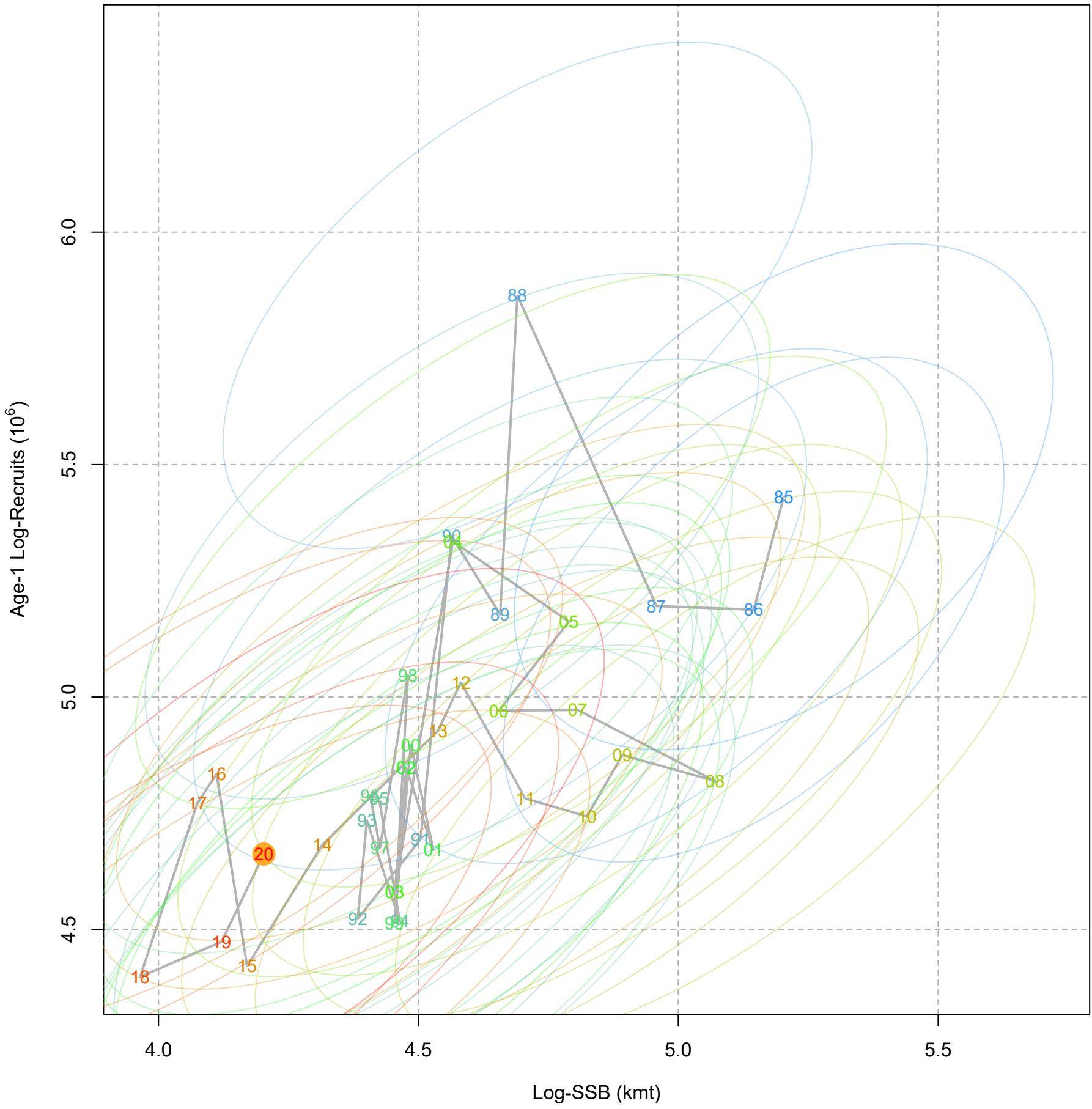


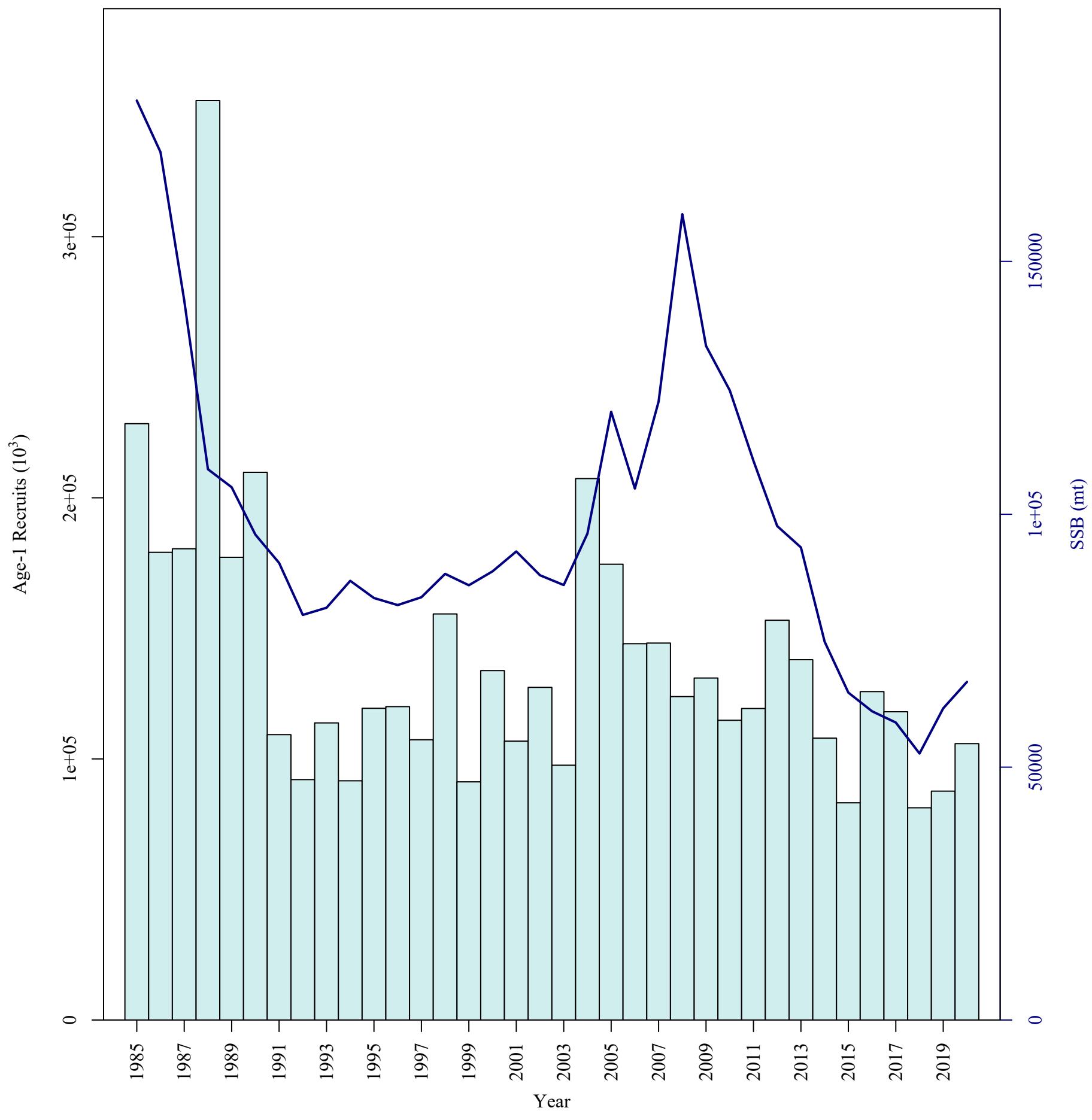


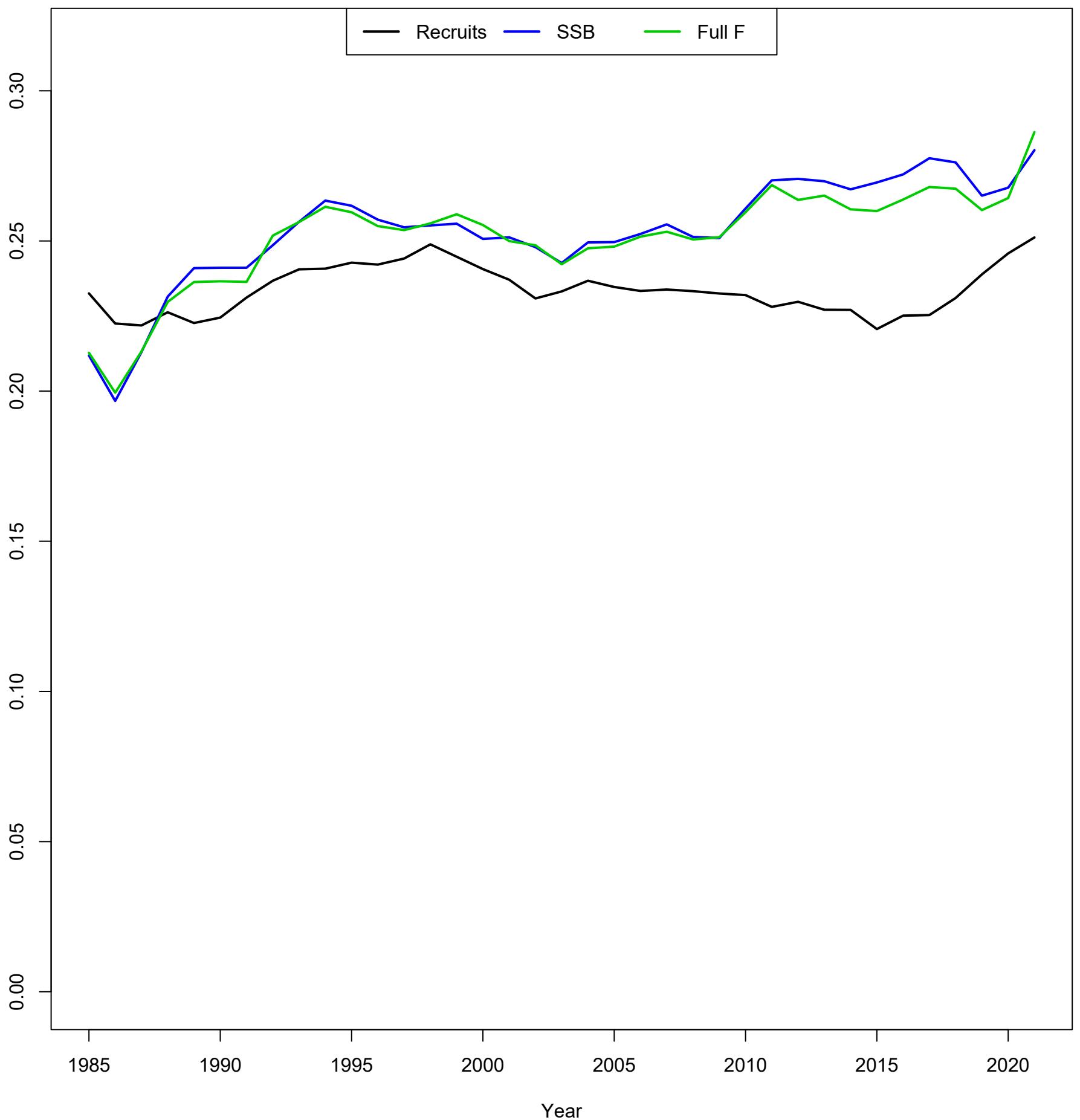


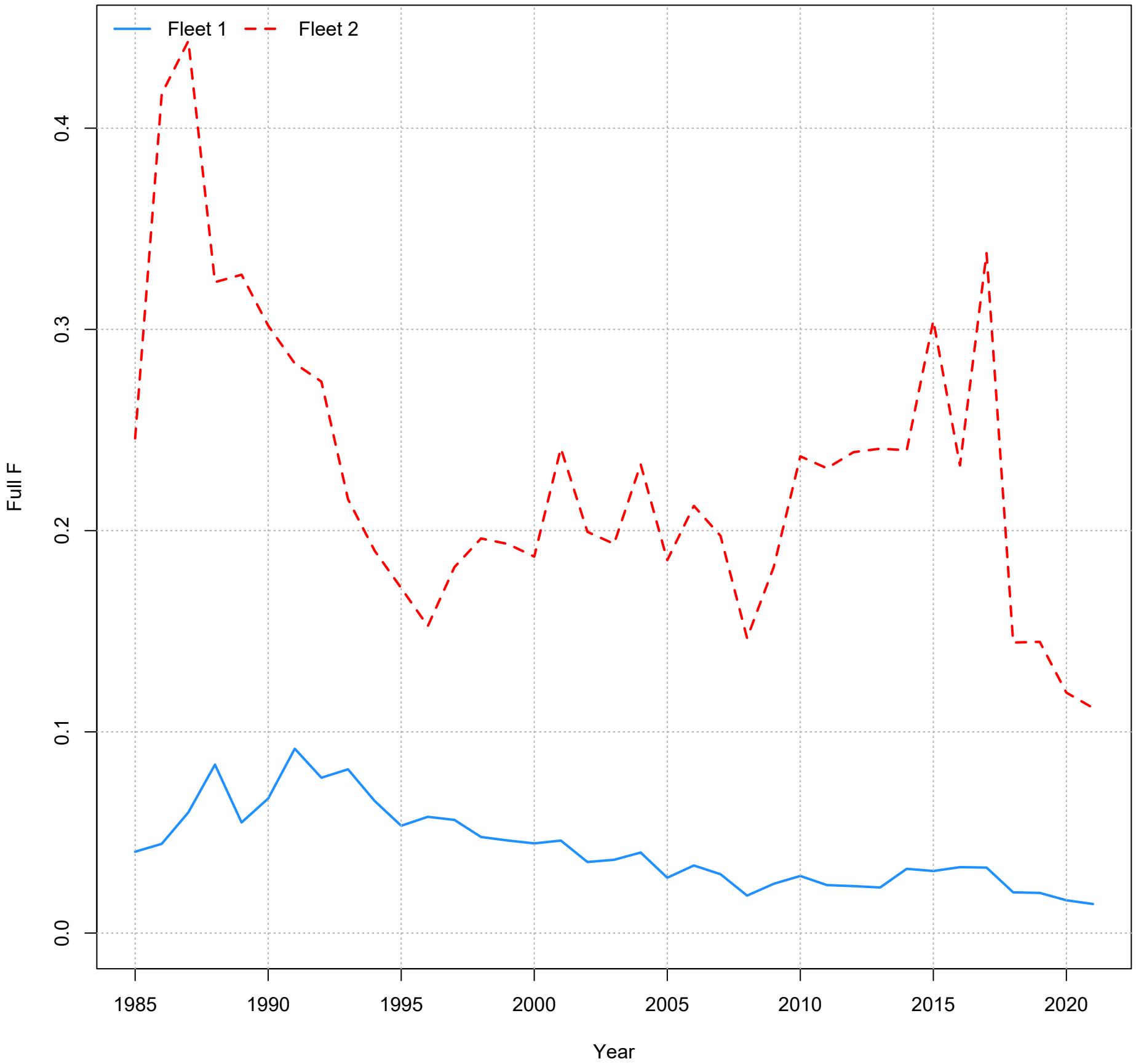


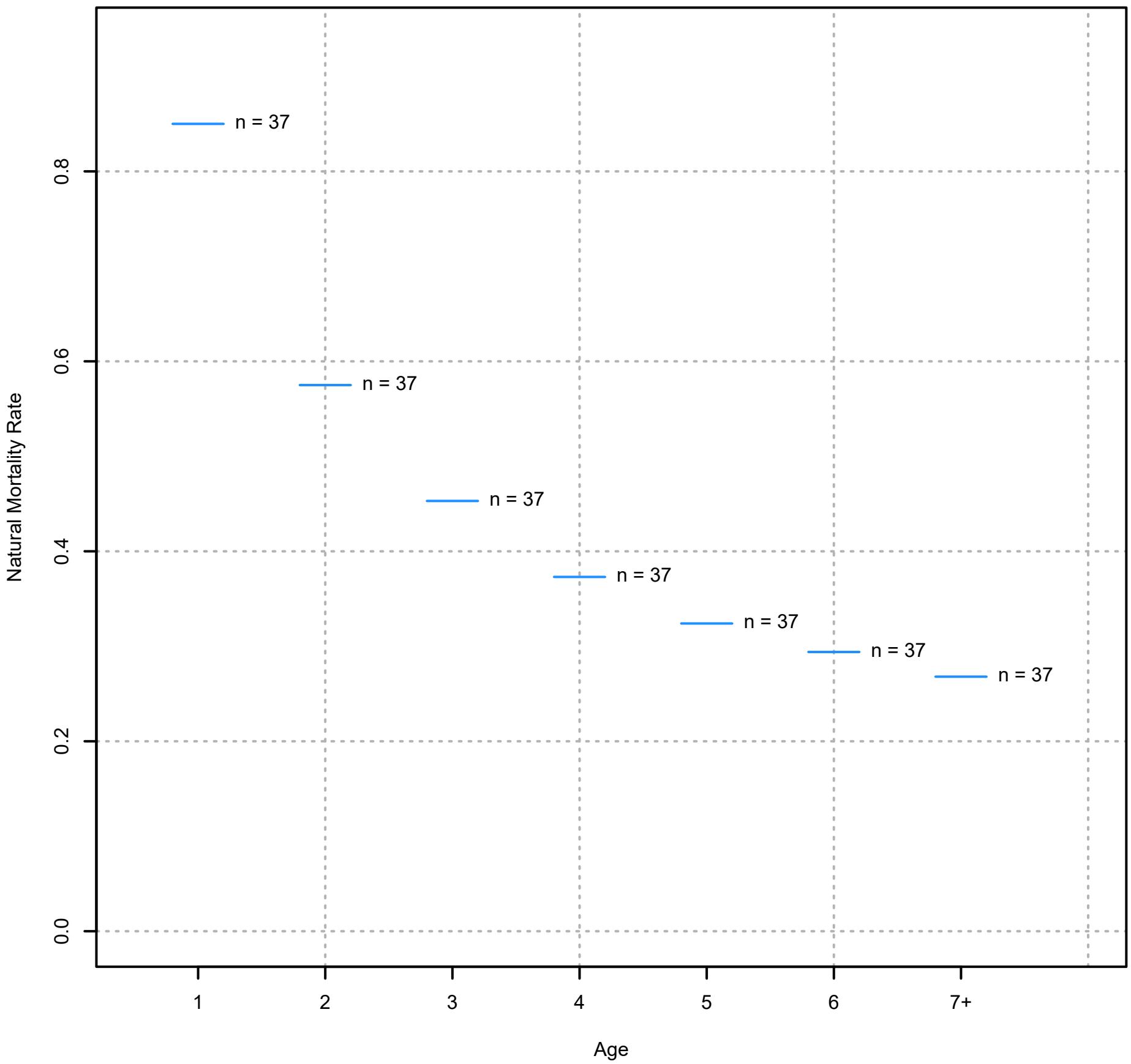


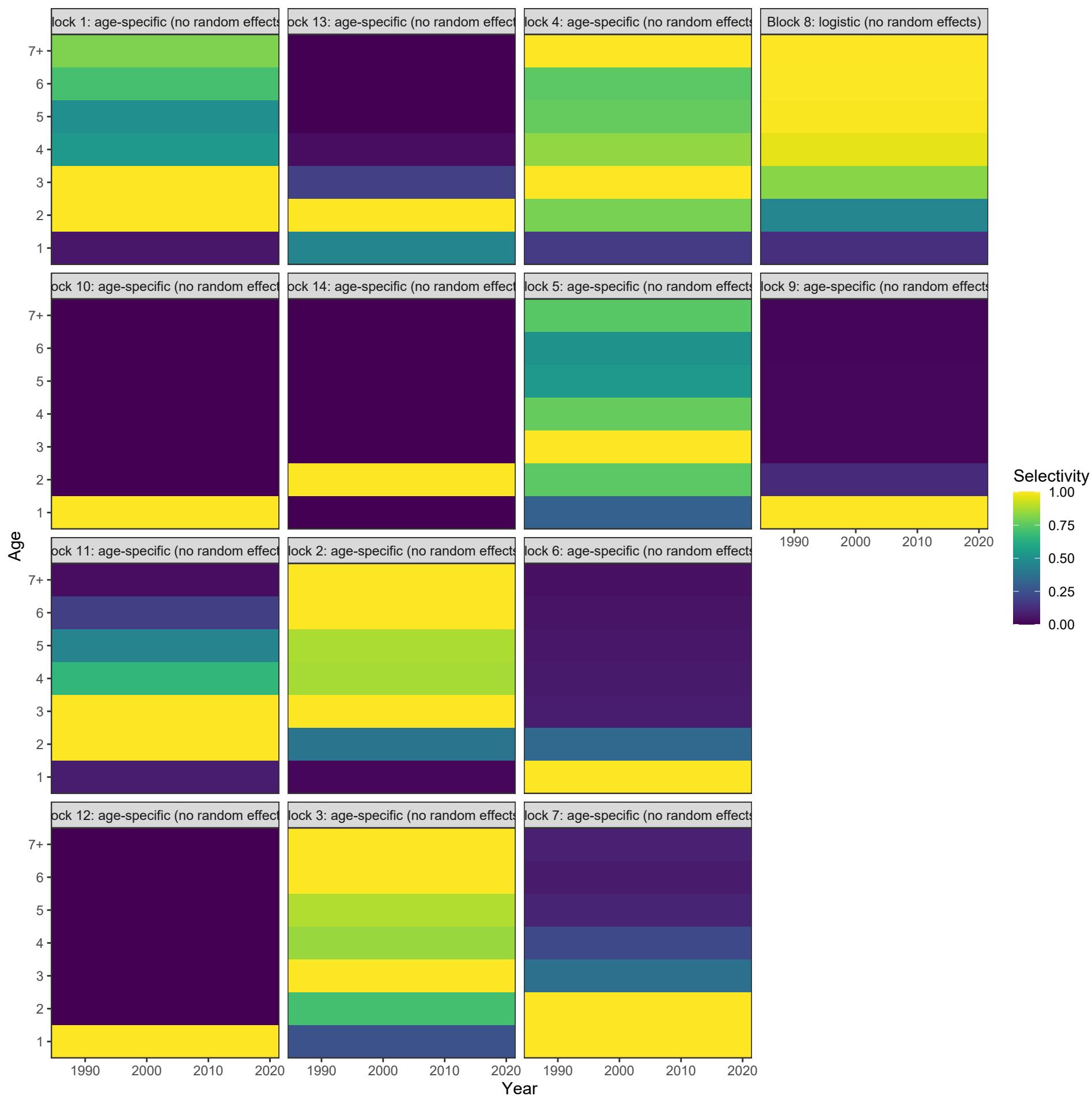


