Norton Sound red king crab stock assessment

Appendix C: Model data and control files

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Model 26.0 data file

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#======================================================================================================
# Gmacs Main  Data  File  NSRKC 2025 - May 2026 - used with GMACS version 2.20.34a
# GEAR_INDEX   DESCRIPTION
#    1         : Winter Commercial Fishery Retained catch
#    2         : Winter Subsistence Fishery Retained catch
#    3         : Winter Subsistence Fishery Total catch
#    4         : Summer Commercial Fishery Retained catch
#    5         : Summer Commercial Fishery Total catch
#    6         : ADF&G Survey
#    7         : NMFS Survey
#    8         : Pot CPUE

# Fisheries:  1 Winter Pot Fishery, 2 Winter Subsistace, 3 Summer Pot Fishery
# Surveys:    4 NMFS Trawl Survey, 5 ADFG Trawl Survey, 6 NBS Trawl Survey, 7 Winter Pot survey
#======================================================================================================

1976  # Start year
2025  # End year
#2025  # Projection year
7     # Number of seasons
7     # Number of distinct data groups (fleet, among fishing fleets and surveys)
1     # Number of sexes
1     # Number of shell condition types
1     # Number of maturity types
8     # Number of size-classes in the model
7     # Season recruitment occurs
4     # Season molting and growth occurs
1     # Season to calculate SSB
1     # Season for N output
# maximum size-class (males then females)
8
# size_breaks (a vector giving the break points between size intervals with dimension nclass+1)
63.5    73.5    83.5    93.5    103.5   113.5   123.5   133.5   143.5
# Natural mortality per season input type (1 = vector by season, 2 = matrix by season/year)
2
# Proportion of the total natural mortality to be applied each season (each row must add to 1)
# 1. Winter Fishery (Feb01)
# 2. Mortality between winter and summer fishery
# 3. Summer fishery
# 4. Time between summer fishery and Nov 1 (Molt and recruit)
# 5. Time to Feb 01
# 6. Feb 01 recruit

0   0   0.3452055   0.1863014   0.1351932   0.3333  0 # 1976
0   0   0.3452055   0.1863014   0.1351932   0.3333  0 # 1977
0   0   0.3452055   0.1863014   0.1351932   0.3333  0 # 1978
0   0   0.4493151   0.04109589  0.176289    0.3333  0 # 1979
```

```
0   0   0.4493151   0.04109589  0.176289    0.3333  0 # 1980
0   0   0.4493151   0.1013699   0.1160151   0.3333  0 # 1981
0   0   0.5150685   0.06027397  0.09135753  0.3333  0 # 1982
0   0   0.4931507   0.0109589   0.1625904   0.3333  0 # 1983
0   0   0.4931507   0.03835616  0.1351932   0.3333  0 # 1984
0   0   0.4931507   0.06027397  0.1132753   0.3333  0 # 1985
0   0   0.4931507   0.06575342  0.1077959   0.3333  0 # 1986
0   0   0.4931507   0.03013699  0.1434123   0.3333  0 # 1987
0   0   0.4931507   0.02739726  0.1461521   0.3333  0 # 1988
0   0   0.4931507   0.008219178 0.1653301   0.3333  0 # 1989
0   0   0.4931507   0.0109589   0.1625904   0.3333  0 # 1990
0   0   0.4931507   0.0109589   0.1625904   0.3333  0 # 1991
0   0   0.4931507   0.005479452 0.1680699   0.3333  0 # 1992
0   0   0.4109589   0.1561644   0.09957671  0.3333  0 # 1993
0   0   0.4109589   0.07945205  0.176289    0.3333  0 # 1994
0   0   0.4109589   0.1643836   0.09135753  0.3333  0 # 1995
0   0   0.4109589   0.169863    0.08587808  0.3333  0 # 1996
0   0   0.4109589   0.1150685   0.1406726   0.3333  0 # 1997
0   0   0.4109589   0.169863    0.08587808  0.3333  0 # 1998
0   0   0.4109589   0.1726027   0.08313836  0.3333  0 # 1999
0   0   0.4109589   0.2410959   0.01464521  0.3333  0 # 2000
0   0   0.4109589   0.1863014   0.06943973  0.3333  0 # 2001
0   0   0.3671233   0.2136986   0.08587808  0.3333  0 # 2002
0   0   0.3671233   0.1890411   0.1105356   0.3333  0 # 2003
0   0   0.3671233   0.1452055   0.1543712   0.3333  0 # 2004
0   0   0.3671233   0.1972603   0.1023164   0.3333  0 # 2005
0   0   0.3671233   0.1835616   0.1160151   0.3333  0 # 2006
0   0   0.3671233   0.169863    0.1297137   0.3333  0 # 2007
0   0   0.3890411   0.1917808   0.08587808  0.3333  0 # 2008
0   0   0.3671233   0.260274    0.03930274  0.3333  0 # 2009
0   0   0.4027397   0.1534247   0.1105356   0.3333  0 # 2010
0   0   0.4027397   0.08767123  0.176289    0.3333  0 # 2011
0   0   0.4054795   0.1890411   0.07217945  0.3333  0 # 2012
0   0   0.4164384   0.1945205   0.0557411   0.3333  0 # 2013
0   0   0.3945205   0.1369863   0.1351932   0.3333  0 # 2014
0   0   0.4054795   0.06849315  0.1927274   0.3333  0 # 2015
0   0   0.4000000   0.06575342  0.2009466   0.3333  0 # 2016
0   0   0.3972603   0.07945205  0.1899877   0.3333  0 # 2017
0   0   0.3917808   0.09589041  0.1790288   0.3333  0 # 2018
0   0   0.3945205   0.1643836   0.1077959   0.3333  0 # 2019
0   0   0.3945205   0.1643836   0.1077959   0.3333  0 # 2020
0   0   0.3945205   0.1643836   0.1077959   0.3333  0 # 2021
0   0   0.3671233   0.109589    0.189987    0.3333  0 # 2022
0   0   0.3835616   0.07671233  0.206426    0.3333  0 # 2023
0   0   0.3643836   0.07945205  0.2228644   0.3333  0 # 2024
0   0   0.4036036   0.097297297  0.1657658  0.333333  0 #   2025 # is this order correct?

# Fishing fleet names (delimited with : no spaces in names)
Winter_Com Subsistence Summer_Com
# Survey names (delimited with : no spaces in names)
NMFS_Trawl ADFG_Trawl NBS_Trawl Winter_Pot
# Are the seasons instantaneous (0) or continuous (1)
1 1 1 1 1 1 1

##  ---------------------------------------------------------------------------------------  ##
# Catch data
##  ---------------------------------------------------------------------------------------  ##
# Use Old format (0)
0
# Number  of  catch data  frames
 4
# Number  of  rows  in  each  data  frame
 47  48  42 46

##  Type of catch: 1 = retained, 2 = discard
##  Units of catch: 1 = biomass, 2 = numbers

##      Winter commercial retained
# year  seas    fleet   sex     obs     cv      type    units   mult    effort  discard_mortality
1978    2   1   1   9.625   0.03    1   2   1   0   0.2
1979    2   1   1   0.221   0.03    1   2   1   0   0.2
1980    2   1   1   0.022   0.03    1   2   1   0   0.2
```

```
#1981   2   1   1   0       0.03    1   2   1   0   0.2
1982    2   1   1   0.017   0.03    1   2   1   0   0.2
1983    2   1   1   0.549   0.03    1   2   1   0   0.2
1984    2   1   1   0.856   0.03    1   2   1   0   0.2
1985    2   1   1   1.168   0.03    1   2   1   0   0.2
1986    2   1   1   2.168   0.03    1   2   1   0   0.2
1987    2   1   1   1.04    0.03    1   2   1   0   0.2
1988    2   1   1   0.425   0.03    1   2   1   0   0.2
1989    2   1   1   0.403   0.03    1   2   1   0   0.2
1990    2   1   1   3.626   0.03    1   2   1   0   0.2
1991    2   1   1   3.8     0.03    1   2   1   0   0.2
1992    2   1   1   7.478   0.03    1   2   1   0   0.2
1993    2   1   1   1.788   0.03    1   2   1   0   0.2
1994    2   1   1   5.753   0.03    1   2   1   0   0.2
1995    2   1   1   7.538   0.03    1   2   1   0   0.2
1996    2   1   1   1.778   0.03    1   2   1   0   0.2
1997    2   1   1   0.083   0.03    1   2   1   0   0.2
1998    2   1   1   0.984   0.03    1   2   1   0   0.2
1999    2   1   1   2.714   0.03    1   2   1   0   0.2
2000    2   1   1   3.045   0.03    1   2   1   0   0.2
2001    2   1   1   1.098   0.03    1   2   1   0   0.2
2002    2   1   1   2.591   0.03    1   2   1   0   0.2
2003    2   1   1   6.853   0.03    1   2   1   0   0.2
2004    2   1   1   0.522   0.03    1   2   1   0   0.2
2005    2   1   1   2.121   0.03    1   2   1   0   0.2
2006    2   1   1   0.075   0.03    1   2   1   0   0.2
2007    2   1   1   3.313   0.03    1   2   1   0   0.2
2008    2   1   1   5.796   0.03    1   2   1   0   0.2
2009    2   1   1   4.951   0.03    1   2   1   0   0.2
2010    2   1   1   4.834   0.03    1   2   1   0   0.2
2011    2   1   1   3.365   0.03    1   2   1   0   0.2
2012    2   1   1   9.157   0.03    1   2   1   0   0.2
2013    2   1   1   22.639  0.03    1   2   1   0   0.2
2014    2   1   1   14.986  0.03    1   2   1   0   0.2
2015    2   1   1   41.046  0.03    1   2   1   0   0.2
2016    2   1   1   29.792  0.03    1   2   1   0   0.2
2017    2   1   1   26.008  0.03    1   2   1   0   0.2
2018    2   1   1   9.18    0.03    1   2   1   0   0.2
2019    2   1   1   1.05    0.03    1   2   1   0   0.2
2020    2   1   1   0.08    0.03    1   2   1   0   0.2
2021    2   1   1   0.32    0.03    1   2   1   0   0.2
2022    2   1   1   2.708   0.03    1   2   1   0   0.2
2023    2   1   1   3.580   0.03    1   2   1   0   0.2
2024    2   1   1   4.830   0.03    1   2   1   0   0.2
2025    2   1   1   2.657   0.03    1   2   1   0   0.2

#       Subsistence retained
1978    2   2   1   12.506  0.03    1   2   1   0   0.2
1979    2   2   1   0.224   0.03    1   2   1   0   0.2
1980    2   2   1   0.213   0.03    1   2   1   0   0.2
1981    2   2   1   0.36    0.03    1   2   1   0   0.2
1982    2   2   1   1.288   0.03    1   2   1   0   0.2
1983    2   2   1   10.432  0.03    1   2   1   0   0.2
1984    2   2   1   11.22   0.03    1   2   1   0   0.2
1985    2   2   1   8.377   0.03    1   2   1   0   0.2
1986    2   2   1   7.052   0.03    1   2   1   0   0.2
1987    2   2   1   5.772   0.03    1   2   1   0   0.2
1988    2   2   1   2.724   0.03    1   2   1   0   0.2
1989    2   2   1   6.126   0.03    1   2   1   0   0.2
1990    2   2   1   12.152  0.03    1   2   1   0   0.2
1991    2   2   1   7.366   0.03    1   2   1   0   0.2
1992    2   2   1   11.736  0.03    1   2   1   0   0.2
1993    2   2   1   1.097   0.03    1   2   1   0   0.2
1994    2   2   1   4.113   0.03    1   2   1   0   0.2
1995    2   2   1   5.426   0.03    1   2   1   0   0.2
1996    2   2   1   1.679   0.03    1   2   1   0   0.2
1997    2   2   1   0.745   0.03    1   2   1   0   0.2
1998    2   2   1   8.622   0.03    1   2   1   0   0.2
1999    2   2   1   7.533   0.03    1   2   1   0   0.2
2000    2   2   1   5.723   0.03    1   2   1   0   0.2
2001    2   2   1   0.256   0.03    1   2   1   0   0.2
2002    2   2   1   2.177   0.03    1   2   1   0   0.2
```

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2003    2   2   1   4.14    0.03    1   2   1   0   0.2
2004    2   2   1   1.181   0.03    1   2   1   0   0.2
2005    2   2   1   3.973   0.03    1   2   1   0   0.2
2006    2   2   1   1.239   0.03    1   2   1   0   0.2
2007    2   2   1   10.69   0.03    1   2   1   0   0.2
2008    2   2   1   9.485   0.03    1   2   1   0   0.2
2009    2   2   1   4.752   0.03    1   2   1   0   0.2
2010    2   2   1   7.044   0.03    1   2   1   0   0.2
2011    2   2   1   6.64    0.03    1   2   1   0   0.2
2012    2   2   1   7.311   0.03    1   2   1   0   0.2
2013    2   2   1   7.622   0.03    1   2   1   0   0.2
2014    2   2   1   3.252   0.03    1   2   1   0   0.2
2015    2   2   1   7.651   0.03    1   2   1   0   0.2
2016    2   2   1   5.34    0.03    1   2   1   0   0.2
2017    2   2   1   6.039   0.03    1   2   1   0   0.2
2018    2   2   1   4.424   0.03    1   2   1   0   0.2
2019    2   2   1   1.54    0.03    1   2   1   0   0.2
2020    2   2   1   0.55    0.03    1   2   1   0   0.2
2021    2   2   1   2.892   0.03    1   2   1   0   0.2
2022    2   2   1   7.630   0.03    1   2   1   0   0.2
2023    2   2   1   5.407   0.03    1   2   1   0   0.2
2024    2   2   1   4.751   0.03    1   2   1   0   0.2
2025    2   2   1   1.897   0.03    1   2   1   0   0.2

# Subistence total
#1978   2   2   1   0   0.03    0   2   1   0   0.2
#1979   2   2   1   0   0.03    0   2   1   0   0.2
#1980   2   2   1   0   0.03    0   2   1   0   0.2
#1981   2   2   1   0   0.03    0   2   1   0   0.2
#1982   2   2   1   0   0.03    0   2   1   0   0.2
#1983   2   2   1   0   0.03    0   2   1   0   0.2
1984    2   2   1   15.923  0.03    0   2   1   0   0.2
1985    2   2   1   10.757  0.03    0   2   1   0   0.2
1986    2   2   1   10.751  0.03    0   2   1   0   0.2
1987    2   2   1   7.406   0.03    0   2   1   0   0.2
1988    2   2   1   3.573   0.03    0   2   1   0   0.2
1989    2   2   1   7.945   0.03    0   2   1   0   0.2
1990    2   2   1   16.635  0.03    0   2   1   0   0.2
1991    2   2   1   9.295   0.03    0   2   1   0   0.2
1992    2   2   1   15.051  0.03    0   2   1   0   0.2
1993    2   2   1   1.193   0.03    0   2   1   0   0.2
1994    2   2   1   4.894   0.03    0   2   1   0   0.2
1995    2   2   1   7.777   0.03    0   2   1   0   0.2
1996    2   2   1   2.936   0.03    0   2   1   0   0.2
1997    2   2   1   1.617   0.03    0   2   1   0   0.2
1998    2   2   1   20.327  0.03    0   2   1   0   0.2
1999    2   2   1   10.651  0.03    0   2   1   0   0.2
2000    2   2   1   9.816   0.03    0   2   1   0   0.2
2001    2   2   1   0.366   0.03    0   2   1   0   0.2
2002    2   2   1   5.119   0.03    0   2   1   0   0.2
2003    2   2   1   9.052   0.03    0   2   1   0   0.2
2004    2   2   1   1.775   0.03    0   2   1   0   0.2
2005    2   2   1   6.484   0.03    0   2   1   0   0.2
2006    2   2   1   2.083   0.03    0   2   1   0   0.2
2007    2   2   1   21.444  0.03    0   2   1   0   0.2
2008    2   2   1   18.621  0.03    0   2   1   0   0.2
2009    2   2   1   6.971   0.03    0   2   1   0   0.2
2010    2   2   1   9.004   0.03    0   2   1   0   0.2
2011    2   2   1   9.183   0.03    0   2   1   0   0.2
2012    2   2   1   11.341  0.03    0   2   1   0   0.2
2013    2   2   1   21.524  0.03    0   2   1   0   0.2
2014    2   2   1   5.421   0.03    0   2   1   0   0.2
2015    2   2   1   9.84    0.03    0   2   1   0   0.2
2016    2   2   1   6.468   0.03    0   2   1   0   0.2
2017    2   2   1   7.185   0.03    0   2   1   0   0.2
2018    2   2   1   5.767   0.03    0   2   1   0   0.2
2019    2   2   1   2.079   0.03    0   2   1   0   0.2
2020    2   2   1   0.815   0.03    0   2   1   0   0.2
2021    2   2   1   3.999   0.03    0   2   1   0   0.2
2022    2   2   1   10.041  0.03    0   2   1   0   0.2
2023    2   2   1   6.613   0.03    0   2   1   0   0.2
2024    2   2   1   5.9879  0.03    0   2   1   0   0.2
```

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2025    2   2   1   2.239   0.03    0   2   1   0   0.2

# Summer Commercial Retain
1977    4   3   1   195.877 0.03    1   2   1   0   0.2
1978    4   3   1   660.829 0.03    1   2   1   0   0.2
1979    4   3   1   970.962 0.03    1   2   1   0   0.2
1980    4   3   1   329.778 0.03    1   2   1   0   0.2
1981    4   3   1   376.313 0.03    1   2   1   0   0.2
1982    4   3   1   63.949  0.03    1   2   1   0   0.2
1983    4   3   1   132.205 0.03    1   2   1   0   0.2
1984    4   3   1   139.759 0.03    1   2   1   0   0.2
1985    4   3   1   146.669 0.03    1   2   1   0   0.2
1986    4   3   1   162.438 0.03    1   2   1   0   0.2
1987    4   3   1   103.338 0.03    1   2   1   0   0.2
1988    4   3   1   76.148  0.03    1   2   1   0   0.2
1989    4   3   1   79.116  0.03    1   2   1   0   0.2
1990    4   3   1   59.132  0.03    1   2   1   0   0.2
#1991   4   3   1   0       0.03    1   2   1   0   0.2
1992    4   3   1   24.902  0.03    1   2   1   0   0.2
1993    4   3   1   115.913 0.03    1   2   1   0   0.2
1994    4   3   1   108.824 0.03    1   2   1   0   0.2
1995    4   3   1   105.967 0.03    1   2   1   0   0.2
1996    4   3   1   74.752  0.03    1   2   1   0   0.2
1997    4   3   1   32.606  0.03    1   2   1   0   0.2
1998    4   3   1   10.661  0.03    1   2   1   0   0.2
1999    4   3   1   8.734   0.03    1   2   1   0   0.2
2000    4   3   1   111.728 0.03    1   2   1   0   0.2
2001    4   3   1   98.321  0.03    1   2   1   0   0.2
2002    4   3   1   86.666  0.03    1   2   1   0   0.2
2003    4   3   1   93.638  0.03    1   2   1   0   0.2
2004    4   3   1   120.289 0.03    1   2   1   0   0.2
2005    4   3   1   138.926 0.03    1   2   1   0   0.2
2006    4   3   1   150.358 0.03    1   2   1   0   0.2
2007    4   3   1   110.344 0.03    1   2   1   0   0.2
2008    4   3   1   143.337 0.03    1   2   1   0   0.2
2009    4   3   1   143.485 0.03    1   2   1   0   0.2
2010    4   3   1   149.822 0.03    1   2   1   0   0.2
2011    4   3   1   141.626 0.03    1   2   1   0   0.2
2012    4   3   1   161.113 0.03    1   2   1   0   0.2
2013    4   3   1   130.603 0.03    1   2   1   0   0.2
2014    4   3   1   129.656 0.03    1   2   1   0   0.2
2015    4   3   1   144.225 0.03    1   2   1   0   0.2
2016    4   3   1   138.997 0.03    1   2   1   0   0.2
2017    4   3   1   135.322 0.03    1   2   1   0   0.2
2018    4   3   1   89.613  0.03    1   2   1   0   0.2
2019    4   3   1   23.964  0.03    1   2   1   0   0.2
#2020   4   3   1   0       0.03    1   2   1   0   0.2
#2021   4   3   1   0       0.03    1   2   1   0   0.2
2022    4   3   1   125.042 0.03    1   2   1   0   0.2
2023    4   3   1   148.062 0.03    1   2   1   0   0.2
2024    4   3   1   140.379 0.03    1   2   1   0   0.2
2025    4   3   1   100.758 0.03    1   2   1   0   0.2

