VPA Diagnostics Tue Apr 29 16:47:05 2014

VPA model run: GARM3_REV_63TO07_REDO

VPA Version 3.1

Run date: 29−APR−2014 16:35

C:/NFT_PROGRAMS/VPA/GBHADDOCK_2008/GARM3_REV_63TO07_REDO.DAT

garm3−rev−base F5to7 backward 1931 to 2007 data

Data Years: 1963−2007

Age Range: 1−9

Surveys Used: 30 out of 30

Survey Weight Factors: No

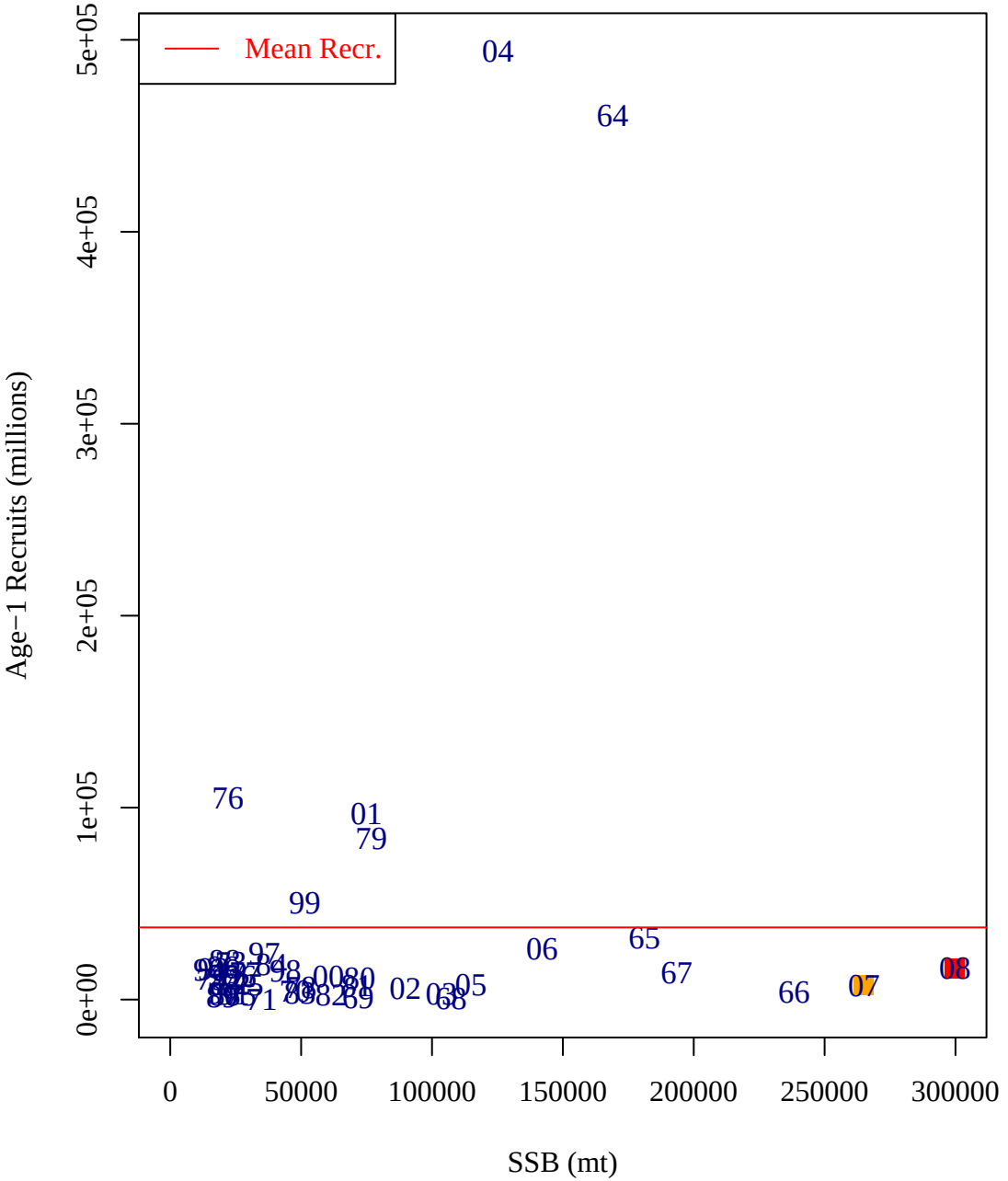
Full F Method: Classic

F oldest age method: Average

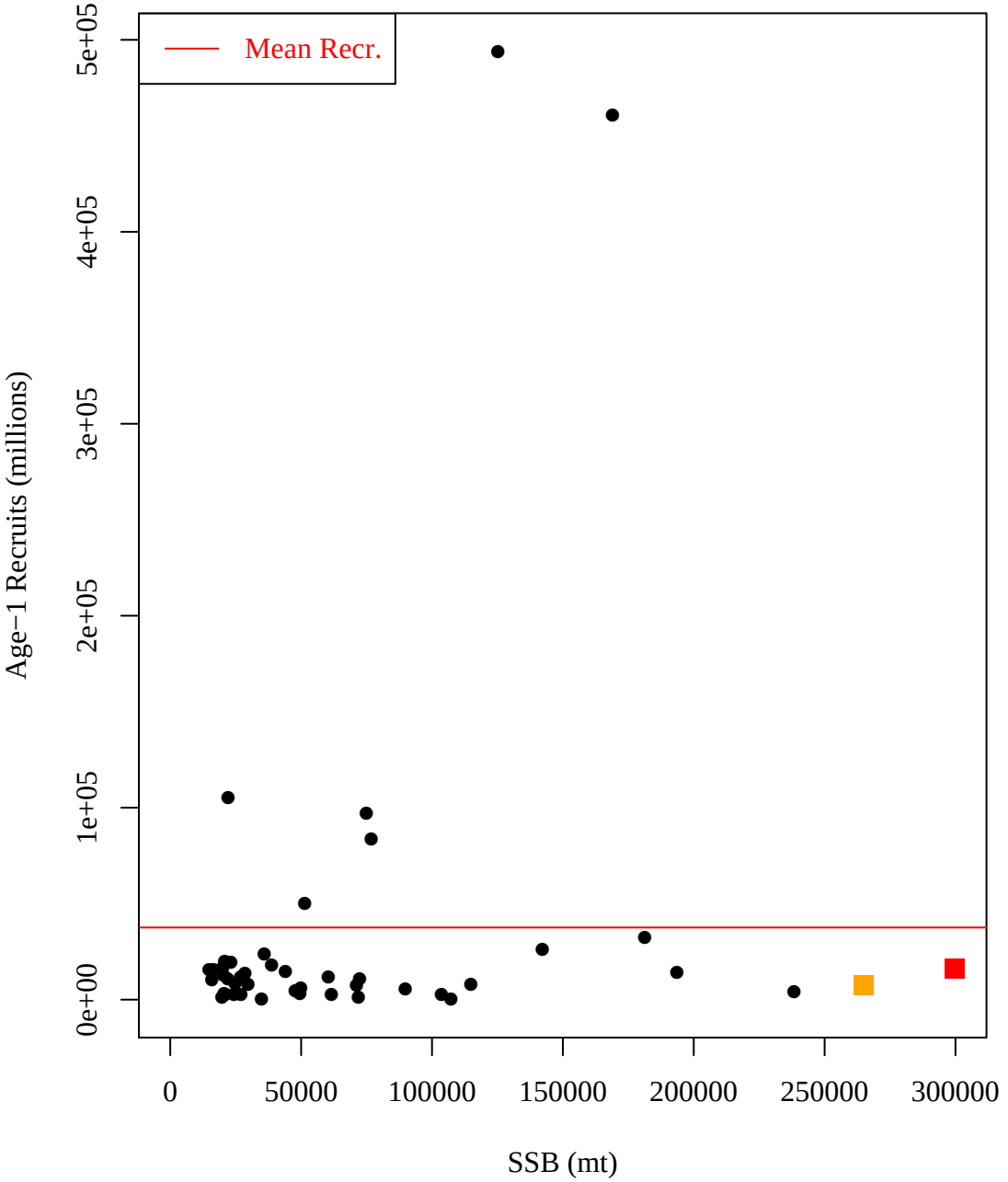
F oldest age terminal year: FoldMethod

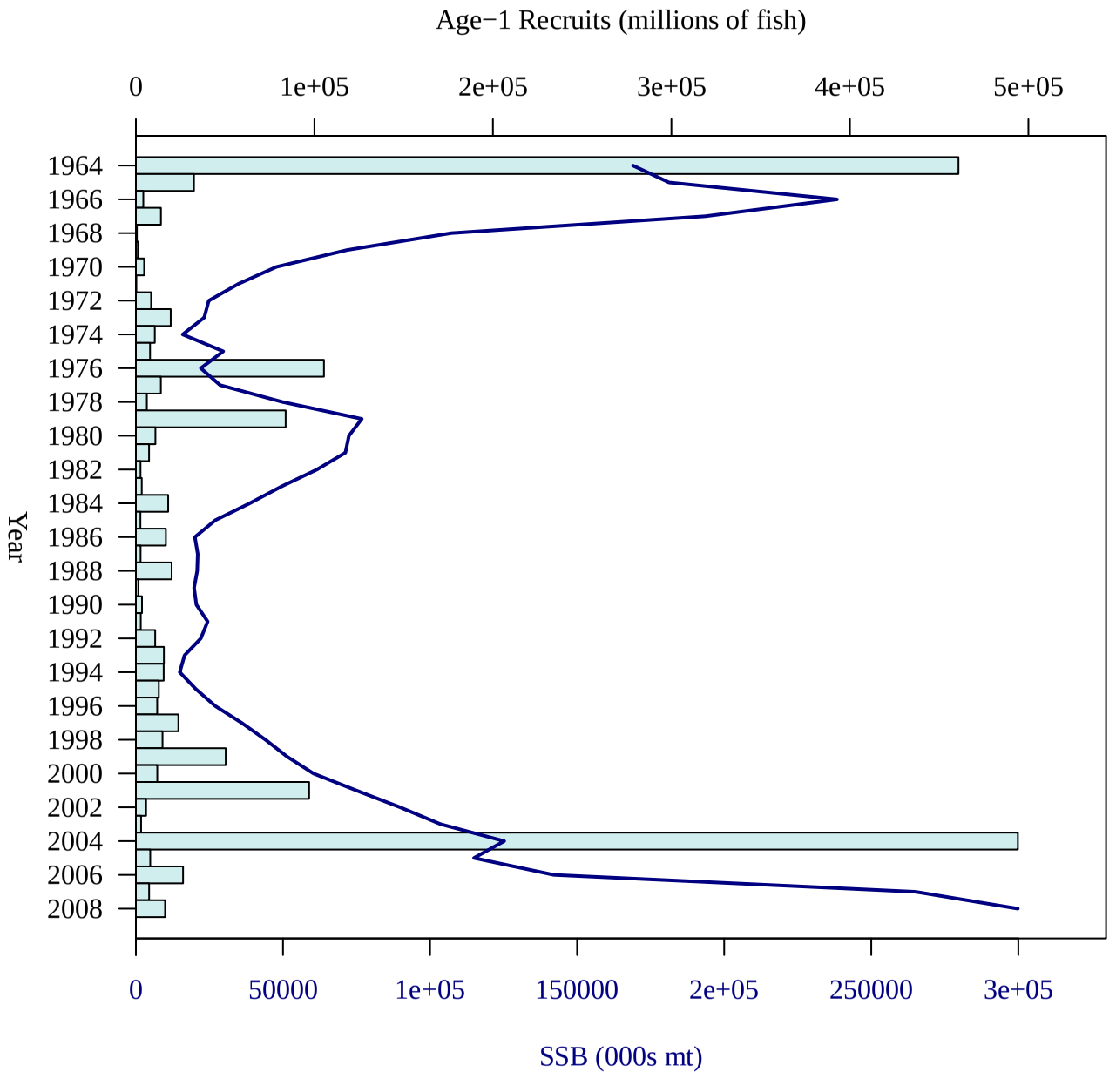
Ages used for F on oldest age: 5−7

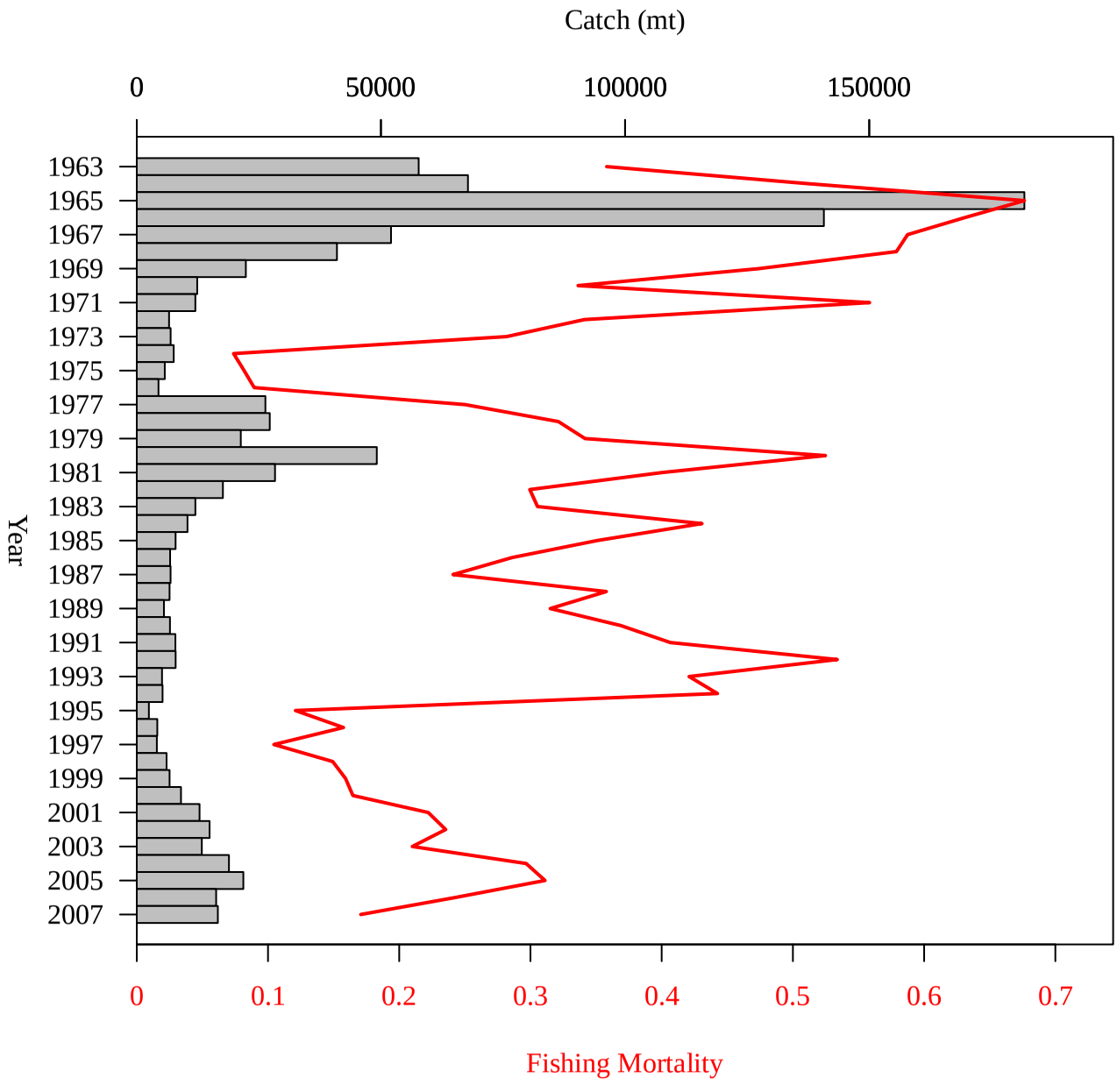
Estimation of youngest age in year T+1: NA

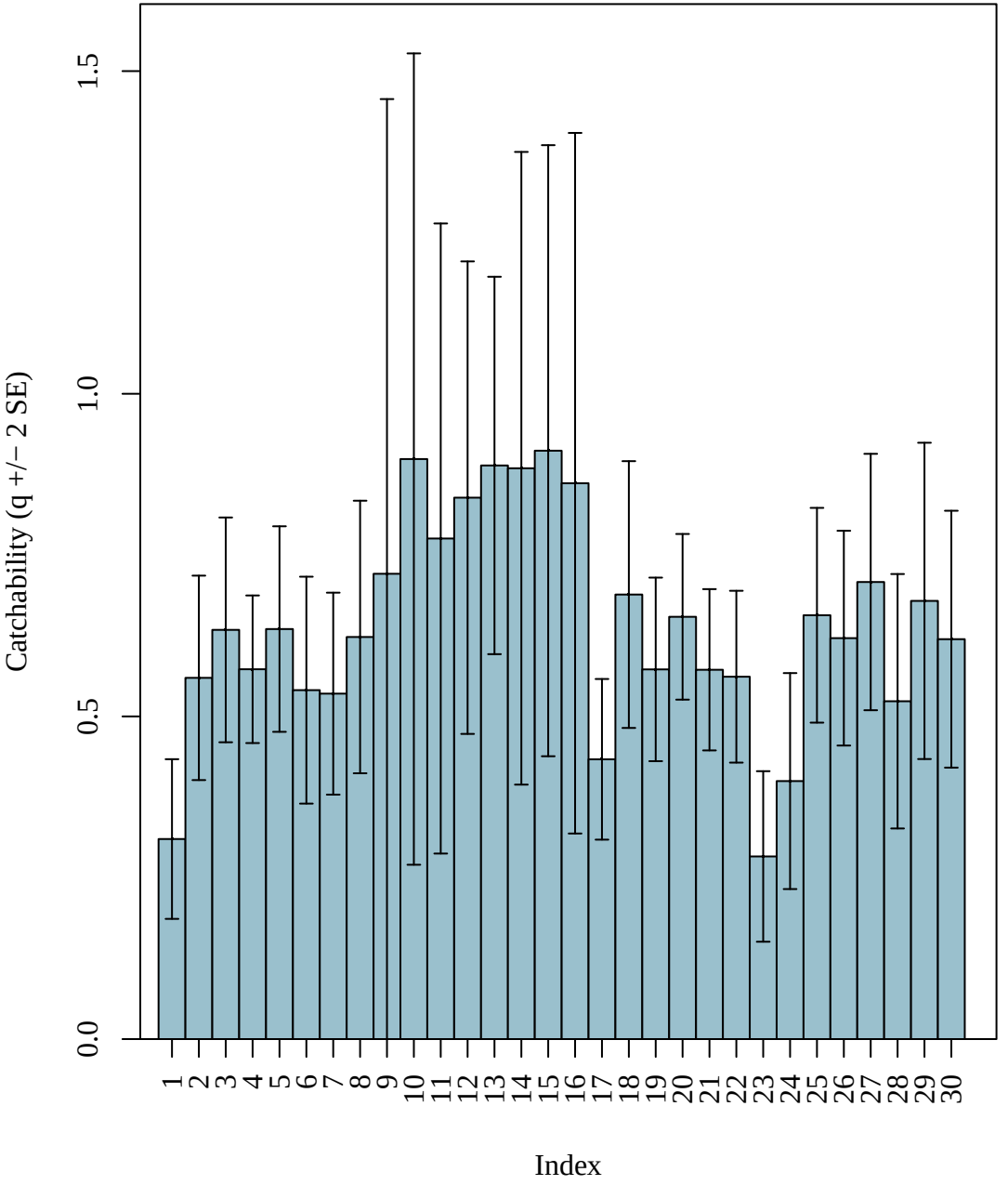


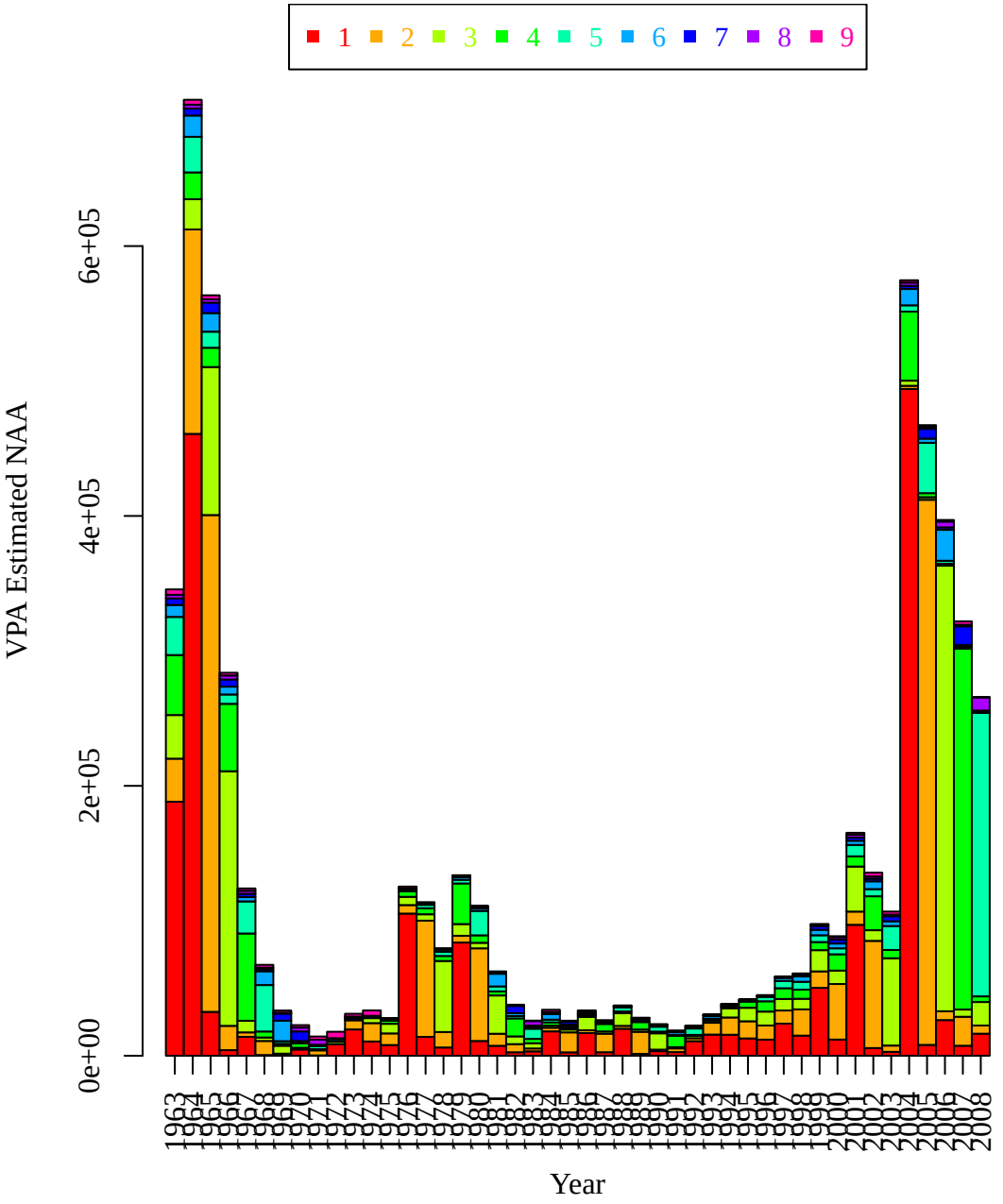
Mean Recr.
Age−1 Recruits (millions)
SSB (mt)
0e+00
1e+05
2e+05
3e+05
4e+05
5e+05
0
50000
100000
150000
200000
250000
300000
04
64
76
01
79
99
06
65
67
66
07
08
02
05