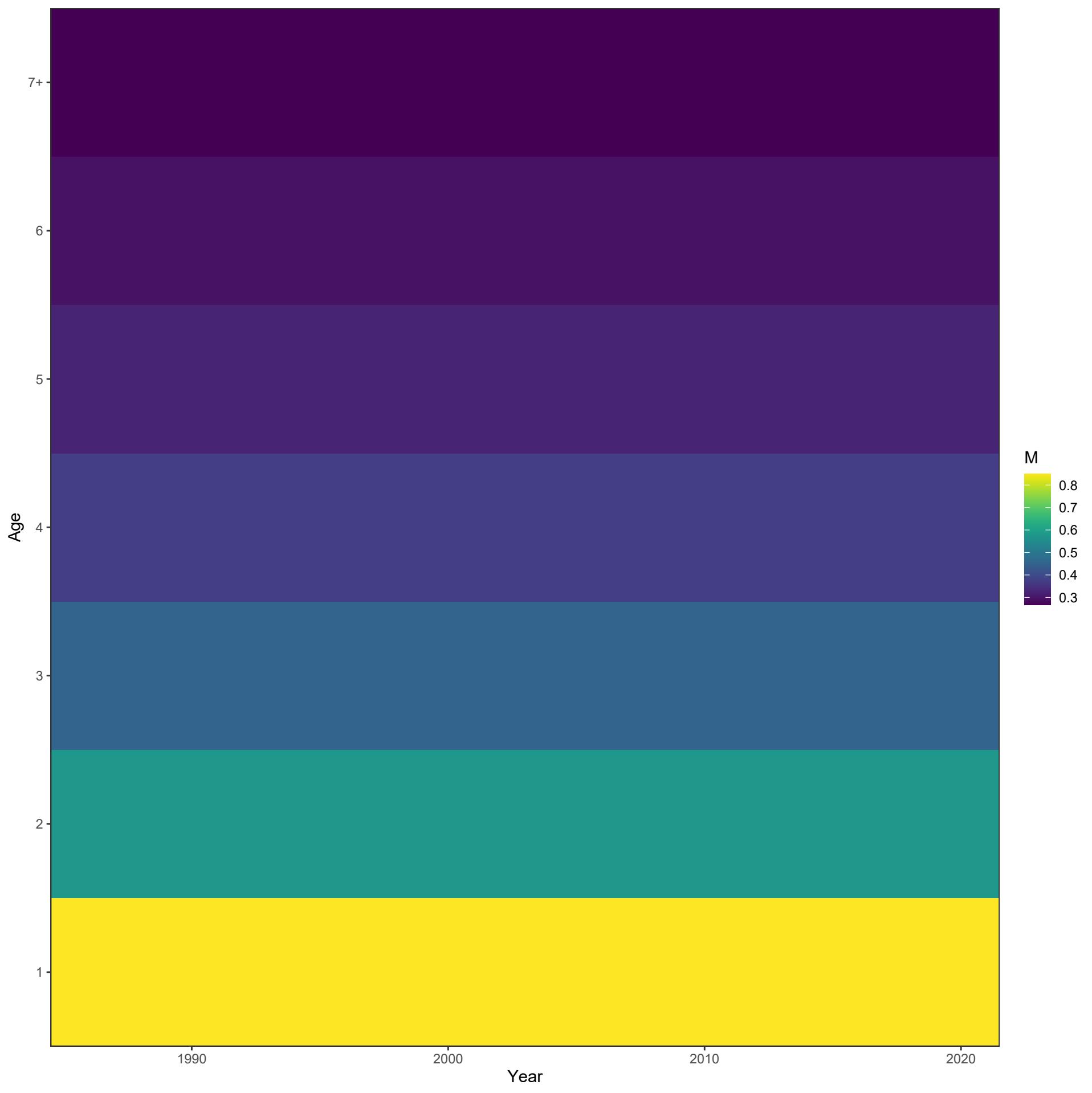


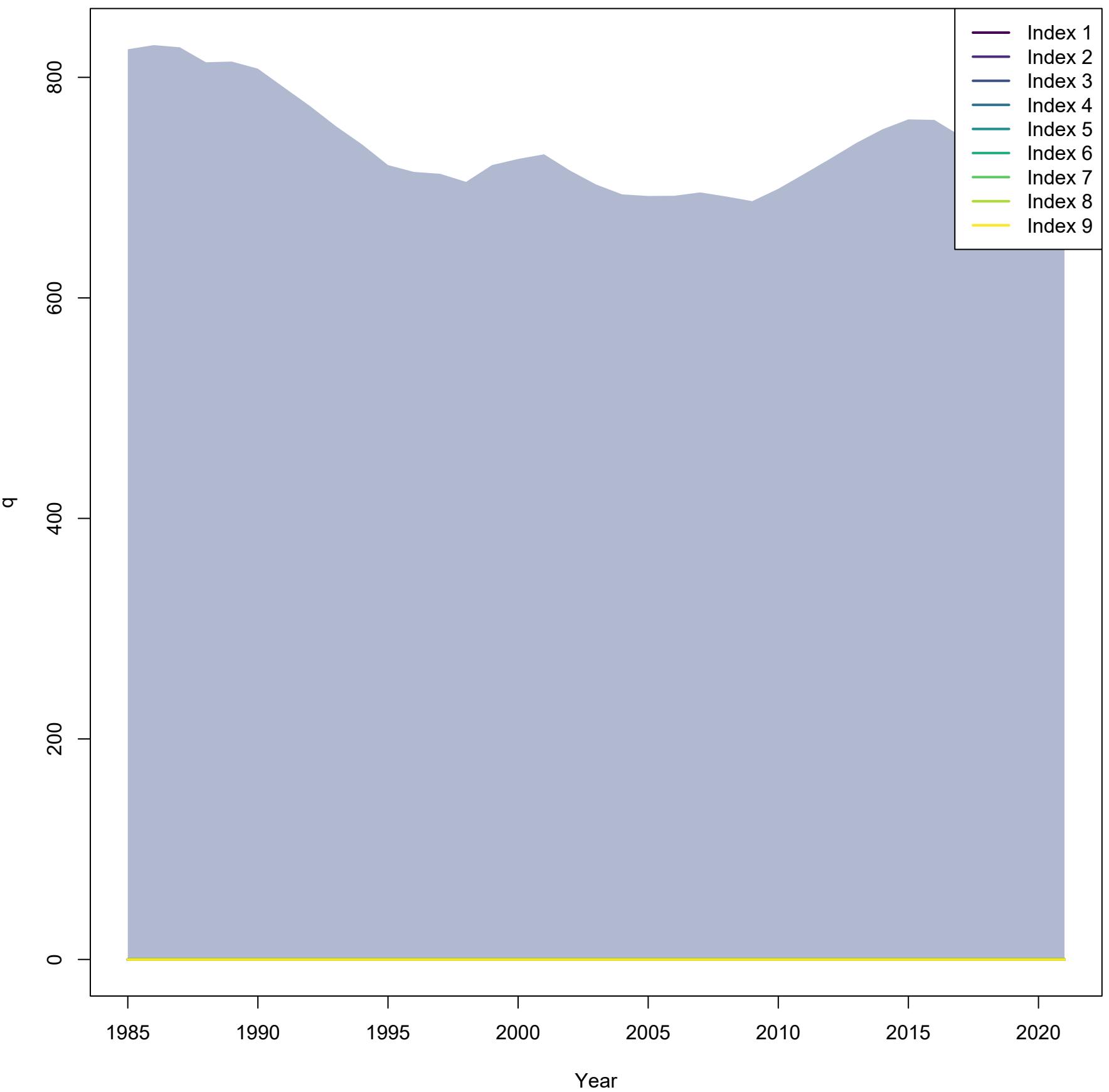




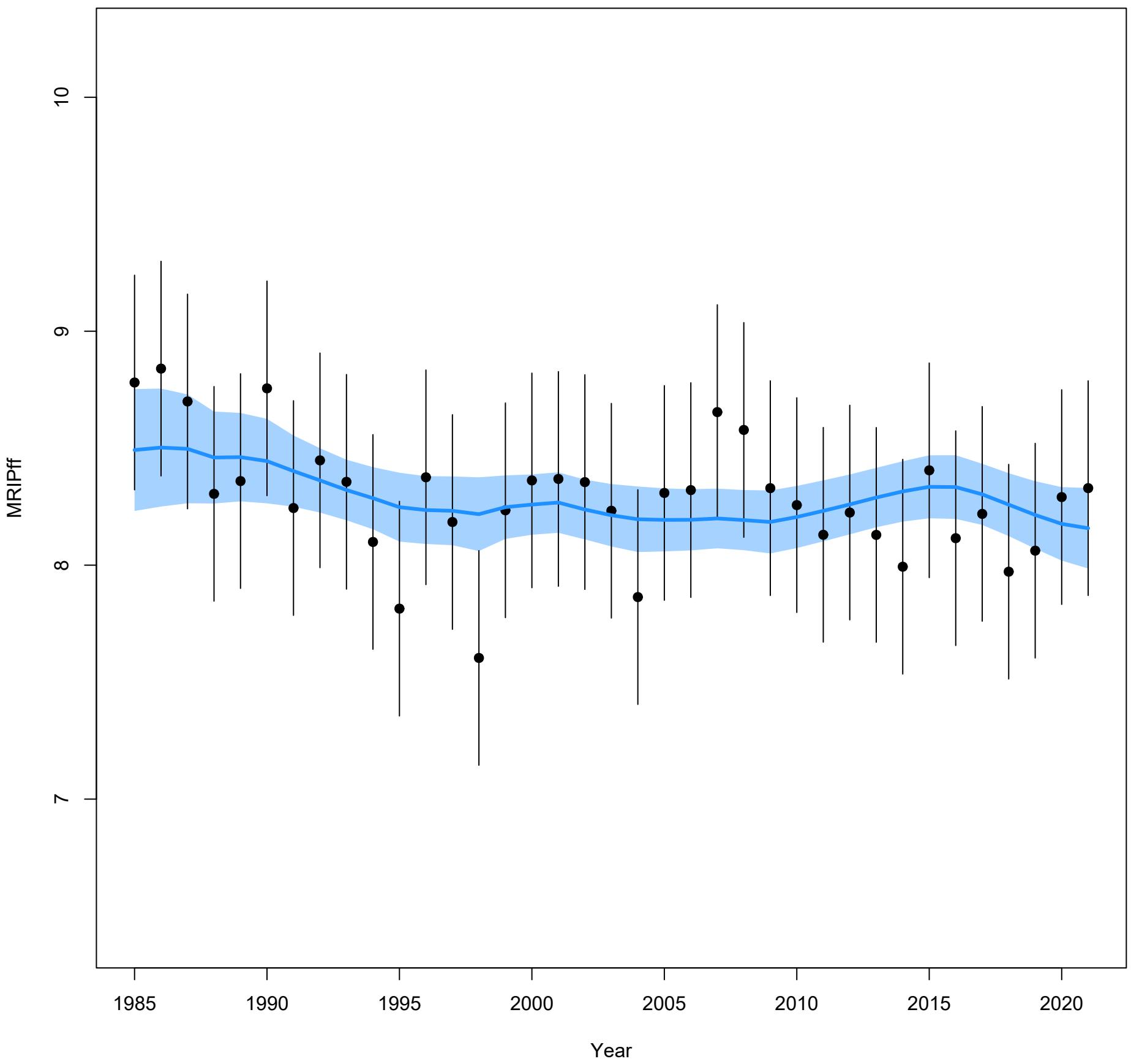




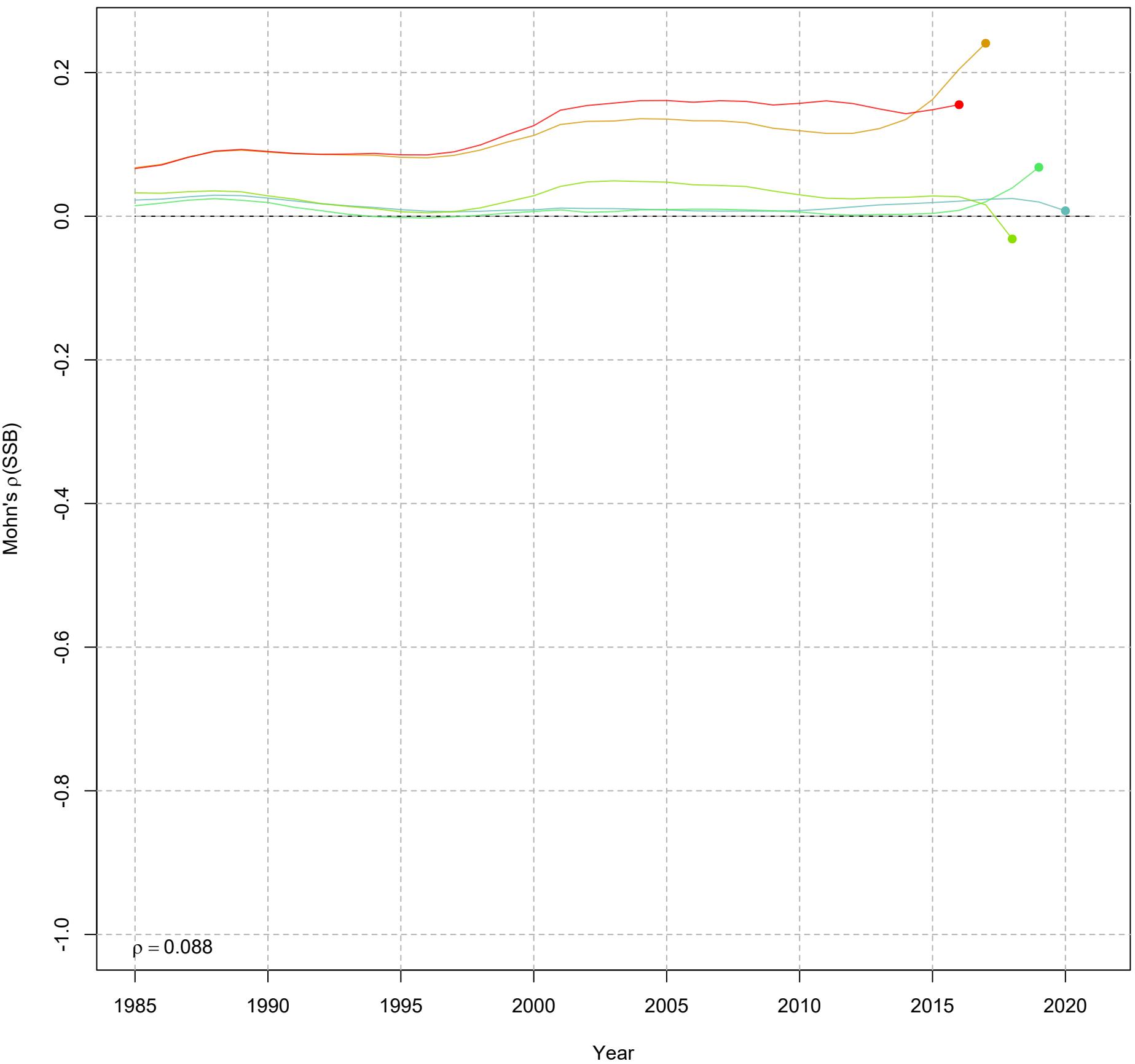




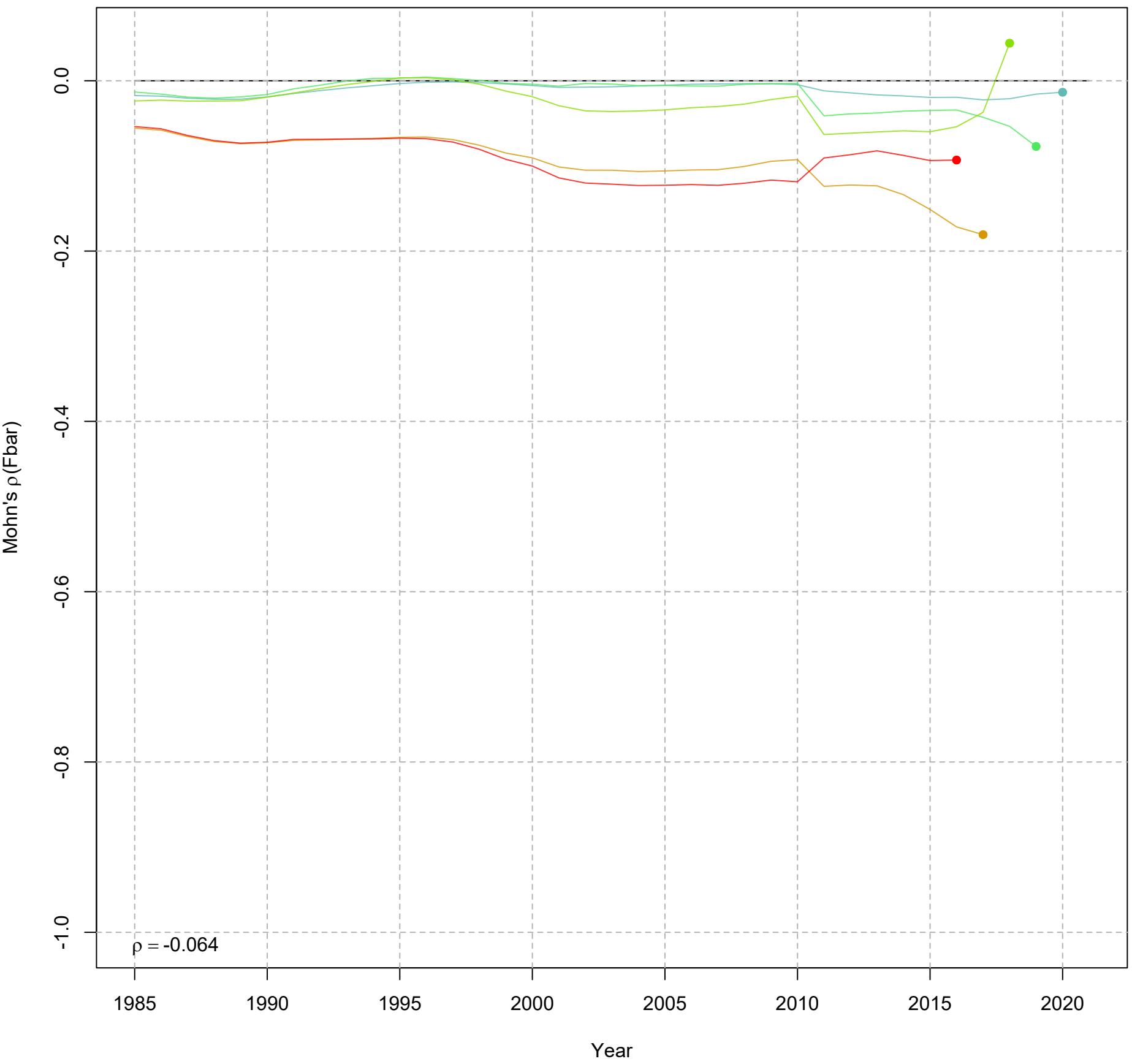
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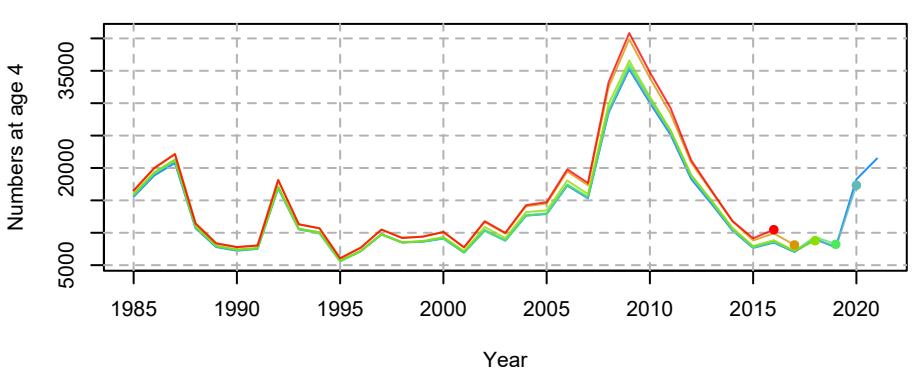
