Rebuilding analysis for canary rockfish based on the 2009 updated stock assessment

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Summary

Based on the 2009 stock assessment, this rebuilding analysis compares the results of applying a suite of potential future management actions to the U.S. canary rockfish stock. The base case model for the 2009 assessment estimated that the canary rockfish resource is at 23.7% of the unexploited equilibrium spawning biomass at the beginning of 2009. This represents a reduction from the 2007 assessment which estimated depletion in 2007 to be 32.4%; the change is largely due to a revised historical catch time-series for California. As in 2007, uncertainty about the base case results is included through integration or rebuilding trajectories over two alternate (and less likely) states of nature corresponding to lower and higher stock-recruitment steepness (h), the parameter largely governing productivity and recent rebuilding trajectory. The 2009-2010 OYs were set at 105 mt based on the 2007 rebuilding analysis. In the context of the 2007 assessment, the 105 mt OYs represented an SPR rate of 92.2%, or slightly less fishing mortality than the target rebuilding SPR rate of 88.7% used from the 2002 and 2005 rebuilding analyses. These levels of harvest are estimated to be far below those which would result in overfishing based on the 2009 assessment.

Because of the reduction in estimated relative depletion in the 2009 stock assessment compared to the 2007 assessment, management alternatives are presented that accommodate three potential OY levels for 2010: 105 mt (the status quo, selected based on the 2007 rebuilding analysis), as well as 85 mt and 44 mt (alternative values under consideration in 2007). Starting from each of these values for the 2010 OY, various management options for 2011 and subsequent years are considered ranging from zero fishing mortality to the largest removal that could occur without overfishing (ABC catches). In the absence of any future fishing mortality (beginning in 2011 and assuming a 2010 OY of 105 mt) the canary rockfish stock is projected to have a 50% probability of recovery to the rebuilding target ($SB_{40\%}$) by 2024. In contrast, the stock is not projected to reach this level until 2180 if the ABC catches are removed. The current rebuilding harvest rate (SPR = 88.7%) would produce an OY of 101.5 mt in 2011 and has a 50% probability of rebuilding by 2027. The harvest rate that is consistent with the current 2010 OY (105 mt) is SPR = 92.2%, and if continued, results in an OY of 68.6 mt and a 50% probability of recovery by 2026 (this is consistent with the preliminary forecasts reported in the 2009 updated stock assessment for the base case). Selecting an alternate OY for 2010 (either 85 or 44 mt) results in only very small differences in the 2011 OY (0.2 or 0.4 mt larger), or the probability of recovery by T_{MAX} (0.1 or 0.2% larger) and no difference in the year in which there is a 50% probability of recovery, 2027. A range of additional management approaches to recovery based on historical and recalculated reference points as well as harvest rates corresponding to short-term OYs are presented.

Introduction

The stock assessments conducted in 1999 for canary rockfish documented that the stock had declined below the overfished level in the northern (Columbia and U.S. Vancouver INPFC areas) and southern regions (Conception, Monterey and Eureka areas; Crone et al. 1999, Williams et al. 1999). Canary rockfish was determined to be in an "overfished" state on Jan. 1, 2000 and development of a rebuilding plan was initiated while preliminary rebuilding estimates were implemented through adjustments of annual management measures. The first rebuilding analysis for canary rockfish was conducted in 2000 based on the 1999 stock assessment (Methot 2000). This analysis has subsequently been updated on the basis of the 2002 (Methot and Piner), 2005 (Methot and Stewart), 2007 (Stewart, 2008b) and now the 2009 updated stock assessment results.

The first rebuilding analysis used results from the northern area assessment to project rates of potential stock recovery (Methot 2000). The stock was found to have long recovery times based on extremely low productivity. The initial rebuilding OY for 2001 and 2002 was set at 93 mt based upon a 50% probability of rebuilding by the year 2057 and maintaining a constant catch throughout the rebuilding period.

The rebuilding analysis was updated in 2002 (Methot and Piner, 2002) to incorporate the coast-wide assessment results. This analysis was the basis of a change from a constant catch to a constant harvest rate rebuilding strategy, as was done for other west coast groundfish rebuilding plans. The results of the 2002 assessment and rebuilding analysis indicated that the relative spawning biomass had reached a low of 6.6% in 2000 (compared to the unfished equilibrium level), the year of the overfished declaration. By 2002 it had increased to 7.9%. The rate of rebuilding was based on the model-estimated stock-recruitment relationship with a steepness of 0.33 and stochastic projections sampling lognormal deviations about this relationship. The time to rebuild from the year of declaration with no fishing, T_{MIN}, was estimated to be year 2057. The mean generation time was calculated to be 19 years. The maximum allowable time to rebuild, T_{MAX}, was therefore calculated to be the year 2076 (2057 plus one mean generation time). The year with a 50% probability of recovery, T_{TARGET}, was 2074 on the basis of a harvest rate that would achieve a 60% probability of rebuilding by 2076 (T_{MAX}). This rebuilding harvest rate produced an OY in 2003 of 41 mt. The 2002 analysis demonstrated the sensitivity of the target harvest rate (and short-term OYs) to the commercial vs. recreational allocation, because of the difference in selectivity between the two gear groups. Final calculations were based upon a 50:50 division of rebuilding OYs.

The 2005 rebuilding analysis (Methot 2005) recalculated all rebuilding reference points on the basis of two alternate models for selectivity (sex-specific or not) and a profile of values for stock-recruitment steepness for each model. Rebuilding projections therefore included uncertainty in selectivity, steepness and future recruitment strength. The stock was estimated to be at 9.4% of unexploited spawning biomass in 2005. The time to rebuild from the year of declaration (2000) with no fishing, T_{MIN}, was estimated to be year 2048. Mean generation time was estimated to be 23 years. The maximum allowable time to rebuild, T_{MAX}, was therefore calculated to be the year 2071 (2048 plus one mean generation time). The year with a 50% probability of recovery, T_{TARGET}, was 2063 on the basis of the same harvest rate selected in 2002 (SPR= 88.7%). This harvest rate was projected to achieve a 55.4% probability of rebuilding by 2071 (T_{MAX}). Because

of slightly below-average recruitments since the stock had been declared overfished, the projected year with a 50% probability of rebuilding to target stock size if fishing mortality were zero beginning in 2007 ($T_{F=0}$) was 2053. A list of reference points from the 2005 rebuilding analysis is presented in Table 1. The 2005 rebuilding analysis projected OYs based on three fishing fleets (trawl, non-trawl and recreational) maintaining a 50:50 split between commercial and recreation sectors, although this had not been realized in the actual removals during the intervening years since 2002.

The 2007 rebuilding analysis revised both the estimated reference points and rebuilding trajectories (Stewart 2008a). That analysis estimated that the canary rockfish resource was at 32.4% of the unexploited equilibrium spawning biomass at the beginning of 2007. Uncertainty in that result was included through the integration over two alternate (and less likely) states of nature corresponding to lower and higher stock-recruitment steepness (h), the parameter largely governing productivity and recent rebuilding trajectory. Conditioned on the 2007-2008 OYs of 44 mt (based on the rebuilding SPR rate of 88.7% used in the 2002 and 2005 rebuilding analyses), various management options were presented. In the absence of any future fishing mortality, the canary rockfish stock was projected to have a 50% probability of recovery to the rebuilding target ($SB_{40\%}$) by 2019. In contrast, the stock was not projected to reach this level for 143 years (2152) if the ABC catches are removed. Application of the previous rebuilding harvest rate (SPR = 88.7%) was estimated to produce an OY of 155.2 mt in 2009 and had a 50% probability of rebuilding by 2021. The council opted to set 2009-2010 OYs at 105 mt, corresponding to an SPR of 92.2%, resulting in an estimated median year to rebuild of 2020.

2009 Assessment summary

The 2009 canary rockfish stock assessment estimated the unexploited spawning biomass (SB_0) to be 25, 993 mt, somewhat lower than the estimate from the 2007 assessment of 32,561 mt for the base case model (Stewart 2008b). The stock was estimated to be at 23.7% of this level at the beginning of 2009 (Stewart 2009). The steepness of the spawner-recruitment relationship, which largely determines the rate of increase in recruitment as the stock rebuilds, was 0.511 in the base model (as in 2007), with the degree of recruitment variability (σ_r) set at 0.50. Two alternative states of nature were presented, representing lower stock-recruitment steepness (0.345) and higher steepness (0.72); each of these states was assigned a probability equal to half that of the base case model (0.5), based on a meta-analysis of west coast rockfish (M. Dorn, Alaska Fisheries Science Center, personal communication). These alternate models estimated the stock to be at a much lower (9%) or higher (40%) relative stock size.

Updates in the 2009 assessment included:

- Addition of the revised California historical catch history which produced a 24% reduction in estimated cumulative catch over the period 1916-1981.
- Addition of recent NWFSC trawl survey data (2007-2008).
- Addition of recent fishery port and observer sampling (2007-2008).

Changes in the results of the 2009 assessment compared to those in 2007 were due primarily to the revised California historical catch history.

Management performance under rebuilding

Following the 1999 declaration that the canary rockfish stock was overfished the canary OY was reduced by over 70% in 2000 and by the same margin again over the next three years. Managers employed several tools in an effort to constrain catches to these dramatically lower targets. These included: reductions in trip/bag limits for canary and co-occurring species, the institution of spatial closures, and new gear restrictions intended to reduce trawling in rocky shelf habitats and the coincident catch of rockfish in shelf flatfish trawls. In recent years, the total mortality has been slightly above the OY (higher in retrospect based on current methods used for total mortality estimates), but well below the ABC. Since the overfished determination in 1999, the total 9-year catch (749 mt) has been 14% above the sum of the OYs for 2000-2008. This level of removals represents only 34% of the sum of the ABCs for that period (Table 1).

Rebuilding calculations

This rebuilding analysis was conducted using software developed by A. Punt (version 3.12a, September 2009). Since the 2007 rebuilding analysis, this software has been improved to accommodate as many fleets as the assessment model contains (12), where only five were previously allowable. The steps followed were:

1. Define how virgin biomass (SB_0) will be calculated.
2. Define how future recruitment will be generated.
3. Define the fishery selectivity and allocation to be applied during rebuilding.
4. Decide how to include uncertainty in input parameters from the stock assessment in the rebuilding analysis.
5. Recalculate rebuilding reference points from the most current assessment results
   a) Calculate the projected year in which the stock would rebuild with a 50% probability if all future fishing mortality was eliminated ($T_{F=0}$).
   b) Calculate the projected year for a 50% probability of rebuilding from the year in which the stock was first declared overfished (T_{MIN}).
   c) Calculate the mean generation time.
   d) Calculate the maximum allowable rebuilding time (T_{MAX}).
6. Identification and analysis of alternative harvest strategies for rebuilding.

1. Definition of SB_0

The equilibrium spawning biomass level (SB_0) used in this rebuilding analysis is calculated via the stock-recruitment relationship in order to be consistent with assessment model results. This level is estimated to be 25,993 mt in the base case assessment model, which dictates that the rebuilding target ($SB_{40\%}$) is 10,397 mt (Table 2).

2. Generation of future recruitment

The parameters of the stock recruitment relationship (unexploited equilibrium recruitment [natural log of R_0], steepness [h], and the degree of recruitment variability [σ_r]) from the 2009 stock assessment are used to generate future recruitments in the rebuilding analysis. These values are provided in Table 3.

3. Fishery selectivity and allocation

In order to project the effect of fishing on the canary rockfish rebuilding trajectory, it is necessary to specify the fishery selectivity and relative allocation among fleets. Following the method employed in 2007, this analysis projects forward using selectivity and allocation averaged over the three most recent years (2006-2008). This choice also provides some consistency between assessment model results and short term-forecasts from the rebuilding analysis, although the two still may differ. The resulting selectivity and weight at age are included in the basic input data files (Appendices A and B).

4. Inclusion of uncertainty

Uncertainty is included in this rebuilding analysis via integration of the three states of nature for stock-recruitment steepness reported in the 2009 assessment as well as stochastic future recruitment strengths. Specifically, the model using a low value for steepness is given a probability of 25%, the base case 50% and the model using a high value for steepness 25%. This is achieved through the use of multiple parameter vectors in the rebuilding input files. Because these three states are discrete levels from a continuous probability distribution, it is expected that there will be a reasonably high degree of 'stair-stepping' in reported probabilities. This means that interpretation of the relative difference between 60% and 70% probabilities are probably not as meaningful as those between 70% and 80% where the upper tail is actually informing the difference. A similar pattern should exist in the lower tail as well. Addition of more parameter vectors would tend to smooth this pattern in the results, but is unlikely to substantially change the median values upon which decisions are generally made.

5. Recalculate reference points

The median year of recovery in the absence of fishing ($T_{F=0}$) was calculated by setting fishing mortality to zero in 2011 for each 2010 OY levels under consideration. The value for $T_{F=0 \text{ in } 2011}$ is equal to 2024 with a 2010 OY of 105, 85 or 44 mt. The value for T_{MIN}, the median year for rebuilding to the target level in the absence of fishing since the year of declaration (2000) is also 2024 (revised upward from 2019 in the 2007 analysis). That T_{MIN} is equal to $T_{F=0}$ indicates harvest rates during this eight-year period have been low enough to have had no appreciable effect on the stock trajectory.

The estimated generation time has remained constant since the 2007 analysis at 22 years. In conjunction with T_{MIN}, the mean generation time dictates the revised estimate of T_{MAX}, 2046 (increased from 2041 in the 2007 analysis). Applying the same harvest rate (SPR_{TARGET} = 88.7%) used to find T_{TARGET} in the 2007 rebuilding analysis leads to a revised T_{TARGET} of 2027 regardless of the 2010 OY selected. This harvest rate generates a P_{MAX} (probability of recovery by T_{MAX}) of 75%.

All reference points from the 2007 rebuilding analysis and those recalculated here are summarized in Table 2.

6. Alternate rebuilding strategies

Assuming that a constant rate of harvest will be applied throughout a rebuilding period, the basis for rebuilding alternatives can be divided into two approaches: 1) strategies based on selection of a harvest rate, and 2) strategies based selection of a

T_{TARGET} (year for 50% probability of recovery). The result of each of these strategies is contingent on the actual OY removed in 2010. This rebuilding analysis therefore presents 15 alternate strategies for each possible value for the 2010 OY. Specifically, the alternatives are:

Based on the current OY for 2010 (105 mt, option a), calculate the results of the following strategies (in increasing SPR order for easier interpretation). Repeat this for 2010 OYs of 85 mt (option b) or 44 mt (option c) using the SPR values calculated for option a:

1) Eliminate all harvest beginning in 2011 (F=0).
2) Apply the harvest rate that would currently generate a 44 mt 2010 OY (SPR=94.4%)
3) Apply the harvest rate which generated the 2009-2010 OYs (105 mt; SPR=92.2%).
4) Apply the harvest rate that would currently generate an 85 mt 2010 OY (SPR=89.5%)
5) Apply the current rebuilding harvest rate target (SPR_{TARGET}=88.7%).
6) Apply the harvest rate that would currently generate the 105 mt 2010 OY (SPR=87.2%)
7) Apply the harvest rate that estimated to generate a 50% probability of recovery by the T_{MAX} from 2007 (2041, SPR=64.5%)
8) Apply a 40:10 harvest policy.
9) Apply the ABC harvest rate ($SPR_{50\%}$).

Apply the harvest rate that achieves a 50% probability of recovery for years distributed between $T_{F=0}$ (2024) and the current T_{MAX} of 2046 (in increasing SPR order for easier interpretation):

10) 2046
11) 2043
12) 2039
13) 2035
14) 2031
15) 2027

Results

Summary results from alternatives 1a-9a are presented in Table 4. Detailed results are presented in Tables 10-12 and Figures 1-3. In the absence of any future fishing mortality, the canary rockfish stock is projected to have a 50% probability of recovery to the rebuilding target ($SB_{40\%}$) by 2024 (alternative 1a). In contrast, the stock is not projected to reach this level until 2180 if the ABC catches are removed (alternative 9a). These two scenarios bound the range of fishing mortality between none and the overfishing level; all other scenarios lie within this range.

Fishing at the current SPR target (alternative 5a) results in a small decrease from the 105 mt OY in 2010 to 101.5 mt in 2011. The harvest rate target retains the same probability of median recovery by T_{MAX} of 75.0% from 2007 even though T_{MAX} is estimated to be slightly larger at 2046 (instead of 2041 in 2007). The current rebuilding

harvest rate (SPR = 88.7%) results in a median year to rebuild (T_{TARGET}) of 2027. The harvest rate that is consistent with the 2010 OY (105 mt) is SPR = 87.2% (alternate 6a), and if continued, also results in a 50% probability of recovery achieved by 2027. Because the estimate of the year with 50% probability of recovery under no fishing, and for all levels of 2010 OY considered here is 2024, it is not estimated to be possible to rebuild by the 2007 T_{TARGET} of 2021. This suggests the need to consider 'resetting' the reference points from the 2007 rebuilding analysis in light of the changes to the stock assessment results and estimated current status.

Figures 4-6 and Table 5 show the results of alternate management actions 10a-15a, fishing at SPR rates that result in a 50% probability of recovery by an arbitrary range of years between $T_{F=0 \text{ in } 2011}$ and T_{MAX}. These runs correspond to harvest rates in excess of the SPR = 88.7% value used from 2002 to 2007. Detailed results of these management alternatives are presented in tables 13-15. Note that there are a range of SPR values that satisfy this condition so, for example, the SPR that achieves a 50% probability of recovery by 2027 is 86.0%; however this is the same year in which the target SPR of 88.7% achieves a 50% probability of recovery. The most useful interpretation of these alternatives may be to compare SPR rates and actual probabilities of recovery by some year of interest (i.e., alternatives do differ in the estimated probability of recovery by 2027).

Applying the same set of 15 management alternatives, but reducing the 2010 OY to 85 or 44 mt, yields little change to these basic results (Tables 6-9). Only very small differences in the 2011 OY (0.2 or 0.4 mt larger), or the probability of recovery by T_{MAX} (0.1 or 0.2% larger) are achieved with alternate 2010 OY levels, and there is no difference in the year in which there is a 50% probability of recovery, 2027.

Supplementary run for GMT

After the review of the rebuilding plan by the SSC on 30 September – 1 October 2009 an additional rebuilding option was requested by the GMT. This additional run consisted of projecting with the SPR corresponding to a 155 mt OY in 2011 (83.4%). The summary results of this run are reported in table 16.

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Tables

Table 1. Canary rockfish management performance under rebuilding.

Year	ABC (mt)	OY (mt)	Landings (mt)[1]	Total Catch (mt)
2000	287	200	55.7	199.9
2001	228	93	42.6	133.0
2002	228	93	47.8	98.1
2003	272	44	8.6	59.9
2004	256	47.3	10.7	50.3
2005	270	46.8	12.0	60.4
2006	279	47	7.3	62.0
2007	172	44	12.1	44.7
2008	179	44	9.4	40.5

[1]Excludes all at-sea whiting, recreational and research catches.
[2]Includes the Columbia and Vancouver INPFC areas only.

Table 2. Summary of rebuilding reference points for canary rockfish from Amendment 16-4 (for comparison) the 2007 rebuilding analysis (to which the rebuilding plan was 'reset' in 2007) and recalculated values based on the 2009 assessment results.

	Source		
Parameter	Amendment 16-4	2007 Rebuilding analysis	2009 Rebuilding analysis
SB_0	34,155	32,561	25,993
Rebuilding target ($SB_{40\%}$)	13,662	13,024	10,397
SB_{2009}	NA	11,073	6,170
T_{MIN}	2048	2019	2024
Mean generation time	23	22	22
T_{MAX}	2071	2041	2046
$T_{F=0}$ (begin in 2007)	2053	NA	NA
$T_{F=0}$ (begin in 2009)	NA	2019	NA
$T_{F=0}$ (begin in 2011, 105 mt removed in 2010)	NA	NA	2024
$T_{F=0}$ (begin in 2011, 85 mt removed in 2010)	NA	NA	2024
$T_{F=0}$ (begin in 2011, 44 mt removed in 2010)	NA	NA	2024
P_{MAX}	55.4%	75.0%	NA
P_{MAX} (105 mt removed in 2010)	NA	NA	75%
P_{MAX} (85 mt removed in 2010)	NA	NA	75%
P_{MAX} (44 mt removed in 2010)	NA	NA	75%
T_{TARGET}	2063	2021	NA
T_{TARGET} (105 mt removed in 2010)	NA	NA	2027
T_{TARGET} (85 mt removed in 2010)	NA	NA	2027
T_{TARGET} (44 mt removed in 2010)	NA	NA	2027
SPR_{TARGET}	88.7%	88.7%	88.7%

Table 3. Stock-recruitment parameters for the three states of nature included in this rebuilding analysis.

	State of nature		
Parameter	Low steepness	Base case	High steepness
R_0 (1000s)	3,203	3,335	3,529
Steepness (h)	0.345	0.511	0.72
σ_r	0.50	0.50	0.50

Table 4. Results of rebuilding alternatives based on selection of an SPR target or year for 50% probability of recovery and a 2010 OY of 105 mt (option a).

Run	1a	2a	3a	4a	5a	6a	7a	8a	9a
Basis	F=0 2011+	SPR from 2010 OY of 44 mt	2007 SPR from 2010 OY of 105 mt	SPR from 2010 OY of 85 mt	SPR = 88.7%	SPR from 2010 OY of 105 mt	SPR that achieves 50% prob. recovery by 2007 T_{MAX}	40:10 Harvest policy	ABC harvest rate SPR = 50%
2011 OY (mt)	0.0	48.6	68.6	93.9	101.5	116.2	380.8	493.2	613.5
2011 ABC (mt)	613.5	613.5	613.5	613.5	613.5	613.5	613.5	613.5	613.5
2012 OY (mt)	0.0	51.1	72.1	98.5	106.5	121.7	392.0	503.4	621.5
2012 ABC (mt)	647.3	645.3	644.4	643.4	643.0	642.4	631.3	626.6	621.5
50% prob. recovery by:	2024	2025	2026	2026	2027	2027	2041	2111	2180
SPR_{TARGET}	100%	94.4%	92.2%	89.5%	88.7%	87.2%	64.5%	<=50%	50%
Probability of recovery by reference points based on the 2007 rebuilding analysis:									
2019 (T_{MIN} and $T_{F=0}$ from 2009)	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%
2021 (T_{TARGET})	26.9%	25.8%	25.6%	25.5%	25.5%	25.4%	25.0%	25.0%	25.0%
2041 (T_{MAX})	75.0%	75.0%	75.0%	75.0%	75.0%	74.9%	50.2%	26.8%	25.4%
Probability of recovery by recalculated 2009 reference points:									
2024 (T_{MIN} and $T_{F=0}$ from 2011)	50.3%	42.6%	40.0%	37.1%	36.5%	33.6%	25.0%	25.0%	25.0%
2027 (T_{TARGET})	70.2%	64.0%	60.7%	56.8%	56.0%	54.1%	26.1%	25.0%	25.0%
2046 (T_{MAX})	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	60.0%	28.0%	25.6%

Table 5. Results of rebuilding alternatives based on a year for 50% probability of recovery and a 2010 OY of 105 mt (option a).

Run	10a	11a	12a	13a	14a	15a
Basis	SPR that achieves 50% prob. recovery by 2046	SPR that achieves 50% prob. recovery by 2043	SPR that achieves 50% prob. recovery by 2039	SPR that achieves 50% prob. recovery by 2035	SPR that achieves 50% prob. recovery by 2031	SPR that achieves 50% prob. recovery by 2027
2011 OY (mt)	415.0	396.4	364.8	307.8	253.4	128.0
2011 ABC (mt)	613.5	613.5	613.5	613.5	613.5	613.5
2012 OY (mt)	426.2	407.6	375.9	318.4	263.1	134.1
2012 ABC (mt)	629.9	630.6	632.0	634.4	636.6	641.9
50% prob. recovery by:	2046	2043	2039	2035	2031	2027
SPR_{TARGET}	62.1%	63.4%	65.7%	70.0%	74.4%	86.0%
Probability of recovery by reference points based on the 2007 rebuilding analysis:						
2019 (T_{MIN} and $T_{F=0}$ from 2009)	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%
2021 (T_{TARGET})	25.0%	25.0%	25.0%	25.0%	25.0%	25.2%
2041 (T_{MAX})	41.4%	46.5%	53.6%	65.2%	71.0%	74.9%
Probability of recovery by recalculated 2009 reference points:						
2024 (T_{MIN} and $T_{F=0}$ from 2011)	25.0%	25.0%	25.0%	25.5%	26.4%	32.8%
2027 (T_{TARGET})	25.4%	25.6%	26.5%	28.7%	32.9%	52.5%
2046 (T_{MAX})	50.0%	55.3%	62.2%	70.1%	73.9%	75%

Table 6. Results of rebuilding alternatives based on selection of an SPR target or year for 50% probability of recovery and a 2010 OY of 85 mt (option b).

Run	1b	2b	3b	4b	5b	6b	7b	8b	9b
Basis	F=0 2011+	SPR from 2010 OY of 44 mt	2007 SPR from 2010 OY of 105 mt	SPR from 2010 OY of 85 mt	SPR = 88.7%	SPR from 2010 OY of 105 mt	SPR that achieves 50% prob. recovery by 2007 T_{MAX}	40:10 Harvest policy	ABC harvest rate SPR = 50%
2011 OY (mt)	0.0	48.6	68.6	94.0	101.7	116.3	381.3	494.2	614.3
2011 ABC (mt)	614.3	614.3	614.3	614.3	614.3	614.3	614.3	614.3	614.3
2012 OY (mt)	0.0	51.2	72.2	98.6	106.6	121.9	392.5	504.4	622.3
2012 ABC (mt)	648.1	646.1	645.2	644.2	643.8	643.2	632.1	627.3	622.3
50% prob. recovery by:	2024	2025	2026	2026	2027	2027	2041	2111	2180
SPR_{TARGET}	100%	94.4%	92.2%	89.5%	88.7%	87.2%	64.5%	<=50%	50%
Probability of recovery by reference points based on the 2007 rebuilding analysis:									
2019 (T_{MIN} and $T_{F=0}$ from 2009)	25.0%	25.5%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%
2021 (T_{TARGET})	26.9%	25.8%	25.6%	25.5%	25.5%	25.4%	25.0%	25.0%	25.0%
2041 (T_{MAX})	75.0%	75.0%	75.0%	75.0%	75.0%	74.9%	50.4%	26.8%	25.4%
Probability of recovery by recalculated 2009 reference points:									
2024 (T_{MIN} and $T_{F=0}$ from 2011)	50.3%	42.7%	40.1%	37.1%	36.5%	33.8%	25.0%	25.0%	25.0%
2027(T_{TARGET})	70.2%	64.1%	60.9%	57.1%	56.1%	54.2%	26.2%	25.0%	25.0%
2046 (T_{MAX})	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	60.1%	28.0%	25.6%

Table 7. Results of rebuilding alternatives based on a year for 50% probability of recovery and a 2010 OY of 85 mt (option b).

Run	10b	11b	12b	13b	14b	15b
Basis	SPR that achieves 50% prob. recovery by 2046	SPR that achieves 50% prob. recovery by 2043	SPR that achieves 50% prob. recovery by 2039	SPR that achieves 50% prob. recovery by 2035	SPR that achieves 50% prob. recovery by 2031	SPR that achieves 50% prob. recovery by 2027
2011 OY (mt)	415.5	396.8	364.8	308.2	254.3	128.2
2011 ABC (mt)	614.3	614.3	614.3	614.3	614.3	614.3
2012 OY (mt)	426.7	408.0	375.9	318.8	264.0	134.2
2012 ABC (mt)	630.6	631.4	632.8	635.1	637.4	642.7
50% prob. recovery by:	2046	2043	2039	2035	2031	2027
SPR_{TARGET}	62.1%	63.4%	65.7%	70.0%	74.4%	86.0%
Probability of recovery by reference points based on the 2007 rebuilding analysis:						
2019 (T_{MIN} and $T_{F=0}$ from 2009)	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%
2021 (T_{TARGET})	25.0%	25.0%	25.0%	25.0%	25.0%	25.2%
2041 (T_{MAX})	41.4%	46.6%	53.9%	65.2%	71.0%	74.9%
Probability of recovery by recalculated 2009 reference points:						
2024 (T_{MIN} and $T_{F=0}$ from 2011)	25.0%	25.0%	25.0%	25.5%	26.4%	32.8%
2027 (T_{TARGET})	25.4%	25.6%	26.5%	28.9%	23.0%	52.7%
2046 (T_{MAX})	50.0%	55.6%	62.5%	70.1%	73.9%	75.0%

Table 8. Results of rebuilding alternatives based on selection of an SPR target or year for 50% probability of recovery and a 2010 OY of 44 mt (option c).