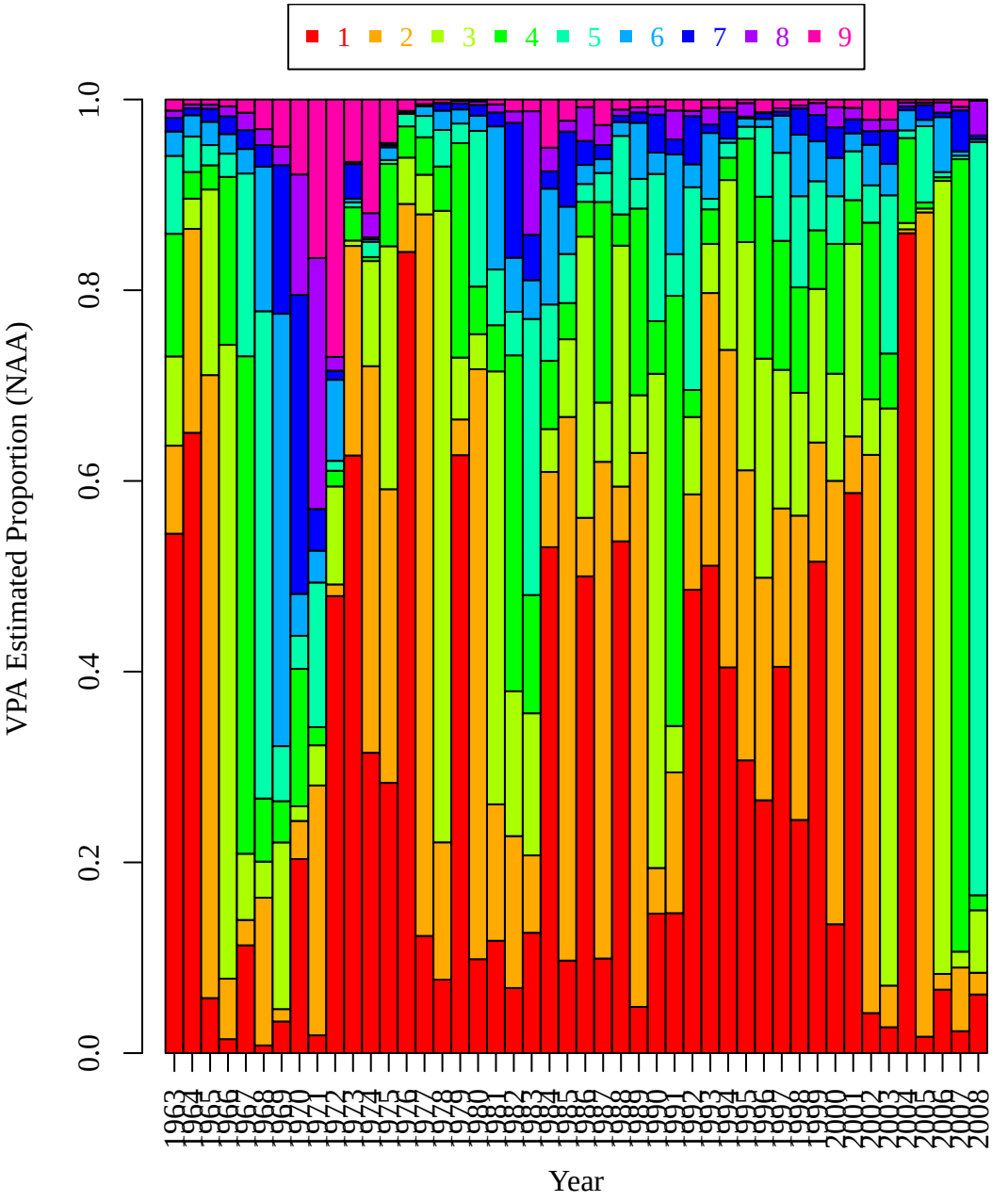

Mean Recr.
Age−1 Recruits (millions)
0e+00
1e+05
2e+05
3e+05
4e+05
5e+05
0
50000
100000
150000
200000
250000
300000
SSB (mt)

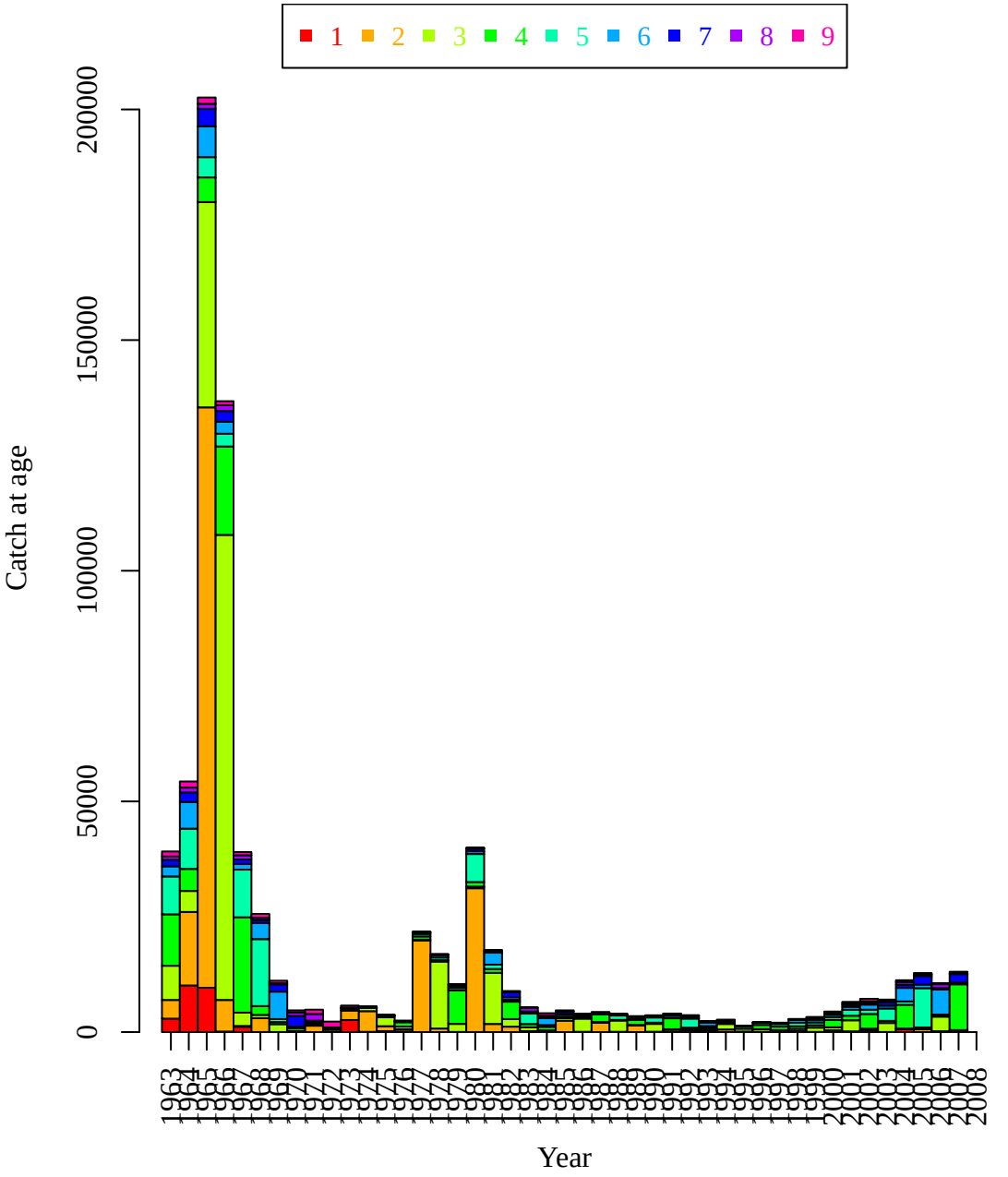

Age−1 Recruits (millions of fish)
0
1e+05
2e+05
3e+05
4e+05
5e+05
Year
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
0
50000
1e+05
150000
2e+05
250000
3e+05
SSB (000s mt)

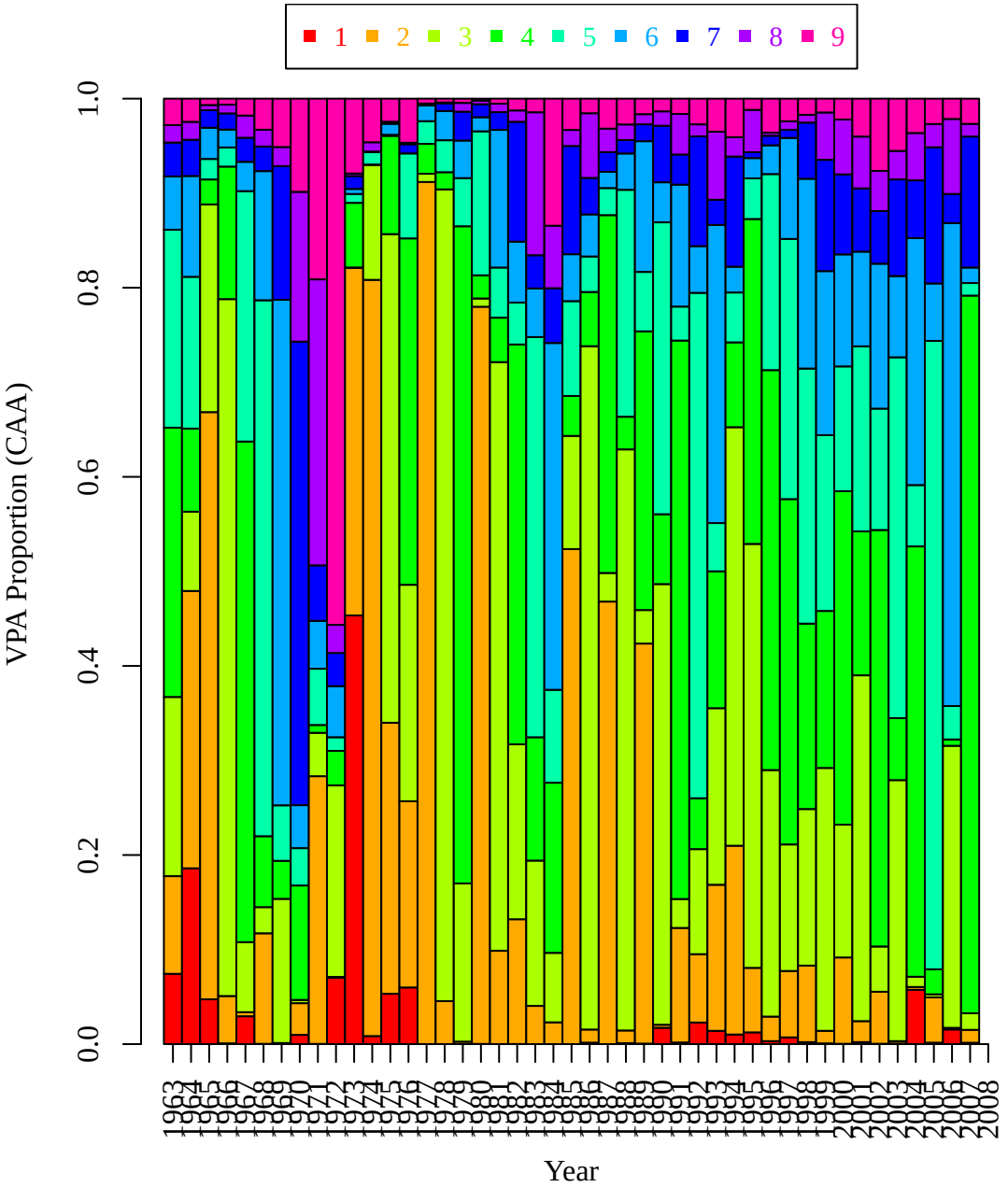

Catch (mt)
0
50000
100000
150000
Year
1963
1965
1967
1969
1971
1973
1975
1977
1979
1981
1983
1985
1987
1989
1991
1993
1995
1997
1999
2001
2003
2005
2007
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
Fishing Mortality

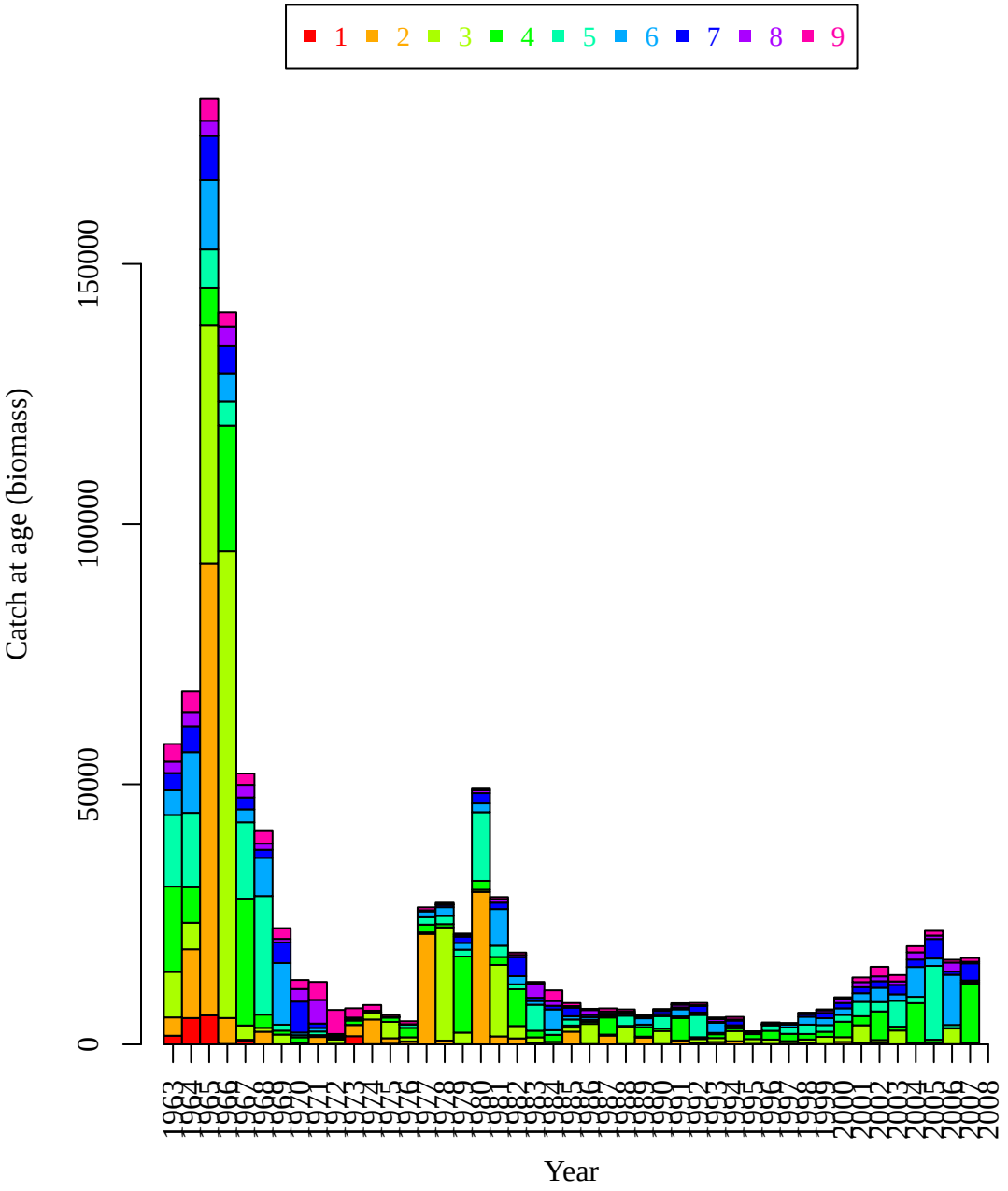

Catchability (q +/− 2 SE)
0.0
0.5
1.0
1.5
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
Index

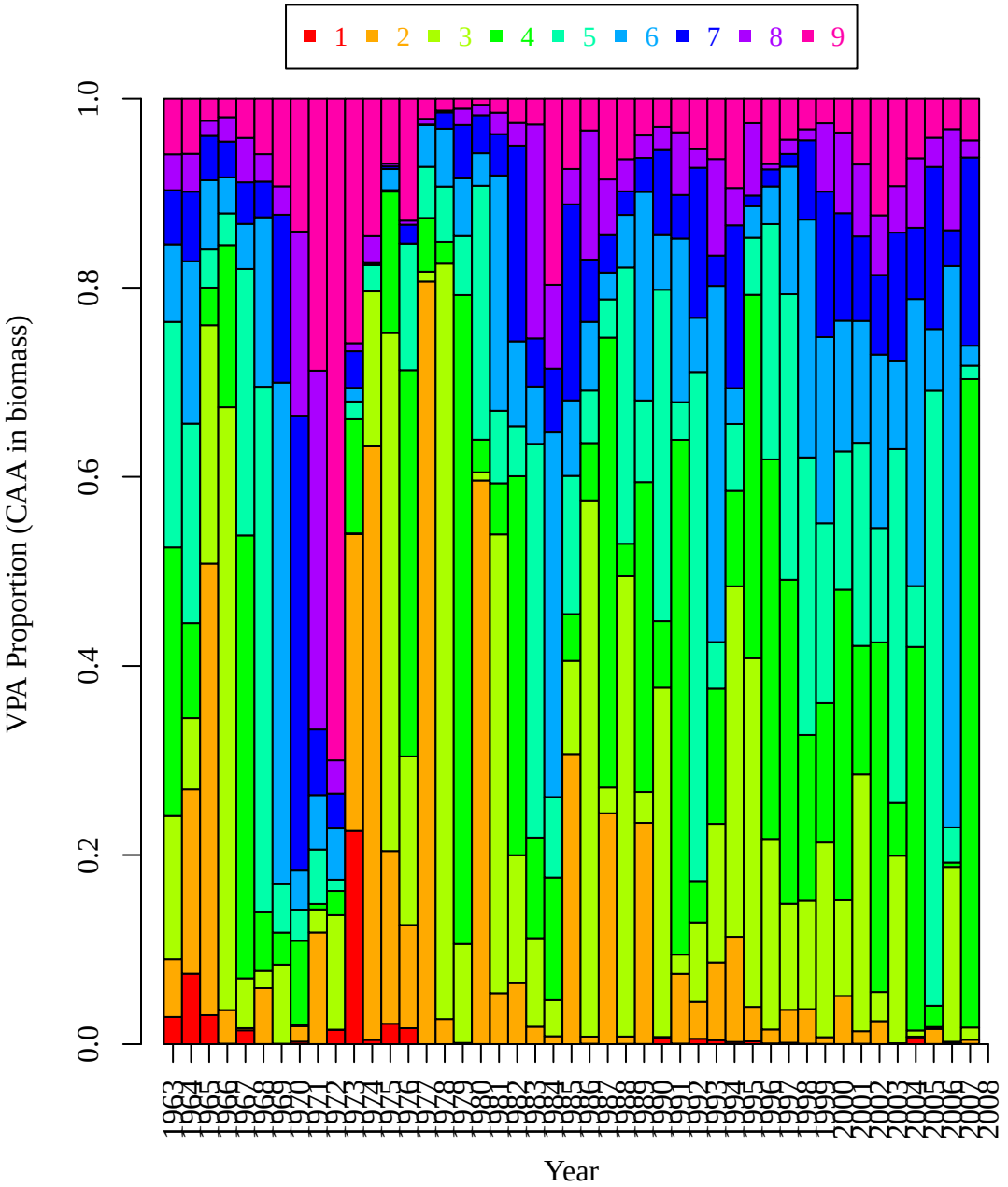

1 2 3 4 5 6 7 8 9
VPA Estimated NAA
0e+00
2e+05
4e+05
6e+05
1963
1964
1965
1966
1967
1968
1969
1970
1971
1972
1973
1974
1975
1976
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
Year

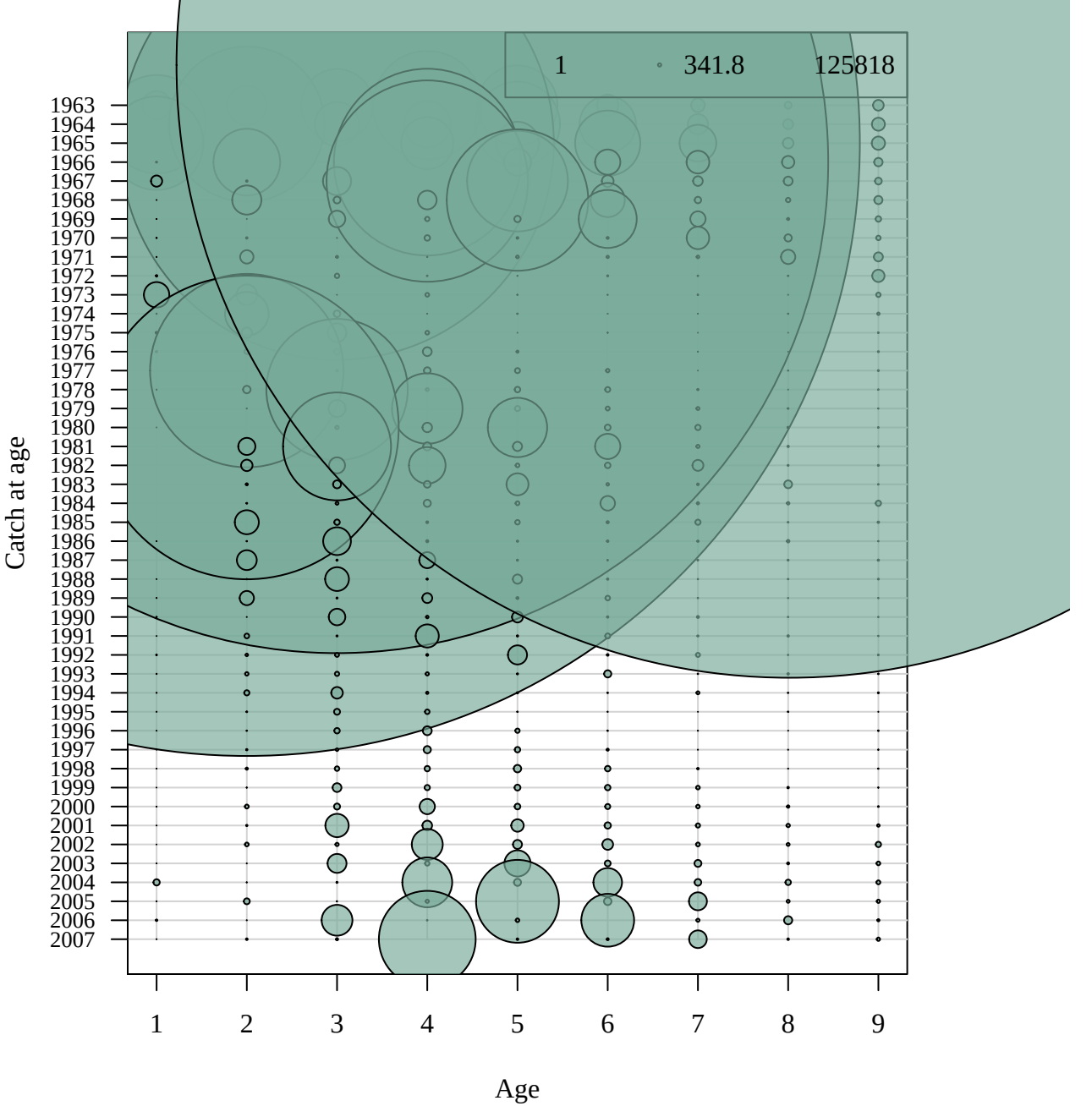

1 2 3 4 5 6 7 8 9
VPA Estimated Proportion (NAA)
0.0
0.2
0.4
0.6
0.8
1.0
1963
1964
1965
1966
1967
1968
1969
1970
1971
1972
1973
1974
1975
1976
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
Year

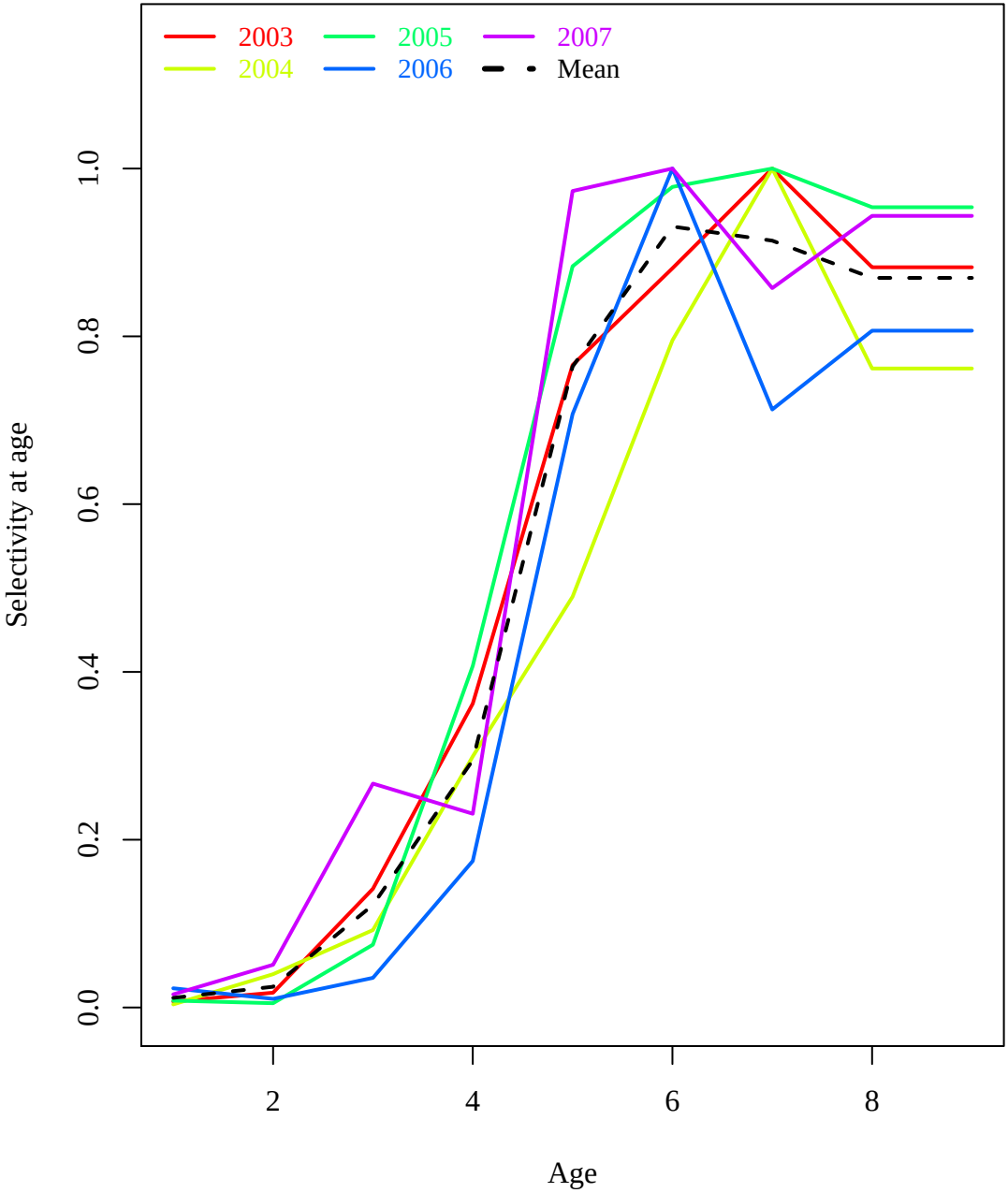

1 2 3 4 5 6 7 8 9
Catch at age
0
50000
100000
150000
200000
1963
1964
1965
1966
1967
1968
1969
1970
1971
1972
1973
1974
1975
1976
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
Year