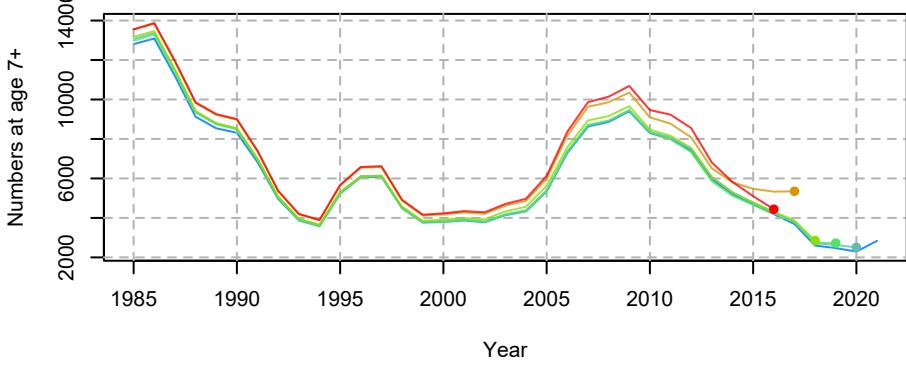
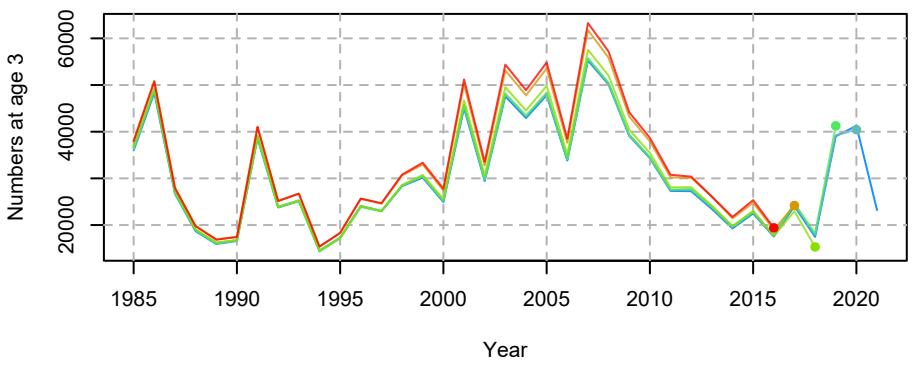
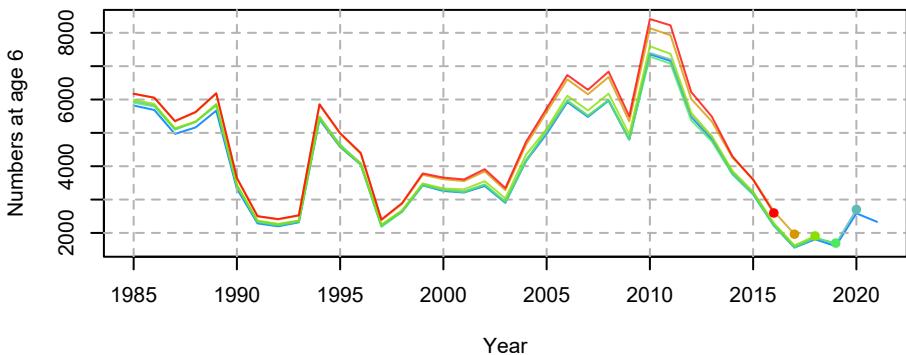
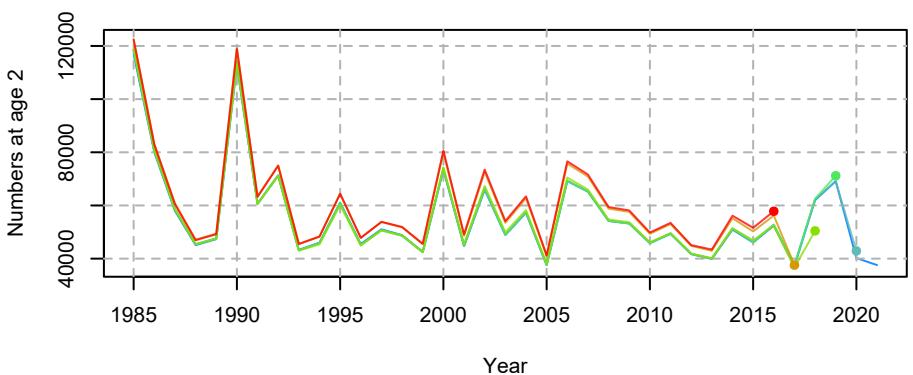
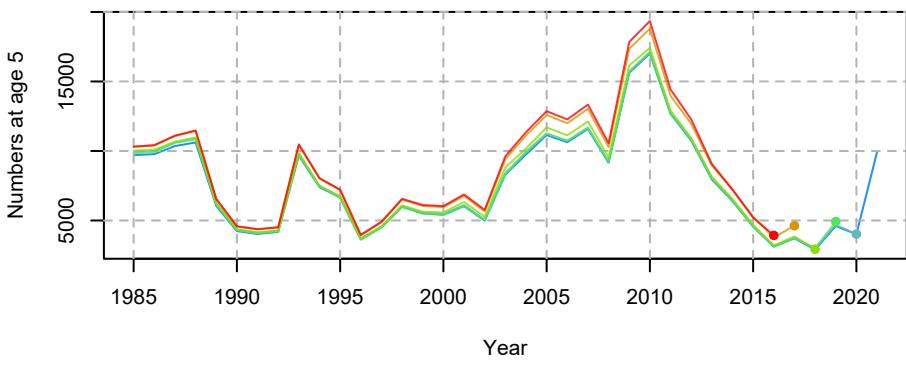
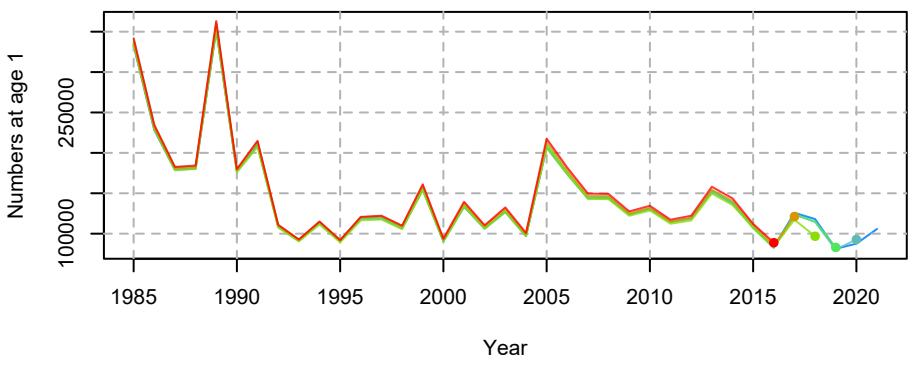