##  ------------------------------------------------------------------------------------  ##
##  RELATIVE  ABUNDANCE DATA
##  ------------------------------------------------------------------------------------  ##
##  Units of abundance: 1 = biomass, 2 = numbers
## Use old format (0)
0
##  Number  of  relative  abundance indicies
6
# Type of 'survey' catchability (1=Selectivity; 2=Selectivity+Retention), by data frame
1 1 1 2 2 2
##  Number  of  rows  in    index
73
# ADFG/NOAA Trawl survey
#Index  Year    Season  Fleet   Sex Maturity    Value   CV  Type    Time    RAI_id
1   1976    4   4   1   0   4247.462    0.311   2   1.411765    1
1   1979    4   4   1   0   1417.215    0.204   2   1           1
1   1982    4   4   1   0   2791.733    0.289   2   1.318182    1
1   1985    4   4   1   0   2306.321    0.254   2   2.363636    1
1   1988    4   4   1   0   2263.353    0.288   2   2.2         1
```

```
1    1991    4    4    1    0    3132.508    0.428    2    6.25         1

#    ADFG    Trawl survey
2    1996    4    5    1    0    1313.757    0.259    2    0.6612903    2
2    1999    4    5    1    0    2630.53     0.236    2    0.4920635    2
2    2002    4    5    1    0    1769.85     0.418    2    0.5897436    2
2    2006    4    5    1    0    3322.53     0.391    2    0.6865672    2
2    2008    4    5    1    0    2962.1      0.30     2    0.5571429    2
2    2011    4    5    1    0    3209.285    0.289    2    1.03125      2
2    2014    4    5    1    0    5949.46     0.473    2    0.58         2
2    2017    4    5    1    0    1762.072    0.223    2    1.241379     2
2    2018    4    5    1    0    1109.39     0.249    2    0.8857143    2
2    2019    4    5    1    0    4675.99     0.598    2    0.4666667    2
2    2020    4    5    1    0    1725.99     0.298    2    0.7          2
2    2021    4    5    1    0    2430.44     0.608    2    0.5166667    2
2    2023    4    5    1    0    3548.08     0.315    2    1.214286     2
2    2024    4    5    1    0    1407.401    0.281    2    1.413793     2


#    NOAA    NBS survey
3    2010    4    6    1    0    1980.079    0.436    2    0.6071429    3
3    2017    4    6    1    0    864.497     0.467    2    1.965517     3
3    2019    4    6    1    0    2071.94     0.346    2    0.5882353    3
3    2021    4    6    1    0    2338.06     0.441    2    0.6666667    3
3    2022    4    6    1    0    2103.02     0.363    2    0.6166667    3
3    2023    4    6    1    0    1686.34     0.391    2    1.3          3
3    2025    4    6    1    0    1632.63     0.636    2    1.3          3

#    ST  CPUE
4    1977    4    3    1    0    2.82    0.35    2    0.5    4
4    1978    4    3    1    0    3.41    0.23    2    0.5    4
4    1979    4    3    1    0    1.55    0.22    2    0.5    4
4    1980    4    3    1    0    1.82    0.28    2    0.5    4
4    1981    4    3    1    0    0.62    0.20    2    0.5    4
4    1982    4    3    1    0    0.18    0.27    2    0.5    4
4    1983    4    3    1    0    0.72    0.22    2    0.5    4
4    1984    4    3    1    0    1.11    0.23    2    0.5    4
4    1985    4    3    1    0    0.67    0.24    2    0.5    4
4    1986    4    3    1    0    1.63    0.52    2    0.5    4
4    1987    4    3    1    0    0.64    0.35    2    0.5    4
4    1988    4    3    1    0    1.60    0.71    2    0.5    4
4    1989    4    3    1    0    1.35    0.33    2    0.5    4
4    1990    4    3    1    0    1.06    0.45    2    0.5    4
4    1992    4    3    1    0    0.26    0.32    2    0.5    4
5    1993    4    3    1    0    1.02    0.09    2    0.5    5
5    1994    4    3    1    0    0.44    0.17    2    0.5    5
5    1995    4    3    1    0    1.09    0.13    2    0.5    5
5    1996    4    3    1    0    1.01    0.09    2    0.5    5
5    1997    4    3    1    0    1.14    0.09    2    0.5    5
5    1998    4    3    1    0    1.31    0.12    2    0.5    5
5    1999    4    3    1    0    0.97    0.10    2    0.5    5
5    2000    4    3    1    0    2.08    0.11    2    0.5    5
5    2001    4    3    1    0    0.76    0.25    2    0.5    5
5    2002    4    3    1    0    0.76    0.09    2    0.5    5
5    2003    4    3    1    0    1.65    0.08    2    0.5    5
5    2004    4    3    1    0    1.36    0.07    2    0.5    5
5    2005    4    3    1    0    0.64    0.12    2    0.5    5
5    2006    4    3    1    0    0.93    0.10    2    0.5    5
6    2007    4    3    1    0    0.88    0.22    2    0.5    6
6    2008    4    3    1    0    1.18    0.05    2    0.5    6
6    2009    4    3    1    0    0.81    0.04    2    0.5    6
6    2010    4    3    1    0    1.19    0.05    2    0.5    6
6    2011    4    3    1    0    1.36    0.05    2    0.5    6
6    2012    4    3    1    0    1.20    0.04    2    0.5    6
6    2013    4    3    1    0    0.62    0.04    2    0.5    6
6    2014    4    3    1    0    0.94    0.04    2    0.5    6
6    2015    4    3    1    0    1.17    0.05    2    0.5    6
6    2016    4    3    1    0    1.03    0.05    2    0.5    6
6    2017    4    3    1    0    0.88    0.05    2    0.5    6
6    2018    4    3    1    0    0.51    0.05    2    0.5    6
6    2019    4    3    1    0    0.24    0.06    2    0.5    6
6    2022    4    3    1    0    1.31    0.07    2    0.5    6
```

```
6   2023    4   3   1   0   2.00    0.07    2   0.5     6
6   2024    4   3   1   0   2.63    0.14    2   0.5     6
6   2025    4   3   1   0   0.90    0.10    2   0.5     6
999 # chk

##  ---------------------------------------------------------------------------------  ##
##  SIZE COMPOSITION DATA FOR ALL FLEETS
##  ---------------------------------------------------------------------------------  ##
## Use old format (0)
0
##  Number  of  length  frequency matrices
8
##  Number  of  rows  in  each  matrix
4 46 14 8 6 14 7 27
##  Number  of  bins  in  each  matrix  (columns  of  size  data)
8 8 8 8 8 8 8 8
##  SIZE  COMPOSITION DATA  FOR ALL FLEETS
##  SIZE  COMP  LEGEND
##  Sex:  1 = male, 2 = female, 0 = both  sexes combined
##  Type  of  composition:  1 = retained, 2 = discard,  0 = total composition
##  Maturity  state:  1 = immature, 2 = mature, 0 = both  states  combined
##  Shell condition:  1 = new shell,  2 = old shell,  0 = both  shell types combined

## Winter Com Retain
##Year, Seas,   Fleet,  Sex,    Type,   Shell,  Maturity,       Nsamp,  DataVec
2015    2   1   1   1   0   0   10  0   0   0   49  310 155 52  10
2016    2   1   1   1   0   0   10  0   0   0   37  555 360 51  13
2017    2   1   1   1   0   0   10  0   0   0   2   152 263 103 20
2018    2   1   1   1   0   0   10  0   0   0   0   58  166 146 31

## Summer Com Retain
##Year, Seas,   Fleet,  Sex,    Type,   Shell,  Maturity,   Nsamp,  DataVec
1977    4   3   1   1   0   0   10  0   0   0   5   747 592 129 76
1978    4   3   1   1   0   0   10  0   0   0   4   74  188 106 17
1979    4   3   1   1   0   0   10  0   0   0   42  428 637 430 123
1980    4   3   1   1   0   0   10  0   0   0   4   108 339 413 204
1981    4   3   1   1   0   0   10  0   0   0   7   139 365 709 564
1982    4   3   1   1   0   0   10  0   0   0   50  224 204 272 343
1983    4   3   1   1   0   0   10  0   0   0   34  360 295 68  45
1984    4   3   1   1   0   0   10  0   0   0   103 467 317 68  8
1985    4   3   1   1   0   0   10  0   0   1   180 930 1084    440 56
1986    4   3   1   1   0   0   10  0   0   0   35  428 491 161 23
1987    4   3   1   1   0   0   10  0   0   0   38  408 707 599 233
1988    4   3   1   1   0   0   10  0   1   0   45  403 605 381 87
1989    4   3   1   1   0   0   10  0   0   0   44  570 1141    663 177
1990    4   3   1   1   0   0   10  0   0   0   20  233 542 392 102
#1991   4   3   1   1   0   0   10  0   0   0   0   0   0   0   0
1992    4   3   1   1   0   0   10  0   0   0   51  718 1013    503 281
1993    4   3   1   1   0   0   10  0   0   0   260 4424    7791    4607    722
1994    4   3   1   1   0   0   10  0   0   0   20  114 134 109 27
1995    4   3   1   1   0   0   10  0   0   0   55  364 422 251 75
1996    4   3   1   1   0   0   10  0   0   0   36  270 295 136 50
1997    4   3   1   1   0   0   10  0   0   0   39  505 459 151 44
1998    4   3   1   1   0   0   10  0   0   0   53  364 407 171 60
1999    4   3   1   1   0   0   10  0   0   0   37  178 164 128 55
2000    4   3   1   1   0   0   10  0   0   0   382 6063    7868    2493    407
2001    4   3   1   1   0   0   10  0   0   0   504 4955    8390    4592    1589
2002    4   3   1   1   0   0   10  0   0   0   255 1369    1688    1481    426
2003    4   3   1   1   0   0   10  0   0   0   127 2037    1914    910 238
2004    4   3   1   1   0   0   10  0   0   0   88  3905    4060    1159    394
2005    4   3   1   1   0   0   10  0   0   0   12  1471    2766    962 149
2006    4   3   1   1   0   0   10  0   0   0   16  1556    3259    1632    244
2007    4   3   1   1   0   0   10  0   0   0   73  2340    2438    1028    246
2008    4   3   1   1   0   0   10  0   0   0   35  2541    2539    526 125
2009    4   3   1   1   0   0   10  0   0   0   70  2539    2464    789 164
2010    4   3   1   1   0   0   10  0   0   0   42  2597    2457    722 84
2011    4   3   1   1   0   0   10  0   0   0   16  965 1163    336 72
2012    4   3   1   1   0   0   10  0   0   0   14  1355    2550    1011    126
2013    4   3   1   1   0   0   10  0   0   0   29  1535    2509    1602    397
2014    4   3   1   1   0   0   10  0   0   0   41  1517    1510    1202    412
2015    4   3   1   1   0   0   10  0   0   0   61  2086    1314    555 157
2016    4   3   1   1   0   0   10  0   0   0   7   419 767 292 58
```

```
2017    4   3   1   1   0   0   10  0   0   0   7   702 1725    892 108
2018    4   3   1   1   0   0   10  0   0   0   9   323 1039    1041    247
2019    4   3   1   1   0   0   10  0   0   0   10  382 379 305 60
#2020   4   3   1   1   0   0   10  0   0   0   0   0   0   0   0
#2021   4   3   1   1   0   0   10  0   0   0   0   0   0   0   0
2022    4   3   1   1   0   0   10  0   0   0   76  1734    1041    120 10
2023    4   3   1   1   0   0   10  0   0   0   11  814 1236    367 30
2024    4   3   1   1   0   0   10  0   0   0   4   371 1186    929 196
2025    4   3   1   1   0   0   10  0   0   0   4   229 711 858 408


## Summer Com Discards
##Year, Seas,   Fleet,  Sex,    Type,   Shell,  Maturity,   Nsamp,  DataVec
1987    4   3   1   2   0   0   10  69  218 390 426 42  0   0   0
1988    4   3   1   2   0   0   10  11  37  131 413 130 0   0   0
1989    4   3   1   2   0   0   10  89  227 309 325 50  0   0   0
1990    4   3   1   2   0   0   10  48  124 147 166 22  0   0   0
1992    4   3   1   2   0   0   10  68  112 184 194 24  0   0   0
1994    4   3   1   2   0   0   10  124 113 220 331 62  0   0   0
2012    4   3   1   2   0   0   10  244 139 197 335 119 9   1   0
2013    4   3   1   2   0   0   10  847 723 391 423 115 8   2   0
2014    4   3   1   2   0   0   10  79  179 475 774 226 17  5   0
2015    4   3   1   2   0   0   10  26  120 280 733 320 43  12  5
2016    4   3   1   2   0   0   10  19  22  72  227 77  9   0   0
2017    4   3   1   2   0   0   10  55  90  76  168 144 8   0   0
2018    4   3   1   2   0   0   10  52  97  201 167 13  0   0   1
2019    4   3   1   2   0   0   10  30  13  15  33  3   0   0   0

## Summer Com total
##Year, Seas,   Fleet,  Sex,    Type,   Shell,  Maturity,   Nsamp,  DataVec
2012    4   3   1   0   0   0   10  244 139 197 364 476 529 184 23
2013    4   3   1   0   0   0   10  847 723 391 489 777 850 440 80
2014    4   3   1   0   0   0   10  79  179 475 808 879 538 383 165
2015    4   3   1   0   0   0   10  26  120 280 821 1231    482 194 61
2016    4   3   1   0   0   0   10  19  22  72  261 671 822 207 40
2017    4   3   1   0   0   0   10  55  90  76  171 578 1080    582 83
2018    4   3   1   0   0   0   10  52  97  201 191 169 386 421 109
2019    4   3   1   0   0   0   10  30  13  15  39  45  45  36  13

## NMFS Trawl
##Year, Seas,   Fleet,  Sex,    Type,   Shell,  Maturity,   Nsamp,  DataVec
1976    4   4   1   0   0   0   20  10  23  96  110 124 100 21  10
1979    4   4   1   0   0   0   20  6   3   3   12  40  99  48  9
1982    4   4   1   0   0   0   20  71  20  46  65  58  15  7   10
1985    4   4   1   0   0   0   20  29  20  28  24  45  36  21  5
1988    4   4   1   0   0   0   20  60  66  42  37  41  46  28  10
1991    4   4   1   0   0   0   20  75  45  14  36  73  58  35  8

## ADFG Trawl
##Year, Seas,   Fleet,  Sex,    Type,   Shell,  Maturity,   Nsamp,  DataVec
1996    4   5   1   0   0   0   20  79  59  42  33  28  13  12  9
1999    4   5   1   0   0   0   20  9   3   30  90  88  47  14  2
2002    4   5   1   0   0   0   20  25  36  50  53  26  29  19  6
2006    4   5   1   0   0   0   20  69  98  80  48  37  28  12  1
2008    4   5   1   0   0   0   20  34  44  70  48  50  11  15  3
2011    4   5   1   0   0   0   20  42  36  31  42  83  58  20  3
2014    4   5   1   0   0   0   20  30  57  101 107 56  23  10  3
2017    4   5   1   0   0   0   20  17  16  8   13  19  33  10  0
2018    4   5   1   0   0   0   20  27  12  9   5   3   4   10  3
2019    4   5   1   0   0   0   20  170 92  14  6   5   8   10  2
2020    4   5   1   0   0   0   20  17  33  39  9   8   4   0   1
2021    4   5   1   0   0   0   20  10  27  37  35  37  8   2   2
2023    4   5   1   0   0   0   20  0   1   10  27  89  89  23  1
2024    4   5   1   0   0   0   20  3   3   2   7   12  36  26  4

##NOAA  NBS Trawl
##Year, Seas,   Fleet,  Sex,    Type,   Shell,  Maturity,   Nsamp,  DataVec
2010    4   6   1   0   0   0   20  1   5   10  27  17  9   2   2
2017    4   6   1   0   0   0   20  7   6   10  6   5   14  6   4
2019    4   6   1   0   0   0   20  54  43  17  8   4   1   6   2
2021    4   6   1   0   0   0   20  5   17  26  18  13  3   0   0
2022    4   6   1   0   0   0   20  68  71  69  67  55  32  12  4
```

```
2023    4   6   1   0   0   0   20  1   3   6   12  26  22  7   1
2025    4   6   1   0   0   0   20  4   3   4   5   7   19  19  2

##Winter Pot Survey
##Year, Seas,   Fleet,  Sex,    Type,   Shell,  Maturity,       Nsamp,  DataVec
1982    2   7   1   0   0   0   10  0   108 246 233 79  25  26  2
1983    2   7   1   0   0   0   10  68  215.5   711.5   729 592 202.5   39.5    24.5
1984    2   7   1   0   0   0   10  23  271 434.5   408.5   356 154 20  10
1985    2   7   1   0   0   0   10  16  72  200 284.5   145 62.5    8   0.5
1986    2   7   1   0   0   0   10  25.5    72.5    104 153.5   149.5   74  14  0.5
1987    2   7   1   0   0   0   10  0   8   23  34  53  22  4   0
1989    2   7   1   0   0   0   10  8   66  74.5    67.5    121.5   128.5   33  1
1990    2   7   1   0   0   0   10  7   102.5   430 544 426.5   369 162 35
1991    2   7   1   0   0   0   10  2   16  118 371 377 272 105 22
1993    2   7   1   0   0   0   10  0   1   6   13  58  70  24  9
1995    2   7   1   0   0   0   10  8   50  68  87  247 260 114 24
1996    2   7   1   0   0   0   10  102 215 325 327 268 220 95  28
1997    2   7   1   0   0   0   10  28  85  87  44  65  55  26  8
1998    2   7   1   0   0   0   10  1   123 370 248 76  36  19  8
1999    2   7   1   0   0   0   10  6   25  152 477 498 118 25  6
2000    2   7   1   0   0   0   10  10  50  60  94  218 114 27  2
2002    2   7   1   0   0   0   10  50  248 222 143 57  64  36  8
2003    2   7   1   0   0   0   10  21  85  185 251 165 71  37  9
2004    2   7   1   0   0   0   10  0   5   51  82  100 46  10  2
2005    2   7   1   0   0   0   10  2   31  58  73  104 99  35  3
2006    2   7   1   0   0   0   10  2   76  121 116 102 66  25  4
2007    2   7   1   0   0   0   10  11  22  32  57  24  13  0   0
2008    2   7   1   0   0   0   10  72  662 1123    716 631 287 52  9
2009    2   7   1   0   0   0   10  1   37  70  185 126 96  7   3
2010    2   7   1   0   0   0   10  4   27  78  157 199 96  15  2
2011    2   7   1   0   0   0   10  12  46  87  141 168 105 36  1
2012    2   7   1   0   0   0   10  17  78  156 134 117 120 48  5