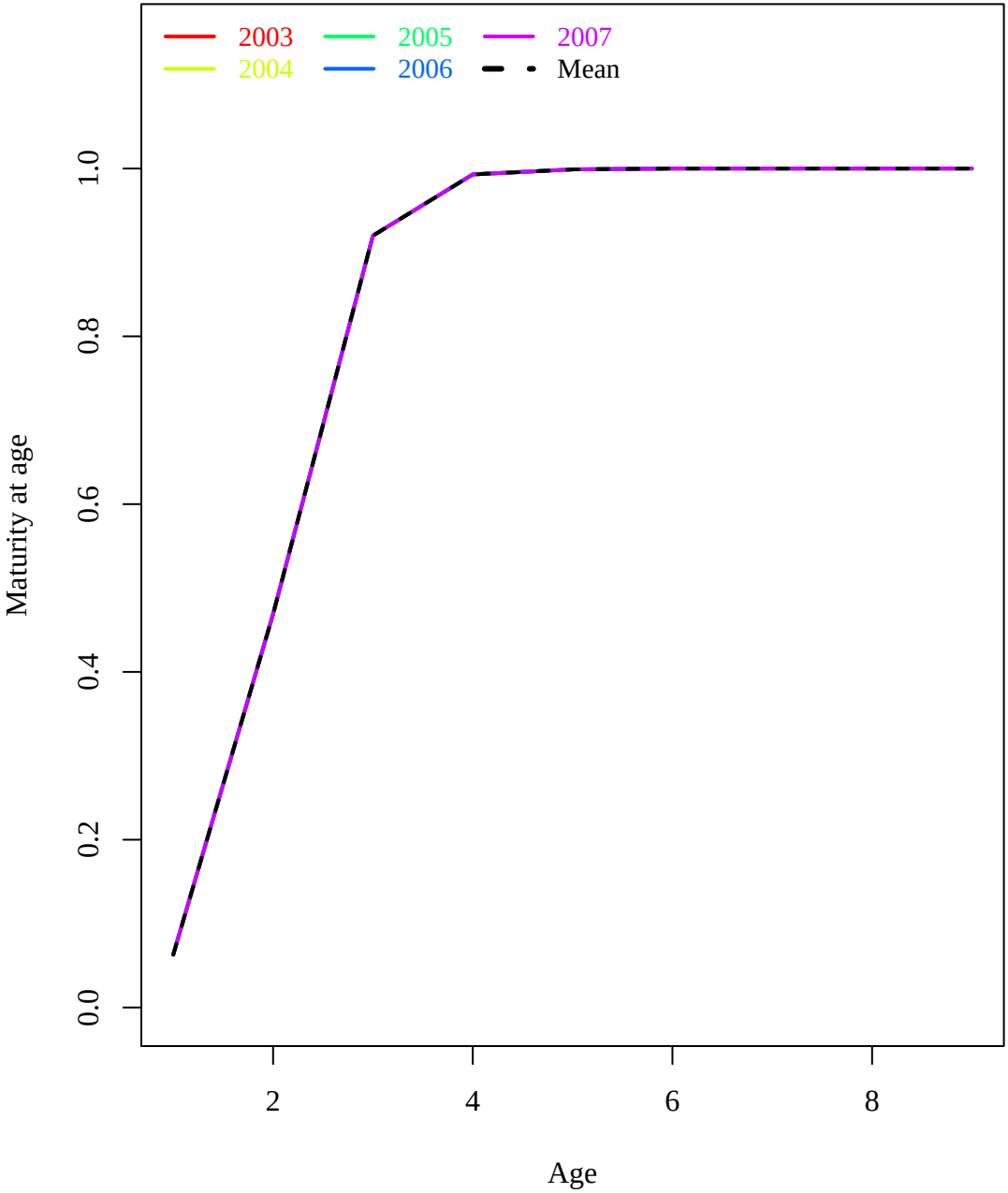

1 2 3 4 5 6 7 8 9
VPA Proportion (CAA)
0.0
0.2
0.4
0.6
0.8
1.0
1963
1964
1965
1966
1967
1968
1969
1970
1971
1972
1973
1974
1975
1976
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
Year

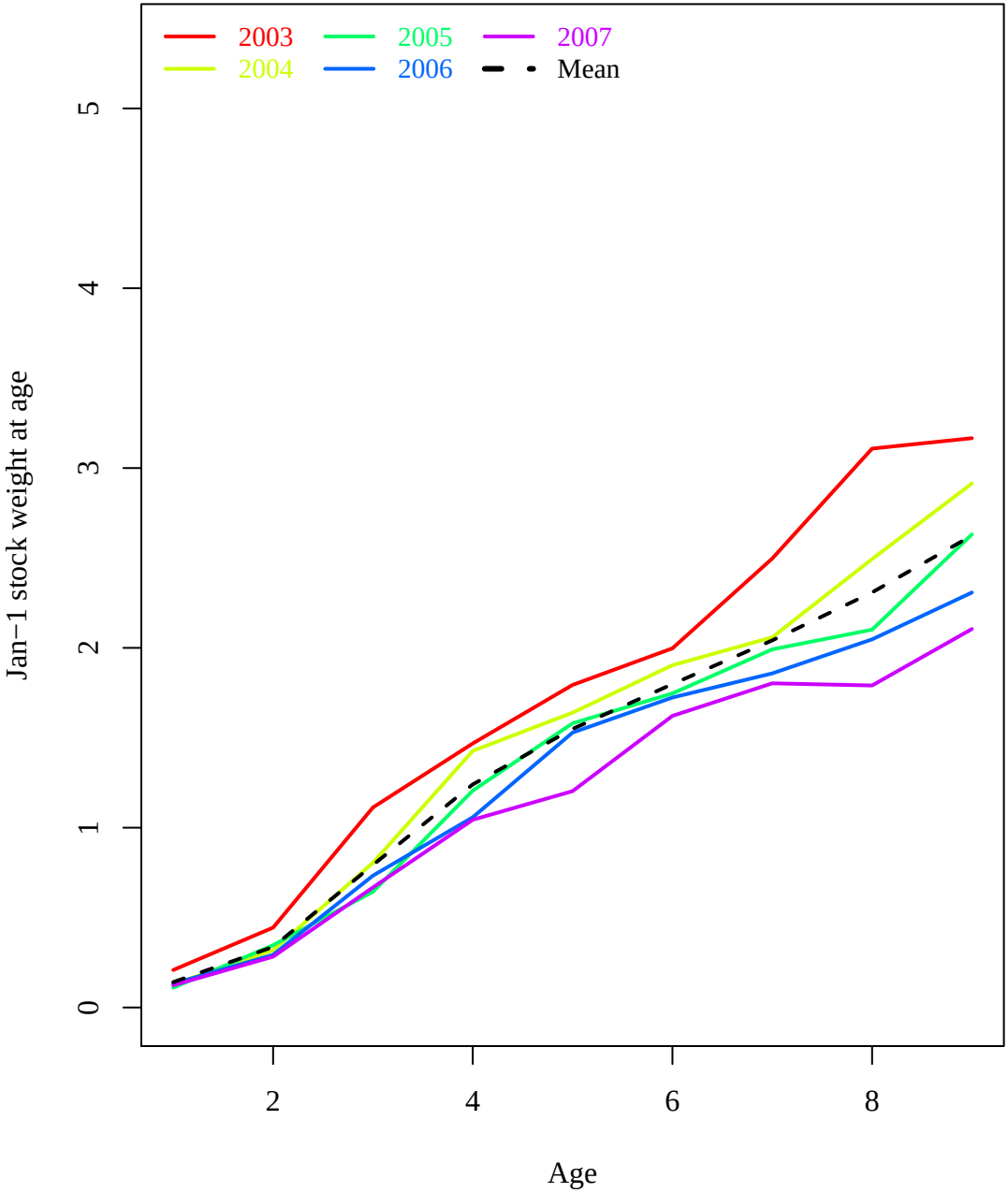

1 2 3 4 5 6 7 8 9
Catch at age (biomass)
0
50000
100000
150000
1963
1964
1965
1966
1967
1968
1969
1970
1971
1972
1973
1974
1975
1976
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
Year

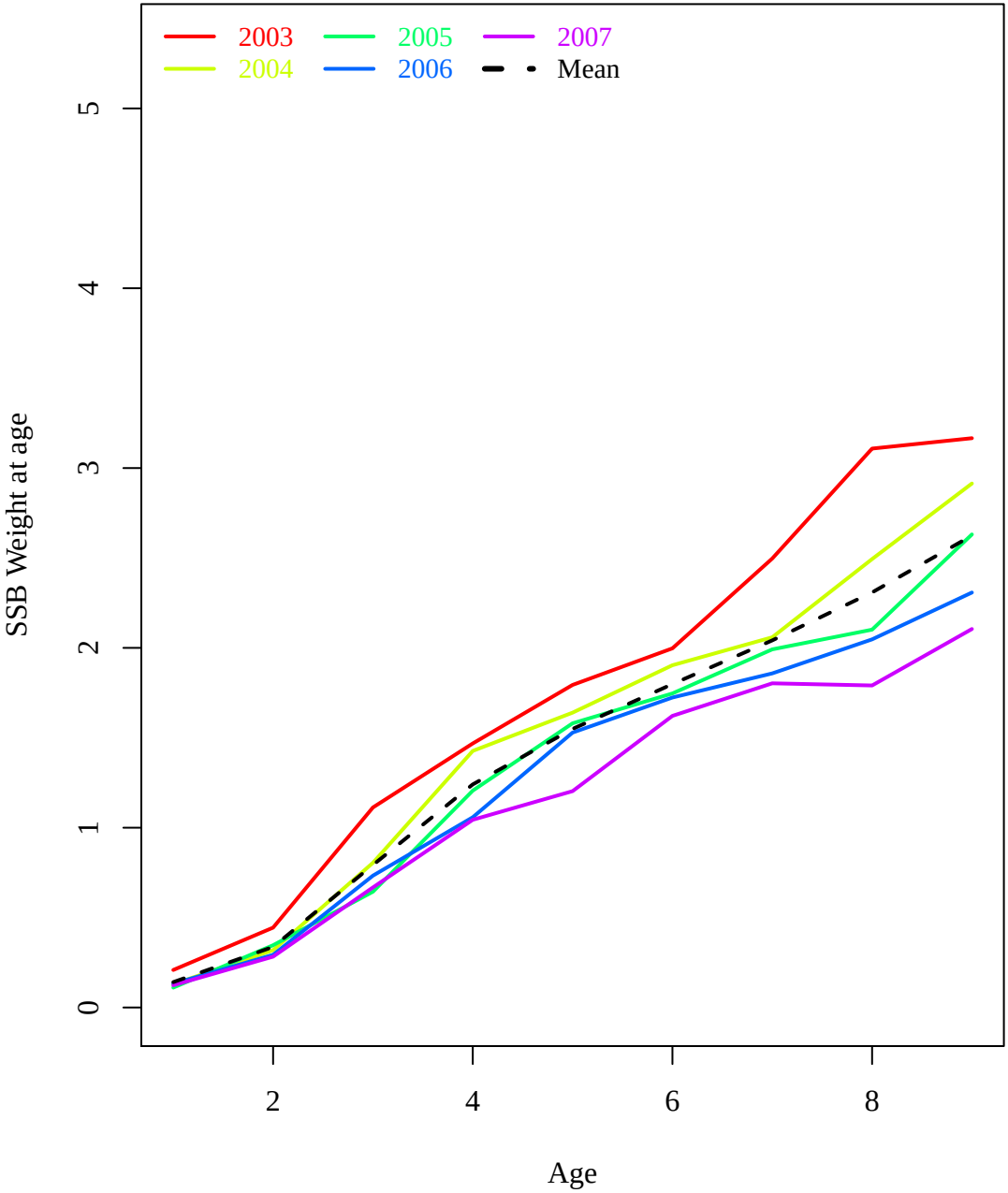

1 2 3 4 5 6 7 8 9
VPA Proportion (CAA in biomass)
0.0
0.2
0.4
0.6
0.8
1.0
1963
1964
1965
1966
1967
1968
1969
1970
1971
1972
1973
1974
1975
1976
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
Year

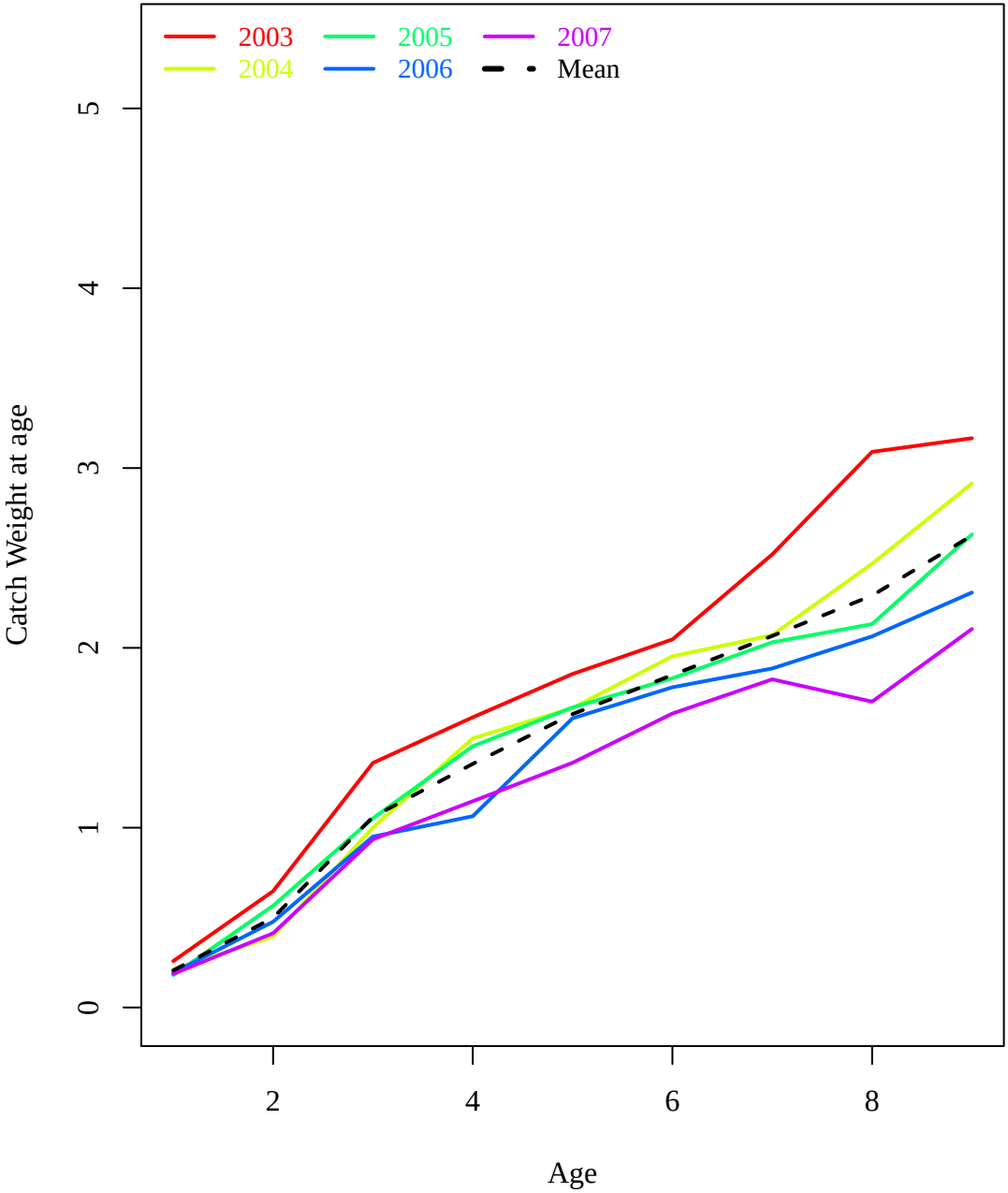

1
341.8
125818
Catch at age
1963
1964
1965
1966
1967
1968
1969
1970
1971
1972
1973
1974
1975
1976
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
1
2
3
4
5
6
7
8
9
Age

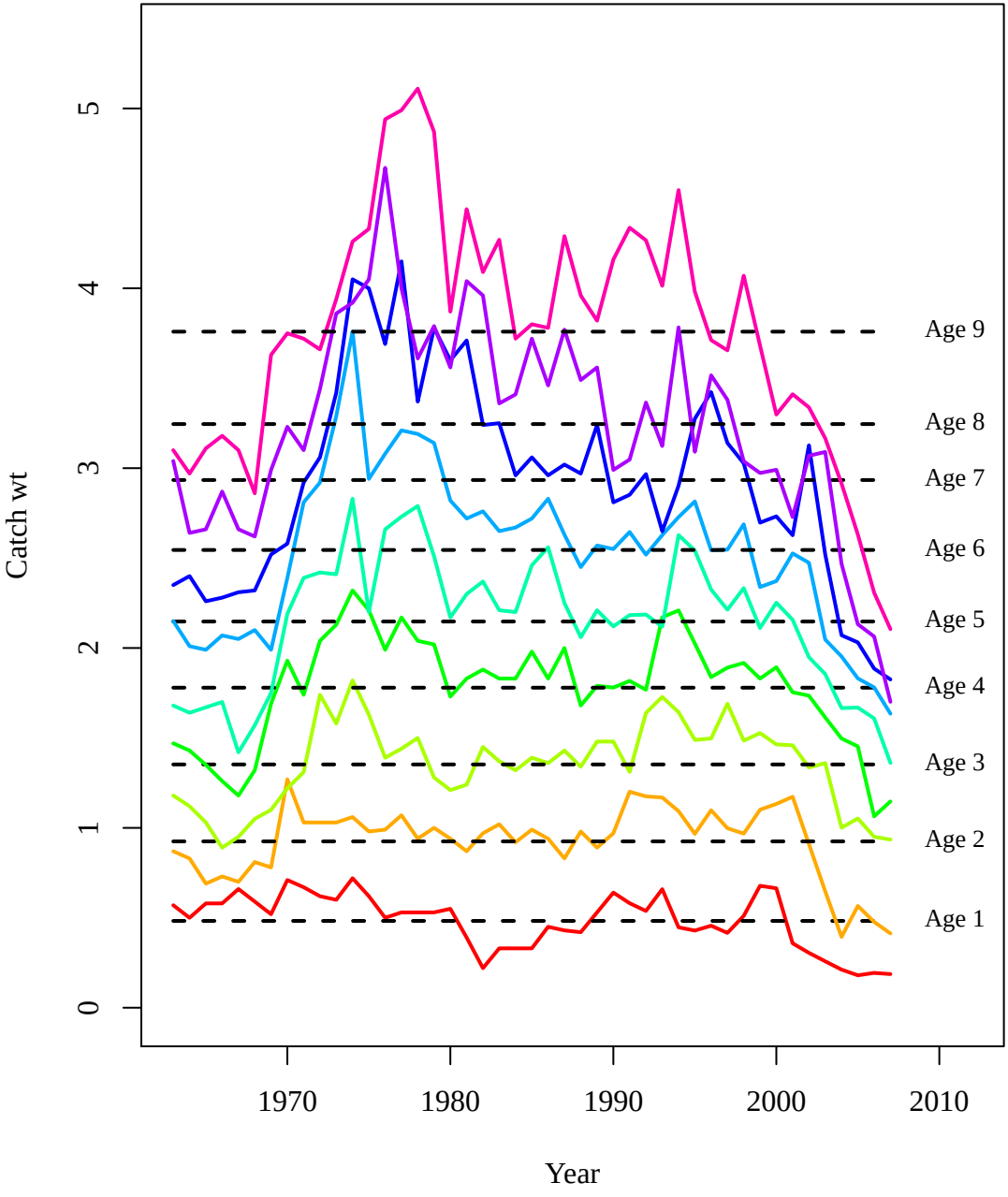

2003
2004
2005
2006
2007
Mean
Selectivity at age
0.0
0.2
0.4
0.6
0.8
1.0
2
4
6
8
Age

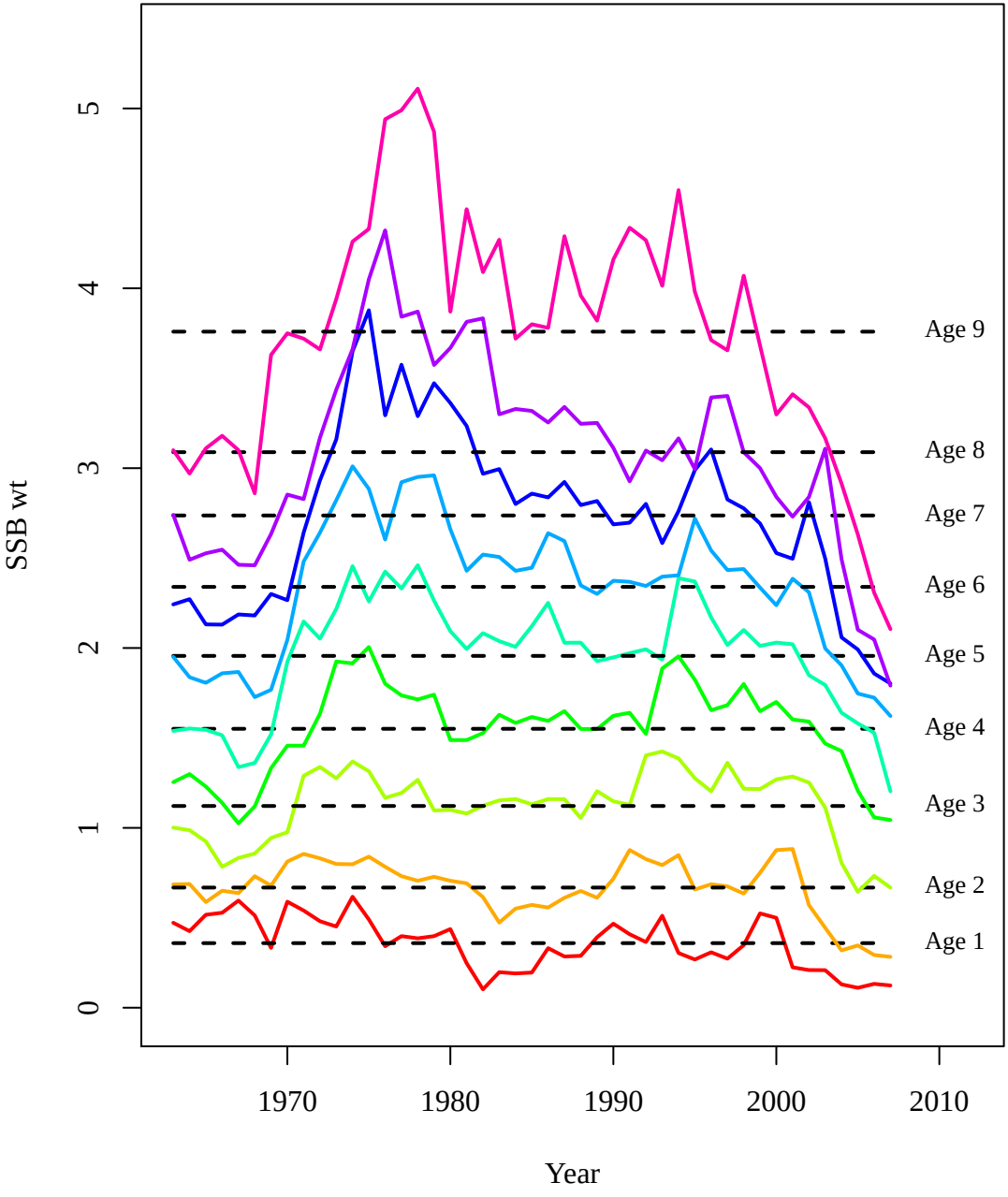

2003
2004
2005
2006
2007
Mean
Maturity at age
0.0
0.2
0.4
0.6
0.8
1.0
2
4
6
8
Age