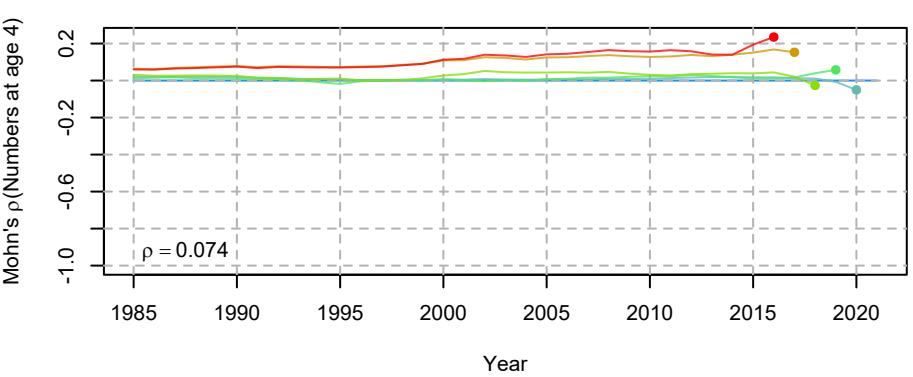
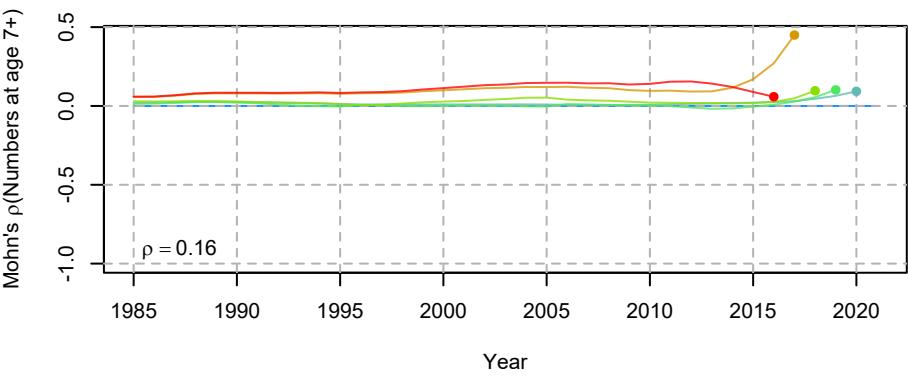
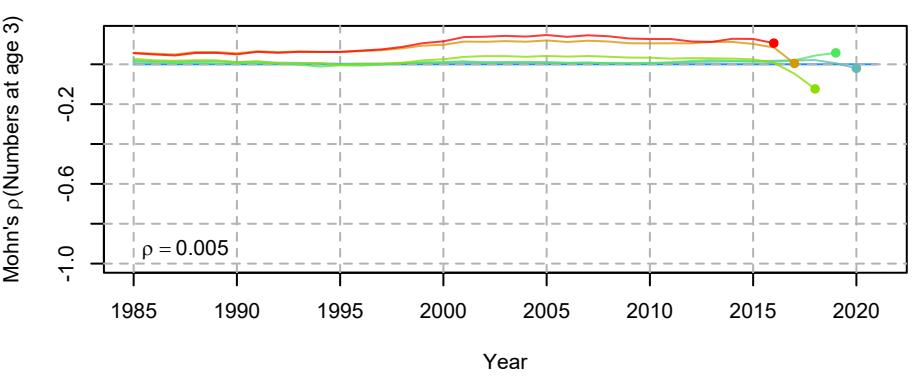
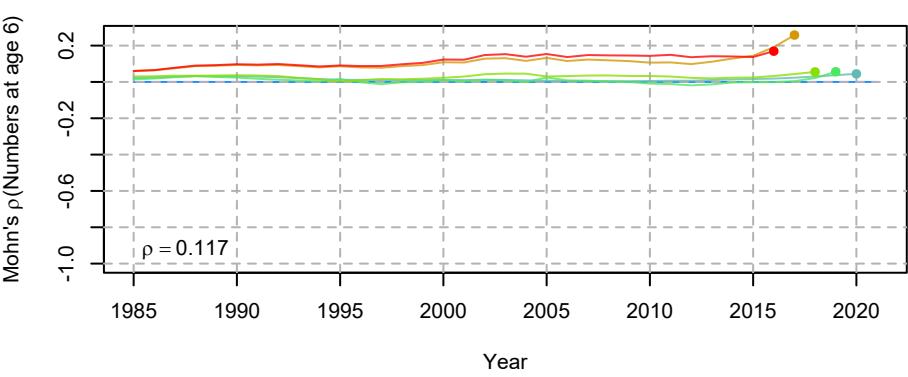
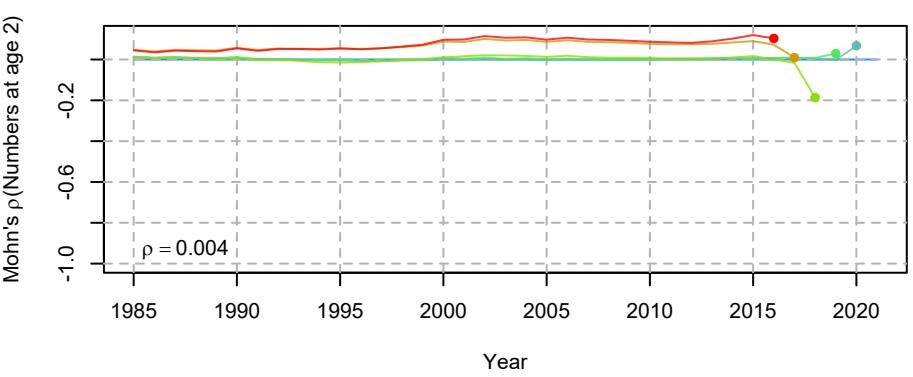
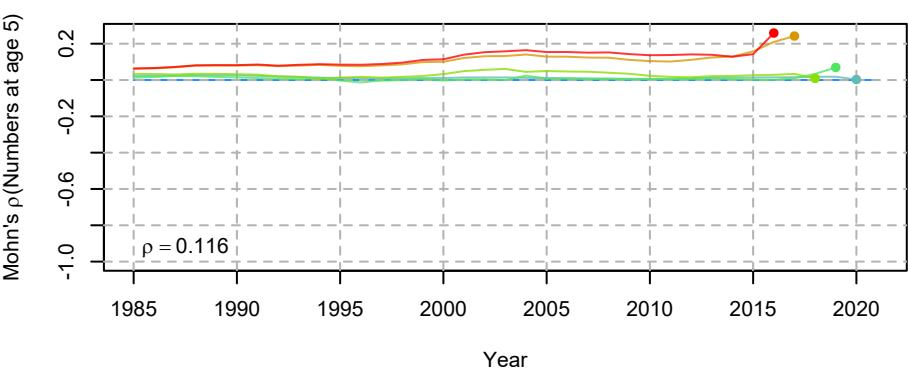
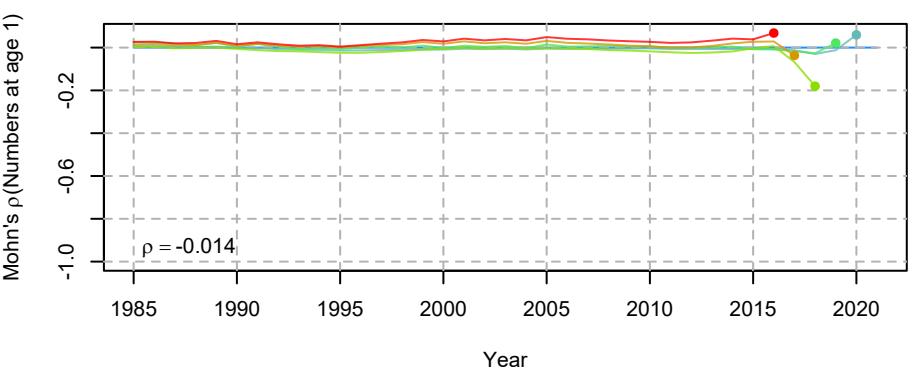