Run	1c	2c	3c	4c	5c	6c	7c	8c	9c
Basis	F=0 2011+	SPR from 2010 OY of 44 mt	2007 SPR from 2010 OY of 105 mt	SPR from 2010 OY of 85 mt	SPR = 88.7%	SPR from 2010 OY of 105 mt	SPR that achieves 50% prob. recovery by 2007 T_{MAX}	40:10 Harvest policy	ABC harvest rate SPR = 50%
2011 OY (mt)	0.0	48.7	68.8	94.2	101.9	116.6	382.4	496.3	615.9
2011 ABC (mt)	614.3	615.9	615.9	615.9	615.9	615.9	615.9	615.9	615.9
2012 OY (mt)	0.0	51.3	72.3	98.9	106.9	122.2	393.5	506.4	623.9
2012 ABC (mt)	648.1	647.7	646.9	645.8	645.5	644.8	633.7	628.9	623.9
50% prob. recovery by:	2024	2025	2026	2026	2026	2027	2041	2111	2179
SPR_{TARGET}	100%	94.4%	92.2%	89.5%	88.7%	87.2%	64.5%	<=50%	50%
Probability of recovery by reference points based on the 2007 rebuilding analysis:									
2019 (T_{MIN} and $T_{F=0}$ from 2009)	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%
2021 (T_{TARGET})	26.9%	25.8%	25.6%	25.5%	25.5%	25.4%	25.0%	25.0%	25.0%
2041 (T_{MAX})	75%	75.0%	75.0%	75.0%	75.0%	74.9%	50.5%	26.9%	25.4%
Probability of recovery by recalculated 2009 reference points:									
2024 (T_{MIN} and $T_{F=0}$ from 2011)	50.3%	43.3%	40.5%	37.2%	36.7%	34.2%	25.0%	25.0%	25.0%
2027 (T_{TARGET})	70.2%	64.4%	61.2%	57.5%	56.2%	54.7%	26.3%	25.0%	25.0%
2046 (T_{MAX})	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	60.2%	28.1%	25.6%

Table 9. Results of rebuilding alternatives based on a year for 50% probability of recovery and a 2010 OY of 44 mt (option c).

Run	10c	11c	12c	13c	14c	15c
Basis	SPR that achieves 50% prob. recovery by 2046	SPR that achieves 50% prob. recovery by 2043	SPR that achieves 50% prob. recovery by 2039	SPR that achieves 50% prob. recovery by 2035	SPR that achieves 50% prob. recovery by 2031	SPR that achieves 50% prob. recovery by 2027
2011 OY (mt)	416.6	397.9	365.8	309.1	255.0	128.6
2011 ABC (mt)	615.9	615.9	615.9	615.9	615.9	615.9
2012 OY (mt)	427.8	409.0	376.9	319.6	264.7	134.6
2012 ABC (mt)	632.2	633.0	634.4	636.8	639.0	644.3
50% prob. recovery by:	2046	2043	2039	2035	2031	2027
SPR_{TARGET}	62.1%	63.4%	65.7%	70.0%	74.4%	86.0%
Probability of recovery by reference points based on the 2007 rebuilding analysis:						
2019 (T_{MIN} and $T_{F=0}$ from 2009)	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%
2021 (T_{TARGET})	25.0%	25.0%	25.0%	25.0%	25.0%	25.2%
2041 (T_{MAX})	42.0%	46.8%	54.1%	65.2%	71.0%	74.9%
Probability of recovery by recalculated 2009 reference points:						
2024 (T_{MIN} and $T_{F=0}$ from 2011)	25.0%	25.0%	25.0%	25.5%	26.4%	33.1%
2027 (T_{TARGET})	25.4%	25.6%	26.5%	28.9%	33.6%	53.1%
2046 (T_{MAX})	50.4%	56.0%	62.6%	70.1%	74.0%	75.0%

Table 10. Probability of recovery for rebuilding alternatives based on selection of an SPR target or year for 50% probability of recovery and a 2010 OY of 105 mt (option a). Note that after 25 years the table is compressed.

Run	1a	2a	3a	4a	5a	6a	7a	8a	9a
Basis	F=0 2011+	SPR from 2010 OY of 44 mt	2007 SPR from 2010 OY of 105 mt	SPR from 2010 OY of 85 mt	SPR = 88.7%	SPR from 2010 OY of 105 mt	SPR that achieves 50% prob. recovery by 2007 T_{MAX}	40:10 Harvest policy	ABC harvest rate SPR = 50%
2009	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%
2010	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%
2011	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%
2012	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%
2013	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%
2014	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%
2015	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%
2016	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%
2017	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%
2018	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%
2019	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%
2020	25.1%	25.1%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%
2021	26.9%	25.8%	25.6%	25.5%	25.5%	25.4%	25.0%	25.0%	25.0%
2022	32.2%	28.6%	27.9%	27.1%	26.9%	26.6%	25.0%	25.0%	25.0%
2023	41.3%	34.8%	32.5%	30.6%	30.0%	29.1%	25.0%	25.0%	25.0%
2024	50.3%	42.6%	40.0%	37.1%	36.5%	33.6%	25.0%	25.0%	25.0%
2025	59.2%	51.0%	47.7%	43.3%	42.1%	39.9%	25.0%	25.0%	25.0%
2026	65.7%	58.4%	55.8%	51.0%	49.9%	46.8%	25.5%	25.0%	25.0%
2027	70.2%	64.0%	60.7%	56.8%	56.0%	54.1%	26.1%	25.0%	25.0%
2028	72.0%	68.0%	65.4%	62.2%	60.9%	59.1%	26.6%	25.0%	25.0%
2029	73.8%	70.9%	69.2%	66.1%	64.8%	63.2%	27.7%	25.1%	25.0%
2030	74.4%	72.5%	70.8%	68.9%	68.4%	66.6%	28.8%	25.1%	25.1%
2031	74.7%	74.0%	73.1%	70.2%	70.0%	68.8%	29.9%	25.1%	25.1%
2032	75.0%	74.2%	73.9%	73.0%	71.9%	70.3%	32.4%	25.2%	25.1%
2033	75.0%	74.5%	74.2%	73.6%	73.4%	72.7%	33.8%	25.3%	25.1%
2043	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	53.9%	27.5%	25.6%
2053	76.0%	75.0%	75.0%	75.0%	75.0%	75.0%	66.5%	30.7%	26.5%
2063	86.3%	79.7%	77.3%	75.9%	75.7%	75.3%	71.7%	34.6%	28.3%
2073	96.1%	90.5%	87.5%	83.6%	82.2%	80.0%	74.4%	39.1%	30.7%
2083	99.3%	97.1%	95.1%	91.8%	91.0%	88.9%	74.7%	42.0%	32.0%
2093	99.9%	99.4%	98.8%	96.9%	96.4%	95.0%	74.8%	44.5%	34.1%
2103	100.0%	99.9%	99.9%	99.3%	98.8%	98.3%	75.0%	47.6%	36.8%

Table 11. Median spawning biomass (mt) for rebuilding alternatives based on selection of an SPR target or year for 50% probability of recovery and a 2010 OY of 105 mt (option a). Note that after 25 years the table is compressed.

Run	1a	2a	3a	4a	5a	6a	7a	8a	9a
Basis	F=0 2011+	SPR from 2010 OY of 44 mt	2007 SPR from 2010 OY of 105 mt	SPR from 2010 OY of 85 mt	SPR = 88.7%	SPR from 2010 OY of 105 mt	SPR that achieves 50% prob. recovery by 2007 T_{MAX}	40:10 Harvest policy	ABC harvest rate SPR = 50%
2009	6,170	6,170	6,170	6,170	6,170	6,170	6,170	6,170	6,170
2010	6,378	6,378	6,378	6,378	6,378	6,378	6,378	6,378	6,378
2011	6,546	6,546	6,546	6,546	6,546	6,546	6,546	6,546	6,546
2012	6,720	6,702	6,695	6,685	6,683	6,677	6,580	6,539	6,495
2013	6,883	6,846	6,830	6,811	6,805	6,794	6,595	6,512	6,423
2014	7,061	7,003	6,979	6,949	6,940	6,923	6,613	6,486	6,350
2015	7,272	7,190	7,156	7,114	7,101	7,077	6,649	6,476	6,290
2016	7,518	7,410	7,366	7,311	7,294	7,262	6,708	6,487	6,251
2017	7,800	7,665	7,610	7,540	7,519	7,480	6,793	6,523	6,236
2018	8,116	7,952	7,885	7,801	7,775	7,727	6,903	6,583	6,245
2019	8,464	8,269	8,189	8,090	8,060	8,004	7,037	6,665	6,276
2020	8,825	8,597	8,505	8,389	8,354	8,288	7,179	6,753	6,318
2021	9,206	8,945	8,840	8,708	8,669	8,594	7,336	6,853	6,374
2022	9,603	9,307	9,188	9,040	8,995	8,911	7,506	6,970	6,442
2023	10,021	9,690	9,557	9,389	9,338	9,243	7,671	7,061	6,500
2024	10,414	10,048	9,901	9,718	9,663	9,559	7,840	7,166	6,566
2025	10,836	10,432	10,271	10,071	10,009	9,893	8,018	7,296	6,652
2026	11,280	10,836	10,657	10,436	10,369	10,244	8,219	7,425	6,750
2027	11,740	11,256	11,062	10,820	10,748	10,612	8,403	7,532	6,828
2028	12,201	11,672	11,461	11,198	11,119	10,971	8,593	7,630	6,913
2029	12,599	12,029	11,801	11,519	11,434	11,275	8,731	7,705	6,958
2030	13,008	12,405	12,163	11,860	11,769	11,599	8,904	7,789	7,042
2031	13,442	12,802	12,546	12,230	12,135	11,957	9,108	7,882	7,129
2032	13,899	13,202	12,924	12,587	12,485	12,292	9,240	7,971	7,163
2033	14,253	13,531	13,242	12,884	12,776	12,572	9,396	8,043	7,231
2043	17,619	16,555	16,117	15,577	15,416	15,115	10,519	8,474	7,552
2053	20,281	18,905	18,358	17,685	17,488	17,113	11,504	8,784	7,905
2063	22,049	20,531	19,930	19,187	18,962	18,548	12,147	8,958	8,118
2073	22,951	21,335	20,668	19,889	19,660	19,206	12,614	9,078	8,305
2083	23,484	21,853	21,175	20,379	20,128	19,662	12,907	9,130	8,423
2093	23,777	22,096	21,388	20,622	20,377	19,921	13,041	9,111	8,498
2103	24,222	22,486	21,801	20,954	20,727	20,271	13,214	9,131	8,551

Table 12. Median catches (mt) for rebuilding alternatives based on selection of an SPR target or year for 50% probability of recovery and a 2010 OY of 105 mt (option a). Note that after 25 years the table is compressed.

Run	1a	2a	3a	4a	5a	6a	7a	8a	9a
Basis	F=0 2011+	SPR from 2010 OY of 44 mt	2007 SPR from 2010 OY of 105 mt	SPR from 2010 OY of 85 mt	SPR = 88.7%	SPR from 2010 OY of 105 mt	SPR that achieves 50% prob. recovery by 2007 T_{MAX}	40:10 Harvest policy	ABC harvest rate SPR = 50%
2009	105	105	105	105	105	105	105	105	105
2010	105	105	105	105	105	105	105	105	105
2011	0	49	69	94	102	116	381	493	614
2012	0	51	72	99	107	122	392	503	622
2013	0	53	75	103	111	127	401	510	626
2014	0	56	78	107	115	132	410	516	631
2015	0	58	82	111	120	137	420	525	639
2016	0	61	85	115	125	142	430	535	646
2017	0	63	88	120	129	147	440	547	653
2018	0	65	92	124	134	152	449	558	658
2019	0	68	95	128	138	157	457	571	663
2020	0	70	98	133	144	163	469	586	673
2021	0	73	102	138	149	169	479	602	680
2022	0	76	106	144	155	175	492	620	689
2023	0	79	110	148	159	180	500	635	693
2024	0	81	113	152	164	186	510	646	701
2025	0	84	117	157	169	192	518	661	705
2026	0	86	120	162	174	197	529	672	714
2027	0	90	125	168	181	204	542	689	723
2028	0	92	128	172	185	209	549	700	727
2029	0	95	132	177	190	215	560	710	735
2030	0	97	135	180	194	219	565	716	735
2031	0	99	138	184	198	224	573	727	738
2032	0	102	141	188	202	228	582	735	745
2033	0	104	144	192	206	232	585	741	746
2043	0	124	172	228	244	275	653	798	780
2053	0	140	193	256	274	308	706	840	812
2063	0	151	208	274	294	330	743	864	836
2073	0	156	214	283	303	340	766	867	849
2083	0	160	219	290	311	349	782	881	864
2093	0	163	223	295	315	353	788	872	862
2103	0	165	227	299	320	358	795	883	869

Table 13. Probability of recovery for rebuilding alternatives based on selection of a year for 50% probability of recovery and a 2010 OY of 105 mt (option a). Note that after 25 years the table is compressed.

Run	10a	11a	12a	13a	14a	15a
Basis	SPR that achieves 50% prob. recovery by 2046	SPR that achieves 50% prob. recovery by 2043	SPR that achieves 50% prob. recovery by 2039	SPR that achieves 50% prob. recovery by 2035	SPR that achieves 50% prob. recovery by 2031	SPR that achieves 50% prob. recovery by 2027
2009	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%
2010	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%
2011	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%
2012	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%
2013	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%
2014	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%
2015	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%
2016	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%
2017	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%
2018	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%
2019	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%
2020	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%
2021	25.0%	25.0%	25.0%	25.0%	25.0%	25.2%
2022	25.0%	25.0%	25.0%	25.0%	25.0%	25.9%
2023	25.0%	25.0%	25.0%	25.1%	25.5%	28.5%
2024	25.0%	25.0%	25.0%	25.5%	26.4%	32.8%
2025	25.0%	25.0%	25.4%	26.1%	27.8%	39.0%
2026	25.1%	25.2%	25.9%	27.4%	29.8%	45.3%
2027	25.4%	25.6%	26.5%	28.7%	32.9%	52.5%
2028	25.7%	26.3%	27.5%	30.2%	37.0%	56.9%
2029	26.4%	26.9%	28.4%	33.0%	41.4%	61.5%
2030	26.8%	27.9%	29.3%	36.3%	46.2%	65.5%
2031	27.6%	28.6%	31.9%	40.2%	50.0%	67.5%
2032	28.5%	30.6%	34.4%	43.3%	53.5%	69.4%
2033	30.1%	32.6%	36.0%	46.6%	56.2%	71.5%
2043	45.2%	50.0%	57.6%	67.8%	72.9%	75.0%
2053	58.8%	62.9%	68.2%	73.4%	74.7%	75.0%
2063	67.8%	70.4%	72.8%	74.9%	75.0%	75.2%
2073	71.5%	74.0%	74.6%	75.0%	75.0%	78.7%
2083	73.4%	74.5%	74.9%	75.0%	75.2%	86.4%
2093	74.4%	74.7%	74.9%	75.1%	76.1%	93.4%
2103	74.9%	74.9%	75.0%	75.4%	78.3%	97.9%

Table 14. Median spawning biomass (mt) for rebuilding alternatives based on selection of a year for 50% probability of recovery and a 2010 OY of 105 mt (option a). Note that after 25 years the table is compressed.

Run	10a	11a	12a	13a	14a	15a
Basis	SPR that achieves 50% prob. recovery by 2046	SPR that achieves 50% prob. recovery by 2043	SPR that achieves 50% prob. recovery by 2039	SPR that achieves 50% prob. recovery by 2035	SPR that achieves 50% prob. recovery by 2031	SPR that achieves 50% prob. recovery by 2027
2009	6,170	6,170	6,170	6,170	6,170	6,170
2010	6,378	6,378	6,378	6,378	6,378	6,378
2011	6,546	6,546	6,546	6,546	6,546	6,546
2012	6,568	6,575	6,586	6,607	6,627	6,673
2013	6,570	6,584	6,607	6,650	6,691	6,785
2014	6,574	6,595	6,632	6,698	6,761	6,908
2015	6,595	6,625	6,674	6,765	6,852	7,057
2016	6,639	6,676	6,740	6,857	6,970	7,236
2017	6,708	6,754	6,832	6,976	7,115	7,447
2018	6,803	6,857	6,951	7,122	7,290	7,688
2019	6,921	6,984	7,093	7,293	7,488	7,958
2020	7,046	7,118	7,242	7,471	7,695	8,235
2021	7,187	7,267	7,407	7,665	7,920	8,533
2022	7,340	7,430	7,584	7,871	8,154	8,843
2023	7,488	7,587	7,759	8,075	8,387	9,165
2024	7,641	7,749	7,935	8,282	8,627	9,475
2025	7,802	7,919	8,121	8,498	8,874	9,802
2026	7,987	8,112	8,329	8,735	9,139	10,143
2027	8,152	8,288	8,524	8,965	9,406	10,502
2028	8,324	8,469	8,723	9,198	9,674	10,852
2029	8,446	8,600	8,867	9,374	9,883	11,147
2030	8,602	8,765	9,049	9,582	10,119	11,463
2031	8,789	8,961	9,261	9,826	10,395	11,814
2032	8,902	9,084	9,402	10,003	10,608	12,137
2033	9,045	9,234	9,564	10,190	10,820	12,410
2043	10,026	10,291	10,757	11,646	12,549	14,890
2053	10,897	11,226	11,785	12,867	13,993	16,815
2063	11,477	11,844	12,471	13,712	14,958	18,206
2073	11,896	12,277	12,957	14,244	15,566	18,865
2083	12,157	12,562	13,262	14,555	15,882	19,296
2093	12,286	12,702	13,380	14,727	16,121	19,539
2103	12,451	12,863	13,588	14,874	16,314	19,909

Table 15. Median catches (mt) for rebuilding alternatives based on selection of a year for 50% probability of recovery and a 2010 OY of 105 mt (option a). Note that after 25 years the table is compressed.

Run	10a	11a	12a	13a	14a	15a
Basis	SPR that achieves 50% prob. recovery by 2046	SPR that achieves 50% prob. recovery by 2043	SPR that achieves 50% prob. recovery by 2039	SPR that achieves 50% prob. recovery by 2035	SPR that achieves 50% prob. recovery by 2031	SPR that achieves 50% prob. recovery by 2027
2009	105	105	105	105	105	105
2010	105	105	105	105	105	105
2011	415	396	365	308	253	128
2012	426	408	376	318	263	134
2013	435	417	385	327	271	139
2014	444	425	394	336	279	145
2015	454	436	404	346	289	150
2016	464	445	414	355	297	156
2017	474	455	424	365	306	162
2018	483	465	433	374	315	167
2019	490	472	441	382	322	172
2020	502	484	453	393	332	179
2021	512	494	463	403	342	185
2022	525	507	476	415	353	192
2023	534	516	484	424	361	197
2024	543	526	494	434	370	203
2025	551	533	502	442	378	209
2026	562	544	513	451	387	215
2027	574	557	526	464	399	223
2028	581	564	533	471	406	228
2029	593	575	544	482	416	235
2030	597	580	549	488	422	239
2031	604	587	557	496	430	244
2032	614	597	566	505	437	249
2033	617	600	570	509	442	253
2043	681	666	638	577	508	298
2053	732	718	691	631	559	334
2063	770	756	729	668	595	358
2073	791	778	751	688	612	369
2083	809	795	768	706	627	379
2093	813	801	773	713	633	383
2103	821	808	780	719	642	387

Table 16. Results of the supplementary rebuilding projection based on the SPR corresponding to a 2011 OY of 155 mt (assuming a 2010 OY of 105 mt, option a).

Basis	Run Supplement SPR corresponding to a 2011 OY of 155 mt
2011 OY (mt)	155.0
2011 ABC (mt)	613.5
2012 OY (mt)	162.0
2012 ABC (mt)	640.8
50% prob. recovery by:	2028
SPR_{TARGET}	83.4%
Probability of recovery by reference points based on the 2007 rebuilding analysis:	
2019 (T_{MIN} and $T_{F=0}$ from 2009)	25.0%
2021 (T_{TARGET})	25.1%
2041 (T_{MAX})	74.6%
Probability of recovery by recalculated 2009 reference points:	
2024 (T_{MIN} and $T_{F=0}$ from 2011)	30.7%
2027 (T_{TARGET})	46.9%
2046 (T_{MAX})	75.0%

Figures

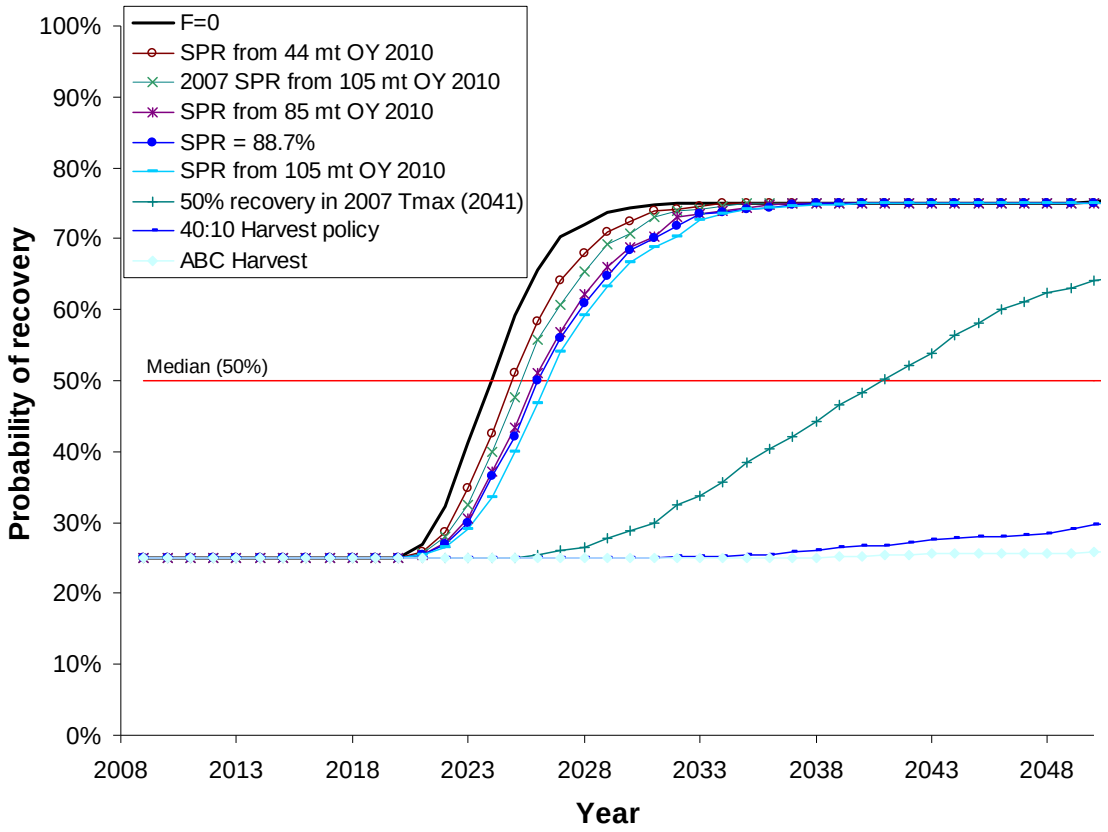

Figure 1. Probability of recovery for rebuilding alternatives 1a-9a.

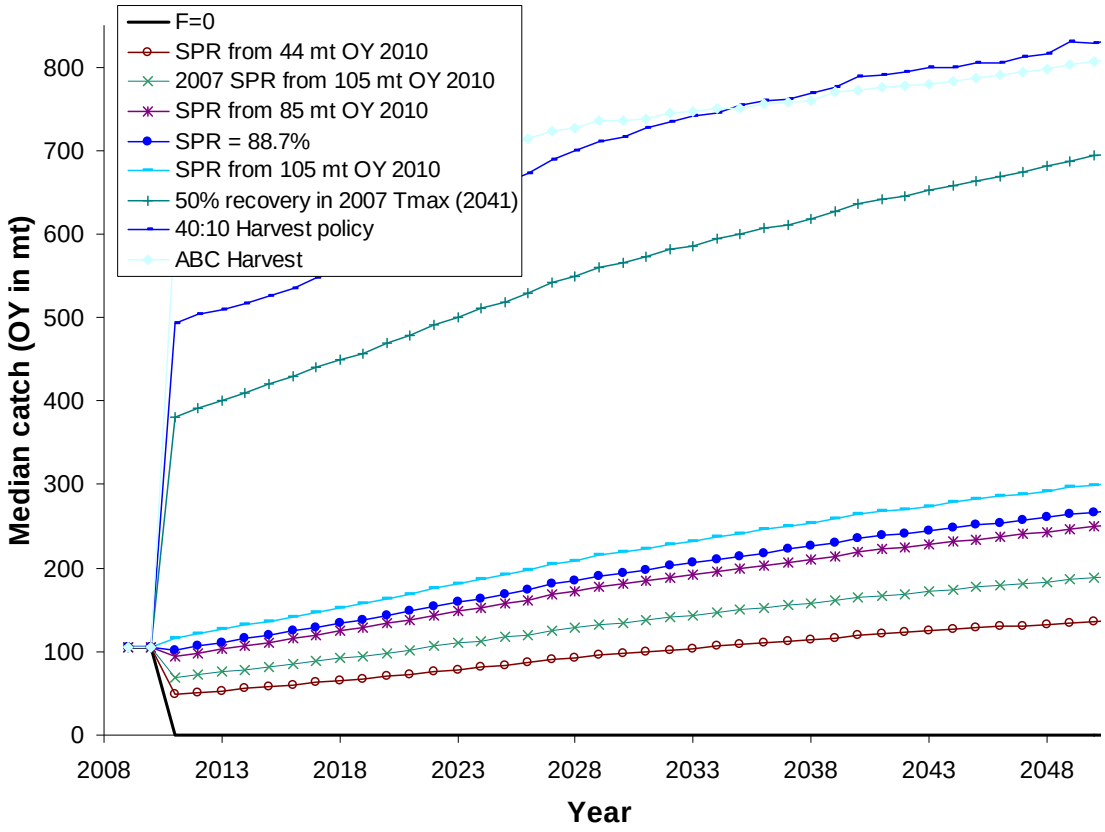

Figure 2. Projected median catch (mt) for rebuilding alternatives 1a-9a.

