APPENDIX 5

Full report of the 2008 assessment final model ASAP F08_T2007_T2 run.

```
Age Structured Assessment Program (ASAP) Version 2.0
Start time for run: Tue May 13 11:50:16 2008

obj_fun        = 4313

Component              Lambda         obj_fun
__Catch_Fleet_1          10           2098.46
__Catch_Fleet_2          10           1408.82
Catch_Fleet_Total        20           3507.28
Discard_Fleet_Total       0           0
__Index_Fit_1             1           64.0763
__Index_Fit_2             1           44.2648
__Index_Fit_3             1           30.9745
__Index_Fit_4             1           27.8193
__Index_Fit_5             1           9.71092
__Index_Fit_6             1           18.0658
__Index_Fit_7             1           3.70982
__Index_Fit_8             1           -2.52673
__Index_Fit_9             1           -47.8742
__Index_Fit_10            1           -36.6491
__Index_Fit_11            1           11.1087
__Index_Fit_12            1           -6.15912
__Index_Fit_13            1           -37.2882
__Index_Fit_14            1           27.5961
__Index_Fit_15            1           -14.232
__Index_Fit_16            1           13.7773
__Index_Fit_17            1           -21.2778
__Index_Fit_18            1           -6.5077
__Index_Fit_19            1           -33.2446
__Index_Fit_20            1           -47.0116
__Index_Fit_21            1           16.1494
__Index_Fit_22            1           1.6832
__Index_Fit_23            1           -37.15
__Index_Fit_24            1           -52.7859
__Index_Fit_25            1           10.3506
__Index_Fit_26            1           -13.1098
__Index_Fit_27            1           0.801612
__Index_Fit_28            1           12.5251
__Index_Fit_29            1           43.4257
__Index_Fit_30            1           31.987
__Index_Fit_31            1           -3.62967
__Index_Fit_32            1           -10.7252
__Index_Fit_33            1           -22.4509
__Index_Fit_34            1           21.096
__Index_Fit_35            1           79.0436
__Index_Fit_36            1           19.1408
__Index_Fit_37            1           -2.44679
__Index_Fit_38            1           -5.73109
__Index_Fit_39            1           -32.9443
Index_Fit_Total          39           53.5617
Catch_Age_Comps        see_below      666.288
Discard_Age_Comps      see_below      0
Survey_Age_Comps       see_below      0
__Sel_Param_1             1           0.866845
__Sel_Param_2             1           3.66947
__Sel_Param_3             1           1.15382
__Sel_Param_4             1           2.65425
__Sel_Param_5             1           0.926282
__Sel_Param_6             1           4.2666
__Sel_Param_7             1           1.66344
__Sel_Param_8             1           3.69603
__Sel_Param_9             1           1.25195
__Sel_Param_10            1           3.36641
__Sel_Param_11            1           1.34415
__Sel_Param_12            1           0.173468
Sel_Params_Total         12           25.0327
Index_Sel_Params_Total    0           0
q_year1_Total             0           0
q_devs_Total         390000           0
__Fmult_year1_fleet_1     1           0.608193
__Fmult_year1_fleet_2     1           0.783259
Fmult_year1_fleet_Total   2           1.39145
Fmult_devs_fleet_Total    0           0
N_year_1                  1           58.6859
Recruit_devs              0           0
```

```
SRR_steepness                    0.05          0.0204231
SRR_unexpl_stock                 0.05          0.745703
Fmult_Max_penalty        1000          0
F_penalty                        0            0

 Input and Estimated effective sample sizes for fleet 1
1982  173  26.6801
1983  173  30.217
1984  173  90.0055
1985  173  302.546
1986  173  99.2317
1987  173  142.346
1988  173  435.377
1989  173  159.708
1990  173  130.282
1991  173  19.4867
1992  173  190.144
1993  173  103.484
1994  173  122.286
1995  173  140.589
1996  173  33.5065
1997  173  131.041
1998  173  291.569
1999  173  63.2269
2000  173  183.738
2001  173  154.811
2002  173  96.6285
2003  173  545.974
2004  173  245.475
2005  173  195.693
2006  173  154.771
2007  173  113.851
 Total  4498  4202.67
 Input and Estimated effective sample sizes for fleet 2
1982  101  507.719
1983  101  57.6236
1984  101  57.7075
1985  101  36.809
1986  101  14.8722
1987  101  22.6396
1988  101  166.708
1989  101  96.0275
1990  101  28.1179
1991  101  565.73
1992  101  13.3874
1993  101  61.784
1994  101  16.7393
1995  101  16.4124
1996  101  4.6383
1997  101  39.9822
1998  101  39.6751
1999  101  43.9303
2000  101  17.919
2001  101  130.124
2002  101  64.1021
2003  101  402.233
2004  101  85.0967
2005  101  64.3133
2006  101  157.817
2007  101  126.039
 Total  2626  2838.15

 Input and Estimated effective Discard sample sizes for fleet 1
1982  0  1e+15
1983  0  1e+15
1984  0  1e+15
1985  0  1e+15
1986  0  1e+15
1987  0  1e+15
1988  0  1e+15
1989  0  1e+15
1990  0  1e+15
1991  0  1e+15
1992  0  1e+15
1993  0  1e+15
1994  0  1e+15
1995  0  1e+15
1996  0  1e+15
1997  0  1e+15
1998  0  1e+15
1999  0  1e+15
```

```
2000  0  1e+15
2001  0  1e+15
2002  0  1e+15
2003  0  1e+15
2004  0  1e+15
2005  0  1e+15
2006  0  1e+15
2007  0  1e+15
 Total  0  2.6e+16
 Input and Estimated effective Discard sample sizes for fleet 2
1982  0  1e+15
1983  0  1e+15
1984  0  1e+15
1985  0  1e+15
1986  0  1e+15
1987  0  1e+15
1988  0  1e+15
1989  0  1e+15
1990  0  1e+15
1991  0  1e+15
1992  0  1e+15
1993  0  1e+15
1994  0  1e+15
1995  0  1e+15
1996  0  1e+15
1997  0  1e+15
1998  0  1e+15
1999  0  1e+15
2000  0  1e+15
2001  0  1e+15
2002  0  1e+15
2003  0  1e+15
2004  0  1e+15
2005  0  1e+15
2006  0  1e+15
2007  0  1e+15
 Total  0  2.6e+16

Observed and predicted total fleet catch by year and standardized residual
 fleet 1 total catches
1982  18667  18828.6  -0.0863912
1983  26089  25464.7  0.242808
1984  25641  25371  0.106119
1985  20339  20655.7  -0.154916
1986  20289  20699.5  -0.20081
1987  17790  17787.5  0.00141991
1988  21320  20904.8  0.197175
1989  9561  9375.39  0.196527
1990  6528  6258.7  0.422331
1991  9835  9638.19  0.202643
1992  10771  10813.3  -0.0392901
1993  9720  10033  -0.317771
1994  10819  10979.1  -0.147287
1995  9436  8756.92  0.748737
1996  10314  10043.2  0.266711
1997  9376  9636.12  -0.274335
1998  10735  10947.8  -0.196812
1999  8616  8651.32  -0.0410168
2000  12555  12737.4  -0.144596
2001  10249  10378.2  -0.125586
2002  10205  10383.9  -0.17419
2003  11729  12016.2  -0.242518
2004  13060  13342.9  -0.214802
2005  12549  12585.2  -0.0288801
2006  11254  11204.9  0.0438227
2007  8934  8919.28  0.0165293
 fleet 2 total catches
1982  296  296.889  -0.0300794
1983  376  376.18  -0.00480431
1984  415  414.984  0.000388468
1985  92  92.0122  -0.00132393
1986  578  578.088  -0.00152913
1987  522  521.855  0.00279191
1988  341  340.881  0.0035083
1989  754  751.981  0.0268817
1990  1448  1446.74  0.00870732
1991  1481  1481.99  -0.00672032
1992  1034  1035.91  -0.0185398
1993  1756  1757.47  -0.00840307
1994  1593  1586.56  0.0405876
1995  1060  1058.27  0.0164158
```

```
1996  1144  1147.56  -0.0311187
1997  881  883.006  -0.022806
1998  1123  1122.81  0.00171425
1999  2259  2251.84  0.0318083
2000  1678  1675.4  0.015565
2001  1742  1739.51  0.0143322
2002  1226  1226.57  -0.00468948
2003  1410  1412.3  -0.0163075
2004  1278  1279.45  -0.0113804
2005  1229  1227.75  0.0101849
2006  1083  1081.79  0.0111654
2007  1434  1434.04  -0.000280138
```
Observed and predicted total fleet Discards by year and standardized residual
```
 fleet 1 total Discards
1982  0  0  0
1983  0  0  0
1984  0  0  0
1985  0  0  0
1986  0  0  0
1987  0  0  0
1988  0  0  0
1989  0  0  0
1990  0  0  0
1991  0  0  0
1992  0  0  0
1993  0  0  0
1994  0  0  0
1995  0  0  0
1996  0  0  0
1997  0  0  0
1998  0  0  0
1999  0  0  0
2000  0  0  0
2001  0  0  0
2002  0  0  0
2003  0  0  0
2004  0  0  0
2005  0  0  0
2006  0  0  0
2007  0  0  0
 fleet 2 total Discards
1982  0  0  0
1983  0  0  0
1984  0  0  0
1985  0  0  0
1986  0  0  0
1987  0  0  0
1988  0  0  0
1989  0  0  0
1990  0  0  0
1991  0  0  0
1992  0  0  0
1993  0  0  0
1994  0  0  0
1995  0  0  0
1996  0  0  0
1997  0  0  0
1998  0  0  0
1999  0  0  0
2000  0  0  0
2001  0  0  0
2002  0  0  0
2003  0  0  0
2004  0  0  0
2005  0  0  0
2006  0  0  0
2007  0  0  0

Index data
index number 1
units = 2
month = 1
starting and ending ages for selectivity = 2  2
selectivity choice = -1
 year, obs index, pred index, standardized residual
1992  7.15  2.84957  3.13375
1993  6.5  3.29769  2.31155
1994  3.76  3.43684  0.306125
1995  6.07  3.93633  1.47537
1996  22.17  4.76141  5.2398
1997  3.86  3.54155  0.293305
```

```
1998  1.68  3.57544  -2.57287
1999  2.11  3.92204  -2.11174
2000  0.7  3.09799  -5.06686
2001  3.07  3.80517  -0.731307
2002  2.77  3.59521  -0.888247
2003  8.17  4.08072  2.36475
2004  1.45  3.069  -2.55412
2005  2.96  4.74534  -1.60776
2006  2.64  2.32244  0.436574
2007  2.77  2.79312  -0.0283147
index number 2
units = 2
month = 1
starting and ending ages for selectivity = 3  3
selectivity choice = -1
 year, obs index, pred index, standardized residual
1992  4.74  3.45418  1.07798
1993  6.7  3.05469  2.67553
1994  7.2  3.69645  2.27112
1995  4.59  4.16197  0.333466
1996  8.33  7.64029  0.294414
1997  4.8  9.49679  -2.32435
1998  3.25  7.45934  -2.83012
1999  4.8  7.54208  -1.53931
2000  6.52  8.0889  -0.734493
2001  5.33  6.49764  -0.674779
2002  10.74  8.11799  0.953443
2003  14.36  7.81897  2.07076
2004  8.68  8.87894  -0.0771934
2005  4.03  6.67258  -1.71767
2006  9.06  10.2968  -0.435894
2007  6.18  5.0958  0.657108
index number 3
units = 2
month = 1
starting and ending ages for selectivity = 4  4
selectivity choice = -1
 year, obs index, pred index, standardized residual
1992  0.33  0.461835  -1.14496
1993  0.31  0.501473  -1.63843
1994  0.82  0.555506  1.32656
1995  0.25  0.722483  -3.61504
1996  0.6  0.893556  -1.35672
1997  1.04  1.94817  -2.13813
1998  2.29  3.42231  -1.36859
1999  2.9  2.81456  0.101873
2000  4.96  3.09555  1.60594
2001  6.42  3.21006  2.36111
2002  5.58  2.88469  2.24748
2003  8.48  3.81161  2.724
2004  4.56  3.70443  0.707836
2005  3.07  4.12654  -1.0075
2006  4.29  3.07693  1.13215
2007  5.15  5.05648  0.06243
index number 4
units = 2
month = 1
starting and ending ages for selectivity = 5  5
selectivity choice = -1
 year, obs index, pred index, standardized residual
1992  0.04  0.0455408  -0.441913
1993  0.05  0.0830297  -1.72767
1994  0.26  0.114488  2.79402
1995  0.02  0.136193  -6.53474
1996  0.12  0.110174  0.291029
1997  0.43  0.178478  2.99536
1998  0.42  0.669946  -1.59062
1999  0.84  1.27852  -1.4309
2000  2.51  1.28225  2.28801
2001  2.44  1.28395  2.18715
2002  2.26  1.58984  1.19816
2003  2.67  1.53023  1.89624
2004  1.64  2.05439  -0.767412
2005  1.34  1.92911  -1.24128
2006  2.47  2.12562  0.511497
2007  1.54  1.74562  -0.426922
index number 5
units = 2
month = 1
starting and ending ages for selectivity = 6  8
selectivity choice = -1
```

```
 year, obs index, pred index, standardized residual
1992  0.04  0.0471203  -0.558063
1993  0.04  0.0188264   2.56717
1994  0.01  0.029193   -3.64948
1996  0.03  0.0327319  -0.296878
1997  0.15  0.0343817   5.01809
1998  0.12  0.0911681   0.936047
1999  0.41  0.360765    0.435794
2000  1.08  0.948949    0.440665
2001  1.34  1.08311     0.724995
2002  1.33  1.36496    -0.088385
2003  1.96  1.81001     0.271197
2004  1.44  2.0274     -1.16539
2005  1.49  2.42386    -1.65752
2006  2.6   2.50733     0.123636
2007  1.19  2.95807    -3.10187
index number 6
units = 2
month = 1
starting and ending ages for selectivity = 2   2
selectivity choice = -1
 year, obs index, pred index, standardized residual
1982  0.7   0.580534    0.485738
1983  0.32  0.695198   -2.01394
1984  0.17  0.766471   -3.90911
1985  0.55  0.436905    0.597534
1986  1.48  0.528792    2.6715
1987  0.47  0.578572   -0.539466
1988  0.6   0.442844    0.788342
1989  0.06  0.118849   -1.77419
1990  0.63  0.264453    2.25321
1991  0.79  0.339911    2.18908
1992  0.77  0.284686    2.58273
1993  0.73  0.329455    2.06514
1994  0.35  0.343358    0.0497359
1995  0.79  0.393259    1.81067
1996  1.08  0.475688    2.12835
1997  0.29  0.353818   -0.516292
1998  0.27  0.357204   -0.726496
1999  0.22  0.391831   -1.49825
2000  0.19  0.309505   -1.26657
2001  0.48  0.380155    0.605332
2002  0.34  0.359179   -0.14244
2003  0.54  0.407684    0.729591
2004  0.3   0.306608   -0.0565571
2005  0.26  0.474083   -1.55924
2006  0.04  0.232023   -4.56312
2007  0.24  0.279047   -0.391275
index number 7
units = 2
month = 1
starting and ending ages for selectivity = 3   3
selectivity choice = -1
 year, obs index, pred index, standardized residual
1982  1.43  0.734744    1.72849
1983  0.39  0.758975   -1.72827
1984  0.33  0.793682   -2.27796
1985  1.56  0.825328    1.65258
1986  0.43  0.495326   -0.367113
1987  0.43  0.53146    -0.549882
1988  0.81  0.659388    0.533992
1989  0.23  0.395088   -1.40434
1990  0.03  0.109479   -3.36023
1991  0.27  0.288689   -0.173721
1992  0.41  0.322568    0.622562
1993  0.5   0.285261    1.45671
1994  0.53  0.345191    1.11298
1995  0.27  0.388664   -0.945594
1996  0.56  0.713486   -0.628744
1997  0.67  0.886855   -0.727842
1998  0.52  0.696588   -0.758891
1999  0.74  0.704315    0.128292
2000  1.03  0.755379    0.804911
2001  0.89  0.60678     0.994293
2002  0.89  0.758096    0.416381
2003  1.29  0.730172    1.47726
2004  1.45  0.829157    1.45076
2005  0.65  0.623117    0.109637
2006  1.04  0.961561    0.20355
2007  0.52  0.47587     0.230197
index number 8
```

```
units = 2
month = 1
starting and ending ages for selectivity = 4   4
selectivity choice = -1
 year, obs index, pred index, standardized residual
1982  0.12  0.0974708  0.539746
1983  0.19  0.165977  0.350876
1984  0.09  0.126363  -0.880844
1985  0.21  0.116343  1.53293
1986  0.2  0.131329  1.09177
1987  0.02  0.064429  -3.03653
1988  0.07  0.0907741  -0.674566
1989  0.02  0.0640305  -3.02042
1990  0.06  0.0610398  -0.0445978
1992  0.01  0.0469204  -4.0126
1993  0.04  0.0509474  -0.627937
1994  0.04  0.0564369  -0.893554
1995  0.02  0.073401  -3.37494
1996  0.12  0.0907812  0.724301
1997  0.09  0.197925  -2.04562
1998  0.32  0.347691  -0.215428
1999  0.48  0.285946  1.34452
2000  0.63  0.314494  1.80337
2001  1.02  0.326128  2.95979
2002  0.74  0.293072  2.40422
2003  0.59  0.387242  1.09298
2004  0.85  0.376354  2.11473
2005  0.58  0.419238  0.842535
2006  0.24  0.312602  -0.686019
2007  1.46  0.513715  2.71126
index number 9
units = 2
month = 1
starting and ending ages for selectivity = 5   5
selectivity choice = -1
 year, obs index, pred index, standardized residual
1982  0.02  0.0262072  -0.70162
1983  0.03  0.0294298  0.0498095
1984  0.05  0.0364831  0.818092
1985  0.04  0.0243334  1.29013
1986  0.02  0.0243703  -0.512997
1987  0.01  0.0223625  -2.08902
1988  0.02  0.0145594  0.824114
1989  0.01  0.0113938  -0.338687
1991  0.02  0.0187979  0.160902
1994  0.01  0.0135824  -0.794776
1997  0.01  0.021174  -1.94726
1998  0.06  0.0794799  -0.729804
1999  0.13  0.151679  -0.400332
2000  0.12  0.152121  -0.615657
2001  0.2  0.152322  0.706855
2002  0.31  0.188613  1.28974
2003  0.29  0.181541  1.21583
2004  0.27  0.243725  0.265754
2005  0.15  0.228863  -1.09665
2006  0.25  0.252175  -0.0224881
2007  0.57  0.207094  2.62805
index number 10
units = 2
month = 1
starting and ending ages for selectivity = 6   8
selectivity choice = -1
 year, obs index, pred index, standardized residual
1983  0.02  0.0158499  0.603673
1984  0.02  0.0115939  1.41532
1985  0.02  0.0113393  1.47294
1986  0.01  0.00883552  0.32136
1992  0.01  0.00668783  1.04424
1995  0.01  0.00624098  1.22374
1998  0.02  0.0129396  1.13028
1999  0.03  0.0512036  -1.38769
2000  0.17  0.134685  0.604433
2001  0.1  0.153727  -1.11617
2002  0.19  0.19373  -0.0504622
2003  0.2  0.256896  -0.649842
2004  0.16  0.287751  -1.52347
2005  0.17  0.34402  -1.82971
2006  0.2  0.355867  -1.49574
2007  0.46  0.419842  0.237114
index number 11
units = 2
```

```
month = 1
starting and ending ages for selectivity = 3  3
selectivity choice = -1
 year, obs index, pred index, standardized residual
1983  1.52  1.36419  0.195029
1984  1.46  1.42658  0.0417643
1985  1.39  1.48346  -0.117351
1986  0.8  0.890308  -0.192882
1987  0.83  0.955256  -0.253472
1988  0.58  1.1852  -1.28876
1989  0.62  0.710137  -0.244789
1990  0.21  0.19678  0.117256
1991  0.38  0.518894  -0.561805
1992  0.84  0.579789  0.668583
1993  1.04  0.512733  1.27539
1994  0.8  0.620453  0.458352
1995  0.67  0.698591  -0.0753595
1996  1.16  1.28243  -0.180948
1997  1.24  1.59405  -0.452947
1998  1.29  1.25206  0.0538363
1999  2.13  1.26595  0.938304
2000  1.73  1.35773  0.436971
2001  1.2  1.09064  0.17233
2002  1.36  1.36261  -0.00346277
2003  1.17  1.31242  -0.207158
2004  1.31  1.49034  -0.232597
2005  1.49  1.12  0.51477
2006  1.14  1.72833  -0.750433
2007  0.72  0.855337  -0.310623
index number 12
units = 2
month = 1
starting and ending ages for selectivity = 4  4
selectivity choice = -1
 year, obs index, pred index, standardized residual
1983  0.4  0.402302  -0.0103492
1984  0.34  0.306284  0.188332
1985  0.43  0.281997  0.760829
1986  0.46  0.318322  0.663938
1987  0.11  0.156166  -0.631975
1988  0.2  0.220022  -0.172064
1989  0.18  0.1552  0.267338
1990  0.05  0.147951  -1.95642
1991  0.03  0.0602119  -1.25637
1992  0.09  0.113728  -0.421987
1993  0.25  0.123489  1.27195
1994  0.03  0.136794  -2.73624
1995  0.09  0.177913  -1.22898
1996  0.28  0.22004  0.434583
1997  0.57  0.47974  0.310888
1998  1.14  0.84275  0.544826
1999  1.63  0.693089  1.54221
2000  1.49  0.762285  1.20865
2001  1.22  0.790484  0.782598
2002  0.93  0.710361  0.485853
2003  0.86  0.938614  -0.157746
2004  1.03  0.912223  0.218985
2005  1.37  1.01617  0.538801
2006  0.54  0.757698  -0.610835
2007  1.22  1.24517  -0.0368212
index number 13
units = 2
month = 1
starting and ending ages for selectivity = 5  5
selectivity choice = -1
 year, obs index, pred index, standardized residual
1983  0.03  0.0583056  -1.19835
1984  0.12  0.0722795  0.914228
1985  0.07  0.0482088  0.672579
1986  0.05  0.0482819  0.0630587
1987  0.11  0.044304  1.64001
1988  0.03  0.0288448  0.070814