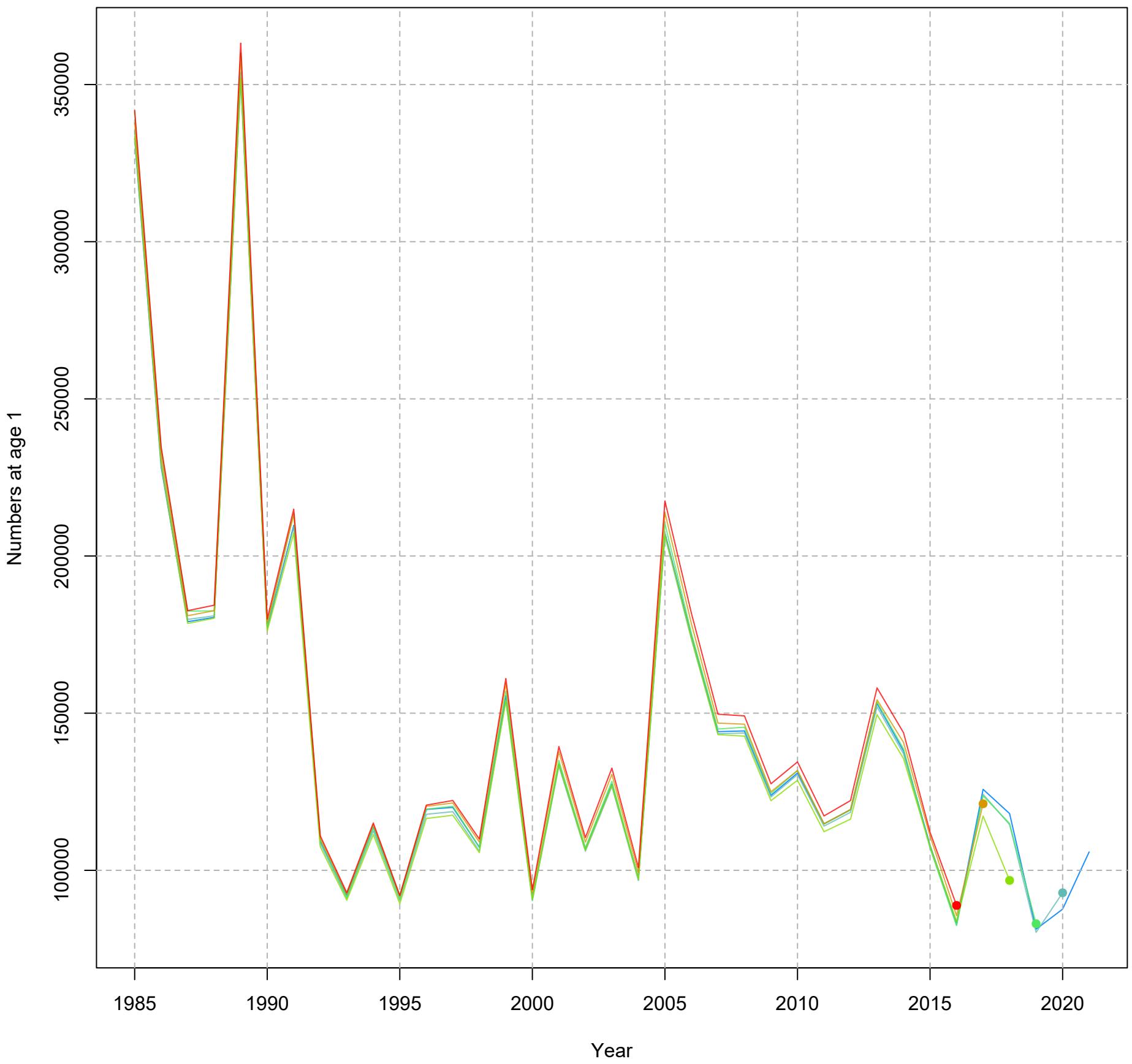


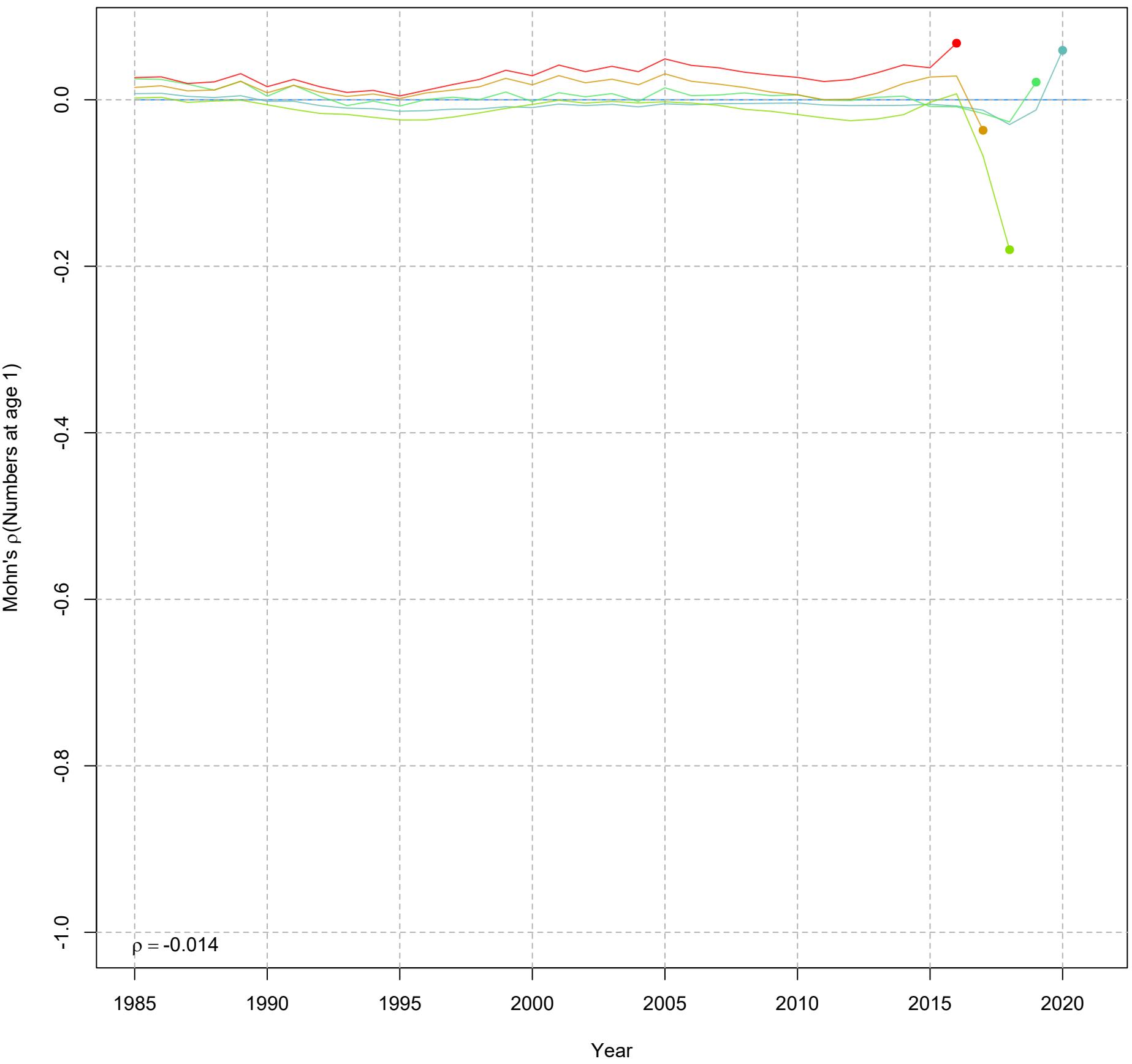










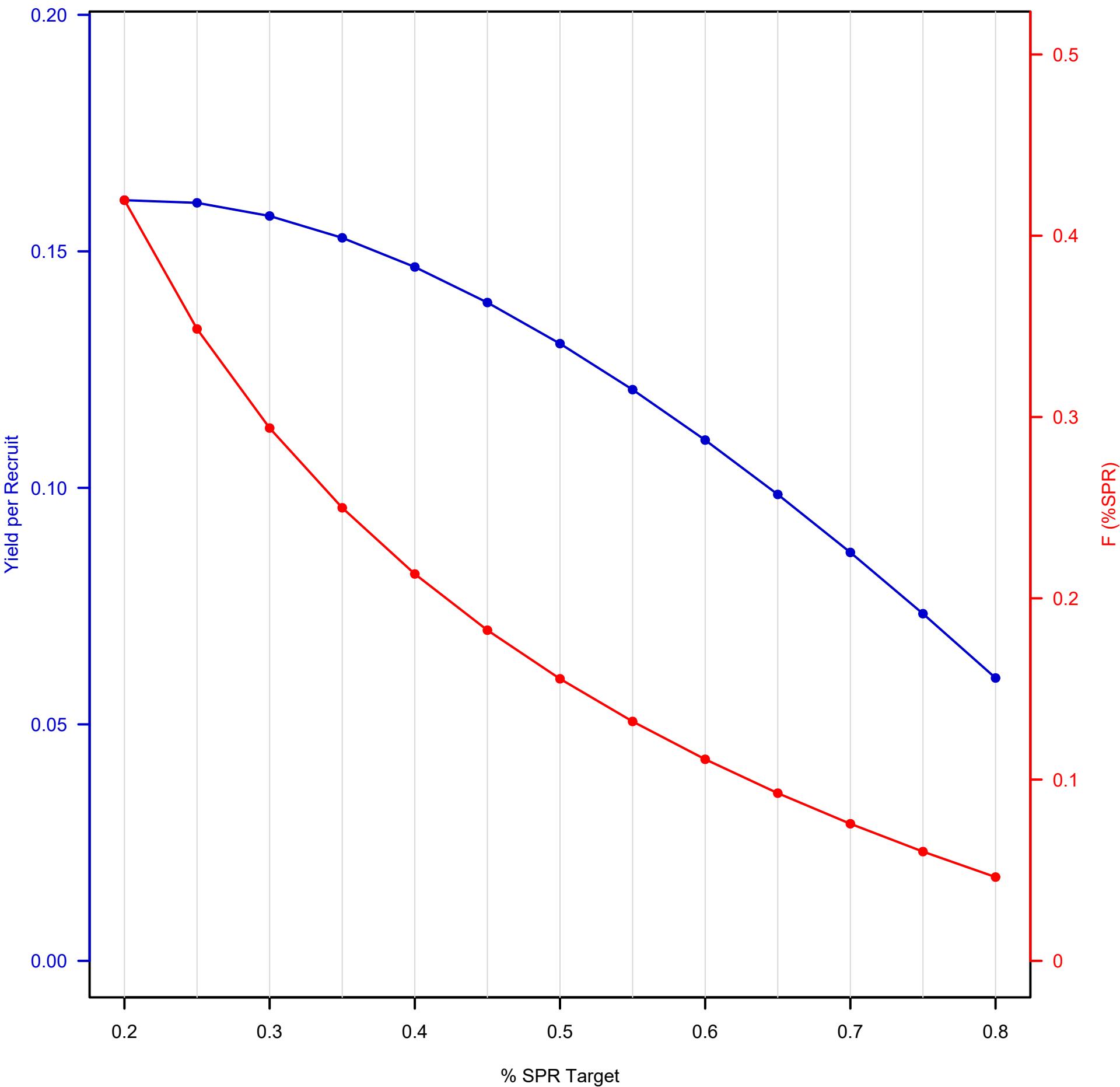


BF28W_M7ECOV

MRIP Forage Fish Index as an environmental covariate on
catchability

REFERENCE POINT PLOTS

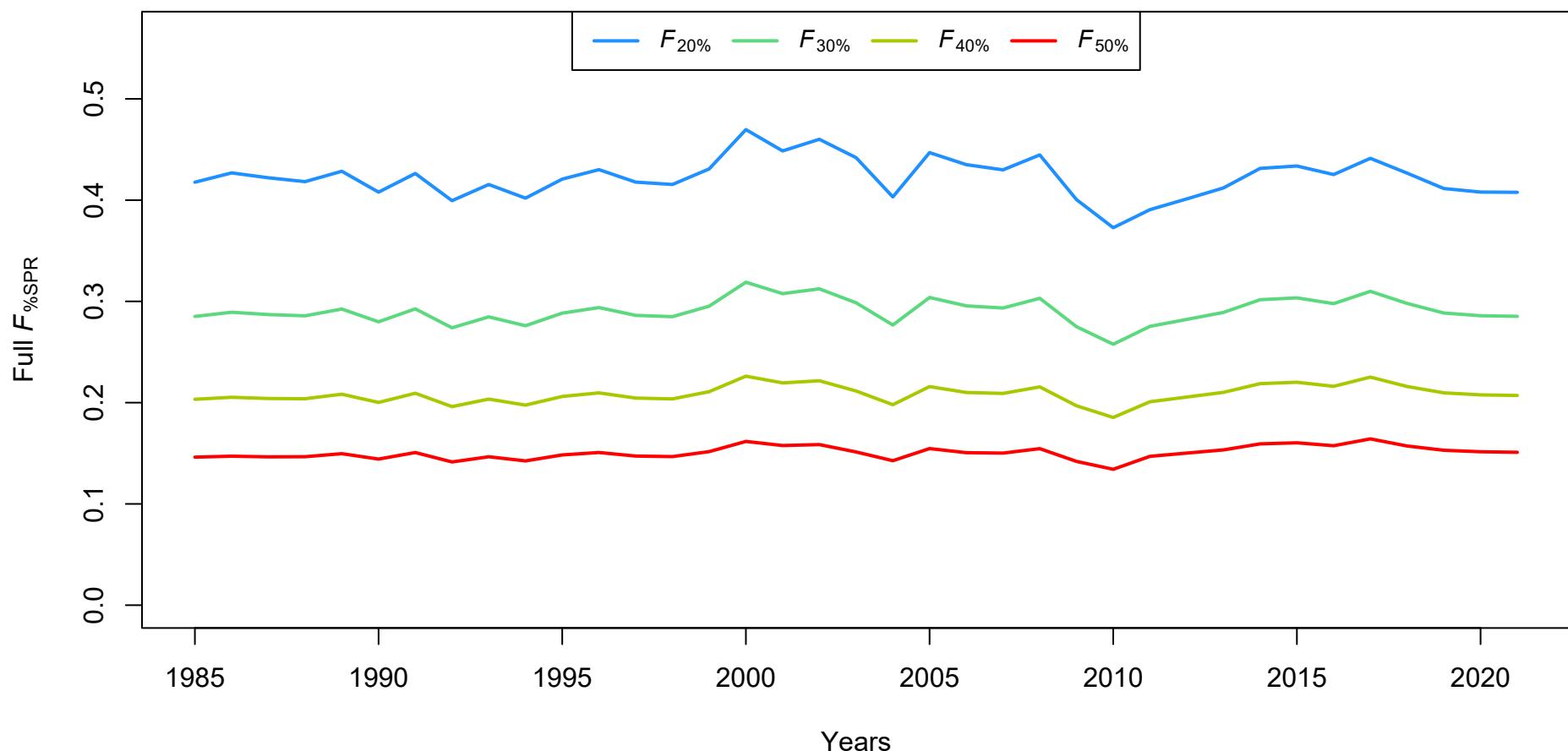
SPR Target Reference Points (Years Avg = 5)