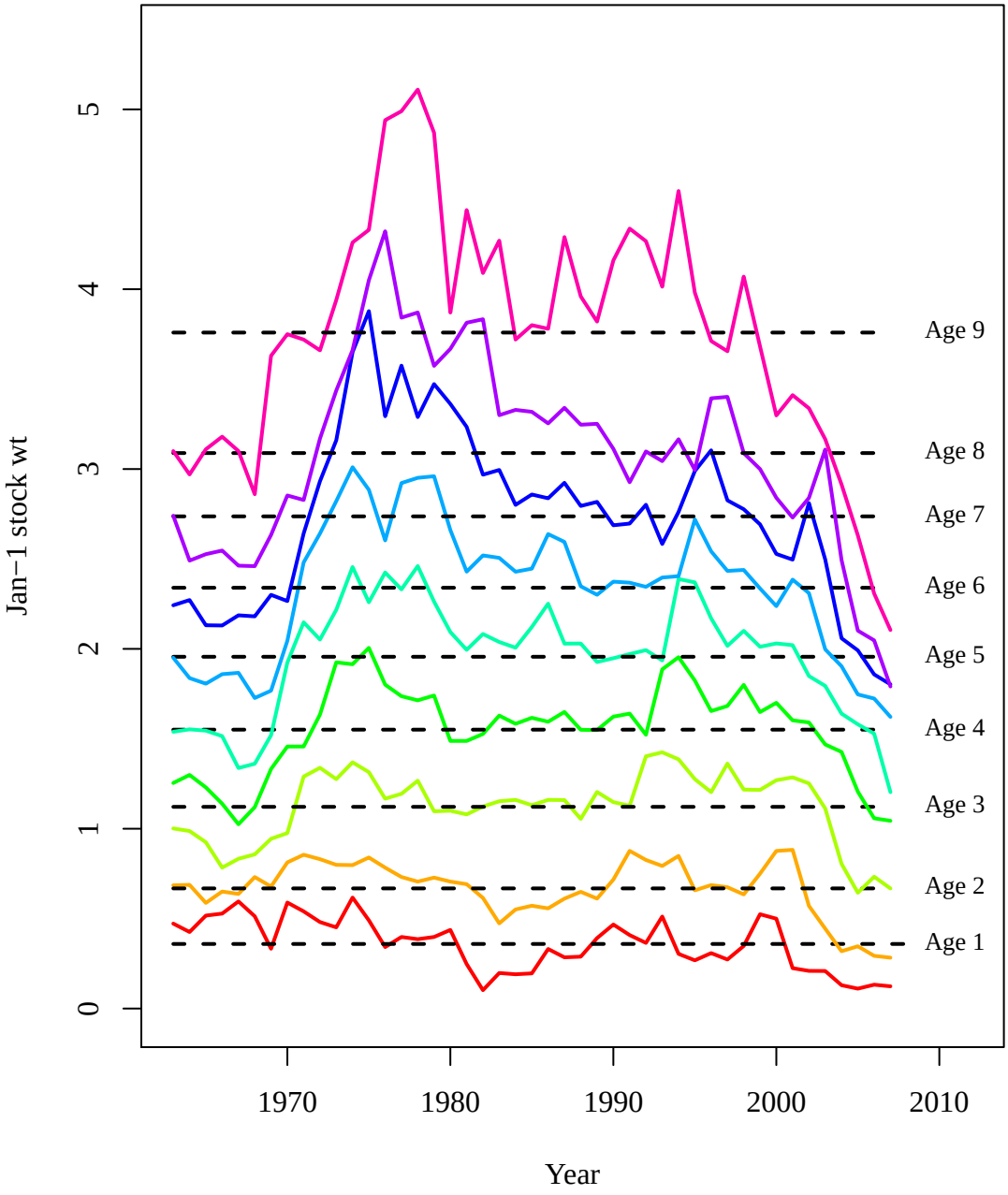

2003
2004
2005
2006
2007
Mean
Jan−1 stock weight at age
0
1
2
3
4
5
2
4
6
8
Age

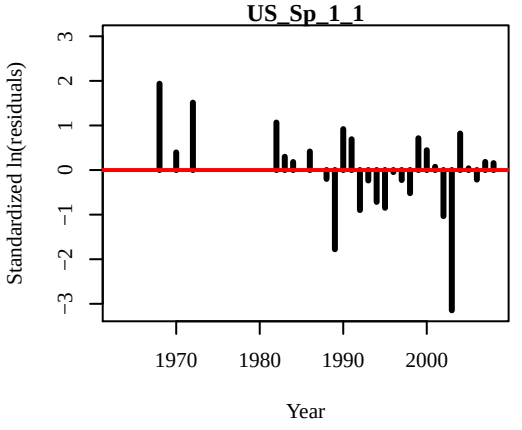

2003
2004
2005
2006
2007
Mean
SSB Weight at age
0
1
2
3
4
5
2
4
6
8
Age

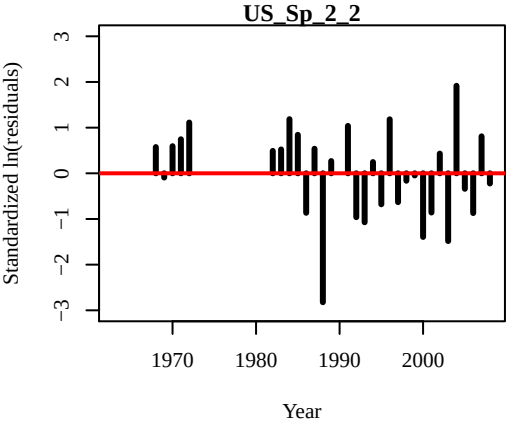

2003
2004
2005
2006
2007
Mean
Catch Weight at age
0
1
2
3
4
5
2
4
6
8
Age

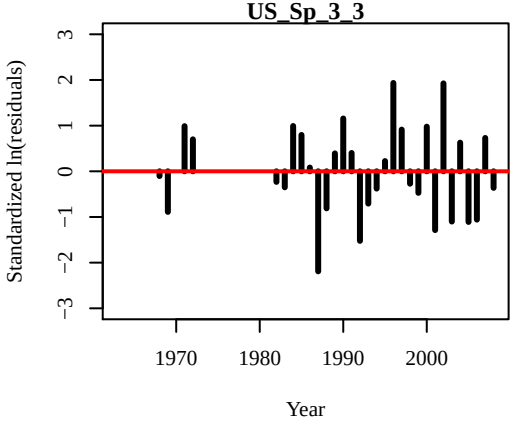

Catch wt
0
1
2
3
4
5
1970
1980
1990
2000
2010
Year
Age 9
Age 8
Age 7
Age 6
Age 5
Age 4
Age 3
Age 2
Age 1

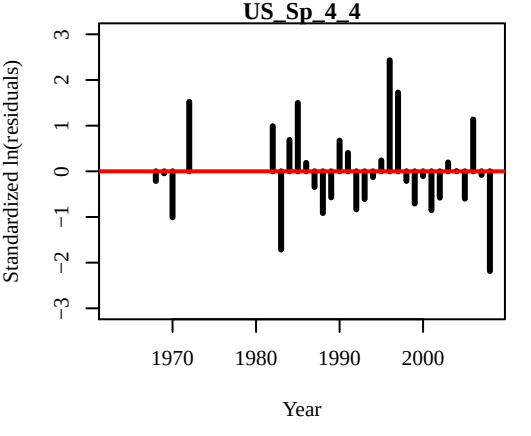

SSB wt
0
1
2
3
4
5
1970
1980
1990
2000
2010
Year
Age 9
Age 8
Age 7
Age 6
Age 5
Age 4
Age 3
Age 2
Age 1

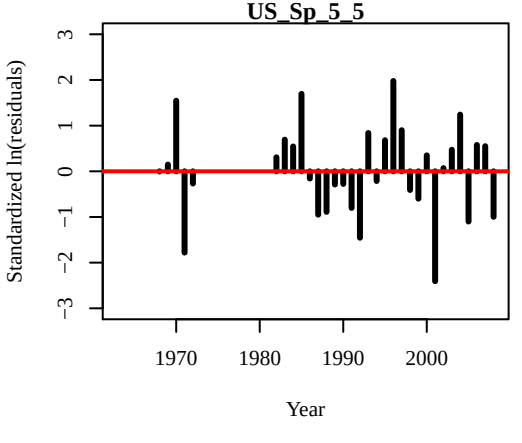

Jan−1 stock wt
0
1
2
3
4
5
1970
1980
1990
2000
2010
Year
Age 9
Age 8
Age 7
Age 6
Age 5
Age 4
Age 3
Age 2
Age 1