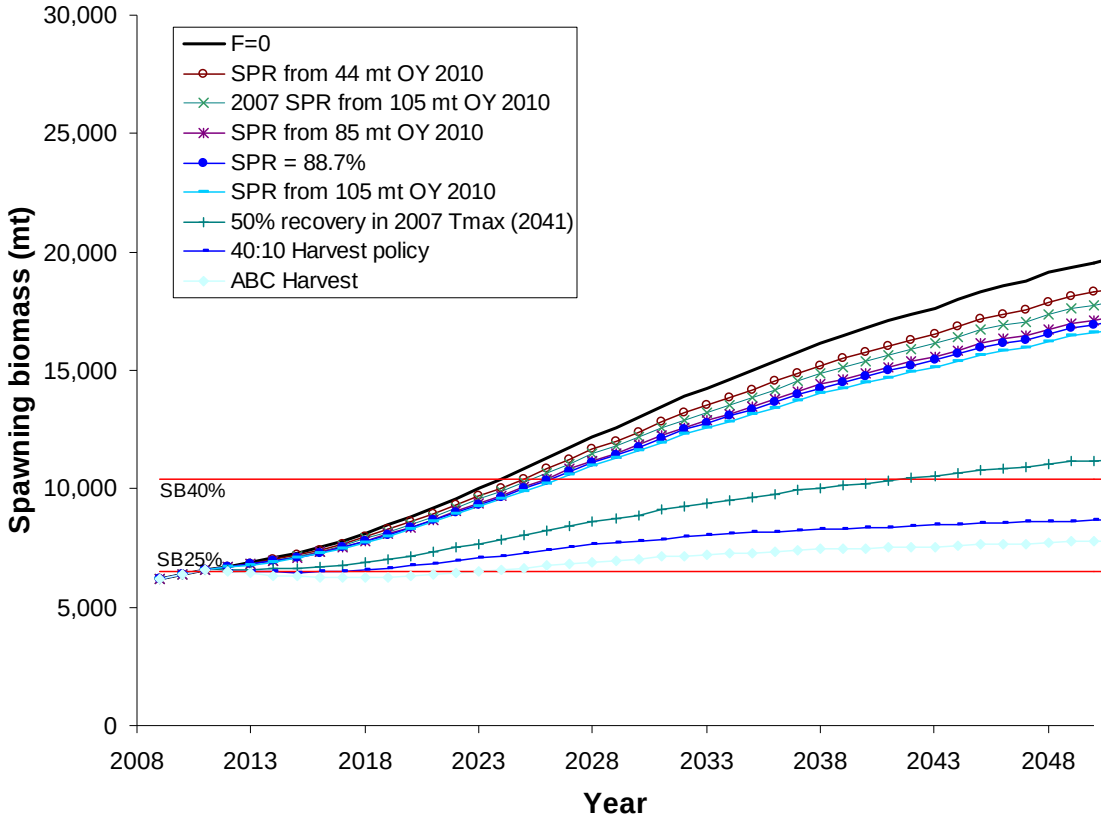

Figure 3. Projected median spawning biomass (mt) for rebuilding alternatives 1a-9a.

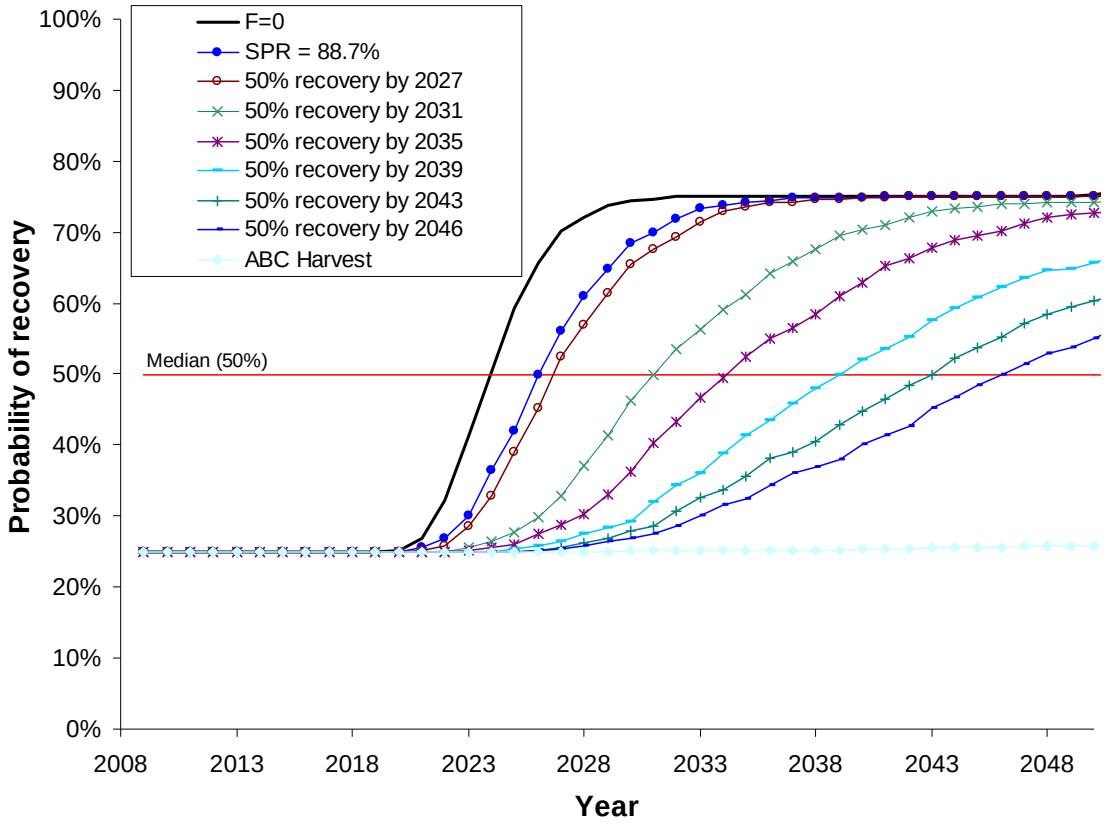

Figure 4. Probability of recovery for rebuilding alternatives 10a-15a (1a, 5a, 9a are also included for comparison).

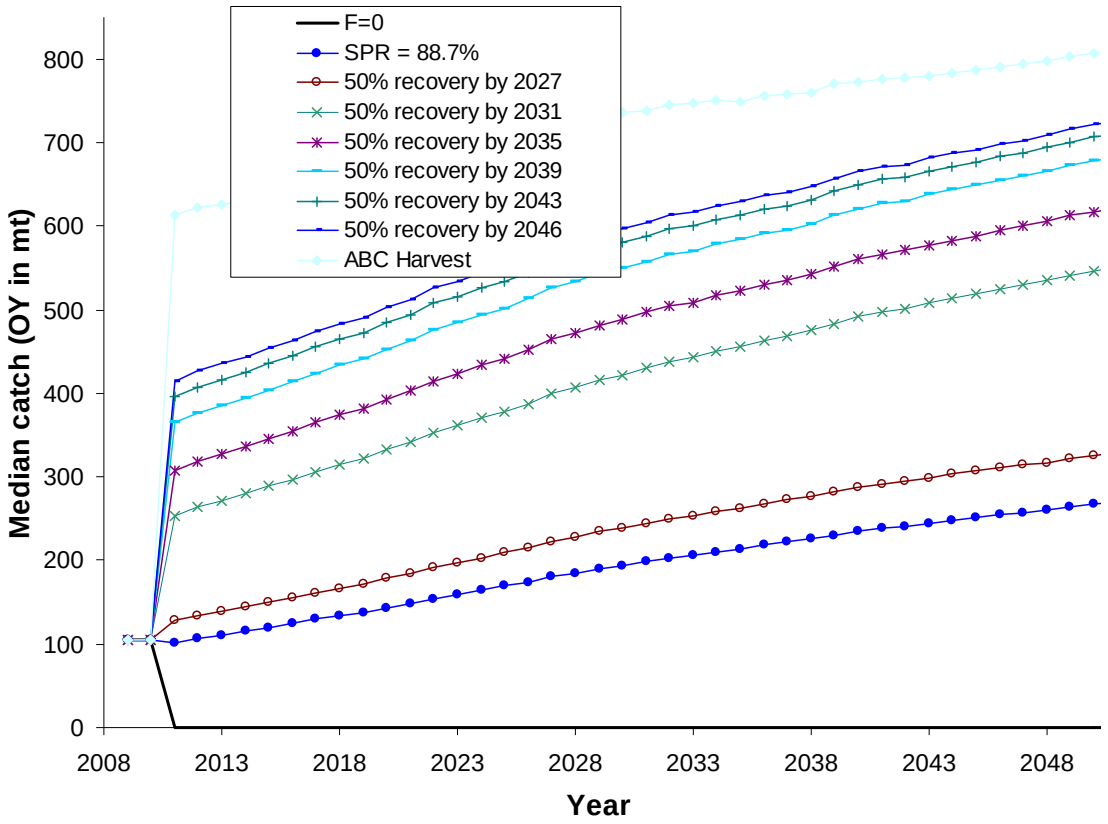

Figure 5. Projected median catch (mt) for rebuilding alternatives 10a-15a (1a, 5a, 9a are also included for comparison).

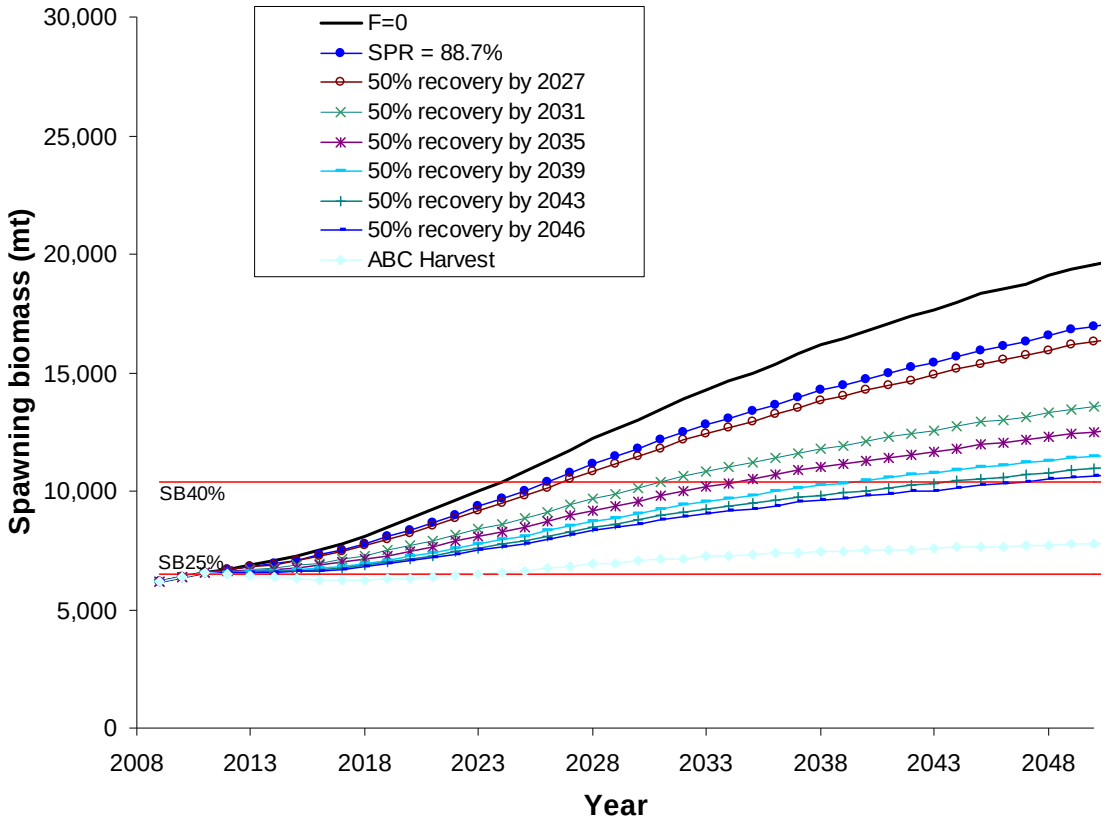

Figure 6. Projected median spawning biomass (mt) for rebuilding alternatives 10a-15a (1a, 5a, 9a are also included for comparison).

Appendix A. Basic input file for rebuilding analyses.

```
# Title
Canary_rebuilding_2009
# Number of sexes
2
# Age range to consider (minimum age; maximum age)
0 40
# Number of fleets
12
# First year of projection (Yinit)
2009
# First Year of rebuilding period (Ydecl)
2000
# Number of simulations
1000
# Maximum number of years
500
# Conduct projections with multiple starting values (0=No;else yes)
1
# Number of parameter vectors
4
# Is the maximum age a plus-group (1=Yes;2=No)
1
# Generate future recruitments using historical recruitments (1)  historical recruits/spawner (2)  or a stock-recruitment (3)
3
# Constant fishing mortality (1) or constant Catch (2) projections
1
# Fishing mortality based on SPR (1) or actual rate (2)
1
# Pre-specify the year of recovery (or -1) to ignore
-1
# Fecundity-at-age
# 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 #runnumber: 8
Canary_data.SS Canary_control.SS 4962.98 25992.5 6169.83
 0 0 5.60845e-005 0.000752569 0.005562 0.0269058 0.0911702 0.227337 0.442257 0.713769 1.00816 1.2982 1.56879 1.81423
2.03403 2.22982 2.40392 2.55863 2.69607 2.8181 2.9264 3.02242 3.1075 3.18281 3.24941 3.30827 3.36023 3.40608 3.44651
3.48213 3.5135 3.54111 3.56541 3.58677 3.60555 3.62206 3.63657 3.64931 3.6605 3.67032 3.67895 #female fecundity; weighted by
N in year Y_init across morphs and areas
# Age specific selectivity and weight adjusted for discard and discard mortality
 #wt and selex for gender,fleet: 1 1
 0.0121154 0.0198187 0.105522 0.242686 0.406624 0.584938 0.768731 0.953831 1.13539 1.30563 1.46632 1.63217 1.81801 2.02282
2.22822 2.41587 2.57928 2.72039 2.84321 2.95115 3.04659 3.13125 3.20641 3.27312 3.33228 3.38469 3.43106 3.47206 3.50827
3.54022 3.5684 3.59322 3.61508 3.63432 3.65125 3.66614 3.67922 3.69072 3.70082 3.70969 3.71749
 0 7.61857e-005 0.000728455 0.0132098 0.0884314 0.284411 0.560157 0.795101 0.90622 0.88108 0.758177 0.604762 0.475464
0.389328 0.340208 0.314892 0.302616 0.296842 0.294148 0.29288 0.292271 0.291969 0.291815 0.291733 0.291687 0.291661
0.291646 0.291636 0.29163 0.291626 0.291623 0.291621 0.29162 0.291619 0.291618 0.291617 0.291617 0.291617 0.291616
0.291616 0.291616
 #wt and selex for gender,fleet: 1 2
 0.0121154 0.0197693 0.0757641 0.259985 0.468083 0.65906 0.846994 1.03011 1.20997 1.39107 1.57601 1.76274 1.94702 2.12502
2.29376 2.45101 2.59542 2.72659 2.84483 2.95089 3.0457 3.13024 3.20548 3.27231 3.3316 3.38412 3.43059 3.47166 3.50793
3.53993 3.56814 3.59299 3.61488 3.63414 3.65108 3.66598 3.67907 3.69058 3.70069 3.70957 3.71736
 0 7.60843e-005 0.000125505 0.000482563 0.00851223 0.0623258 0.218189 0.464411 0.708355 0.872112 0.947138 0.964093
0.953565 0.93425 0.91528 0.900083 0.889144 0.881749 0.876923 0.873826 0.871846 0.870572 0.869744 0.869196 0.868827
0.868574 0.868397 0.86827 0.868177 0.868109 0.868057 0.868018 0.867987 0.867963 0.867943 0.867928 0.867915 0.867905
0.867896 0.867889 0.867883
 #wt and selex for gender,fleet: 1 3
 0.0121154 0.0197844 0.0991828 0.247786 0.417982 0.602516 0.792326 0.982598 1.17333 1.36673 1.56162 1.75341 1.93807
2.11354 2.27878 2.43297 2.57548 2.70599 2.82456 2.93158 3.02766 3.11359 3.19017 3.25826 3.31867 3.37218 3.4195 3.46132
3.49822 3.53076 3.55944 3.58469 3.60692 3.62647 3.64366 3.65878 3.67206 3.68373 3.69398 3.70298 3.71089
 0 7.61152e-005 0.000330042 0.00563877 0.0453757 0.173538 0.398949 0.648975 0.837901 0.937452 0.969077 0.962604 0.937947
0.906456 0.87462 0.845857 0.821516 0.801716 0.785974 0.773607 0.763936 0.75637 0.75043 0.745741 0.742015 0.739031
0.736625 0.734669 0.733068 0.731749 0.730654 0.729741 0.728976 0.72833 0.727784 0.72732 0.726924 0.726585 0.726294
0.726044 0.725828
 #wt and selex for gender,fleet: 1 4
```

0.0121154 0.0197697 0.0815096 0.271705 0.449243 0.627118 0.803421 0.979399 1.16305 1.35941 1.56351 1.76586 1.95955
2.14127 2.30975 2.46462 2.60604 2.73443 2.85044 2.95484 3.04847 3.13218 3.20684 3.27328 3.33229 3.38462 3.43095 3.47192
3.50812 3.54006 3.56823 3.59306 3.61492 3.63416 3.65109 3.66597 3.67906 3.69056 3.70066 3.70954 3.71733
0 7.60852e-005 0.000140377 0.00186043 0.0293651 0.16021 0.426067 0.711105 0.893914 0.970664 0.993241 0.997883 0.998175
0.99765 0.997041 0.996489 0.996018 0.995627 0.995307 0.995046 0.994834 0.994662 0.994521 0.994406 0.994311 0.994232
0.994167 0.994113 0.994067 0.994029 0.993996 0.993968 0.993945 0.993924 0.993907 0.993892 0.993879 0.993868 0.993859
0.99385 0.993843
#wt and selex for gender,fleet: 1 5
0.0121154 0.0198782 0.129714 0.221372 0.329599 0.472068 0.626784 0.785565 0.947755 1.11481 1.29142 1.48513 1.70058
1.93027 2.15536 2.35941 2.53664 2.68884 2.82008 2.93415 3.03397 3.12173 3.19908 3.26736 3.32765 3.38089 3.42789 3.46936
3.50593 3.53816 3.56656 3.59156 3.61356 3.63292 3.64994 3.6649 3.67805 3.6896 3.69975 3.70866 3.71648
0 7.63078e-005 0.0133353 0.409632 0.897939 0.86165 0.615746 0.369451 0.200098 0.103647 0.0540144 0.0297452 0.0181
0.0124972 0.00975475 0.00837578 0.00765919 0.00727302 0.00705687 0.0069312 0.00685538 0.00680799 0.00677736 0.00675693
0.00674291 0.00673303 0.00672591 0.00672065 0.0067167 0.00671367 0.00671132 0.00670946 0.00670798 0.00670679
0.00670581 0.00670501 0.00670435 0.0067038 0.00670333 0.00670294 0.00670261
#wt and selex for gender,fleet: 1 6
0.0121154 0.0200622 0.112809 0.235654 0.376161 0.526949 0.693393 0.866028 1.0355 1.20511 1.38174 1.57131 1.77507 1.98591
2.19099 2.37958 2.54718 2.69409 2.82263 2.93536 3.03452 3.12196 3.19916 3.26736 3.32762 3.38085 3.42784 3.46931 3.50589
3.53812 3.56652 3.59152 3.61353 3.63289 3.64991 3.66488 3.67803 3.68958 3.69973 3.70864 3.71647
0 7.66892e-005 0.00459171 0.0933304 0.426054 0.800228 0.933762 0.853167 0.664863 0.466667 0.312597 0.211187 0.150431
0.115812 0.0965109 0.0857791 0.0797514 0.076302 0.0742801 0.0730622 0.0723072 0.0718255 0.0715093 0.0712959 0.0711482
0.0710434 0.0709675 0.0709113 0.0708689 0.0708365 0.0708112 0.0707913 0.0707753 0.0707625 0.070752 0.0707434 0.0707362
0.0707303 0.0707253 0.0707211 0.0707175
#wt and selex for gender,fleet: 1 7
0.0121154 0.0197704 0.0776609 0.223959 0.423528 0.634459 0.853635 1.07468 1.29232 1.50289 1.70398 1.89402 2.07205 2.23761
2.3906 2.53119 2.65972 2.77662 2.88241 2.97766 3.06298 3.13908 3.20669 3.26657 3.31947 3.36611 3.40717 3.44329 3.47502
3.5029 3.52737 3.54884 3.56769 3.58422 3.59872 3.61145 3.6226 3.63239 3.64097 3.64849 3.65509
0 7.60861e-005 0.00013483 0.000373576 0.0023123 0.0108353 0.0346882 0.0825737 0.157714 0.255746 0.36694 0.48022 0.58638
0.679514 0.756997 0.818704 0.866045 0.901141 0.926253 0.943462 0.954539 0.960927 0.963785 0.964027 0.96238 0.959414
0.955574 0.951204 0.946567 0.941856 0.937214 0.932739 0.928496 0.924525 0.920848 0.91747 0.91439 0.911596 0.909075
0.906809 0.904779
#wt and selex for gender,fleet: 1 8
0.0121154 0.0199309 0.121343 0.236785 0.358955 0.497576 0.645228 0.786927 0.925148 1.06761 1.22846 1.432 1.69157 1.97148
2.21907 2.41989 2.58432 2.72373 2.84504 2.95205 3.047 3.13142 3.20646 3.27311 3.33225 3.38465 3.43103 3.47203 3.50824
3.54019 3.56837 3.5932 3.61506 3.6343 3.65123 3.66612 3.6792 3.6907 3.7008 3.70968 3.71747
0 7.64168e-005 0.00541276 0.167158 0.653514 0.911151 0.791506 0.510638 0.267013 0.123307 0.0548854 0.0260376 0.0146276
0.0102269 0.00852665 0.00785605 0.00758249 0.00746607 0.00741411 0.00738973 0.00737769 0.00737144 0.00736803
0.00736609 0.00736494 0.00736422 0.00736376 0.00736345 0.00736324 0.00736309 0.00736299 0.00736291 0.00736285
0.0073628 0.00736277 0.00736274 0.00736272 0.0073627 0.00736268 0.00736267 0.00736266
#wt and selex for gender,fleet: 1 9
0.0121154 0.019847 0.12438 0.241619 0.363082 0.503693 0.666745 0.83736 1.01541 1.2077 1.41867 1.64361 1.86847 2.07937
2.2698 2.43935 2.59002 2.72413 2.84368 2.95029 3.04533 3.12996 3.20523 3.27209 3.33139 3.38392 3.4304 3.47148 3.50776
3.53976 3.56798 3.59284 3.61473 3.634 3.65094 3.66585 3.67895 3.69046 3.70057 3.70945 3.71725
0 7.62443e-005 0.00360374 0.142215 0.622145 0.91765 0.875554 0.682244 0.475418 0.320152 0.223051 0.16814 0.13868
0.123218 0.115113 0.110812 0.10848 0.107179 0.106432 0.105988 0.105716 0.105543 0.105431 0.105355 0.105302 0.105265
0.105239 0.105219 0.105204 0.105192 0.105183 0.105176 0.10517 0.105166 0.105162 0.105159 0.105157 0.105154 0.105153
0.105151 0.10515
#wt and selex for gender,fleet: 1 10
0.0121154 0.0198148 0.123426 0.247629 0.375745 0.513216 0.658096 0.795227 0.933695 1.10386 1.34205 1.63082 1.89827
2.11758 2.30123 2.46175 2.60522 2.73436 2.85064 2.95514 3.04879 3.1325 3.20714 3.27357 3.33256 3.38487 3.43119 3.47215
3.50834 3.54028 3.56844 3.59326 3.61511 3.63435 3.65127 3.66615 3.67924 3.69073 3.70083 3.7097 3.7175
0 7.61782e-005 0.00206457 0.0908323 0.494991 0.858499 0.841134 0.579215 0.313029 0.153017 0.0813117 0.0543369 0.0451569
0.0421833 0.0412328 0.0409251 0.0408223 0.0407864 0.0407732 0.040768 0.0407659 0.0407649 0.0407645 0.0407643 0.0407641
0.0407641 0.040764 0.040764 0.040764 0.040764 0.040764 0.040764 0.040764 0.040764 0.040764 0.040764 0.040764 0.040764
0.040764 0.040764 0.040764
#wt and selex for gender,fleet: 1 11
0.0121154 0.0197693 0.0745412 0.179418 0.469633 0.749378 0.955778 1.14693 1.32718 1.49878 1.66526 1.83026 1.99539 2.1591
2.31783 2.46801 2.60733 2.73481 2.85042 2.95464 3.04818 3.13185 3.20649 3.27292 3.33193 3.38426 3.43059 3.47157 3.50777
3.53973 3.5679 3.59273 3.6146 3.63384 3.65077 3.66566 3.67875 3.69025 3.70036 3.70924 3.71703
0 7.6084e-005 0.000122913 0.000125883 0.000360693 0.00487464 0.0347248 0.128809 0.302843 0.518818 0.715031 0.85368
0.933513 0.972447 0.989036 0.995307 0.997347 0.997791 0.997677 0.99739 0.99707 0.996764 0.99649 0.996249 0.99604 0.99586
0.995706 0.995574 0.995461 0.995364 0.99528 0.995208 0.995146 0.995093 0.995047 0.995007 0.994972 0.994942 0.994916
0.994894 0.994874
#wt and selex for gender,fleet: 1 12
0.0121154 0.0197693 0.0745433 0.176326 0.321363 0.506035 0.721966 0.950785 1.176 1.39076 1.59441 1.78822 1.97309 2.1486
2.3135 2.46657 2.60714 2.73514 2.85098 2.95528 3.04885 3.13253 3.20716 3.27358 3.33257 3.38487 3.43119 3.47215 3.50833
3.54027 3.56843 3.59324 3.6151 3.63433 3.65125 3.66613 3.67922 3.69071 3.70081 3.70968 3.71747
0 0.229137 0.370199 0.372533 0.379622 0.407376 0.471503 0.572305 0.690872 0.801717 0.887101 0.942561 0.973553 0.988784
0.99553 0.998292 0.999362 0.999763 0.999911 0.999966 0.999986 0.999994 0.999997 0.999998 0.999998 0.999998 0.999997