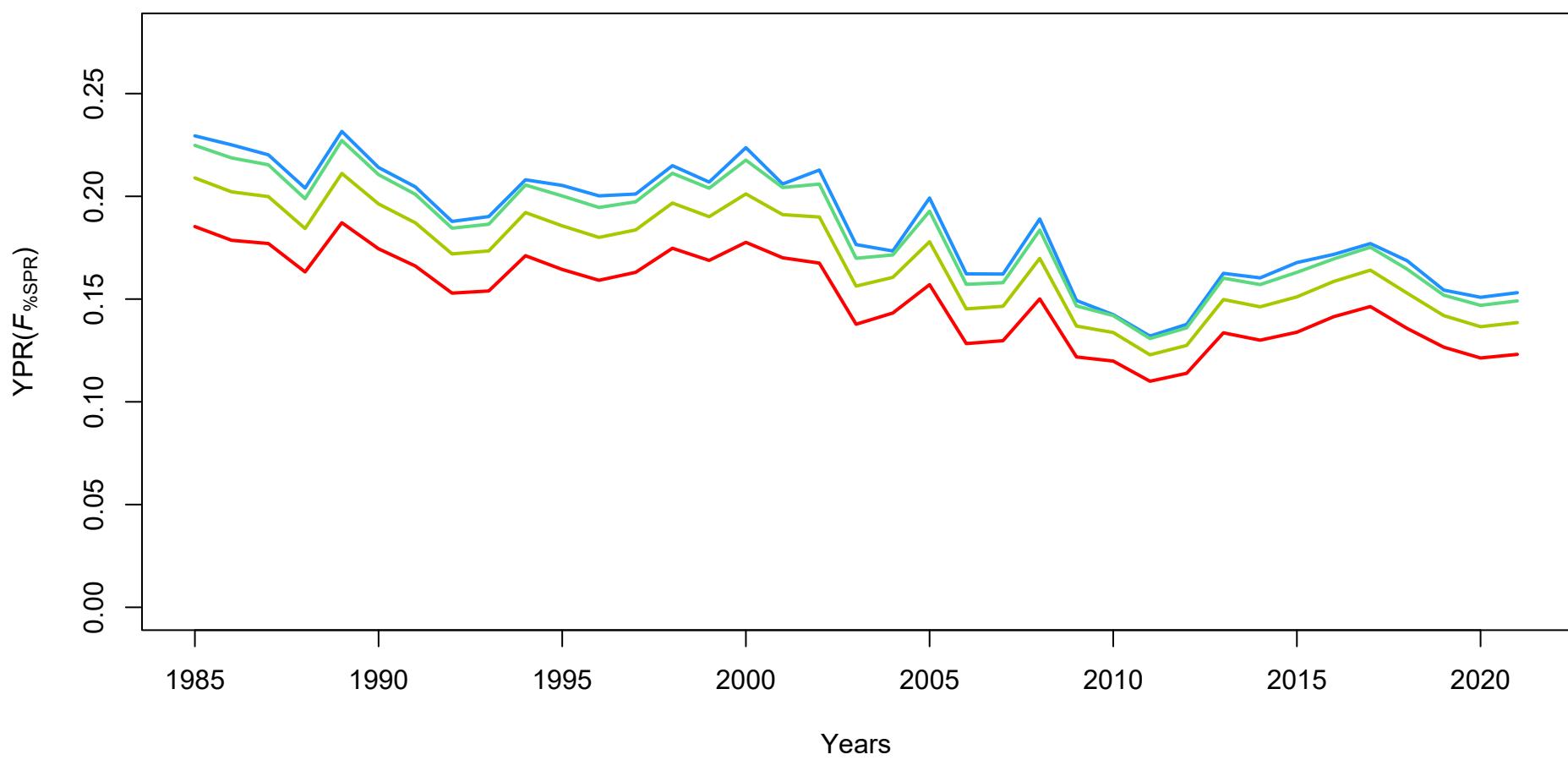
SPR Target Reference Points (Years Avg = 5)

% SPR	F(%SPR)	YPR
0.2	0.4196	0.1608
0.25	0.3486	0.1603
0.3	0.2939	0.1575
0.35	0.2499	0.1529
0.4	0.2134	0.1467
0.45	0.1824	0.1392
0.5	0.1556	0.1305
0.55	0.1321	0.1208
0.6	0.1112	0.1101
0.65	0.0925	0.0986
0.7	0.0756	0.0863
0.75	0.0603	0.0734
0.8	0.0462	0.0598

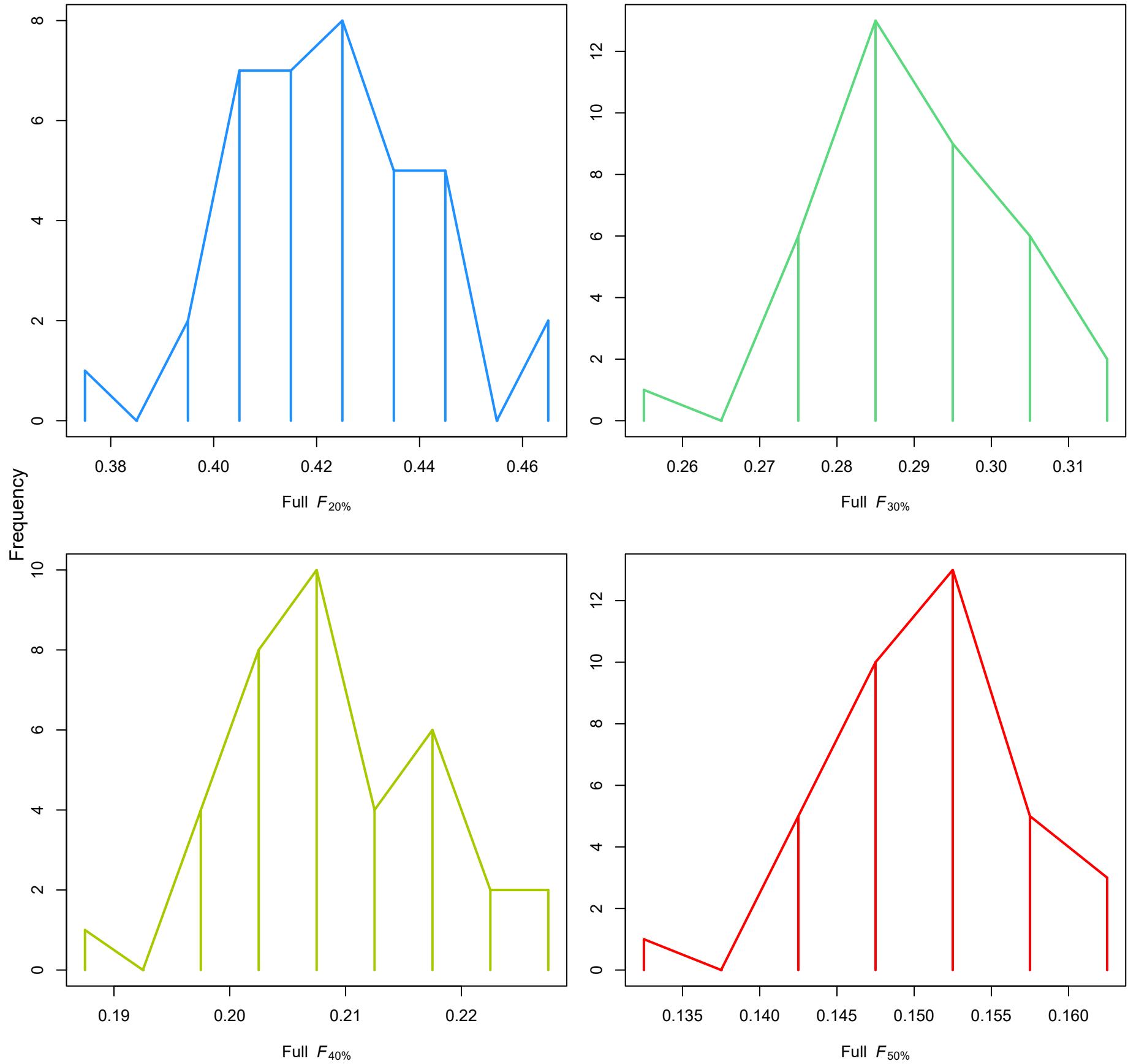
Annual $F_{\%SPR}$ Reference Points



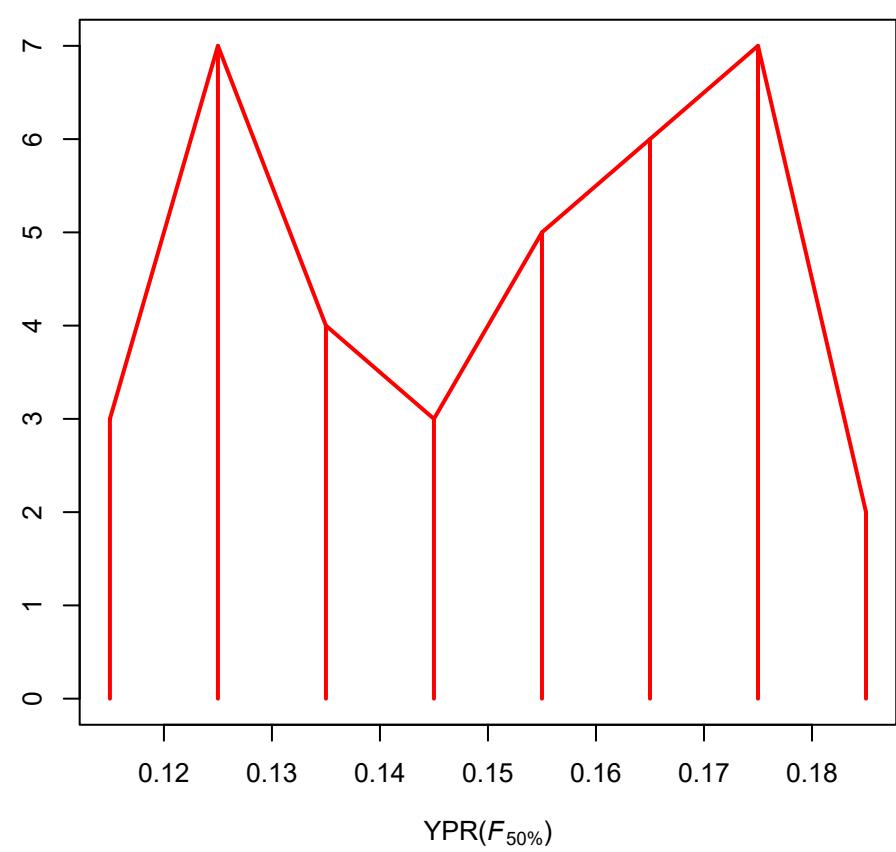
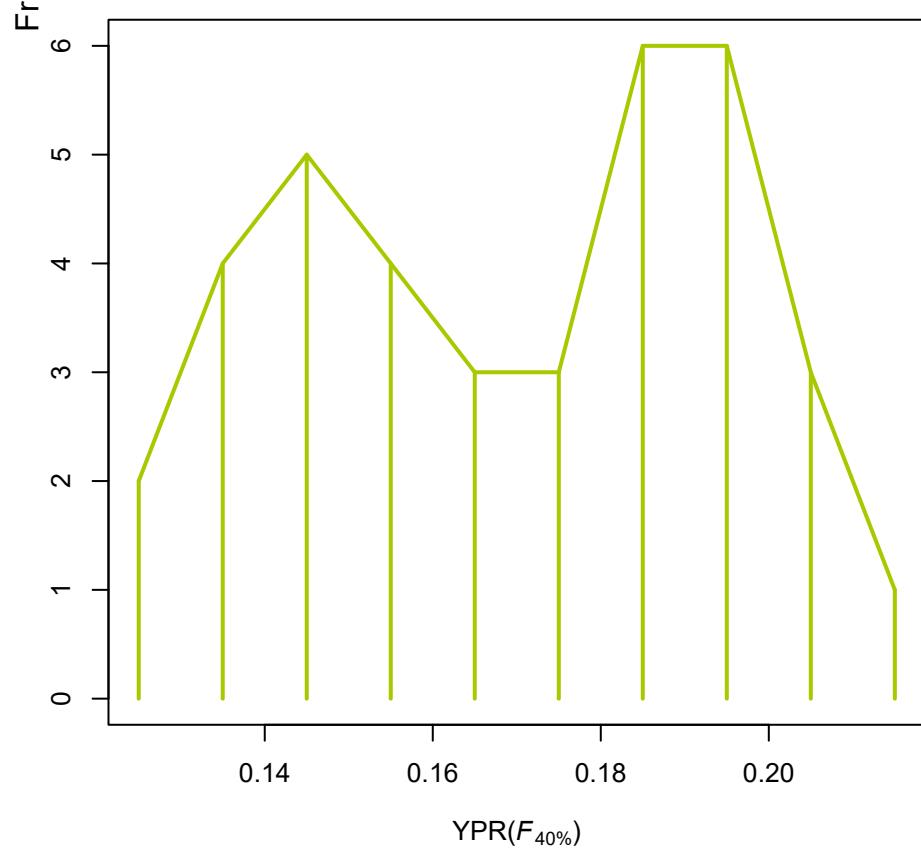
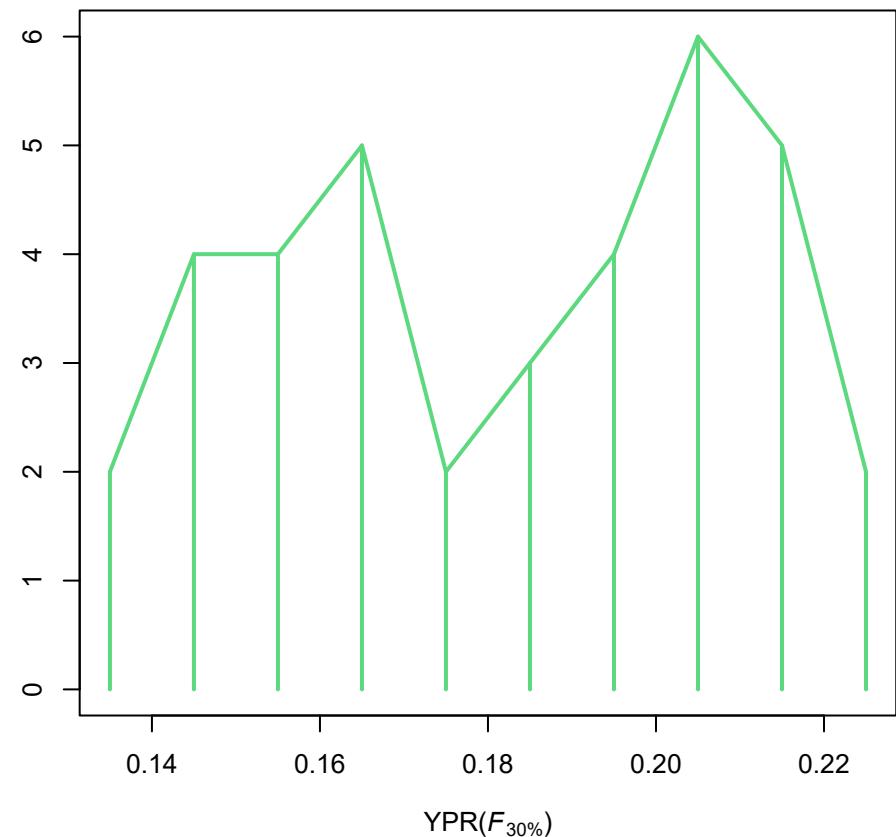
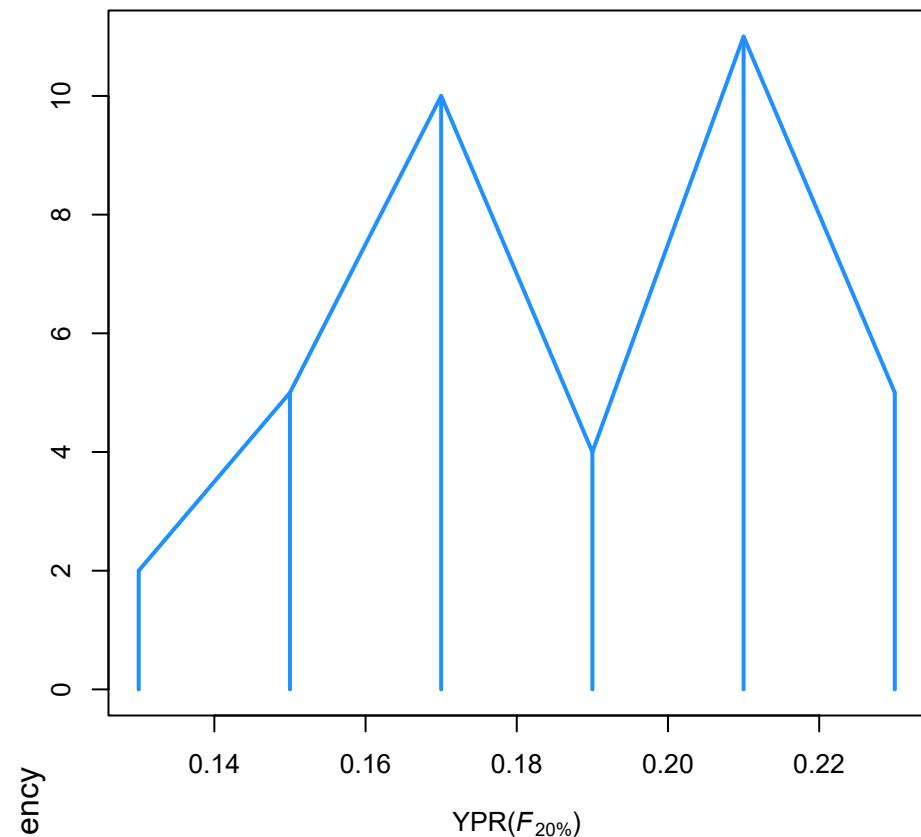
Annual YPR($F_{\%SPR}$) Reference Points