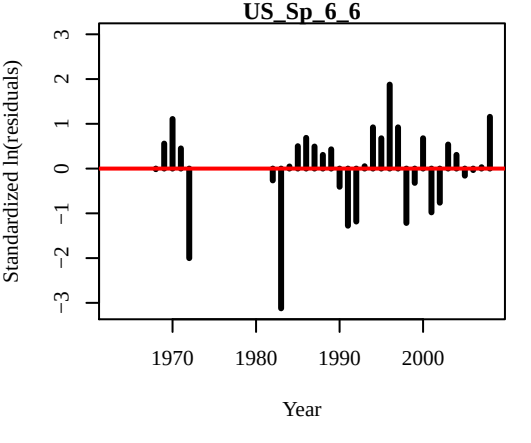

US_Sp_1_1
Standardized ln(residuals)
3
2
1
0
−1
−2
−3
1970
1980
1990
2000
Year

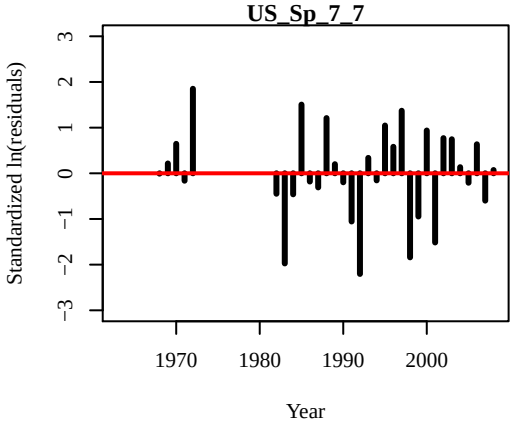

US_Sp_2_2
Standardized ln(residuals)
3
2
1
0
−1
−2
−3
1970
1980
1990
2000
Year

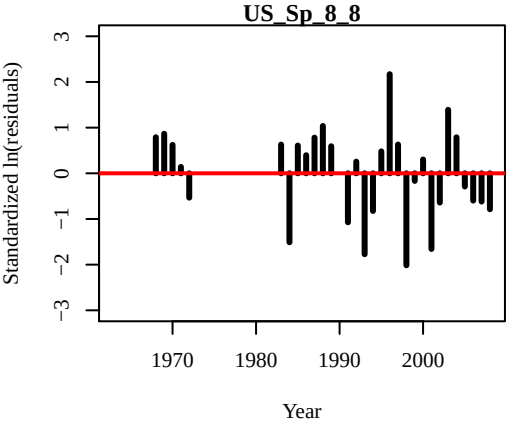

US_Sp_3_3
Standardized ln(residuals)
3
2
1
0
−1
−2
−3
1970
1980
1990
2000
Year

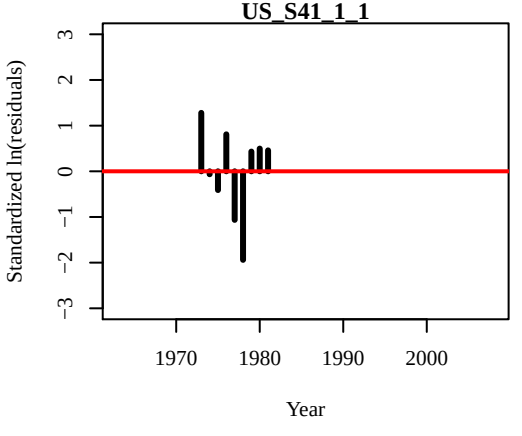

US_Sp_4_4
Standardized ln(residuals)
3
2
1
0
−1
−2
−3
1970
1980
1990
2000
Year

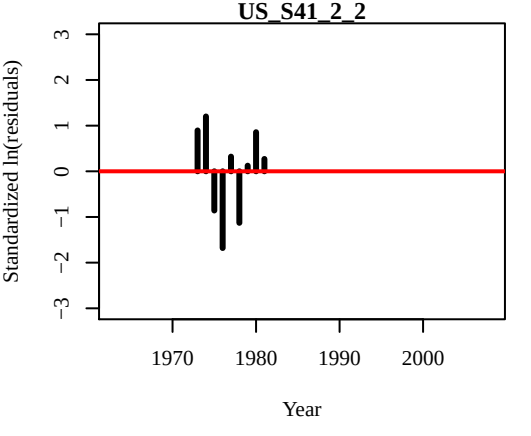

US_Sp_5_5
Standardized ln(residuals)
3
2
1
0
−1
−2
−3
1970
1980
1990
2000
Year

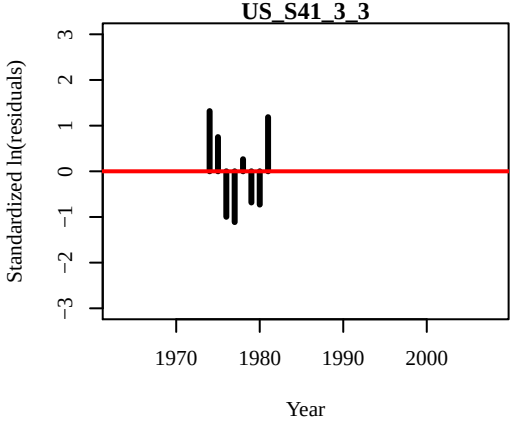

US_Sp_6_6
Standardized ln(residuals)
3
2
1
0
−1
−2
−3
1970
1980
1990
2000
Year

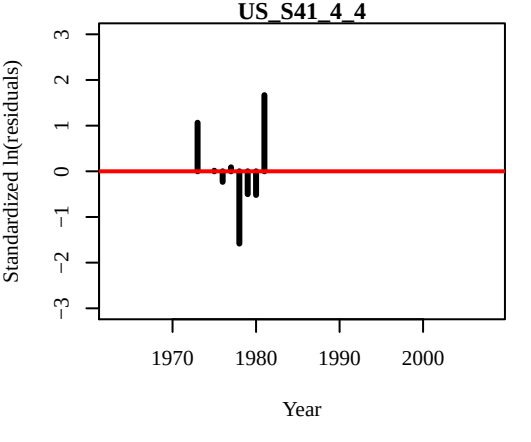

US_Sp_7_7
Standardized ln(residuals)
Year

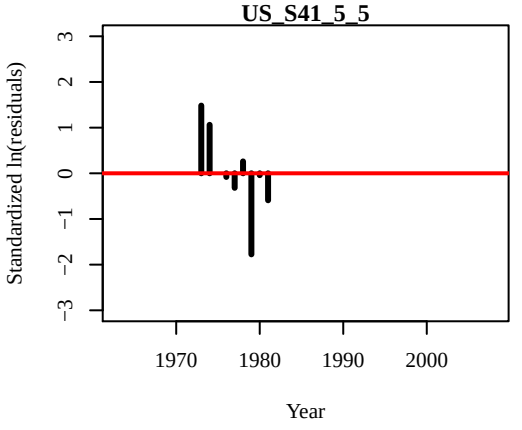

US_Sp_8_8
Standardized ln(residuals)
Year

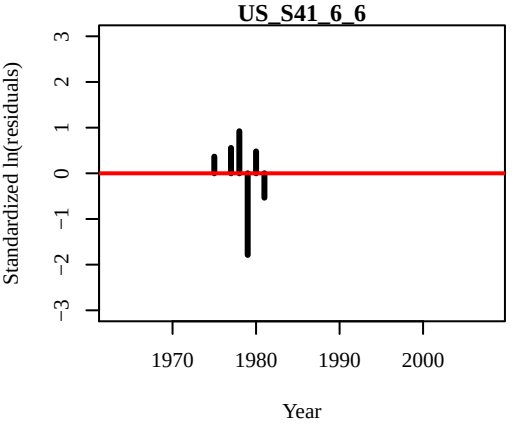

US_S41_1_1
Standardized ln(residuals)
Year

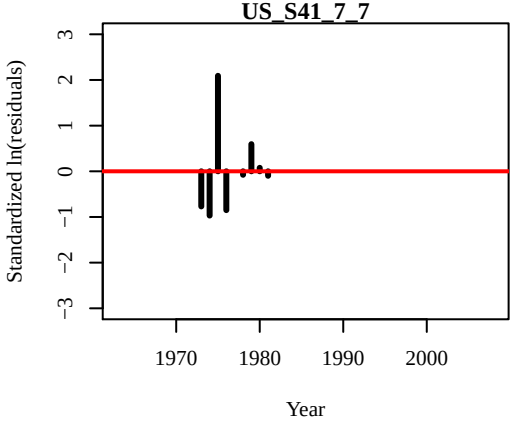

US_S41_2_2
Standardized ln(residuals)
Year

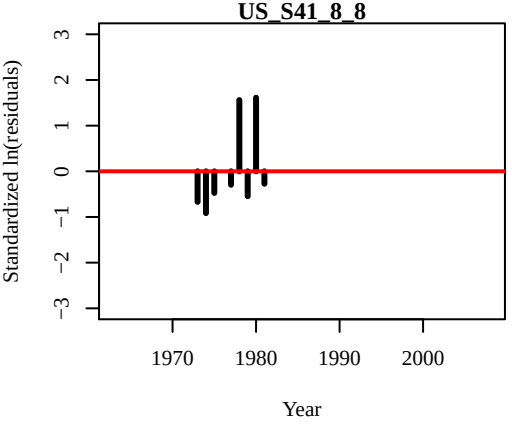

US_S41_3_3
Standardized ln(residuals)
Year

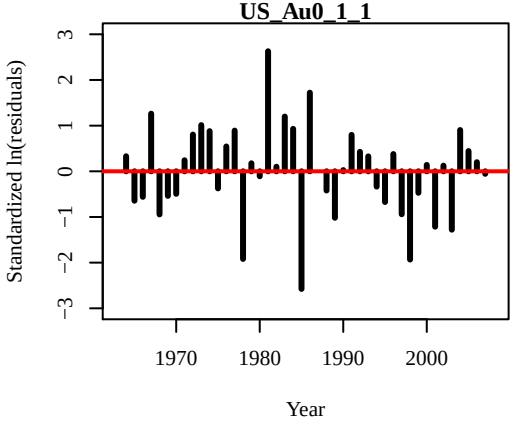

US_S41_4_4
Standardized ln(residuals)
Year

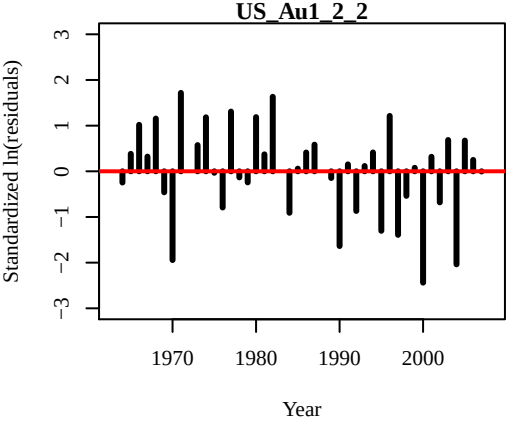

US_S41_5_5
Standardized ln(residuals)
3
2
1
0
−1
−2
−3
1970
1980
1990
2000
Year

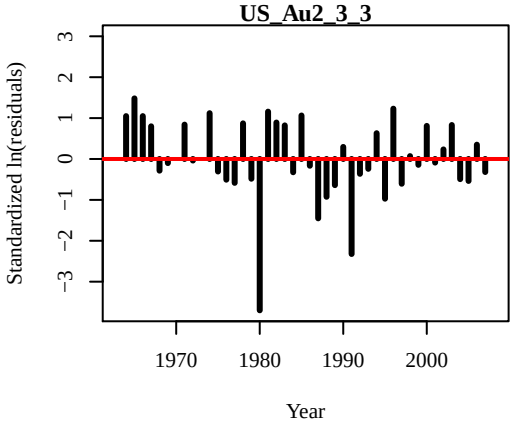

US_S41_6_6
Standardized ln(residuals)
3
2
1
0
−1
−2
−3
1970
1980
1990
2000
Year

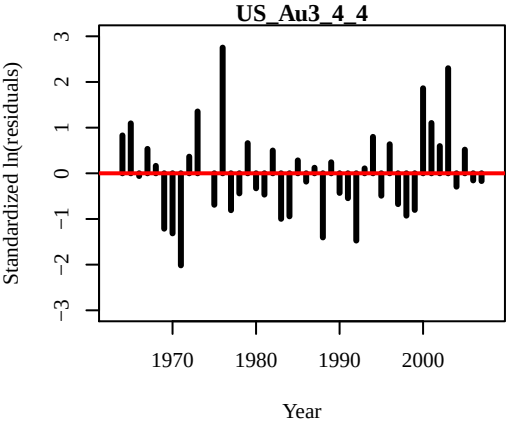

US_S41_7_7
Standardized ln(residuals)
3
2
1
0
−1
−2
−3
1970
1980
1990
2000
Year

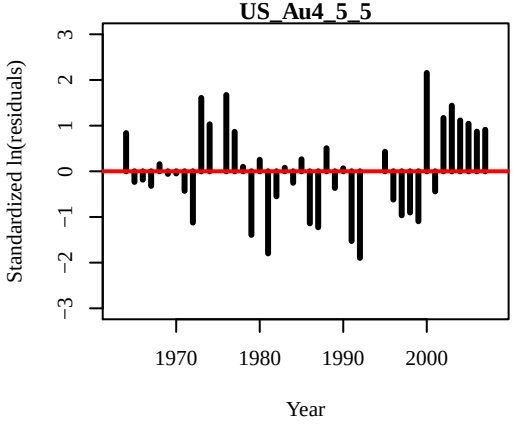

US_S41_8_8
Standardized ln(residuals)
3
2
1
0
−1
−2
−3
1970
1980
1990
2000
Year

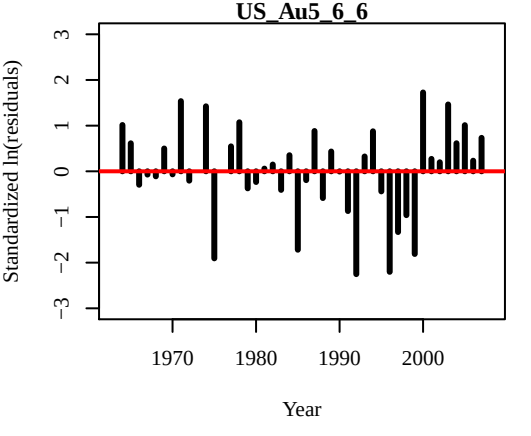

US_Au0_1_1
Standardized ln(residuals)
3
2
1
0
−1
−2
−3
1970
1980
1990
2000
Year

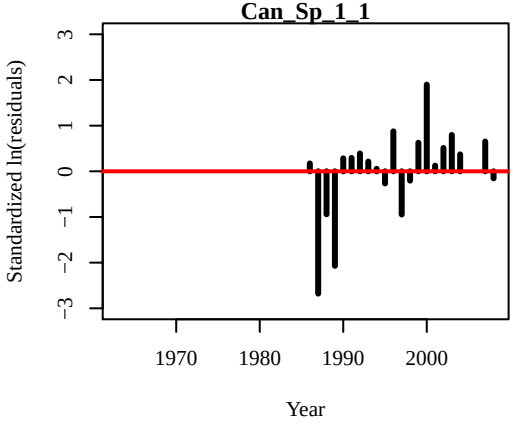

US_Au1_2_2
Standardized ln(residuals)
3
2
1
0
−1
−2
−3
1970
1980
1990
2000
Year

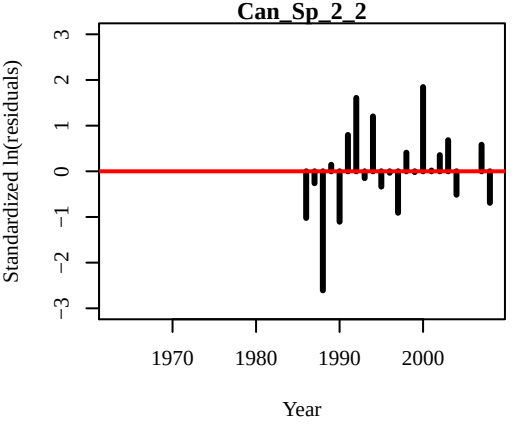

US_Au2_3_3
Standardized ln(residuals)
Year

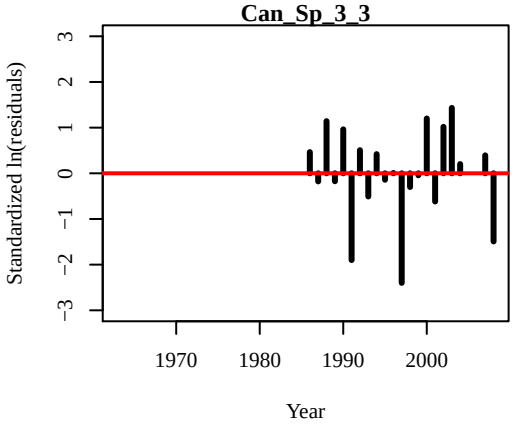

US_Au3_4_4
Standardized ln(residuals)
Year

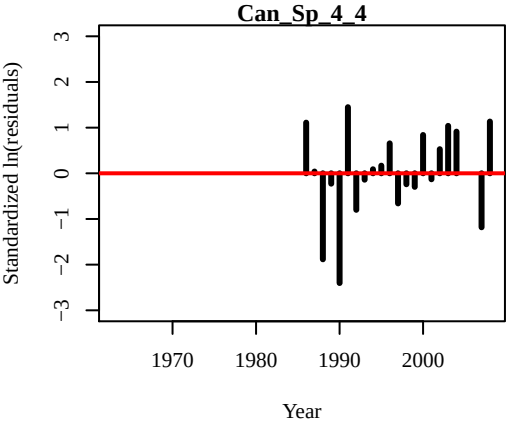

US_Au4_5_5
Standardized ln(residuals)
Year

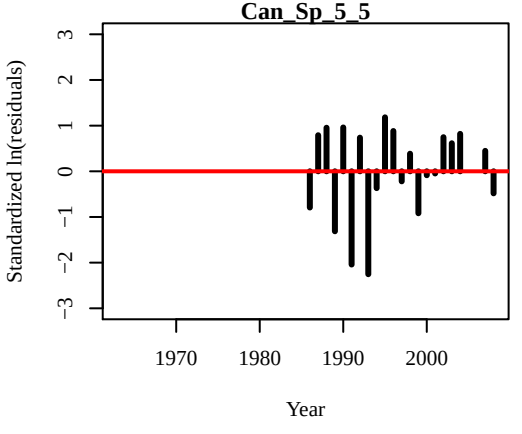

US_Au5_6_6
Standardized ln(residuals)
Year

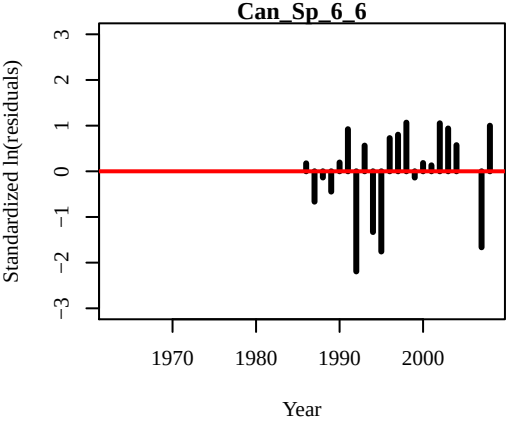

Can_Sp_1_1
Standardized ln(residuals)
Year

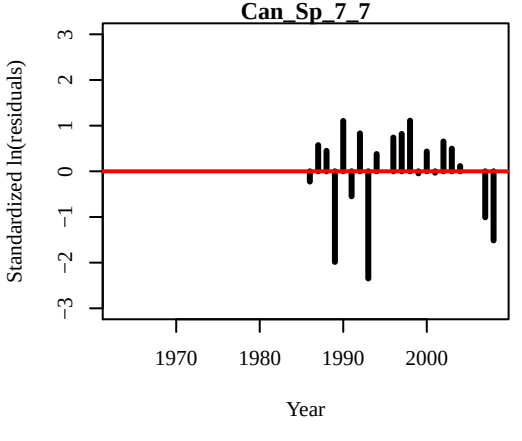

Can_Sp_2_2
Standardized ln(residuals)
Year

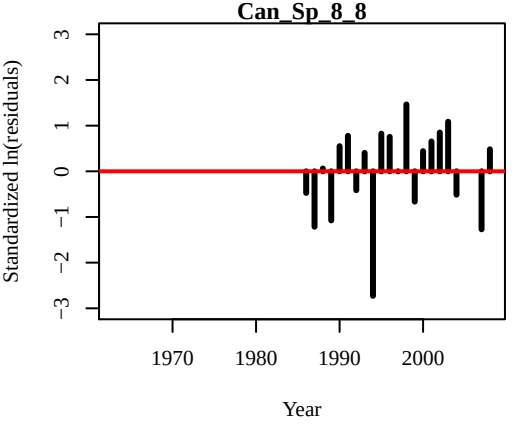

Can_Sp_3_3
Standardized ln(residuals)
3
2
1
0
−1
−2
−3
1970
1980
1990
2000
Year

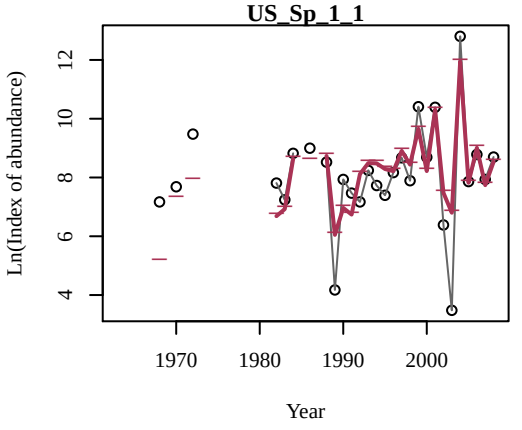

Can_Sp_4_4
Standardized ln(residuals)
3
2
1
0
−1
−2
−3
1970
1980
1990
2000
Year

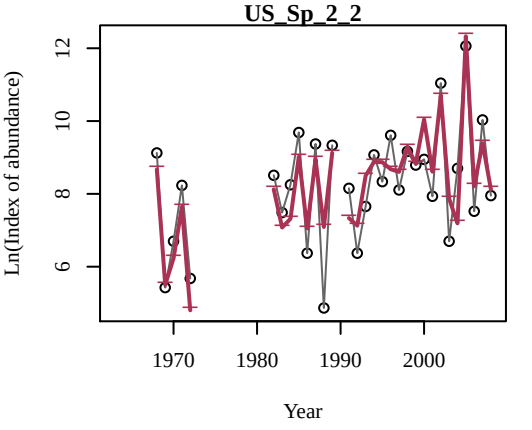

Can_Sp_5_5
Standardized ln(residuals)
3
2
1
0
−1
−2
−3
1970
1980
1990
2000
Year

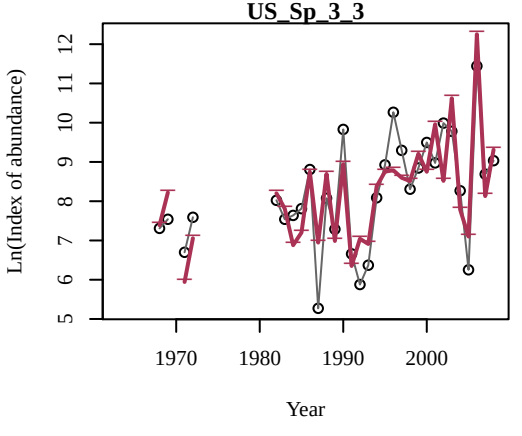

Can_Sp_6_6
Standardized ln(residuals)
3
2
1
0
−1
−2
−3
1970
1980
1990
2000
Year

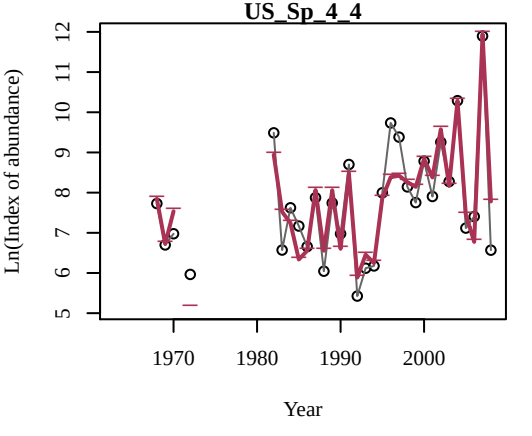

Can_Sp_7_7
Standardized ln(residuals)
3
2
1
0
−1
−2
−3
1970
1980
1990
2000
Year

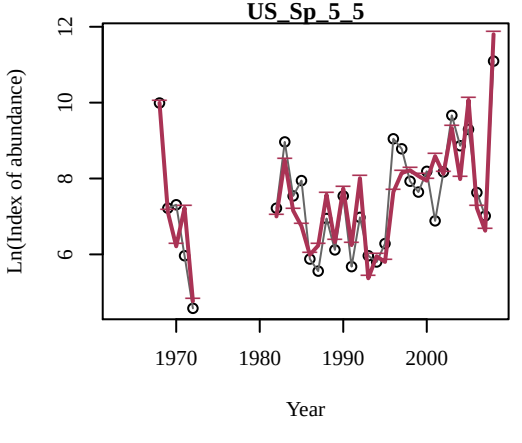

Can_Sp_8_8
Standardized ln(residuals)
3
2
1
0
−1
−2
−3
1970
1980