##  ------------------------------------------------------------------------------------  ##
##  Growth  data
##  ------------------------------------------------------------------------------------  ##
# Type of growth increment (0=no growth data;1=size-at-release; 2= size-class-at-release)
3
# nobs_growth
66
# Class-at-release; Sex; Class-at-recapture;  Years-at-liberty;  number transition matrix; sample size
1 1 2 1 1 3 1993 1
1 1 3 1 1 3 1993 4
1 1 3 2 1 3 1993 1
1 1 4 2 1 3 1993 6
1 1 5 2 1 3 1993 4
1 1 5 3 1 3 1993 11
1 1 6 3 1 3 1993 11
2 1 3 1 1 3 1993 21
2 1 4 1 1 3 1993 22
2 1 4 2 1 3 1993 12
2 1 5 1 1 3 1993 4
2 1 5 2 1 3 1993 96
2 1 5 3 1 3 1993 19
2 1 6 2 1 3 1993 5
2 1 6 3 1 3 1993 48
2 1 7 3 1 3 1993 6
3 1 4 1 1 3 1993 47
3 1 4 2 1 3 1993 5
3 1 4 3 1 3 1993 2
3 1 5 1 1 3 1993 91
3 1 5 2 1 3 1993 36
3 1 5 3 1 3 1993 14
3 1 6 1 1 3 1993 7
3 1 6 2 1 3 1993 70
3 1 6 3 1 3 1993 28
3 1 7 1 1 3 1993 1
3 1 7 2 1 3 1993 3
3 1 7 3 1 3 1993 9
4 1 4 1 1 3 1993 10
4 1 4 2 1 3 1993 2
4 1 5 1 1 3 1993 196
```

```
4 1 5 2 1 3 1993 34
4 1 5 3 1 3 1993 3
4 1 6 1 1 3 1993 108
4 1 6 2 1 3 1993 39
4 1 6 3 1 3 1993 35
4 1 7 1 1 3 1993 2
4 1 7 2 1 3 1993 19
4 1 7 3 1 3 1993 14
4 1 8 1 1 3 1993 1
5 1 5 1 1 3 1993 75
5 1 5 2 1 3 1993 7
5 1 6 1 1 3 1993 143
5 1 6 2 1 3 1993 77
5 1 6 3 1 3 1993 9
5 1 7 1 1 3 1993 22
5 1 7 2 1 3 1993 24
5 1 7 3 1 3 1993 21
5 1 8 3 1 3 1993 4
6 1 6 1 1 3 1993 88
6 1 6 2 1 3 1993 11
6 1 7 1 1 3 1993 98
6 1 7 2 1 3 1993 47
6 1 7 3 1 3 1993 11
6 1 8 1 1 3 1993 24
6 1 8 2 1 3 1993 7
6 1 8 3 1 3 1993 3
7 1 7 1 1 3 1993 56
7 1 7 2 1 3 1993 9
7 1 7 3 1 3 1993 1
7 1 8 1 1 3 1993 25
7 1 8 2 1 3 1993 16
7 1 8 3 1 3 1993 9
8 1 8 1 1 3 1993 26
8 1 8 2 1 3 1993 8
8 1 8 3 1 3 1993 1

##  -------------------------------------------------------------------------------------  ##
# Environmental data
##  -------------------------------------------------------------------------------------  ##
## Use old format (0)
0
# Number of series
0
# Year ranges

# Indices
# Index Year Value

##  eof

## eof
9999
```

Model 26.0 control file

```
## GMACS Version 2.20.34a - May 2026

# Block structure
# Number of blocks
2
# Block structure
1 1
# The blocks. Use 0 to indicate the end of the model period.
2008 0
2008 0

## ===================================================================================##
# Treatment of environmental variable use
# Number of environmental treatments
0
## Number of links for each treatment
#1
#2
## Treatment #1
## Var power Zscore
#1     1     1990 2020
## Treatment #2
## Var power Zscore
#1     2     2000 2020
#2     1     2010 2020

##  ---------------------------------------------------------------------------------- ##
##  GENERAL  CONTROLS
##  ---------------------------------------------------------------------------------- ##
#
1976       # First year of recruitment estimation,rec_dev.
2025       # last year of recruitment estimation, rec_dev
   0       # Terminal molting (0 = off, 1 = on). If on, the calc_stock_recruitment_relationship() isn't called in the procedure
   2       # phase for recruitment estimation, earlier -1. rec_dev estimation phase, BBRKC uses 2
  -2       # phase for recruitment sex-ratio estimation
  0.5      # Initial value for Expected sex-ratio
   3       # Initial conditions (0 = Unfished, 1 = Steady-state fished, 2 = Free parameters, 3 = Free parameters (revised))
   1       # Reference size-class for initial conditons = 3
   1       # Lambda (proportion of mature male biomass for SPR reference points).
   0       # Stock-Recruit-Relationship (0 = none, 1 = Beverton-Holt)
   1       # Use years specified to computed average sex ratio in the calculation of average recruitment for reference points (0 = off -i.e. Rec based on End year, 1 = on)
  200      ### Year to compute equilibria
   5       # Devpar phase (!!)
   0       # First year of bias-correction
   0       # First full bias-correction
   0       # Last full bias-correction
   0       # Last year of bias-correction
   0       # recruitment size distribution option (0: standard way; 1: Tanner crab approach)
   0       # mirror growth between sexes (0: standard way; 1: AIGKC way)
```

```
# Expecting 23 theta parameters
# Core parameters
## Initial: Initial value for the parameter (must lie between lower and upper)
## Lower & Upper: Range for the parameter
## Phase: Set equal to a negative number not to estimate
## Prior type:
## 0: Uniform   - parameters are the range of the uniform prior
## 1: Normal    - parameters are the mean and sd
## 2: Lognormal - parameters are the mean and sd of the log
## 3: Beta      - parameters are the two beta parameters [see dbeta]
## 4: Gamma     - parameters are the two gamma parameters [see dgamma]

# Initial   Lower_bound      Upper_bound    Prior_type  Prior_1        Prior_2      Phase  Block   Blk_fn  Env_L   Env_vr  RW  RW_Blk  RW_Sigma
7.00000000   -15.00000000     20.00000000     0         -10.00000000    20.00000000   -1      0         0      0        0   0       0         0 # Log(R0)
10.11100000   -15.00000000    20.00000000     0         -10.00000000    20.00000000    1      0         0      0        0   0       0         0 # Log(Rinitial)
8.00000000   -15.00000000     20.00000000     0         -10.00000000    20.00000000    1      0         0      0        0   0       0         0 # Log(Rbar)
72.50000000    65.00000000   130.00000000     1          72.50000000     7.25000000    5      0         0      0        0   0       0         0 # Recruitment_ra-males
0.75000000     0.00000001      1.60000000     0           0.10000000     5.00000000    3      0         0      0        0   0       0         0 # Recruitment_rb-males
-0.10000000   -15.00000000     0.75000000     0         -10.00000000     0.75000000   -2      0         0      0        0   0       0         0 # log(SigmaR)
0.75000000     0.20000000      1.00000000     3           3.00000000     2.00000000   -4      0         0      0        0   0       0         0 # Steepness
0.00100000     0.00000000      1.00000000     3           1.01000000     1.01000000   -3      0         0      0        0   0       0         0 # Rho
0.64670000   -15.00000000      5.00000000     0          10.00000000    20.00000000    2      0         0      0        0   0       0         0 # Scaled_logN_for_male_mature_mature_newshell_clas
1.00340000   -15.00000000      5.00000000     0          10.00000000    20.00000000    2      0         0      0        0   0       0         0 # Scaled_logN_for_male_mature_mature_newshell_clas
1.36040000   -15.00000000      5.00000000     0          10.00000000    20.00000000    2      0         0      0        0   0       0         0 # Scaled_logN_for_male_mature_mature_newshell_clas
1.40420000   -15.00000000      5.00000000     0          10.00000000    20.00000000    2      0         0      0        0   0       0         0 # Scaled_logN_for_male_mature_mature_newshell_clas
1.45990000   -15.00000000      5.00000000     0          10.00000000    20.00000000    2      0         0      0        0   0       0         0 # Scaled_logN_for_male_mature_mature_newshell_clas
1.26570000   -15.00000000      5.00000000     0          10.00000000    20.00000000    2      0         0      0        0   0       0         0 # Scaled_logN_for_male_mature_mature_newshell_clas
0.72280000   -15.00000000      5.00000000     0          10.00000000    20.00000000    2      0         0      0        0   0       0         0 # Scaled_logN_for_male_mature_mature_newshell_clas

##Allometry
# weight-at-length input  method  (1 = allometry  [w_l = a*l^b],  2 = vector by sex; 3= matrix by sex)
2
 0.5239661 0.8202686 1.197317 1.700319 2.317965 2.988772 3.68294 4.367152 # this is from the version 2.20.14 ctl file
# 0.52420370 0.82067430 1.19824500 1.70175900 2.32125400 2.99365100 3.68849500 4.37139500
# Proportion mature by sex and size
 0.00000000 0.00000000 0.00000000 1.00000000 1.00000000 1.00000000 1.00000000 1.00000000
# Proportion legal by sex and size
 0.00000000 0.00000000 0.00000000 0.00000000 1.00000000 1.00000000 1.00000000 1.00000000

## ================================================================================= ##
## GROWTH PARAMETER CONTROLS                                                         ##
## ================================================================================= ##
##
# Maximum number of size-classes to which recruitment must occur
 3
# Use functional maturity for terminally molting animals (0=no; 1=Yes)?
0
# Growth transition
##Type_1: Options for the growth matrix
#  1: Pre-specified growth transition matrix (requires molt probability)
#  2: Pre-specified size transition matrix (molt probability is ignored)
```

```
#  3: Growth increment is gamma distributed (requires molt probability)
#  4: Post-molt size is gamma distributed (requires molt probability)
#  5: Von Bert.: kappa varies among individuals (requires molt probability)
#  6: Von Bert.: Linf varies among individuals (requires molt probability)
#  7: Von Bert.: kappa and Linf varies among individuals (requires molt probability)
#  8: Growth increment is normally distributed (requires molt probability)
## Type_2: Options for the growth increment model matrix
#  1: Linear
#  2: Individual
#  3: Individual (Same as 2)
#  Block: Block number for time-varying growth
## Type_1 Type_2  Block
       8      1      0
# Molt probability
# Type: Options for the molt probability function
#  0: Pre-specified
#  1: Constant at 1
#  2: Logistic
#  3: Individual
#  Block: Block number for time-varying growth
## Type Block
     2    0

## General parameter specificiations
##  Initial: Initial value for the parameter (must lie between lower and upper)
##  Lower & Upper: Range for the parameter
##  Prior type:
##   0: Uniform   - parameters are the range of the uniform prior
##   1: Normal    - parameters are the mean and sd
##   2: Lognormal - parameters are the mean and sd of the log
##   3: Beta      - parameters are the two beta parameters [see dbeta]
##   4: Gamma     - parameters are the two gamma parameters [see dgamma]
##  Phase: Set equal to a negative number not to estimate
##  Relative: 0: absolute; 1 relative
##  Block: Block number for time-varying selectivity
##  Block_fn: 0:absolute values; 1:exponential
##  Env_L: Environmental link - options are 0:none; 1:additive; 2:multiplicative; 3:exponential
##  EnvL_var: Environmental variable
##  RW: 0 for no random walk changes; 1 otherwise
##  RW_blk: Block number for random walks
##  Sigma_RW: Sigma used for the random walk

# Inputs for sex * type 1
# MAIN PARS: Initial  Lower_bound  Upper_bound Prior_type       Prior_1      Prior_2  Phase  Block Blk_fn  Env_L Env_vr     RW RW_Blk RW_Sigma
           36.998620     0.000000   200.000000          0     0.000000    20.000000      2      0      0      0      0      0      0   0.3000 # Alpha_male_period_1
#            0.243015    -0.200000    20.000000          0     0.000000    10.000000      2      0      0      0      0      0      0   0.3000 # Beta_male_period_1
             0.243015    -0.200000     1.000000          0     0.000000    10.000000      2      0      0      0      0      0      0   0.3000 # Beta_male_period_1
            3.773156     2.000000    10.000000          0     0.000000     3.000000      5      0      0      0      0      0      0   0.3000 # Gscale_male_period_1
# EXTRA PARS: Initial  Lower_bound  Upper_bound Prior_type      Prior_1      Prior_2  Phase Reltve
# Inputs for sex * type 2
# MAIN PARS: Initial  Lower_bound  Upper_bound Prior_type       Prior_1      Prior_2  Phase  Block Blk_fn  Env_L Env_vr     RW RW_Blk RW_Sigma
          122.965900    50.000000   200.000000          0     0.000000   170.000000      2      0      0      0      0      0      0   0.3000 # Molt_probability_mu_male_period_1
```

```
           0.127616     0.000000     1.000000         0     0.000000     3.000000      2      0      0      0      0      0      0   0.3000 # Molt_probability_CV_male_period_1
# EXTRA PARS: Initial  Lower_bound  Upper_bound Prior_type      Prior_1      Prior_2  Phase Reltve


## ==================================================================================== ##
## NATURAL MORTALITY PARAMETER CONTROLS                                                ##
## ==================================================================================== ##
##
# Relative: 0 - absolute values; 1+ - based on another M-at-size vector (indexed by ig)
# Type: 0 for standard; 1: Spline
#  For spline: set extra to the number of knots, the parameters are the knots (phase -1) and the log-differences from base M
# Extra: control the number of knots for splines
# Brkpts: number of changes in M by size
# Mirror: Mirror M-at-size over to that for another partition (indexed by ig)
# Block: Block number for time-varying M-at-size
# Block_fn: 0:absolute values; 1:exponential
# Env_L: Environmental link - options are 0: none; 1:additive; 2:multiplicative; 3:exponential
# EnvL_var: Environmental variable
# RW: 0 for no random walk changes; 1 otherwise
# RW_blk: Block number for random walks
# Sigma_RW: Sigma for the random walk parameters
# Mirror_RW: Should time-varying aspects be mirrored (Indexed by ig)
## Relative?   Type   Extra  Brkpts  Mirror   Block  Blk_fn Env_L   EnvL_Vr      RW  RW_blk Sigma_RW Mirr_RW
         0      0      0      1      0      0      1      0      0      0      0   0.3000      0
# MaxMbreaks
7  # sex*maturity state: male & 1

#      Initial    Lower_bound    Upper_bound  Prior_type        Prior_1        Prior_2  Phase
    0.23000000     0.01000000     1.00000000          0     0.00000000     0.20000000     -1 # M_base_male_mature
    0.50000000     0.05000000     1.00000000          1     0.00000000     0.25000000      3 # M estimated for males > 123 mm carapace length

## ==================================================================================== ##
## SELECTIVITY PARAMETERS CONTROLS                                                     ##
## ==================================================================================== ##
##
# ## Selectivity parameter controls
# ## Selectivity (and retention) types
# ##  <0: Mirror selectivity
# ##   0: Nonparametric selectivity (one parameter per class)
# ##   1: Nonparametric selectivity (one parameter per class, constant from last specified class)
# ##   2: Logistic selectivity (inflection point and slope)
# ##   3: Logistic selectivity (50% and 95% selection)
# ##   4: Double normal selectivity (3 parameters)
# ##   5: Flat equal to zero (1 parameter; phase must be negative)
# ##   6: Flat equal to one (1 parameter; phase must be negative)
# ##   7: Flat-topped double normal selectivity (4 parameters)
# ##   8: Declining logistic selectivity with initial values (50% and 95% selection plus extra)
# ##   9: Cubic-spline (specified with knots and values at knots)
# ##      Inputs: knots (in length units); values at knots (0-1) - at least one should have phase -1
# ##  10: One parameter logistic selectivity (inflection point and slope)
## Selectivity specifications --
# ## Extra (type 1): number of selectivity parameters to estimated
```

```
# #  Winter_Com Subsistence Summer_Com NMFS_Trawl ADFG_Trawl NBS_Trawl Winter_Pot
 0 0 0 0 0 0 0 # is selectivity sex=specific? (1=Yes; 0=No)
 10 -1 -1 10 -4 -4 8 # male selectivity type.
 #-1 -1 10 10 -4 -4 8 # male selectivity type.
 #-3 -3 10 10 -4 -4 8 # male selectivity type.
 0 0 0 0 0 0 0 # selectivity within another gear
 0 0 0 0 0 0 3 # male extra parameters for each pattern
 0 0 1 1 1 1 0 # male: is maximum selectivity at size forced to equal 1 (1) or not (0)
 0 0 0 0 0 0 4 # size-class at which selectivity is forced to equal 1 (ignored if the previous input is 1)
## Retention specifications --
 0 0 0 0 0 0 0 # is retention sex=specific? (1=Yes; 0=No)
 2 0 2 5 5 5 5 # male retention type. Note: changed these from 6's be 5's when moved to 2.20.31 (but this shouldn't matter because retention flag = 0?)
 1 1 1 0 0 0 0 # male retention flag (0 = no, 1 = yes)
 0 0 0 0 0 0 0 # male extra parameters for each pattern
 0 0 0 0 0 0 0 # male - should maximum retention be estimated for males (1=Yes; 0=No)

## General parameter specificiations
##  Initial: Initial value for the parameter (must lie between lower and upper)
##  Lower & Upper: Range for the parameter
##  Prior type:
##   0: Uniform   - parameters are the range of the uniform prior
##   1: Normal    - parameters are the mean and sd
##   2: Lognormal - parameters are the mean and sd of the log
##   3: Beta      - parameters are the two beta parameters [see dbeta]
##   4: Gamma     - parameters are the two gamma parameters [see dgamma]
##  Phase: Set equal to a negative number not to estimate
##  Relative: 0: absolute; 1 relative
##  Block: Block number for time-varying selectivity
##  Block_fn: 0:absolute values; 1:exponential
##  Env_L: Environmental link - options are 0:none; 1:additive; 2:multiplicative; 3:exponential
##  EnvL_var: Environmental variable
##  RW: 0 for no random walk changes; 1 otherwise
##  RW_blk: Block number for random walks
##  Sigma_RW: Sigma used for the random walk

# Inputs for type*sex*fleet: selectivity male Winter_Com
# MAIN PARS:  Initial  Lower_bound  Upper_bound Prior_type     Prior_1      Prior_2  Phase  Block Blk_fn  Env_L Env_vr     RW RW_Blk RW_Sigma
#             0.143640     0.000010   20.000000          0     0.100000   100.000000      2      0      0      0      0      0      0   0.3000 # Sel_Winter_Com_male_period_1_par_1

# Inputs for type*sex*fleet: selectivity male Summer_Com
# MAIN PARS:  Initial  Lower_bound  Upper_bound Prior_type     Prior_1      Prior_2  Phase  Block Blk_fn  Env_L Env_vr     RW RW_Blk RW_Sigma
              0.200000     0.000010     5.000000          0     0.100000   100.000000      2      0      0      0      0      0      0   0.3000 # Sel_Summer_Com_male_period_1_par_1

# Inputs for type*sex*fleet: selectivity male NMFS_Trawl
# MAIN PARS:  Initial  Lower_bound  Upper_bound Prior_type     Prior_1      Prior_2  Phase  Block Blk_fn  Env_L Env_vr     RW RW_Blk RW_Sigma
             0.092094     0.000010    20.000000          0     0.100000   100.000000      2      0      0      0      0      0      0   0.3000 # Sel_NMFS_Trawl_male_period_1_par_1