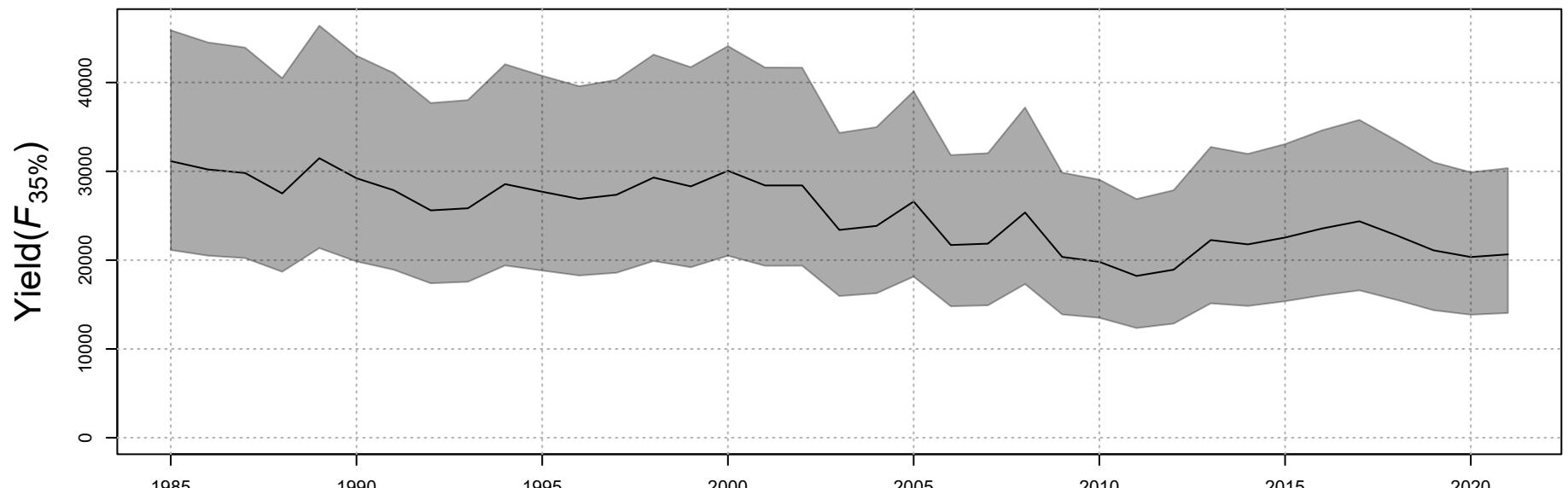


Frequencies of Annual $F_{\% \text{SPR}}$ Reference Points

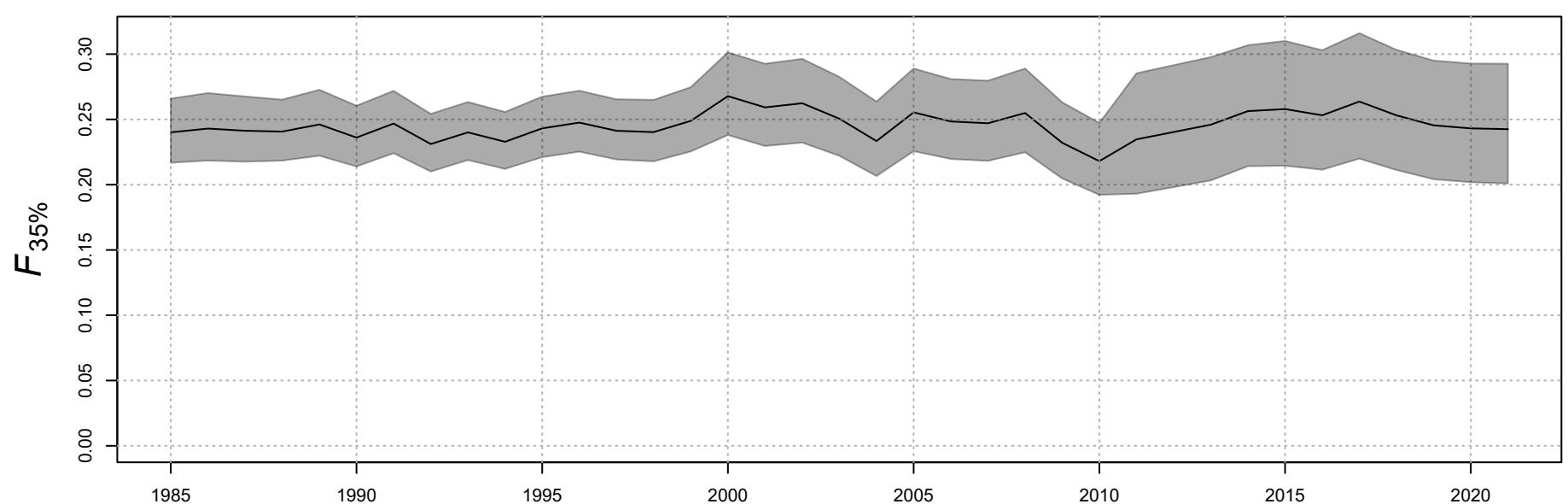


Frequencies of Annual YPR($F_{\% \text{SPR}}$) Reference Points

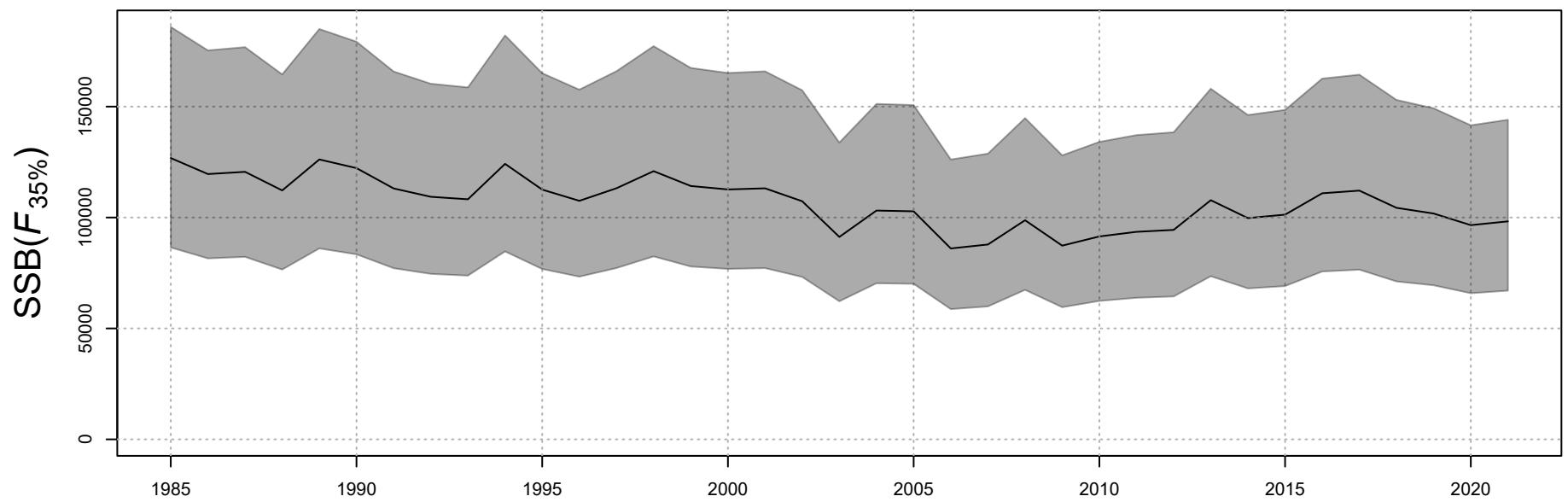




1985 1990 1995 2000 2005 2010 2015 2020

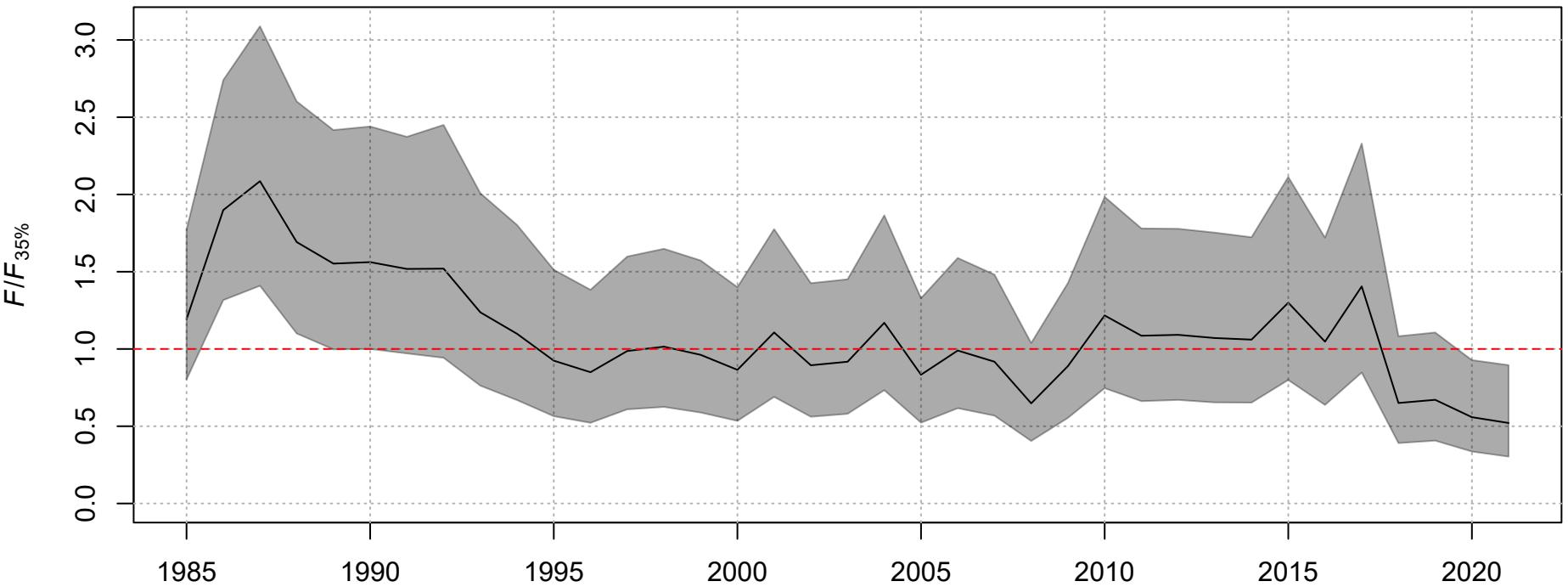
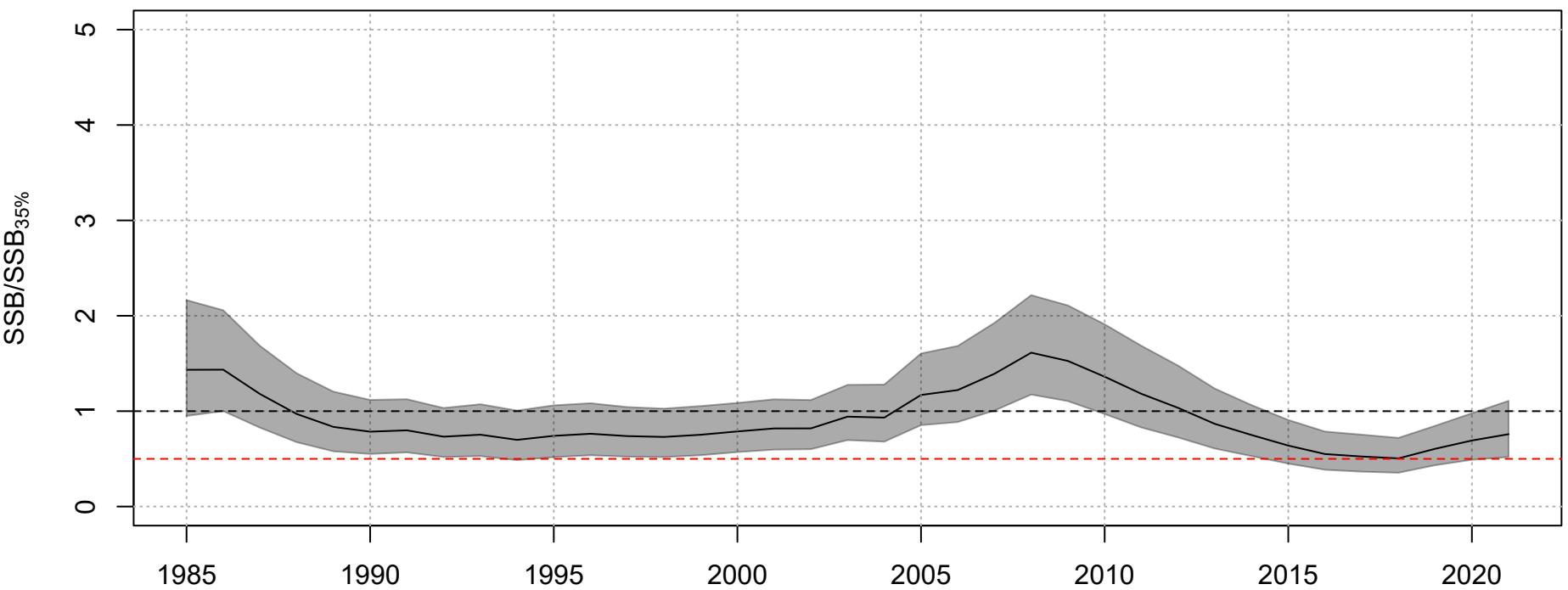


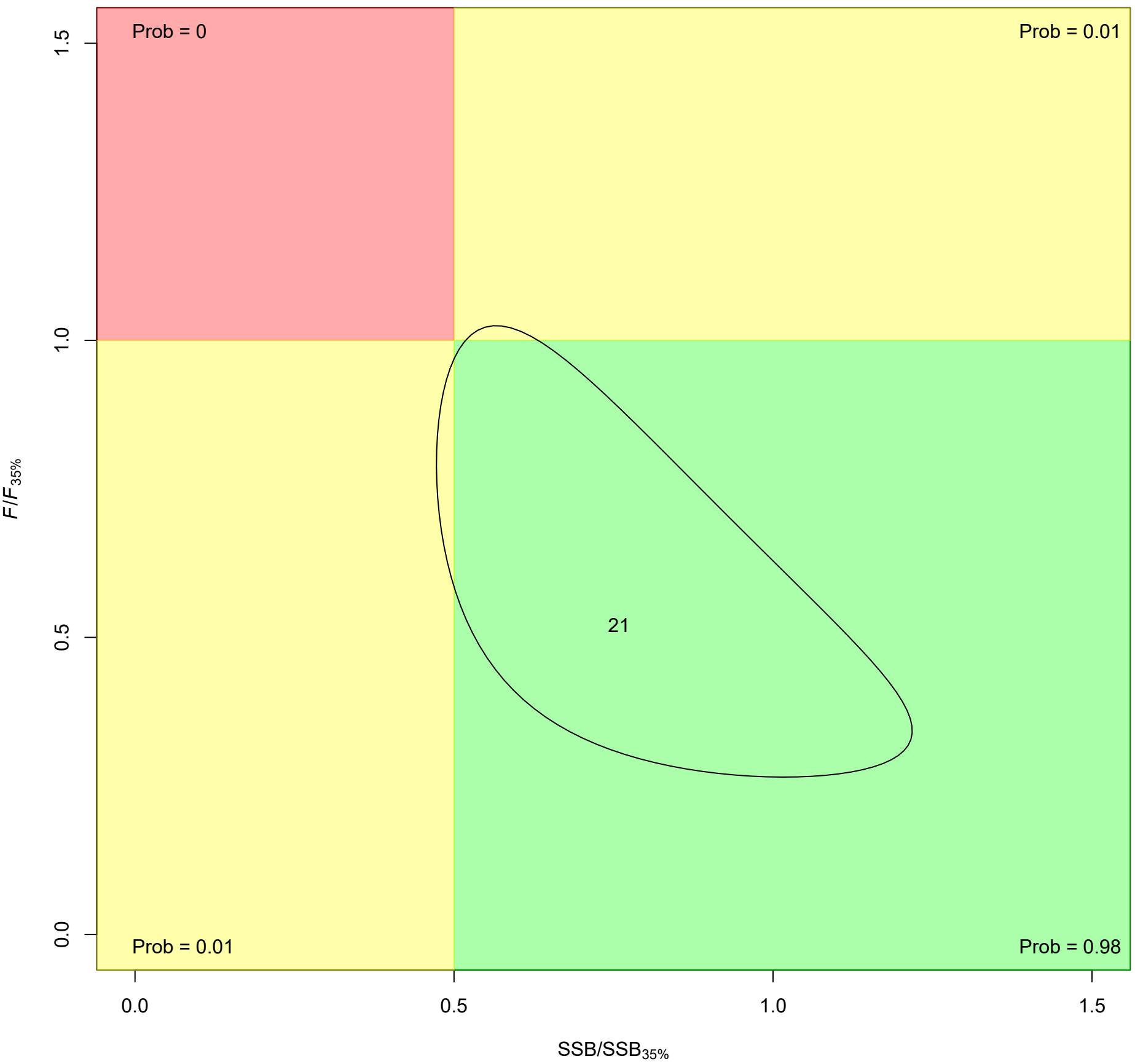
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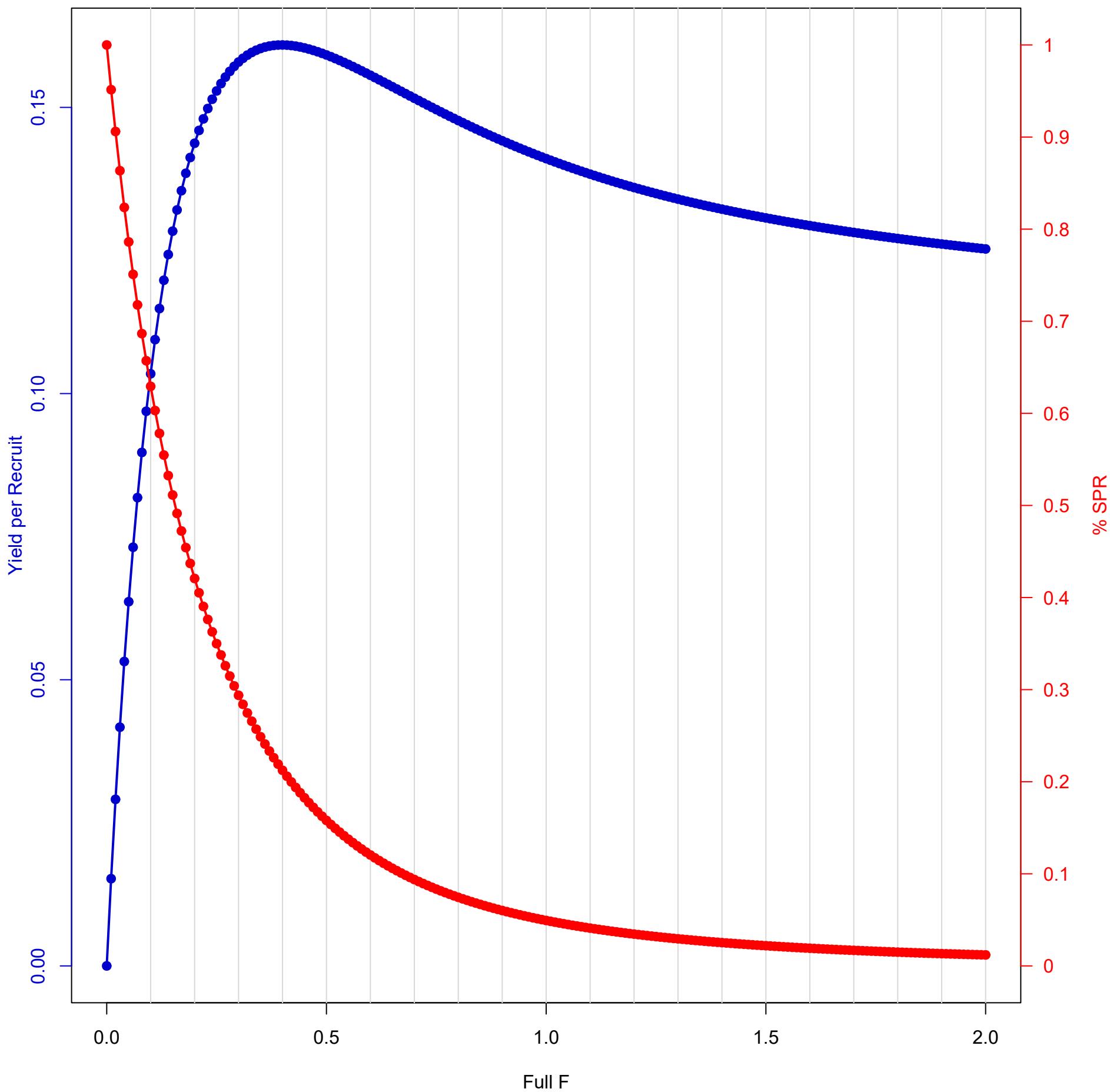
1985 1990 1995 2000 2005 2010 2015 2020

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	0.1603	0.2488	0.7	0.1516	0.0938
0.01	0.0152	0.9514	0.36	0.1605	0.2409	0.71	0.1512	0.0916
0.02	0.0291	0.906	0.37	0.1607	0.2334	0.72	0.1508	0.0894
0.03	0.0417	0.8635	0.38	0.1608	0.2261	0.73	0.1504	0.0874
0.04	0.0532	0.8236	0.39	0.1609	0.2191	0.74	0.15	0.0853
0.05	0.0636	0.7861	0.4	0.1609	0.2124	0.75	0.1496	0.0834
0.06	0.0732	0.7509	0.41	0.1609	0.206	0.76	0.1492	0.0815
0.07	0.0818	0.7178	0.42	0.1608	0.1998	0.77	0.1488	0.0797
0.08	0.0897	0.6866	0.43	0.1607	0.1938	0.78	0.1485	0.0779
0.09	0.0969	0.6571	0.44	0.1606	0.1881	0.79	0.1481	0.0762
0.1	0.1035	0.6293	0.45	0.1604	0.1826	0.8	0.1477	0.0745
0.11	0.1094	0.603	0.46	0.1602	0.1773	0.81	0.1473	0.0728