1990
2000
Year

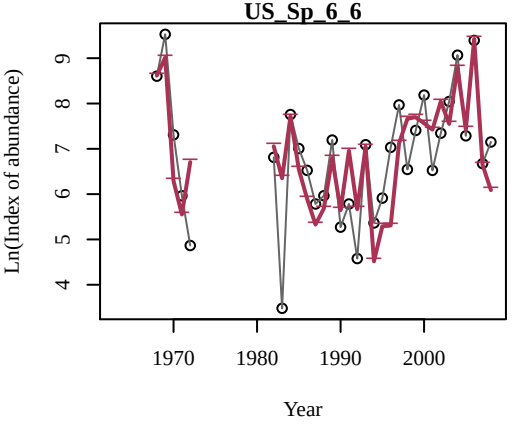

US_Sp_1_1
Ln(Index of abundance)
Year

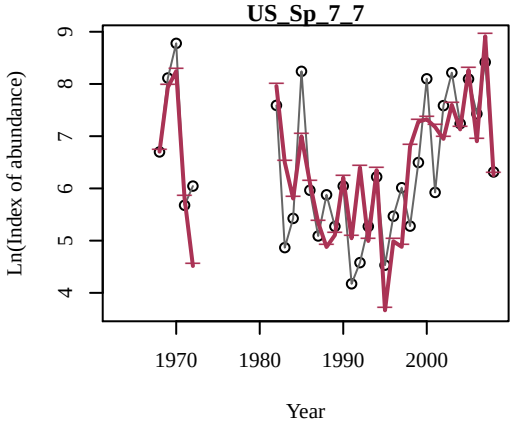

US_Sp_2_2
Ln(Index of abundance)
Year

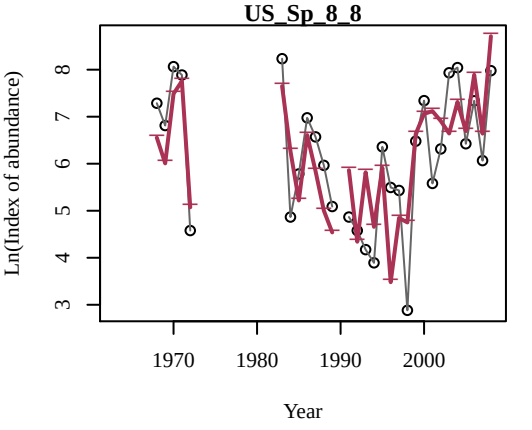

US_Sp_3_3
Ln(Index of abundance)
Year

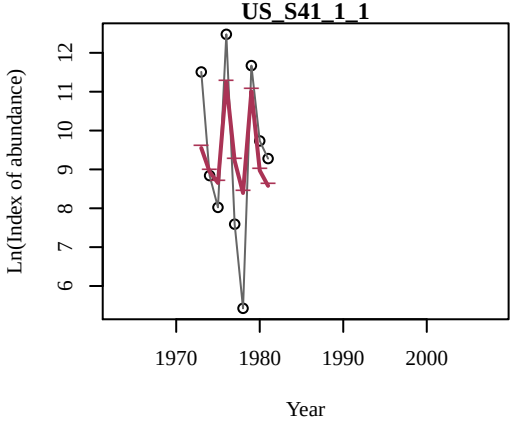

US_Sp_4_4
Ln(Index of abundance)
Year

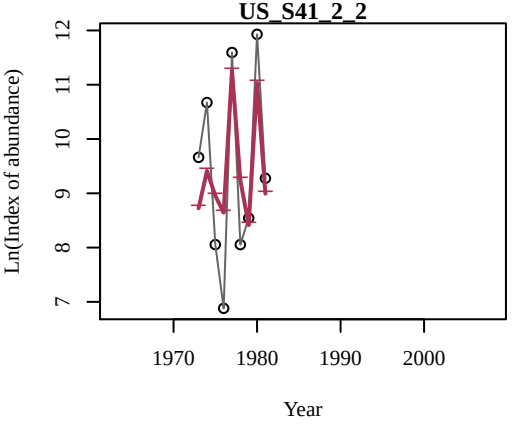

US_Sp_5_5
Ln(Index of abundance)
Year

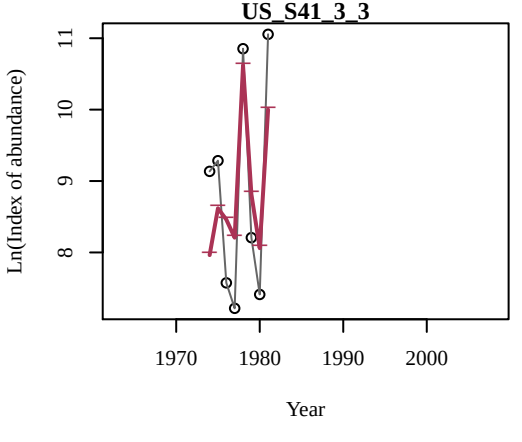

US_Sp_6_6
Ln(Index of abundance)
Year

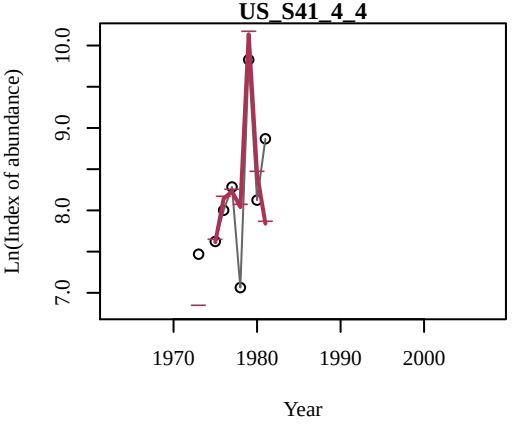

US_Sp_7_7
Ln(Index of abundance)
Year

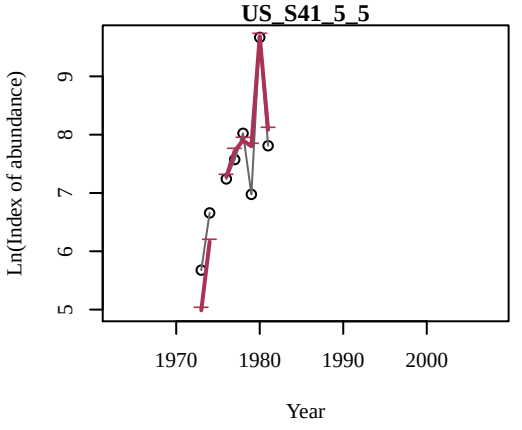

US_Sp_8_8
Ln(Index of abundance)
Year

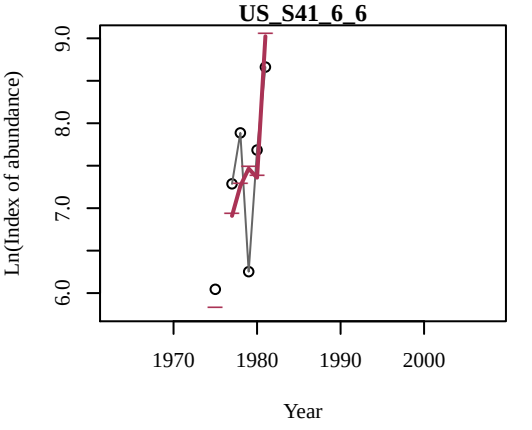

US_S41_1_1
Ln(Index of abundance)
Year

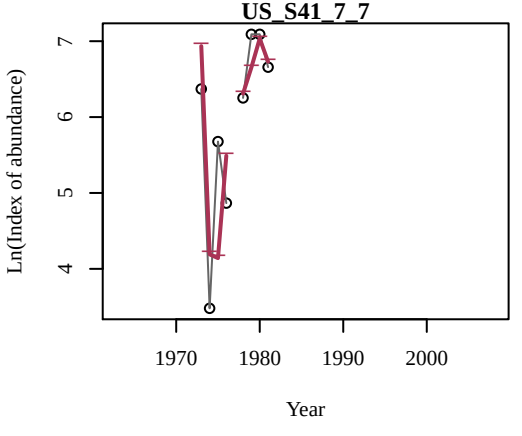

US_S41_2_2
Ln(Index of abundance)
Year

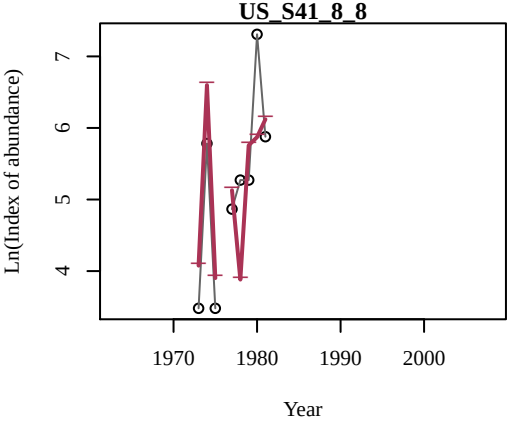

US_S41_3_3
Ln(Index of abundance)
Year

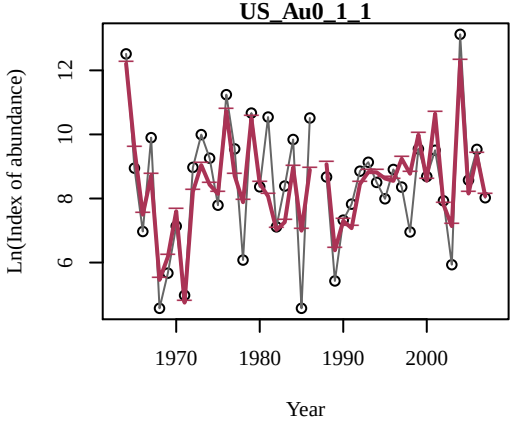

US_S41_4_4
Ln(Index of abundance)
Year

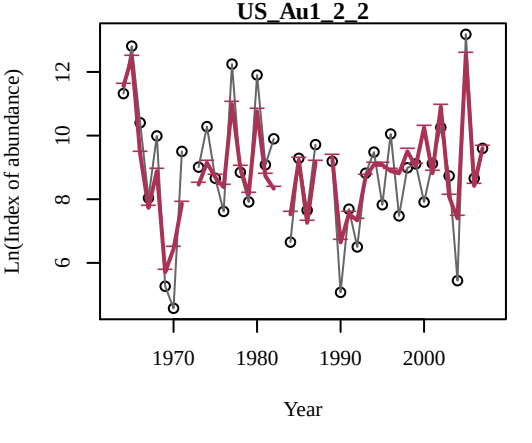

US_S41_5_5
Ln(Index of abundance)
5
6
7
8
9
1970
1980
1990
2000
Year

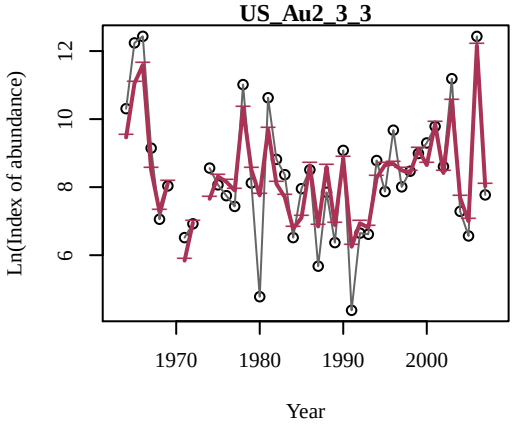

US_S41_6_6
Ln(Index of abundance)
6.0
7.0
8.0
9.0
1970
1980
1990
2000
Year

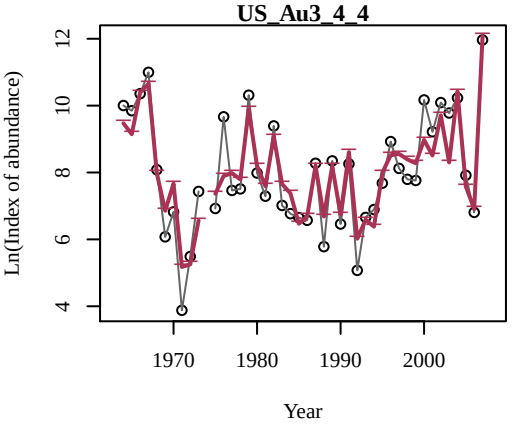

US_S41_7_7
Ln(Index of abundance)
4
5
6
7
1970
1980
1990
2000
Year

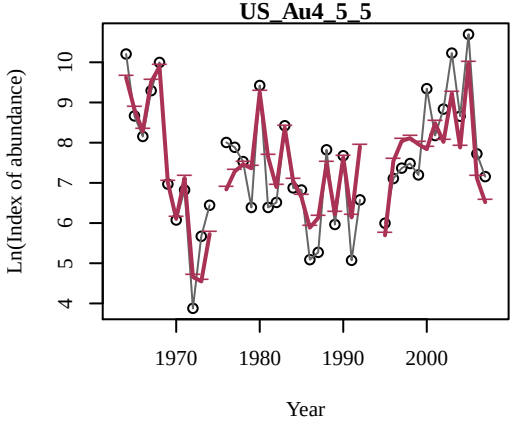

US_S41_8_8
Ln(Index of abundance)
4
5
6
7
1970
1980
1990
2000
Year

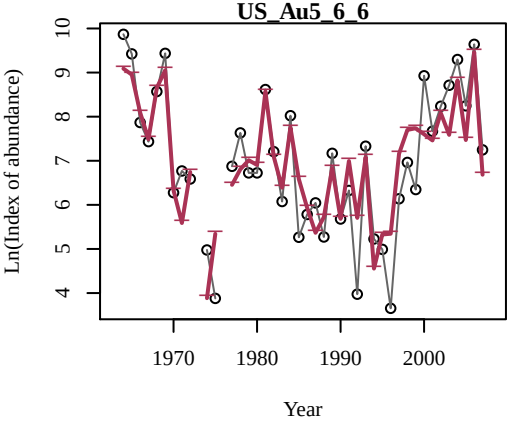

US_Au0_1_1
Ln(Index of abundance)
6
8
10
12
1970
1980
1990
2000
Year

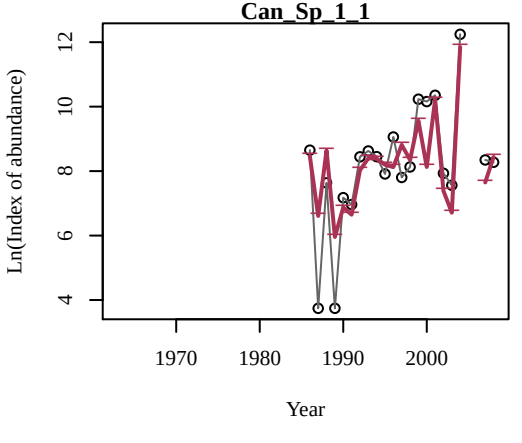

US_Au1_2_2
Ln(Index of abundance)
6
8
10
12
1970
1980
1990
2000
Year

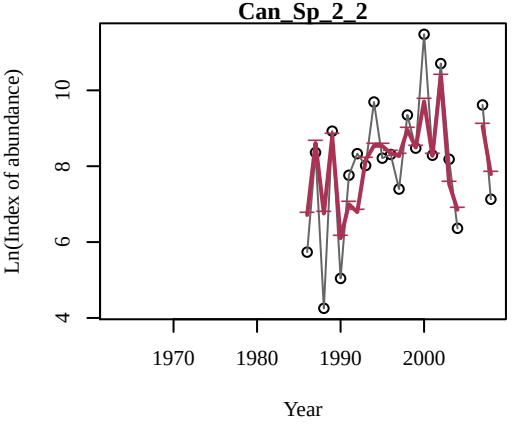

US_Au2_3_3
Ln(Index of abundance)
Year

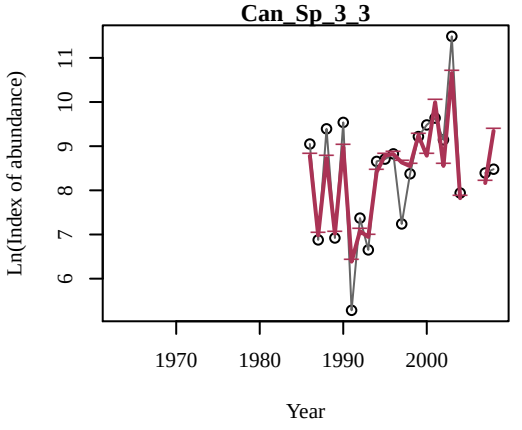

US_Au3_4_4
Ln(Index of abundance)
Year

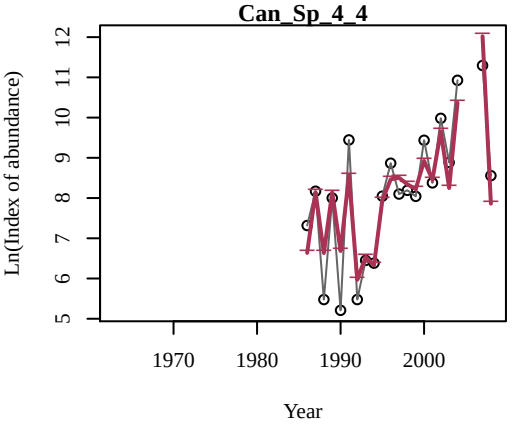

US_Au4_5_5
Ln(Index of abundance)
Year

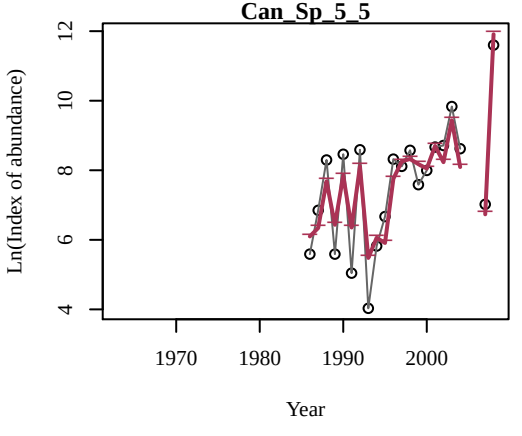

US_Au5_6_6
Ln(Index of abundance)
Year

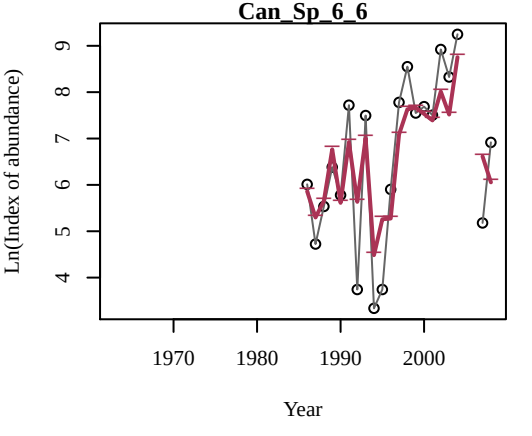

Can_Sp_1_1
Ln(Index of abundance)
Year

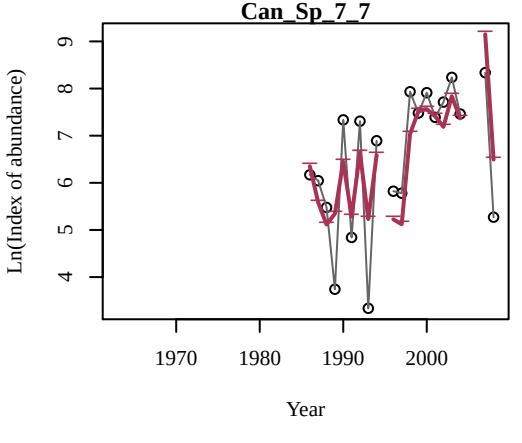

Can_Sp_2_2
Ln(Index of abundance)
Year

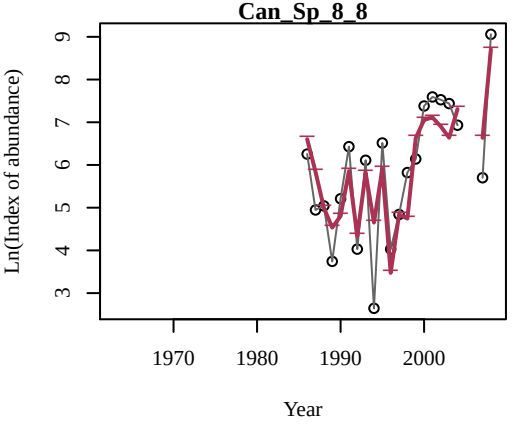

Can_Sp_3_3
Ln(Index of abundance)
Year

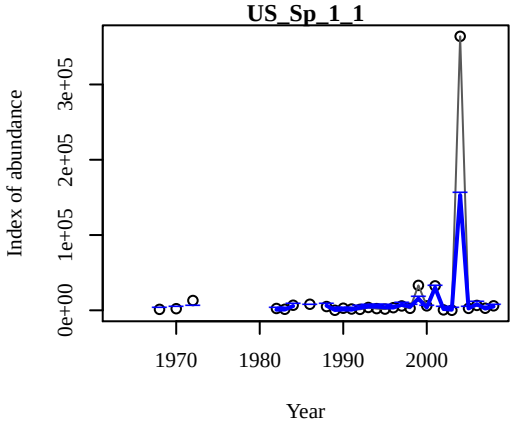

Can_Sp_4_4
Ln(Index of abundance)
Year

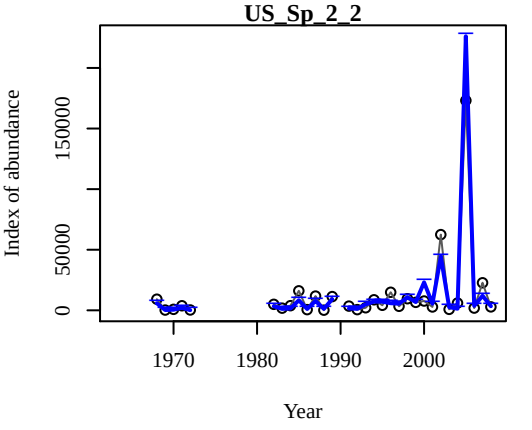

Can_Sp_5_5
Ln(Index of abundance)
Year

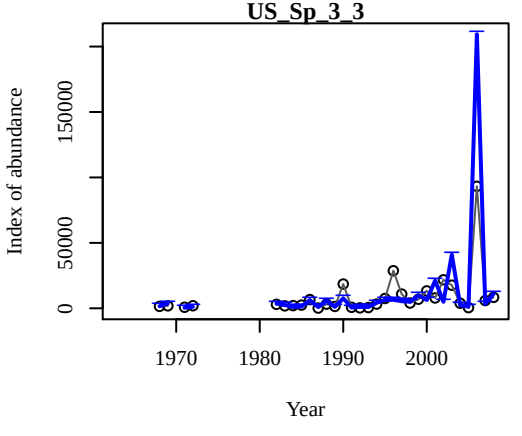

Can_Sp_6_6
Ln(Index of abundance)
Year

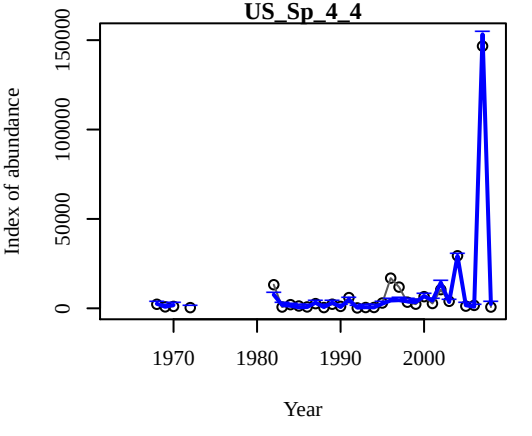

Can_Sp_7_7
Ln(Index of abundance)
Year

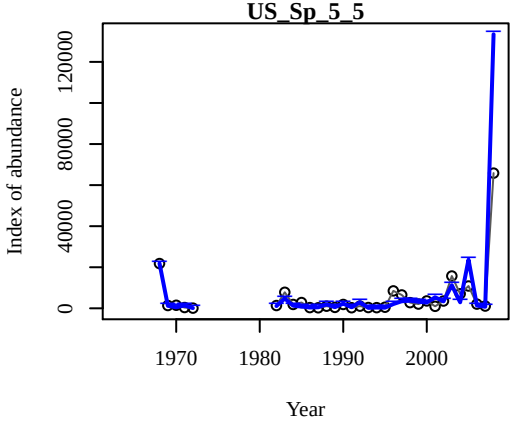

Can_Sp_8_8
Ln(Index of abundance)
Year

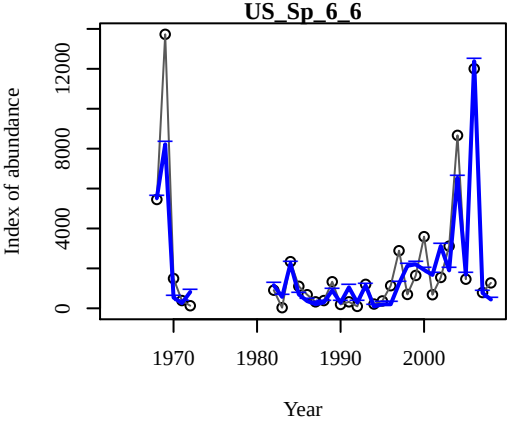

US_Sp_1_1
Index of abundance
0e+00
1e+05
2e+05
3e+05
1970
1980
1990
2000
Year

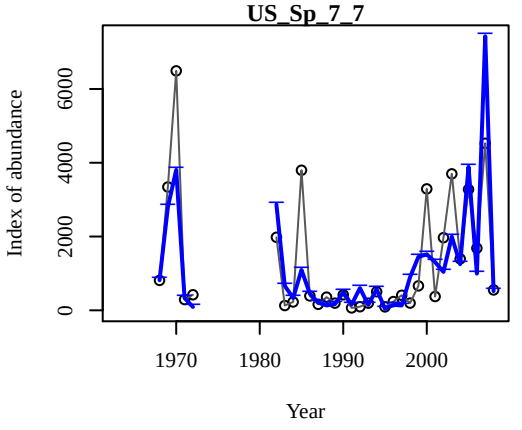

US_Sp_2_2
Index of abundance
0
50000
150000
1970
1980
1990
2000
Year

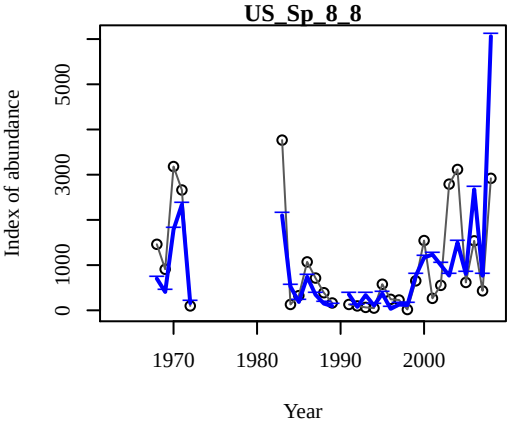

US_Sp_3_3
Index of abundance
0
50000
150000
1970
1980
1990
2000
Year

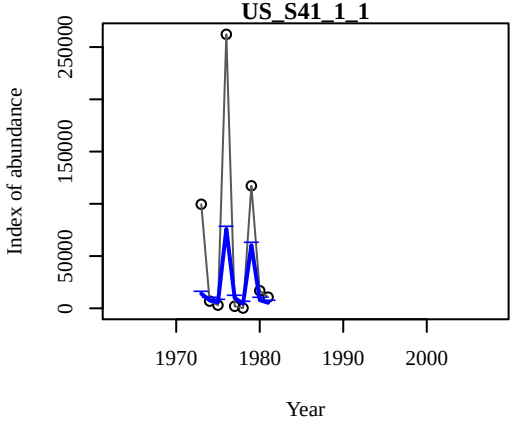

US_Sp_4_4
Index of abundance
0
50000
100000
150000
1970
1980
1990
2000
Year

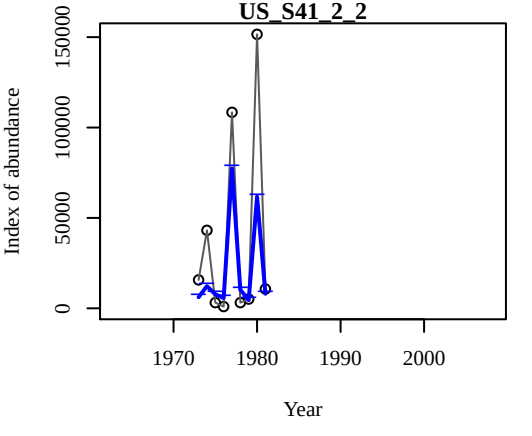

US_Sp_5_5
Index of abundance
0
40000
80000
120000
1970
1980
1990