0.999997 0.999996 0.999995 0.999994 0.999993 0.999991 0.99999 0.999989 0.999988 0.999987 0.999986 0.999985 0.999985 0.999984
#wt and selex for gender,fleet: 2 1
0.0122237 0.0230702 0.133993 0.287337 0.455106 0.625078 0.791462 0.952135 1.10442 1.24386 1.36856 1.4815 1.58773 1.69088 1.79154 1.88769 1.97647 2.05576 2.12474 2.18372 2.23363 2.27565 2.31095 2.34058 2.36545 2.38634 2.4039 2.41867 2.43109 2.44155 2.45036 2.45778 2.46403 2.4693 2.47374 2.47748 2.48064 2.4833 2.48555 2.48744 2.48903
0 8.25105e-005 0.00132103 0.0221277 0.121862 0.332966 0.589812 0.795762 0.903919 0.917096 0.859547 0.762877 0.657049 0.562265 0.487011 0.431538 0.392358 0.365253 0.346604 0.333712 0.324701 0.318309 0.313701 0.310323 0.307806 0.305901 0.304439 0.303304 0.302411 0.301702 0.301135 0.300677 0.300305 0.300001 0.299752 0.299547 0.299377 0.299236 0.299118 0.299021 0.298939
#wt and selex for gender,fleet: 2 2
0.0122237 0.0226282 0.0922991 0.32984 0.528538 0.705843 0.871705 1.02712 1.17379 1.31363 1.44747 1.57435 1.69235 1.79982 1.89606 1.98122 2.0559 2.12093 2.17724 2.22575 2.26739 2.30301 2.3334 2.35928 2.38127 2.39994 2.41577 2.42918 2.44053 2.45014 2.45826 2.46513 2.47093 2.47583 2.47997 2.48347 2.48642 2.48891 2.49101 2.49279 2.49428
0 8.1489e-005 0.000131624 0.00104931 0.0153314 0.0846218 0.243533 0.463319 0.674916 0.829308 0.91878 0.959927 0.972657 0.971106 0.96334 0.953522 0.943683 0.934728 0.926981 0.920466 0.915076 0.910655 0.907044 0.904096 0.901689 0.899718 0.8981 0.896769 0.895671 0.894762 0.894009 0.893382 0.89286 0.892425 0.892061 0.891757 0.891501 0.891287 0.891108 0.890957 0.89083
#wt and selex for gender,fleet: 2 3
0.0122237 0.0227649 0.129835 0.295324 0.469673 0.645379 0.816364 0.980294 1.13714 1.28744 1.43038 1.56375 1.68545 1.79451 1.89106 1.97582 2.04978 2.11399 2.16949 2.21728 2.25829 2.29339 2.32335 2.34888 2.37059 2.38904 2.40469 2.41796 2.4292 2.43871 2.44676 2.45357 2.45932 2.46418 2.46829 2.47176 2.47468 2.47716 2.47924 2.48101 2.48249
0 8.18014e-005 0.000553204 0.00995017 0.0657317 0.210538 0.427593 0.648726 0.816573 0.916208 0.962599 0.976935 0.974618 0.964382 0.950818 0.93638 0.922394 0.909541 0.898105 0.888139 0.879572 0.872272 0.866087 0.860864 0.856464 0.852761 0.849647 0.847028 0.844826 0.842974 0.841417 0.840106 0.839003 0.838074 0.837292 0.836633 0.836079 0.835611 0.835217 0.834885 0.834605
#wt and selex for gender,fleet: 2 4
0.0122237 0.0226317 0.110939 0.327954 0.503135 0.668777 0.825792 0.977192 1.1275 1.27821 1.42593 1.56528 1.6924 1.80582 1.90566 1.99279 2.06837 2.13362 2.18973 2.23783 2.27896 2.31405 2.34394 2.36935 2.39093 2.40924 2.42476 2.4379 2.44902 2.45843 2.46639 2.47312 2.4788 2.4836 2.48766 2.49108 2.49397 2.49641 2.49847 2.50021 2.50168
0 8.14967e-005 0.000176686 0.00414407 0.0482656 0.203184 0.459893 0.711328 0.877062 0.95703 0.987071 0.996225 0.998448 0.998726 0.998528 0.998239 0.997956 0.997702 0.99748 0.99729 0.997128 0.996992 0.996876 0.996779 0.996697 0.996628 0.99657 0.996521 0.99648 0.996446 0.996417 0.996392 0.996372 0.996354 0.99634 0.996327 0.996317 0.996308 0.996301 0.996295 0.996289
#wt and selex for gender,fleet: 2 5
0.0122237 0.0238549 0.153559 0.245583 0.358529 0.497697 0.642529 0.786907 0.929504 1.06942 1.20634 1.3403 1.47096 1.59689 1.71563 1.82451 1.92166 2.00643 2.07923 2.14114 2.19346 2.23754 2.27463 2.30582 2.33205 2.35411 2.37267 2.3883 2.40145 2.41253 2.42186 2.42973 2.43635 2.44194 2.44665 2.45062 2.45396 2.45679 2.45917 2.46117 2.46287
0 8.40824e-005 0.0360114 0.534041 0.908571 0.82085 0.58616 0.369423 0.219461 0.128819 0.0772918 0.0485641 0.0324559 0.0232345 0.0177996 0.0144883 0.0124006 0.0110393 0.0101233 0.00948858 0.0090371 0.00870831 0.00846387 0.0082788 0.00813647 0.0080255 0.00793796 0.0078682 0.00781214 0.00776674 0.00772976 0.00769947 0.00767454 0.00765395 0.00763689 0.00762271 0.0076109 0.00760104 0.00759281 0.00758591 0.00758013
#wt and selex for gender,fleet: 2 6
0.0122237 0.0251492 0.13938 0.273019 0.413085 0.558423 0.712638 0.866014 1.01152 1.15014 1.28395 1.41362 1.53855 1.6572 1.76756 1.86786 1.95709 2.0351 2.10243 2.16004 2.20906 2.25062 2.28578 2.31549 2.34058 2.36174 2.3796 2.39467 2.40738 2.4181 2.42714 2.43477 2.4412 2.44663 2.45121 2.45507 2.45833 2.46107 2.46339 2.46535 2.46699
0 8.76362e-005 0.00923743 0.143634 0.511921 0.836982 0.930887 0.855024 0.700844 0.536834 0.399934 0.299207 0.229739 0.183175 0.152172 0.131395 0.117277 0.107509 0.100617 0.0956578 0.0920207 0.0893058 0.0872463 0.0856613 0.0844258 0.0834518 0.0826764 0.0820538 0.0815502 0.0811404 0.080805 0.0805293 0.0803017 0.0801133 0.0799568 0.0798265 0.0797179 0.0796271 0.0795511 0.0794874 0.079434
#wt and selex for gender,fleet: 2 7
0.0122237 0.0226381 0.0945282 0.276606 0.483918 0.686676 0.883453 1.07023 1.24435 1.40444 1.54991 1.68079 1.7975 1.90077 1.99152 2.07079 2.13968 2.19928 2.25064 2.29476 2.33256 2.36486 2.39241 2.41587 2.43581 2.45275 2.46711 2.47929 2.4896 2.49833 2.50572 2.51196 2.51724 2.5217 2.52547 2.52865 2.53134 2.53361 2.53553 2.53714 2.53851
0 8.15111e-005 0.000145695 0.00056819 0.00349411 0.0141287 0.0390204 0.0820075 0.141971 0.213812 0.290965 0.367523 0.439273 0.503811 0.56019 0.608447 0.649178 0.683243 0.71157 0.735051 0.754487 0.770572 0.783891 0.794932 0.804098 0.811717 0.818062 0.823353 0.827771 0.831466 0.834558 0.83715 0.839324 0.841149 0.842682 0.84397 0.845054 0.845966 0.846733 0.84738 0.847924
#wt and selex for gender,fleet: 2 8
0.0122237 0.0241411 0.1491 0.269134 0.390383 0.524261 0.660066 0.788106 0.910708 1.03157 1.15434 1.2836 1.42283 1.56968 1.71462 1.84659 1.95944 2.05267 2.12877 2.1909 2.24188 2.28396 2.31889 2.34799 2.37232 2.39271 2.40983 2.42422 2.43632 2.44651 2.4551 2.46233 2.46842 2.47356 2.47789 2.48155 2.48463 2.48722 2.48941 2.49126 2.49282
0 8.49744e-005 0.0129253 0.253583 0.730037 0.903094 0.76197 0.511305 0.296435 0.159457 0.084579 0.0465793 0.0277806 0.0184315 0.0136667 0.0111501 0.00976454 0.00896785 0.00848961 0.00819054 0.00799628 0.00786568 0.00777512 0.00771058 0.00766347 0.00762836 0.0076017 0.00758115 0.00756509 0.00755239 0.00754226 0.0075341 0.00752748 0.00752208 0.00751766 0.00751401 0.007511 0.0075085 0.00750642 0.00750469 0.00750325
#wt and selex for gender,fleet: 2 9
0.0122237 0.023389 0.153625 0.274497 0.394861 0.532894 0.684804 0.837769 0.990266 1.14374 1.29762 1.44864 1.59178 1.72247 1.83819 1.93854 2.02453 2.09774 2.15987 2.21251 2.2571 2.29483 2.32675 2.35376 2.37659 2.39589 2.41221 2.426 2.43764 2.44748 2.45579 2.4628 2.46872 2.47372 2.47794 2.4815 2.48451 2.48705 2.48919 2.49099 2.49252

0 8.31855e-005 0.00927142 0.224227 0.704963 0.921341 0.856756 0.683263 0.505403 0.367113 0.27312 0.213269 0.176124
0.153115 0.138689 0.129459 0.123409 0.119339 0.116531 0.114546 0.11311 0.11205 0.111254 0.110645 0.110174 0.109804
0.109511 0.109276 0.109087 0.108933 0.108807 0.108704 0.10862 0.108549 0.108491 0.108442 0.108402 0.108368 0.10834
0.108316 0.108297
#wt and selex for gender,fleet: 2 10
0.0122237 0.0230733 0.154526 0.283613 0.40897 0.54048 0.67284 0.796196 0.917012 1.05014 1.20996 1.39497 1.57973 1.7393
1.86809 1.9715 2.05595 2.12608 2.18496 2.23469 2.27681 2.31253 2.34283 2.36852 2.3903 2.40875 2.42437 2.43758 2.44877
2.45822 2.46621 2.47297 2.47867 2.48349 2.48756 2.491 2.4939 2.49635 2.49842 2.50016 2.50163
0 8.24768e-005 0.00532456 0.15207 0.588044 0.872818 0.816537 0.580408 0.346275 0.192045 0.110484 0.0721447 0.0550477
0.0474974 0.0441015 0.0425184 0.0417455 0.0413485 0.0411336 0.0410113 0.0409382 0.0408926 0.0408629 0.040843 0.0408291
0.0408192 0.0408119 0.0408065 0.0408024 0.0407992 0.0407967 0.0407947 0.0407931 0.0407919 0.0407908 0.04079 0.0407893
0.0407887 0.0407882 0.0407879 0.0407875
#wt and selex for gender,fleet: 2 11
0.0122237 0.0226278 0.0866666 0.218955 0.578135 0.808471 0.984547 1.14202 1.28552 1.41706 1.53805 1.64963 1.75253 1.84709
1.93333 2.01116 2.08059 2.14185 2.1954 2.24184 2.28188 2.31625 2.34564 2.37071 2.39204 2.41017 2.42556 2.4386 2.44965 2.459
2.46691 2.4736 2.47925 2.48403 2.48807 2.49148 2.49435 2.49678 2.49883 2.50057 2.50203
0 8.14878e-005 0.000122929 0.000134457 0.000743525 0.00807741 0.0421984 0.127294 0.266051 0.433677 0.596479 0.73095
0.829371 0.895278 0.936734 0.961777 0.976579 0.985268 0.990394 0.993458 0.995323 0.996483 0.997219 0.997698 0.998015
0.99823 0.998378 0.998482 0.998556 0.998609 0.998648 0.998677 0.998699 0.998716 0.998728 0.998738 0.998746 0.998752
0.998757 0.998761 0.998764
#wt and selex for gender,fleet: 2 12
0.0122237 0.0226278 0.0866621 0.20162 0.357558 0.54493 0.748326 0.948871 1.13515 1.30394 1.45562 1.59145 1.71273 1.82061
1.91608 2.00006 2.07347 2.13726 2.1924 2.23985 2.28055 2.31534 2.34501 2.37028 2.39175 2.40998 2.42544 2.43853 2.44962
2.45901 2.46694 2.47365 2.47932 2.48411 2.48816 2.49157 2.49446 2.49689 2.49895 2.50069 2.50215
0 0.245411 0.370244 0.373258 0.383689 0.416914 0.481583 0.571616 0.670773 0.762972 0.838524 0.894714 0.933485 0.95876
0.974584 0.984248 0.990082 0.993607 0.995757 0.99709 0.997935 0.998484 0.998849 0.999097 0.999271 0.999396 0.999486
0.999553 0.999604 0.999644 0.999674 0.999698 0.999717 0.999732 0.999744 0.999754 0.999763 0.999769 0.999775 0.99978
0.999783
M and current age-structure in year Yinit: 2009
gender = 1
0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.0646611 0.0693223 0.0739834 0.0786446 0.0833057 0.0879669 0.092628 0.0972892 0.0972892
0.0972892 0.0972892 0.0972892 0.0972892 0.0972892 0.0972892 0.0972892 0.0972892 0.0972892 0.0972892 0.0972892 0.0972892
0.0972892 0.0972892 0.0972892 0.0972892 0.0972892 0.0972892 0.0972892 0.0972892 0.0972892 0.0972892 0.0972892 0.0972892
0.0972892
943.044 476.335 1009.06 700.946 233.582 155.545 396.539 324.225 583.242 252.883 445.382 203.407 168.931 230.704 204.024
247.079 174.232 151.347 193.523 141.496 133.806 93.3955 64.3178 40.2669 20.197 55.504 10.7594 10.925 16.5886 5.31609 4.1342
7.02513 4.47613 2.10638 3.92993 1.68379 1.68156 1.70175 1.12415 0.681024 6.52282
gender = 2
0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06
0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06
943.044 476.335 1009.06 700.925 233.482 155.391 396.023 323.858 585.338 256.008 457.033 212.489 180.218 252.6 230.623
289.14 210.986 190.034 253.058 194.056 193.402 142.308 102.725 66.9583 34.923 100.582 20.6643 22.3232 35.8482 12.0013
9.58888 16.533 10.6119 5.0068 9.35633 4.02341 4.04294 4.11899 2.73124 1.65257 17.5752
Age-structure at Ydeclare= 2000
451.977 812.647 381.154 328.429 470.548 434.467 544.777 395.455 351.917 459.845 342.732 329.335 232.704 161.561 101.533
50.895 139.802 27.0912 27.5009 41.7491 13.377 10.4017 17.6734 11.2598 5.29828 9.88456 4.23486 4.22904 4.27967 2.82698
1.71257 1.37839 1.5485 2.49473 1.17285 0.829737 0.702508 0.683997 0.750328 0.835693 6.00474
451.977 812.647 381.153 328.37 469.248 431.751 539.501 390.687 349.258 462.423 353.206 351.087 257.873 185.912 121.071
63.1032 181.65 37.3039 40.2856 64.6766 21.648 17.2935 29.8131 19.1337 9.02664 16.867 7.25268 7.2875 7.42426 4.92273 2.97847
2.3835 2.65583 4.24247 1.98134 1.39674 1.18216 1.15455 1.27522 1.43592 13.9655
Year for Tmin Age-structure (set to Ydecl by SS)
2000
recruitment and biomass
Number of historical assessment years
95
Historical data
year recruitment spawner in B0 in R project in R/S project
1915 1916 1917 1918 1919 1920 1921 1922 1923 1924 1925 1926 1927 1928 1929 1930 1931 1932 1933 1934 1935 1936 1937 1938
1939 1940 1941 1942 1943 1944 1945 1946 1947 1948 1949 1950 1951 1952 1953 1954 1955 1956 1957 1958 1959 1960 1961 1962
1963 1964 1965 1966 1967 1968 1969 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986
1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009
#years (with first value representing R0)
3335.48 3335.51 3335.08 3334.39 3333.69 3333.27 3332.84 3332.5 3332.22 3331.89 3331.56 3331.17 3330.6 3330.14 3329.6
3328.95 3328.27 3327.52 3327.1 3326.74 3326.4 3325.95 3325.57 3325.12 3324.67 3324.19 3322.99 3320.95 3317.67 3304.86
3285.2 3241.98 3216.13 3204.9 3195.94 3186.81 3176.77 3170.48 3165.7 3165.85 3163.78 3161.36 3161.96 3153.44 3146.68
3209.97 3653.71 2948.6 2417 2227.57 2349.55 2945.21 5510.01 2978.1 2274.5 2378.71 3234.84 3955.07 3113.64 2468.65 4547.39
1912.15 3150.09 3766.87 1661.56 1575.89 3527.02 1621.86 1102.9 3971.8 1043.03 1557.99 1903.02 2122.14 2341.9 1937.13
2130.52 1382.39 1354.83 1662 1202.41 1201.79 786.554 859.509 1725.8 903.954 1935.95 1003.71 1148.4 421.757 594.459 1678.6
2275.54 1011.58 1886.09 #recruits; first value is R0 (virgin)

```
25992.5  25992.5 25978.4 25956 25933.2 25919.5 25905.7 25894.8 25885.8 25875 25864.2 25851.5 25833.4 25818.3 25801.1 25780
25758.1 25734 25720.6 25709.2 25698.3 25683.8 25671.8 25657.2 25643 25627.6 25589.5 25524.6 25421 25022.3 24428.6 23195.1
22500.9 22208.8 21979.8 21750 21501.1 21347.5 21231.7 21235.3 21185.4 21127.3 21141.6 20938.9 20779.7 20606.4 20381.1
20192.3 19957.5 19859.2 19833.8 19706.2 18789.2 18572.4 18291.3 18027.2 17746.4 17393.7 17014.7 16422.7 16118.3 15847.6
15730 15338.2 14586.1 13717.3 12677 11860.2 10242.8 8887.09 8604.16 8198.95 7920.21 7228.45 6533.23 5700.26 5074.42
4259.99 3592.23 3177.96 3205.27 3305.24 3270.34 3254.06 3186.92 3316.49 3698.69 4079.78 4439.83 4781.42 5090.51 5371.5
5642.17 5911.83 6169.83 #spbio; first value is S0 (virgin)
1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0  # in Bzero
0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1  0 0 0 # in R project
0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1  0 0 0 # in R/S project
# Number of years with pre-specified catches
2
# catches for years with pre-specified catches go next
2009 105
2010 105
# Number of future recruitments to override
9
# Process for overiding (-1 for average otherwise index in data list)
2001 1 2001
2002 1 2002
2003 1 2003
2004 1 2004
2005 1 2005
2006 1 2006
2007 1 2007
2008 1 2008
2009 1 2009
# Which probability to product detailed results for (1=0.5; 2=0.6; etc.)
1
# Steepness sigma-R Auto-correlation
0.511 0.5 0
# Target SPR rate (FMSY Proxy); manually change to SPR_MSY if not using SPR_target
0.5
# Discount rate (for cumulative catch)
0.1
# Truncate the series when 0.4B0 is reached (1=Yes)
0
# Set F to FMSY once 0.4B0 is reached (1=Yes)
0
# Maximum possible F for projection (-1 to set to FMSY)
-1
# Definition of recovery (1=now only;2=now or before)
2
# Projection type
11
# Definition of the 40-10 rule
10 40
# Calculate coefficients of variation (1=Yes)
0
# Number of replicates to use
10
# Random number seed
-99004
# File with multiple parameter vectors
blend.dat
# User-specific projection (1=Yes); Output replaced (1->9)
0  5
# Catches and Fs (Year; 1/2/3 (F or C or SPR); value); Final row is -1
2011 1 3
-1 -1 -1
# Fixed catch project (1=Yes); Output replaced (1->9); Approach (-1=Read in else 1-9)
0 2 -1
# Split of Fs
2009 0.006828 0.057863 0.073656 0.031324 0.009649 0.050502 0.028069 0.197650 0.218997 0.186357 0.025607 0.033478
-1 1 1 1 1 1 1 1 1 1 1 1
# Yrs to define T_target for projection type 4 (a.k.a. 5 pre-specified inputs)
0.5 0.85 0.887 0.922 0.95
```

```
# Year for probability of recovery
2020 2021 2025 2030 2035 2040 2045 2050
# Time varying weight-at-age (1=Yes;0=No)
0
# File with time series of weight-at-age data
none
# Use bisection (0) or linear interpolation (1)
1
# Target Depletion
0.4
# CV of implementation error
0
```

Appendix B. Parameter vector input file for rebuilding analyses.

base steepness vector 1
0 0 5.60845e-005 0.000752569 0.005562 0.0269058 0.0911702 0.227337 0.442257 0.713769 1.00816 1.2982 1.56879 1.81423 2.03403 2.22982 2.40392 2.55863 2.69607 2.8181 2.9264 3.02242 3.1075 3.18281 3.24941 3.30827 3.36023 3.40608 3.44651 3.48213 3.5135 3.54111 3.56541 3.58677 3.60555 3.62206 3.63657 3.64931 3.6605 3.67032 3.67895 #female fecundity; weighted by N in year Y_init across morphs and areas
0.0121154 0.0198187 0.105522 0.242686 0.406624 0.584938 0.768731 0.953831 1.13539 1.30563 1.46632 1.63217 1.81801 2.02282 2.22822 2.41587 2.57928 2.72039 2.84321 2.95115 3.04659 3.13125 3.20641 3.27312 3.33228 3.38469 3.43106 3.47206 3.50827 3.54022 3.5684 3.59322 3.61508 3.63432 3.65125 3.66614 3.67922 3.69072 3.70082 3.70969 3.71749 #bodywt for gender,fleet: 1 / 1
0 7.61857e-005 0.000728455 0.0132098 0.0884314 0.284411 0.560157 0.795101 0.90622 0.88108 0.758177 0.604762 0.475464 0.389328 0.340208 0.314892 0.302616 0.296842 0.294148 0.29288 0.292271 0.291969 0.291815 0.291733 0.291687 0.291661 0.291646 0.291636 0.29163 0.291626 0.291623 0.291621 0.29162 0.291619 0.291618 0.291617 0.291617 0.291617 0.291616 0.291616 0.291616 #selex for gender,fleet: 1 / 1
0.0121154 0.0197693 0.0757641 0.259985 0.468083 0.65906 0.846994 1.03011 1.20997 1.39107 1.57601 1.76274 1.94702 2.12502 2.29376 2.45101 2.59542 2.72659 2.84483 2.95089 3.0457 3.13024 3.20548 3.27231 3.3316 3.38412 3.43059 3.47166 3.50793 3.53993 3.56814 3.59299 3.61488 3.63414 3.65108 3.66598 3.67907 3.69058 3.70069 3.70957 3.71736 #bodywt for gender,fleet: 1 / 2
0 7.60843e-005 0.000125505 0.000482563 0.00851223 0.0623258 0.218189 0.464411 0.708355 0.872112 0.947138 0.964093 0.953565 0.93425 0.91528 0.900083 0.889144 0.881749 0.876923 0.873826 0.871846 0.870572 0.869744 0.869196 0.868827 0.868574 0.868397 0.86827 0.868177 0.868109 0.868057 0.868018 0.867987 0.867963 0.867943 0.867928 0.867915 0.867905 0.867896 0.867889 0.867883 #selex for gender,fleet: 1 / 2
0.0121154 0.0197844 0.0991828 0.247786 0.417982 0.602516 0.792326 0.982598 1.17333 1.36673 1.56162 1.75341 1.93807 2.11354 2.27878 2.43297 2.57548 2.70599 2.82456 2.93158 3.02766 3.11359 3.19017 3.25826 3.31867 3.37218 3.4195 3.46132 3.49822 3.53076 3.55944 3.58469 3.60692 3.62647 3.64366 3.65878 3.67206 3.68373 3.69398 3.70298 3.71089 #bodywt for gender,fleet: 1 / 3
0 7.61152e-005 0.000330042 0.00563877 0.0453757 0.173538 0.398949 0.648975 0.837901 0.937452 0.969077 0.962604 0.937947 0.906456 0.87462 0.845857 0.821516 0.801716 0.785974 0.773607 0.763936 0.75637 0.75043 0.745741 0.742015 0.739031 0.736625 0.734669 0.733068 0.731749 0.730654 0.729741 0.728976 0.72833 0.727784 0.72732 0.726924 0.726585 0.726294 0.726044 0.725828 #selex for gender,fleet: 1 / 3
0.0121154 0.0197697 0.0815096 0.271705 0.449243 0.627118 0.803421 0.979399 1.16305 1.35941 1.56351 1.76586 1.95955 2.14127 2.30975 2.46462 2.60604 2.73443 2.85044 2.95484 3.04847 3.13218 3.20684 3.27328 3.33229 3.38462 3.43095 3.47192 3.50812 3.54006 3.56823 3.59306 3.61492 3.63416 3.65109 3.66597 3.67906 3.69056 3.70066 3.70954 3.71733 #bodywt for gender,fleet: 1 / 4
0 7.60852e-005 0.000140377 0.00186043 0.0293651 0.16021 0.426067 0.711105 0.893914 0.970664 0.993241 0.997883 0.998175 0.99765 0.997041 0.996489 0.996018 0.995627 0.995307 0.995046 0.994834 0.994662 0.994521 0.994406 0.994311 0.994232 0.994167 0.994113 0.994067 0.994029 0.993996 0.993968 0.993945 0.993924 0.993907 0.993892 0.993879 0.993868 0.993859 0.99385 0.993843 #selex for gender,fleet: 1 / 4
0.0121154 0.0198782 0.129714 0.221372 0.329599 0.472068 0.626784 0.785565 0.947755 1.11481 1.29142 1.48513 1.70058 1.93027 2.15536 2.35941 2.53664 2.68884 2.82008 2.93415 3.03397 3.12173 3.19908 3.26736 3.32765 3.38089 3.42789 3.46936 3.50593 3.53816 3.56656 3.59156 3.61356 3.63292 3.64994 3.6649 3.67805 3.6896 3.69975 3.70866 3.71648 #bodywt for gender,fleet: 1 / 5
0 7.63078e-005 0.0133353 0.409632 0.897939 0.86165 0.615746 0.369451 0.200098 0.103647 0.0540144 0.0297452 0.0181 0.0124972 0.00975475 0.00837578 0.00765919 0.00727302 0.00705687 0.0069312 0.00685538 0.00680799 0.00677736 0.00675693 0.00674291 0.00673303 0.00672591 0.00672065 0.0067167 0.00671367 0.00671132 0.00670946 0.00670798 0.00670679 0.00670581 0.00670501 0.00670435 0.0067038 0.00670333 0.00670294 0.00670261 #selex for gender,fleet: 1 / 5
0.0121154 0.0200622 0.112809 0.235654 0.376161 0.526949 0.693393 0.866028 1.0355 1.20511 1.38174 1.57131 1.77507 1.98591 2.19099 2.37958 2.54718 2.69409 2.82263 2.93536 3.03452 3.12196 3.19916 3.26736 3.32762 3.38085 3.42784 3.46931 3.50589 3.53812 3.56652 3.59152 3.61353 3.63289 3.64991 3.66488 3.67803 3.68958 3.69973 3.70864 3.71647 #bodywt for gender,fleet: 1 / 6
0 7.66892e-005 0.00459171 0.0933304 0.426054 0.800228 0.933762 0.853167 0.664863 0.466667 0.312597 0.211187 0.150431 0.115812 0.0965109 0.0857791 0.0797514 0.076302 0.0742801 0.0730622 0.0723072 0.0718255 0.0715093 0.0712959 0.0711482 0.0710434 0.0709675 0.0709113 0.0708689 0.0708365 0.0708112 0.0707913 0.0707753 0.0707625 0.070752 0.0707434 0.0707362 0.0707303 0.0707253 0.0707211 0.0707175 #selex for gender,fleet: 1 / 6
0.0121154 0.0197704 0.0776609 0.223959 0.423528 0.634459 0.853635 1.07468 1.29232 1.50289 1.70398 1.89402 2.07205 2.23761 2.3906 2.53119 2.65972 2.77662 2.88241 2.97766 3.06298 3.13908 3.20669 3.26657 3.31947 3.36611 3.40717 3.44329 3.47502 3.5029 3.52737 3.54884 3.56769 3.58422 3.59872 3.61145 3.6226 3.63239 3.64097 3.64849 3.65509 #bodywt for gender,fleet: 1 / 7
0 7.60861e-005 0.00013483 0.000373576 0.0023123 0.0108353 0.0346882 0.0825737 0.157714 0.255746 0.36694 0.48022 0.58638 0.679514 0.756997 0.818704 0.866045 0.901141 0.926253 0.943462 0.954539 0.960927 0.963785 0.964027 0.96238 0.959414 0.955574 0.951204 0.946567 0.941856 0.937214 0.932739 0.928496 0.924525 0.920848 0.91747 0.91439 0.911596 0.909075 0.906809 0.904779 #selex for gender,fleet: 1 / 7
0.0121154 0.0199309 0.121343 0.236785 0.358955 0.497576 0.645228 0.786927 0.925148 1.06761 1.22846 1.432 1.69157 1.97148 2.21907 2.41989 2.58432 2.72373 2.84504 2.95205 3.047 3.13142 3.20646 3.27311 3.33225 3.38465 3.43103 3.47203 3.50824 3.54019 3.56837 3.5932 3.61506 3.6343 3.65123 3.66612 3.6792 3.6907 3.7008 3.70968 3.71747 #bodywt for gender,fleet: 1 / 8