# Inputs for type*sex*fleet: selectivity male ADFG_Trawl
# MAIN PARS:  Initial  Lower_bound  Upper_bound Prior_type     Prior_1      Prior_2  Phase  Block Blk_fn  Env_L Env_vr     RW RW_Blk RW_Sigma
#             0.092094     0.000010    20.000000          0     0.100000   100.000000      2      0      0      0      0      0      0   0.3000 # Sel_NMFS_Trawl_male_period_1_par_1

# Inputs for type*sex*fleet: selectivity male NBS_Trawl
```

```
# MAIN PARS:  Initial  Lower_bound  Upper_bound Prior_type     Prior_1      Prior_2  Phase  Block Blk_fn  Env_L Env_vr     RW RW_Blk RW_Sigma
#            0.092094     0.000010    20.000000          0     0.100000   100.000000      2      0      0      0      0      0      0   0.3000 # Sel_NMFS_Trawl_male_period_1_par_1

# Inputs for type*sex*fleet: selectivity male Winter_Pot
# MAIN PARS:  Initial  Lower_bound  Upper_bound Prior_type     Prior_1      Prior_2  Phase  Block Blk_fn  Env_L Env_vr     RW RW_Blk RW_Sigma
           128.894800    40.000000   200.000000          0    10.000000   200.000000      2      0      0      0      0      0      0   0.3000 # Sel_Winter_Com_male_period_1_par_1
             0.154697     0.010000    20.000000          0     0.100000   100.000000      2      0      0      0      0      0      0   0.3000 # Sel_Winter_Com_male_period_1_par_2
             0.045586     0.000010     0.999990          0     0.100000   100.000000      2      0      0      0      0      0      0   0.3000 # Sel_Winter_Com_male_period_1_par_3
             0.375288     0.000010     0.999990          0     0.100000   100.000000      2      0      0      0      0      0      0   0.3000 # Sel_Winter_Com_male_period_1_par_4
             0.733787     0.000010     0.999990          0     0.100000   100.000000      2      0      0      0      0      0      0   0.3000 # Sel_Winter_Com_male_period_1_par_5

# Inputs for type*sex*fleet: retention male Winter_Com
# MAIN PARS:  Initial  Lower_bound  Upper_bound Prior_type     Prior_1      Prior_2  Phase  Block Blk_fn  Env_L Env_vr     RW RW_Blk RW_Sigma
           100.49375    50.000000   200.000000          0     1.000000   900.000000     -2      2      0      0      0      0      0   0.3000 # Ret_Winter_Com_male_period_1_par_1
             2.48336     0.001000    20.000000          0     1.000000   900.000000     -2      2      0      0      0      0      0   0.3000 # Ret_Winter_Com_male_period_1_par_2
# EXTRA PARS: Initial  Lower_bound  Upper_bound Prior_type      Prior_1      Prior_2  Phase Reltve
           100.49375    50.000000   700.000000          0     0.100000   100.000000      2      0 # Ret_Summer_Com_male_period_2_par_1
              2.4833     1.000000    20.000000          0     0.100000   100.000000      2      0 # Ret_Summer_Com_male_period_2_par_2

# Inputs for type*sex*fleet: retention male Subsistence
# MAIN PARS:  Initial  Lower_bound  Upper_bound Prior_type     Prior_1      Prior_2  Phase  Block Blk_fn  Env_L Env_vr     RW RW_Blk RW_Sigma
             0.000001     0.000000     0.000002          0     1.000000   900.000000     -2      0      0      0      0      0      0   0.3000 # Ret_Subsistence_male_period_1_par_1
             0.000001     0.000000     0.000002          0     1.000000   900.000000     -2      0      0      0      0      0      0   0.3000 # Ret_Subsistence_male_period_1_par_2
             0.000001     0.000000     0.000002          0     1.000000   900.000000     -2      0      0      0      0      0      0   0.3000 # Ret_Subsistence_male_period_1_par_3
             0.999999     0.000000     1.000000          0     1.000000   900.000000     -2      0      0      0      0      0      0   0.3000 # Ret_Subsistence_male_period_1_par_4
             0.999999     0.000000     1.000000          0     1.000000   900.000000     -2      0      0      0      0      0      0   0.3000 # Ret_Subsistence_male_period_1_par_5
             0.999999     0.000000     1.000000          0     1.000000   900.000000     -2      0      0      0      0      0      0   0.3000 # Ret_Subsistence_male_period_1_par_6
             0.999999     0.000000     1.000000          0     1.000000   900.000000     -2      0      0      0      0      0      0   0.3000 # Ret_Subsistence_male_period_1_par_7
             0.999999     0.000000     1.000000          0     1.000000   900.000000     -2      0      0      0      0      0      0   0.3000 # Ret_Subsistence_male_period_1_par_8

# Inputs for type*sex*fleet: retention male Summer_Com
# MAIN PARS:  Initial  Lower_bound  Upper_bound Prior_type     Prior_1      Prior_2  Phase  Block Blk_fn  Env_L Env_vr     RW RW_Blk RW_Sigma
           104.310600    50.000000   700.000000          0     1.000000   900.000000      2      1      0      0      0      0      0   0.3000 # Ret_Summer_Com_male_period_1_par_1
             2.421736     1.000000    20.000000          0     1.000000   900.000000      2      1      0      0      0      0      0   0.3000 # Ret_Summer_Com_male_period_1_par_2
# EXTRA PARS: Initial  Lower_bound  Upper_bound Prior_type      Prior_1      Prior_2  Phase Reltve
           105.150900    50.000000   700.000000          0     0.100000   100.000000      2      0 # Ret_Summer_Com_male_period_2_par_1
             1.648215     1.000000    20.000000          0     0.100000   100.000000      2      0 # Ret_Summer_Com_male_period_2_par_2


## ================================================================================= ##
## CATCHABILITY PARAMETER CONTROLS                                                   ##
## ================================================================================= ##
##
# Catchability (specifications)
# Analytic: should q be estimated analytically (1) or not (0)
# Lambda: the weight lambda
# Emphasis: the weighting emphasis
# Block: Block number for time-varying M-at-size
# Block_fn: 0:absolute values; 1:exponential
# Env_L: Environmental link - options are 0: none; 1:additive; 2:multiplicative; 3:exponential
# EnvL_var: Environmental variable
# RW: 0 for no random walk changes; 1 otherwise
```

```
# RW_blk: Block number for random walks
# Sigma_RW: Sigma for the random walk parameters
## Analytic  Lambda Emphass  Mirror   Block   Env_L EnvL_Vr      RW  RW_blk Sigma_RW
         0       1       1       0       0       0       0       0       0   0.3000
         0       1       1       0       0       0       0       0       0   0.3000
         0       1       1       0       0       0       0       0       0   0.3000
         0       1       1       0       0       0       0       0       0   0.3000
         0       1       1       0       0       0       0       0       0   0.3000
         0       1       1       0       0       0       0       0       0   0.3000
# Catchability (parameters)
#      Initial    Lower_bound    Upper_bound  Prior_type        Prior_1        Prior_2  Phase
    0.77700000     0.10000000     2.00000000           0     0.10000000     1.00000000      2 # NMFS trawl survey
    1.00000000     0.10000000     2.00000000           0     0.10000000     1.00000000     -2 # ADF&G trawl survey
    0.77700000     0.10000000     2.00000000           0     0.10000000     1.00000000      2 # NBS trawl survey
    0.00150000     0.00000000     2.00000000           0     0.00000000     1.00000000      1 # block 1 - std CPUE
    0.00150000     0.00000000     2.00000000           0     0.00000000     1.00000000      1 # block 2 - std CPUE
    0.00150000     0.00000000     2.00000000           0     0.00000000     1.00000000      1 # block 3 - std CPUE

## ================================================================================== ##
## ADDITIONAL CV PARAMETER CONTROLS                                                   ##
## ================================================================================== ##
##
# Catchability (specifications)
# Mirror: should additional variance be mirrored (value > 1) or not (0)?
# Block: Block number for time-varying M-at-size
# Block_fn: 0:absolute values; 1:exponential
# Env_L: Environmental link - options are 0: none; 1:additive; 2:multiplicative; 3:exponential
# EnvL_var: Environmental variable
# RW: 0 for no random walk changes; 1 otherwise
# RW_blk: Block number for random walks
# Sigma_RW: Sigma for the random walk parameters
##   Mirror   Block   Env_L EnvL_Vr     RW   RW_blk Sigma_RW
         0       0       0       0       0       0   0.3000
         0       0       0       0       0       0   0.3000
         0       0       0       0       0       0   0.3000
         0       0       0       0       0       0   0.3000
         4       0       0       0       0       0   0.3000
         4       0       0       0       0       0   0.3000
## Mirror Block Env_L EnvL_Var  RW RW_blk Sigma_RW
# Additional variance (parameters)
#      Initial    Lower_bound    Upper_bound  Prior_type        Prior_1        Prior_2  Phase
    0.00010000     0.00000001     2.00000000           0     1.00000000   100.00000000     -4
    0.00010000     0.00000001     2.00000000           0     1.00000000   100.00000000     -4
    0.00010000     0.00000001     2.00000000           0     1.00000000   100.00000000     -4
    0.10000000     0.00000001     2.00000000           0     1.00000000   100.00000000      4
#    0.00010000     0.00000001     2.00000000           0     1.00000000   100.00000000     -4
#    0.00010000     0.00000001     2.00000000           0     1.00000000   100.00000000     -4

## ================================================================================== ##
## CONTROLS ON F                                                                      ##
## ================================================================================== ##
##
```

```
# Controls on F
#   Initial_male_F Initial_fema_F Pen_SD (early) Pen_SD (later) Phz_mean_F_mal Phz_mean_F_fem   Lower_mean_F   Upper_mean_F Low_ann_male_F  Up_ann_male_F    Low_ann_f_F     Up_ann_f_F
          0.020000       0.000000       0.500000      45.500000       1.000000      -1.000000     -15.000000       4.000000     -10.000000      10.000000     -10.000000      10.000000  # Winter_C
          0.020000       0.000000       0.500000      45.500000       1.000000      -1.000000     -15.000000       4.000000     -10.000000      10.000000     -10.000000      10.000000  # Subsiste
          0.120000       0.000000       0.500000      45.500000       1.000000      -1.000000     -15.000000       4.000000     -10.000000      10.000000     -10.000000      10.000000  # Summer_C
          0.000000       0.000000       2.000000      20.000000      -1.000000      -1.000000     -15.000000       4.000000     -10.000000      10.000000     -10.000000      10.000000  # NMFS_Tra
          0.000000       0.000000       2.000000      20.000000      -1.000000      -1.000000     -15.000000       4.000000     -10.000000      10.000000     -10.000000      10.000000  # ADFG_Tra
          0.000000       0.000000       2.000000      20.000000      -1.000000      -1.000000     -15.000000       4.000000     -10.000000      10.000000     -10.000000      10.000000  # NBS_Traw
          0.000000       0.000000       2.000000      20.000000      -1.000000      -1.000000     -15.000000       4.000000     -10.000000      10.000000     -10.000000      10.000000  # Winter_P

## ================================================================================= ##
## SIZE COMPOSITIONS OPTIONS                                                         ##
## ================================================================================= ##
##
# Options when fitting size-composition data
## Likelihood types:
##  1:Multinomial with estimated/fixed sample size
##  2:Robust approximation to multinomial
##  3:logistic normal
##  4:multivariate-t
##  5:Dirichlet

# Using oldshell and newshell
#  Winter_Com Winter_Com Summer_Com Summer_Com Summer_Com Summer_Com Summer_Com Summer_Com NMFS_Trawl NMFS_Trawl ADFG_Trawl ADFG_Trawl NBS_Trawl NBS_Trawl Winter_Pot Winter_Pot
#  male male male male male male male male male male male male male male male male
#  retained retained retained retained discard discard total total total total total total total total total total
#  newshell oldshell newshell oldshell newshell oldshell newshell oldshell newshell oldshell newshell oldshell newshell oldshell newshell oldshell
#  immature+mature immature+mature immature+mature immature+mature immature+mature immature+mature immature+mature immature+mature immature+mature immature+mature immature+mature immature+mature
#  1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1 # Type of likelihood
#  0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0 # Auto tail compression
#  0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0 # Auto tail compression (pmin)
#  1   1   2   2   3   3   4   4   5   5   6   6   7   7   8   8 # Composition aggregator codes
#  1   1   1   1   1   1   1   1   2   2   2   2   2   2   2   2 # Set to 1 for catch-based predictions; 2 for survey or total catch predictions
#  -4   -4   -4   -4   -4   -4   -4   -4   -4   -4   -4   -4   -4   -4   -4   -4 # Phz for estimating effective sample size (if appl.)
#  1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1 # Lambda for effective sample size
#  1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1 # Lambda for overall likelihood. Or emphasis?
#  0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0 # Survey to set Q for this comp. Does 0 keep this as is? Ask Buck. Added in version 2.20.16. Use 0 for non-survey fleets.
#  0   0   0   0   0   0   0   0   3   4   1   2   5   6   5   6 # Survey to set Q for this comp. Does 0 keep this as is? Ask Buck. Added in version 2.20.16. Use 0 for non-survey fleets.
#  0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0 # Survey to set Q for this comp. Does 0 keep this as is? Ask Buck. Added in version 2.20.16
#  1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1 # Initial value for effective sample size multiplier

# Using only one shell condition
#  Winter_Com      Summer_Com      Summer_Com      Summer_Com      NMFS_Trawl      ADFG_Trawl      NBS_Trawl       Winter_Pot
#  male            male            male            male            male            male            male            male
#  retained        retained        discard         total           total           total           total           total
#  immature+mature immature+mature immature+mature immature+mature immature+mature immature+mature immature+mature immature+mature
  1   1   1   1   1   1   1   1 # Type of likelihood
  0   0   0   0   0   0   0   0 # Auto tail compression
  0   0   0   0   0   0   0   0 # Auto tail compression (pmin)
  1   2   3   4   5   6   7   8 # Composition aggregator codes
  1   1   1   1   2   2   2   2 # Set to 1 for catch-based predictions; 2 for survey or total catch predictions
#  -4   -4   -4   -4   -4   -4   -4   -4 # Phz for estimating effective sample size (if appl.)
```

```
  1   1   1   1   1   1   1   1  # Lambda for effective sample size
  1   1   1   1   1   1   1   1  # Lambda for overall likelihood. Or emphasis?
  0   0   0   0   0   0   0   0  # Survey to set Q for this comp.

# Effective sample size parameters (number matches max(Composition Aggregator code))
#      Initial    Lower_bound    Upper_bound  Prior_type        Prior_1        Prior_2  Phase
    1.00000000     0.10000000     10.00000000          0       0                999      -1 # Overdispersion_parameter_for_size_comp_1(possibly extended)
    1.00000000     0.10000000     10.00000000          0       0                999      -1 # Overdispersion_parameter_for_size_comp_2(possibly extended)
    1.00000000     0.10000000     10.00000000          0       0                999      -1 # Overdispersion_parameter_for_size_comp_3(possibly extended)
    1.00000000     0.10000000     10.00000000          0       0                999      -1 # Overdispersion_parameter_for_size_comp_4(possibly extended)
    1.00000000     0.10000000     10.00000000          0       0                999      -1 # Overdispersion_parameter_for_size_comp_5(possibly extended)
    1.00000000     0.10000000     10.00000000          0       0                999      -1 # Overdispersion_parameter_for_size_comp_6(possibly extended)
    1.00000000     0.10000000     10.00000000          0       0                999      -1 # Overdispersion_parameter_for_size_comp_7(possibly extended)
    1.00000000     0.10000000     10.00000000          0       0                999      -1 # Overdispersion_parameter_for_size_comp_8(possibly extended)

## ================================================================================= ##
## EMPHASIS FACTORS                                                                  ##
## ================================================================================= ##

1.0000 # Emphasis on tagging data

 1.0000 1.0000 0.0000 1.0000 # Emphasis on Catch: (by catch dataframes)

#AEP AEP AEP AEP
   1.0000   0.0000   0.0000   0.0000 # Winter_Com
   0.1000   0.0000   0.0000   0.0000 # Subsistence
   1.0000   0.0000   0.0000   0.0000 # Summer_Com
   0.0000   0.0000   0.0000   0.0000 # NMFS_Trawl
   0.0000   0.0000   0.0000   0.0000 # ADFG_Trawl
   0.0000   0.0000   0.0000   0.0000 # NBS_Trawl
   0.0000   0.0000   0.0000   0.0000 # Winter_Pot
#
## Emphasis Factors (Priors/Penalties: 13 values) ##
     1.0000 #--Log_fdevs
     0.0000 #--MeanF
     0.0000 #--Mdevs
     1.0000 #--Rec_devs
    15.0000 #--Initial_devs
     1.0000 #--Fst_dif_dev
     3.0000 #--Mean_sex_ratio
    60.0000 #--Molt_prob
     0.1000 #--free selectivity
     1.0000 #--Init_n_at_len
     0.0000 #--Fvecs
     0.0000 #--Fdovss
     1.0000 #--Random walk in selectivity

# eof_ctl
9999
```

Model 26.1 data file

```
#==================================================================================================
# Gmacs Main  Data  File  NSRKC 2025 - May 2026 - GMACS 2.20.34a
# GEAR_INDEX   DESCRIPTION
#    1        : Winter Commercial Fishery Retained catch
#    2        : Winter Subsistence Fishery Retained catch
#    3        : Winter Subsistence Fishery Total catch
#    4        : Summer Commercial Fishery Retained catch
#    5        : Summer Commercial Fishery Total catch
#    6        : ADF&G Survey
#    7        : NMFS Survey
#    8        : Pot CPUE

# Fisheries:  1 Winter Pot Fishery, 2 Winter Subsistace, 3 Summer Pot Fishery
# Surveys:    4 NMFS Trawl Survey, 5 ADFG Trawl Survey, 6 NBS Trawl Survey, 7 Winter Pot survey
#==================================================================================================

1976  # Start year
2025  # End year
#2025  # Projection year
7     # Number of seasons
7     # Number of distinct data groups (fleet, among fishing fleets and surveys)
1     # Number of sexes
1     # Number of shell condition types
1     # Number of maturity types
8     # Number of size-classes in the model
7     # Season recruitment occurs
4     # Season molting and growth occurs
1     # Season to calculate SSB
1     # Season for N output
# maximum size-class (males then females)
8
# size_breaks (a vector giving the break points between size intervals with dimension nclass+1)
63.5    73.5    83.5    93.5    103.5   113.5   123.5   133.5   143.5
# Natural mortality per season input type (1 = vector by season, 2 = matrix by season/year)
2
# Proportion of the total natural mortality to be applied each season (each row must add to 1)
# 1. Winter Fishery (Feb01)
# 2. Mortality between winter and summer fishery
# 3. Summer fishery
# 4. Time between summer fishery and Nov 1 (Molt and recruit)
# 5. Time to Feb 01
# 6. Feb 01 recruit