0.12	0.1149	0.5782	0.47	0.16	0.1722	0.82	0.147	0.0713
0.13	0.1198	0.5547	0.48	0.1597	0.1673	0.83	0.1466	0.0697
0.14	0.1243	0.5324	0.49	0.1594	0.1625	0.84	0.1462	0.0682
0.15	0.1284	0.5113	0.5	0.1592	0.158	0.85	0.1459	0.0668
0.16	0.1321	0.4913	0.51	0.1589	0.1536	0.86	0.1455	0.0654
0.17	0.1354	0.4723	0.52	0.1585	0.1494	0.87	0.1452	0.064
0.18	0.1385	0.4542	0.53	0.1582	0.1453	0.88	0.1448	0.0627
0.19	0.1412	0.437	0.54	0.1579	0.1413	0.89	0.1445	0.0614
0.2	0.1437	0.4207	0.55	0.1575	0.1375	0.9	0.1442	0.0602
0.21	0.146	0.4051	0.56	0.1571	0.1339	0.91	0.1438	0.0589
0.22	0.148	0.3903	0.57	0.1568	0.1303	0.92	0.1435	0.0577
0.23	0.1498	0.3762	0.58	0.1564	0.1269	0.93	0.1432	0.0566
0.24	0.1514	0.3627	0.59	0.156	0.1236	0.94	0.1429	0.0555
0.25	0.1529	0.3499	0.6	0.1556	0.1204	0.95	0.1426	0.0544
0.26	0.1542	0.3376	0.61	0.1552	0.1173	0.96	0.1422	0.0533
0.27	0.1553	0.3259	0.62	0.1548	0.1144	0.97	0.1419	0.0523
0.28	0.1563	0.3147	0.63	0.1544	0.1115	0.98	0.1416	0.0513
0.29	0.1572	0.3041	0.64	0.154	0.1087	0.99	0.1413	0.0503
0.3	0.1579	0.2938	0.65	0.1536	0.106	1	0.141	0.0493
0.31	0.1586	0.284	0.66	0.1532	0.1034	1.01	0.1408	0.0484
0.32	0.1591	0.2747	0.67	0.1528	0.1009	1.02	0.1405	0.0475
0.33	0.1596	0.2657	0.68	0.1524	0.0984	1.03	0.1402	0.0466
0.34	0.16	0.2571	0.69	0.152	0.0961	1.04	0.1399	0.0458