1989  0.03  0.022573  0.512958
1991  0.04  0.0372419  0.128843
1993  0.03  0.0195152  0.775459
1994  0.01  0.0269091  -1.78513
1995  0.01  0.0320107  -2.09821
1996  0.02  0.0258951  -0.465853
1997  0.04  0.0419494  -0.0858115
1998  0.29  0.157464  1.1013
1999  0.33  0.300502  0.168867
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2000  0.31  0.301378  0.050867
2001  0.4  0.301777  0.508148
2002  0.37  0.373675  -0.0178218
2003  0.35  0.359664  -0.0491171
2004  0.25  0.482861  -1.18711
2005  0.66  0.453417  0.677041
2006  0.47  0.499603  -0.110154
2007  0.35  0.410289  -0.286609
index number 14
units = 2
month = 1
starting and ending ages for selectivity = 3   3
selectivity choice = -1
 year, obs index, pred index, standardized residual
1982  1.584  0.785839  1.26409
1983  0.599  0.811756  -0.548116
1984  0.078  0.848876  -4.30505
1985  1.26  0.882723  0.641744
1986  0.522  0.529772  -0.026653
1987  0.64  0.568419  0.213897
1988  1.005  0.705243  0.638759
1989  0.363  0.422563  -0.273997
1990  0.021  0.117093  -3.09902
1991  0.05  0.308765  -3.28316
1992  0.342  0.345  -0.0157488
1993  0.492  0.305099  0.861736
1994  1.217  0.369197  2.1511
1995  1.302  0.415692  2.05894
1996  0.686  0.763103  -0.192088
1997  1.279  0.948528  0.539072
1998  1.212  0.74503  0.877532
1999  0.878  0.753294  0.276262
2000  1.659  0.80791  1.29757
2001  1.026  0.648977  0.825996
2002  1.511  0.810815  1.12258
2003  1.44  0.78095  1.10347
2004  0.283  0.886819  -2.05981
2005  0.351  0.66645  -1.15629
2006  2.44  1.02843  1.55806
2007  0.392  0.508963  -0.470888
index number 15
units = 2
month = 1
starting and ending ages for selectivity = 4   4
selectivity choice = -1
 year, obs index, pred index, standardized residual
1982  0.142  0.125939  0.216453
1983  0.45  0.214454  1.33658
1984  0.067  0.16327  -1.6063
1985  0.036  0.150323  -2.57752
1986  0.185  0.169687  0.15581
1987  0.013  0.083247  -3.34864
1988  0.123  0.117287  0.0857731
1989  0.102  0.082732  0.377567
1990  0.081  0.0788679  0.0481053
1991  0.012  0.032097  -1.77427
1992  0.09  0.0606245  0.712535
1993  0.065  0.0658278  -0.022822
1994  0.048  0.0729207  -0.754123
1995  0.053  0.0948395  -1.04938
1996  0.114  0.117296  -0.0514
1997  0.181  0.255734  -0.623323
1998  0.659  0.449243  0.690985
1999  1.112  0.369463  1.98708
2000  1.205  0.406349  1.96032
2001  0.73  0.421381  0.990972
2002  0.397  0.37867  0.0852473
2003  0.624  0.500345  0.398282
2004  0.323  0.486276  -0.737809
2005  1.029  0.541686  1.15715
2006  0.975  0.403904  1.58925
2007  1.008  0.663757  0.753466
index number 16
units = 2
month = 1
starting and ending ages for selectivity = 4   4
selectivity choice = -1
 year, obs index, pred index, standardized residual
1982  0.405  0.476298  -0.29243
1983  1.662  0.811057  1.29382
1984  0.625  0.617481  0.0218269
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1985  0.267  0.568517  -1.36297
1986  1.895  0.641751  1.95266
1987  0.679  0.314837  1.38602
1988  0.663  0.443574  0.724799
1989  0.429  0.312889  0.569161
1990  0.317  0.298275  0.109799
1992  0.288  0.22928  0.411204
1993  0.186  0.248958  -0.525756
1994  0.478  0.275783  0.991854
1995  0.076  0.358679  -2.7983
1996  0.506  0.443609  0.237314
1997  1.282  0.967176  0.508187
1998  1.508  1.69902  -0.215083
1999  0.59  1.3973  -1.55483
2000  0.94  1.5368  -0.8865
2001  2.303  1.59365  0.663983
2002  1.083  1.43212  -0.503898
2003  1.302  1.89228  -0.674255
2004  1.254  1.83908  -0.690563
2005  1.455  2.04864  -0.617061
2006  2.049  1.52755  0.52963
2007  3.745  2.5103  0.721385
index number 17
units = 2
month = 1
starting and ending ages for selectivity = 5   5
selectivity choice = -1
 year, obs index, pred index, standardized residual
1982  0.012  0.0456839  -2.41084
1983  0.02  0.0513015  -1.69877
1984  0.154  0.0635968  1.59489
1985  0.127  0.0424176  1.97763
1986  0.04  0.0424819  -0.108562
1987  0.214  0.0389819  3.07094
1988  0.011  0.0253798  -1.50773
1989  0.006  0.0198614  -2.15868
1990  0.016  0.0230425  -0.657791
1991  0.011  0.0327682  -1.96851
1992  0.006  0.00941804  -0.813087
1994  0.03  0.0236766  0.426878
1997  0.114  0.0369101  2.0337
1998  0.351  0.138548  1.67637
1999  0.262  0.264404  -0.0164685
2000  0.379  0.265175  0.644075
2001  0.494  0.265526  1.11958
2002  0.307  0.328786  -0.12364
2003  0.178  0.316458  -1.03768
2004  0.256  0.424857  -0.913549
2005  0.136  0.398949  -1.94077
2006  1.35  0.439588  2.02344
2007  0.559  0.361002  0.788557
index number 18
units = 2
month = 1
starting and ending ages for selectivity = 3   3
selectivity choice = -1
 year, obs index, pred index, standardized residual
1984  0.271  0.370923  -0.56604
1985  0.325  0.385713  -0.308864
1986  0.1  0.231488  -1.51369
1987  0.086  0.248376  -1.91266
1988  0.223  0.308162  -0.583311
1989  0.049  0.184642  -2.39237
1990  0.022  0.0511647  -1.52207
1991  0.189  0.134917  0.607894
1992  0.188  0.150751  0.398215
1993  0.151  0.133315  0.224633
1994  0.314  0.161324  1.20102
1995  0.051  0.18164  -2.29066
1996  0.266  0.333444  -0.407528
1997  0.507  0.414467  0.363412
1998  0.594  0.325547  1.08451
1999  0.593  0.329158  1.06157
2000  0.726  0.353023  1.30027
2001  0.34  0.283576  0.327252
2002  1.264  0.354292  2.29375
2003  1.016  0.341243  1.96756
2004  0.818  0.387503  1.34738
2005  0.264  0.291211  -0.176909
2006  0.36  0.449381  -0.399931
2007  0.21  0.222396  -0.103425
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index number 19
units = 2
month = 1
starting and ending ages for selectivity = 4   4
selectivity choice = -1
 year, obs index, pred index, standardized residual
1984  0.044  0.0720104  -0.888384
1985  0.04  0.0663002  -0.911273
1986  0.082  0.0748407  0.164754
1987  0.014  0.0367161  -1.73875
1988  0.035  0.0517294  -0.704543
1989  0.024  0.036489  -0.755541
1990  0.013  0.0347847  -1.77494
1991  0.029  0.0141564  1.29326
1992  0.021  0.0267385  -0.435664
1993  0.015  0.0290334  -1.19095
1994  0.025  0.0321617  -0.454273
1995  0.02  0.041829  -1.33064
1996  0.086  0.0517335  0.916557
1997  0.057  0.112792  -1.23079
1998  0.503  0.198139  1.68007
1999  0.385  0.162952  1.55053
2000  0.524  0.179221  1.9348
2001  0.365  0.18585  1.2172
2002  0.465  0.167013  1.84661
2003  0.395  0.220677  1.0499
2004  0.41  0.214472  1.16855
2005  0.15  0.238911  -0.839395
2006  0.068  0.178142  -1.73679
2007  0.56  0.292751  1.1697
index number 20
units = 2
month = 1
starting and ending ages for selectivity = 5   5
selectivity choice = -1
 year, obs index, pred index, standardized residual
1985  0.058  0.0193235  1.98214
1986  0.008  0.0193527  -1.5931
1987  0.004  0.0177583  -2.68805
1988  0.009  0.0115618  -0.451718
1989  0.016  0.00904791  1.02803
1990  0.006  0.0104971  -1.0087
1991  0.028  0.0149276  1.13431
1992  0.004  0.00429041  -0.126395
1993  0.018  0.00782226  1.50294
1994  0.018  0.0107859  0.923564
1995  0.005  0.0128308  -1.69953
1996  0.023  0.0103795  1.43489
1997  0.036  0.0168145  1.37288
1998  0.116  0.0631159  1.09757
1999  0.139  0.12045  0.25832
2000  0.074  0.120801  -0.883801
2001  0.12  0.120961  -0.0143838
2002  0.233  0.149779  0.79687
2003  0.232  0.144163  0.858032
2004  0.194  0.193545  0.00423858
2005  0.033  0.181742  -3.07672
2006  0.065  0.200255  -2.02918
2007  0.316  0.164455  1.17779
index number 21
units = 2
month = 1
starting and ending ages for selectivity = 3   3
selectivity choice = -1
 year, obs index, pred index, standardized residual
1985  0.571  0.943953  -0.906537
1986  0.339  0.566519  -0.926058
1987  1.17  0.607847  1.18092
1988  1.067  0.754162  0.625773
1989  0.884  0.451874  1.21017
1990  0.029  0.125215  -2.63787
1991  0.674  0.330182  1.28687
1992  0.826  0.36893  1.4535
1993  0.57  0.326262  1.00617
1994  0.827  0.394806  1.33344
1995  0.3  0.444527  -0.70914
1996  0.384  0.816035  -1.35942
1997  0.887  1.01432  -0.24189
1998  0.681  0.796709  -0.282999
1999  0.269  0.805546  -1.97797
2000  0.679  0.86395  -0.434424
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2001  0.395  0.693993  -1.01634
2002  2.689  0.867057  2.04111
2003  3.087  0.83512  2.35771
2004  1.459  0.948332  0.776901
2005  0.385  0.712678  -1.1105
2006  1.093  1.09977  -0.0111293
2007  0.217  0.544267  -1.65829
index number 22
units = 2
month = 1
starting and ending ages for selectivity = 4  4
selectivity choice = -1
 year, obs index, pred index, standardized residual
1985  0.331  0.375915  -0.229471
1986  0.528  0.424339  0.394155
1987  0.298  0.208177  0.646886
1988  0.223  0.2933  -0.494173
1989  0.481  0.206889  1.52149
1990  0.095  0.197226  -1.31732
1991  0.11  0.0802653  0.568324
1992  0.34  0.151604  1.45654
1993  0.366  0.164616  1.44093
1994  0.152  0.182353  -0.328336
1995  0.085  0.237166  -1.85047
1996  0.117  0.293323  -1.65749
1997  1.188  0.639517  1.11686
1998  1.373  1.12343  0.361786
1999  1.054  0.923921  0.237543
2000  1.484  1.01616  0.682957
2001  0.871  1.05375  -0.343492
2002  1.137  0.946945  0.329853
2003  1.93  1.25122  0.781592
2004  1.319  1.21604  0.146574
2005  0.755  1.3546  -1.05416
2006  0.744  1.01005  -0.551316
2007  0.592  1.65987  -1.85926
index number 23
units = 2
month = 1
starting and ending ages for selectivity = 5  5
selectivity choice = -1
 year, obs index, pred index, standardized residual
1985  0.072  0.055919  0.455827
1986  0.075  0.0560038  0.526713
1987  0.072  0.0513897  0.608152
1988  0.033  0.0334581  -0.0248605
1989  0.037  0.0261832  0.623609
1990  0.015  0.0303769  -1.27253
1991  0.042  0.0431981  -0.0507254
1992  0.036  0.0124158  1.9198
1993  0.046  0.0226364  1.27875
1994  0.039  0.0312128  0.401674
1995  0.024  0.0371303  -0.786958
1996  0.012  0.0300366  -1.65462
1997  0.042  0.0486585  -0.265379
1998  0.373  0.182647  1.28765
1999  0.321  0.348562  -0.148555
2000  0.346  0.349579  -0.0185568
2001  0.341  0.350042  -0.0471946
2002  0.436  0.433438  0.0106289
2003  0.479  0.417186  0.249171
2004  0.407  0.560087  -0.575783
2005  0.44  0.525933  -0.321724
2006  0.355  0.579507  -0.883766
2007  0.23  0.475908  -1.31132
index number 24
units = 2
month = 1
starting and ending ages for selectivity = 6  8
selectivity choice = -1
 year, obs index, pred index, standardized residual
1985  0.025  0.0119964  1.32417
1986  0.009  0.00934748  -0.0683157
1987  0.007  0.00724286  -0.0615059
1988  0.003  0.0085802  -1.89508
1989  0.003  0.003491  -0.273349
1990  0.001  0.00396183  -2.48273
1991  0.012  0.00683811  1.01422
1992  0.022  0.00707534  2.04581
1993  0.025  0.00282687  3.93085
1994  0.007  0.00438346  0.844111
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1995   0.009   0.0066026   0.558619
1996   0.005   0.00491484   0.030979
1997   0.005   0.00516257   -0.0577029
1998   0.04   0.0136893   1.9337
1999   0.075   0.0541705   0.586735
2000   0.127   0.142489   -0.20753
2001   0.191   0.162635   0.289926
2002   0.134   0.204955   -0.766351
2003   0.183   0.271781   -0.713259
2004   0.203   0.304424   -0.73076
2005   0.119   0.363953   -2.01601
2006   0.151   0.376487   -1.64758
2007   0.179   0.444169   -1.63895
index number 25
units = 2
month = 1
starting and ending ages for selectivity = 4   4
selectivity choice = -1
 year, obs index, pred index, standardized residual
1982   1.74   0.320978   3.0482
1983   0.52   0.546572   -0.0898761
1984   0.42   0.416121   0.0167333
1985   0.49   0.383124   0.443717
1986   0.28   0.432476   -0.783999
1987   0.51   0.212169   1.58162
1988   0.37   0.298925   0.384681
1989   0.24   0.210856   0.233469
1990   0.07   0.201008   -1.9023
1991   0.12   0.0818045   0.690984
1992   0.08   0.154512   -1.18707
1993   0.41   0.167773   1.6114
1994   0.22   0.18585   0.304205
1995   0.03   0.241714   -3.76287
1996   0.2   0.298948   -0.724876
1997   1.03   0.65178   0.82524
1998   0.96   1.14497   -0.317757
1999   0.36   0.941639   -1.73399
2000   1.91   1.03565   1.10381
2001   1.24   1.07396   0.259252
2002   0.63   0.965104   -0.769172
2003   1.38   1.27521   0.142415
2004   2.08   1.23936   0.933749
2005   1.3   1.38058   -0.108451
2006   1.38   1.02942   0.528555
2007   1.13   1.6917   -0.727691
index number 26
units = 2
month = 1
starting and ending ages for selectivity = 5   5
selectivity choice = -1
 year, obs index, pred index, standardized residual
1982   0.2   0.0576979   2.24178
1983   0.07   0.0647929   0.139401
1984   0.11   0.0803215   0.567061
1985   0.1   0.0535726   1.12555
1986   0.02   0.0536538   -1.77962
1987   0.13   0.0492334   1.75102
1988   0.02   0.0320542   -0.850647
1992   0.01   0.0118948   -0.312916
1993   0.11   0.0216865   2.92831
1994   0.07   0.0299031   1.53384
1997   0.01   0.0466168   -2.77608
1998   0.03   0.174983   -3.18026
1999   0.09   0.333937   -2.36449
2000   0.35   0.33491   0.0794755
2001   0.45   0.335354   0.530305
2002   0.3   0.415251   -0.58628
2003   0.4   0.399681   0.00143956
2004   0.49   0.536586   -0.163786
2005   0.78   0.503865   0.788052
2006   0.69   0.555191   0.392019
2007   0.44   0.455939   -0.0641716
index number 27
units = 2
month = 1
starting and ending ages for selectivity = 2   2
selectivity choice = -1
 year, obs index, pred index, standardized residual
1990   0.17   0.19741   -0.269579
1991   0.07   0.253738   -2.32241
1992   0.15   0.212514   -0.628247
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1993  0.11  0.245933  -1.45097
1994  0.08  0.256311  -2.0998
1995  0.2  0.293561  -0.692082
1996  0.41  0.355094  0.259282
1997  0.17  0.26412  -0.794579
1998  0.07  0.266647  -2.4119
1999  0.26  0.292496  -0.212382
2000  0.63  0.231041  1.80902
2001  0.42  0.28378  0.707027
2002  0.81  0.268121  1.99381
2003  1.48  0.304329  2.85239
2004  0.54  0.228878  1.54799
2005  0.55  0.353895  0.795142
2006  0.24  0.173202  0.588232
2007  0.25  0.208304  0.329051
index number 28
units = 2
month = 1
starting and ending ages for selectivity = 3  8
selectivity choice = -1
 year, obs index, pred index, standardized residual
1990  0.1  0.100368  -0.00662966
1991  0.08  0.264663  -2.15763
1992  0.18  0.295723  -0.895318
1993  0.14  0.261521  -1.12688
1994  0.05  0.316464  -3.32758
1995  0.22  0.356318  -0.869586
1996  0.53  0.654108  -0.379423
1997  0.52  0.813048  -0.806044
1998  0.36  0.638616  -1.0337
1999  0.61  0.6457  -0.102569
2000  1.89  0.692515  1.8106
2001  0.55  0.556283  -0.0204832
2002  1.11  0.695005  0.844338
2003  2.25  0.669405  2.18623
2004  1.53  0.760153  1.26147
2005  1.9  0.57126  2.16724
2006  1.08  0.881537  0.366175
2007  1.39  0.436267  2.08977
index number 29
units = 2
month = 1
starting and ending ages for selectivity = 2  2
selectivity choice = -1
 year, obs index, pred index, standardized residual
1988  3.06  5.02211  -0.89346
1989  0.51  1.34782  -1.75259
1990  1.44  2.99905  -1.32306
1991  2.69  3.85479  -0.648811
1992  3  3.22851  -0.132381
1993  5.69  3.73621  0.758571
1994  1.07  3.89387  -2.32951
1995  2.93  4.45978  -0.757596
1996  5.1  5.39458  -0.101268
1997  8.25  4.01251  1.29987
1998  5.8  4.0509  0.647269
1999  6.12  4.44359  0.577261
2000  3.91  3.50997  0.194641
2001  3.32  4.31118  -0.471129
2002  9.11  4.0733  1.45158
2003  5.61  4.62337  0.348823
2004  6.27  3.47712  1.06323
2005  5.99  5.37638  0.194904
2006  5.74  2.63128  1.40662
2007  4.1  3.16455  0.467034
index number 30
units = 2
month = 1
starting and ending ages for selectivity = 3  3
selectivity choice = -1
 year, obs index, pred index, standardized residual
1988  1.03  1.27629  -0.386641
1989  0.18  0.764718  -2.60869
1990  0.11  0.211905  -1.1824
1991  0.27  0.558776  -1.31165
1992  0.57  0.624351  -0.164246
1993  0.2  0.552141  -1.83131
1994  0.08  0.668141  -3.82763
1995  0.28  0.752284  -1.78233
1996  2.7  1.381  1.20907
1997  5.25  1.71657  2.01601
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1998  2.67  1.34829  1.23214
1999  3.46  1.36325  1.67967
2000  1.82  1.46209  0.394892
2001  1.18  1.17446  0.00848167
2002  4.13  1.46734  1.86618
2003  2.55  1.4133   1.0643
2004  2.49  1.60489  0.792098
2005  1.24  1.20608  0.050013
2006  3.22  1.86116  0.988578
2007  2.49  0.921078  1.79345
index number 31
units = 2
month = 1
starting and ending ages for selectivity = 4   4
selectivity choice = -1
 year, obs index, pred index, standardized residual
1990  0.03  0.0802986  -1.77553
1991  0.02  0.0326792  -0.885476
1992  0.06  0.0617243  -0.0510951
1993  0.01  0.0670219  -3.43082
1995  0.05  0.0965599  -1.18688
1996  0.18  0.119424   0.73989
1997  1.02  0.260373   2.46242
1998  0.29  0.457392  -0.821731
1999  0.65  0.376166   0.986348
2000  0.45  0.413721   0.151587
2001  0.41  0.429025  -0.0817988
2002  1.28  0.385539   2.16401
2003  0.57  0.509421   0.20263
2004  0.57  0.495098   0.254064
2005  0.53  0.551513  -0.0717522
2006  0.48  0.411231   0.278858
2007  1.22  0.675798   1.06528
index number 32
units = 2
month = 1
starting and ending ages for selectivity = 5   8
selectivity choice = -1
 year, obs index, pred index, standardized residual
1992  0.02  0.0115223  0.994474
1993  0.01  0.0210074  -1.33863
1994  0.02  0.0289666  -0.667996
1995  0.16  0.0344582  2.76896
1996  0.05  0.0278751  1.0537
1997  0.18  0.0451569  2.49375
1998  0.04  0.169503  -2.60408
1999  0.18  0.323479  -1.0571
2000  0.22  0.324422  -0.700466
2001  0.15  0.324852  -1.39354
2002  0.81  0.402246  1.26231
2003  0.51  0.387164  0.496945
2004  0.43  0.519782  -0.341964
2005  0.32  0.488086  -0.761335
2006  0.4   0.537804  -0.533855
2007  0.53  0.44166   0.328822
index number 33
units = 2
month = 1
starting and ending ages for selectivity = 1   1
selectivity choice = -1
 year, obs index, pred index, standardized residual
1985  0.24   0.0917319  1.73444
1986  0.172  0.101269   0.955278
1987  0.075  0.0769689  -0.046731
1988  0.015  0.0209152  -0.599493
1990  0.032  0.0600539  -1.13524
1991  0.036  0.0506361  -0.615218
1992  0.013  0.0581052  -2.70022
1993  0.084  0.060694   0.58605
1994  0.132  0.068971   1.17061
1995  0.023  0.0807101  -2.26391
1996  0.069  0.0599258  0.254275
1997  0.033  0.0602847  -1.08667
1999  0.044  0.0523443  -0.313165
2000  0.012  0.0641977  -3.02438
2001  0.021  0.0605887  -1.91084
2002  0.442  0.0686721  3.35784
2004  0.255  0.0798565  2.09379
2005  0.067  0.0390885  0.971779
2006  0.098  0.0469753  1.32611
2007  0.13   0.0651553  1.24571
```