0   0   0.3452055   0.1863014   0.1351932   0.3333  0 # 1976
0   0   0.3452055   0.1863014   0.1351932   0.3333  0 # 1977
0   0   0.3452055   0.1863014   0.1351932   0.3333  0 # 1978
0   0   0.4493151   0.04109589  0.176289    0.3333  0 # 1979
0   0   0.4493151   0.04109589  0.176289    0.3333  0 # 1980
0   0   0.4493151   0.1013699   0.1160151   0.3333  0 # 1981
0   0   0.5150685   0.06027397  0.09135753  0.3333  0 # 1982
0   0   0.4931507   0.0109589   0.1625904   0.3333  0 # 1983
0   0   0.4931507   0.03835616  0.1351932   0.3333  0 # 1984
0   0   0.4931507   0.06027397  0.1132753   0.3333  0 # 1985
0   0   0.4931507   0.06575342  0.1077959   0.3333  0 # 1986
0   0   0.4931507   0.03013699  0.1434123   0.3333  0 # 1987
0   0   0.4931507   0.02739726  0.1461521   0.3333  0 # 1988
0   0   0.4931507   0.008219178 0.1653301   0.3333  0 # 1989
0   0   0.4931507   0.0109589   0.1625904   0.3333  0 # 1990
0   0   0.4931507   0.0109589   0.1625904   0.3333  0 # 1991
0   0   0.4931507   0.005479452 0.1680699   0.3333  0 # 1992
0   0   0.4109589   0.1561644   0.09957671  0.3333  0 # 1993
0   0   0.4109589   0.07945205  0.176289    0.3333  0 # 1994
0   0   0.4109589   0.1643836   0.09135753  0.3333  0 # 1995
0   0   0.4109589   0.169863    0.08587808  0.3333  0 # 1996
0   0   0.4109589   0.1150685   0.1406726   0.3333  0 # 1997
0   0   0.4109589   0.169863    0.08587808  0.3333  0 # 1998
0   0   0.4109589   0.1726027   0.08313836  0.3333  0 # 1999
0   0   0.4109589   0.2410959   0.01464521  0.3333  0 # 2000
0   0   0.4109589   0.1863014   0.06943973  0.3333  0 # 2001
```

```
0   0   0.3671233   0.2136986   0.08587808  0.3333  0 # 2002
0   0   0.3671233   0.1890411   0.1105356   0.3333  0 # 2003
0   0   0.3671233   0.1452055   0.1543712   0.3333  0 # 2004
0   0   0.3671233   0.1972603   0.1023164   0.3333  0 # 2005
0   0   0.3671233   0.1835616   0.1160151   0.3333  0 # 2006
0   0   0.3671233   0.169863    0.1297137   0.3333  0 # 2007
0   0   0.3890411   0.1917808   0.08587808  0.3333  0 # 2008
0   0   0.3671233   0.260274    0.03930274  0.3333  0 # 2009
0   0   0.4027397   0.1534247   0.1105356   0.3333  0 # 2010
0   0   0.4027397   0.08767123  0.176289    0.3333  0 # 2011
0   0   0.4054795   0.1890411   0.07217945  0.3333  0 # 2012
0   0   0.4164384   0.1945205   0.0557411   0.3333  0 # 2013
0   0   0.3945205   0.1369863   0.1351932   0.3333  0 # 2014
0   0   0.4054795   0.06849315  0.1927274   0.3333  0 # 2015
0   0   0.4000000   0.06575342  0.2009466   0.3333  0 # 2016
0   0   0.3972603   0.07945205  0.1899877   0.3333  0 # 2017
0   0   0.3917808   0.09589041  0.1790288   0.3333  0 # 2018
0   0   0.3945205   0.1643836   0.1077959   0.3333  0 # 2019
0   0   0.3945205   0.1643836   0.1077959   0.3333  0 # 2020
0   0   0.3945205   0.1643836   0.1077959   0.3333  0 # 2021
0   0   0.3671233   0.109589    0.189987    0.3333  0 # 2022
0   0   0.3835616   0.07671233  0.206426    0.3333  0 # 2023
0   0   0.3643836   0.07945205  0.2228644   0.3333  0 # 2024
0   0   0.4036036   0.097297297  0.1657658  0.333333  0 #   2025 # is this order correct?

# Fishing fleet names (delimited with : no spaces in names)
Winter_Com Subsistence Summer_Com
# Survey names (delimited with : no spaces in names)
NMFS_Trawl ADFG_Trawl NBS_Trawl Winter_Pot # keep as is because size comps are by these fleets
# Are the seasons instantaneous (0) or continuous (1)
1 1 1 1 1 1 1

##  ------------------------------------------------------------------------------------  ##
# Catch data
##  ------------------------------------------------------------------------------------  ##
# Use Old format (0)
0
# Number  of  catch data  frames
 4
# Number  of  rows  in  each  data  frame
 47  48  42 46

##  Type of catch: 1 = retained, 2 = discard
##  Units of catch: 1 = biomass, 2 = numbers

##      Winter commercial retained
# year  seas    fleet   sex     obs     cv      type    units   mult    effort  discard_mortality
1978    2   1   1   9.625   0.03    1   2   1   0   0.2
1979    2   1   1   0.221   0.03    1   2   1   0   0.2
1980    2   1   1   0.022   0.03    1   2   1   0   0.2
#1981   2   1   1   0       0.03    1   2   1   0   0.2
1982    2   1   1   0.017   0.03    1   2   1   0   0.2
1983    2   1   1   0.549   0.03    1   2   1   0   0.2
1984    2   1   1   0.856   0.03    1   2   1   0   0.2
1985    2   1   1   1.168   0.03    1   2   1   0   0.2
1986    2   1   1   2.168   0.03    1   2   1   0   0.2
1987    2   1   1   1.04    0.03    1   2   1   0   0.2
1988    2   1   1   0.425   0.03    1   2   1   0   0.2
1989    2   1   1   0.403   0.03    1   2   1   0   0.2
1990    2   1   1   3.626   0.03    1   2   1   0   0.2
1991    2   1   1   3.8     0.03    1   2   1   0   0.2
1992    2   1   1   7.478   0.03    1   2   1   0   0.2
1993    2   1   1   1.788   0.03    1   2   1   0   0.2
1994    2   1   1   5.753   0.03    1   2   1   0   0.2
1995    2   1   1   7.538   0.03    1   2   1   0   0.2
1996    2   1   1   1.778   0.03    1   2   1   0   0.2
1997    2   1   1   0.083   0.03    1   2   1   0   0.2
1998    2   1   1   0.984   0.03    1   2   1   0   0.2
1999    2   1   1   2.714   0.03    1   2   1   0   0.2
2000    2   1   1   3.045   0.03    1   2   1   0   0.2
2001    2   1   1   1.098   0.03    1   2   1   0   0.2
2002    2   1   1   2.591   0.03    1   2   1   0   0.2
```

```
2003    2    1    1    6.853   0.03    1    2    1    0    0.2
2004    2    1    1    0.522   0.03    1    2    1    0    0.2
2005    2    1    1    2.121   0.03    1    2    1    0    0.2
2006    2    1    1    0.075   0.03    1    2    1    0    0.2
2007    2    1    1    3.313   0.03    1    2    1    0    0.2
2008    2    1    1    5.796   0.03    1    2    1    0    0.2
2009    2    1    1    4.951   0.03    1    2    1    0    0.2
2010    2    1    1    4.834   0.03    1    2    1    0    0.2
2011    2    1    1    3.365   0.03    1    2    1    0    0.2
2012    2    1    1    9.157   0.03    1    2    1    0    0.2
2013    2    1    1    22.639  0.03    1    2    1    0    0.2
2014    2    1    1    14.986  0.03    1    2    1    0    0.2
2015    2    1    1    41.046  0.03    1    2    1    0    0.2
2016    2    1    1    29.792  0.03    1    2    1    0    0.2
2017    2    1    1    26.008  0.03    1    2    1    0    0.2
2018    2    1    1    9.18    0.03    1    2    1    0    0.2
2019    2    1    1    1.05    0.03    1    2    1    0    0.2
2020    2    1    1    0.08    0.03    1    2    1    0    0.2
2021    2    1    1    0.32    0.03    1    2    1    0    0.2
2022    2    1    1    2.708   0.03    1    2    1    0    0.2
2023    2    1    1    3.580   0.03    1    2    1    0    0.2
2024    2    1    1    4.830   0.03    1    2    1    0    0.2
2025    2    1    1    2.657   0.03    1    2    1    0    0.2

#       Subsistence retained
1978    2    2    1    12.506  0.03    1    2    1    0    0.2
1979    2    2    1    0.224   0.03    1    2    1    0    0.2
1980    2    2    1    0.213   0.03    1    2    1    0    0.2
1981    2    2    1    0.36    0.03    1    2    1    0    0.2
1982    2    2    1    1.288   0.03    1    2    1    0    0.2
1983    2    2    1    10.432  0.03    1    2    1    0    0.2
1984    2    2    1    11.22   0.03    1    2    1    0    0.2
1985    2    2    1    8.377   0.03    1    2    1    0    0.2
1986    2    2    1    7.052   0.03    1    2    1    0    0.2
1987    2    2    1    5.772   0.03    1    2    1    0    0.2
1988    2    2    1    2.724   0.03    1    2    1    0    0.2
1989    2    2    1    6.126   0.03    1    2    1    0    0.2
1990    2    2    1    12.152  0.03    1    2    1    0    0.2
1991    2    2    1    7.366   0.03    1    2    1    0    0.2
1992    2    2    1    11.736  0.03    1    2    1    0    0.2
1993    2    2    1    1.097   0.03    1    2    1    0    0.2
1994    2    2    1    4.113   0.03    1    2    1    0    0.2
1995    2    2    1    5.426   0.03    1    2    1    0    0.2
1996    2    2    1    1.679   0.03    1    2    1    0    0.2
1997    2    2    1    0.745   0.03    1    2    1    0    0.2
1998    2    2    1    8.622   0.03    1    2    1    0    0.2
1999    2    2    1    7.533   0.03    1    2    1    0    0.2
2000    2    2    1    5.723   0.03    1    2    1    0    0.2
2001    2    2    1    0.256   0.03    1    2    1    0    0.2
2002    2    2    1    2.177   0.03    1    2    1    0    0.2
2003    2    2    1    4.14    0.03    1    2    1    0    0.2
2004    2    2    1    1.181   0.03    1    2    1    0    0.2
2005    2    2    1    3.973   0.03    1    2    1    0    0.2
2006    2    2    1    1.239   0.03    1    2    1    0    0.2
2007    2    2    1    10.69   0.03    1    2    1    0    0.2
2008    2    2    1    9.485   0.03    1    2    1    0    0.2
2009    2    2    1    4.752   0.03    1    2    1    0    0.2
2010    2    2    1    7.044   0.03    1    2    1    0    0.2
2011    2    2    1    6.64    0.03    1    2    1    0    0.2
2012    2    2    1    7.311   0.03    1    2    1    0    0.2
2013    2    2    1    7.622   0.03    1    2    1    0    0.2
2014    2    2    1    3.252   0.03    1    2    1    0    0.2
2015    2    2    1    7.651   0.03    1    2    1    0    0.2
2016    2    2    1    5.34    0.03    1    2    1    0    0.2
2017    2    2    1    6.039   0.03    1    2    1    0    0.2
2018    2    2    1    4.424   0.03    1    2    1    0    0.2
2019    2    2    1    1.54    0.03    1    2    1    0    0.2
2020    2    2    1    0.55    0.03    1    2    1    0    0.2
2021    2    2    1    2.892   0.03    1    2    1    0    0.2
2022    2    2    1    7.630   0.03    1    2    1    0    0.2
2023    2    2    1    5.407   0.03    1    2    1    0    0.2
2024    2    2    1    4.751   0.03    1    2    1    0    0.2
```

```
2025    2   2   1   1.897   0.03    1   2   1   0   0.2

# Subistence total
#1978   2   2   1   0   0.03    0   2   1   0   0.2
#1979   2   2   1   0   0.03    0   2   1   0   0.2
#1980   2   2   1   0   0.03    0   2   1   0   0.2
#1981   2   2   1   0   0.03    0   2   1   0   0.2
#1982   2   2   1   0   0.03    0   2   1   0   0.2
#1983   2   2   1   0   0.03    0   2   1   0   0.2
1984    2   2   1   15.923  0.03    0   2   1   0   0.2
1985    2   2   1   10.757  0.03    0   2   1   0   0.2
1986    2   2   1   10.751  0.03    0   2   1   0   0.2
1987    2   2   1   7.406   0.03    0   2   1   0   0.2
1988    2   2   1   3.573   0.03    0   2   1   0   0.2
1989    2   2   1   7.945   0.03    0   2   1   0   0.2
1990    2   2   1   16.635  0.03    0   2   1   0   0.2
1991    2   2   1   9.295   0.03    0   2   1   0   0.2
1992    2   2   1   15.051  0.03    0   2   1   0   0.2
1993    2   2   1   1.193   0.03    0   2   1   0   0.2
1994    2   2   1   4.894   0.03    0   2   1   0   0.2
1995    2   2   1   7.777   0.03    0   2   1   0   0.2
1996    2   2   1   2.936   0.03    0   2   1   0   0.2
1997    2   2   1   1.617   0.03    0   2   1   0   0.2
1998    2   2   1   20.327  0.03    0   2   1   0   0.2
1999    2   2   1   10.651  0.03    0   2   1   0   0.2
2000    2   2   1   9.816   0.03    0   2   1   0   0.2
2001    2   2   1   0.366   0.03    0   2   1   0   0.2
2002    2   2   1   5.119   0.03    0   2   1   0   0.2
2003    2   2   1   9.052   0.03    0   2   1   0   0.2
2004    2   2   1   1.775   0.03    0   2   1   0   0.2
2005    2   2   1   6.484   0.03    0   2   1   0   0.2
2006    2   2   1   2.083   0.03    0   2   1   0   0.2
2007    2   2   1   21.444  0.03    0   2   1   0   0.2
2008    2   2   1   18.621  0.03    0   2   1   0   0.2
2009    2   2   1   6.971   0.03    0   2   1   0   0.2
2010    2   2   1   9.004   0.03    0   2   1   0   0.2
2011    2   2   1   9.183   0.03    0   2   1   0   0.2
2012    2   2   1   11.341  0.03    0   2   1   0   0.2
2013    2   2   1   21.524  0.03    0   2   1   0   0.2
2014    2   2   1   5.421   0.03    0   2   1   0   0.2
2015    2   2   1   9.84    0.03    0   2   1   0   0.2
2016    2   2   1   6.468   0.03    0   2   1   0   0.2
2017    2   2   1   7.185   0.03    0   2   1   0   0.2
2018    2   2   1   5.767   0.03    0   2   1   0   0.2
2019    2   2   1   2.079   0.03    0   2   1   0   0.2
2020    2   2   1   0.815   0.03    0   2   1   0   0.2
2021    2   2   1   3.999   0.03    0   2   1   0   0.2
2022    2   2   1   10.041  0.03    0   2   1   0   0.2
2023    2   2   1   6.613   0.03    0   2   1   0   0.2
2024    2   2   1   5.9879  0.03    0   2   1   0   0.2
2025    2   2   1   2.239   0.03    0   2   1   0   0.2

# Summer Commercial Retain
1977    4   3   1   195.877 0.03    1   2   1   0   0.2
1978    4   3   1   660.829 0.03    1   2   1   0   0.2
1979    4   3   1   970.962 0.03    1   2   1   0   0.2
1980    4   3   1   329.778 0.03    1   2   1   0   0.2
1981    4   3   1   376.313 0.03    1   2   1   0   0.2
1982    4   3   1   63.949  0.03    1   2   1   0   0.2
1983    4   3   1   132.205 0.03    1   2   1   0   0.2
1984    4   3   1   139.759 0.03    1   2   1   0   0.2
1985    4   3   1   146.669 0.03    1   2   1   0   0.2
1986    4   3   1   162.438 0.03    1   2   1   0   0.2
1987    4   3   1   103.338 0.03    1   2   1   0   0.2
1988    4   3   1   76.148  0.03    1   2   1   0   0.2
1989    4   3   1   79.116  0.03    1   2   1   0   0.2
1990    4   3   1   59.132  0.03    1   2   1   0   0.2
#1991   4   3   1   0       0.03    1   2   1   0   0.2
1992    4   3   1   24.902  0.03    1   2   1   0   0.2
1993    4   3   1   115.913 0.03    1   2   1   0   0.2
1994    4   3   1   108.824 0.03    1   2   1   0   0.2
1995    4   3   1   105.967 0.03    1   2   1   0   0.2
```

```
1996    4   3   1   74.752  0.03    1   2   1   0   0.2
1997    4   3   1   32.606  0.03    1   2   1   0   0.2
1998    4   3   1   10.661  0.03    1   2   1   0   0.2
1999    4   3   1   8.734   0.03    1   2   1   0   0.2
2000    4   3   1   111.728 0.03    1   2   1   0   0.2
2001    4   3   1   98.321  0.03    1   2   1   0   0.2
2002    4   3   1   86.666  0.03    1   2   1   0   0.2
2003    4   3   1   93.638  0.03    1   2   1   0   0.2
2004    4   3   1   120.289 0.03    1   2   1   0   0.2
2005    4   3   1   138.926 0.03    1   2   1   0   0.2
2006    4   3   1   150.358 0.03    1   2   1   0   0.2
2007    4   3   1   110.344 0.03    1   2   1   0   0.2
2008    4   3   1   143.337 0.03    1   2   1   0   0.2
2009    4   3   1   143.485 0.03    1   2   1   0   0.2
2010    4   3   1   149.822 0.03    1   2   1   0   0.2
2011    4   3   1   141.626 0.03    1   2   1   0   0.2
2012    4   3   1   161.113 0.03    1   2   1   0   0.2
2013    4   3   1   130.603 0.03    1   2   1   0   0.2
2014    4   3   1   129.656 0.03    1   2   1   0   0.2
2015    4   3   1   144.225 0.03    1   2   1   0   0.2
2016    4   3   1   138.997 0.03    1   2   1   0   0.2
2017    4   3   1   135.322 0.03    1   2   1   0   0.2
2018    4   3   1   89.613  0.03    1   2   1   0   0.2
2019    4   3   1   23.964  0.03    1   2   1   0   0.2
#2020   4   3   1   0       0.03    1   2   1   0   0.2
#2021   4   3   1   0       0.03    1   2   1   0   0.2
2022    4   3   1   125.042 0.03    1   2   1   0   0.2
2023    4   3   1   148.062 0.03    1   2   1   0   0.2
2024    4   3   1   140.379 0.03    1   2   1   0   0.2
2025    4   3   1   100.758 0.03    1   2   1   0   0.2

##  ---------------------------------------------------------------------------------  ##
##  RELATIVE  ABUNDANCE DATA
##  ---------------------------------------------------------------------------------  ##
##  Units of abundance: 1 = biomass, 2 = numbers
## Use old format (0)
0
##  Number  of  relative  abundance indicies
#6
5 # combining ADF&G and NBS into one model-based index
# Type of 'survey' catchability (1=Selectivity; 2=Selectivity+Retention), by data frame
#1 1 1 2 2 2
1 1 2 2 2 # combining ADF&G and NBS into one model-based index
##  Number  of  rows  in    index
#73
69 # combining ADF&G and NBS into one model-based index
# ADFG/NOAA Trawl survey
#Index  Year    Season  Fleet   Sex Maturity    Value   CV  Type    Time    RAI_id
1   1976    4   4   1   0   4247.462    0.311   2   1.411765    1
1   1979    4   4   1   0   1417.215    0.204   2   1           1
1   1982    4   4   1   0   2791.733    0.289   2   1.318182    1
1   1985    4   4   1   0   2306.321    0.254   2   2.363636    1
1   1988    4   4   1   0   2263.353    0.288   2   2.2         1
1   1991    4   4   1   0   3132.508    0.428   2   6.25        1