0 7.64168e-005 0.00541276 0.167158 0.653514 0.911151 0.791506 0.510638 0.267013 0.123307 0.0548854 0.0260376 0.0146276 0.0102269 0.00852665 0.00785605 0.00758249 0.00746607 0.00741411 0.00738973 0.00737769 0.00737144 0.00736803 0.00736609 0.00736494 0.00736422 0.00736376 0.00736345 0.00736324 0.00736309 0.00736299 0.00736291 0.00736285 0.0073628 0.00736277 0.00736274 0.00736272 0.0073627 0.00736268 0.00736267 0.00736266 #selex for gender,fleet: 1 / 8
0.0121154 0.019847 0.12438 0.241619 0.363082 0.503693 0.666745 0.83736 1.01541 1.2077 1.41867 1.64361 1.86847 2.07937 2.2698 2.43935 2.59002 2.72413 2.84368 2.95029 3.04533 3.12996 3.20523 3.27209 3.33139 3.38392 3.4304 3.47148 3.50776 3.53976 3.56798 3.59284 3.61473 3.634 3.65094 3.66585 3.67895 3.69046 3.70057 3.70945 3.71725 #bodywt for gender,fleet: 1 / 9
0 7.62443e-005 0.00360374 0.142215 0.622145 0.91765 0.875554 0.682244 0.475418 0.320152 0.223051 0.16814 0.13868 0.123218 0.115113 0.110812 0.10848 0.107179 0.106432 0.105988 0.105716 0.105543 0.105431 0.105355 0.105302 0.105265 0.105239 0.105219 0.105204 0.105192 0.105183 0.105176 0.10517 0.105166 0.105162 0.105159 0.105157 0.105154 0.105153 0.105151 0.10515 #selex for gender,fleet: 1 / 9
0.0121154 0.0198148 0.123426 0.247629 0.375745 0.513216 0.658096 0.795227 0.933695 1.10386 1.34205 1.63082 1.89827 2.11758 2.30123 2.46175 2.60522 2.73436 2.85064 2.95514 3.04879 3.1325 3.20714 3.27357 3.33256 3.38487 3.43119 3.47215 3.50834 3.54028 3.56844 3.59326 3.61511 3.63435 3.65127 3.66615 3.67924 3.69073 3.70083 3.7097 3.7175 #bodywt for gender,fleet: 1 / 10
0 7.61782e-005 0.00206457 0.0908323 0.494991 0.858499 0.841134 0.579215 0.313029 0.153017 0.0813117 0.0543369 0.0451569 0.0421833 0.0412328 0.0409251 0.0408223 0.0407864 0.0407732 0.040768 0.0407659 0.0407649 0.0407645 0.0407643 0.0407641 0.0407641 0.040764 0.040764 0.040764 0.040764 0.040764 0.040764 0.040764 0.040764 0.040764 0.040764 0.040764 0.040764 0.040764 0.040764 #selex for gender,fleet: 1 / 10
0.0121154 0.0197693 0.0745412 0.179418 0.469633 0.749378 0.955778 1.14693 1.32718 1.49878 1.66526 1.83026 1.99539 2.1591 2.31783 2.46801 2.60733 2.73481 2.85042 2.95464 3.04818 3.13185 3.20649 3.27292 3.33193 3.38426 3.43059 3.47157 3.50777 3.53973 3.5679 3.59273 3.6146 3.63384 3.65077 3.66566 3.67875 3.69025 3.70036 3.70924 3.71703 #bodywt for gender,fleet: 1 / 11
0 7.6084e-005 0.000122913 0.000125883 0.000360693 0.00487464 0.0347248 0.128809 0.302843 0.518818 0.715031 0.85368 0.933513 0.972447 0.989036 0.995307 0.997347 0.997791 0.997677 0.99739 0.99707 0.996764 0.99649 0.996249 0.99604 0.99586 0.995706 0.995574 0.995461 0.995364 0.99528 0.995208 0.995146 0.995093 0.995047 0.995007 0.994972 0.994942 0.994916 0.994894 0.994874 #selex for gender,fleet: 1 / 11
0.0121154 0.0197693 0.0745433 0.176326 0.321363 0.506035 0.721966 0.950785 1.176 1.39076 1.59441 1.78822 1.97309 2.1486 2.3135 2.46657 2.60714 2.73514 2.85098 2.95528 3.04885 3.13253 3.20716 3.27358 3.33257 3.38487 3.43119 3.47215 3.50833 3.54027 3.56843 3.59324 3.6151 3.63433 3.65125 3.66613 3.67922 3.69071 3.70081 3.70968 3.71747 #bodywt for gender,fleet: 1 / 12
0 0.229137 0.370199 0.372533 0.379622 0.407376 0.471503 0.572305 0.690872 0.801717 0.887101 0.942561 0.973553 0.988784 0.99553 0.998292 0.999362 0.999763 0.999911 0.999966 0.999986 0.999994 0.999997 0.999998 0.999998 0.999998 0.999997 0.999997 0.999996 0.999995 0.999994 0.999993 0.999991 0.99999 0.999989 0.999988 0.999987 0.999986 0.999985 0.999985 0.999984 #selex for gender,fleet: 1 / 12
0.0122237 0.0230702 0.133993 0.287337 0.455106 0.625078 0.791462 0.952135 1.10442 1.24386 1.36856 1.4815 1.58773 1.69088 1.79154 1.88769 1.97647 2.05576 2.12474 2.18372 2.23363 2.27565 2.31095 2.34058 2.36545 2.38634 2.4039 2.41867 2.43109 2.44155 2.45036 2.45778 2.46403 2.4693 2.47374 2.47748 2.48064 2.4833 2.48555 2.48744 2.48903 #bodywt for gender,fleet: 2 / 1
0 8.25105e-005 0.00132103 0.0221277 0.121862 0.332966 0.589812 0.795762 0.903919 0.917096 0.859547 0.762877 0.657049 0.562265 0.487011 0.431538 0.392358 0.365253 0.346604 0.333712 0.324701 0.318309 0.313701 0.310323 0.307806 0.305901 0.304439 0.303304 0.302411 0.301702 0.301135 0.300677 0.300305 0.300001 0.299752 0.299547 0.299377 0.299236 0.299118 0.299021 0.298939 #selex for gender,fleet: 2 / 1
0.0122237 0.0226282 0.0922991 0.32984 0.528538 0.705843 0.871705 1.02712 1.17379 1.31363 1.44747 1.57435 1.69235 1.79982 1.89606 1.98122 2.0559 2.12093 2.17724 2.22575 2.26739 2.30301 2.3334 2.35928 2.38127 2.39994 2.41577 2.42918 2.44053 2.45014 2.45826 2.46513 2.47093 2.47583 2.47997 2.48347 2.48642 2.48891 2.49101 2.49279 2.49428 #bodywt for gender,fleet: 2 / 2
0 8.1489e-005 0.000131624 0.00104931 0.0153314 0.0846218 0.243533 0.463319 0.674916 0.829308 0.91878 0.959927 0.972657 0.971106 0.96334 0.953522 0.943683 0.934728 0.926981 0.920466 0.915076 0.910655 0.907044 0.904096 0.901689 0.899718 0.8981 0.896769 0.895671 0.894762 0.894009 0.893382 0.89286 0.892425 0.892061 0.891757 0.891501 0.891287 0.891108 0.890957 0.89083 #selex for gender,fleet: 2 / 2
0.0122237 0.0227649 0.129835 0.295324 0.469673 0.645379 0.816364 0.980294 1.13714 1.28744 1.43038 1.56375 1.68545 1.79451 1.89106 1.97582 2.04978 2.11399 2.16949 2.21728 2.25829 2.29339 2.32335 2.34888 2.37059 2.38904 2.40469 2.41796 2.4292 2.43871 2.44676 2.45357 2.45932 2.46418 2.46829 2.47176 2.47468 2.47716 2.47924 2.48101 2.48249 #bodywt for gender,fleet: 2 / 3
0 8.18014e-005 0.000553204 0.00995017 0.0657317 0.210538 0.427593 0.648726 0.816573 0.916208 0.962599 0.976935 0.974618 0.964382 0.950818 0.93638 0.922394 0.909541 0.898105 0.888139 0.879572 0.872272 0.866087 0.860864 0.856464 0.852761 0.849647 0.847028 0.844826 0.842974 0.841417 0.840106 0.839003 0.838074 0.837292 0.836633 0.836079 0.835611 0.835217 0.834885 0.834605 #selex for gender,fleet: 2 / 3
0.0122237 0.0226317 0.110939 0.327954 0.503135 0.668777 0.825792 0.977192 1.1275 1.27821 1.42593 1.56528 1.6924 1.80582 1.90566 1.99279 2.06837 2.13362 2.18973 2.23783 2.27896 2.31405 2.34394 2.36935 2.39093 2.40924 2.42476 2.4379 2.44902 2.45843 2.46639 2.47312 2.4788 2.4836 2.48766 2.49108 2.49397 2.49641 2.49847 2.50021 2.50168 #bodywt for gender,fleet: 2 / 4
0 8.14967e-005 0.000176686 0.00414407 0.0482656 0.203184 0.459893 0.711328 0.877062 0.95703 0.987071 0.996225 0.998448 0.998726 0.998528 0.998239 0.997956 0.997702 0.99748 0.99729 0.997128 0.996992 0.996876 0.996779 0.996697 0.996628 0.99657 0.996521 0.99648 0.996446 0.996417 0.996392 0.996372 0.996354 0.99634 0.996327 0.996317 0.996308 0.996301 0.996295 0.996289 #selex for gender,fleet: 2 / 4

0.0122237 0.0238549 0.153559 0.245583 0.358529 0.497697 0.642529 0.786907 0.929504 1.06942 1.20634 1.3403 1.47096 1.59689 1.71563 1.82451 1.92166 2.00643 2.07923 2.14114 2.19346 2.23754 2.27463 2.30582 2.33205 2.35411 2.37267 2.3883 2.40145 2.41253 2.42186 2.42973 2.43635 2.44194 2.44665 2.45062 2.45396 2.45679 2.45917 2.46117 2.46287 #bodywt for gender,fleet: 2 / 5
0 8.40824e-005 0.0360114 0.534041 0.908571 0.82085 0.58616 0.369423 0.219461 0.128819 0.0772918 0.0485641 0.0324559 0.0232345 0.0177996 0.0144883 0.0124006 0.0110393 0.0101233 0.00948858 0.0090371 0.00870831 0.00846387 0.0082788 0.00813647 0.0080255 0.00793796 0.0078682 0.00781214 0.00776674 0.00772976 0.00769947 0.00767454 0.00765395 0.00763689 0.00762271 0.0076109 0.00760104 0.00759281 0.00758591 0.00758013 #selex for gender,fleet: 2 / 5
0.0122237 0.0251492 0.13938 0.273019 0.413085 0.558423 0.712638 0.866014 1.01152 1.15014 1.28395 1.41362 1.53855 1.6572 1.76756 1.86786 1.95709 2.0351 2.10243 2.16004 2.20906 2.25062 2.28578 2.31549 2.34058 2.36174 2.3796 2.39467 2.40738 2.4181 2.42714 2.43477 2.4412 2.44663 2.45121 2.45507 2.45833 2.46107 2.46339 2.46535 2.46699 #bodywt for gender,fleet: 2 / 6
0 8.76362e-005 0.00923743 0.143634 0.511921 0.836982 0.930887 0.855024 0.700844 0.536834 0.399934 0.299207 0.229739 0.183175 0.152172 0.131395 0.117277 0.107509 0.100617 0.0956578 0.0920207 0.0893058 0.0872463 0.0856613 0.0844258 0.0834518 0.0826764 0.0820538 0.0815502 0.0811404 0.080805 0.0805293 0.0803017 0.0801133 0.0799568 0.0798265 0.0797179 0.0796271 0.0795511 0.0794874 0.079434 #selex for gender,fleet: 2 / 6
0.0122237 0.0226381 0.0945282 0.276606 0.483918 0.686676 0.883453 1.07023 1.24435 1.40444 1.54991 1.68079 1.7975 1.90077 1.99152 2.07079 2.13968 2.19928 2.25064 2.29476 2.33256 2.36486 2.39241 2.41587 2.43581 2.45275 2.46711 2.47929 2.4896 2.49833 2.50572 2.51196 2.51724 2.5217 2.52547 2.52865 2.53134 2.53361 2.53553 2.53714 2.53851 #bodywt for gender,fleet: 2 / 7
0 8.15111e-005 0.000145695 0.00056819 0.00349411 0.0141287 0.0390204 0.0820075 0.141971 0.213812 0.290965 0.367523 0.439273 0.503811 0.56019 0.608447 0.649178 0.683243 0.71157 0.735051 0.754487 0.770572 0.783891 0.794932 0.804098 0.811717 0.818062 0.823353 0.827771 0.831466 0.834558 0.83715 0.839324 0.841149 0.842682 0.84397 0.845054 0.845966 0.846733 0.84738 0.847924 #selex for gender,fleet: 2 / 7
0.0122237 0.0241411 0.1491 0.269134 0.390383 0.524261 0.660066 0.788106 0.910708 1.03157 1.15434 1.2836 1.42283 1.56968 1.71462 1.84659 1.95944 2.05267 2.12877 2.1909 2.24188 2.28396 2.31889 2.34799 2.37232 2.39271 2.40983 2.42422 2.43632 2.44651 2.4551 2.46233 2.46842 2.47356 2.47789 2.48155 2.48463 2.48722 2.48941 2.49126 2.49282 #bodywt for gender,fleet: 2 / 8
0 8.49744e-005 0.0129253 0.253583 0.730037 0.903094 0.76197 0.511305 0.296435 0.159457 0.084579 0.0465793 0.0277806 0.0184315 0.0136667 0.0111501 0.00976454 0.00896785 0.00848961 0.00819054 0.00799628 0.00786568 0.00777512 0.00771058 0.00766347 0.00762836 0.0076017 0.00758115 0.00756509 0.00755239 0.00754226 0.0075341 0.00752748 0.00752208 0.00751766 0.00751401 0.007511 0.0075085 0.00750642 0.00750469 0.00750325 #selex for gender,fleet: 2 / 8
0.0122237 0.023389 0.153625 0.274497 0.394861 0.532894 0.684804 0.837769 0.990266 1.14374 1.29762 1.44864 1.59178 1.72247 1.83819 1.93854 2.02453 2.09774 2.15987 2.21251 2.2571 2.29483 2.32675 2.35376 2.37659 2.39589 2.41221 2.426 2.43764 2.44748 2.45579 2.4628 2.46872 2.47372 2.47794 2.4815 2.48451 2.48705 2.48919 2.49099 2.49252 #bodywt for gender,fleet: 2 / 9
0 8.31855e-005 0.00927142 0.224227 0.704963 0.921341 0.856756 0.683263 0.505403 0.367113 0.27312 0.213269 0.176124 0.153115 0.138689 0.129459 0.123409 0.119339 0.116531 0.114546 0.11311 0.11205 0.111254 0.110645 0.110174 0.109804 0.109511 0.109276 0.109087 0.108933 0.108807 0.108704 0.10862 0.108549 0.108491 0.108442 0.108402 0.108368 0.10834 0.108316 0.108297 #selex for gender,fleet: 2 / 9
0.0122237 0.0230733 0.154526 0.283613 0.40897 0.54048 0.67284 0.796196 0.917012 1.05014 1.20996 1.39497 1.57973 1.7393 1.86809 1.9715 2.05595 2.12608 2.18496 2.23469 2.27681 2.31253 2.34283 2.36852 2.3903 2.40875 2.42437 2.43758 2.44877 2.45822 2.46621 2.47297 2.47867 2.48349 2.48756 2.491 2.4939 2.49635 2.49842 2.50016 2.50163 #bodywt for gender,fleet: 2 / 10
0 8.24768e-005 0.00532456 0.15207 0.588044 0.872818 0.816537 0.580408 0.346275 0.192045 0.110484 0.0721447 0.0550477 0.0474974 0.0441015 0.0425184 0.0417455 0.0413485 0.0411336 0.0410113 0.0409382 0.0408926 0.0408629 0.040843 0.0408291 0.0408192 0.0408119 0.0408065 0.0408024 0.0407992 0.0407967 0.0407947 0.0407931 0.0407919 0.0407908 0.04079 0.0407893 0.0407887 0.0407882 0.0407879 0.0407875 #selex for gender,fleet: 2 / 10
0.0122237 0.0226278 0.0866666 0.218955 0.578135 0.808471 0.984547 1.14202 1.28552 1.41706 1.53805 1.64963 1.75253 1.84709 1.93333 2.01116 2.08059 2.14185 2.1954 2.24184 2.28188 2.31625 2.34564 2.37071 2.39204 2.41017 2.42556 2.4386 2.44965 2.459 2.46691 2.4736 2.47925 2.48403 2.48807 2.49148 2.49435 2.49678 2.49883 2.50057 2.50203 #bodywt for gender,fleet: 2 / 11
0 8.14878e-005 0.000122929 0.000134457 0.000743525 0.00807741 0.0421984 0.127294 0.266051 0.433677 0.596479 0.73095 0.829371 0.895278 0.936734 0.961777 0.976579 0.985268 0.990394 0.993458 0.995323 0.996483 0.997219 0.997698 0.998015 0.99823 0.998378 0.998482 0.998556 0.998609 0.998648 0.998677 0.998699 0.998716 0.998728 0.998738 0.998746 0.998752 0.998757 0.998761 0.998764 #selex for gender,fleet: 2 / 11
0.0122237 0.0226278 0.0866621 0.20162 0.357558 0.54493 0.748326 0.948871 1.13515 1.30394 1.45562 1.59145 1.71273 1.82061 1.91608 2.00006 2.07347 2.13726 2.1924 2.23985 2.28055 2.31534 2.34501 2.37028 2.39175 2.40998 2.42544 2.43853 2.44962 2.45901 2.46694 2.47365 2.47932 2.48411 2.48816 2.49157 2.49446 2.49689 2.49895 2.50069 2.50215 #bodywt for gender,fleet: 2 / 12
0 0.245411 0.370244 0.373258 0.383689 0.416914 0.481583 0.571616 0.670773 0.762972 0.838524 0.894714 0.933485 0.95876 0.974584 0.984248 0.990082 0.993607 0.995757 0.99709 0.997935 0.998484 0.998849 0.999097 0.999271 0.999396 0.999486 0.999553 0.999604 0.999644 0.999674 0.999698 0.999717 0.999732 0.999744 0.999754 0.999763 0.999769 0.999775 0.99978 0.999783 #selex for gender,fleet: 2 / 12
0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.0646611 0.0693223 0.0739834 0.0786446 0.0833057 0.0879669 0.092628 0.0972892 #mean M for year Yinit: 2009 sex: 1

943.044 476.335 1009.06 700.946 233.582 155.545 396.539 324.225 583.242 252.883 445.382 203.407 168.931 230.704 204.024 247.079 174.232 151.347 193.523 141.496 133.806 93.3955 64.3178 40.2669 20.197 55.504 10.7594 10.925 16.5886 5.31609 4.1342 7.02513 4.47613 2.10638 3.92993 1.68379 1.68156 1.70175 1.12415 0.681024 6.52282 #numbers for year Yinit: 2009 sex: 1
0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 #mean M for year Yinit: 2009 sex: 2
943.044 476.335 1009.06 700.925 233.482 155.391 396.023 323.858 585.338 256.008 457.033 212.489 180.218 252.6 230.623 289.14 210.986 190.034 253.058 194.056 193.402 142.308 102.725 66.9583 34.923 100.582 20.6643 22.3232 35.8482 12.0013 9.58888 16.533 10.6119 5.0068 9.35633 4.02341 4.04294 4.11899 2.73124 1.65257 17.5752 #numbers for year Yinit: 2009 sex: 2
451.977 812.647 381.154 328.429 470.548 434.467 544.777 395.455 351.917 459.845 342.732 329.335 232.704 161.561 101.533 50.895 139.802 27.0912 27.5009 41.7491 13.377 10.4017 17.6734 11.2598 5.29828 9.88456 4.23486 4.22904 4.27967 2.82698 1.71257 1.37839 1.5485 2.49473 1.17285 0.829737 0.702508 0.683997 0.750328 0.835693 6.00474 #numbers for year Ydeclare: 2000 sex: 1
451.977 812.647 381.153 328.37 469.248 431.751 539.501 390.687 349.258 462.423 353.206 351.087 257.873 185.912 121.071 63.1032 181.65 37.3039 40.2856 64.6766 21.648 17.2935 29.8131 19.1337 9.02664 16.867 7.25268 7.2875 7.42426 4.92273 2.97847 2.3835 2.65583 4.24247 1.98134 1.39674 1.18216 1.15455 1.27522 1.43592 13.9655 #numbers for year Ydeclare: 2000 sex: 2
#R0 1916 1917 1918 1919 1920 1921 1922 1923 1924 1925 1926 1927 1928 1929 1930 1931 1932 1933 1934 1935 1936 1937 1938 1939 1940 1941 1942 1943 1944 1945 1946 1947 1948 1949 1950 1951 1952 1953 1954 1955 1956 1957 1958 1959 1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 #years
3335.48 3335.51 3335.08 3334.39 3333.69 3333.27 3332.84 3332.5 3332.22 3331.89 3331.56 3331.17 3330.6 3330.14 3329.6 3328.95 3328.27 3327.52 3327.1 3326.74 3326.4 3325.95 3325.57 3325.12 3324.67 3324.19 3322.99 3320.95 3317.67 3304.86 3285.2 3241.98 3216.13 3204.9 3195.94 3186.81 3176.77 3170.48 3165.7 3165.85 3163.78 3161.36 3161.96 3153.44 3146.68 3209.97 3653.71 2948.6 2417 2227.57 2349.55 2945.21 5510.01 2978.1 2274.5 2378.71 3234.84 3955.07 3113.64 2468.65 4547.39 1912.15 3150.09 3766.87 1661.56 1575.89 3527.02 1621.86 1102.9 3971.8 1043.03 1557.99 1903.02 2122.14 2341.9 1937.13 2130.52 1382.39 1354.83 1662 1202.41 1201.79 786.554 859.509 1725.8 903.954 1935.95 1003.71 1148.4 421.757 594.459 1678.6 2275.54 1011.58 1886.09 #Recruits
25992.5 25992.5 25978.4 25956 25933.2 25919.5 25905.7 25894.8 25885.8 25875 25864.2 25851.5 25833.4 25818.3 25801.1 25780 25758.1 25734 25720.6 25709.2 25698.3 25683.8 25671.8 25657.2 25643 25627.6 25589.5 25524.6 25421 25022.3 24428.6 23195.1 22500.9 22208.8 21979.8 21750 21501.1 21347.5 21231.7 21235.3 21185.4 21127.3 21141.6 20938.9 20779.7 20606.4 20381.1 20192.3 19957.5 19859.2 19833.8 19706.2 18789.2 18572.4 18291.3 18027.2 17746.4 17393.7 17014.7 16422.7 16118.3 15847.6 15730 15338.2 14586.1 13717.3 12677 11860.2 10242.8 8887.09 8604.16 8198.95 7920.21 7228.45 6533.23 5700.26 5074.42 4259.99 3592.23 3177.96 3205.27 3305.24 3270.34 3254.06 3186.92 3316.49 3698.69 4079.78 4439.83 4781.42 5090.51 5371.5 5642.17 5911.83 6169.83 #SpawnBio
0.511 0.5 0 # spawn-recr steepness, sigmaR, autocorr
base steepness vector 2
0 0 5.60845e-005 0.000752569 0.005562 0.0269058 0.0911702 0.227337 0.442257 0.713769 1.00816 1.2982 1.56879 1.81423 2.03403 2.22982 2.40392 2.55863 2.69607 2.8181 2.9264 3.02242 3.1075 3.18281 3.24941 3.30827 3.36023 3.40608 3.44651 3.48213 3.5135 3.54111 3.56541 3.58677 3.60555 3.62206 3.63657 3.64931 3.6605 3.67032 3.67895 #female fecundity; weighted by N in year Y_init across morphs and areas
0.0121154 0.0198187 0.105522 0.242686 0.406624 0.584938 0.768731 0.953831 1.13539 1.30563 1.46632 1.63217 1.81801 2.02282 2.22822 2.41587 2.57928 2.72039 2.84321 2.95115 3.04659 3.13125 3.20641 3.27312 3.33228 3.38469 3.43106 3.47206 3.50827 3.54022 3.5684 3.59322 3.61508 3.63432 3.65125 3.66614 3.67922 3.69072 3.70082 3.70969 3.71749 #bodywt for gender,fleet: 1 / 1
0 7.61857e-005 0.000728455 0.0132098 0.0884314 0.284411 0.560157 0.795101 0.90622 0.88108 0.758177 0.604762 0.475464 0.389328 0.340208 0.314892 0.302616 0.296842 0.294148 0.29288 0.292271 0.291969 0.291815 0.291733 0.291687 0.291661 0.291646 0.291636 0.29163 0.291626 0.291623 0.291621 0.29162 0.291619 0.291618 0.291617 0.291617 0.291617 0.291616 0.291616 0.291616 #selex for gender,fleet: 1 / 1
0.0121154 0.0197693 0.0757641 0.259985 0.468083 0.65906 0.846994 1.03011 1.20997 1.39107 1.57601 1.76274 1.94702 2.12502 2.29376 2.45101 2.59542 2.72659 2.84483 2.95089 3.0457 3.13024 3.20548 3.27231 3.3316 3.38412 3.43059 3.47166 3.50793 3.53993 3.56814 3.59299 3.61488 3.63414 3.65108 3.66598 3.67907 3.69058 3.70069 3.70957 3.71736 #bodywt for gender,fleet: 1 / 2
0 7.60843e-005 0.000125505 0.000482563 0.00851223 0.0623258 0.218189 0.464411 0.708355 0.872112 0.947138 0.964093 0.953565 0.93425 0.91528 0.900083 0.889144 0.881749 0.876923 0.873826 0.871846 0.870572 0.869744 0.869196 0.868827 0.868574 0.868397 0.86827 0.868177 0.868109 0.868057 0.868018 0.867987 0.867963 0.867943 0.867928 0.867915 0.867905 0.867896 0.867889 0.867883 #selex for gender,fleet: 1 / 2
0.0121154 0.0197844 0.0991828 0.247786 0.417982 0.602516 0.792326 0.982598 1.17333 1.36673 1.56162 1.75341 1.93807 2.11354 2.27878 2.43297 2.57548 2.70599 2.82456 2.93158 3.02766 3.11359 3.19017 3.25826 3.31867 3.37218 3.4195 3.46132 3.49822 3.53076 3.55944 3.58469 3.60692 3.62647 3.64366 3.65878 3.67206 3.68373 3.69398 3.70298 3.71089 #bodywt for gender,fleet: 1 / 3
0 7.61152e-005 0.000330042 0.00563877 0.0453757 0.173538 0.398949 0.648975 0.837901 0.937452 0.969077 0.962604 0.937947 0.906456 0.87462 0.845857 0.821516 0.801716 0.785974 0.773607 0.763936 0.75637 0.75043 0.745741 0.742015 0.739031 0.736625 0.734669 0.733068 0.731749 0.730654 0.729741 0.728976 0.72833 0.727784 0.72732 0.726924 0.726585 0.726294 0.726044 0.725828 #selex for gender,fleet: 1 / 3
0.0121154 0.0197697 0.0815096 0.271705 0.449243 0.627118 0.803421 0.979399 1.16305 1.35941 1.56351 1.76586 1.95955 2.14127 2.30975 2.46462 2.60604 2.73443 2.85044 2.95484 3.04847 3.13218 3.20684 3.27328 3.33229 3.38462 3.43095