2000
Year

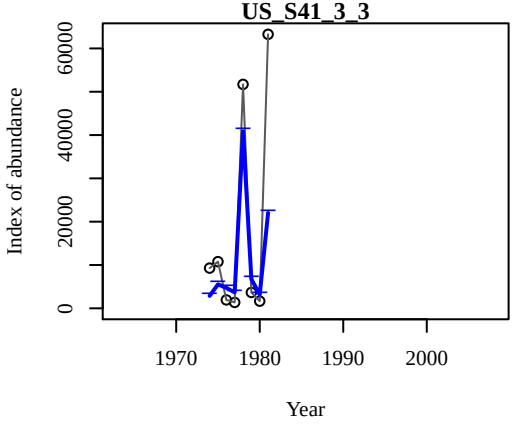

US_Sp_6_6
Index of abundance
0
4000
8000
12000
1970
1980
1990
2000
Year

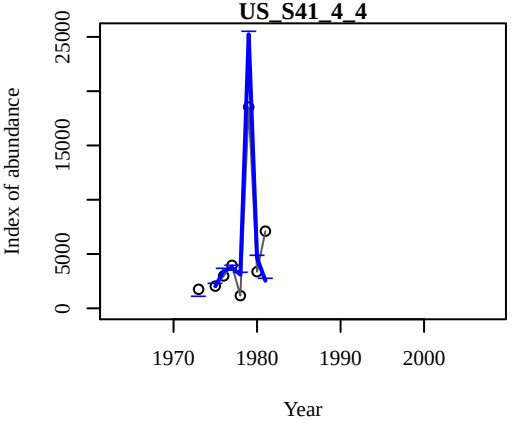

US_Sp_7_7
Index of abundance
0
2000
4000
6000
1970
1980
1990
2000
Year

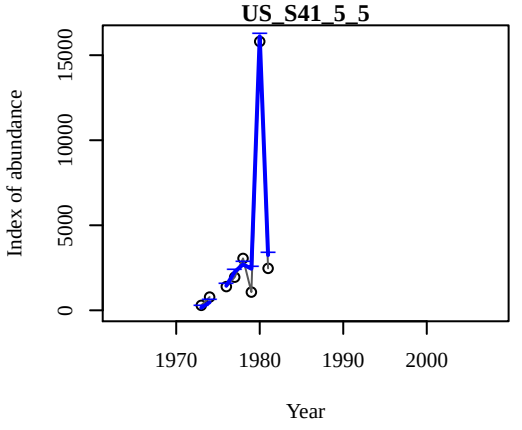

US_Sp_8_8
Index of abundance
0
1000
3000
5000
1970
1980
1990
2000
Year

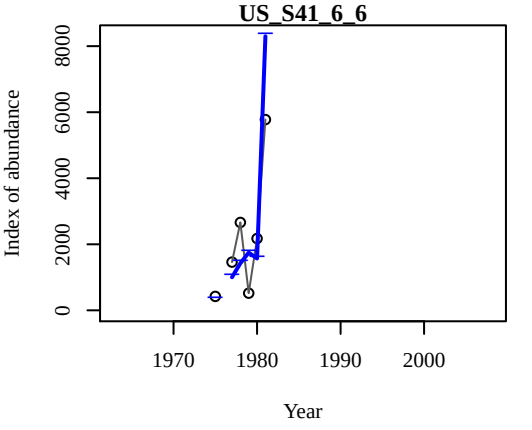

US_S41_1_1
Index of abundance
0
50000
150000
250000
1970
1980
1990
2000
Year

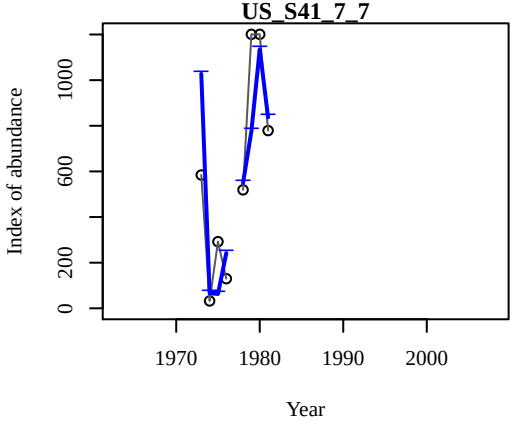

US_S41_2_2
Index of abundance
0
50000
100000
150000
1970
1980
1990
2000
Year

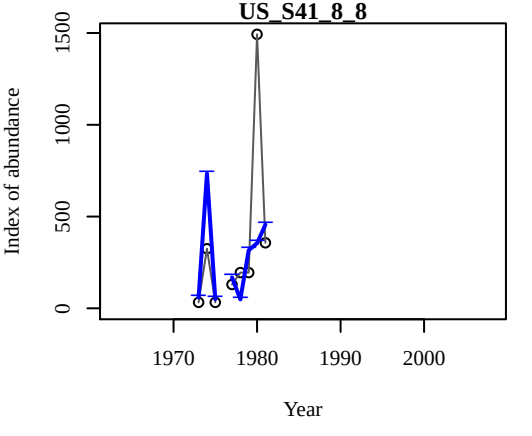

US_S41_3_3
Index of abundance
0
20000
40000
60000
1970
1980
1990
2000
Year

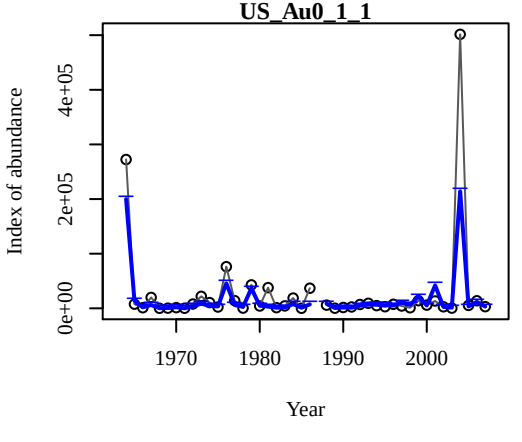

US_S41_4_4
Index of abundance
0
5000
15000
25000
1970
1980
1990
2000
Year

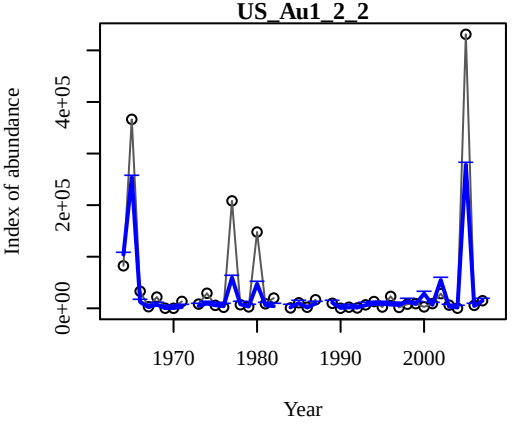

US_S41_5_5
Index of abundance
0
5000
10000
15000
1970
1980
1990
2000
Year

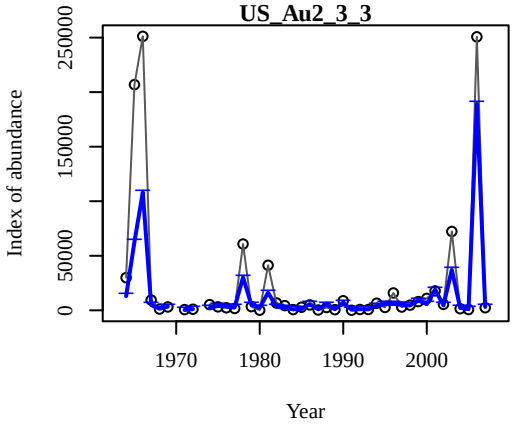

US_S41_6_6
Index of abundance
0
2000
4000
6000
8000
1970
1980
1990
2000
Year

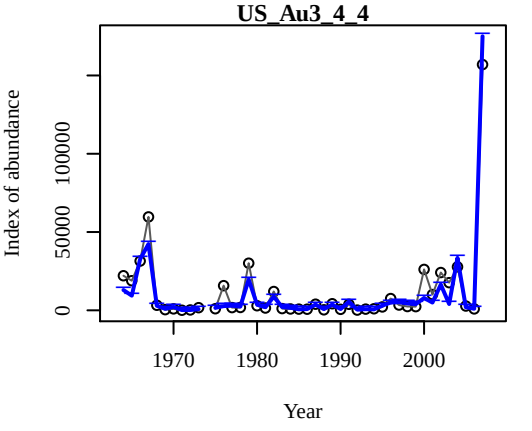

US_S41_7_7
Index of abundance
0
200
600
1000
1970
1980
1990
2000
Year

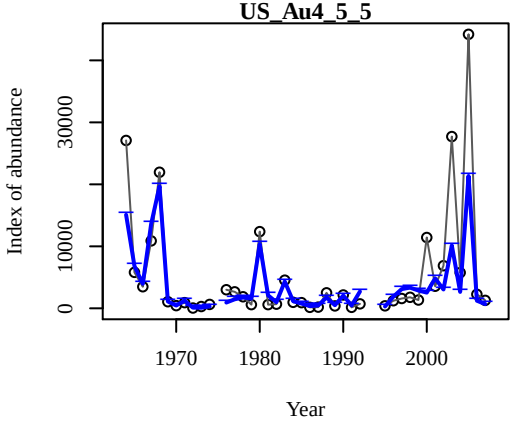

US_S41_8_8
Index of abundance
0
500
1000
1500
1970
1980
1990
2000
Year

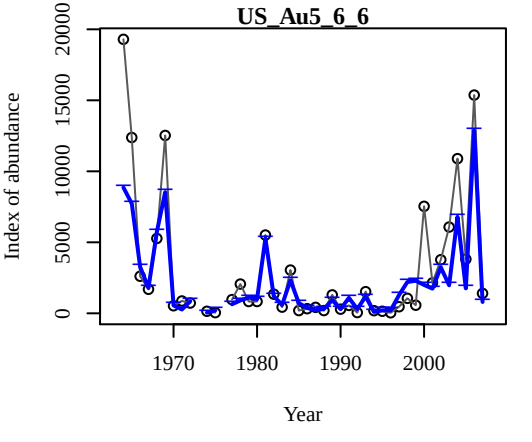

US_Au0_1_1
Index of abundance
0e+00
2e+05
4e+05
1970
1980
1990
2000
Year

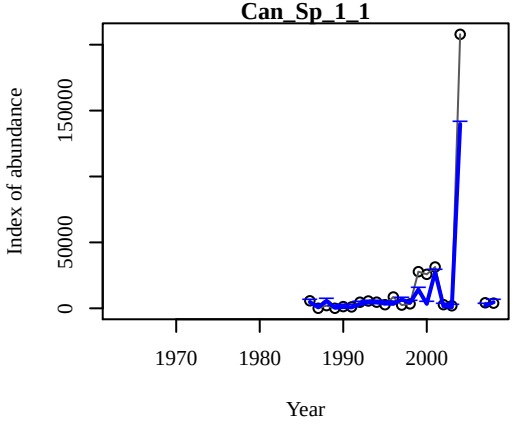

US_Au1_2_2
Index of abundance
0e+00
2e+05
4e+05
1970
1980
1990
2000
Year

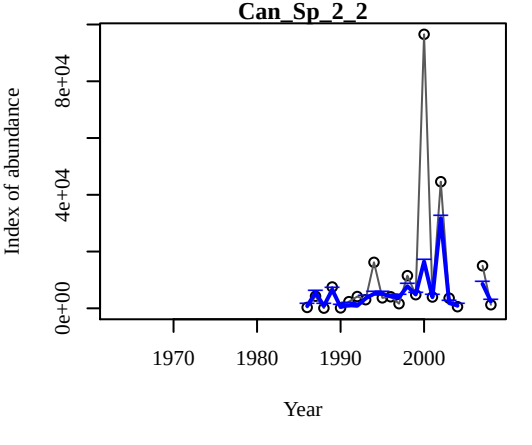

US_Au2_3_3
Index of abundance
0
50000
150000
250000
1970
1980
1990
2000
Year

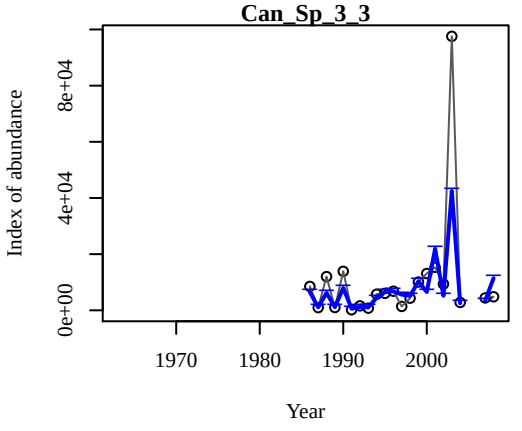

US_Au3_4_4
Index of abundance
0
50000
100000
1970
1980
1990
2000
Year

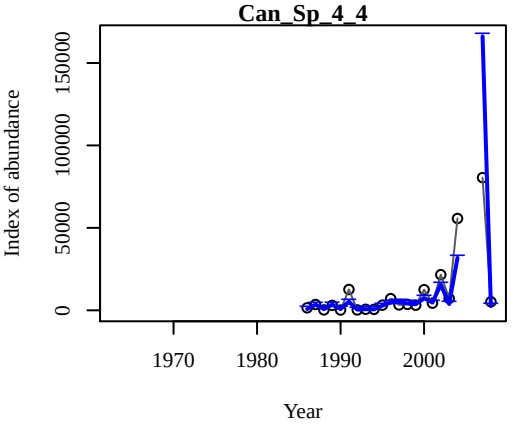

US_Au4_5_5
Index of abundance
0
10000
30000
1970
1980
1990
2000
Year

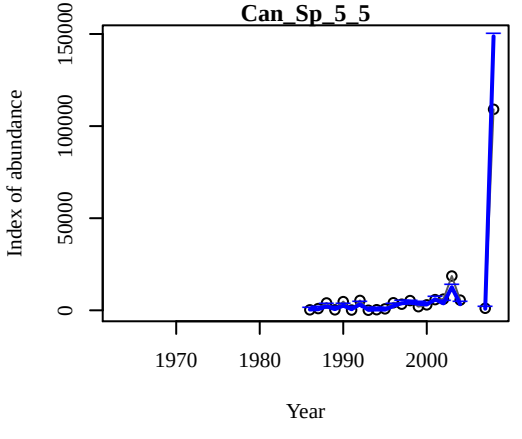

US_Au5_6_6
Index of abundance
0
5000
10000
15000
20000
1970
1980
1990
2000
Year

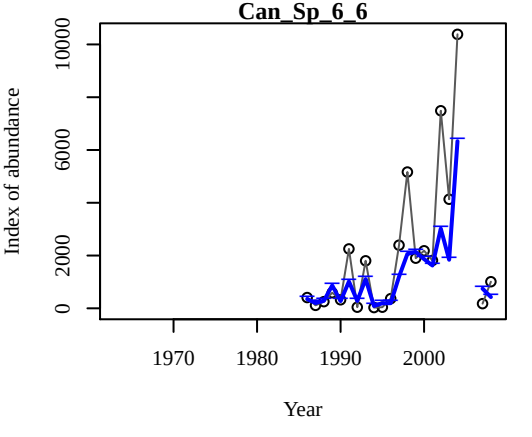

Can_Sp_1_1
Index of abundance
0
50000
150000
1970
1980
1990
2000
Year

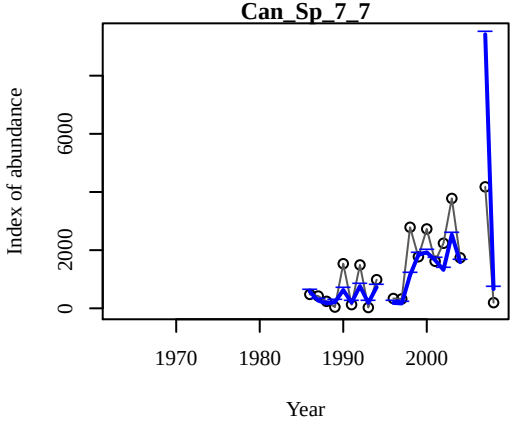

Can_Sp_2_2
Index of abundance
0e+00
4e+04
8e+04
1970
1980
1990
2000
Year

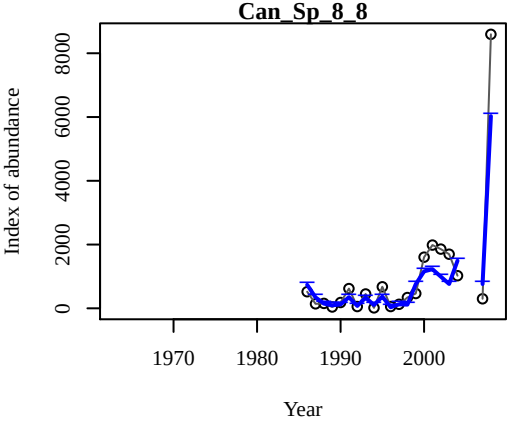

Can_Sp_3_3
Index of abundance
0e+00
4e+04
8e+04
1970
1980
1990
2000
Year

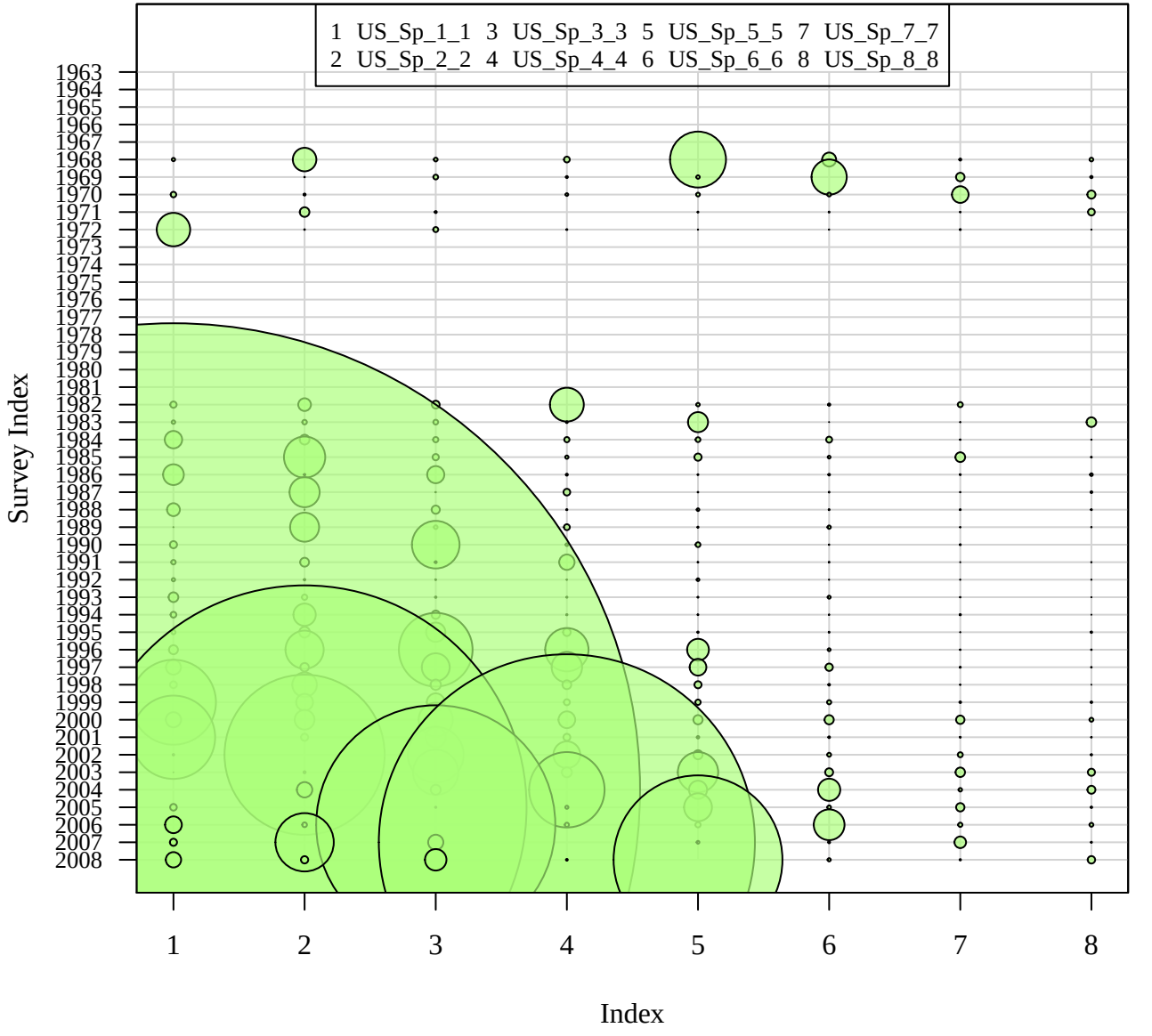

Can_Sp_4_4
Index of abundance
0
50000
100000
150000
1970
1980
1990
2000
Year

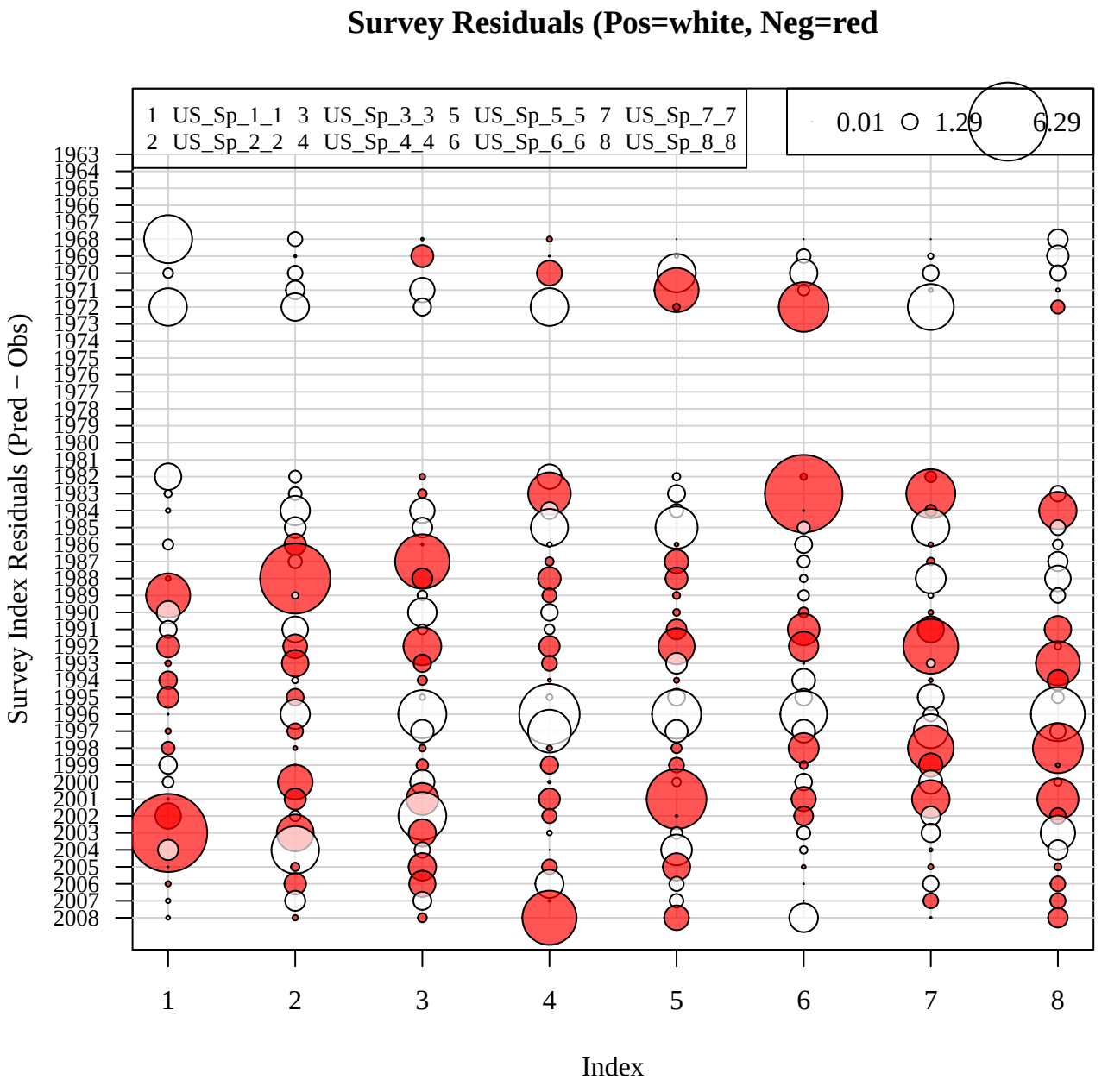

Can_Sp_5_5
Index of abundance
0
50000
100000
150000
1970
1980
1990
2000
Year

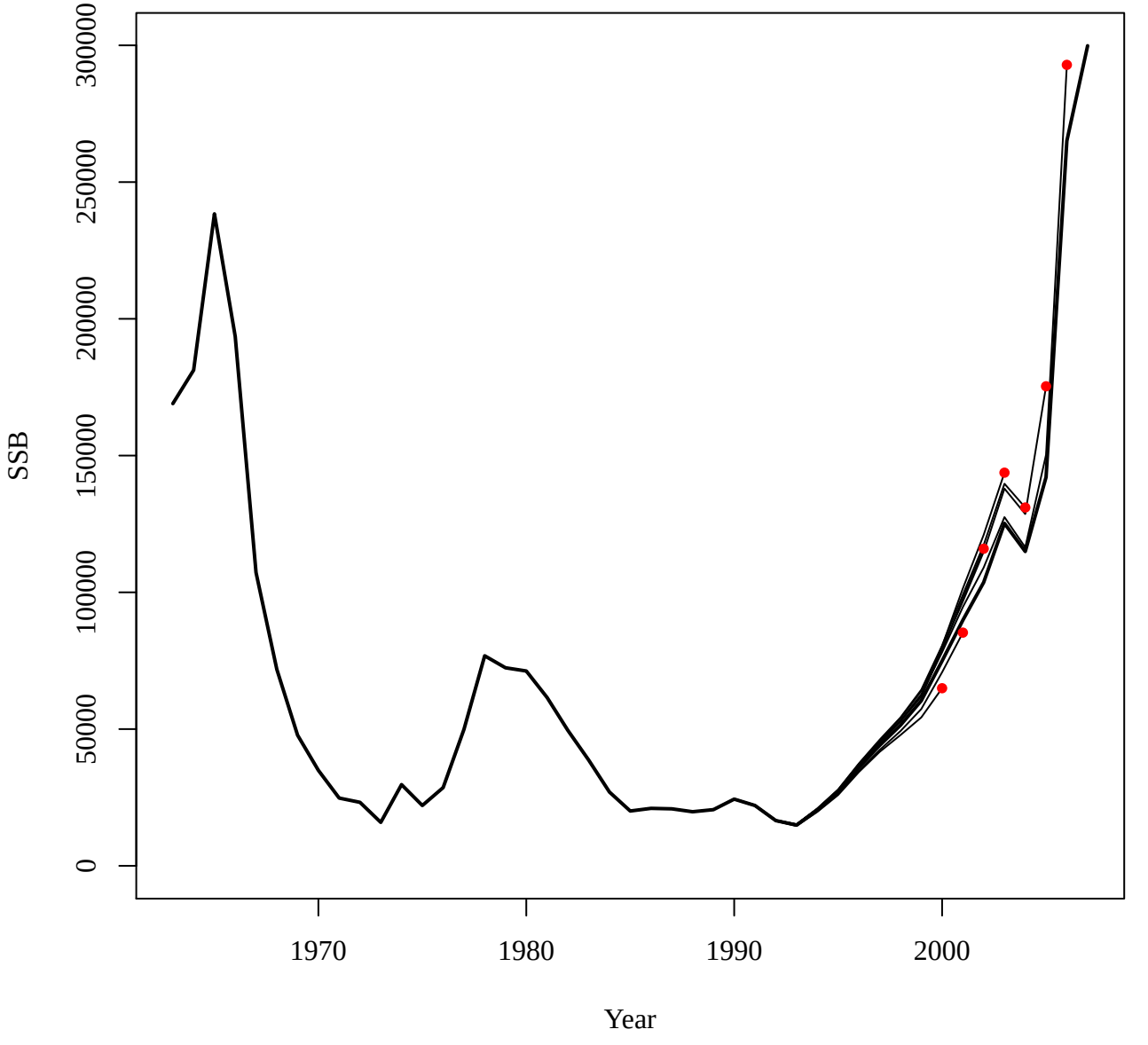

Can_Sp_6_6
Index of abundance
0
2000
6000
10000
1970
1980
1990
2000
Year

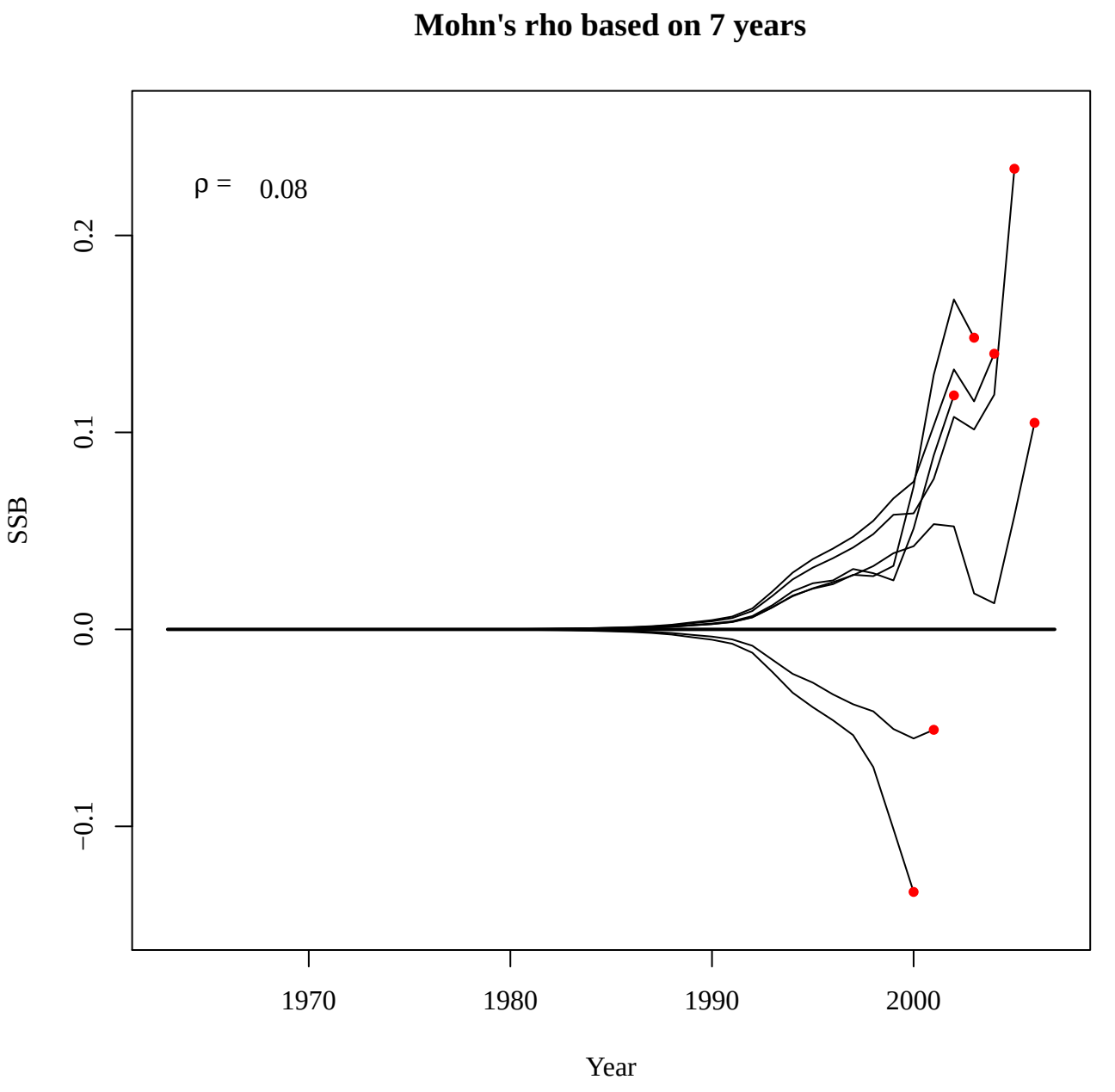

Can_Sp_7_7
Index of abundance
0
2000
6000
1970
1980
1990
2000
Year

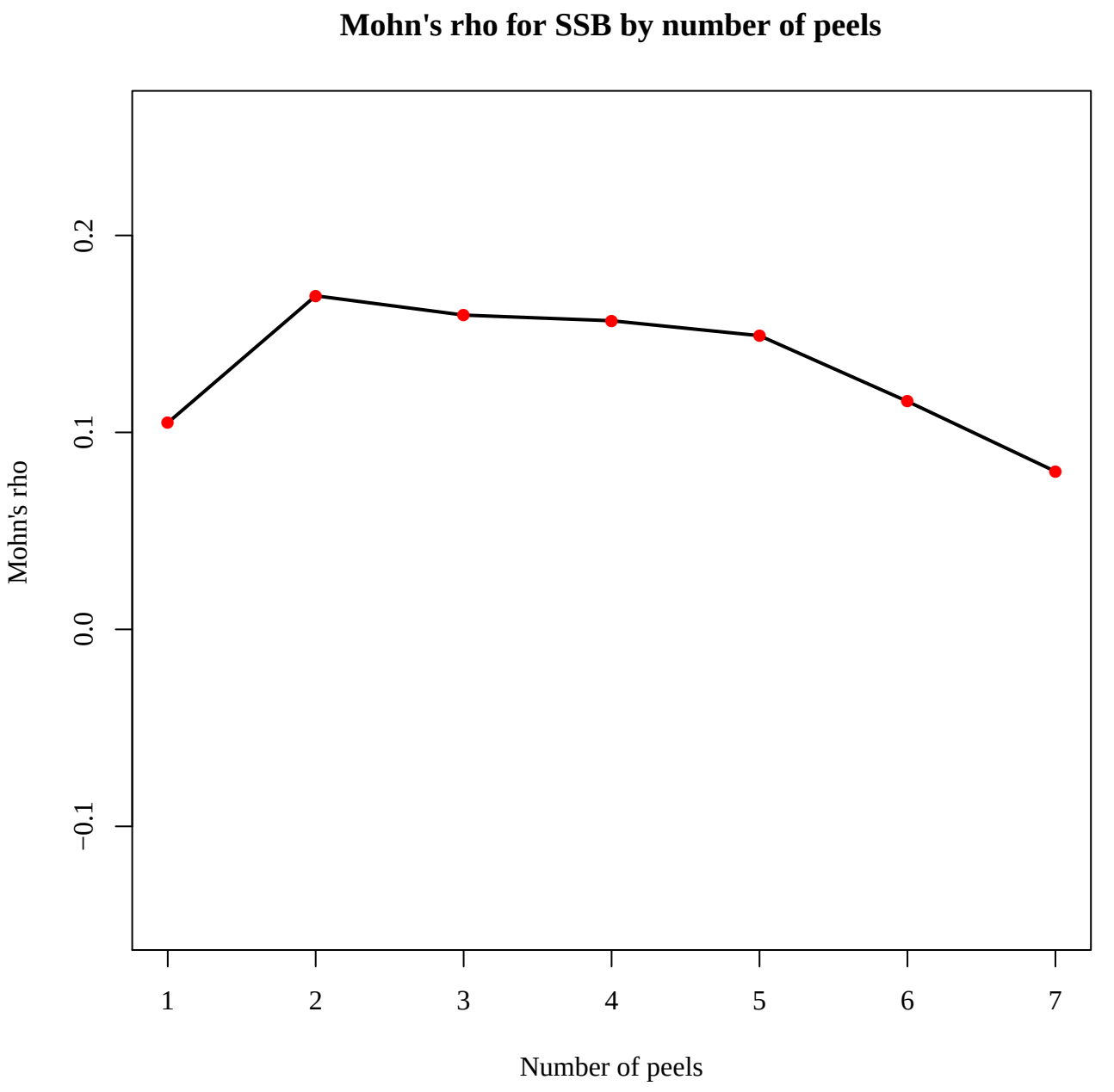

Can_Sp_8_8
Index of abundance
0
2000
4000
6000
8000
1970
1980
1990
2000
Year

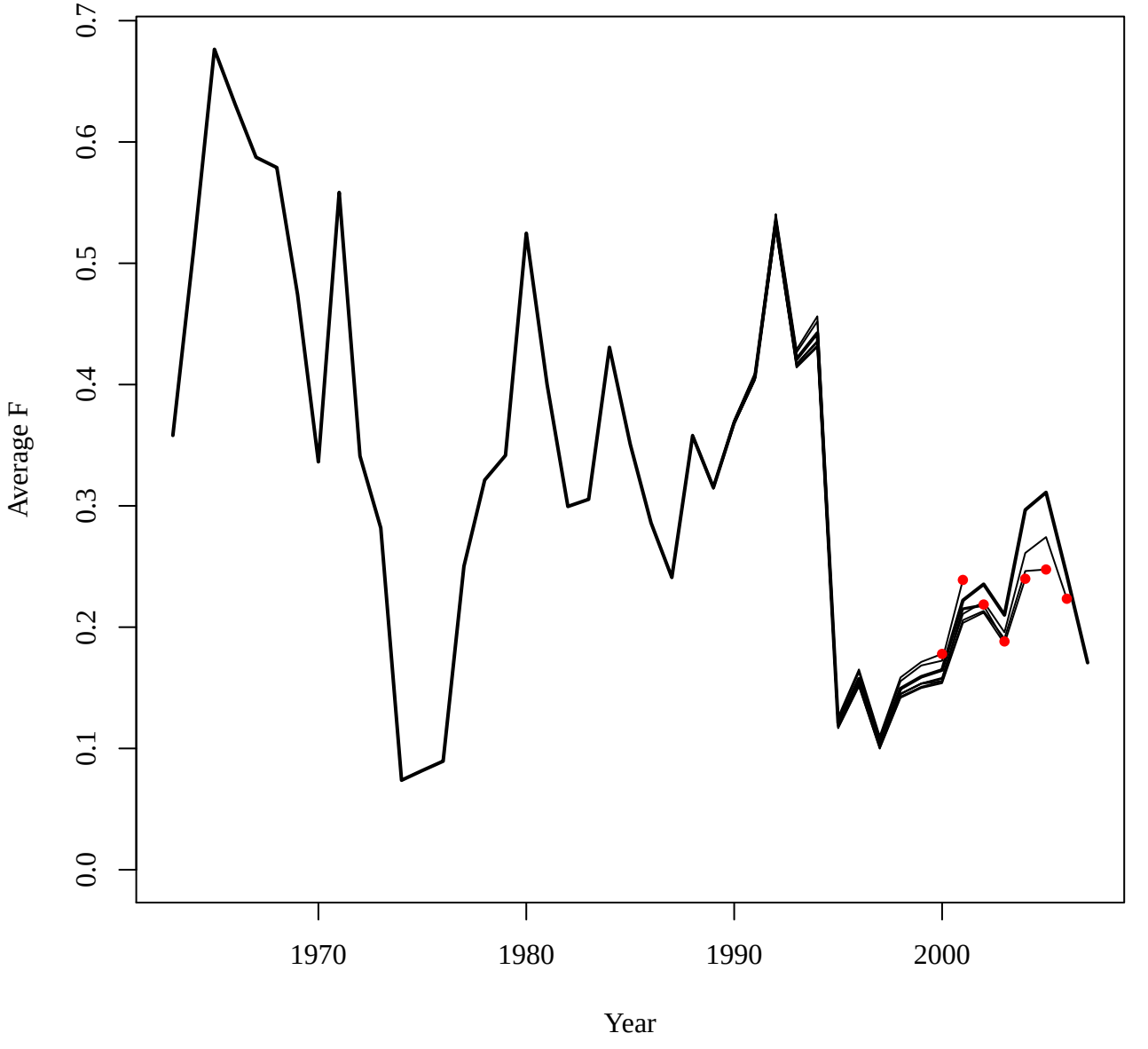

1 US_Sp_1_1 3 US_Sp_3_3 5 US_Sp_5_5 7 US_Sp_7_7
2 US_Sp_2_2 4 US_Sp_4_4 6 US_Sp_6_6 8 US_Sp_8_8
Survey Index
1963
1964
1965
1966
1967
1968
1969
1970
1971
1972
1973
1974
1975
1976
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
1
2
3
4
5
6
7
8
Index