#   ADFG    Trawl survey
#2  1996    4   5   1   0   1313.757    0.259   2   0.6612903   2
#2  1999    4   5   1   0   2630.53     0.236   2   0.4920635   2
#2  2002    4   5   1   0   1769.85     0.418   2   0.5897436   2
#2  2006    4   5   1   0   3322.53     0.391   2   0.6865672   2
#2  2008    4   5   1   0   2962.1      0.30    2   0.5571429   2
#2  2011    4   5   1   0   3209.285    0.289   2   1.03125     2
#2  2014    4   5   1   0   5949.46     0.473   2   0.58        2
#2  2017    4   5   1   0   1762.072    0.223   2   1.241379    2
#2  2018    4   5   1   0   1109.39     0.249   2   0.8857143   2
#2  2019    4   5   1   0   4675.99     0.598   2   0.4666667   2
#2  2020    4   5   1   0   1725.99     0.298   2   0.7         2
#2  2021    4   5   1   0   2430.44     0.608   2   0.5166667   2
#2  2023    4   5   1   0   3548.08     0.315   2   1.214286    2
#2  2024    4   5   1   0   1407.401    0.281   2   1.413793    2
```

```
#   NOAA    NBS survey
#3  2010    4   6   1   0   1980.079    0.436   2   0.6071429   3
#3  2017    4   6   1   0   864.497     0.467   2   1.965517    3
#3  2019    4   6   1   0   2071.94     0.346   2   0.5882353   3
#3  2021    4   6   1   0   2338.06     0.441   2   0.6666667   3
#3  2022    4   6   1   0   2103.02     0.363   2   0.6166667   3
#3  2023    4   6   1   0   1686.34     0.391   2   1.3         3
#3  2025    4   6   1   0   1632.63     0.636   2   1.3         3

#   Model-based index from ADFG and NBS surveys; delta gamma with depth
# using "Time" from the NBS survey in years with both surveys
2   1996    4   5   1   0   1132.81     0.317   2   0.6612903   2
2   1999    4   5   1   0   2344.54     0.292   2   0.4920635   2
2   2002    4   5   1   0   1121.98     0.283   2   0.5897436   2
2   2006    4   5   1   0   1676.87     0.283   2   0.6865672   2
2   2008    4   5   1   0   1948.51     0.276   2   0.5571429   2
2   2010    4   5   1   0   1250.49     0.320   2   0.6071429   2
2   2011    4   5   1   0   1901.21     0.294   2   1.03125     2
2   2014    4   5   1   0   3687.42     0.318   2   0.58        2
2   2017    4   5   1   0   1176.11     0.261   2   1.965517    2
2   2018    4   5   1   0    851.22     0.355   2   0.8857143   2
2   2019    4   5   1   0   1935.61     0.249   2   0.5882353   2
2   2020    4   5   1   0   1130.80     0.332   2   0.7         2
2   2021    4   5   1   0   1361.35     0.277   2   0.6666667   2
2   2022    4   5   1   0    958.69     0.409   2   0.6166667   2
2   2023    4   5   1   0   2072.67     0.251   2   1.214286    2
2   2024    4   5   1   0   1915.86     0.308   2   1.3         2
2   2025    4   5   1   0    896.47     0.368   2   1.3         2

#   ST  CPUE
#4  1977    4   3   1   0   2.82    0.35    2   0.5     4
#4  1978    4   3   1   0   3.41    0.23    2   0.5     4
#4  1979    4   3   1   0   1.55    0.22    2   0.5     4
#4  1980    4   3   1   0   1.82    0.28    2   0.5     4
#4  1981    4   3   1   0   0.62    0.20    2   0.5     4
#4  1982    4   3   1   0   0.18    0.27    2   0.5     4
#4  1983    4   3   1   0   0.72    0.22    2   0.5     4
#4  1984    4   3   1   0   1.11    0.23    2   0.5     4
#4  1985    4   3   1   0   0.67    0.24    2   0.5     4
#4  1986    4   3   1   0   1.63    0.52    2   0.5     4
#4  1987    4   3   1   0   0.64    0.35    2   0.5     4
#4  1988    4   3   1   0   1.60    0.71    2   0.5     4
#4  1989    4   3   1   0   1.35    0.33    2   0.5     4
#4  1990    4   3   1   0   1.06    0.45    2   0.5     4
#4  1992    4   3   1   0   0.26    0.32    2   0.5     4
#5  1993    4   3   1   0   1.02    0.09    2   0.5     5
#5  1994    4   3   1   0   0.44    0.17    2   0.5     5
#5  1995    4   3   1   0   1.09    0.13    2   0.5     5
#5  1996    4   3   1   0   1.01    0.09    2   0.5     5
#5  1997    4   3   1   0   1.14    0.09    2   0.5     5
#5  1998    4   3   1   0   1.31    0.12    2   0.5     5
#5  1999    4   3   1   0   0.97    0.10    2   0.5     5
#5  2000    4   3   1   0   2.08    0.11    2   0.5     5
#5  2001    4   3   1   0   0.76    0.25    2   0.5     5
#5  2002    4   3   1   0   0.76    0.09    2   0.5     5
#5  2003    4   3   1   0   1.65    0.08    2   0.5     5
#5  2004    4   3   1   0   1.36    0.07    2   0.5     5
#5  2005    4   3   1   0   0.64    0.12    2   0.5     5
#5  2006    4   3   1   0   0.93    0.10    2   0.5     5
#6  2007    4   3   1   0   0.88    0.22    2   0.5     6
#6  2008    4   3   1   0   1.18    0.05    2   0.5     6
#6  2009    4   3   1   0   0.81    0.04    2   0.5     6
#6  2010    4   3   1   0   1.19    0.05    2   0.5     6
#6  2011    4   3   1   0   1.36    0.05    2   0.5     6
#6  2012    4   3   1   0   1.20    0.04    2   0.5     6
#6  2013    4   3   1   0   0.62    0.04    2   0.5     6
#6  2014    4   3   1   0   0.94    0.04    2   0.5     6
#6  2015    4   3   1   0   1.17    0.05    2   0.5     6
#6  2016    4   3   1   0   1.03    0.05    2   0.5     6
#6  2017    4   3   1   0   0.88    0.05    2   0.5     6
#6  2018    4   3   1   0   0.51    0.05    2   0.5     6
#6  2019    4   3   1   0   0.24    0.06    2   0.5     6
```

```
#6  2022   4   3   1   0   1.31    0.07    2   0.5    6
#6  2023   4   3   1   0   2.00    0.07    2   0.5    6
#6  2024   4   3   1   0   2.63    0.14    2   0.5    6
#6  2025   4   3   1   0   0.90    0.10    2   0.5    6

3   1977   4   3   1   0   2.82    0.35    2   0.5    3
3   1978   4   3   1   0   3.41    0.23    2   0.5    3
3   1979   4   3   1   0   1.55    0.22    2   0.5    3
3   1980   4   3   1   0   1.82    0.28    2   0.5    3
3   1981   4   3   1   0   0.62    0.20    2   0.5    3
3   1982   4   3   1   0   0.18    0.27    2   0.5    3
3   1983   4   3   1   0   0.72    0.22    2   0.5    3
3   1984   4   3   1   0   1.11    0.23    2   0.5    3
3   1985   4   3   1   0   0.67    0.24    2   0.5    3
3   1986   4   3   1   0   1.63    0.52    2   0.5    3
3   1987   4   3   1   0   0.64    0.35    2   0.5    3
3   1988   4   3   1   0   1.60    0.71    2   0.5    3
3   1989   4   3   1   0   1.35    0.33    2   0.5    3
3   1990   4   3   1   0   1.06    0.45    2   0.5    3
3   1992   4   3   1   0   0.26    0.32    2   0.5    3
4   1993   4   3   1   0   1.02    0.09    2   0.5    4
4   1994   4   3   1   0   0.44    0.17    2   0.5    4
4   1995   4   3   1   0   1.09    0.13    2   0.5    4
4   1996   4   3   1   0   1.01    0.09    2   0.5    4
4   1997   4   3   1   0   1.14    0.09    2   0.5    4
4   1998   4   3   1   0   1.31    0.12    2   0.5    4
4   1999   4   3   1   0   0.97    0.10    2   0.5    4
4   2000   4   3   1   0   2.08    0.11    2   0.5    4
4   2001   4   3   1   0   0.76    0.25    2   0.5    4
4   2002   4   3   1   0   0.76    0.09    2   0.5    4
4   2003   4   3   1   0   1.65    0.08    2   0.5    4
4   2004   4   3   1   0   1.36    0.07    2   0.5    4
4   2005   4   3   1   0   0.64    0.12    2   0.5    4
4   2006   4   3   1   0   0.93    0.10    2   0.5    4
5   2007   4   3   1   0   0.88    0.22    2   0.5    5
5   2008   4   3   1   0   1.18    0.05    2   0.5    5
5   2009   4   3   1   0   0.81    0.04    2   0.5    5
5   2010   4   3   1   0   1.19    0.05    2   0.5    5
5   2011   4   3   1   0   1.36    0.05    2   0.5    5
5   2012   4   3   1   0   1.20    0.04    2   0.5    5
5   2013   4   3   1   0   0.62    0.04    2   0.5    5
5   2014   4   3   1   0   0.94    0.04    2   0.5    5
5   2015   4   3   1   0   1.17    0.05    2   0.5    5
5   2016   4   3   1   0   1.03    0.05    2   0.5    5
5   2017   4   3   1   0   0.88    0.05    2   0.5    5
5   2018   4   3   1   0   0.51    0.05    2   0.5    5
5   2019   4   3   1   0   0.24    0.06    2   0.5    5
5   2022   4   3   1   0   1.31    0.07    2   0.5    5
5   2023   4   3   1   0   2.00    0.07    2   0.5    5
5   2024   4   3   1   0   2.63    0.14    2   0.5    5
5   2025   4   3   1   0   0.90    0.10    2   0.5    5
999 # chk

##  ----------------------------------------------------------------------------------  ##
##  SIZE COMPOSITION DATA FOR ALL FLEETS
##  ----------------------------------------------------------------------------------  ##
## Use old format (0)
0
##  Number  of  length  frequency matrices
8
##  Number  of  rows  in  each  matrix
4 46 14 8 6 14 7 27
##  Number  of  bins  in  each  matrix  (columns  of  size  data)
8 8 8 8 8 8 8 8
##  SIZE  COMPOSITION DATA  FOR ALL FLEETS
##  SIZE  COMP  LEGEND
##  Sex:  1 = male, 2 = female, 0 = both  sexes combined
##  Type  of  composition:  1 = retained, 2 = discard,  0 = total composition
##  Maturity  state:  1 = immature, 2 = mature, 0 = both  states  combined
##  Shell condition:  1 = new shell,  2 = old shell,  0 = both  shell types combined

## Winter Com Retain
```

```
##Year, Seas,   Fleet,  Sex,    Type,   Shell,  Maturity,       Nsamp,  DataVec
2015    2   1   1   1   0   0   10  0   0   0   49  310 155 52  10
2016    2   1   1   1   0   0   10  0   0   0   37  555 360 51  13
2017    2   1   1   1   0   0   10  0   0   0   2   152 263 103 20
2018    2   1   1   1   0   0   10  0   0   0   0   58  166 146 31

## Summer Com Retain
##Year, Seas,   Fleet,  Sex,    Type,   Shell,  Maturity,   Nsamp,  DataVec
1977    4   3   1   1   0   0   10  0   0   0   5   747 592 129 76
1978    4   3   1   1   0   0   10  0   0   0   4   74  188 106 17
1979    4   3   1   1   0   0   10  0   0   0   42  428 637 430 123
1980    4   3   1   1   0   0   10  0   0   0   4   108 339 413 204
1981    4   3   1   1   0   0   10  0   0   0   7   139 365 709 564
1982    4   3   1   1   0   0   10  0   0   0   50  224 204 272 343
1983    4   3   1   1   0   0   10  0   0   0   34  360 295 68  45
1984    4   3   1   1   0   0   10  0   0   0   103 467 317 68  8
1985    4   3   1   1   0   0   10  0   0   1   180 930 1084    440 56
1986    4   3   1   1   0   0   10  0   0   0   35  428 491 161 23
1987    4   3   1   1   0   0   10  0   0   0   38  408 707 599 233
1988    4   3   1   1   0   0   10  0   1   0   45  403 605 381 87
1989    4   3   1   1   0   0   10  0   0   0   44  570 1141    663 177
1990    4   3   1   1   0   0   10  0   0   0   20  233 542 392 102
#1991   4   3   1   1   0   0   10  0   0   0   0   0   0   0   0
1992    4   3   1   1   0   0   10  0   0   0   51  718 1013    503 281
1993    4   3   1   1   0   0   10  0   0   0   260 4424    7791    4607    722
1994    4   3   1   1   0   0   10  0   0   0   20  114 134 109 27
1995    4   3   1   1   0   0   10  0   0   0   55  364 422 251 75
1996    4   3   1   1   0   0   10  0   0   0   36  270 295 136 50
1997    4   3   1   1   0   0   10  0   0   0   39  505 459 151 44
1998    4   3   1   1   0   0   10  0   0   0   53  364 407 171 60
1999    4   3   1   1   0   0   10  0   0   0   37  178 164 128 55
2000    4   3   1   1   0   0   10  0   0   0   382 6063    7868    2493    407
2001    4   3   1   1   0   0   10  0   0   0   504 4955    8390    4592    1589
2002    4   3   1   1   0   0   10  0   0   0   255 1369    1688    1481    426
2003    4   3   1   1   0   0   10  0   0   0   127 2037    1914    910 238
2004    4   3   1   1   0   0   10  0   0   0   88  3905    4060    1159    394
2005    4   3   1   1   0   0   10  0   0   0   12  1471    2766    962 149
2006    4   3   1   1   0   0   10  0   0   0   16  1556    3259    1632    244
2007    4   3   1   1   0   0   10  0   0   0   73  2340    2438    1028    246
2008    4   3   1   1   0   0   10  0   0   0   35  2541    2539    526 125
2009    4   3   1   1   0   0   10  0   0   0   70  2539    2464    789 164
2010    4   3   1   1   0   0   10  0   0   0   42  2597    2457    722 84
2011    4   3   1   1   0   0   10  0   0   0   16  965 1163    336 72
2012    4   3   1   1   0   0   10  0   0   0   14  1355    2550    1011    126
2013    4   3   1   1   0   0   10  0   0   0   29  1535    2509    1602    397
2014    4   3   1   1   0   0   10  0   0   0   41  1517    1510    1202    412
2015    4   3   1   1   0   0   10  0   0   0   61  2086    1314    555 157
2016    4   3   1   1   0   0   10  0   0   0   7   419 767 292 58
2017    4   3   1   1   0   0   10  0   0   0   7   702 1725    892 108
2018    4   3   1   1   0   0   10  0   0   0   9   323 1039    1041    247
2019    4   3   1   1   0   0   10  0   0   0   10  382 379 305 60
#2020   4   3   1   1   0   0   10  0   0   0   0   0   0   0   0
#2021   4   3   1   1   0   0   10  0   0   0   0   0   0   0   0
2022    4   3   1   1   0   0   10  0   0   0   76  1734    1041    120 10
2023    4   3   1   1   0   0   10  0   0   0   11  814 1236    367 30
2024    4   3   1   1   0   0   10  0   0   0   4   371 1186    929 196
2025    4   3   1   1   0   0   10  0   0   0   4   229 711 858 408


## Summer Com Discards
##Year, Seas,   Fleet,  Sex,    Type,   Shell,  Maturity,   Nsamp,  DataVec
1987    4   3   1   2   0   0   10  69  218 390 426 42  0   0   0
1988    4   3   1   2   0   0   10  11  37  131 413 130 0   0   0
1989    4   3   1   2   0   0   10  89  227 309 325 50  0   0   0
1990    4   3   1   2   0   0   10  48  124 147 166 22  0   0   0
1992    4   3   1   2   0   0   10  68  112 184 194 24  0   0   0
1994    4   3   1   2   0   0   10  124 113 220 331 62  0   0   0
2012    4   3   1   2   0   0   10  244 139 197 335 119 9   1   0
2013    4   3   1   2   0   0   10  847 723 391 423 115 8   2   0
2014    4   3   1   2   0   0   10  79  179 475 774 226 17  5   0
2015    4   3   1   2   0   0   10  26  120 280 733 320 43  12  5
2016    4   3   1   2   0   0   10  19  22  72  227 77  9   0   0
```

```
2017    4   3   1   2   0   0   10  55  90  76  168 144 8   0   0
2018    4   3   1   2   0   0   10  52  97  201 167 13  0   0   1
2019    4   3   1   2   0   0   10  30  13  15  33  3   0   0   0

## Summer Com total
##Year, Seas,   Fleet,  Sex,    Type,   Shell,  Maturity,   Nsamp,  DataVec
2012    4   3   1   0   0   0   10  244 139 197 364 476 529 184 23
2013    4   3   1   0   0   0   10  847 723 391 489 777 850 440 80
2014    4   3   1   0   0   0   10  79  179 475 808 879 538 383 165
2015    4   3   1   0   0   0   10  26  120 280 821 1231    482 194 61
2016    4   3   1   0   0   0   10  19  22  72  261 671 822 207 40
2017    4   3   1   0   0   0   10  55  90  76  171 578 1080    582 83
2018    4   3   1   0   0   0   10  52  97  201 191 169 386 421 109
2019    4   3   1   0   0   0   10  30  13  15  39  45  45  36  13

## NMFS Trawl
##Year, Seas,   Fleet,  Sex,    Type,   Shell,  Maturity,   Nsamp,  DataVec
1976    4   4   1   0   0   0   20  10  23  96  110 124 100 21  10
1979    4   4   1   0   0   0   20  6   3   3   12  40  99  48  9
1982    4   4   1   0   0   0   20  71  20  46  65  58  15  7   10
1985    4   4   1   0   0   0   20  29  20  28  24  45  36  21  5
1988    4   4   1   0   0   0   20  60  66  42  37  41  46  28  10
1991    4   4   1   0   0   0   20  75  45  14  36  73  58  35  8

## ADFG Trawl
##Year, Seas,   Fleet,  Sex,    Type,   Shell,  Maturity,   Nsamp,  DataVec
1996    4   5   1   0   0   0   20  79  59  42  33  28  13  12  9
1999    4   5   1   0   0   0   20  9   3   30  90  88  47  14  2
2002    4   5   1   0   0   0   20  25  36  50  53  26  29  19  6
2006    4   5   1   0   0   0   20  69  98  80  48  37  28  12  1
2008    4   5   1   0   0   0   20  34  44  70  48  50  11  15  3
2011    4   5   1   0   0   0   20  42  36  31  42  83  58  20  3
2014    4   5   1   0   0   0   20  30  57  101 107 56  23  10  3
2017    4   5   1   0   0   0   20  17  16  8   13  19  33  10  0
2018    4   5   1   0   0   0   20  27  12  9   5   3   4   10  3
2019    4   5   1   0   0   0   20  170 92  14  6   5   8   10  2
2020    4   5   1   0   0   0   20  17  33  39  9   8   4   0   1
2021    4   5   1   0   0   0   20  10  27  37  35  37  8   2   2
2023    4   5   1   0   0   0   20  0   1   10  27  89  89  23  1
2024    4   5   1   0   0   0   20  3   3   2   7   12  36  26  4

##NOAA  NBS Trawl
##Year, Seas,   Fleet,  Sex,    Type,   Shell,  Maturity,   Nsamp,  DataVec
2010    4   6   1   0   0   0   20  1   5   10  27  17  9   2   2
2017    4   6   1   0   0   0   20  7   6   10  6   5   14  6   4
2019    4   6   1   0   0   0   20  54  43  17  8   4   1   6   2
2021    4   6   1   0   0   0   20  5   17  26  18  13  3   0   0
2022    4   6   1   0   0   0   20  68  71  69  67  55  32  12  4
2023    4   6   1   0   0   0   20  1   3   6   12  26  22  7   1
2025    4   6   1   0   0   0   20  4   3   4   5   7   19  19  2