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index number 34
units = 2
month = 1
starting and ending ages for selectivity = 1  1
selectivity choice = -1
 year, obs index, pred index, standardized residual
1982  2.27  1.79398  0.424417
1983  5.01  1.99211  1.66315
1984  1.58  1.13925  0.589811
1985  1.26  1.37337  -0.155374
1986  1.26  1.51616  -0.333746
1987  0.39  1.15235  -1.9538
1988  0.54  0.313134  0.982735
1989  1.24  0.705756  1.01638
1990  2.54  0.899102  1.87286
1991  2.64  0.758103  2.25011
1992  0.89  0.869926  0.0411421
1993  0.5  0.908684  -1.07732
1994  2.41  1.0326  1.52845
1995  0.63  1.20836  -1.17454
1996  0.81  0.897184  -0.184354
1997  0.89  0.902557  -0.025267
1998  0.73  0.990054  -0.549517
1999  0.53  0.783677  -0.705339
2000  0.57  0.96114  -0.942239
2001  0.47  0.907108  -1.18578
2002  0.77  1.02813  -0.52137
2003  0.44  0.77322  -1.01673
2004  1.3  1.19558  0.151007
2005  0.35  0.585217  -0.927027
2006  0.8  0.703295  0.23234
index number 35
units = 2
month = 1
starting and ending ages for selectivity = 1  1
selectivity choice = -1
 year, obs index, pred index, standardized residual
1982  3.408  15.5629  -2.73891
1983  17.699  17.2817  0.0430296
1984  13.31  9.88303  0.536861
1985  12.843  11.9141  0.135395
1986  59.526  13.1527  2.72272
1987  7.584  9.99666  -0.498114
1988  1.763  2.71645  -0.779621
1989  2.855  6.12248  -1.37579
1990  4.733  7.79976  -0.900852
1991  7.337  6.57659  0.197316
1992  8.487  7.54666  0.211773
1993  4.145  7.88289  -1.1592
1994  22.311  8.9579  1.64567
1995  13.067  10.4826  0.397423
1996  6.493  7.78313  -0.326833
1997  7.997  7.82974  0.0381183
1998  14.983  8.58877  1.00351
1999  8.565  6.79844  0.416564
2000  9.874  8.33795  0.304931
2001  13.543  7.86922  0.979077
2002  5.406  8.91909  -0.902926
2003  8.18  6.70773  0.357849
2004  6.993  10.3717  -0.710842
2005  2.198  5.07679  -1.50967
2006  9.658  6.10113  0.828318
2007  15.438  8.46232  1.08421
index number 36
units = 2
month = 1
starting and ending ages for selectivity = 1  1
selectivity choice = -1
 year, obs index, pred index, standardized residual
1988  0.17  0.426863  -1.66031
1989  1  0.962085  0.0697049
1990  1.28  1.22565  0.0782423
1991  1  1.03344  -0.0593244
1992  1.1  1.18588  -0.135569
1993  2.55  1.23872  1.30208
1994  1.66  1.40764  0.29738
1995  4.95  1.64723  1.98425
1996  1.66  1.22304  0.550896
1997  1.65  1.23036  0.529231
1998  0.67  1.34964  -1.26294
1999  1.03  1.06831  -0.0658515
```

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2000  0.95  1.31022   -0.579771
2001  0.62  1.23657   -1.24501
2002  1.51  1.40154   0.134416
2003  0.6   1.05405   -1.01615
2004  0.9   1.62981   -1.07089
2005  3.11  0.797765  2.45362
2006  0.81  0.95873   -0.304005
index number 37
units = 2
month = 1
starting and ending ages for selectivity = 1  1
selectivity choice = -1
 year, obs index, pred index, standardized residual
1982  0.55  0.503709  0.158551
1983  0.96  0.559341  0.97414
1984  0.18  0.319875  -1.0369
1985  0.59  0.385612  0.766961
1986  0.39  0.425703  -0.157969
1987  0.07  0.323553  -2.76074
1988  0.06  0.087921  -0.689063
1989  0.31  0.198161  0.807002
1990  0.44  0.252448  1.00191
1991  0.76  0.212859  2.29515
1992  0.99  0.244256  2.52381
1993  0.23  0.255139  -0.18706
1994  0.75  0.289933  1.71398
1995  0.93  0.33928   1.81846
1996  0.11  0.25191   -1.49427
1997  0.17  0.253418  -0.719988
1998  0.38  0.277985  0.563744
1999  0.21  0.220039  -0.084215
2000  0.22  0.269867  -0.368434
2001  0.12  0.254696  -1.35719
2002  0.06  0.288676  -2.83305
2003  0.18  0.217103  -0.337982
2004  0.36  0.335692  0.126076
2005  0.16  0.164316  -0.0480009
2006  0.31  0.19747   0.813303
2007  0.12  0.273892  -1.48823
index number 38
units = 2
month = 1
starting and ending ages for selectivity = 1  1
selectivity choice = -1
 year, obs index, pred index, standardized residual
1986  0.32  0.288458  0.187139
1987  0.26  0.219241  0.307497
1988  0.01  0.0595756  -3.21843
1989  0.14  0.134275  0.0753021
1990  0.36  0.17106   1.34188
1991  0.38  0.144234  1.747
1992  0.37  0.165509  1.45078
1993  0.05  0.172883  -2.23726
1994  0.57  0.196459  1.92093
1995  0.3   0.229897  0.47997
1996  0.08  0.170695  -1.3667
1997  0.22  0.171717  0.446841
1998  0.39  0.188364  1.31245
1999  0.35  0.149099  1.53886
2000  0.21  0.182863  0.249537
2001  0.14  0.172583  -0.377332
2002  0.13  0.195608  -0.736824
2003  0.21  0.14711   0.641875
2004  0.27  0.227466  0.309139
2005  0.01  0.111341  -4.34618
2006  0.17  0.133806  0.431741
2007  0.17  0.18559   -0.158236
index number 39
units = 2
month = 1
starting and ending ages for selectivity = 1  1
selectivity choice = -1
 year, obs index, pred index, standardized residual
1990  0.02  0.0318227  -0.837575
1992  0.01  0.03079   -2.02809
1993  0.01  0.0321618  -2.1067
1994  0.04  0.0365478  0.16277
1995  0.03  0.0427684  -0.639483
1996  0.02  0.0317548  -0.833724
1997  0.04  0.031945   0.405518
1999  0.03  0.0277373  0.141418
```