3.47192 3.50812 3.54006 3.56823 3.59306 3.61492 3.63416 3.65109 3.66597 3.67906 3.69056 3.70066 3.70954 3.71733 #bodywt for gender,fleet: 1 / 4
0 7.60852e-005 0.000140377 0.00186043 0.0293651 0.16021 0.426067 0.711105 0.893914 0.970664 0.993241 0.997883 0.998175 0.99765 0.997041 0.996489 0.996018 0.995627 0.995307 0.995046 0.994834 0.994662 0.994521 0.994406 0.994311 0.994232 0.994167 0.994113 0.994067 0.994029 0.993996 0.993968 0.993945 0.993924 0.993907 0.993892 0.993879 0.993868 0.993859 0.99385 0.993843 #selex for gender,fleet: 1 / 4
0.0121154 0.0198782 0.129714 0.221372 0.329599 0.472068 0.626784 0.785565 0.947755 1.11481 1.29142 1.48513 1.70058 1.93027 2.15536 2.35941 2.53664 2.68884 2.82008 2.93415 3.03397 3.12173 3.19908 3.26736 3.32765 3.38089 3.42789 3.46936 3.50593 3.53816 3.56656 3.59156 3.61356 3.63292 3.64994 3.6649 3.67805 3.6896 3.69975 3.70866 3.71648 #bodywt for gender,fleet: 1 / 5
0 7.63078e-005 0.0133353 0.409632 0.897939 0.86165 0.615746 0.369451 0.200098 0.103647 0.0540144 0.0297452 0.0181 0.0124972 0.00975475 0.00837578 0.00765919 0.00727302 0.00705687 0.0069312 0.00685538 0.00680799 0.00677736 0.00675693 0.00674291 0.00673303 0.00672591 0.00672065 0.0067167 0.00671367 0.00671132 0.00670946 0.00670798 0.00670679 0.00670581 0.00670501 0.00670435 0.0067038 0.00670333 0.00670294 0.00670261 #selex for gender,fleet: 1 / 5
0.0121154 0.0200622 0.112809 0.235654 0.376161 0.526949 0.693393 0.866028 1.0355 1.20511 1.38174 1.57131 1.77507 1.98591 2.19099 2.37958 2.54718 2.69409 2.82263 2.93536 3.03452 3.12196 3.19916 3.26736 3.32762 3.38085 3.42784 3.46931 3.50589 3.53812 3.56652 3.59152 3.61353 3.63289 3.64991 3.66488 3.67803 3.68958 3.69973 3.70864 3.71647 #bodywt for gender,fleet: 1 / 6
0 7.66892e-005 0.00459171 0.0933304 0.426054 0.800228 0.933762 0.853167 0.664863 0.466667 0.312597 0.211187 0.150431 0.115812 0.0965109 0.0857791 0.0797514 0.076302 0.0742801 0.0730622 0.0723072 0.0718255 0.0715093 0.0712959 0.0711482 0.0710434 0.0709675 0.0709113 0.0708689 0.0708365 0.0708112 0.0707913 0.0707753 0.0707625 0.070752 0.0707434 0.0707362 0.0707303 0.0707253 0.0707211 0.0707175 #selex for gender,fleet: 1 / 6
0.0121154 0.0197704 0.0776609 0.223959 0.423528 0.634459 0.853635 1.07468 1.29232 1.50289 1.70398 1.89402 2.07205 2.23761 2.3906 2.53119 2.65972 2.77662 2.88241 2.97766 3.06298 3.13908 3.20669 3.26657 3.31947 3.36611 3.40717 3.44329 3.47502 3.5029 3.52737 3.54884 3.56769 3.58422 3.59872 3.61145 3.6226 3.63239 3.64097 3.64849 3.65509 #bodywt for gender,fleet: 1 / 7
0 7.60861e-005 0.00013483 0.000373576 0.0023123 0.0108353 0.0346882 0.0825737 0.157714 0.255746 0.36694 0.48022 0.58638 0.679514 0.756997 0.818704 0.866045 0.901141 0.926253 0.943462 0.954539 0.960927 0.963785 0.964027 0.96238 0.959414 0.955574 0.951204 0.946567 0.941856 0.937214 0.932739 0.928496 0.924525 0.920848 0.91747 0.91439 0.911596 0.909075 0.906809 0.904779 #selex for gender,fleet: 1 / 7
0.0121154 0.0199309 0.121343 0.236785 0.358955 0.497576 0.645228 0.786927 0.925148 1.06761 1.22846 1.432 1.69157 1.97148 2.21907 2.41989 2.58432 2.72373 2.84504 2.95205 3.047 3.13142 3.20646 3.27311 3.33225 3.38465 3.43103 3.47203 3.50824 3.54019 3.56837 3.5932 3.61506 3.6343 3.65123 3.66612 3.6792 3.6907 3.7008 3.70968 3.71747 #bodywt for gender,fleet: 1 / 8
0 7.64168e-005 0.00541276 0.167158 0.653514 0.911151 0.791506 0.510638 0.267013 0.123307 0.0548854 0.0260376 0.0146276 0.0102269 0.00852665 0.00785605 0.00758249 0.00746607 0.00741411 0.00738973 0.00737769 0.00737144 0.00736803 0.00736609 0.00736494 0.00736422 0.00736376 0.00736345 0.00736324 0.00736309 0.00736299 0.00736291 0.00736285 0.0073628 0.00736277 0.00736274 0.00736272 0.0073627 0.00736268 0.00736267 0.00736266 #selex for gender,fleet: 1 / 8
0.0121154 0.019847 0.12438 0.241619 0.363082 0.503693 0.666745 0.83736 1.01541 1.2077 1.41867 1.64361 1.86847 2.07937 2.2698 2.43935 2.59002 2.72413 2.84368 2.95029 3.04533 3.12996 3.20523 3.27209 3.33139 3.38392 3.4304 3.47148 3.50776 3.53976 3.56798 3.59284 3.61473 3.634 3.65094 3.66585 3.67895 3.69046 3.70057 3.70945 3.71725 #bodywt for gender,fleet: 1 / 9
0 7.62443e-005 0.00360374 0.142215 0.622145 0.91765 0.875554 0.682244 0.475418 0.320152 0.223051 0.16814 0.13868 0.123218 0.115113 0.110812 0.10848 0.107179 0.106432 0.105988 0.105716 0.105543 0.105431 0.105355 0.105302 0.105265 0.105239 0.105219 0.105204 0.105192 0.105183 0.105176 0.10517 0.105166 0.105162 0.105159 0.105157 0.105154 0.105153 0.105151 0.10515 #selex for gender,fleet: 1 / 9
0.0121154 0.0198148 0.123426 0.247629 0.375745 0.513216 0.658096 0.795227 0.933695 1.10386 1.34205 1.63082 1.89827 2.11758 2.30123 2.46175 2.60522 2.73436 2.85064 2.95514 3.04879 3.1325 3.20714 3.27357 3.33256 3.38487 3.43119 3.47215 3.50834 3.54028 3.56844 3.59326 3.61511 3.63435 3.65127 3.66615 3.67924 3.69073 3.70083 3.7097 3.7175 #bodywt for gender,fleet: 1 / 10
0 7.61782e-005 0.00206457 0.0908323 0.494991 0.858499 0.841134 0.579215 0.313029 0.153017 0.0813117 0.0543369 0.0451569 0.0421833 0.0412328 0.0409251 0.0408223 0.0407864 0.0407732 0.040768 0.0407659 0.0407649 0.0407645 0.0407643 0.0407641 0.0407641 0.040764 0.040764 0.040764 0.040764 0.040764 0.040764 0.040764 0.040764 0.040764 0.040764 0.040764 0.040764 0.040764 0.040764 #selex for gender,fleet: 1 / 10
0.0121154 0.0197693 0.0745412 0.179418 0.469633 0.749378 0.955778 1.14693 1.32718 1.49878 1.66526 1.83026 1.99539 2.1591 2.31783 2.46801 2.60733 2.73481 2.85042 2.95464 3.04818 3.13185 3.20649 3.27292 3.33193 3.38426 3.43059 3.47157 3.50777 3.53973 3.5679 3.59273 3.6146 3.63384 3.65077 3.66566 3.67875 3.69025 3.70036 3.70924 3.71703 #bodywt for gender,fleet: 1 / 11
0 7.6084e-005 0.000122913 0.000125883 0.000360693 0.00487464 0.0347248 0.128809 0.302843 0.518818 0.715031 0.85368 0.933513 0.972447 0.989036 0.995307 0.997347 0.997791 0.997677 0.99739 0.99707 0.996764 0.99649 0.996249 0.99604 0.99586 0.995706 0.995574 0.995461 0.995364 0.99528 0.995208 0.995146 0.995093 0.995047 0.995007 0.994972 0.994942 0.994916 0.994894 0.994874 #selex for gender,fleet: 1 / 11
0.0121154 0.0197693 0.0745433 0.176326 0.321363 0.506035 0.721966 0.950785 1.176 1.39076 1.59441 1.78822 1.97309 2.1486 2.3135 2.46657 2.60714 2.73514 2.85098 2.95528 3.04885 3.13253 3.20716 3.27358 3.33257 3.38487 3.43119 3.47215 3.50833 3.54027 3.56843 3.59324 3.6151 3.63433 3.65125 3.66613 3.67922 3.69071 3.70081 3.70968 3.71747 #bodywt for gender,fleet: 1 / 12
0 0.229137 0.370199 0.372533 0.379622 0.407376 0.471503 0.572305 0.690872 0.801717 0.887101 0.942561 0.973553 0.988784 0.99553 0.998292 0.999362 0.999763 0.999911 0.999966 0.999986 0.999994 0.999997 0.999998 0.999998 0.999998

0.999997 0.999997 0.999996 0.999995 0.999994 0.999993 0.999991 0.99999 0.999989 0.999988 0.999987 0.999986 0.999985 0.999985 0.999984 #selex for gender,fleet: 1 / 12
0.0122237 0.0230702 0.133993 0.287337 0.455106 0.625078 0.791462 0.952135 1.10442 1.24386 1.36856 1.4815 1.58773 1.69088 1.79154 1.88769 1.97647 2.05576 2.12474 2.18372 2.23363 2.27565 2.31095 2.34058 2.36545 2.38634 2.4039 2.41867 2.43109 2.44155 2.45036 2.45778 2.46403 2.4693 2.47374 2.47748 2.48064 2.4833 2.48555 2.48744 2.48903 #bodywt for gender,fleet: 2 / 1
0 8.25105e-005 0.00132103 0.0221277 0.121862 0.332966 0.589812 0.795762 0.903919 0.917096 0.859547 0.762877 0.657049 0.562265 0.487011 0.431538 0.392358 0.365253 0.346604 0.333712 0.324701 0.318309 0.313701 0.310323 0.307806 0.305901 0.304439 0.303304 0.302411 0.301702 0.301135 0.300677 0.300305 0.300001 0.299752 0.299547 0.299377 0.299236 0.299118 0.299021 0.298939 #selex for gender,fleet: 2 / 1
0.0122237 0.0226282 0.0922991 0.32984 0.528538 0.705843 0.871705 1.02712 1.17379 1.31363 1.44747 1.57435 1.69235 1.79982 1.89606 1.98122 2.0559 2.12093 2.17724 2.22575 2.26739 2.30301 2.3334 2.35928 2.38127 2.39994 2.41577 2.42918 2.44053 2.45014 2.45826 2.46513 2.47093 2.47583 2.47997 2.48347 2.48642 2.48891 2.49101 2.49279 2.49428 #bodywt for gender,fleet: 2 / 2
0 8.1489e-005 0.000131624 0.00104931 0.0153314 0.0846218 0.243533 0.463319 0.674916 0.829308 0.91878 0.959927 0.972657 0.971106 0.96334 0.953522 0.943683 0.934728 0.926981 0.920466 0.915076 0.910655 0.907044 0.904096 0.901689 0.899718 0.8981 0.896769 0.895671 0.894762 0.894009 0.893382 0.89286 0.892425 0.892061 0.891757 0.891501 0.891287 0.891108 0.890957 0.89083 #selex for gender,fleet: 2 / 2
0.0122237 0.0227649 0.129835 0.295324 0.469673 0.645379 0.816364 0.980294 1.13714 1.28744 1.43038 1.56375 1.68545 1.79451 1.89106 1.97582 2.04978 2.11399 2.16949 2.21728 2.25829 2.29339 2.32335 2.34888 2.37059 2.38904 2.40469 2.41796 2.4292 2.43871 2.44676 2.45357 2.45932 2.46418 2.46829 2.47176 2.47468 2.47716 2.47924 2.48101 2.48249 #bodywt for gender,fleet: 2 / 3
0 8.18014e-005 0.000553204 0.00995017 0.0657317 0.210538 0.427593 0.648726 0.816573 0.916208 0.962599 0.976935 0.974618 0.964382 0.950818 0.93638 0.922394 0.909541 0.898105 0.888139 0.879572 0.872272 0.866087 0.860864 0.856464 0.852761 0.849647 0.847028 0.844826 0.842974 0.841417 0.840106 0.839003 0.838074 0.837292 0.836633 0.836079 0.835611 0.835217 0.834885 0.834605 #selex for gender,fleet: 2 / 3
0.0122237 0.0226317 0.110939 0.327954 0.503135 0.668777 0.825792 0.977192 1.1275 1.27821 1.42593 1.56528 1.6924 1.80582 1.90566 1.99279 2.06837 2.13362 2.18973 2.23783 2.27896 2.31405 2.34394 2.36935 2.39093 2.40924 2.42476 2.4379 2.44902 2.45843 2.46639 2.47312 2.4788 2.4836 2.48766 2.49108 2.49397 2.49641 2.49847 2.50021 2.50168 #bodywt for gender,fleet: 2 / 4
0 8.14967e-005 0.000176686 0.00414407 0.0482656 0.203184 0.459893 0.711328 0.877062 0.95703 0.987071 0.996225 0.998448 0.998726 0.998528 0.998239 0.997956 0.997702 0.99748 0.99729 0.997128 0.996992 0.996876 0.996779 0.996697 0.996628 0.99657 0.996521 0.99648 0.996446 0.996417 0.996392 0.996372 0.996354 0.99634 0.996327 0.996317 0.996308 0.996301 0.996295 0.996289 #selex for gender,fleet: 2 / 4
0.0122237 0.0238549 0.153559 0.245583 0.358529 0.497697 0.642529 0.786907 0.929504 1.06942 1.20634 1.3403 1.47096 1.59689 1.71563 1.82451 1.92166 2.00643 2.07923 2.14114 2.19346 2.23754 2.27463 2.30582 2.33205 2.35411 2.37267 2.3883 2.40145 2.41253 2.42186 2.42973 2.43635 2.44194 2.44665 2.45062 2.45396 2.45679 2.45917 2.46117 2.46287 #bodywt for gender,fleet: 2 / 5
0 8.40824e-005 0.0360114 0.534041 0.908571 0.82085 0.58616 0.369423 0.219461 0.128819 0.0772918 0.0485641 0.0324559 0.0232345 0.0177996 0.0144883 0.0124006 0.0110393 0.0101233 0.00948858 0.0090371 0.00870831 0.00846387 0.0082788 0.00813647 0.0080255 0.00793796 0.0078682 0.00781214 0.00776674 0.00772976 0.00769947 0.00767454 0.00765395 0.00763689 0.00762271 0.0076109 0.00760104 0.00759281 0.00758591 0.00758013 #selex for gender,fleet: 2 / 5
0.0122237 0.0251492 0.13938 0.273019 0.413085 0.558423 0.712638 0.866014 1.01152 1.15014 1.28395 1.41362 1.53855 1.6572 1.76756 1.86786 1.95709 2.0351 2.10243 2.16004 2.20906 2.25062 2.28578 2.31549 2.34058 2.36174 2.3796 2.39467 2.40738 2.4181 2.42714 2.43477 2.4412 2.44663 2.45121 2.45507 2.45833 2.46107 2.46339 2.46535 2.46699 #bodywt for gender,fleet: 2 / 6
0 8.76362e-005 0.00923743 0.143634 0.511921 0.836982 0.930887 0.855024 0.700844 0.536834 0.399934 0.299207 0.229739 0.183175 0.152172 0.131395 0.117277 0.107509 0.100617 0.0956578 0.0920207 0.0893058 0.0872463 0.0856613 0.0844258 0.0834518 0.0826764 0.0820538 0.0815502 0.0811404 0.080805 0.0805293 0.0803017 0.0801133 0.0799568 0.0798265 0.0797179 0.0796271 0.0795511 0.0794874 0.079434 #selex for gender,fleet: 2 / 6
0.0122237 0.0226381 0.0945282 0.276606 0.483918 0.686676 0.883453 1.07023 1.24435 1.40444 1.54991 1.68079 1.7975 1.90077 1.99152 2.07079 2.13968 2.19928 2.25064 2.29476 2.33256 2.36486 2.39241 2.41587 2.43581 2.45275 2.46711 2.47929 2.4896 2.49833 2.50572 2.51196 2.51724 2.5217 2.52547 2.52865 2.53134 2.53361 2.53553 2.53714 2.53851 #bodywt for gender,fleet: 2 / 7
0 8.15111e-005 0.000145695 0.00056819 0.00349411 0.0141287 0.0390204 0.0820075 0.141971 0.213812 0.290965 0.367523 0.439273 0.503811 0.56019 0.608447 0.649178 0.683243 0.71157 0.735051 0.754487 0.770572 0.783891 0.794932 0.804098 0.811717 0.818062 0.823353 0.827771 0.831466 0.834558 0.83715 0.839324 0.841149 0.842682 0.84397 0.845054 0.845966 0.846733 0.84738 0.847924 #selex for gender,fleet: 2 / 7
0.0122237 0.0241411 0.1491 0.269134 0.390383 0.524261 0.660066 0.788106 0.910708 1.03157 1.15434 1.2836 1.42283 1.56968 1.71462 1.84659 1.95944 2.05267 2.12877 2.1909 2.24188 2.28396 2.31889 2.34799 2.37232 2.39271 2.40983 2.42422 2.43632 2.44651 2.4551 2.46233 2.46842 2.47356 2.47789 2.48155 2.48463 2.48722 2.48941 2.49126 2.49282 #bodywt for gender,fleet: 2 / 8
0 8.49744e-005 0.0129253 0.253583 0.730037 0.903094 0.76197 0.511305 0.296435 0.159457 0.084579 0.0465793 0.0277806 0.0184315 0.0136667 0.0111501 0.00976454 0.00896785 0.00848961 0.00819054 0.00799628 0.00786568 0.00777512 0.00771058 0.00766347 0.00762836 0.0076017 0.00758115 0.00756509 0.00755239 0.00754226 0.0075341 0.00752748 0.00752208 0.00751766 0.00751401 0.007511 0.0075085 0.00750642 0.00750469 0.00750325 #selex for gender,fleet: 2 / 8
0.0122237 0.023389 0.153625 0.274497 0.394861 0.532894 0.684804 0.837769 0.990266 1.14374 1.29762 1.44864 1.59178 1.72247 1.83819 1.93854 2.02453 2.09774 2.15987 2.21251 2.2571 2.29483 2.32675 2.35376 2.37659 2.39589 2.41221 2.426

2.43764 2.44748 2.45579 2.4628 2.46872 2.47372 2.47794 2.4815 2.48451 2.48705 2.48919 2.49099 2.49252 #bodywt for gender,fleet: 2 / 9
0 8.31855e-005 0.00927142 0.224227 0.704963 0.921341 0.856756 0.683263 0.505403 0.367113 0.27312 0.213269 0.176124 0.153115 0.138689 0.129459 0.123409 0.119339 0.116531 0.114546 0.11311 0.11205 0.111254 0.110645 0.110174 0.109804 0.109511 0.109276 0.109087 0.108933 0.108807 0.108704 0.10862 0.108549 0.108491 0.108442 0.108402 0.108368 0.10834 0.108316 0.108297 #selex for gender,fleet: 2 / 9
0.0122237 0.0230733 0.154526 0.283613 0.40897 0.54048 0.67284 0.796196 0.917012 1.05014 1.20996 1.39497 1.57973 1.7393 1.86809 1.9715 2.05595 2.12608 2.18496 2.23469 2.27681 2.31253 2.34283 2.36852 2.3903 2.40875 2.42437 2.43758 2.44877 2.45822 2.46621 2.47297 2.47867 2.48349 2.48756 2.491 2.4939 2.49635 2.49842 2.50016 2.50163 #bodywt for gender,fleet: 2 / 10
0 8.24768e-005 0.00532456 0.15207 0.588044 0.872818 0.816537 0.580408 0.346275 0.192045 0.110484 0.0721447 0.0550477 0.0474974 0.0441015 0.0425184 0.0417455 0.0413485 0.0411336 0.0410113 0.0409382 0.0408926 0.0408629 0.040843 0.0408291 0.0408192 0.0408119 0.0408065 0.0408024 0.0407992 0.0407967 0.0407947 0.0407931 0.0407919 0.0407908 0.04079 0.0407893 0.0407887 0.0407882 0.0407879 0.0407875 #selex for gender,fleet: 2 / 10
0.0122237 0.0226278 0.0866666 0.218955 0.578135 0.808471 0.984547 1.14202 1.28552 1.41706 1.53805 1.64963 1.75253 1.84709 1.93333 2.01116 2.08059 2.14185 2.1954 2.24184 2.28188 2.31625 2.34564 2.37071 2.39204 2.41017 2.42556 2.4386 2.44965 2.459 2.46691 2.4736 2.47925 2.48403 2.48807 2.49148 2.49435 2.49678 2.49883 2.50057 2.50203 #bodywt for gender,fleet: 2 / 11
0 8.14878e-005 0.000122929 0.000134457 0.000743525 0.00807741 0.0421984 0.127294 0.266051 0.433677 0.596479 0.73095 0.829371 0.895278 0.936734 0.961777 0.976579 0.985268 0.990394 0.993458 0.995323 0.996483 0.997219 0.997698 0.998015 0.99823 0.998378 0.998482 0.998556 0.998609 0.998648 0.998677 0.998699 0.998716 0.998728 0.998738 0.998746 0.998752 0.998757 0.998761 0.998764 #selex for gender,fleet: 2 / 11
0.0122237 0.0226278 0.0866621 0.20162 0.357558 0.54493 0.748326 0.948871 1.13515 1.30394 1.45562 1.59145 1.71273 1.82061 1.91608 2.00006 2.07347 2.13726 2.1924 2.23985 2.28055 2.31534 2.34501 2.37028 2.39175 2.40998 2.42544 2.43853 2.44962 2.45901 2.46694 2.47365 2.47932 2.48411 2.48816 2.49157 2.49446 2.49689 2.49895 2.50069 2.50215 #bodywt for gender,fleet: 2 / 12
0 0.245411 0.370244 0.373258 0.383689 0.416914 0.481583 0.571616 0.670773 0.762972 0.838524 0.894714 0.933485 0.95876 0.974584 0.984248 0.990082 0.993607 0.995757 0.99709 0.997935 0.998484 0.998849 0.999097 0.999271 0.999396 0.999486 0.999553 0.999604 0.999644 0.999674 0.999698 0.999717 0.999732 0.999744 0.999754 0.999763 0.999769 0.999775 0.99978 0.999783 #selex for gender,fleet: 2 / 12
0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.0646611 0.0693223 0.0739834 0.0786446 0.0833057 0.0879669 0.092628 0.0972892 #mean M for year Yinit: 2009 sex: 1
943.044 476.335 1009.06 700.946 233.582 155.545 396.539 324.225 583.242 252.883 445.382 203.407 168.931 230.704 204.024 247.079 174.232 151.347 193.523 141.496 133.806 93.3955 64.3178 40.2669 20.197 55.504 10.7594 10.925 16.5886 5.31609 4.1342 7.02513 4.47613 2.10638 3.92993 1.68379 1.68156 1.70175 1.12415 0.681024 6.52282 #numbers for year Yinit: 2009 sex: 1
0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 #mean M for year Yinit: 2009 sex: 2
943.044 476.335 1009.06 700.925 233.482 155.391 396.023 323.858 585.338 256.008 457.033 212.489 180.218 252.6 230.623 289.14 210.986 190.034 253.058 194.056 193.402 142.308 102.725 66.9583 34.923 100.582 20.6643 22.3232 35.8482 12.0013 9.58888 16.533 10.6119 5.0068 9.35633 4.02341 4.04294 4.11899 2.73124 1.65257 17.5752 #numbers for year Yinit: 2009 sex: 2
451.977 812.647 381.154 328.429 470.548 434.467 544.777 395.455 351.917 459.845 342.732 329.335 232.704 161.561 101.533 50.895 139.802 27.0912 27.5009 41.7491 13.377 10.4017 17.6734 11.2598 5.29828 9.88456 4.23486 4.22904 4.27967 2.82698 1.71257 1.37839 1.5485 2.49473 1.17285 0.829737 0.702508 0.683997 0.750328 0.835693 6.00474 #numbers for year Ydeclare: 2000 sex: 1
451.977 812.647 381.153 328.37 469.248 431.751 539.501 390.687 349.258 462.423 353.206 351.087 257.873 185.912 121.071 63.1032 181.65 37.3039 40.2856 64.6766 21.648 17.2935 29.8131 19.1337 9.02664 16.867 7.25268 7.2875 7.42426 4.92273 2.97847 2.3835 2.65583 4.24247 1.98134 1.39674 1.18216 1.15455 1.27522 1.43592 13.9655 #numbers for year Ydeclare: 2000 sex: 2
#R0 1916 1917 1918 1919 1920 1921 1922 1923 1924 1925 1926 1927 1928 1929 1930 1931 1932 1933 1934 1935 1936 1937 1938 1939 1940 1941 1942 1943 1944 1945 1946 1947 1948 1949 1950 1951 1952 1953 1954 1955 1956 1957 1958 1959 1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 #years
3335.48 3335.51 3335.08 3334.39 3333.69 3333.27 3332.84 3332.5 3332.22 3331.89 3331.56 3331.17 3330.6 3330.14 3329.6 3328.95 3328.27 3327.52 3327.1 3326.74 3326.4 3325.95 3325.57 3325.12 3324.67 3324.19 3322.99 3320.95 3317.67 3304.86 3285.2 3241.98 3216.13 3204.9 3195.94 3186.81 3176.77 3170.48 3165.7 3165.85 3163.78 3161.36 3161.96 3153.44 3146.68 3209.97 3653.71 2948.6 2417 2227.57 2349.55 2945.21 5510.01 2978.1 2274.5 2378.71 3234.84 3955.07 3113.64 2468.65 4547.39 1912.15 3150.09 3766.87 1661.56 1575.89 3527.02 1621.86 1102.9 3971.8 1043.03 1557.99 1903.02 2122.14 2341.9 1937.13 2130.52 1382.39 1354.83 1662 1202.41 1201.79 786.554 859.509 1725.8 903.954 1935.95 1003.71 1148.4 421.757 594.459 1678.6 2275.54 1011.58 1886.09 #Recruits
25992.5 25992.5 25978.4 25956 25933.2 25919.5 25905.7 25894.8 25885.8 25875 25864.2 25851.5 25833.4 25818.3 25801.1 25780 25758.1 25734 25720.6 25709.2 25698.3 25683.8 25671.8 25657.2 25643 25627.6 25589.5 25524.6 25421 25022.3 24428.6 23195.1 22500.9 22208.8 21979.8 21750 21501.1 21347.5 21231.7 21235.3 21185.4 21127.3 21141.6 20938.9 20779.7 20606.4 20381.1 20192.3 19957.5 19859.2 19833.8 19706.2 18789.2 18572.4 18291.3 18027.2 17746.4 17393.7 17014.7 16422.7 16118.3 15847.6 15730 15338.2 14586.1 13717.3 12677 11860.2 10242.8 8887.09 8604.16 8198.95