##Winter Pot Survey
##Year, Seas,   Fleet,  Sex,    Type,   Shell,  Maturity,       Nsamp,  DataVec
1982    2   7   1   0   0   0   10  0   108 246 233 79  25  26  2
1983    2   7   1   0   0   0   10  68  215.5   711.5   729 592 202.5   39.5    24.5
1984    2   7   1   0   0   0   10  23  271 434.5   408.5   356 154 20  10
1985    2   7   1   0   0   0   10  16  72  200 284.5   145 62.5    8   0.5
1986    2   7   1   0   0   0   10  25.5    72.5    104 153.5   149.5   74  14  0.5
1987    2   7   1   0   0   0   10  0   8   23  34  53  22  4   0
1989    2   7   1   0   0   0   10  8   66  74.5    67.5    121.5   128.5   33  1
1990    2   7   1   0   0   0   10  7   102.5   430 544 426.5   369 162 35
1991    2   7   1   0   0   0   10  2   16  118 371 377 272 105 22
1993    2   7   1   0   0   0   10  0   1   6   13  58  70  24  9
1995    2   7   1   0   0   0   10  8   50  68  87  247 260 114 24
1996    2   7   1   0   0   0   10  102 215 325 327 268 220 95  28
1997    2   7   1   0   0   0   10  28  85  87  44  65  55  26  8
1998    2   7   1   0   0   0   10  1   123 370 248 76  36  19  8
1999    2   7   1   0   0   0   10  6   25  152 477 498 118 25  6
2000    2   7   1   0   0   0   10  10  50  60  94  218 114 27  2
2002    2   7   1   0   0   0   10  50  248 222 143 57  64  36  8
2003    2   7   1   0   0   0   10  21  85  185 251 165 71  37  9
2004    2   7   1   0   0   0   10  0   5   51  82  100 46  10  2
```

```
2005    2   7   1   0   0   0   10  2   31  58  73  104 99  35  3
2006    2   7   1   0   0   0   10  2   76  121 116 102 66  25  4
2007    2   7   1   0   0   0   10  11  22  32  57  24  13  0   0
2008    2   7   1   0   0   0   10  72  662 1123    716 631 287 52  9
2009    2   7   1   0   0   0   10  1   37  70  185 126 96  7   3
2010    2   7   1   0   0   0   10  4   27  78  157 199 96  15  2
2011    2   7   1   0   0   0   10  12  46  87  141 168 105 36  1
2012    2   7   1   0   0   0   10  17  78  156 134 117 120 48  5

##  ---------------------------------------------------------------------------------  ##
##  Growth  data
##  ---------------------------------------------------------------------------------  ##
# Type of growth increment (0=no growth data;1=size-at-release; 2= size-class-at-release)
3
# nobs_growth
66
# Class-at-release; Sex; Class-at-recapture;  Years-at-liberty;  number transition matrix; sample size
1 1 2 1 1 3 1993 1
1 1 3 1 1 3 1993 4
1 1 3 2 1 3 1993 1
1 1 4 2 1 3 1993 6
1 1 5 2 1 3 1993 4
1 1 5 3 1 3 1993 11
1 1 6 3 1 3 1993 11
2 1 3 1 1 3 1993 21
2 1 4 1 1 3 1993 22
2 1 4 2 1 3 1993 12
2 1 5 1 1 3 1993 4
2 1 5 2 1 3 1993 96
2 1 5 3 1 3 1993 19
2 1 6 2 1 3 1993 5
2 1 6 3 1 3 1993 48
2 1 7 3 1 3 1993 6
3 1 4 1 1 3 1993 47
3 1 4 2 1 3 1993 5
3 1 4 3 1 3 1993 2
3 1 5 1 1 3 1993 91
3 1 5 2 1 3 1993 36
3 1 5 3 1 3 1993 14
3 1 6 1 1 3 1993 7
3 1 6 2 1 3 1993 70
3 1 6 3 1 3 1993 28
3 1 7 1 1 3 1993 1
3 1 7 2 1 3 1993 3
3 1 7 3 1 3 1993 9
4 1 4 1 1 3 1993 10
4 1 4 2 1 3 1993 2
4 1 5 1 1 3 1993 196
4 1 5 2 1 3 1993 34
4 1 5 3 1 3 1993 3
4 1 6 1 1 3 1993 108
4 1 6 2 1 3 1993 39
4 1 6 3 1 3 1993 35
4 1 7 1 1 3 1993 2
4 1 7 2 1 3 1993 19
4 1 7 3 1 3 1993 14
4 1 8 1 1 3 1993 1
5 1 5 1 1 3 1993 75
5 1 5 2 1 3 1993 7
5 1 6 1 1 3 1993 143
5 1 6 2 1 3 1993 77
5 1 6 3 1 3 1993 9
5 1 7 1 1 3 1993 22
5 1 7 2 1 3 1993 24
5 1 7 3 1 3 1993 21
5 1 8 3 1 3 1993 4
6 1 6 1 1 3 1993 88
6 1 6 2 1 3 1993 11
6 1 7 1 1 3 1993 98
6 1 7 2 1 3 1993 47
6 1 7 3 1 3 1993 11
6 1 8 1 1 3 1993 24
```

```
6 1 8 2 1 3 1993 7
6 1 8 3 1 3 1993 3
7 1 7 1 1 3 1993 56
7 1 7 2 1 3 1993 9
7 1 7 3 1 3 1993 1
7 1 8 1 1 3 1993 25
7 1 8 2 1 3 1993 16
7 1 8 3 1 3 1993 9
8 1 8 1 1 3 1993 26
8 1 8 2 1 3 1993 8
8 1 8 3 1 3 1993 1

##  ------------------------------------------------------------------------------------  ##
# Environmental data
##  ------------------------------------------------------------------------------------  ##
## Use old format (0)
0
# Number of series
0
# Year ranges

# Indices
# Index Year Value

##  eof

## eof
9999
```

Model 26.1 control file

```
## GMACS Version 2.20.34a - May 2026

# Block structure
# Number of blocks
2
# Block structure
1 1
# The blocks. Use 0 to indicate the end of the model period.
2008 0
2008 0

## =====================================================================================##
# Treatment of environmental variable use
# Number of environmental treatments
0
## Number of links for each treatment
#1
#2
## Treatment #1
## Var power Zscore
#1     1     1990 2020
## Treatment #2
## Var power Zscore
#1     2     2000 2020
#2     1     2010 2020

##  ------------------------------------------------------------------------------------ ##
##  GENERAL  CONTROLS
##  ------------------------------------------------------------------------------------ ##
#
1976       # First year of recruitment estimation,rec_dev.
2025       # last year of recruitment estimation, rec_dev
   0       # Terminal molting (0 = off, 1 = on). If on, the calc_stock_recruitment_relationship() isn't called in the procedure
   2       # phase for recruitment estimation, earlier -1. rec_dev estimation phase, BBRKC uses 2
  -2       # phase for recruitment sex-ratio estimation
  0.5      # Initial value for Expected sex-ratio
   3       # Initial conditions (0 = Unfished, 1 = Steady-state fished, 2 = Free parameters, 3 = Free parameters (revised))
   1       # Reference size-class for initial conditons = 3
   1       # Lambda (proportion of mature male biomass for SPR reference points).
   0       # Stock-Recruit-Relationship (0 = none, 1 = Beverton-Holt)
   1       # Use years specified to computed average sex ratio in the calculation of average recruitment for reference points (0 = off -i.e. Rec based on End year, 1 = on)
  200      ### Year to compute equilibria
   5       # Devpar phase (!!)
   0       # First year of bias-correction
   0       # First full bias-correction
   0       # Last full bias-correction
   0       # Last year of bias-correction
   0       # recruitment size distribution option (0: standard way; 1: Tanner crab approach)
   0       # mirror growth between sexes (0: standard way; 1: AIGKC way)
```

```
# Expecting 23 theta parameters
# Core parameters
## Initial: Initial value for the parameter (must lie between lower and upper)
## Lower & Upper: Range for the parameter
## Phase: Set equal to a negative number not to estimate
## Prior type:
## 0: Uniform   - parameters are the range of the uniform prior
## 1: Normal    - parameters are the mean and sd
## 2: Lognormal - parameters are the mean and sd of the log
## 3: Beta      - parameters are the two beta parameters [see dbeta]
## 4: Gamma     - parameters are the two gamma parameters [see dgamma]

# Initial   Lower_bound      Upper_bound    Prior_type  Prior_1         Prior_2      Phase  Block   Blk_fn  Env_L   Env_vr  RW  RW_Blk  RW_Sigma
7.00000000   -15.00000000     20.00000000     0         -10.00000000    20.00000000   -1       0         0      0        0   0       0         0 # Log(R0)
10.11100000   -15.00000000    20.00000000     0         -10.00000000    20.00000000    1       0         0      0        0   0       0         0 # Log(Rinitial)
8.00000000   -15.00000000     20.00000000     0         -10.00000000    20.00000000    1       0         0      0        0   0       0         0 # Log(Rbar)
72.50000000    65.00000000   130.00000000     1          72.50000000     7.25000000    5       0         0      0        0   0       0         0 # Recruitment_ra-males
0.75000000     0.00000001      1.60000000     0           0.10000000     5.00000000    3       0         0      0        0   0       0         0 # Recruitment_rb-males
-0.10000000   -15.00000000     0.75000000     0         -10.00000000     0.75000000   -2       0         0      0        0   0       0         0 # log(SigmaR)
0.75000000     0.20000000      1.00000000     3           3.00000000     2.00000000   -4       0         0      0        0   0       0         0 # Steepness
0.00100000     0.00000000      1.00000000     3           1.01000000     1.01000000   -3       0         0      0        0   0       0         0 # Rho
0.64670000   -15.00000000      5.00000000     0          10.00000000    20.00000000    2       0         0      0        0   0       0         0 # Scaled_logN_for_male_mature_mature_newshell_clas
1.00340000   -15.00000000      5.00000000     0          10.00000000    20.00000000    2       0         0      0        0   0       0         0 # Scaled_logN_for_male_mature_mature_newshell_clas
1.36040000   -15.00000000      5.00000000     0          10.00000000    20.00000000    2       0         0      0        0   0       0         0 # Scaled_logN_for_male_mature_mature_newshell_clas
1.40420000   -15.00000000      5.00000000     0          10.00000000    20.00000000    2       0         0      0        0   0       0         0 # Scaled_logN_for_male_mature_mature_newshell_clas
1.45990000   -15.00000000      5.00000000     0          10.00000000    20.00000000    2       0         0      0        0   0       0         0 # Scaled_logN_for_male_mature_mature_newshell_clas
1.26570000   -15.00000000      5.00000000     0          10.00000000    20.00000000    2       0         0      0        0   0       0         0 # Scaled_logN_for_male_mature_mature_newshell_clas
0.72280000   -15.00000000      5.00000000     0          10.00000000    20.00000000    2       0         0      0        0   0       0         0 # Scaled_logN_for_male_mature_mature_newshell_clas

##Allometry
# weight-at-length input  method  (1 = allometry  [w_l = a*l^b],  2 = vector by sex; 3= matrix by sex)
2
 0.5239661 0.8202686 1.197317 1.700319 2.317965 2.988772 3.68294 4.367152 # this is from the version 2.20.14 ctl file
# 0.52420370 0.82067430 1.19824500 1.70175900 2.32125400 2.99365100 3.68849500 4.37139500
# Proportion mature by sex and size
 0.00000000 0.00000000 0.00000000 1.00000000 1.00000000 1.00000000 1.00000000 1.00000000
# Proportion legal by sex and size
 0.00000000 0.00000000 0.00000000 0.00000000 1.00000000 1.00000000 1.00000000 1.00000000

## ================================================================================= ##
## GROWTH PARAMETER CONTROLS                                                         ##
## ================================================================================= ##
##
# Maximum number of size-classes to which recruitment must occur
 3
# Use functional maturity for terminally molting animals (0=no; 1=Yes)?
0
# Growth transition
##Type_1: Options for the growth matrix
#  1: Pre-specified growth transition matrix (requires molt probability)
#  2: Pre-specified size transition matrix (molt probability is ignored)
```

```
#  3: Growth increment is gamma distributed (requires molt probability)
#  4: Post-molt size is gamma distributed (requires molt probability)
#  5: Von Bert.: kappa varies among individuals (requires molt probability)
#  6: Von Bert.: Linf varies among individuals (requires molt probability)
#  7: Von Bert.: kappa and Linf varies among individuals (requires molt probability)
#  8: Growth increment is normally distributed (requires molt probability)
## Type_2: Options for the growth increment model matrix
#  1: Linear
#  2: Individual
#  3: Individual (Same as 2)
#  Block: Block number for time-varying growth
## Type_1 Type_2  Block
       8      1      0
# Molt probability
# Type: Options for the molt probability function
#  0: Pre-specified
#  1: Constant at 1
#  2: Logistic
#  3: Individual
#  Block: Block number for time-varying growth
## Type Block
      2     0

## General parameter specificiations
##  Initial: Initial value for the parameter (must lie between lower and upper)
##  Lower & Upper: Range for the parameter
##  Prior type:
##   0: Uniform   - parameters are the range of the uniform prior
##   1: Normal    - parameters are the mean and sd
##   2: Lognormal - parameters are the mean and sd of the log
##   3: Beta      - parameters are the two beta parameters [see dbeta]
##   4: Gamma     - parameters are the two gamma parameters [see dgamma]
##  Phase: Set equal to a negative number not to estimate
##  Relative: 0: absolute; 1 relative
##  Block: Block number for time-varying selectivity
##  Block_fn: 0:absolute values; 1:exponential
##  Env_L: Environmental link - options are 0:none; 1:additive; 2:multiplicative; 3:exponential
##  EnvL_var: Environmental variable
##  RW: 0 for no random walk changes; 1 otherwise
##  RW_blk: Block number for random walks
##  Sigma_RW: Sigma used for the random walk

# Inputs for sex * type 1
# MAIN PARS: Initial  Lower_bound  Upper_bound Prior_type       Prior_1      Prior_2  Phase  Block Blk_fn  Env_L Env_vr     RW RW_Blk RW_Sigma
            36.998620     0.000000   200.000000          0     0.000000    20.000000      2      0      0      0      0      0      0   0.3000 # Alpha_male_period_1
 #           0.243015    -0.200000    20.000000          0     0.000000    10.000000      2      0      0      0      0      0      0   0.3000 # Beta_male_period_1
             0.243015    -0.200000     1.000000          0     0.000000    10.000000      2      0      0      0      0      0      0   0.3000 # Beta_male_period_1
             3.773156     2.000000    10.000000          0     0.000000     3.000000      5      0      0      0      0      0      0   0.3000 # Gscale_male_period_1
# EXTRA PARS: Initial  Lower_bound  Upper_bound Prior_type      Prior_1      Prior_2  Phase Reltve
# Inputs for sex * type 2
# MAIN PARS: Initial  Lower_bound  Upper_bound Prior_type       Prior_1      Prior_2  Phase  Block Blk_fn  Env_L Env_vr     RW RW_Blk RW_Sigma
           122.965900    50.000000   200.000000          0     0.000000   170.000000      2      0      0      0      0      0      0   0.3000 # Molt_probability_mu_male_period_1
```

```
            0.127616     0.000000     1.000000          0     0.000000     3.000000      2      0      0      0      0      0      0   0.3000 # Molt_probability_CV_male_period_1
# EXTRA PARS: Initial  Lower_bound  Upper_bound Prior_type      Prior_1      Prior_2  Phase Reltve


## ==================================================================================== ##
## NATURAL MORTALITY PARAMETER CONTROLS                                                ##
## ==================================================================================== ##
##
# Relative: 0 - absolute values; 1+ - based on another M-at-size vector (indexed by ig)
# Type: 0 for standard; 1: Spline
#  For spline: set extra to the number of knots, the parameters are the knots (phase -1) and the log-differences from base M
# Extra: control the number of knots for splines
# Brkpts: number of changes in M by size
# Mirror: Mirror M-at-size over to that for another partition (indexed by ig)
# Block: Block number for time-varying M-at-size
# Block_fn: 0:absolute values; 1:exponential
# Env_L: Environmental link - options are 0: none; 1:additive; 2:multiplicative; 3:exponential
# EnvL_var: Environmental variable
# RW: 0 for no random walk changes; 1 otherwise
# RW_blk: Block number for random walks
# Sigma_RW: Sigma for the random walk parameters
# Mirror_RW: Should time-varying aspects be mirrored (Indexed by ig)
## Relative?   Type   Extra  Brkpts  Mirror   Block  Blk_fn Env_L   EnvL_Vr      RW  RW_blk Sigma_RW Mirr_RW
         0      0       0       1       0       0       1       0       0       0       0   0.3000       0
# MaxMbreaks
7  # sex*maturity state: male & 1

#      Initial    Lower_bound    Upper_bound  Prior_type        Prior_1        Prior_2  Phase
    0.23000000     0.01000000     1.00000000           0     0.00000000     0.20000000     -1 # M_base_male_mature
    0.50000000     0.05000000     1.00000000           1     0.00000000     0.25000000      3 # M estimated for males > 123 mm carapace length

## ==================================================================================== ##
## SELECTIVITY PARAMETERS CONTROLS                                                      ##
## ==================================================================================== ##
##
# ## Selectivity parameter controls
# ## Selectivity (and retention) types
# ##  <0: Mirror selectivity
# ##   0: Nonparametric selectivity (one parameter per class)
# ##   1: Nonparametric selectivity (one parameter per class, constant from last specified class)
# ##   2: Logistic selectivity (inflection point and slope)
# ##   3: Logistic selectivity (50% and 95% selection)
# ##   4: Double normal selectivity (3 parameters)
# ##   5: Flat equal to zero (1 parameter; phase must be negative)
# ##   6: Flat equal to one (1 parameter; phase must be negative)
# ##   7: Flat-topped double normal selectivity (4 parameters)
# ##   8: Declining logistic selectivity with initial values (50% and 95% selection plus extra)
# ##   9: Cubic-spline (specified with knots and values at knots)
# ##      Inputs: knots (in length units); values at knots (0-1) - at least one should have phase -1
# ##  10: One parameter logistic selectivity (inflection point and slope)
## Selectivity specifications --
# ## Extra (type 1): number of selectivity parameters to estimated
```

```
# #  Winter_Com Subsistence Summer_Com NMFS_Trawl ADFG_Trawl NBS_Trawl Winter_Pot
 0 0 0 0 0 0 0 # is selectivity sex=specific? (1=Yes; 0=No)
 #10 -1 -1 10 -4 -4 8 # male selectivity type.
 10 -1 -1 10 -4 -4 8 # male selectivity type.
 0 0 0 0 0 0 0 # selectivity within another gear
 0 0 0 0 0 0 3 # male extra parameters for each pattern
 0 0 1 1 1 1 0 # male: is maximum selectivity at size forced to equal 1 (1) or not (0)
 0 0 0 0 0 0 4 # size-class at which selectivity is forced to equal 1 (ignored if the previous input is 1)
## Retention specifications --
 0 0 0 0 0 0 0 # is retention sex=specific? (1=Yes; 0=No)
 2 0 2 5 5 5 5 # male retention type. Note: changed these from 6's be 5's when moved to 2.20.31 (but this shouldn't matter because retention flag = 0?)
 1 1 1 0 0 0 0 # male retention flag (0 = no, 1 = yes)
 0 0 0 0 0 0 0 # male extra parameters for each pattern
 0 0 0 0 0 0 0 # male - should maximum retention be estimated for males (1=Yes; 0=No)