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2000  0.09  0.0340184   1.75453
2001  0.01  0.032106   -2.10357
2002  0.11  0.0363895   1.99491
2003  0.05  0.0273672   1.08686
2004  0.1   0.042316    1.55092
2005  0.04  0.0207131   1.18683
2007  0.04  0.0345259   0.265406

Input and Estimated effective sample sizes for index 1
1992  0  0
1993  0  0
1994  0  0
1995  0  0
1996  0  0
1997  0  0
1998  0  0
1999  0  0
2000  0  0
2001  0  0
2002  0  0
2003  0  0
2004  0  0
2005  0  0
2006  0  0
2007  0  0
 Total  0   0
Input and Estimated effective sample sizes for index 2
1992  0  0
1993  0  0
1994  0  0
1995  0  0
1996  0  0
1997  0  0
1998  0  0
1999  0  0
2000  0  0
2001  0  0
2002  0  0
2003  0  0
2004  0  0
2005  0  0
2006  0  0
2007  0  0
 Total  0   0
Input and Estimated effective sample sizes for index 3
1992  0  0
1993  0  0
1994  0  0
1995  0  0
1996  0  0
1997  0  0
1998  0  0
1999  0  0
2000  0  0
2001  0  0
2002  0  0
2003  0  0
2004  0  0
2005  0  0
2006  0  0
2007  0  0
 Total  0   0
Input and Estimated effective sample sizes for index 4
1992  0  0
1993  0  0
1994  0  0
1995  0  0
1996  0  0
1997  0  0
1998  0  0
1999  0  0
2000  0  0
2001  0  0
2002  0  0
2003  0  0
2004  0  0
2005  0  0
2006  0  0
2007  0  0
 Total  0   0
Input and Estimated effective sample sizes for index 5
```

```
1992  0  0
1993  0  0
1994  0  0
1996  0  0
1997  0  0
1998  0  0
1999  0  0
2000  0  0
2001  0  0
2002  0  0
2003  0  0
2004  0  0
2005  0  0
2006  0  0
2007  0  0
 Total  0  0
Input and Estimated effective sample sizes for index 6
1982  0  0
1983  0  0
1984  0  0
1985  0  0
1986  0  0
1987  0  0
1988  0  0
1989  0  0
1990  0  0
1991  0  0
1992  0  0
1993  0  0
1994  0  0
1995  0  0
1996  0  0
1997  0  0
1998  0  0
1999  0  0
2000  0  0
2001  0  0
2002  0  0
2003  0  0
2004  0  0
2005  0  0
2006  0  0
2007  0  0
 Total  0  0
Input and Estimated effective sample sizes for index 7
1982  0  0
1983  0  0
1984  0  0
1985  0  0
1986  0  0
1987  0  0
1988  0  0
1989  0  0
1990  0  0
1991  0  0
1992  0  0
1993  0  0
1994  0  0
1995  0  0
1996  0  0
1997  0  0
1998  0  0
1999  0  0
2000  0  0
2001  0  0
2002  0  0
2003  0  0
2004  0  0
2005  0  0
2006  0  0
2007  0  0
 Total  0  0
Input and Estimated effective sample sizes for index 8
1982  0  0
1983  0  0
1984  0  0
1985  0  0
1986  0  0
1987  0  0
1988  0  0
1989  0  0
```

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1990  0  0
1992  0  0
1993  0  0
1994  0  0
1995  0  0
1996  0  0
1997  0  0
1998  0  0
1999  0  0
2000  0  0
2001  0  0
2002  0  0
2003  0  0
2004  0  0
2005  0  0
2006  0  0
2007  0  0
 Total  0  0
Input and Estimated effective sample sizes for index 9
1982  0  0
1983  0  0
1984  0  0
1985  0  0
1986  0  0
1987  0  0
1988  0  0
1989  0  0
1991  0  0
1994  0  0
1997  0  0
1998  0  0
1999  0  0
2000  0  0
2001  0  0
2002  0  0
2003  0  0
2004  0  0
2005  0  0
2006  0  0
2007  0  0
 Total  0  0
Input and Estimated effective sample sizes for index 10
1983  0  0
1984  0  0
1985  0  0
1986  0  0
1992  0  0
1995  0  0
1998  0  0
1999  0  0
2000  0  0
2001  0  0
2002  0  0
2003  0  0
2004  0  0
2005  0  0
2006  0  0
2007  0  0
 Total  0  0
Input and Estimated effective sample sizes for index 11
1983  0  0
1984  0  0
1985  0  0
1986  0  0
1987  0  0
1988  0  0
1989  0  0
1990  0  0
1991  0  0
1992  0  0
1993  0  0
1994  0  0
1995  0  0
1996  0  0
1997  0  0
1998  0  0
1999  0  0
2000  0  0
2001  0  0
2002  0  0
2003  0  0
```

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2004  0  0
2005  0  0
2006  0  0
2007  0  0
 Total  0  0
Input and Estimated effective sample sizes for index 12
1983  0  0
1984  0  0
1985  0  0
1986  0  0
1987  0  0
1988  0  0
1989  0  0
1990  0  0
1991  0  0
1992  0  0
1993  0  0
1994  0  0
1995  0  0
1996  0  0
1997  0  0
1998  0  0
1999  0  0
2000  0  0
2001  0  0
2002  0  0
2003  0  0
2004  0  0
2005  0  0
2006  0  0
2007  0  0
 Total  0  0
Input and Estimated effective sample sizes for index 13
1983  0  0
1984  0  0
1985  0  0
1986  0  0
1987  0  0
1988  0  0
1989  0  0
1991  0  0
1993  0  0
1994  0  0
1995  0  0
1996  0  0
1997  0  0
1998  0  0
1999  0  0
2000  0  0
2001  0  0
2002  0  0
2003  0  0
2004  0  0
2005  0  0
2006  0  0
2007  0  0
 Total  0  0
Input and Estimated effective sample sizes for index 14
1982  0  0
1983  0  0
1984  0  0
1985  0  0
1986  0  0
1987  0  0
1988  0  0
1989  0  0
1990  0  0
1991  0  0
1992  0  0
1993  0  0
1994  0  0
1995  0  0
1996  0  0
1997  0  0
1998  0  0
1999  0  0
2000  0  0
2001  0  0
2002  0  0
2003  0  0
2004  0  0
```

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2005  0  0
2006  0  0
2007  0  0
 Total  0  0
Input and Estimated effective sample sizes for index 15
1982  0  0
1983  0  0
1984  0  0
1985  0  0
1986  0  0
1987  0  0
1988  0  0
1989  0  0
1990  0  0
1991  0  0
1992  0  0
1993  0  0
1994  0  0
1995  0  0
1996  0  0
1997  0  0
1998  0  0
1999  0  0
2000  0  0
2001  0  0
2002  0  0
2003  0  0
2004  0  0
2005  0  0
2006  0  0
2007  0  0
 Total  0  0
Input and Estimated effective sample sizes for index 16
1982  0  0
1983  0  0
1984  0  0
1985  0  0
1986  0  0
1987  0  0
1988  0  0
1989  0  0
1990  0  0
1992  0  0
1993  0  0
1994  0  0
1995  0  0
1996  0  0
1997  0  0
1998  0  0
1999  0  0
2000  0  0
2001  0  0
2002  0  0
2003  0  0
2004  0  0
2005  0  0
2006  0  0
2007  0  0
 Total  0  0
Input and Estimated effective sample sizes for index 17
1982  0  0
1983  0  0
1984  0  0
1985  0  0
1986  0  0
1987  0  0
1988  0  0
1989  0  0
1990  0  0
1991  0  0
1992  0  0
1994  0  0
1997  0  0
1998  0  0
1999  0  0
2000  0  0
2001  0  0
2002  0  0
2003  0  0
2004  0  0
2005  0  0
```

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2006  0  0
2007  0  0
 Total  0  0
Input and Estimated effective sample sizes for index 18
1984  0  0
1985  0  0
1986  0  0
1987  0  0
1988  0  0
1989  0  0
1990  0  0
1991  0  0
1992  0  0
1993  0  0
1994  0  0
1995  0  0
1996  0  0
1997  0  0
1998  0  0
1999  0  0
2000  0  0
2001  0  0
2002  0  0
2003  0  0
2004  0  0
2005  0  0
2006  0  0
2007  0  0
 Total  0  0
Input and Estimated effective sample sizes for index 19
1984  0  0
1985  0  0
1986  0  0
1987  0  0
1988  0  0
1989  0  0
1990  0  0
1991  0  0
1992  0  0
1993  0  0
1994  0  0
1995  0  0
1996  0  0
1997  0  0
1998  0  0
1999  0  0
2000  0  0
2001  0  0
2002  0  0
2003  0  0
2004  0  0
2005  0  0
2006  0  0
2007  0  0
 Total  0  0
Input and Estimated effective sample sizes for index 20
1985  0  0
1986  0  0
1987  0  0
1988  0  0
1989  0  0
1990  0  0
1991  0  0
1992  0  0
1993  0  0
1994  0  0
1995  0  0
1996  0  0
1997  0  0
1998  0  0
1999  0  0
2000  0  0
2001  0  0
2002  0  0
2003  0  0
2004  0  0
2005  0  0
2006  0  0
2007  0  0
 Total  0  0
Input and Estimated effective sample sizes for index 21
```

```
1985  0   0
1986  0   0
1987  0   0
1988  0   0
1989  0   0
1990  0   0
1991  0   0
1992  0   0
1993  0   0
1994  0   0
1995  0   0
1996  0   0
1997  0   0
1998  0   0
1999  0   0
2000  0   0
2001  0   0
2002  0   0
2003  0   0
2004  0   0
2005  0   0
2006  0   0
2007  0   0
 Total  0   0
Input and Estimated effective sample sizes for index 22
1985  0   0
1986  0   0
1987  0   0
1988  0   0
1989  0   0
1990  0   0
1991  0   0
1992  0   0
1993  0   0
1994  0   0
1995  0   0
1996  0   0
1997  0   0
1998  0   0
1999  0   0
2000  0   0
2001  0   0
2002  0   0
2003  0   0
2004  0   0
2005  0   0
2006  0   0
2007  0   0
 Total  0   0
Input and Estimated effective sample sizes for index 23
1985  0   0
1986  0   0
1987  0   0
1988  0   0
1989  0   0
1990  0   0
1991  0   0
1992  0   0
1993  0   0
1994  0   0
1995  0   0
1996  0   0
1997  0   0
1998  0   0
1999  0   0
2000  0   0
2001  0   0
2002  0   0
2003  0   0
2004  0   0
2005  0   0
2006  0   0
2007  0   0
 Total  0   0
Input and Estimated effective sample sizes for index 24
1985  0   0
1986  0   0
1987  0   0
1988  0   0
1989  0   0
1990  0   0
```

```
1991  0   0
1992  0   0
1993  0   0
1994  0   0
1995  0   0
1996  0   0
1997  0   0
1998  0   0
1999  0   0
2000  0   0
2001  0   0
2002  0   0
2003  0   0
2004  0   0
2005  0   0
2006  0   0
2007  0   0
 Total   0   0
Input and Estimated effective sample sizes for index 25
1982  0   0
1983  0   0
1984  0   0
1985  0   0
1986  0   0
1987  0   0
1988  0   0
1989  0   0
1990  0   0
1991  0   0
1992  0   0
1993  0   0
1994  0   0
1995  0   0
1996  0   0
1997  0   0
1998  0   0
1999  0   0
2000  0   0
2001  0   0
2002  0   0
2003  0   0
2004  0   0
2005  0   0
2006  0   0
2007  0   0
 Total   0   0
Input and Estimated effective sample sizes for index 26
1982  0   0
1983  0   0
1984  0   0
1985  0   0
1986  0   0
1987  0   0
1988  0   0
1992  0   0
1993  0   0
1994  0   0
1997  0   0
1998  0   0
1999  0   0
2000  0   0
2001  0   0
2002  0   0
2003  0   0
2004  0   0
2005  0   0
2006  0   0
2007  0   0
 Total   0   0
Input and Estimated effective sample sizes for index 27
1990  0   0
1991  0   0
1992  0   0
1993  0   0
1994  0   0
1995  0   0
1996  0   0
1997  0   0
1998  0   0
1999  0   0
2000  0   0
```