7920.21 7228.45 6533.23 5700.26 5074.42 4259.99 3592.23 3177.96 3205.27 3305.24 3270.34 3254.06 3186.92 3316.49 3698.69 4079.78 4439.83 4781.42 5090.51 5371.5 5642.17 5911.83 6169.83 #SpawnBio
0.511 0.5 0 # spawn-recr steepness, sigmaR, autocorr
high steepness vector 1
0 0 5.6167e-005 0.000745938 0.00548496 0.0264995 0.0899436 0.224968 0.438991 0.710218 1.00487 1.29551 1.56686 1.81314 2.03381 2.2305 2.40552 2.56116 2.69952 2.82247 2.93167 3.02856 3.11447 3.19058 3.25794 3.31751 3.37014 3.41662 3.45762 3.49378 3.52564 3.55371 3.57842 3.60017 3.6193 3.63613 3.65092 3.66392 3.67535 3.68539 3.69421 #female fecundity; weighted by N in year Y_init across morphs and areas
0.0121134 0.0198975 0.104334 0.241976 0.405711 0.583998 0.767911 0.953184 1.13534 1.30674 1.46853 1.63514 1.82151 2.0266 2.23195 2.4194 2.58276 2.72407 2.84735 2.95591 3.05206 3.13747 3.21339 3.28083 3.3407 3.39378 3.4408 3.48239 3.51915 3.55161 3.58026 3.60551 3.62777 3.64738 3.66463 3.67982 3.69318 3.70492 3.71525 3.72433 3.7323 #bodywt for gender,fleet: 1 / 1
0 7.64487e-005 0.000631826 0.0117142 0.0816825 0.270875 0.545237 0.785438 0.90425 0.886106 0.767585 0.6156 0.486193 0.399761 0.350599 0.325421 0.313319 0.307689 0.305093 0.303886 0.303314 0.303034 0.302893 0.302818 0.302778 0.302755 0.302741 0.302733 0.302728 0.302724 0.302722 0.30272 0.302719 0.302718 0.302718 0.302717 0.302717 0.302716 0.302716 0.302716 0.302716 #selex for gender,fleet: 1 / 1
0.0121134 0.0198595 0.0756815 0.256005 0.463924 0.655021 0.843646 1.02772 1.20839 1.39005 1.57564 1.76338 1.9488 2.12774 2.29711 2.45476 2.59949 2.73102 2.84971 2.95631 3.05173 3.13692 3.21282 3.28032 3.34026 3.39342 3.44049 3.48213 3.51893 3.55142 3.58009 3.60537 3.62764 3.64726 3.66452 3.67972 3.69308 3.70484 3.71517 3.72425 3.73223 #bodywt for gender,fleet: 1 / 2
0 7.63702e-005 0.000125408 0.000458159 0.00799557 0.0592888 0.210515 0.45382 0.699303 0.867306 0.946852 0.968064 0.961691 0.946296 0.93071 0.91819 0.909231 0.903233 0.899365 0.896915 0.895371 0.894391 0.893763 0.893353 0.89308 0.892895 0.892767 0.892677 0.892611 0.892563 0.892527 0.8925 0.892479 0.892463 0.892449 0.892439 0.89243 0.892424 0.892418 0.892413 0.892409 #selex for gender,fleet: 1 / 2
0.0121134 0.0198748 0.0984773 0.244728 0.414114 0.598858 0.789682 0.981313 1.17301 1.36678 1.5621 1.75477 1.94049 2.11689 2.28283 2.43755 2.58052 2.71148 2.83053 2.93807 3.03471 3.12122 3.19841 3.2671 3.3281 3.38218 3.43006 3.4724 3.5098 3.5428 3.57191 3.59756 3.62016 3.64005 3.65756 3.67296 3.6865 3.6984 3.70887 3.71806 3.72614 #bodywt for gender,fleet: 1 / 3
0 7.64018e-005 0.000335658 0.00551098 0.0434926 0.166043 0.384385 0.632117 0.825399 0.93199 0.970012 0.968972 0.949171 0.921913 0.893512 0.867358 0.844913 0.826454 0.811648 0.799933 0.790717 0.783472 0.777761 0.773237 0.76963 0.766736 0.764396 0.76249 0.760928 0.759639 0.758569 0.757675 0.756924 0.756291 0.755754 0.755297 0.754908 0.754574 0.754288 0.754041 0.753828 #selex for gender,fleet: 1 / 3
0.0121134 0.0198602 0.0833051 0.264551 0.440572 0.620707 0.801003 0.980511 1.16492 1.3598 1.56246 1.76436 1.95829 2.14058 2.30977 2.46544 2.6077 2.73697 2.85388 2.95916 3.05366 3.13822 3.2137 3.28091 3.34065 3.39367 3.44065 3.48222 3.51897 3.55143 3.58007 3.60533 3.62759 3.64719 3.66445 3.67964 3.693 3.70475 3.71508 3.72416 3.73213 #bodywt for gender,fleet: 1 / 4
0 7.63717e-005 0.000148387 0.00205187 0.0288781 0.151044 0.401287 0.68206 0.87527 0.963175 0.99121 0.997575 0.998281 0.997837 0.997234 0.996669 0.996179 0.995769 0.99543 0.995154 0.994928 0.994744 0.994594 0.99447 0.994369 0.994285 0.994215 0.994157 0.994108 0.994066 0.994031 0.994001 0.993976 0.993954 0.993936 0.99392 0.993906 0.993894 0.993884 0.993875 0.993867 #selex for gender,fleet: 1 / 4
0.0121134 0.0200118 0.126383 0.220904 0.330206 0.472775 0.627249 0.785313 0.94653 1.11257 1.28857 1.4829 1.70079 1.93392 2.16163 2.36674 2.54402 2.696 2.82711 2.94125 3.04132 3.12946 3.20729 3.27609 3.33693 3.39072 3.43825 3.48024 3.5173 3.54999 3.57882 3.60422 3.62659 3.64629 3.66362 3.67887 3.69228 3.70407 3.71443 3.72354 3.73154 #bodywt for gender,fleet: 1 / 5
0 7.66855e-005 0.0134796 0.391591 0.890732 0.87369 0.631075 0.379063 0.204015 0.104505 0.0537352 0.0292232 0.017639 0.0121577 0.00952093 0.00821813 0.00755271 0.00720006 0.00700581 0.00689457 0.0068284 0.00678758 0.00676151 0.00674432 0.00673264 0.00672448 0.00671864 0.00671437 0.00671118 0.00670875 0.00670687 0.0067054 0.00670423 0.00670329 0.00670252 0.0067019 0.00670138 0.00670094 0.00670058 0.00670028 0.00670002 #selex for gender,fleet: 1 / 5
0.0121134 0.0201204 0.111969 0.234414 0.375134 0.526199 0.69297 0.86663 1.03729 1.20798 1.38553 1.57576 1.77976 1.99036 2.195 2.38327 2.55084 2.69801 2.82702 2.94036 3.04022 3.12838 3.20631 3.27523 3.33618 3.39007 3.43768 3.47973 3.51685 3.54959 3.57845 3.60388 3.62628 3.646 3.66335 3.67861 3.69203 3.70384 3.71421 3.72332 3.73133 #bodywt for gender,fleet: 1 / 6
0 7.69125e-005 0.00432395 0.0889756 0.414726 0.792726 0.935143 0.862012 0.677543 0.479304 0.323347 0.219885 0.157557 0.121899 0.10196 0.0908507 0.0846014 0.0810219 0.0789225 0.0776576 0.0768736 0.0763735 0.0760453 0.075824 0.0756709 0.0755624 0.0754838 0.0754256 0.0753818 0.0753483 0.0753221 0.0753016 0.0752851 0.0752719 0.0752611 0.0752522 0.0752448 0.0752387 0.0752335 0.0752292 0.0752255 #selex for gender,fleet: 1 / 6
0.0121134 0.0198603 0.0771108 0.220539 0.421084 0.632034 0.851061 1.07212 1.28996 1.5009 1.70246 1.89306 2.07173 2.23798 2.39169 2.53303 2.66233 2.78002 2.88661 2.98265 3.06876 3.14562 3.21395 3.27451 3.32804 3.37527 3.41688 3.45349 3.48568 3.51396 3.53881 3.56063 3.57978 3.5966 3.61136 3.62431 3.63567 3.64564 3.65439 3.66207 3.66881 #bodywt for gender,fleet: 1 / 7
0 7.63715e-005 0.000132667 0.000335584 0.00204669 0.00980894 0.0320954 0.0777674 0.150626 0.246939 0.357339 0.470762 0.577778 0.672179 0.751066 0.814119 0.86264 0.898707 0.924582 0.942366 0.953859 0.960533 0.963569 0.963905 0.962282 0.959288 0.95538 0.950913 0.946159 0.941319 0.936539 0.931924 0.927543 0.923437 0.91963 0.91613 0.912934 0.910033 0.907412 0.905055 0.902941 #selex for gender,fleet: 1 / 7
0.0121134 0.0200162 0.119952 0.235333 0.358186 0.497279 0.645797 0.788234 0.927105 1.07058 1.2337 1.44147 1.70484 1.98399 2.22789 2.42568 2.58866 2.72773 2.84929 2.95685 3.05249 3.13765 3.21345 3.28084 3.34068 3.39376 3.44077 3.48236 3.51912 3.55159 3.58023 3.60549 3.62775 3.64736 3.66462 3.6798 3.69316 3.70491 3.71524 3.72431 3.73229 #bodywt for gender,fleet: 1 / 8

0 7.66952e-005 0.00529085 0.162201 0.645409 0.912385 0.800432 0.519808 0.27256 0.125965 0.0561901 0.0268758 0.0153451 0.010928 0.00923428 0.00857159 0.00830349 0.00819033 0.00814025 0.00811693 0.00810551 0.00809962 0.00809644 0.00809463 0.00809357 0.00809291 0.00809249 0.00809221 0.00809202 0.00809188 0.00809179 0.00809172 0.00809167 0.00809162 0.00809159 0.00809157 0.00809155 0.00809153 0.00809152 0.00809151 0.0080915 #selex for gender,fleet: 1 / 8
0.0121134 0.0199345 0.122844 0.240212 0.362553 0.503376 0.667024 0.83847 1.01729 1.21024 1.4216 1.64648 1.87092 2.08141 2.27169 2.44142 2.59253 2.72726 2.84753 2.95492 3.05075 3.13618 3.21223 3.27983 3.33984 3.39305 3.44016 3.48184 3.51866 3.55118 3.57987 3.60516 3.62745 3.64707 3.66435 3.67955 3.69292 3.70468 3.71502 3.7241 3.73208 #bodywt for gender,fleet: 1 / 9
0 7.65261e-005 0.00347174 0.136224 0.610469 0.916338 0.883772 0.695043 0.488211 0.331108 0.232221 0.176105 0.145949 0.130115 0.121821 0.117424 0.115044 0.11372 0.11296 0.11251 0.112235 0.112061 0.111947 0.111871 0.111819 0.111782 0.111755 0.111735 0.11172 0.111709 0.1117 0.111693 0.111687 0.111683 0.111679 0.111676 0.111673 0.111671 0.11167 0.111668 0.111667 #selex for gender,fleet: 1 / 9
0.0121134 0.0199024 0.122074 0.245964 0.374576 0.512522 0.658263 0.79616 0.935195 1.10636 1.34609 1.63485 1.90058 2.11863 2.30203 2.46291 2.60704 2.73699 2.85413 2.9595 3.05401 3.13856 3.21402 3.28122 3.34094 3.39394 3.4409 3.48246 3.5192 3.55165 3.58029 3.60554 3.62779 3.64739 3.66465 3.67983 3.69319 3.70493 3.71526 3.72433 3.73231 #bodywt for gender,fleet: 1 / 10
0 7.64596e-005 0.00199539 0.0877991 0.487252 0.857103 0.847436 0.586845 0.317635 0.155307 0.0828321 0.0557763 0.0466606 0.0437416 0.04282 0.0425255 0.0424283 0.0423948 0.0423826 0.0423779 0.042376 0.0423751 0.0423747 0.0423745 0.0423744 0.0423744 0.0423744 0.0423743 0.0423743 0.0423743 0.0423743 0.0423743 0.0423743 0.0423743 0.0423743 0.0423743 0.0423743 0.0423743 0.0423743 0.0423743 #selex for gender,fleet: 1 / 10
0.0121134 0.0198594 0.0745567 0.178467 0.457893 0.744291 0.952193 1.14458 1.32609 1.49872 1.66574 1.83083 1.99585 2.15954 2.3185 2.46917 2.60917 2.73745 2.85392 2.95901 3.05341 3.13792 3.21337 3.28057 3.34031 3.39332 3.4403 3.48188 3.51863 3.5511 3.57975 3.60501 3.62727 3.64688 3.66414 3.67934 3.6927 3.70445 3.71478 3.72386 3.73184 #bodywt for gender,fleet: 1 / 11
0 7.63699e-005 0.000122957 0.000125427 0.000324686 0.00430852 0.0316035 0.120328 0.288901 0.503084 0.701783 0.844823 0.928569 0.970051 0.988006 0.994919 0.997237 0.997794 0.997724 0.997452 0.997136 0.996829 0.996552 0.996308 0.996095 0.995912 0.995755 0.99562 0.995504 0.995404 0.995319 0.995245 0.995181 0.995127 0.995079 0.995038 0.995002 0.994971 0.994945 0.994921 0.994901 #selex for gender,fleet: 1 / 11
0.0121134 0.0198594 0.07456 0.176041 0.320717 0.505258 0.72134 0.950491 1.17622 1.39162 1.59573 1.78963 1.97428 2.14957 2.3145 2.4679 2.60906 2.73782 2.85448 2.95965 3.05408 3.1386 3.21404 3.28122 3.34094 3.39394 3.4409 3.48246 3.5192 3.55164 3.58028 3.60553 3.62778 3.64738 3.66463 3.67981 3.69317 3.70491 3.71523 3.72431 3.73228 #bodywt for gender,fleet: 1 / 12
0 0.210464 0.338889 0.341043 0.348293 0.376072 0.439959 0.541052 0.661778 0.777254 0.868952 0.930774 0.966817 0.98535 0.993939 0.997606 0.999081 0.999652 0.999867 0.999949 0.999979 0.999991 0.999996 0.999997 0.999998 0.999998 0.999997 0.999996 0.999995 0.999994 0.999993 0.999992 0.99999 0.999989 0.999988 0.999987 0.999986 0.999985 0.999984 0.999983 0.999982 #selex for gender,fleet: 1 / 12
0.0122301 0.0231399 0.133874 0.288077 0.45576 0.625444 0.791406 0.95158 1.10355 1.24313 1.36827 1.4816 1.58799 1.69112 1.7917 1.88783 1.97668 2.05611 2.12528 2.18446 2.23459 2.27682 2.31232 2.34214 2.36719 2.38824 2.40595 2.42086 2.43341 2.44398 2.45289 2.4604 2.46673 2.47207 2.47657 2.48037 2.48358 2.48628 2.48856 2.49049 2.49212 #bodywt for gender,fleet: 2 / 1
0 8.26811e-005 0.00115328 0.0199777 0.113807 0.318576 0.574188 0.784299 0.898804 0.918274 0.866075 0.773217 0.669435 0.575286 0.49987 0.443944 0.404299 0.376821 0.357906 0.344836 0.33571 0.329246 0.324594 0.321189 0.318656 0.316742 0.315276 0.314137 0.313244 0.312535 0.311968 0.311511 0.31114 0.310837 0.310588 0.310383 0.310213 0.310073 0.309956 0.309858 0.309776 #selex for gender,fleet: 2 / 1
0.0122301 0.0227653 0.0920589 0.327744 0.526764 0.704168 0.870245 1.02587 1.17261 1.31235 1.44606 1.57296 1.6912 1.79909 1.89583 1.98147 2.05657 2.12197 2.17859 2.22738 2.26926 2.3051 2.3357 2.36176 2.38392 2.40275 2.41872 2.43226 2.44373 2.45344 2.46166 2.46861 2.47448 2.47945 2.48365 2.4872 2.4902 2.49273 2.49487 2.49667 2.4982 #bodywt for gender,fleet: 2 / 2
0 8.18111e-005 0.000131321 0.00100262 0.014588 0.081079 0.235402 0.451822 0.663455 0.820665 0.913903 0.95858 0.974339 0.97543 0.970029 0.962323 0.954335 0.946966 0.940551 0.93514 0.930658 0.926981 0.923978 0.921527 0.919527 0.91789 0.916547 0.915443 0.914533 0.913779 0.913155 0.912635 0.912203 0.911842 0.91154 0.911288 0.911076 0.910899 0.91075 0.910624 0.910519 #selex for gender,fleet: 2 / 2
0.0122301 0.0229171 0.12916 0.293165 0.467263 0.643313 0.814955 0.97954 1.13669 1.28684 1.42947 1.56274 1.68467 1.79415 1.89117 1.97638 2.05074 2.1153 2.17111 2.21918 2.26045 2.29578 2.32596 2.35169 2.3736 2.39221 2.40802 2.42142 2.43279 2.44241 2.45056 2.45746 2.46329 2.46822 2.47239 2.47591 2.47889 2.48141 2.48353 2.48532 2.48684 #bodywt for gender,fleet: 2 / 3
0 8.21612e-005 0.00056313 0.00971395 0.0630924 0.201725 0.411943 0.630491 0.801199 0.906528 0.958578 0.977462 0.978758 0.971572 0.960674 0.94855 0.936528 0.925306 0.915204 0.906321 0.898628 0.892034 0.886418 0.881657 0.877632 0.874234 0.871369 0.868954 0.86692 0.865206 0.863762 0.862546 0.86152 0.860656 0.859928 0.859313 0.858795 0.858359 0.85799 0.857679 0.857417 #selex for gender,fleet: 2 / 3
0.0122301 0.0227726 0.114349 0.320737 0.496335 0.664708 0.825056 0.978826 1.12939 1.27863 1.4246 1.56288 1.68964 1.80311 1.9032 1.99066 2.06659 2.1322 2.18867 2.23712 2.27857 2.31397 2.34413 2.3698 2.39162 2.41014 2.42585 2.43916 2.45044 2.45999 2.46806 2.4749 2.48067 2.48556 2.48969 2.49318 2.49612 2.49861 2.50071 2.50249 2.50399 #bodywt for gender,fleet: 2 / 4
0 8.18276e-005 0.000196049 0.00442914 0.0468993 0.1913 0.433242 0.680383 0.854231 0.945068 0.982269 0.99469 0.998102 0.998762 0.998685 0.998436 0.998167 0.997916 0.997695 0.997503 0.997338 0.997198 0.997079 0.996979 0.996894 0.996822 0.996762 0.996711 0.996668 0.996632 0.996601 0.996576 0.996554 0.996536 0.996521 0.996508 0.996497 0.996487 0.99648 0.996473 0.996467 #selex for gender,fleet: 2 / 4

0.0122301 0.0245311 0.151307 0.2462 0.359389 0.497844 0.64158 0.784517 0.925614 1.06417 1.20006 1.33352 1.46439 1.59125 1.71143 1.82195 1.92064 2.00672 2.08055 2.14323 2.19615 2.24069 2.27814 2.30963 2.33609 2.35836 2.37709 2.39286 2.40615 2.41734 2.42677 2.43472 2.44143 2.44708 2.45185 2.45588 2.45927 2.46213 2.46455 2.46659 2.46831 #bodywt for gender,fleet: 2 / 5
0 8.57153e-005 0.0355682 0.514537 0.904125 0.833753 0.601838 0.380531 0.225481 0.131491 0.0781998 0.0486628 0.0322293 0.0229038 0.0174571 0.0141683 0.0121124 0.0107825 0.00989411 0.00928258 0.00885009 0.00853674 0.0083048 0.00812988 0.00799578 0.00789152 0.00780947 0.00774421 0.00769184 0.0076495 0.00761503 0.00758682 0.00756362 0.00754447 0.0075286 0.00751542 0.00750443 0.00749527 0.00748761 0.00748119 0.00747581 #selex for gender,fleet: 2 / 5
0.0122301 0.0252339 0.139249 0.272807 0.412929 0.557995 0.711906 0.86546 1.01128 1.1501 1.28403 1.41377 1.53873 1.65736 1.7677 1.86801 1.95728 2.03538 2.10285 2.16063 2.20984 2.2516 2.28696 2.31686 2.34213 2.36347 2.38149 2.39671 2.40955 2.4204 2.42955 2.43727 2.44379 2.4493 2.45394 2.45786 2.46118 2.46397 2.46633 2.46832 2.47 #bodywt for gender,fleet: 2 / 6
0 8.78657e-005 0.00879679 0.138053 0.499965 0.829202 0.931773 0.86338 0.713898 0.551382 0.413801 0.311512 0.240403 0.192442 0.160351 0.138763 0.124047 0.113842 0.106627 0.101428 0.0976099 0.0947572 0.0925913 0.0909232 0.0896221 0.0885958 0.0877783 0.0871216 0.0865903 0.0861575 0.0858033 0.0855119 0.0852713 0.0850719 0.0849063 0.0847683 0.0846531 0.0845569 0.0844763 0.0844087 0.084352 #selex for gender,fleet: 2 / 6
0.0122301 0.0227733 0.0934284 0.27442 0.483673 0.686623 0.883196 1.06971 1.24361 1.40353 1.54892 1.6798 1.79659 1.9 1.99093 2.07043 2.13957 2.19943 2.25106 2.29544 2.33349 2.36603 2.39381 2.41748 2.43762 2.45473 2.46926 2.48158 2.49202 2.50087 2.50836 2.5147 2.52006 2.52459 2.52842 2.53166 2.53439 2.53671 2.53866 2.54031 2.5417 #bodywt for gender,fleet: 2 / 7
0 8.18293e-005 0.00014184 0.000507743 0.00312817 0.0129045 0.0362606 0.0772556 0.135189 0.205336 0.281323 0.357264 0.428858 0.493578 0.550352 0.599119 0.640404 0.675021 0.703872 0.727833 0.747699 0.764164 0.777816 0.789146 0.798562 0.806397 0.812928 0.818378 0.822933 0.826745 0.829938 0.832616 0.834864 0.836752 0.83834 0.839675 0.840799 0.841745 0.842542 0.843213 0.843779 #selex for gender,fleet: 2 / 7
0.0122301 0.0243703 0.148418 0.268693 0.390184 0.523903 0.659665 0.787536 0.909848 1.03056 1.15362 1.28386 1.42472 1.57328 1.71926 1.85137 1.9638 2.05644 2.13201 2.19376 2.24449 2.28644 2.3213 2.35041 2.37478 2.39522 2.41241 2.42688 2.43906 2.44932 2.45797 2.46527 2.47143 2.47662 2.481 2.4847 2.48782 2.49045 2.49267 2.49455 2.49613 #bodywt for gender,fleet: 2 / 8
0 8.55502e-005 0.012729 0.24745 0.721729 0.904173 0.770907 0.521893 0.304617 0.164659 0.0876838 0.0484973 0.0290913 0.0194444 0.0145352 0.0119481 0.0105274 0.00971285 0.00922529 0.00892125 0.00872429 0.0085922 0.00850082 0.00843582 0.00838846 0.00835321 0.00832649 0.00830591 0.00828984 0.00827715 0.00826702 0.00825887 0.00825227 0.00824688 0.00824246 0.00823882 0.00823581 0.00823331 0.00823124 0.00822951 0.00822806 #selex for gender,fleet: 2 / 8
0.0122301 0.0235704 0.152895 0.274252 0.394975 0.532626 0.684385 0.837377 0.989838 1.14324 1.29702 1.44791 1.59092 1.72153 1.83724 1.93768 2.02382 2.09723 2.15959 2.21249 2.25733 2.29531 2.32747 2.3547 2.37775 2.39724 2.41373 2.42768 2.43947 2.44943 2.45785 2.46497 2.47098 2.47606 2.48035 2.48397 2.48703 2.48961 2.49179 2.49363 2.49519 #bodywt for gender,fleet: 2 / 9
0 8.36244e-005 0.00901129 0.21654 0.693338 0.920178 0.865182 0.696711 0.519807 0.380344 0.284665 0.223341 0.185104 0.161343 0.146412 0.136845 0.130569 0.126344 0.123429 0.121367 0.119877 0.118777 0.11795 0.117319 0.116829 0.116445 0.116141 0.115897 0.115701 0.115541 0.115411 0.115304 0.115216 0.115143 0.115082 0.115032 0.11499 0.114955 0.114925 0.1149 0.11488 #selex for gender,fleet: 2 / 9
0.0122301 0.0232266 0.153999 0.283071 0.408574 0.539926 0.672219 0.795451 0.915946 1.04876 1.20848 1.3936 1.5784 1.73788 1.8666 1.97005 2.05466 2.12501 2.18416 2.23417 2.27658 2.31257 2.34313 2.36907 2.39107 2.40972 2.42553 2.43891 2.45024 2.45983 2.46794 2.4748 2.4806 2.4855 2.48964 2.49314 2.4961 2.49859 2.5007 2.50248 2.50399 #bodywt for gender,fleet: 2 / 10
0 8.28434e-005 0.00521382 0.148235 0.579852 0.870679 0.822222 0.589119 0.353613 0.196924 0.113619 0.0743816 0.0568918 0.0491854 0.0457315 0.0441283 0.0433494 0.0429513 0.042737 0.0426155 0.0425433 0.0424984 0.0424694 0.0424499 0.0424364 0.0424267 0.0424197 0.0424145 0.0424105 0.0424074 0.042405 0.0424031 0.0424016 0.0424004 0.0423994 0.0423986 0.0423979 0.0423974 0.0423969 0.0423965 0.0423962 #selex for gender,fleet: 2 / 10
0.0122301 0.0227648 0.0866573 0.21618 0.572614 0.807696 0.984476 1.14229 1.28603 1.4177 1.5387 1.65014 1.7528 1.84709 1.9331 2.01077 2.08015 2.14145 2.19511 2.24172 2.28196 2.31653 2.34614 2.37141 2.39295 2.41126 2.42682 2.44001 2.4512 2.46068 2.4687 2.47549 2.48124 2.48609 2.4902 2.49367 2.4966 2.49907 2.50117 2.50293 2.50443 #bodywt for gender,fleet: 2 / 11
0 8.18099e-005 0.000122936 0.000132906 0.000669999 0.00729851 0.0388435 0.119153 0.252623 0.41679 0.579028 0.715333 0.816778 0.885838 0.929986 0.95708 0.973344 0.983037 0.98884 0.992357 0.994529 0.995897 0.996778 0.997359 0.997749 0.998017 0.998205 0.998338 0.998435 0.998506 0.998559 0.998599 0.998629 0.998653 0.998671 0.998686 0.998698 0.998707 0.998714 0.998721 0.998725 #selex for gender,fleet: 2 / 11
0.0122301 0.0227648 0.0866576 0.201217 0.356817 0.544205 0.747813 0.94854 1.13497 1.30393 1.45574 1.59162 1.71286 1.82062 1.91596 1.99983 2.07321 2.13703 2.19226 2.23986 2.28073 2.31572 2.34559 2.37105 2.39271 2.41112 2.42674 2.43999 2.45121 2.46072 2.46876 2.47557 2.48133 2.4862 2.49031 2.49379 2.49672 2.49921 2.5013 2.50307 2.50457 #bodywt for gender,fleet: 2 / 12
0 0.225456 0.338844 0.341808 0.352433 0.385648 0.450032 0.540133 0.640534 0.735487 0.815002 0.875702 0.918858 0.947937 0.966796 0.978732 0.986196 0.990858 0.993789 0.995657 0.996868 0.99767 0.998212 0.998587 0.998852 0.999042 0.999183 0.999288 0.999367 0.999429 0.999477 0.999515 0.999545 0.999569 0.999589 0.999605 0.999618 0.999629 0.999638 0.999645 0.999651 #selex for gender,fleet: 2 / 12
0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.0644465 0.068893 0.0733395 0.077786 0.0822325 0.086679 0.0911255 0.095572 #mean M for year Yinit: 2009 sex: 1

1398.98 795.677 1754.46 1223.68 419.93 280.661 709.725 575.92 1017.42 446.834 756.658 352.775 284.009 384.948 345.11 409.083 286.909 246.536 312.862 230.895 217.84 154.699 106.924 66.0117 34.3334 87.8974 17.8653 17.585 26.2419 8.58623 6.46187 10.8146 6.79992 3.31743 5.70722 2.56931 2.43054 2.43237 1.60787 0.984122 9.06428 #numbers for year Yinit: 2009 sex: 1

0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 #mean M for year Yinit: 2009 sex: 2

1398.98 795.677 1754.45 1223.66 419.83 280.504 709.2 575.544 1021.31 452.382 776.132 368.176 302.646 420.772 388.927 476.815 345.76 307.566 405.196 312.005 308.372 229.735 166.132 106.941 58.0384 156.325 33.8074 35.5796 56.5326 19.4873 15.2119 26.0766 16.6585 8.20744 14.2257 6.45762 6.16994 6.23571 4.14825 2.54046 25.8408 #numbers for year Yinit: 2009 sex: 2