## General parameter specificiations
##  Initial: Initial value for the parameter (must lie between lower and upper)
##  Lower & Upper: Range for the parameter
##  Prior type:
##   0: Uniform   - parameters are the range of the uniform prior
##   1: Normal    - parameters are the mean and sd
##   2: Lognormal - parameters are the mean and sd of the log
##   3: Beta      - parameters are the two beta parameters [see dbeta]
##   4: Gamma     - parameters are the two gamma parameters [see dgamma]
##  Phase: Set equal to a negative number not to estimate
##  Relative: 0: absolute; 1 relative
##  Block: Block number for time-varying selectivity
##  Block_fn: 0:absolute values; 1:exponential
##  Env_L: Environmental link - options are 0:none; 1:additive; 2:multiplicative; 3:exponential
##  EnvL_var: Environmental variable
##  RW: 0 for no random walk changes; 1 otherwise
##  RW_blk: Block number for random walks
##  Sigma_RW: Sigma used for the random walk

# Inputs for type*sex*fleet: selectivity male Winter_Com
# MAIN PARS:  Initial  Lower_bound  Upper_bound Prior_type     Prior_1      Prior_2  Phase  Block Blk_fn  Env_L Env_vr     RW RW_Blk RW_Sigma
#            0.143640     0.000010   20.000000          0     0.100000   100.000000      2      0      0      0      0      0      0   0.3000 # Sel_Winter_Com_male_period_1_par_1

# Inputs for type*sex*fleet: selectivity male Summer_Com
# MAIN PARS:  Initial  Lower_bound  Upper_bound Prior_type     Prior_1      Prior_2  Phase  Block Blk_fn  Env_L Env_vr     RW RW_Blk RW_Sigma
             0.200000     0.000010     5.000000          0     0.100000   100.000000      2      0      0      0      0      0      0   0.3000 # Sel_Summer_Com_male_period_1_par_1

# Inputs for type*sex*fleet: selectivity male NMFS_Trawl
# MAIN PARS:  Initial  Lower_bound  Upper_bound Prior_type     Prior_1      Prior_2  Phase  Block Blk_fn  Env_L Env_vr     RW RW_Blk RW_Sigma
            0.092094     0.000010    20.000000          0     0.100000   100.000000      2      0      0      0      0      0      0   0.3000 # Sel_NMFS_Trawl_male_period_1_par_1

# Inputs for type*sex*fleet: selectivity male ADFG_Trawl
# MAIN PARS:  Initial  Lower_bound  Upper_bound Prior_type     Prior_1      Prior_2  Phase  Block Blk_fn  Env_L Env_vr     RW RW_Blk RW_Sigma
#            0.092094     0.000010    20.000000          0     0.100000   100.000000      2      0      0      0      0      0      0   0.3000 # Sel_NMFS_Trawl_male_period_1_par_1

# Inputs for type*sex*fleet: selectivity male NBS_Trawl
# MAIN PARS:  Initial  Lower_bound  Upper_bound Prior_type     Prior_1      Prior_2  Phase  Block Blk_fn  Env_L Env_vr     RW RW_Blk RW_Sigma
```

```
#            0.092094     0.000010    20.000000          0     0.100000   100.000000      2      0      0      0      0      0      0   0.3000 # Sel_NMFS_Trawl_male_period_1_par_1

# Inputs for type*sex*fleet: selectivity male Winter_Pot
# MAIN PARS:  Initial  Lower_bound  Upper_bound Prior_type     Prior_1      Prior_2  Phase  Block Blk_fn  Env_L Env_vr     RW RW_Blk RW_Sigma
           128.894800    40.000000   200.000000          0    10.000000   200.000000      2      0      0      0      0      0      0   0.3000 # Sel_Winter_Com_male_period_1_par_1
             0.154697     0.010000    20.000000          0     0.100000   100.000000      2      0      0      0      0      0      0   0.3000 # Sel_Winter_Com_male_period_1_par_2
             0.045586     0.000010     0.999990          0     0.100000   100.000000      2      0      0      0      0      0      0   0.3000 # Sel_Winter_Com_male_period_1_par_3
             0.375288     0.000010     0.999990          0     0.100000   100.000000      2      0      0      0      0      0      0   0.3000 # Sel_Winter_Com_male_period_1_par_4
             0.733787     0.000010     0.999990          0     0.100000   100.000000      2      0      0      0      0      0      0   0.3000 # Sel_Winter_Com_male_period_1_par_5

# Inputs for type*sex*fleet: retention male Winter_Com
# MAIN PARS:  Initial  Lower_bound  Upper_bound Prior_type     Prior_1      Prior_2  Phase  Block Blk_fn  Env_L Env_vr     RW RW_Blk RW_Sigma
           100.49375    50.000000   200.000000          0     1.000000   900.000000     -2      2      0      0      0      0      0   0.3000 # Ret_Winter_Com_male_period_1_par_1
             2.48336     0.001000    20.000000          0     1.000000   900.000000     -2      2      0      0      0      0      0   0.3000 # Ret_Winter_Com_male_period_1_par_2
# EXTRA PARS: Initial  Lower_bound  Upper_bound Prior_type      Prior_1      Prior_2  Phase Reltve
           100.49375    50.000000   700.000000          0     0.100000   100.000000      2      0 # Ret_Summer_Com_male_period_2_par_1
              2.4833     1.000000    20.000000          0     0.100000   100.000000      2      0 # Ret_Summer_Com_male_period_2_par_2

# Inputs for type*sex*fleet: retention male Subsistence
# MAIN PARS:  Initial  Lower_bound  Upper_bound Prior_type     Prior_1      Prior_2  Phase  Block Blk_fn  Env_L Env_vr     RW RW_Blk RW_Sigma
             0.000001     0.000000     0.000002          0     1.000000   900.000000     -2      0      0      0      0      0      0   0.3000 # Ret_Subsistence_male_period_1_par_1
             0.000001     0.000000     0.000002          0     1.000000   900.000000     -2      0      0      0      0      0      0   0.3000 # Ret_Subsistence_male_period_1_par_2
             0.000001     0.000000     0.000002          0     1.000000   900.000000     -2      0      0      0      0      0      0   0.3000 # Ret_Subsistence_male_period_1_par_3
             0.999999     0.000000     1.000000          0     1.000000   900.000000     -2      0      0      0      0      0      0   0.3000 # Ret_Subsistence_male_period_1_par_4
             0.999999     0.000000     1.000000          0     1.000000   900.000000     -2      0      0      0      0      0      0   0.3000 # Ret_Subsistence_male_period_1_par_5
             0.999999     0.000000     1.000000          0     1.000000   900.000000     -2      0      0      0      0      0      0   0.3000 # Ret_Subsistence_male_period_1_par_6
             0.999999     0.000000     1.000000          0     1.000000   900.000000     -2      0      0      0      0      0      0   0.3000 # Ret_Subsistence_male_period_1_par_7
             0.999999     0.000000     1.000000          0     1.000000   900.000000     -2      0      0      0      0      0      0   0.3000 # Ret_Subsistence_male_period_1_par_8

# Inputs for type*sex*fleet: retention male Summer_Com
# MAIN PARS:  Initial  Lower_bound  Upper_bound Prior_type     Prior_1      Prior_2  Phase  Block Blk_fn  Env_L Env_vr     RW RW_Blk RW_Sigma
           104.310600    50.000000   700.000000          0     1.000000   900.000000      2      1      0      0      0      0      0   0.3000 # Ret_Summer_Com_male_period_1_par_1
             2.421736     1.000000    20.000000          0     1.000000   900.000000      2      1      0      0      0      0      0   0.3000 # Ret_Summer_Com_male_period_1_par_2
# EXTRA PARS: Initial  Lower_bound  Upper_bound Prior_type      Prior_1      Prior_2  Phase Reltve
           105.150900    50.000000   700.000000          0     0.100000   100.000000      2      0 # Ret_Summer_Com_male_period_2_par_1
             1.648215     1.000000    20.000000          0     0.100000   100.000000      2      0 # Ret_Summer_Com_male_period_2_par_2


## ================================================================================= ##
## CATCHABILITY PARAMETER CONTROLS                                                   ##
## ================================================================================= ##
##
# Catchability (specifications)
# Analytic: should q be estimated analytically (1) or not (0)
# Lambda: the weight lambda
# Emphasis: the weighting emphasis
# Block: Block number for time-varying M-at-size
# Block_fn: 0:absolute values; 1:exponential
# Env_L: Environmental link - options are 0: none; 1:additive; 2:multiplicative; 3:exponential
# EnvL_var: Environmental variable
# RW: 0 for no random walk changes; 1 otherwise
# RW_blk: Block number for random walks
```

```
# Sigma_RW: Sigma for the random walk parameters
## Analytic  Lambda Emphass  Mirror   Block   Env_L EnvL_Vr      RW  RW_blk Sigma_RW
          0       1       1       0       0       0       0       0       0   0.3000
 #         0       1       1       0       0       0       0       0       0   0.3000
          0       1       1       0       0       0       0       0       0   0.3000
          0       1       1       0       0       0       0       0       0   0.3000
          0       1       1       0       0       0       0       0       0   0.3000
          0       1       1       0       0       0       0       0       0   0.3000
# Catchability (parameters)
#      Initial    Lower_bound    Upper_bound  Prior_type        Prior_1        Prior_2  Phase
    0.77700000     0.10000000     2.00000000           0     0.10000000     1.00000000      2 # NMFS trawl survey
    1.00000000     0.10000000     2.00000000           0     0.10000000     1.00000000     -2 # ADF&G trawl survey - now ADFG/NBS model-based index
#    0.77700000     0.10000000     2.00000000           0     0.10000000     1.00000000      2 # NBS trawl survey
    0.00150000     0.00000000     2.00000000           0     0.00000000     1.00000000      1 # block 1 - std CPUE
    0.00150000     0.00000000     2.00000000           0     0.00000000     1.00000000      1 # block 2 - std CPUE
    0.00150000     0.00000000     2.00000000           0     0.00000000     1.00000000      1 # block 3 - std CPUE

## ================================================================================== ##
## ADDITIONAL CV PARAMETER CONTROLS                                                   ##
## ================================================================================== ##
##
# Catchability (specifications)
# Mirror: should additional variance be mirrored (value > 1) or not (0)?
# Block: Block number for time-varying M-at-size
# Block_fn: 0:absolute values; 1:exponential
# Env_L: Environmental link - options are 0: none; 1:additive; 2:multiplicative; 3:exponential
# EnvL_var: Environmental variable
# RW: 0 for no random walk changes; 1 otherwise
# RW_blk: Block number for random walks
# Sigma_RW: Sigma for the random walk parameters
##   Mirror   Block   Env_L EnvL_Vr     RW   RW_blk Sigma_RW
          0       0       0       0       0       0   0.3000
#          0       0       0       0       0       0   0.3000 # removed due to addition of ADFG/NBS model-based index
          0       0       0       0       0       0   0.3000
          0       0       0       0       0       0   0.3000
          4       0       0       0       0       0   0.3000
          4       0       0       0       0       0   0.3000
## Mirror Block Env_L EnvL_Var  RW RW_blk Sigma_RW
# Additional variance (parameters)
#      Initial    Lower_bound    Upper_bound  Prior_type        Prior_1        Prior_2  Phase
    0.00010000     0.00000001     2.00000000           0     1.00000000   100.00000000     -4
 #   0.00010000     0.00000001     2.00000000           0     1.00000000   100.00000000     -4 # removed due to addition of ADFG/NBS model-based index
    0.00010000     0.00000001     2.00000000           0     1.00000000   100.00000000     -4
    0.10000000     0.00000001     2.00000000           0     1.00000000   100.00000000      4
#    0.00010000     0.00000001     2.00000000           0     1.00000000   100.00000000     -4
#    0.00010000     0.00000001     2.00000000           0     1.00000000   100.00000000     -4

## ================================================================================== ##
## CONTROLS ON F                                                                      ##
## ================================================================================== ##
##
# Controls on F
```

```
#   Initial_male_F Initial_fema_F Pen_SD (early) Pen_SD (later) Phz_mean_F_mal Phz_mean_F_fem   Lower_mean_F   Upper_mean_F Low_ann_male_F  Up_ann_male_F    Low_ann_f_F     Up_ann_f_F
          0.020000       0.000000       0.500000      45.500000       1.000000      -1.000000     -15.000000       4.000000     -10.000000      10.000000     -10.000000      10.000000  # Winter_C
          0.020000       0.000000       0.500000      45.500000       1.000000      -1.000000     -15.000000       4.000000     -10.000000      10.000000     -10.000000      10.000000  # Subsiste
          0.120000       0.000000       0.500000      45.500000       1.000000      -1.000000     -15.000000       4.000000     -10.000000      10.000000     -10.000000      10.000000  # Summer_C
          0.000000       0.000000       2.000000      20.000000      -1.000000      -1.000000     -15.000000       4.000000     -10.000000      10.000000     -10.000000      10.000000  # NMFS_Tra
          0.000000       0.000000       2.000000      20.000000      -1.000000      -1.000000     -15.000000       4.000000     -10.000000      10.000000     -10.000000      10.000000  # ADFG_Tra
          0.000000       0.000000       2.000000      20.000000      -1.000000      -1.000000     -15.000000       4.000000     -10.000000      10.000000     -10.000000      10.000000  # NBS_Traw
          0.000000       0.000000       2.000000      20.000000      -1.000000      -1.000000     -15.000000       4.000000     -10.000000      10.000000     -10.000000      10.000000  # Winter_P

## ================================================================================= ##
## SIZE COMPOSITIONS OPTIONS                                                         ##
## ================================================================================= ##
##
# Options when fitting size-composition data
## Likelihood types:
##  1:Multinomial with estimated/fixed sample size
##  2:Robust approximation to multinomial
##  3:logistic normal
##  4:multivariate-t
##  5:Dirichlet

# Using oldshell and newshell
#  Winter_Com Winter_Com Summer_Com Summer_Com Summer_Com Summer_Com Summer_Com Summer_Com NMFS_Trawl NMFS_Trawl ADFG_Trawl ADFG_Trawl NBS_Trawl NBS_Trawl Winter_Pot Winter_Pot
#  male male male male male male male male male male male male male male male male
#  retained retained retained retained discard discard total total total total total total total total total total
#  newshell oldshell newshell oldshell newshell oldshell newshell oldshell newshell oldshell newshell oldshell newshell oldshell newshell oldshell
#  immature+mature immature+mature immature+mature immature+mature immature+mature immature+mature immature+mature immature+mature immature+mature immature+mature immature+mature immature+mature
#  1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1 # Type of likelihood
#  0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0 # Auto tail compression
#  0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0 # Auto tail compression (pmin)
#  1   1   2   2   3   3   4   4   5   5   6   6   7   7   8   8 # Composition aggregator codes
#  1   1   1   1   1   1   1   1   2   2   2   2   2   2   2   2 # Set to 1 for catch-based predictions; 2 for survey or total catch predictions
#  -4   -4   -4   -4   -4   -4   -4   -4   -4   -4   -4   -4   -4   -4   -4   -4 # Phz for estimating effective sample size (if appl.)
#  1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1 # Lambda for effective sample size
#  1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1 # Lambda for overall likelihood. Or emphasis?
#  0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0 # Survey to set Q for this comp. Does 0 keep this as is? Ask Buck. Added in version 2.20.16. Use 0 for non-survey fleets.
#  0   0   0   0   0   0   0   0   3   4   1   2   5   6   5   6 # Survey to set Q for this comp. Does 0 keep this as is? Ask Buck. Added in version 2.20.16. Use 0 for non-survey fleets.
#  0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0 # Survey to set Q for this comp. Does 0 keep this as is? Ask Buck. Added in version 2.20.16
#  1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1 # Initial value for effective sample size multiplier

# Using only one shell condition
#  Winter_Com      Summer_Com      Summer_Com      Summer_Com      NMFS_Trawl      ADFG_Trawl      NBS_Trawl       Winter_Pot
#  male            male            male            male            male            male            male            male
#  retained        retained        discard         total           total           total           total           total
#  immature+mature immature+mature immature+mature immature+mature immature+mature immature+mature immature+mature immature+mature
  1   1   1   1   1   1   1   1 # Type of likelihood
  0   0   0   0   0   0   0   0 # Auto tail compression
  0   0   0   0   0   0   0   0 # Auto tail compression (pmin)
  1   2   3   4   5   6   7   8 # Composition aggregator codes
  1   1   1   1   2   2   2   2 # Set to 1 for catch-based predictions; 2 for survey or total catch predictions
#  -4   -4   -4   -4   -4   -4   -4   -4 # Phz for estimating effective sample size (if appl.)
  1   1   1   1   1   1   1   1  # Lambda for effective sample size
```

```
  1   1   1   1   1   1   1   1  # Lambda for overall likelihood. Or emphasis?
  0   0   0   0   0   0   0   0  # Survey to set Q for this comp.

# Effective sample size parameters (number matches max(Composition Aggregator code))
#      Initial    Lower_bound    Upper_bound  Prior_type        Prior_1        Prior_2  Phase
    1.00000000     0.10000000     10.00000000          0       0               999      -1 # Overdispersion_parameter_for_size_comp_1(possibly extended)
    1.00000000     0.10000000     10.00000000          0       0               999      -1 # Overdispersion_parameter_for_size_comp_2(possibly extended)
    1.00000000     0.10000000     10.00000000          0       0               999      -1 # Overdispersion_parameter_for_size_comp_3(possibly extended)
    1.00000000     0.10000000     10.00000000          0       0               999      -1 # Overdispersion_parameter_for_size_comp_4(possibly extended)
    1.00000000     0.10000000     10.00000000          0       0               999      -1 # Overdispersion_parameter_for_size_comp_5(possibly extended)
    1.00000000     0.10000000     10.00000000          0       0               999      -1 # Overdispersion_parameter_for_size_comp_6(possibly extended)
    1.00000000     0.10000000     10.00000000          0       0               999      -1 # Overdispersion_parameter_for_size_comp_7(possibly extended)
    1.00000000     0.10000000     10.00000000          0       0               999      -1 # Overdispersion_parameter_for_size_comp_8(possibly extended)

## ==================================================================================== ##
## EMPHASIS FACTORS                                                                     ##
## ==================================================================================== ##

1.0000 # Emphasis on tagging data

 1.0000 1.0000 0.0000 1.0000 # Emphasis on Catch: (by catch dataframes)

#AEP AEP AEP AEP
   1.0000   0.0000   0.0000   0.0000 # Winter_Com
   0.1000   0.0000   0.0000   0.0000 # Subsistence
   1.0000   0.0000   0.0000   0.0000 # Summer_Com
   0.0000   0.0000   0.0000   0.0000 # NMFS_Trawl
   0.0000   0.0000   0.0000   0.0000 # ADFG_Trawl
   0.0000   0.0000   0.0000   0.0000 # NBS_Trawl
   0.0000   0.0000   0.0000   0.0000 # Winter_Pot
#
## Emphasis Factors (Priors/Penalties: 13 values) ##
     1.0000 #--Log_fdevs
     0.0000 #--MeanF
     0.0000 #--Mdevs
     1.0000 #--Rec_devs
    15.0000 #--Initial_devs
     1.0000 #--Fst_dif_dev
     3.0000 #--Mean_sex_ratio
    60.0000 #--Molt_prob
     0.1000 #--free selectivity
     1.0000 #--Init_n_at_len
     0.0000 #--Fvecs
     0.0000 #--Fdovss
     1.0000 #--Random walk in selectivity

# eof_ctl
9999
```