```
2001  0  0
2002  0  0
2003  0  0
2004  0  0
2005  0  0
2006  0  0
2007  0  0
 Total  0  0
Input and Estimated effective sample sizes for index 28
1990  0  0
1991  0  0
1992  0  0
1993  0  0
1994  0  0
1995  0  0
1996  0  0
1997  0  0
1998  0  0
1999  0  0
2000  0  0
2001  0  0
2002  0  0
2003  0  0
2004  0  0
2005  0  0
2006  0  0
2007  0  0
 Total  0  0
Input and Estimated effective sample sizes for index 29
1988  0  0
1989  0  0
1990  0  0
1991  0  0
1992  0  0
1993  0  0
1994  0  0
1995  0  0
1996  0  0
1997  0  0
1998  0  0
1999  0  0
2000  0  0
2001  0  0
2002  0  0
2003  0  0
2004  0  0
2005  0  0
2006  0  0
2007  0  0
 Total  0  0
Input and Estimated effective sample sizes for index 30
1988  0  0
1989  0  0
1990  0  0
1991  0  0
1992  0  0
1993  0  0
1994  0  0
1995  0  0
1996  0  0
1997  0  0
1998  0  0
1999  0  0
2000  0  0
2001  0  0
2002  0  0
2003  0  0
2004  0  0
2005  0  0
2006  0  0
2007  0  0
 Total  0  0
Input and Estimated effective sample sizes for index 31
1990  0  0
1991  0  0
1992  0  0
1993  0  0
1995  0  0
1996  0  0
1997  0  0
1998  0  0
```

```
1999  0  0
2000  0  0
2001  0  0
2002  0  0
2003  0  0
2004  0  0
2005  0  0
2006  0  0
2007  0  0
 Total  0  0
Input and Estimated effective sample sizes for index 32
1992  0  0
1993  0  0
1994  0  0
1995  0  0
1996  0  0
1997  0  0
1998  0  0
1999  0  0
2000  0  0
2001  0  0
2002  0  0
2003  0  0
2004  0  0
2005  0  0
2006  0  0
2007  0  0
 Total  0  0
Input and Estimated effective sample sizes for index 33
1985  0  0
1986  0  0
1987  0  0
1988  0  0
1990  0  0
1991  0  0
1992  0  0
1993  0  0
1994  0  0
1995  0  0
1996  0  0
1997  0  0
1999  0  0
2000  0  0
2001  0  0
2002  0  0
2004  0  0
2005  0  0
2006  0  0
2007  0  0
 Total  0  0
Input and Estimated effective sample sizes for index 34
1982  0  0
1983  0  0
1984  0  0
1985  0  0
1986  0  0
1987  0  0
1988  0  0
1989  0  0
1990  0  0
1991  0  0
1992  0  0
1993  0  0
1994  0  0
1995  0  0
1996  0  0
1997  0  0
1998  0  0
1999  0  0
2000  0  0
2001  0  0
2002  0  0
2003  0  0
2004  0  0
2005  0  0
2006  0  0
 Total  0  0
Input and Estimated effective sample sizes for index 35
1982  0  0
1983  0  0
1984  0  0
```

```
1985  0  0
1986  0  0
1987  0  0
1988  0  0
1989  0  0
1990  0  0
1991  0  0
1992  0  0
1993  0  0
1994  0  0
1995  0  0
1996  0  0
1997  0  0
1998  0  0
1999  0  0
2000  0  0
2001  0  0
2002  0  0
2003  0  0
2004  0  0
2005  0  0
2006  0  0
2007  0  0
 Total  0  0
Input and Estimated effective sample sizes for index 36
1988  0  0
1989  0  0
1990  0  0
1991  0  0
1992  0  0
1993  0  0
1994  0  0
1995  0  0
1996  0  0
1997  0  0
1998  0  0
1999  0  0
2000  0  0
2001  0  0
2002  0  0
2003  0  0
2004  0  0
2005  0  0
2006  0  0
 Total  0  0
Input and Estimated effective sample sizes for index 37
1982  0  0
1983  0  0
1984  0  0
1985  0  0
1986  0  0
1987  0  0
1988  0  0
1989  0  0
1990  0  0
1991  0  0
1992  0  0
1993  0  0
1994  0  0
1995  0  0
1996  0  0
1997  0  0
1998  0  0
1999  0  0
2000  0  0
2001  0  0
2002  0  0
2003  0  0
2004  0  0
2005  0  0
2006  0  0
2007  0  0
 Total  0  0
Input and Estimated effective sample sizes for index 38
1986  0  0
1987  0  0
1988  0  0
1989  0  0
1990  0  0
1991  0  0
1992  0  0
```

```
1993  0  0
1994  0  0
1995  0  0
1996  0  0
1997  0  0
1998  0  0
1999  0  0
2000  0  0
2001  0  0
2002  0  0
2003  0  0
2004  0  0
2005  0  0
2006  0  0
2007  0  0
 Total   0   0
Input and Estimated effective sample sizes for index 39
1990  0  0
1992  0  0
1993  0  0
1994  0  0
1995  0  0
1996  0  0
1997  0  0
1999  0  0
2000  0  0
2001  0  0
2002  0  0
2003  0  0
2004  0  0
2005  0  0
2007  0  0
 Total   0   0

Survey proportions at age by index
 Index number 1
 N/A
 Index number 2
 N/A
 Index number 3
 N/A
 Index number 4
 N/A
 Index number 5
 N/A
 Index number 6
 N/A
 Index number 7
 N/A
 Index number 8
 N/A
 Index number 9
 N/A
 Index number 10
 N/A
 Index number 11
 N/A
 Index number 12
 N/A
 Index number 13
 N/A
 Index number 14
 N/A
 Index number 15
 N/A
 Index number 16
 N/A
 Index number 17
 N/A
 Index number 18
 N/A
 Index number 19
 N/A
 Index number 20
 N/A
 Index number 21
 N/A
 Index number 22
 N/A
 Index number 23
 N/A
```

```
 Index number 24
 N/A
 Index number 25
 N/A
 Index number 26
 N/A
 Index number 27
 N/A
 Index number 28
 N/A
 Index number 29
 N/A
 Index number 30
 N/A
 Index number 31
 N/A
 Index number 32
 N/A
 Index number 33
 N/A
 Index number 34
 N/A
 Index number 35
 N/A
 Index number 36
 N/A
 Index number 37
 N/A
 Index number 38
 N/A
 Index number 39
 N/A

 Index Selectivity at Age
 0 1 0 0 0 0 0 0
 0 0 1 0 0 0 0 0
 0 0 0 1 0 0 0 0
 0 0 0 0 1 0 0 0
 0 0 0 0 0 1 1 1
 0 1 0 0 0 0 0 0
 0 0 1 0 0 0 0 0
 0 0 0 1 0 0 0 0
 0 0 0 0 1 0 0 0
 0 0 0 0 0 1 1 1
 0 0 1 0 0 0 0 0
 0 0 0 1 0 0 0 0
 0 0 0 0 1 0 0 0
 0 0 1 0 0 0 0 0
 0 0 0 1 0 0 0 0
 0 0 0 1 0 0 0 0
 0 0 0 0 1 0 0 0
 0 0 1 0 0 0 0 0
 0 0 0 1 0 0 0 0
 0 0 0 0 1 0 0 0
 0 0 1 0 0 0 0 0
 0 0 0 1 0 0 0 0
 0 0 0 0 1 0 0 0
 0 0 0 0 0 1 1 1
 0 0 0 1 0 0 0 0
 0 0 0 0 1 0 0 0
 0 1 0 0 0 0 0 0
 0 0 1 0 0 0 0 0
 0 1 0 0 0 0 0 0
 0 0 1 0 0 0 0 0
 0 0 0 1 0 0 0 0
 0 0 0 0 1 0 0 0
 1 0 0 0 0 0 0 0
 1 0 0 0 0 0 0 0
 1 0 0 0 0 0 0 0
 1 0 0 0 0 0 0 0
 1 0 0 0 0 0 0 0
 1 0 0 0 0 0 0 0
 1 0 0 0 0 0 0 0

 Deviations section: only applicable if associated lambda > 0
 Nyear1 observed, expected, standardized residual
 2   46050.8   29361.5   0.584285
 3   20734.2   13655.9   0.542161
 4   3070.01   3443.07   -0.148883
 5   665.997   838.774   -0.299445
 6   236.86    204.047   0.193589
```

```
7  61.3409  49.6362  0.27487
8  17.4905  16.0075  0.115024


Fleet Obs, Initial, and Stadardized Residual for Fmult
1  1.16363  0.9  0.333526
2  0.0183163  0.1  -2.20359

Standardized Residuals for Fmult_devs by fleet and year
N/A

Index Obs, Initial, and Standardized Residual for q_year1
N/A

Standardized Residuals for catchability deviations by index and year
 index 1 q_devs standardized residuals
2  0
3  0
4  0
5  0
6  0
7  0
8  0
9  0
10  0
11  0
12  0
13  0
14  0
15  0
16  0
 index 2 q_devs standardized residuals
2  0
3  0
4  0
5  0
6  0
7  0
8  0
9  0
10  0
11  0
12  0
13  0
14  0
15  0
16  0
 index 3 q_devs standardized residuals
2  0
3  0
4  0
5  0
6  0
7  0
8  0
9  0
10  0
11  0
12  0
13  0
14  0
15  0
16  0
 index 4 q_devs standardized residuals
2  0
3  0
4  0
5  0
6  0
7  0
8  0
9  0
10  0
11  0
12  0
13  0
14  0
15  0
16  0
 index 5 q_devs standardized residuals
2  0
3  0
```

```
4   0
5   0
6   0
7   0
8   0
9   0
10  0
11  0
12  0
13  0
14  0
15  0
 index 6 q_devs standardized residuals
2   0
3   0
4   0
5   0
6   0
7   0
8   0
9   0
10  0
11  0
12  0
13  0
14  0
15  0
16  0
17  0
18  0
19  0
20  0
21  0
22  0
23  0
24  0
25  0
26  0
 index 7 q_devs standardized residuals
2   0
3   0
4   0
5   0
6   0
7   0
8   0
9   0
10  0
11  0
12  0
13  0
14  0
15  0
16  0
17  0
18  0
19  0
20  0
21  0
22  0
23  0
24  0
25  0
26  0
 index 8 q_devs standardized residuals
2   0
3   0
4   0
5   0
6   0
7   0
8   0
9   0
10  0
11  0
12  0
13  0
14  0
15  0
16  0
17  0
```

```
18  0
19  0
20  0
21  0
22  0
23  0
24  0
25  0
 index 9 q_devs standardized residuals
2   0
3   0
4   0
5   0
6   0
7   0
8   0
9   0
10  0
11  0
12  0
13  0
14  0
15  0
16  0
17  0
18  0
19  0
20  0
21  0
 index 10 q_devs standardized residuals
2   0
3   0
4   0
5   0
6   0
7   0
8   0
9   0
10  0
11  0
12  0
13  0
14  0
15  0
16  0
 index 11 q_devs standardized residuals
2   0
3   0
4   0
5   0
6   0
7   0
8   0
9   0
10  0
11  0
12  0
13  0
14  0
15  0
16  0
17  0
18  0
19  0
20  0
21  0
22  0
23  0
24  0
25  0
 index 12 q_devs standardized residuals
2   0
3   0
4   0
5   0
6   0
7   0
8   0
9   0
10  0
11  0
```

```
12  0
13  0
14  0
15  0
16  0
17  0
18  0
19  0
20  0
21  0
22  0
23  0
24  0
25  0
 index 13 q_devs standardized residuals
2   0
3   0
4   0
5   0
6   0
7   0
8   0
9   0
10  0
11  0
12  0
13  0
14  0
15  0
16  0
17  0
18  0
19  0
20  0
21  0
22  0
23  0
 index 14 q_devs standardized residuals
2   0
3   0
4   0
5   0
6   0
7   0
8   0
9   0
10  0
11  0
12  0
13  0
14  0
15  0
16  0
17  0
18  0
19  0
20  0
21  0
22  0
23  0
24  0
25  0
26  0
 index 15 q_devs standardized residuals
2   0
3   0
4   0
5   0
6   0
7   0
8   0
9   0
10  0
11  0
12  0
13  0
14  0
15  0
16  0
17  0
18  0
```

```
19   0
20   0
21   0
22   0
23   0
24   0
25   0
26   0
 index 16 q_devs standardized residuals
2    0
3    0
4    0
5    0
6    0
7    0
8    0
9    0
10   0
11   0
12   0
13   0
14   0
15   0
16   0
17   0
18   0
19   0
20   0
21   0
22   0
23   0
24   0
25   0
 index 17 q_devs standardized residuals
2    0
3    0
4    0
5    0
6    0
7    0
8    0
9    0
10   0
11   0
12   0
13   0
14   0
15   0
16   0
17   0
18   0
19   0
20   0
21   0
22   0
23   0
 index 18 q_devs standardized residuals
2    0
3    0
4    0
5    0
6    0
7    0
8    0
9    0
10   0
11   0
12   0
13   0
14   0
15   0
16   0
17   0
18   0
19   0
20   0
21   0
22   0
23   0
24   0
 index 19 q_devs standardized residuals
```

```
2   0
3   0
4   0
5   0
6   0
7   0
8   0
9   0
10  0
11  0
12  0
13  0
14  0
15  0
16  0
17  0
18  0
19  0
20  0
21  0
22  0
23  0
24  0
 index 20 q_devs standardized residuals
2   0
3   0
4   0
5   0
6   0
7   0
8   0
9   0
10  0
11  0
12  0
13  0
14  0
15  0
16  0
17  0
18  0
19  0
20  0
21  0
22  0
23  0
 index 21 q_devs standardized residuals
2   0
3   0
4   0
5   0
6   0
7   0
8   0
9   0
10  0
11  0
12  0
13  0
14  0
15  0
16  0
17  0
18  0
19  0
20  0
21  0
22  0
23  0
 index 22 q_devs standardized residuals
2   0
3   0
4   0
5   0
6   0
7   0
8   0
9   0
10  0
11  0
12  0
```

```
13  0
14  0
15  0
16  0
17  0
18  0
19  0
20  0
21  0
22  0
23  0
 index 23 q_devs standardized residuals
2   0
3   0
4   0
5   0
6   0
7   0
8   0
9   0
10  0
11  0
12  0
13  0
14  0
15  0
16  0
17  0
18  0
19  0
20  0
21  0
22  0
23  0
 index 24 q_devs standardized residuals
2   0
3   0
4   0
5   0
6   0
7   0
8   0
9   0
10  0
11  0
12  0
13  0
14  0
15  0
16  0
17  0
18  0
19  0
20  0
21  0
22  0
23  0
 index 25 q_devs standardized residuals
2   0
3   0
4   0
5   0
6   0
7   0
8   0
9   0
10  0
11  0
12  0
13  0
14  0
15  0
16  0
17  0
18  0
19  0
20  0
21  0
22  0
23  0
24  0
```

```
25  0
26  0
 index 26 q_devs standardized residuals
2   0
3   0
4   0
5   0
6   0
7   0
8   0
9   0
10  0
11  0
12  0
13  0
14  0
15  0
16  0
17  0
18  0
19  0
20  0
21  0
 index 27 q_devs standardized residuals
2   0
3   0
4   0
5   0
6   0
7   0
8   0
9   0
10  0
11  0
12  0
13  0
14  0
15  0
16  0
17  0
18  0
 index 28 q_devs standardized residuals
2   0
3   0
4   0
5   0
6   0
7   0
8   0
9   0
10  0
11  0
12  0
13  0
14  0
15  0
16  0
17  0
18  0
 index 29 q_devs standardized residuals
2   0
3   0
4   0
5   0
6   0
7   0
8   0
9   0
10  0
11  0
12  0
13  0
14  0
15  0
16  0
17  0
18  0
19  0
20  0
 index 30 q_devs standardized residuals
2   0
```

```
3   0
4   0
5   0
6   0
7   0
8   0
9   0
10  0
11  0
12  0
13  0
14  0
15  0
16  0
17  0
18  0
19  0
20  0
 index 31 q_devs standardized residuals
2   0
3   0
4   0
5   0
6   0
7   0
8   0
9   0
10  0
11  0
12  0
13  0
14  0
15  0
16  0
17  0
 index 32 q_devs standardized residuals
2   0
3   0
4   0
5   0
6   0
7   0
8   0
9   0
10  0
11  0
12  0
13  0
14  0
15  0
16  0
 index 33 q_devs standardized residuals
2   0
3   0
4   0
5   0
6   0
7   0
8   0
9   0
10  0
11  0
12  0
13  0
14  0
15  0
16  0
17  0
18  0
19  0
20  0
 index 34 q_devs standardized residuals
2   0
3   0
4   0
5   0
6   0
7   0
8   0
9   0
10  0
```