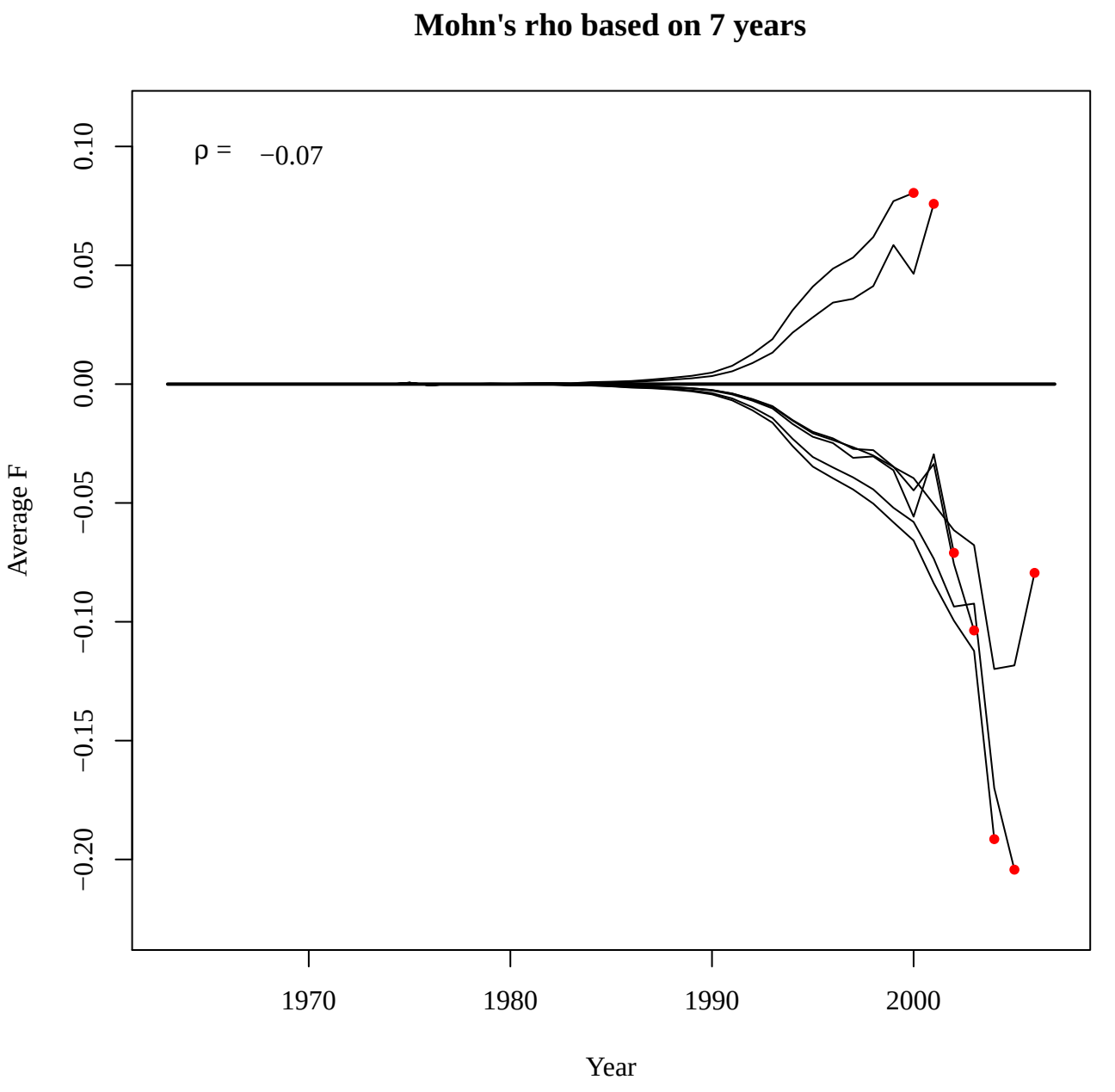

Survey Residuals (Pos=white, Neg=red
1 US_Sp_1_1
2 US_Sp_2_2
3 US_Sp_3_3
4 US_Sp_4_4
5 US_Sp_5_5
6 US_Sp_6_6
7 US_Sp_7_7
8 US_Sp_8_8
0.01
1.29
6.29
Survey Index Residuals (Pred − Obs)
1963
1964
1965
1966
1967
1968
1969
1970
1971
1972
1973
1974
1975
1976
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
1
2
3
4
5
6
7
8
Index

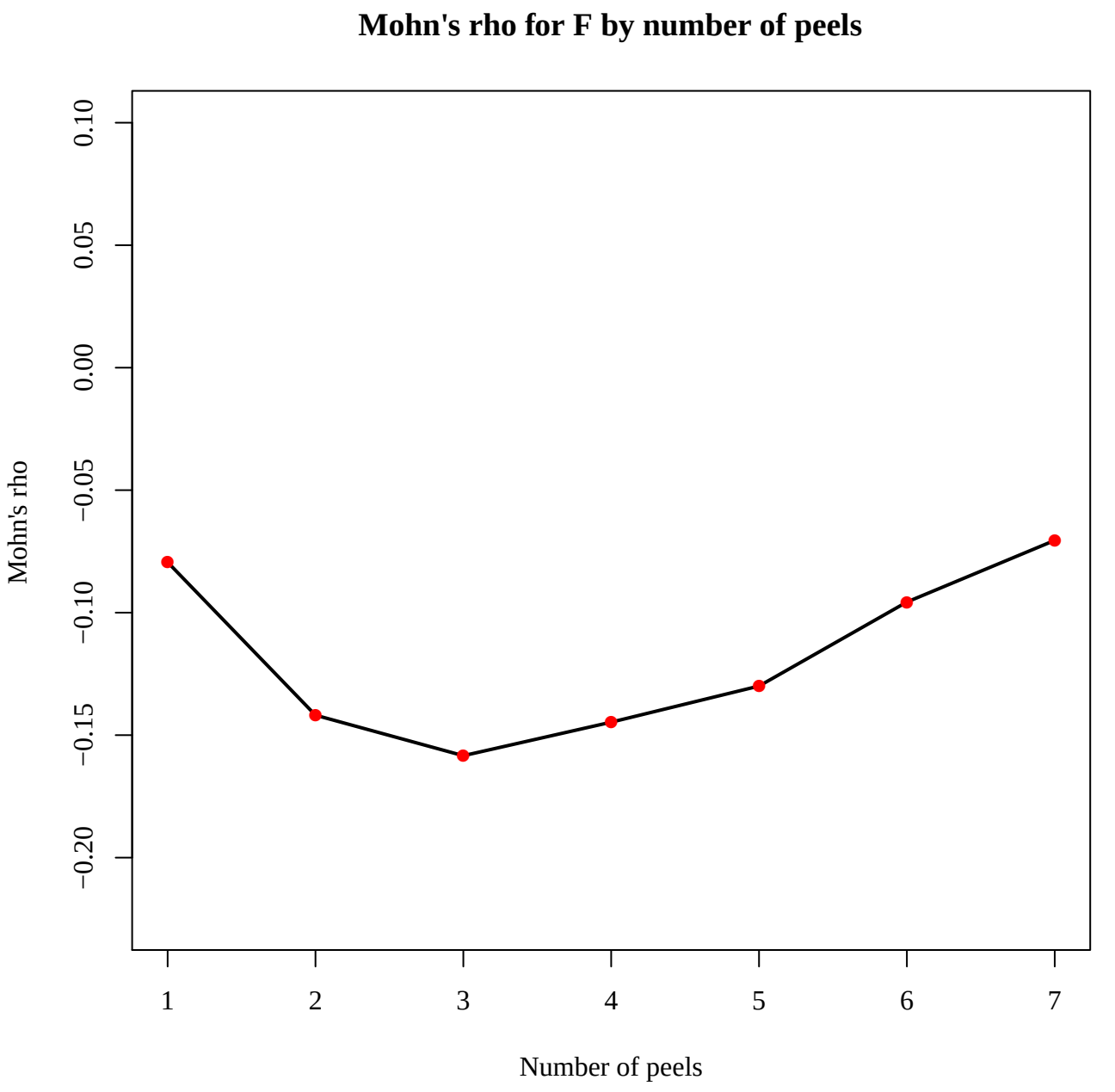

SSB
0
50000
100000
150000
200000
250000
300000
1970
1980
1990
2000
Year

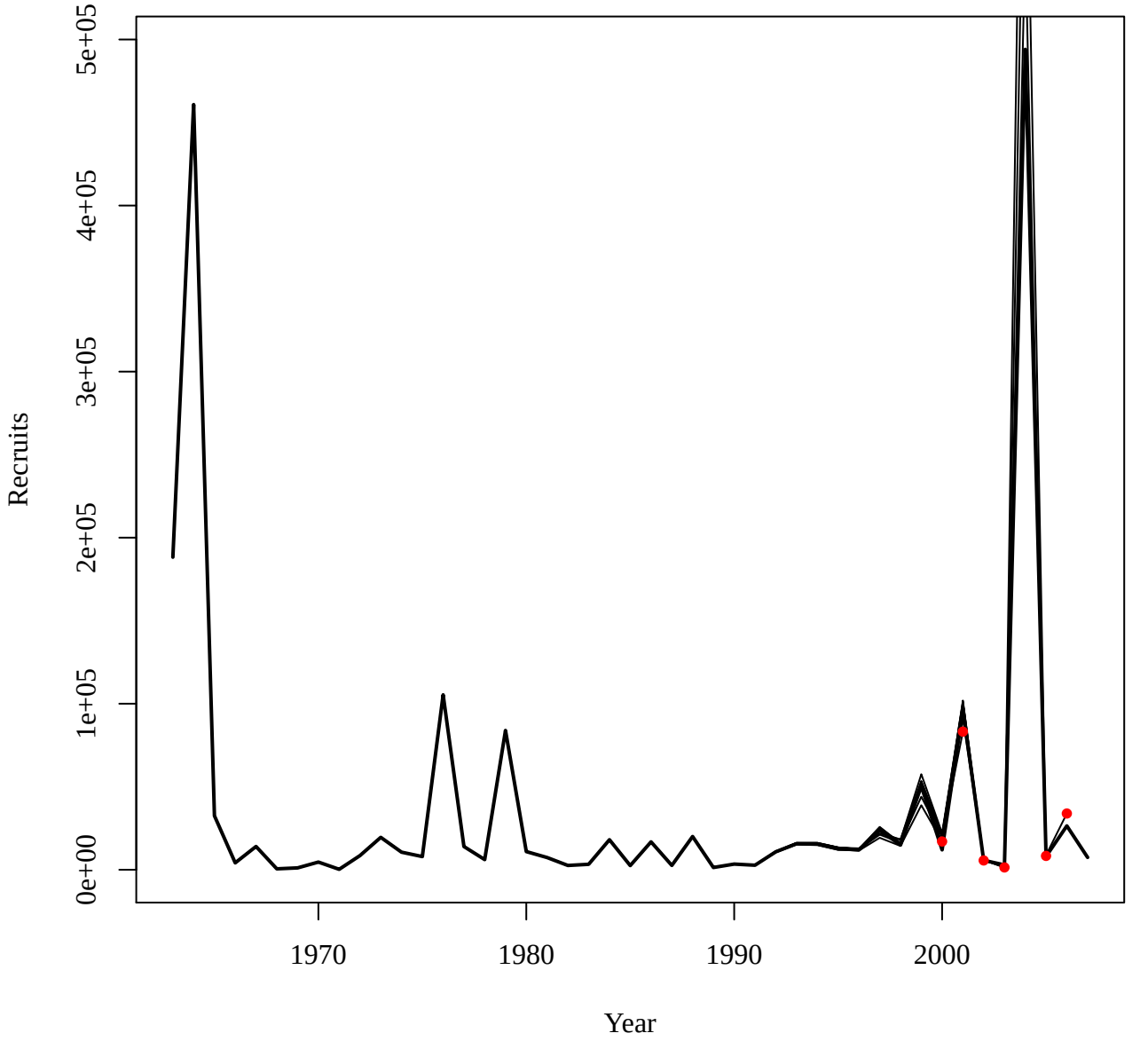

Mohn's rho based on 7 years
ρ = 0.08
0.2
0.1
0.0
−0.1
SSB
1970
1980
1990
2000
Year

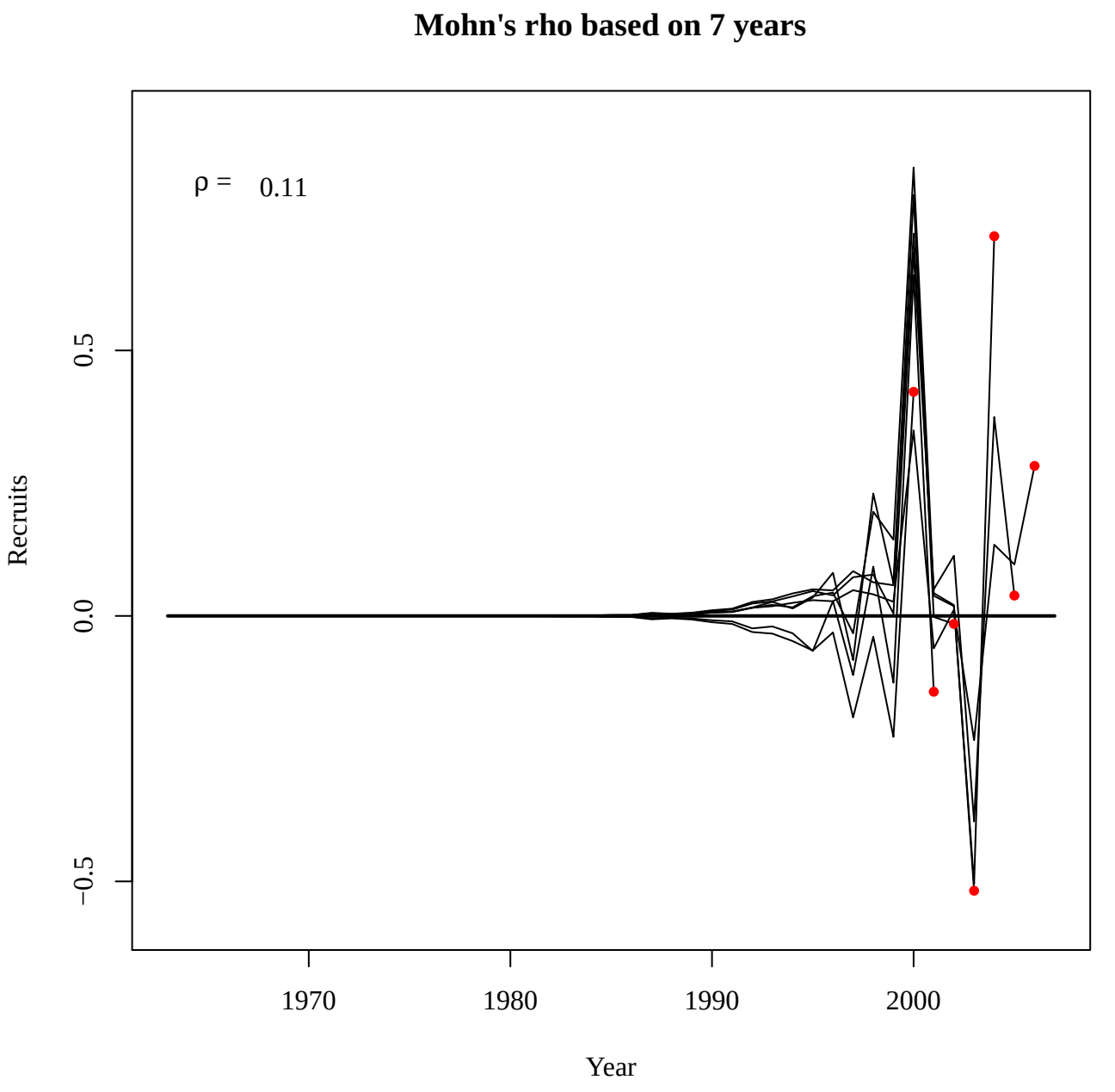

Mohn's rho for SSB by number of peels
Mohn's rho
0.2
0.1
0.0
−0.1
1
2
3
4
5
6
7
Number of peels

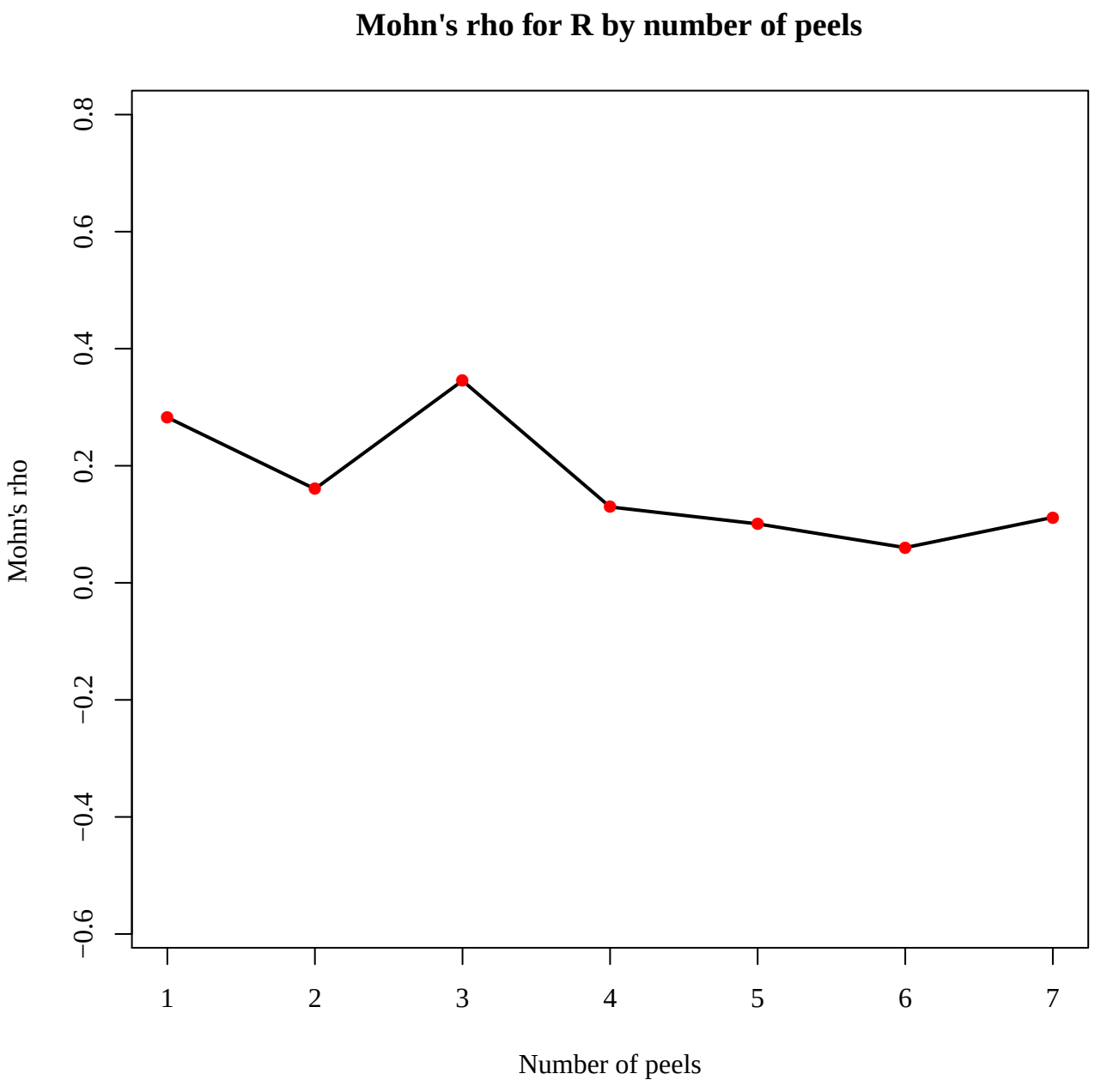

Average F
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
1970
1980
1990
2000
Year

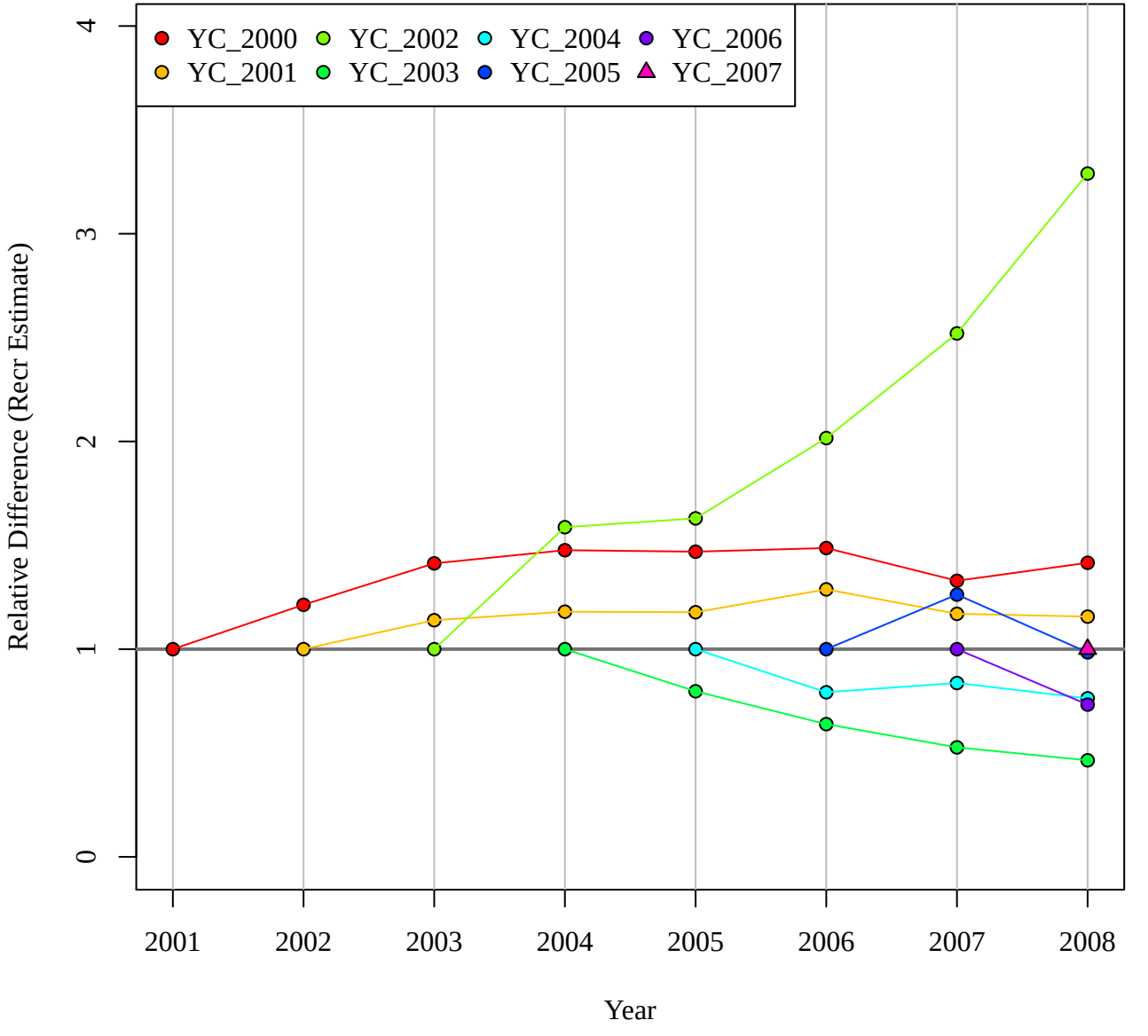

Mohn's rho based on 7 years
ρ = −0.07
0.10
0.05
0.00
−0.05
−0.10
−0.15
−0.20
Average F
1970
1980
1990
2000
Year


Mohn's rho for F by number of peels
Mohn's rho
0.10
0.05
0.00
−0.05
−0.10
−0.15
−0.20
1
2
3
4
5
6
7
Number of peels


Recruits
0e+00
1e+05
2e+05
3e+05
4e+05
5e+05
1970
1980
1990
2000
Year


Mohn's rho based on 7 years
ρ = 0.11
Recruits
0.5
0.0
−0.5
1970
1980
1990
2000
Year


Mohn's rho for R by number of peels
Mohn's rho
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
−0.6
1
2
3
4
5
6
7
Number of peels


YC_2000
YC_2001
YC_2002
YC_2003
YC_2004
YC_2005
YC_2006
YC_2007
Relative Difference (Recr Estimate)
0
1
2
3
4
2001
2002
2003
2004
2005
2006
2007
2008
Year