```
11   0
12   0
13   0
14   0
15   0
16   0
17   0
18   0
19   0
20   0
21   0
22   0
23   0
24   0
25   0
 index 35 q_devs standardized residuals
2    0
3    0
4    0
5    0
6    0
7    0
8    0
9    0
10   0
11   0
12   0
13   0
14   0
15   0
16   0
17   0
18   0
19   0
20   0
21   0
22   0
23   0
24   0
25   0
26   0
 index 36 q_devs standardized residuals
2    0
3    0
4    0
5    0
6    0
7    0
8    0
9    0
10   0
11   0
12   0
13   0
14   0
15   0
16   0
17   0
18   0
19   0
 index 37 q_devs standardized residuals
2    0
3    0
4    0
5    0
6    0
7    0
8    0
9    0
10   0
11   0
12   0
13   0
14   0
15   0
16   0
17   0
18   0
19   0
20   0
21   0
```

```
22  0
23  0
24  0
25  0
26  0
 index 38 q_devs standardized residuals
2  0
3  0
4  0
5  0
6  0
7  0
8  0
9  0
10  0
11  0
12  0
13  0
14  0
15  0
16  0
17  0
18  0
19  0
20  0
21  0
22  0
 index 39 q_devs standardized residuals
2  0
3  0
4  0
5  0
6  0
7  0
8  0
9  0
10  0
11  0
12  0
13  0
14  0
15  0
```

Obs, Initial, and Stadardized Residual for SRR steepness
0.999995 0.7 0.463041

Obs, Initial, and Stadardized Residual for SRR unexpl S
208427 22026.5 2.91758

End of Deviations Section

Selectivity by age and year for each fleet
```
 fleet 1 selectivity at age
 0.0214966 0.418687 0.959371 0.99871 0.999961 0.999999 1 1
 0.0214966 0.418687 0.959371 0.99871 0.999961 0.999999 1 1
 0.0214966 0.418687 0.959371 0.99871 0.999961 0.999999 1 1
 0.0214966 0.418687 0.959371 0.99871 0.999961 0.999999 1 1
 0.0214966 0.418687 0.959371 0.99871 0.999961 0.999999 1 1
 0.0214966 0.418687 0.959371 0.99871 0.999961 0.999999 1 1
 0.0214966 0.418687 0.959371 0.99871 0.999961 0.999999 1 1
 0.0214966 0.418687 0.959371 0.99871 0.999961 0.999999 1 1
 0.0214966 0.418687 0.959371 0.99871 0.999961 0.999999 1 1
 0.0214966 0.418687 0.959371 0.99871 0.999961 0.999999 1 1
 0.0214966 0.418687 0.959371 0.99871 0.999961 0.999999 1 1
 0.0214966 0.418687 0.959371 0.99871 0.999961 0.999999 1 1
 0.0214966 0.418687 0.959371 0.99871 0.999961 0.999999 1 1
 0.00468904 0.0764826 0.592806 0.962395 0.997783 0.999874 0.999993 1
 0.00468904 0.0764826 0.592806 0.962395 0.997783 0.999874 0.999993 1
 0.00468904 0.0764826 0.592806 0.962395 0.997783 0.999874 0.999993 1
 0.00468904 0.0764826 0.592806 0.962395 0.997783 0.999874 0.999993 1
 0.00468904 0.0764826 0.592806 0.962395 0.997783 0.999874 0.999993 1
 0.00468904 0.0764826 0.592806 0.962395 0.997783 0.999874 0.999993 1
 0.00468904 0.0764826 0.592806 0.962395 0.997783 0.999874 0.999993 1
 0.00468904 0.0764826 0.592806 0.962395 0.997783 0.999874 0.999993 1
 0.00468904 0.0764826 0.592806 0.962395 0.997783 0.999874 0.999993 1
 0.00468904 0.0764826 0.592806 0.962395 0.997783 0.999874 0.999993 1
 0.00468904 0.0764826 0.592806 0.962395 0.997783 0.999874 0.999993 1
 0.00468904 0.0764826 0.592806 0.962395 0.997783 0.999874 0.999993 1
 0.00468904 0.0764826 0.592806 0.962395 0.997783 0.999874 0.999993 1
 fleet 2 selectivity at age
 0.133219 1 0.0793395 0.00246479 7.40189e-05 2.22072e-06 6.66242e-08 1.99881e-09
```

```
0.133219 1 0.0793395 0.00246479 7.40189e-05 2.22072e-06 6.66242e-08 1.99881e-09
0.133219 1 0.0793395 0.00246479 7.40189e-05 2.22072e-06 6.66242e-08 1.99881e-09
0.133219 1 0.0793395 0.00246479 7.40189e-05 2.22072e-06 6.66242e-08 1.99881e-09
0.133219 1 0.0793395 0.00246479 7.40189e-05 2.22072e-06 6.66242e-08 1.99881e-09
0.133219 1 0.0793395 0.00246479 7.40189e-05 2.22072e-06 6.66242e-08 1.99881e-09
0.133219 1 0.0793395 0.00246479 7.40189e-05 2.22072e-06 6.66242e-08 1.99881e-09
0.133219 1 0.0793395 0.00246479 7.40189e-05 2.22072e-06 6.66242e-08 1.99881e-09
0.133219 1 0.0793395 0.00246479 7.40189e-05 2.22072e-06 6.66242e-08 1.99881e-09
0.133219 1 0.0793395 0.00246479 7.40189e-05 2.22072e-06 6.66242e-08 1.99881e-09
0.133219 1 0.0793395 0.00246479 7.40189e-05 2.22072e-06 6.66242e-08 1.99881e-09
0.133219 1 0.0793395 0.00246479 7.40189e-05 2.22072e-06 6.66242e-08 1.99881e-09
0.133219 1 0.0793395 0.00246479 7.40189e-05 2.22072e-06 6.66242e-08 1.99881e-09
0.0521548 0.664116 1 0.632226 0.300182 0.120253 0.0444427 0.0159063
0.0521548 0.664116 1 0.632226 0.300182 0.120253 0.0444427 0.0159063
0.0521548 0.664116 1 0.632226 0.300182 0.120253 0.0444427 0.0159063
0.0521548 0.664116 1 0.632226 0.300182 0.120253 0.0444427 0.0159063
0.0521548 0.664116 1 0.632226 0.300182 0.120253 0.0444427 0.0159063
0.0521548 0.664116 1 0.632226 0.300182 0.120253 0.0444427 0.0159063
0.0521548 0.664116 1 0.632226 0.300182 0.120253 0.0444427 0.0159063
0.0521548 0.664116 1 0.632226 0.300182 0.120253 0.0444427 0.0159063
0.0521548 0.664116 1 0.632226 0.300182 0.120253 0.0444427 0.0159063
0.0521548 0.664116 1 0.632226 0.300182 0.120253 0.0444427 0.0159063
0.0521548 0.664116 1 0.632226 0.300182 0.120253 0.0444427 0.0159063

Fmult by year for each fleet
1982   1.16363 0.0183163
1983   1.48149 0.0207686
1984   1.61396 0.0238062
1985   1.52976 0.00754346
1986   1.7371 0.0412011
1987   1.45375 0.0341215
1988   2.0425 0.0324795
1989   1.54384 0.20927
1990   1.14338 0.207133
1991   1.49166 0.201367
1992   1.52722 0.132089
1993   1.28785 0.187671
1994   1.2166 0.140217
1995   1.70968 0.0708892
1996   1.43542 0.0614838
1997   0.883005 0.0430502
1998   0.791504 0.051317
1999   0.544342 0.113706
2000   0.66781 0.0741836
2001   0.486655 0.0693924
2002   0.430056 0.0469552
2003   0.412642 0.0482699
2004   0.4505 0.045047
2005   0.460634 0.046873
2006   0.364006 0.0412391
2007   0.275869 0.0646689

Directed F by age and year for each fleet
 fleet 1 directed F at age
 0.0250141 0.487198 1.11636 1.16213 1.16359 1.16363 1.16363 1.16363
 0.031847 0.620281 1.4213 1.47958 1.48143 1.48149 1.48149 1.48149
 0.0346947 0.675745 1.54839 1.61188 1.6139 1.61396 1.61396 1.61396
 0.0328846 0.640491 1.46761 1.52779 1.5297 1.52976 1.52976 1.52976
 0.0373416 0.727299 1.66652 1.73485 1.73703 1.73709 1.7371 1.7371
 0.0312506 0.608665 1.39468 1.45187 1.45369 1.45375 1.45375 1.45375
 0.0439067 0.855166 1.95951 2.03986 2.04241 2.04249 2.0425 2.0425
 0.0331872 0.646385 1.48111 1.54185 1.54378 1.54384 1.54384 1.54384
 0.0245787 0.478718 1.09692 1.1419 1.14333 1.14338 1.14338 1.14338
 0.0320656 0.624539 1.43106 1.48974 1.4916 1.49166 1.49166 1.49166
 0.0328301 0.639429 1.46517 1.52525 1.52716 1.52722 1.52722 1.52722
 0.0276844 0.539206 1.23553 1.28619 1.2878 1.28785 1.28785 1.28785
 0.0261528 0.509375 1.16717 1.21503 1.21655 1.2166 1.2166 1.2166
 0.00801676 0.130761 1.01351 1.64539 1.70589 1.70947 1.70967 1.70968
 0.00673073 0.109785 0.850924 1.38144 1.43224 1.43524 1.43541 1.43542
 0.00414045 0.0675346 0.523451 0.8498 0.881047 0.882894 0.882999 0.883005
 0.00371139 0.0605363 0.469208 0.76174 0.789749 0.791404 0.791499 0.791504
 0.00255244 0.0416327 0.322689 0.523872 0.543135 0.544273 0.544338 0.544342
 0.00313139 0.0510758 0.395881 0.642697 0.666329 0.667726 0.667805 0.66781
 0.00228195 0.0372207 0.288492 0.468355 0.485576 0.486594 0.486652 0.486655
 0.00201655 0.0328918 0.25494 0.413884 0.429103 0.430002 0.430053 0.430056
 0.00193489 0.0315599 0.244616 0.397124 0.411727 0.41259 0.412639 0.412642
 0.00211241 0.0344555 0.267059 0.433559 0.449501 0.450444 0.450497 0.4505
 0.00215993 0.0352305 0.273066 0.443312 0.459612 0.460576 0.460631 0.460634
 0.00170684 0.0278402 0.215785 0.350318 0.363199 0.363961 0.364004 0.364006
```

```
0.00129356 0.0210992 0.163537 0.265495 0.275257 0.275834 0.275867 0.275869
fleet 2 directed F at age
0.00244008 0.0183163 0.00145321 4.51459e-05 1.35575e-06 4.06754e-08 1.22031e-09 3.66108e-11
0.00276677 0.0207686 0.00164777 5.11903e-05 1.53727e-06 4.61212e-08 1.38369e-09 4.15125e-11
0.00317143 0.0238062 0.00188877 5.86772e-05 1.76211e-06 5.28667e-08 1.58607e-09 4.75839e-11
0.00100493 0.00754346 0.000598494 1.8593e-05 5.58359e-07 1.67519e-08 5.02577e-10 1.50779e-11
0.00548877 0.0412011 0.00326887 0.000101552 3.04966e-06 9.1496e-08 2.74499e-09 8.23531e-11
0.00454564 0.0341215 0.00270719 8.41024e-05 2.52564e-06 7.57743e-08 2.27332e-09 6.82024e-11
0.00432688 0.0324795 0.0025769 8.0055e-05 2.40409e-06 7.21277e-08 2.16392e-09 6.49202e-11
0.0278787 0.20927 0.0166034 0.000515807 1.54899e-05 4.64729e-07 1.39425e-08 4.1829e-10
0.0275941 0.207133 0.0164338 0.00051054 1.53318e-05 4.59984e-07 1.38001e-08 4.1402e-10
0.0268259 0.201367 0.0159763 0.000496327 1.49049e-05 4.47178e-07 1.34159e-08 4.02493e-10
0.0175968 0.132089 0.0104799 0.000325572 9.7771e-06 2.93333e-07 8.80035e-09 2.64021e-10
0.0250013 0.187671 0.0148897 0.000462569 1.38912e-05 4.16764e-07 1.25034e-08 3.75118e-10
0.0186796 0.140217 0.0111248 0.000345606 1.03787e-05 3.11383e-07 9.34187e-09 2.80267e-10
0.00369721 0.0470787 0.0708892 0.044818 0.0212797 0.00852464 0.00315051 0.00112758
0.00320668 0.0408324 0.0614838 0.0388717 0.0184563 0.00739361 0.00273251 0.000977978
0.00224527 0.0285903 0.0430502 0.0272174 0.0129229 0.00517691 0.00191326 0.000684767
0.00267643 0.0340805 0.051317 0.032444 0.0154044 0.00617103 0.00228067 0.000816263
0.00593032 0.075514 0.113706 0.071888 0.0341325 0.0136735 0.00505341 0.00180864
0.00386903 0.0492665 0.0741836 0.0469008 0.0222686 0.00892079 0.00329692 0.00117998
0.00361915 0.0460846 0.0693924 0.0438717 0.0208303 0.00834464 0.00308398 0.00110377
0.00244894 0.0311837 0.0469552 0.0296863 0.0140951 0.0056465 0.00208682 0.000746882
0.00251751 0.0320568 0.0482699 0.0305175 0.0144897 0.0058046 0.00214524 0.000767794
0.00234942 0.0299164 0.045047 0.0284799 0.0135223 0.00541704 0.00200201 0.00071653
0.00244465 0.0311291 0.046873 0.0296343 0.0140704 0.00563661 0.00208316 0.000745574
0.00215082 0.0273875 0.0412391 0.0260724 0.0123792 0.00495912 0.00183278 0.00065596
0.00337279 0.0429476 0.0646689 0.0408854 0.0194124 0.00777663 0.00287406 0.00102864
Discard F by age and year for each fleet
 fleet 1 Discard F at age
 0 0 0 0 0 0 0 0
 0 0 0 0 0 0 0 0
 0 0 0 0 0 0 0 0
 0 0 0 0 0 0 0 0
 0 0 0 0 0 0 0 0
 0 0 0 0 0 0 0 0
 0 0 0 0 0 0 0 0
 0 0 0 0 0 0 0 0
 0 0 0 0 0 0 0 0
 0 0 0 0 0 0 0 0
 0 0 0 0 0 0 0 0
 0 0 0 0 0 0 0 0
 0 0 0 0 0 0 0 0
 0 0 0 0 0 0 0 0
 0 0 0 0 0 0 0 0
 0 0 0 0 0 0 0 0
 0 0 0 0 0 0 0 0
 0 0 0 0 0 0 0 0
 0 0 0 0 0 0 0 0
 0 0 0 0 0 0 0 0
 0 0 0 0 0 0 0 0
 0 0 0 0 0 0 0 0
 0 0 0 0 0 0 0 0
 0 0 0 0 0 0 0 0
 0 0 0 0 0 0 0 0
 0 0 0 0 0 0 0 0
 fleet 2 Discard F at age
 0 0 0 0 0 0 0 0
 0 0 0 0 0 0 0 0
 0 0 0 0 0 0 0 0
 0 0 0 0 0 0 0 0
 0 0 0 0 0 0 0 0
 0 0 0 0 0 0 0 0
 0 0 0 0 0 0 0 0
 0 0 0 0 0 0 0 0
 0 0 0 0 0 0 0 0
 0 0 0 0 0 0 0 0
 0 0 0 0 0 0 0 0
 0 0 0 0 0 0 0 0
 0 0 0 0 0 0 0 0
 0 0 0 0 0 0 0 0
 0 0 0 0 0 0 0 0
 0 0 0 0 0 0 0 0
 0 0 0 0 0 0 0 0
 0 0 0 0 0 0 0 0
 0 0 0 0 0 0 0 0
 0 0 0 0 0 0 0 0
 0 0 0 0 0 0 0 0
 0 0 0 0 0 0 0 0
 0 0 0 0 0 0 0 0
```

```
 0 0 0 0 0 0 0 0
 0 0 0 0 0 0 0 0
Total F
 0.0274542 0.505514 1.11781 1.16218 1.16359 1.16363 1.16363 1.16363
 0.0346137 0.641049 1.42295 1.47963 1.48143 1.48149 1.48149 1.48149
 0.0378661 0.699551 1.55028 1.61194 1.6139 1.61396 1.61396 1.61396
 0.0338896 0.648035 1.46821 1.52781 1.5297 1.52976 1.52976 1.52976
 0.0428304 0.768501 1.66979 1.73496 1.73703 1.73709 1.7371 1.7371
 0.0357962 0.642787 1.39739 1.45196 1.45369 1.45375 1.45375 1.45375
 0.0482335 0.887646 1.96209 2.03994 2.04242 2.04249 2.0425 2.0425
 0.061066 0.855655 1.49772 1.54236 1.54379 1.54384 1.54384 1.54384
 0.0521728 0.685851 1.11336 1.14241 1.14335 1.14338 1.14338 1.14338
 0.0588915 0.825906 1.44703 1.49023 1.49162 1.49166 1.49166 1.49166
 0.0504269 0.771518 1.47565 1.52558 1.52717 1.52722 1.52722 1.52722
 0.0526857 0.726877 1.25042 1.28665 1.28781 1.28785 1.28785 1.28785
 0.0448323 0.649592 1.1783 1.21538 1.21656 1.2166 1.2166 1.2166
 0.011714 0.17784 1.0844 1.69021 1.72717 1.71799 1.71282 1.71081
 0.00993741 0.150617 0.912408 1.42031 1.45069 1.44263 1.43814 1.4364
 0.00638572 0.0961248 0.566501 0.877017 0.89397 0.888071 0.884913 0.88369
 0.00638782 0.0946168 0.520525 0.794184 0.805153 0.797575 0.793779 0.79232
 0.00848276 0.117147 0.436395 0.59576 0.577267 0.557947 0.549392 0.546151
 0.00700041 0.100342 0.470065 0.689597 0.688597 0.676646 0.671102 0.66899
 0.00590109 0.0833053 0.357885 0.512226 0.506407 0.494939 0.489736 0.487759
 0.00446549 0.0640755 0.301895 0.44357 0.443198 0.435649 0.43214 0.430803
 0.0044524 0.0636167 0.292886 0.427642 0.426217 0.418394 0.414784 0.41341
 0.00446183 0.0643719 0.312106 0.462039 0.463024 0.455861 0.452499 0.451217
 0.00460458 0.0663596 0.319939 0.472946 0.473683 0.466212 0.462714 0.461379
 0.00385766 0.0552277 0.257024 0.37639 0.375579 0.36892 0.365837 0.364662
 0.00466635 0.0640468 0.228205 0.30638 0.294669 0.283611 0.278741 0.276897

Average F for ages 4 to 8
Freport unweighted in .std and MCMC files
year    unweighted   Nweighted    Bweighted
1982   1.16333   1.16252   1.16265
1983   1.48111   1.47992   1.4801
1984   1.61354   1.61237   1.61254
1985   1.52936   1.52814   1.52834
1986   1.73665   1.73528   1.73547
1987   1.45338   1.45239   1.45262
1988   2.04197   2.04031   2.04056
1989   1.54353   1.54257   1.54269
1990   1.14318   1.14257   1.14263
1991   1.49137   1.49082   1.49098
1992   1.52688   1.5258   1.52595
1993   1.2876   1.28683   1.28689
1994   1.21635   1.2156   1.21574
1995   1.7118   1.69649   1.70048
1996   1.43763   1.42387   1.42552
1997   0.885532   0.878462   0.879351
1998   0.796603   0.79591   0.796504
1999   0.565303   0.588346   0.585278
2000   0.678987   0.687564   0.685809
2001   0.498213   0.508154   0.505515
2002   0.437072   0.441841   0.440267
2003   0.420089   0.425298   0.423423
2004   0.456928   0.460772   0.45932
2005   0.467387   0.471316   0.469727
2006   0.370278   0.373876   0.37208
2007   0.28806   0.298373   0.29348

Population Numbers at the Start of the Year
 73512 46050.8 20734.2 3070.01 665.997 236.86 61.3409 17.4905
 81631 55146.6 21418 5227.72 747.893 162.016 57.6182 19.2191
 46683 60800.3 22397.4 3980.02 927.138 132.4 28.6803 13.636
 56276.8 34657.5 23290.5 3664.41 618.38 143.768 20.5296 6.58269
 62127.7 41946.4 13977.9 4136.45 619.317 104.314 24.2506 4.58442
 47219.8 45895.3 14997.6 2029.3 568.293 84.9096 14.3007 3.9594
 12831.3 35128.6 18607.7 2859.09 369.996 103.435 15.4536 3.33059
 28919.9 9427.72 11149.2 2016.75 289.547 37.3777 10.4484 1.90085
 36842.6 20977.8 3089.47 1922.55 335.923 48.1598 6.21669 2.05712
 31064.9 26963.4 8146.69 782.425 477.706 83.3903 11.955 2.05898
 35647 22582.7 9102.75 1477.84 137.3 83.7118 14.6124 2.45928
 37235.3 26134.1 8049.96 1604.68 250.324 23.2195 14.1563 2.89113
 42313.1 27236.8 9741.18 1777.58 345.166 53.7822 4.98854 3.66875
 49515 31195.2 10968 2311.89 410.604 79.6358 12.408 2.00582
 36764 37734 20134.3 2859.31 332.159 56.8526 11.1281 2.028
 36984.2 28066.6 25026.7 6234 538.089 60.6381 10.4628 2.4365
 40569.5 28335.2 19657.5 10951.1 2019.8 171.409 19.4307 4.15534
 32112.8 31082 19875.5 9006.37 3854.57 703.172 60.1282 8.32199
 39384.7 24551.5 21316.5 9905.53 3865.81 1685.38 313.455 30.8252
 37170.7 30155.8 17123.1 10272 3870.93 1512.21 667.208 137.201
```

```
42129.8 28491.9 21393.2 9230.8 4793.17 1816.82 717.944 384.685
31684.3 32339.5 20605.2 12196.8 4613.45 2396.46 915.248 559.633
48991.3 24321.7 23398.5 11853.9 6193.72 2346.11 1228.26 761.949
23980.5 37606.6 17584.1 13204.6 5816.03 3035.91 1158.24 990.124
28819 18405.2 27134.9 9845.93 6408.47 2820.56 1483.34 1058.9
39972.2 22135.4 13428.9 16180.3 5262.82 3428.22 1518.94 1379.72

q by index
 index 1 q over time
1992  0.000126184
1993  0.000126184
1994  0.000126184
1995  0.000126184
1996  0.000126184
1997  0.000126184
1998  0.000126184
1999  0.000126184
2000  0.000126184
2001  0.000126184
2002  0.000126184
2003  0.000126184
2004  0.000126184
2005  0.000126184
2006  0.000126184
2007  0.000126184
 index 2 q over time
1992  0.000379466
1993  0.000379466
1994  0.000379466
1995  0.000379466
1996  0.000379466
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1997  3.32673e-05
```

```
1998  3.32673e-05
1999  3.32673e-05
2000  3.32673e-05
2001  3.32673e-05
2002  3.32673e-05
2003  3.32673e-05
2004  3.32673e-05
2005  3.32673e-05
2006  3.32673e-05
 index 37 q over time
1982  6.85207e-06
1983  6.85207e-06
1984  6.85207e-06
1985  6.85207e-06
1986  6.85207e-06
1987  6.85207e-06
1988  6.85207e-06
1989  6.85207e-06
1990  6.85207e-06
1991  6.85207e-06
1992  6.85207e-06
1993  6.85207e-06
1994  6.85207e-06
1995  6.85207e-06
1996  6.85207e-06
1997  6.85207e-06
1998  6.85207e-06
1999  6.85207e-06
2000  6.85207e-06
2001  6.85207e-06
2002  6.85207e-06
2003  6.85207e-06
2004  6.85207e-06
2005  6.85207e-06
2006  6.85207e-06
2007  6.85207e-06
 index 38 q over time
1986  4.64299e-06
1987  4.64299e-06
1988  4.64299e-06
1989  4.64299e-06
1990  4.64299e-06
1991  4.64299e-06
1992  4.64299e-06
1993  4.64299e-06
1994  4.64299e-06
1995  4.64299e-06
1996  4.64299e-06
1997  4.64299e-06
1998  4.64299e-06
1999  4.64299e-06
2000  4.64299e-06
2001  4.64299e-06
2002  4.64299e-06
2003  4.64299e-06
2004  4.64299e-06
2005  4.64299e-06
2006  4.64299e-06
2007  4.64299e-06
 index 39 q over time
1990  8.63746e-07
1992  8.63746e-07
1993  8.63746e-07
1994  8.63746e-07
1995  8.63746e-07
1996  8.63746e-07
1997  8.63746e-07
1999  8.63746e-07
2000  8.63746e-07
2001  8.63746e-07
2002  8.63746e-07
2003  8.63746e-07
2004  8.63746e-07
2005  8.63746e-07
2007  8.63746e-07

Proportions of catch at age by fleet
 fleet 1
Year 1 Obs  =  0.145346 0.527962 0.285212 0.0262759 0.00921763 0.00325989 0.00188287 0.000843076
Year 1 Pred =  0.049384 0.484434 0.388235 0.0590498 0.0128191 0.00455918 0.00118072 0.000337968
Year 2 Obs  =  0.102313 0.592534 0.235019 0.046978 0.014927 0.00695731 0.000344634 0.000926205
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Year 2 Pred =  0.0512962 0.513578 0.335489 0.0838069 0.0119968 0.00259892 0.000924261 0.000309417
Year 3 Obs  =  0.0923461 0.514057 0.310783 0.0639504 0.0166714 0.00191047 8.04408e-05 0.000201102
Year 3 Pred =  0.029454 0.555468 0.336931 0.0611951 0.0142633 0.0020369 0.000441231 0.000210525
Year 4 Obs  =  0.0551004 0.389786 0.48609 0.0477735 0.0134101 0.0068132 0.000811096 0.000216292
Year 4 Pred =  0.0449956 0.409313 0.456434 0.0734316 0.0123989 0.00288268 0.000411637 0.000132464
Year 5 Obs  =  0.0541701 0.481455 0.33418 0.114325 0.00955231 0.00423204 0.00175327 0.000332517
Year 5 Pred =  0.0570858 0.543498 0.294286 0.0889418 0.0133237 0.00224419 0.000521726 9.89693e-05
Year 6 Obs  =  0.0342164 0.530752 0.359106 0.0546401 0.0180365 0.000828885 0.000961507 0.00145884
Year 6 Pred =  0.0402038 0.579018 0.321478 0.0445493 0.0124835 0.00186521 0.000314144 8.72942e-05
Year 7 Obs  =  0.019327 0.520696 0.382537 0.0562958 0.0169045 0.00318606 0.00050029 0.000552952
Year 7 Pred =  0.0135933 0.500978 0.4102 0.0641755 0.00830871 0.0023228 0.000347035 7.50363e-05
Year 8 Obs  =  0.0135973 0.244752 0.573632 0.134542 0.0280693 0.00437341 0.000715649 0.000318066
Year 8 Pred =  0.0588184 0.263107 0.557039 0.103595 0.0148843 0.00192146 0.000537117 9.80668e-05
Year 9 Obs  =  0.0381106 0.599356 0.22759 0.106817 0.0237252 0.00322061 0.00085883 0.000322061
Year 9 Pred =  0.0737869 0.616048 0.174801 0.112403 0.0196574 0.00281827 0.000363796 0.000120849
Year 10 Obs  =  0.0053826 0.484685 0.447632 0.0464406 0.0135817 0.00200283 0.000187765 8.76238e-05
Year 10 Pred =  0.0482566 0.581195 0.316317 0.0312466 0.0190918 0.00333282 0.000477798 8.25889e-05
Year 11 Obs  =  0.01193 0.544721 0.361714 0.068128 0.00908374 0.00423908 0.000121116 6.2375e-05
Year 11 Pred =  0.0572646 0.512767 0.360273 0.0600185 0.00557985 0.00340211 0.000593862 0.000100307
Year 12 Obs  =  0.0148636 0.565594 0.372496 0.0378054 0.00484684 0.00297273 0.00122787 0.000193874
Year 12 Pred =  0.0545833 0.552266 0.316366 0.0650029 0.0101485 0.000941374 0.00057393 0.000117656
Year 13 Obs  =  0.0546856 0.475376 0.397561 0.0573153 0.0123715 0.00161367 0.000776954 0.000299127
Year 13 Pred =  0.0545465 0.520998 0.344764 0.0648166 0.012596 0.0019627 0.000182049 0.000134398
Year 14 Obs  =  0.0207846 0.319422 0.53252 0.091242 0.0297887 0.00577164 0.000375173 9.00414e-05
Year 14 Pred =  0.0294113 0.279512 0.517242 0.14206 0.0258257 0.00503527 0.000786042 0.000127598
Year 15 Obs  =  0.00721218 0.305647 0.549804 0.106069 0.0255535 0.00447653 0.000994784 0.000242479
Year 15 Pred =  0.0136392 0.213678 0.634513 0.120741 0.0143812 0.00247393 0.00048509 8.87848e-05
Year 16 Obs  =  0.000317763 0.122736 0.576343 0.24285 0.0439307 0.0127105 0.000794407 0.000317763
Year 16 Pred =  0.00950554 0.112759 0.630338 0.224686 0.0199686 0.00226042 0.000390575 9.13718e-05
Year 17 Obs  =  0.00138878 0.116581 0.411079 0.383149 0.0756114 0.0106473 0.00146594 7.71545e-05
Year 17 Pred =  0.00928427 0.101434 0.449723 0.363622 0.0692166 0.00590483 0.000670494 0.000144073
Year 18 Obs  =  0.000105218 0.0414558 0.426763 0.380993 0.111741 0.0324071 0.00536611 0.00116792
Year 18 Pred =  0.00673953 0.101067 0.433126 0.298525 0.133522 0.0246137 0.00211279 0.000294108
Year 19 Obs  =  0 0.0624861 0.480027 0.317861 0.106896 0.0255895 0.00520717 0.00193409
Year 19 Pred =  0.0078247 0.0761177 0.432957 0.298404 0.120791 0.0530394 0.0098889 0.0009775
Year 20 Obs  =  0 0.155561 0.362784 0.319844 0.115401 0.0324924 0.0108308 0.0030863
Year 20 Pred =  0.007309 0.0932291 0.361614 0.330361 0.129402 0.0509129 0.0225174 0.00465481
Year 21 Obs  =  9.43556e-05 0.0640675 0.434696 0.340718 0.119266 0.0278349 0.0117945 0.00152856
Year 21 Pred =  0.00732134 0.0785039 0.409216 0.270232 0.145504 0.055453 0.0219498 0.0118205
Year 22 Obs  =  0 0.0676562 0.371839 0.344235 0.139101 0.0496146 0.0200262 0.00752842
Year 22 Pred =  0.00495905 0.080269 0.356434 0.323863 0.127086 0.0663836 0.0253968 0.015608
Year 23 Obs  =  0.00188235 0.041098 0.374195 0.341019 0.147294 0.0595293 0.0232941 0.0116878
Year 23 Pred =  0.00719677 0.0566396 0.376594 0.290958 0.157549 0.0599921 0.0314581 0.0196128
Year 24 Obs  =  0.000249326 0.0587578 0.252733 0.332435 0.185748 0.0877627 0.0421361 0.0401781
Year 24 Pred =  0.00361273 0.0897368 0.289239 0.330823 0.151021 0.0792574 0.0302879 0.0260219
Year 25 Obs  =  0.000371652 0.0432045 0.378063 0.286822 0.162969 0.0790689 0.0336345 0.0158658
Year 25 Pred =  0.00400102 0.0406719 0.423098 0.237199 0.160122 0.0708334 0.0373076 0.0267667
Year 26 Obs  =  0.000251762 0.0304632 0.183661 0.454431 0.194361 0.0813192 0.0342397 0.0212739
Year 26 Pred =  0.00571511 0.0501845 0.218591 0.414476 0.140515 0.0921871 0.040941 0.0373903
 fleet 2
Year 1 Obs  =  0.212871 0.787129 0 0 0 0 0
Year 1 Pred =  0.204666 0.773764 0.0214714 9.74591e-05 6.34572e-07 6.77087e-09 5.26067e-11 4.51762e-13
Year 2 Obs  =  0.158085 0.841915 0 0 0 0 0
Year 2 Pred =  0.20216 0.780064 0.0176439 0.000131533 5.64727e-07 3.67029e-09 3.91598e-11 3.93304e-13
Year 3 Obs  =  0.170732 0.829268 0 0 0 0 0
Year 3 Pred =  0.118741 0.863034 0.018126 9.82463e-05 6.86811e-07 2.94254e-09 1.9123e-11 2.73737e-13
Year 4 Obs  =  0.162602 0.837398 0 0 0 0 0
Year 4 Pred =  0.215428 0.755269 0.0291619 0.00014001 7.0905e-07 4.94568e-09 2.11876e-11 2.04552e-13
Year 5 Obs  =  0.109729 0.890271 0 0 0 0 0
Year 5 Pred =  0.211027 0.774324 0.0145173 0.000130937 5.883e-07 2.97281e-09 2.07343e-11 1.18001e-13
Year 6 Obs  =  0.0805471 0.919453 0 0 0 0 0
Year 6 Pred =  0.150201 0.833705 0.0160274 6.62812e-05 5.57063e-07 2.49707e-09 1.26174e-11 1.05188e-13
Year 7 Obs  =  0.0763889 0.923611 0 0 0 0 0
Year 7 Pred =  0.0640677 0.910012 0.0257998 0.000120456 4.67747e-07 3.92304e-09 1.75842e-11 1.14067e-13
Year 8 Obs  =  0.303895 0.659853 0.0362514 0 0 0 0 0
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Year 8 Pred =  0.350746 0.604679 0.0443273 0.000246016 1.06016e-06 4.10589e-09 3.44338e-11
1.88615e-13
Year 9 Obs   =  0.313165 0.672856 0.0139787 0 0 0 0 0
Year 9 Pred =  0.235297 0.757121 0.00743854 0.000142744 7.4873e-07 3.22045e-09 1.24718e-11
1.24295e-13
Year 10 Obs  =  0.172122 0.827878 0 0 0 0 0 0
Year 10 Pred =  0.174537 0.81015 0.0152672 4.50066e-05 8.24783e-07 4.31955e-09 1.85785e-11
9.63442e-14
Year 11 Obs  =  0.341791 0.646836 0.0104987 0.000874891 0 0 0 0
Year 11 Pred =  0.220488 0.760909 0.0185113 9.20295e-05 2.56616e-07 4.69401e-09 2.45821e-11
1.24568e-13
Year 12 Obs  =  0.237464 0.722774 0.0395405 0.000220897 0 0 0 0
Year 12 Pred =  0.200914 0.783451 0.0155398 9.52854e-05 4.46184e-07 1.24168e-09 2.27114e-11
1.39681e-13
Year 13 Obs  =  0.196259 0.67182 0.122943 0.00897756 0 0 0 0
Year 13 Pred =  0.209821 0.772382 0.0176974 9.92915e-05 5.78732e-07 2.70541e-09 7.52846e-12
1.66744e-13
Year 14 Obs  =  0.154639 0.738519 0.0965323 0.0103093 0 0 0 0
Year 14 Pred =  0.0877395 0.650955 0.234019 0.0250301 0.00208387 0.000162421 9.36956e-06
5.44356e-07
Year 15 Obs  =  0.0323009 0.834956 0.105752 0.0269912 0 0 0 0
Year 15 Pred =  0.0479861 0.586889 0.338566 0.0250893 0.00136855 9.41135e-05 6.81931e-06
4.46706e-07
Year 16 Obs  =  0.0158494 0.52947 0.407628 0.047053 0 0 0 0
Year 16 Pred =  0.0459273 0.425322 0.461897 0.0641178 0.00260963 0.000118093 7.54035e-06
6.31342e-07
Year 17 Obs  =  0.0119311 0.379585 0.483429 0.125055 0 0 0 0
Year 17 Pred =  0.0515527 0.439702 0.378727 0.119251 0.0103957 0.000354529 1.48762e-05 1.14405e-
06
Year 18 Obs  =  0.0376254 0.378344 0.467809 0.116221 0 0 0 0
Year 18 Pred =  0.0389912 0.456477 0.38004 0.102006 0.0208943 0.00153976 4.88412e-05 2.43334e-06
Year 19 Obs  =  0.00768693 0.262404 0.544025 0.185884 0 0 0 0
Year 19 Pred =  0.0506725 0.384823 0.425233 0.114135 0.0211581 0.00371401 0.000255885 9.05273e-06
Year 20 Obs  =  0.00380491 0.470425 0.343826 0.176064 0.00588032 0 0 0
Year 20 Pred =  0.0460866 0.458922 0.345811 0.123031 0.0220696 0.00347124 0.00056732 4.19736e-05
Year 21 Obs  =  0.0455251 0.356441 0.408174 0.18986 0 0 0 0
Year 21 Pred =  0.0483991 0.405143 0.410276 0.105509 0.0260171 0.0039638 0.000579789 0.000111748
Year 22 Obs  =  0.0224967 0.462726 0.37715 0.110278 0.0172034 0.00441112 0.00441112 0.00132333
Year 22 Pred =  0.0341796 0.431904 0.372586 0.131838 0.0236921 0.00494732 0.000699424 0.000153842
Year 23 Obs  =  0.0436105 0.277383 0.470588 0.182556 0.0147059 0.00456389 0.0035497 0.0030426
Year 23 Pred =  0.0550307 0.33811 0.436735 0.131403 0.0325852 0.00496022 0.000961154 0.000214469
Year 24 Obs  =  0.100781 0.466406 0.326172 0.0828125 0.0117188 0.00507813 0.00390625 0.003125
Year 24 Pred =  0.0254107 0.492744 0.308542 0.137431 0.0287314 0.00602782 0.000851221 0.000261744
Year 25 Obs  =  0.0755703 0.285646 0.507605 0.0936312 0.019962 0.00855513 0.00522814 0.00380228
Year 25 Pred =  0.0335615 0.26634 0.538258 0.117515 0.0363296 0.00642465 0.00125044 0.000321088
Year 26 Obs  =  0.0476397 0.301429 0.326548 0.263317 0.044175 0.0103941 0.00476397 0.00173235
Year 26 Pred =  0.0531444 0.364312 0.308278 0.227636 0.0353423 0.00926922 0.00152119 0.000497222

Proportions of Discards at age by fleet
 fleet 1
Year 1 Obs   =  0 0 0 0 0 0 0 0
Year 1 Pred =  1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15
Year 2 Obs   =  0 0 0 0 0 0 0 0
Year 2 Pred =  1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15
Year 3 Obs   =  0 0 0 0 0 0 0 0
Year 3 Pred =  1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15
Year 4 Obs   =  0 0 0 0 0 0 0 0
Year 4 Pred =  1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15
Year 5 Obs   =  0 0 0 0 0 0 0 0
Year 5 Pred =  1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15
Year 6 Obs   =  0 0 0 0 0 0 0 0
Year 6 Pred =  1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15
Year 7 Obs   =  0 0 0 0 0 0 0 0
Year 7 Pred =  1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15
Year 8 Obs   =  0 0 0 0 0 0 0 0
Year 8 Pred =  1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15
Year 9 Obs   =  0 0 0 0 0 0 0 0
Year 9 Pred =  1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15
Year 10 Obs  =  0 0 0 0 0 0 0 0
Year 10 Pred =  1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15
Year 11 Obs  =  0 0 0 0 0 0 0 0
Year 11 Pred =  1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15
Year 12 Obs  =  0 0 0 0 0 0 0 0
Year 12 Pred =  1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15
Year 13 Obs  =  0 0 0 0 0 0 0 0
Year 13 Pred =  1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15
Year 14 Obs  =  0 0 0 0 0 0 0 0
Year 14 Pred =  1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15
Year 15 Obs  =  0 0 0 0 0 0 0 0
Year 15 Pred =  1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15
Year 16 Obs  =  0 0 0 0 0 0 0 0
```

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Year 16 Pred =  1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15
Year 17 Obs  =  0 0 0 0 0 0 0 0
Year 17 Pred =  1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15
Year 18 Obs  =  0 0 0 0 0 0 0 0
Year 18 Pred =  1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15
Year 19 Obs  =  0 0 0 0 0 0 0 0
Year 19 Pred =  1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15
Year 20 Obs  =  0 0 0 0 0 0 0 0
Year 20 Pred =  1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15
Year 21 Obs  =  0 0 0 0 0 0 0 0
Year 21 Pred =  1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15
Year 22 Obs  =  0 0 0 0 0 0 0 0
Year 22 Pred =  1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15
Year 23 Obs  =  0 0 0 0 0 0 0 0
Year 23 Pred =  1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15
Year 24 Obs  =  0 0 0 0 0 0 0 0
Year 24 Pred =  1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15
Year 25 Obs  =  0 0 0 0 0 0 0 0
Year 25 Pred =  1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15
Year 26 Obs  =  0 0 0 0 0 0 0 0
Year 26 Pred =  1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15
 fleet 2
Year 1 Obs  =  0 0 0 0 0 0 0 0
Year 1 Pred =  1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15
Year 2 Obs  =  0 0 0 0 0 0 0 0
Year 2 Pred =  1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15
Year 3 Obs  =  0 0 0 0 0 0 0 0
Year 3 Pred =  1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15
Year 4 Obs  =  0 0 0 0 0 0 0 0
Year 4 Pred =  1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15
Year 5 Obs  =  0 0 0 0 0 0 0 0
Year 5 Pred =  1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15
Year 6 Obs  =  0 0 0 0 0 0 0 0
Year 6 Pred =  1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15
Year 7 Obs  =  0 0 0 0 0 0 0 0
Year 7 Pred =  1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15
Year 8 Obs  =  0 0 0 0 0 0 0 0
Year 8 Pred =  1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15
Year 9 Obs  =  0 0 0 0 0 0 0 0
Year 9 Pred =  1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15
Year 10 Obs  =  0 0 0 0 0 0 0 0
Year 10 Pred =  1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15
Year 11 Obs  =  0 0 0 0 0 0 0 0
Year 11 Pred =  1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15
Year 12 Obs  =  0 0 0 0 0 0 0 0
Year 12 Pred =  1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15
Year 13 Obs  =  0 0 0 0 0 0 0 0
Year 13 Pred =  1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15
Year 14 Obs  =  0 0 0 0 0 0 0 0
Year 14 Pred =  1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15
Year 15 Obs  =  0 0 0 0 0 0 0 0
Year 15 Pred =  1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15
Year 16 Obs  =  0 0 0 0 0 0 0 0
Year 16 Pred =  1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15
Year 17 Obs  =  0 0 0 0 0 0 0 0
Year 17 Pred =  1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15
Year 18 Obs  =  0 0 0 0 0 0 0 0
Year 18 Pred =  1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15
Year 19 Obs  =  0 0 0 0 0 0 0 0
Year 19 Pred =  1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15
Year 20 Obs  =  0 0 0 0 0 0 0 0
Year 20 Pred =  1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15
Year 21 Obs  =  0 0 0 0 0 0 0 0
Year 21 Pred =  1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15
Year 22 Obs  =  0 0 0 0 0 0 0 0
Year 22 Pred =  1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15
Year 23 Obs  =  0 0 0 0 0 0 0 0
Year 23 Pred =  1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15
Year 24 Obs  =  0 0 0 0 0 0 0 0
Year 24 Pred =  1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15
Year 25 Obs  =  0 0 0 0 0 0 0 0
Year 25 Pred =  1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15
Year 26 Obs  =  0 0 0 0 0 0 0 0
Year 26 Pred =  1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15 1e-15

F Reference Points Using Final Year Selectivity and Freport options
 refpt        F          slope to plot on SRR
  F0.1     0.201454      0.506501
  Fmax     0.419999      0.891641
  F30%SPR  0.305528      0.687652
  F40%SPR  0.206915      0.515744
```

```
  Fmsy      0.419984      0.891614      SSBmsy   43898.1    MSY    14686.3
  Fcurrent 0.28806       0.656698


Stock-Recruitment Relationship Parameters
 alpha    = 39140.3
 beta     = 0.260441
 unexpl   = 208427
 steepness = 0.999995
Spawning Stock, Obs Recruits(year+1), Pred Recruits(year+1), standardized residual
init xxxx 73512 39139.8  1.33433
1982  24674.1  81631   39139.9  1.55609
1983  24637.2  46683   39139.9  0.373083
1984  20983.9  56276.8 39139.9  0.768746
1985  18724.4  62127.7 39139.8  0.978135
1986  17691.4  47219.8 39139.8  0.397293
1987  18338.1  12831.3 39139.8  -2.36092
1988  10860.9  28919.9 39139.4  -0.640588
1989  7016.68  36842.6 39138.9  -0.127994
1990  9576.14  31064.9 39139.3  -0.489117
1991  9151.69  35647   39139.2  -0.197847
1992  10535.6  37235.3 39139.4  -0.105578
1993  12098.5  42313.1 39139.5  0.165048
1994  15053.4  49515   39139.7  0.497774
1995  20670.9  36764   39139.9  -0.132567
1996  23326.5  36984.2 39139.9  -0.119928
1997  24649.9  40569.5 39139.9  0.0759434
1998  27654.2  32112.8 39140    -0.418919
1999  28054.4  39384.7 39140    0.0131966
2000  30320.6  37170.7 39140    -0.109287
2001  35650.5  42129.8 39140.1  0.155825
2002  40412    31684.3 39140.1  -0.447363
2003  43672.8  48991.3 39140.1  0.475241
2004  43932.2  23980.5 39140.1  -1.0371
2005  42080.6  28819   39140.1  -0.648022
2006  41671.3  39972.2 39140.1  0.044534
2007  43363.2          xxxx     39140.1


Root Mean Square Error computed from Standardized Residuals
Component                 #resids        RMSE
_Catch_Fleet_1            26             0.239034
_Catch_Fleet_2            26             0.0172357
Catch_Fleet_Total         52             0.169462
_Discard_Fleet_1          0              0
_Discard_Fleet_2          0              0
Discard_Fleet_Total       0              0
_Index_1                  16             2.47416
_Index_2                  16             1.56581
_Index_3                  16             1.7774
_Index_4                  16             2.30417
_Index_5                  15             2.01824
_Index_6                  26             1.84718
_Index_7                  26             1.24458
_Index_8                  25             1.90547
_Index_9                  21             1.10394
_Index_10                 16             1.12998
_Index_11                 25             0.52376
_Index_12                 25             0.974942
_Index_13                 23             0.874376
_Index_14                 26             1.58857
_Index_15                 26             1.27939
_Index_16                 25             1.01676
_Index_17                 23             1.55624
_Index_18                 24             1.25105
_Index_19                 24             1.25697
_Index_20                 23             1.40824
_Index_21                 23             1.32506
_Index_22                 23             1.00765
_Index_23                 23             0.845876
_Index_24                 23             1.45351
_Index_25                 26             1.28712
_Index_26                 21             1.53474
_Index_27                 18             1.46784
_Index_28                 18             1.49051
_Index_29                 20             1.02325
_Index_30                 20             1.59283
_Index_31                 17             1.35936
_Index_32                 16             1.40278
_Index_33                 20             1.64523
_Index_34                 25             1.05951
_Index_35                 26             1.09205
_Index_36                 19             1.04855
```

```
_Index_37                   26        1.33618
_Index_38                   22        1.55052
_Index_39                   15        1.34453
Index_Total                838        1.4048
Nyear1                       7        0.353234
Fmult_Year1                  2        1.57592
_Fmult_devs_Fleet_1          0        0
_Fmult_devs_Fleet_2          0        0
Fmult_devs_Total             0        0
Recruit_devs                 0        0
Fleet_Sel_params            12         1.79915
Index_Sel_params             0        0
q_year1                      0        0
q_devs                       0        0
SRR_steepness                1        -0.463041
SRR_unexpl_S                 1        -2.91758

Projections not requested

that's all
```