789.237 1359.96 648.62 538.378 758.802 706.607 866.944 627.044 553.079 718.17 540.606 518.381 372.69 259.713 160.973 83.6935 214.207 43.529 42.8394 63.9212 20.9127 15.7374 26.3365 16.5587 8.07804 13.8967 6.25592 5.91788 5.92217 3.91467 2.39598 1.95596 2.25665 3.04443 1.6983 1.17446 0.982357 0.946015 1.01558 1.09214 7.90111 #numbers for year Ydeclare: 2000 sex: 1

789.237 1359.96 648.619 538.318 757.498 703.792 861.416 621.929 550.797 723.171 555.538 548.205 407.973 294.806 189.667 102.895 277.059 59.9036 63.032 100.137 34.5139 26.9391 46.176 29.4967 14.5319 25.1865 11.4328 10.9231 11.0393 7.34362 4.49728 3.65373 4.18124 5.58904 3.09313 2.12811 1.77664 1.71393 1.85091 2.01142 19.7443 #numbers for year Ydeclare: 2000 sex: 2

#R0 1916 1917 1918 1919 1920 1921 1922 1923 1924 1925 1926 1927 1928 1929 1930 1931 1932 1933 1934 1935 1936 1937 1938 1939 1940 1941 1942 1943 1944 1945 1946 1947 1948 1949 1950 1951 1952 1953 1954 1955 1956 1957 1958 1959 1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 #years

3202.99 3203 3202.82 3202.55 3202.26 3202.09 3201.92 3201.78 3201.67 3201.54 3201.4 3201.25 3201.02 3200.84 3200.63 3200.36 3200.09 3199.8 3199.64 3199.5 3199.38 3199.2 3199.06 3198.89 3198.73 3198.54 3198.07 3197.24 3195.89 3190.53 3182.26 3163.81 3152.66 3147.8 3143.93 3139.96 3135.58 3132.91 3130.94 3131.23 3130.59 3129.88 3130.58 3127.29 3124.85 3270.29 3527.08 2945.42 2465.45 2296 2449.64 3137.8 4938.06 3177.56 2353.07 2413.63 3229.74 3921.6 3102.18 2579.65 4491.93 2034.2 3210.75 3868.51 1726 1689.77 3717.27 1755.96 1250.86 4382.29 1263.26 1864.76 2377.78 2738.41 3096.17 2677.28 3026.89 2036.65 2061.32 2585.69 1937.33 1934.59 1289.27 1462.64 2888.11 1578.47 3345.1 1769.99 2046.27 759.542 1068.24 2930.25 3956.4 1689.76 2797.96 #Recruits

25499.5 25499.5 25485.2 25462.5 25439.3 25425.5 25411.5 25400.5 25391.3 25380.4 25369.5 25356.8 25338.7 25323.7 25306.5 25285.4 25263.6 25239.8 25226.9 25216.1 25205.9 25192.2 25181 25167.2 25153.9 25139.5 25101.4 25035.3 24928.8 24514.1 23897.4 22617.6 21902.1 21603 21369.6 21135.1 20881.3 20729.2 20618.2 20634.3 20598.8 20559 20598.4 20415.7 20281.7 20134.6 19934.3 19772.3 19562.7 19494.5 19500.8 19401.5 18482.8 18290.7 18032.9 17797.1 17549.1 17231.5 16885.6 16313.9 16031.5 15780.4 15687 15310.4 14563.8 13718.7 12698.2 11902.5 10299.7 8962.38 8709.62 8337.82 8098.06 7446.13 6798.33 6018.64 5456.58 4716.03 4135.44 3828.36 3989.43 4252.29 4411.29 4617.62 4793.41 5182.32 5834.59 6485.45 7107.07 7696.36 8239.6 8747.76 9247.07 9750.85 10244.2 #SpawnBio

0.72 0.5 0 # spawn-recr steepness, sigmaR, autocorr

low steepness vector 1

0 0 5.63139e-005 0.00076536 0.00568959 0.0275288 0.0929084 0.230389 0.446012 0.717344 1.01098 1.30007 1.56968 1.81418 2.03303 2.22787 2.40101 2.55475 2.69121 2.81229 2.91965 3.01477 3.09897 3.17345 3.23927 3.29739 3.34866 3.39387 3.4337 3.46877 3.49963 3.52678 3.55065 3.57162 3.59005 3.60624 3.62045 3.63292 3.64387 3.65347 3.6619 #female fecundity; weighted by N in year Y_init across morphs and areas

0.0121237 0.0198054 0.107796 0.245096 0.409228 0.586933 0.769622 0.953533 1.13351 1.30198 1.46155 1.62689 1.81211 2.01609 2.22115 2.40913 2.57302 2.71435 2.83705 2.94458 3.03944 3.12341 3.19783 3.26381 3.32225 3.37397 3.4197 3.46009 3.49573 3.52716 3.55485 3.57924 3.60069 3.61956 3.63615 3.65073 3.66354 3.67478 3.68466 3.69332 3.70093 #bodywt for gender,fleet: 1 / 1

0 7.59896e-005 0.000880888 0.0155826 0.0991638 0.305995 0.583983 0.810307 0.908661 0.87266 0.744333 0.590363 0.462176 0.37667 0.327394 0.301563 0.288765 0.282598 0.279644 0.278216 0.277512 0.277154 0.276966 0.276863 0.276805 0.276771 0.276751 0.276738 0.276729 0.276724 0.27672 0.276717 0.276715 0.276713 0.276712 0.276711 0.276711 0.27671 0.27671 0.276709 0.276709 #selex for gender,fleet: 1 / 1

0.0121237 0.0197286 0.0759849 0.267257 0.476012 0.666555 0.852979 1.03415 1.21235 1.39213 1.57558 1.76045 1.94286 2.1194 2.28728 2.44413 2.58838 2.71942 2.83744 2.94317 3.03753 3.12153 3.19618 3.2624 3.32107 3.37298 3.41887 3.45938 3.49512 3.52663 3.55439 3.57882 3.60031 3.61922 3.63583 3.65043 3.66326 3.67452 3.68441 3.69308 3.7007 #bodywt for gender,fleet: 1 / 2

0 7.58326e-005 0.000125664 0.000522637 0.00928634 0.0664702 0.227701 0.476258 0.717319 0.875867 0.945684 0.95737 0.941206 0.916234 0.892148 0.872736 0.858565 0.84881 0.842316 0.838061 0.835283 0.83346 0.832249 0.831434 0.830875 0.830484 0.830207 0.830005 0.829857 0.829745 0.82966 0.829595 0.829543 0.829502 0.82947 0.829443 0.829421 0.829403 0.829389 0.829376 0.829366 #selex for gender,fleet: 1 / 2

0.0121237 0.0197469 0.101083 0.252456 0.423785 0.608091 0.796642 0.985284 1.17474 1.36716 1.56081 1.75099 1.93402 2.10813 2.27235 2.42582 2.56777 2.69781 2.81592 2.92247 3.01806 3.10346 3.1795 3.24704 3.3069 3.35986 3.40667 3.44798 3.48441 3.51651 3.54477 3.56963 3.5915 3.61073 3.62762 3.64246 3.65549 3.66693 3.67697 3.68578 3.69351 #bodywt for gender,fleet: 1 / 3

0 7.587e-005 0.000337676 0.00596684 0.0480055 0.18166 0.412143 0.662033 0.846147 0.939904 0.966272 0.954699 0.924946 0.888701 0.852783 0.820729 0.793842 0.772115 0.754933 0.741492 0.731017 0.722847 0.716449 0.711408 0.707409 0.704213 0.701638 0.699548 0.697838 0.696431 0.695265 0.694293 0.693478 0.692792 0.692211 0.691718 0.691297 0.690938 0.690629 0.690364 0.690136 #selex for gender,fleet: 1 / 3

0.0121237 0.0197287 0.0805516 0.281943 0.460759 0.635421 0.806741 0.978878 1.16175 1.35929 1.56441 1.7669 1.96015 2.14117 2.30883 2.46281 2.60328 2.73071 2.84576 2.9492 3.0419 3.12472 3.19852 3.26415 3.32239 3.374 3.41966 3.46001

3.49563 3.52705 3.55473 3.57911 3.60056 3.61943 3.63602 3.65059 3.6634 3.67465 3.68452 3.69319 3.70079 #bodywt for gender,fleet: 1 / 4
0 7.58332e-005 0.000135699 0.00178267 0.0309386 0.172662 0.453624 0.739107 0.909922 0.97648 0.994631 0.997991 0.997995 0.997415 0.996804 0.996264 0.995811 0.995439 0.995137 0.994893 0.994696 0.994536 0.994406 0.9943 0.994214 0.994142 0.994083 0.994033 0.993992 0.993957 0.993927 0.993902 0.993881 0.993863 0.993847 0.993834 0.993822 0.993812 0.993804 0.993796 0.99379 #selex for gender,fleet: 1 / 4
0.0121237 0.0197976 0.135495 0.221845 0.328617 0.470043 0.623994 0.782703 0.945325 1.11324 1.29086 1.48504 1.69959 1.92712 2.15004 2.35276 2.52941 2.68135 2.81236 2.9261 3.02549 3.11272 3.18951 3.25719 3.31687 3.36952 3.41595 3.45687 3.49293 3.52468 3.55262 3.57721 3.59883 3.61783 3.63453 3.6492 3.66209 3.6734 3.68332 3.69204 3.69968 #bodywt for gender,fleet: 1 / 5
0 7.59727e-005 0.0137423 0.436934 0.901149 0.84059 0.591291 0.353288 0.192251 0.100652 0.0531906 0.0297124 0.0182841 0.0126981 0.00991848 0.00849752 0.00774703 0.00733621 0.00710283 0.00696523 0.00688112 0.0068279 0.00679312 0.00676969 0.00675347 0.00674194 0.00673355 0.00672733 0.00672262 0.00671899 0.00671616 0.00671392 0.00671213 0.00671067 0.00670948 0.0067085 0.00670769 0.00670701 0.00670644 0.00670595 0.00670554 #selex for gender,fleet: 1 / 5
0.0121237 0.0201454 0.114462 0.237642 0.377426 0.527442 0.69281 0.863308 1.03063 1.19849 1.37386 1.5629 1.76701 1.97888 2.18515 2.37457 2.54246 2.68919 2.81723 2.92928 3.02768 3.11431 3.19071 3.25814 3.31765 3.37018 3.41651 3.45736 3.49337 3.52507 3.55299 3.57754 3.59914 3.61813 3.63482 3.64947 3.66234 3.67365 3.68357 3.69227 3.69991 #bodywt for gender,fleet: 1 / 6
0 7.66907e-005 0.00530356 0.102516 0.446044 0.811334 0.930433 0.8389 0.645856 0.448581 0.297708 0.199445 0.141023 0.107934 0.0895771 0.0794142 0.0737273 0.0704836 0.0685876 0.0674484 0.0667437 0.0662949 0.0660007 0.0658025 0.0656654 0.0655683 0.065498 0.0654459 0.0654067 0.0653767 0.0653533 0.0653349 0.0653202 0.0653083 0.0652986 0.0652907 0.0652841 0.0652786 0.065274 0.0652701 0.0652668 #selex for gender,fleet: 1 / 6
0.0121237 0.01973 0.078177 0.22876 0.430248 0.64217 0.861526 1.08201 1.29855 1.5077 1.70721 1.89561 2.07203 2.23605 2.38761 2.52686 2.65414 2.76986 2.87452 2.96868 3.05295 3.12804 3.1947 3.25368 3.30575 3.35163 3.39199 3.42747 3.45864 3.48599 3.51 3.53106 3.54954 3.56573 3.57994 3.59239 3.60331 3.61288 3.62126 3.62862 3.63506 #bodywt for gender,fleet: 1 / 7
0 7.58352e-005 0.000136022 0.000402384 0.00255277 0.0118909 0.037647 0.0885997 0.167451 0.269007 0.382828 0.49748 0.603749 0.695961 0.771816 0.831503 0.876683 0.909644 0.932744 0.948106 0.957516 0.962418 0.963957 0.963041 0.960379 0.956531 0.951929 0.946905 0.941707 0.936519 0.931472 0.926654 0.922121 0.917906 0.914024 0.910474 0.907248 0.904333 0.901711 0.899359 0.897257 #selex for gender,fleet: 1 / 7
0.0121237 0.0199301 0.124031 0.238997 0.359519 0.496858 0.642428 0.782425 0.919404 1.06069 1.21973 1.42002 1.67652 1.95729 2.20863 2.41261 2.5786 2.7184 2.83945 2.94588 3.04011 3.12374 3.19799 3.26387 3.32227 3.37396 3.41968 3.46007 3.49571 3.52714 3.55483 3.57921 3.60067 3.61954 3.63613 3.65071 3.66352 3.67477 3.68464 3.69331 3.70091 #bodywt for gender,fleet: 1 / 8
0 7.62443e-005 0.0059436 0.179141 0.668923 0.907466 0.774843 0.494685 0.257793 0.119144 0.0530745 0.0250694 0.0139076 0.00956474 0.00787135 0.00719726 0.00691978 0.00680066 0.00674705 0.00672169 0.00670908 0.00670248 0.00669887 0.00669679 0.00669555 0.00669477 0.00669427 0.00669394 0.00669371 0.00669355 0.00669343 0.00669334 0.00669328 0.00669323 0.00669319 0.00669316 0.00669313 0.00669311 0.00669309 0.00669308 0.00669307 #selex for gender,fleet: 1 / 8
0.0121237 0.01982 0.127601 0.244257 0.363827 0.503563 0.665086 0.834066 1.01074 1.20192 1.41227 1.63735 1.863 2.07482 2.26584 2.43552 2.58593 2.71951 2.83837 2.94421 3.03843 3.12225 3.19671 3.26279 3.32135 3.37318 3.41901 3.45948 3.49519 3.52667 3.55441 3.57883 3.60031 3.61921 3.63582 3.65042 3.66324 3.6745 3.68438 3.69306 3.70067 #bodywt for gender,fleet: 1 / 9
0 7.60193e-005 0.00390098 0.152667 0.638651 0.917328 0.862299 0.664002 0.458409 0.30619 0.211584 0.158206 0.129569 0.11452 0.106617 0.102412 0.100126 0.0988474 0.0981106 0.0976718 0.0974018 0.0972304 0.0971181 0.0970424 0.09699 0.0969528 0.0969258 0.0969058 0.0968907 0.0968791 0.09687 0.0968628 0.0968571 0.0968525 0.0968487 0.0968456 0.096843 0.0968409 0.0968391 0.0968375 0.0968362 #selex for gender,fleet: 1 / 9
0.0121237 0.0197859 0.126201 0.250685 0.377705 0.513955 0.657012 0.792847 0.930654 1.09986 1.33609 1.62426 1.89371 2.11487 2.29914 2.45942 2.60223 2.73053 2.8459 2.94946 3.04219 3.12501 3.1988 3.26441 3.32264 3.37423 3.41988 3.46022 3.49583 3.52724 3.55491 3.57929 3.60073 3.6196 3.63618 3.65076 3.66356 3.6748 3.68468 3.69334 3.70095 #bodywt for gender,fleet: 1 / 10
0 7.59501e-005 0.00224263 0.0961725 0.505107 0.858137 0.832325 0.571734 0.310733 0.153181 0.0816219 0.0542161 0.0447036 0.0415597 0.0405347 0.0401966 0.0400815 0.0400407 0.0400254 0.0400193 0.0400168 0.0400156 0.0400151 0.0400148 0.0400147 0.0400146 0.0400146 0.0400145 0.0400145 0.0400145 0.0400145 0.0400145 0.0400145 0.0400145 0.0400145 0.0400145 0.0400145 0.0400145 0.0400145 0.0400145 0.0400145 0.0400145 #selex for gender,fleet: 1 / 10
0.0121237 0.0197285 0.0745609 0.1813 0.488661 0.758092 0.962167 1.15126 1.32948 1.49949 1.66503 1.82967 1.99465 2.15813 2.31641 2.46592 2.60442 2.73101 2.84569 2.94897 3.04159 3.12437 3.19815 3.26377 3.32201 3.37362 3.41929 3.45965 3.49528 3.5267 3.55438 3.57877 3.60023 3.6191 3.63569 3.65028 3.66309 3.67434 3.68421 3.69288 3.70049 #bodywt for gender,fleet: 1 / 11
0 7.58323e-005 0.000122814 0.00012695 0.000432515 0.0058583 0.0395218 0.140463 0.320105 0.536468 0.728575 0.862002 0.93784 0.974435 0.989861 0.995607 0.997424 0.997777 0.997628 0.997329 0.997005 0.996701 0.996429 0.996192 0.995986 0.99581 0.995659 0.99553 0.995419 0.995324 0.995242 0.995172 0.995112 0.99506 0.995015 0.994976 0.994942 0.994913 0.994888 0.994866 0.994847 #selex for gender,fleet: 1 / 11
0.0121237 0.0197285 0.0745593 0.176562 0.321324 0.504551 0.719523 0.949073 1.17502 1.38951 1.59249 1.78599 1.97097 2.14666 2.31151 2.46419 2.6041 2.73129 2.84622 2.9496 3.04226 3.12504 3.19882 3.26442 3.32264 3.37423 3.41988 3.46021 3.49582 3.52723 3.5549 3.57927 3.60071 3.61957 3.63616 3.65073 3.66353 3.67477 3.68464 3.69331 3.70091 #bodywt for gender,fleet: 1 / 12
0 0.271005 0.438902 0.441374 0.445706 0.466661 0.521572 0.613984 0.725669 0.829624 0.907414 0.955603 0.980939 0.992531 0.997269 0.999046 0.999674 0.999889 0.999962 0.999986 0.999995 0.999998 0.999998 0.999998 0.999998 0.999997

0.999996 0.999995 0.999994 0.999992 0.999991 0.999989 0.999988 0.999986 0.999985 0.999983 0.999982 0.999981 0.999979 0.999978 0.999977 #selex for gender,fleet: 1 / 12
0.0122201 0.0230691 0.134761 0.287492 0.455279 0.625268 0.791788 0.952816 1.10535 1.24463 1.36902 1.48194 1.58856 1.69225 1.79325 1.88937 1.97781 2.05658 2.12499 2.18344 2.23287 2.27447 2.3094 2.33871 2.3633 2.38394 2.40128 2.41584 2.42809 2.43839 2.44706 2.45435 2.46049 2.46566 2.47002 2.47368 2.47677 2.47937 2.48157 2.48341 2.48497 #bodywt for gender,fleet: 2 / 1
0 8.24619e-005 0.00158361 0.0256058 0.135247 0.357419 0.616778 0.815574 0.912377 0.914412 0.848028 0.745879 0.637881 0.543194 0.469051 0.414844 0.376701 0.350321 0.332131 0.319509 0.310645 0.304325 0.299745 0.296369 0.293842 0.291922 0.290442 0.289289 0.288379 0.287655 0.287075 0.286605 0.286223 0.285911 0.285655 0.285443 0.285268 0.285123 0.285002 0.284902 0.284818 #selex for gender,fleet: 2 / 1
0.0122201 0.0225157 0.0929025 0.333776 0.532201 0.70935 0.874839 1.02989 1.17641 1.31634 1.45028 1.57704 1.69458 1.80136 1.89684 1.98127 2.05531 2.11979 2.17562 2.22373 2.26501 2.3003 2.3304 2.35601 2.37776 2.39621 2.41184 2.42508 2.43627 2.44573 2.45372 2.46047 2.46617 2.47097 2.47503 2.47846 2.48134 2.48378 2.48583 2.48756 2.48902 #bodywt for gender,fleet: 2 / 2
0 8.11875e-005 0.000132126 0.00112154 0.0164306 0.089657 0.254694 0.478609 0.689699 0.840068 0.924447 0.960846 0.969418 0.964138 0.952963 0.940058 0.927488 0.916179 0.906438 0.89826 0.891494 0.88594 0.881396 0.877682 0.874644 0.872153 0.870106 0.868421 0.867028 0.865875 0.864919 0.864123 0.863461 0.862908 0.862446 0.862059 0.861735 0.861464 0.861236 0.861044 0.860884 #selex for gender,fleet: 2 / 2
0.0122201 0.02265 0.131205 0.298027 0.472937 0.648642 0.819324 0.982966 1.13981 1.29037 1.4335 1.56671 1.68791 1.7963 1.89214 1.97624 2.04962 2.1133 2.16832 2.21567 2.25628 2.29101 2.32063 2.34585 2.36729 2.38548 2.4009 2.41396 2.42502 2.43436 2.44227 2.44894 2.45458 2.45933 2.46335 2.46674 2.4696 2.47201 2.47404 2.47576 2.4772 #bodywt for gender,fleet: 2 / 3
0 8.14921e-005 0.000565114 0.0104648 0.0693254 0.220606 0.443634 0.665954 0.830137 0.924143 0.965264 0.975266 0.969264 0.955721 0.939166 0.922089 0.905841 0.891093 0.878093 0.866848 0.85724 0.849093 0.842218 0.836433 0.831574 0.827495 0.824072 0.821201 0.81879 0.816766 0.815066 0.813638 0.812438 0.811429 0.81058 0.809865 0.809264 0.808759 0.808333 0.807974 0.807672 #selex for gender,fleet: 2 / 3
0.0122201 0.0225172 0.108616 0.336482 0.510929 0.673518 0.827165 0.976641 1.12734 1.27997 1.42954 1.56986 1.69718 1.81039 1.90983 1.99649 2.07156 2.1363 2.19191 2.23953 2.2802 2.31487 2.34436 2.36941 2.39066 2.40867 2.42392 2.43683 2.44774 2.45696 2.46475 2.47133 2.47688 2.48156 2.48552 2.48886 2.49167 2.49404 2.49604 2.49773 2.49915 #bodywt for gender,fleet: 2 / 4
0 8.1191e-005 0.000164459 0.00404145 0.0511284 0.219436 0.491769 0.744797 0.89962 0.967863 0.991026 0.997323 0.998594 0.998589 0.998305 0.997988 0.997694 0.997435 0.997214 0.997025 0.996866 0.996733 0.99662 0.996526 0.996447 0.996381 0.996325 0.996279 0.996239 0.996207 0.996179 0.996156 0.996136 0.99612 0.996106 0.996094 0.996085 0.996076 0.996069 0.996064 0.996059 #selex for gender,fleet: 2 / 4
0.0122201 0.0232255 0.157052 0.244488 0.35763 0.497479 0.643389 0.789383 0.933784 1.0755 1.21404 1.34926 1.48056 1.6064 1.72433 1.83193 1.9276 2.01092 2.08242 2.1432 2.19457 2.23785 2.27427 2.3049 2.33064 2.35229 2.3705 2.38581 2.3987 2.40955 2.41868 2.42637 2.43284 2.4383 2.44289 2.44676 2.45002 2.45276 2.45508 2.45703 2.45867 #bodywt for gender,fleet: 2 / 5
0 8.25848e-005 0.0377737 0.563769 0.909748 0.797696 0.559197 0.349226 0.207126 0.122049 0.0737915 0.0468251 0.0316276 0.0228692 0.0176682 0.0144748 0.0124458 0.0111133 0.0102105 0.0095812 0.00913107 0.00880168 0.00855576 0.00836889 0.00822474 0.00811205 0.00802297 0.00795186 0.00789462 0.00784823 0.0078104 0.0077794 0.00775388 0.0077328 0.00771533 0.00770081 0.00768872 0.00767863 0.00767021 0.00766316 0.00765725 #selex for gender,fleet: 2 / 5
0.0122201 0.0253877 0.139615 0.27319 0.41314 0.559002 0.71366 0.866685 1.01175 1.15022 1.28413 1.41406 1.53938 1.65845 1.76918 1.86972 1.95903 2.03695 2.10409 2.16142 2.21012 2.25135 2.28617 2.31555 2.34032 2.36121 2.3788 2.39363 2.40613 2.41665 2.42552 2.433 2.4393 2.44461 2.44908 2.45285 2.45603 2.4587 2.46096 2.46286 2.46446 #bodywt for gender,fleet: 2 / 6
0 8.82121e-005 0.010422 0.155651 0.534356 0.850151 0.928775 0.84061 0.67929 0.513564 0.378352 0.28053 0.213939 0.169761 0.140586 0.121165 0.108036 0.0989925 0.0926336 0.0880705 0.0847318 0.0822443 0.0803604 0.0789126 0.0777852 0.0768975 0.0761914 0.075625 0.0751673 0.074795 0.0744907 0.0742407 0.0740345 0.0738639 0.0737223 0.0736046 0.0735064 0.0734245 0.0733559 0.0732986 0.0732505 #selex for gender,fleet: 2 / 6
0.0122201 0.0225262 0.0954699 0.280216 0.487696 0.690832 0.887813 1.07458 1.24853 1.40833 1.55344 1.68389 1.80014 1.90291 1.99314 2.0719 2.14027 2.19937 2.25025 2.29392 2.3313 2.3632 2.39039 2.41352 2.43316 2.44982 2.46395 2.47591 2.48603 2.49458 2.50181 2.50792 2.51308 2.51744 2.52111 2.52422 2.52683 2.52904 2.5309 2.53247 2.53379 #bodywt for gender,fleet: 2 / 7
0 8.12112e-005 0.000147881 0.000614738 0.00383695 0.0154485 0.0423435 0.0882853 0.151688 0.226878 0.306855 0.385503 0.458596 0.523832 0.580412 0.628518 0.668874 0.702436 0.730202 0.75311 0.771991 0.787557 0.800401 0.811015 0.8198 0.827086 0.833138 0.838174 0.842371 0.845874 0.848802 0.851252 0.853304 0.855024 0.856467 0.857678 0.858696 0.859551 0.860271 0.860875 0.861384 #selex for gender,fleet: 2 / 7
0.0122201 0.024044 0.150259 0.269498 0.390246 0.524352 0.660037 0.788272 0.91149 1.03309 1.15646 1.28598 1.425 1.57126 1.7155 1.84695 1.95948 2.05252 2.12846 2.19042 2.24121 2.28308 2.31778 2.34666 2.37078 2.39096 2.40788 2.42209 2.43402 2.44406 2.45251 2.45961 2.4656 2.47064 2.47488 2.47846 2.48147 2.48401 2.48614 2.48795 2.48946 #bodywt for gender,fleet: 2 / 8
0 8.46738e-005 0.0139033 0.268983 0.747114 0.89987 0.743875 0.490772 0.280933 0.149821 0.079037 0.0433798 0.0258076 0.0170799 0.0126296 0.010275 0.00897541 0.00822586 0.00777447 0.00749127 0.00730674 0.00718231 0.0070958 0.00703399 0.00698878 0.00695501 0.00692934 0.00690952 0.00689402 0.00688176 0.00687196 0.00686407 0.00685766 0.00685244 0.00684816 0.00684463 0.00684172 0.0068393 0.0068373 0.00683562 0.00683423 #selex for gender,fleet: 2 / 8
0.0122201 0.0232439 0.155246 0.275111 0.394799 0.533422 0.685544 0.83858 0.991337 1.14517 1.29943 1.45077 1.59415 1.72494 1.84061 1.9408 2.02651 2.09938 2.16114 2.2134 2.2576 2.29497 2.32654 2.35322 2.37575 2.39478 2.41085 2.42441

2.43585 2.44551 2.45366 2.46053 2.46633 2.47121 2.47534 2.47881 2.48174 2.48421 2.4863 2.48805 2.48953 #bodywt for gender,fleet: 2 / 9

0 8.27905e-005 0.00985334 0.238155 0.723562 0.92191 0.842581 0.662282 0.483966 0.348145 0.257069 0.199604 0.164162 0.1423 0.12863 0.119899 0.11418 0.110334 0.107681 0.105804 0.104447 0.103445 0.102691 0.102115 0.101669 0.101319 0.101041 0.100819 0.10064 0.100494 0.100375 0.100278 0.100197 0.100131 0.100076 0.10003 0.099992 0.0999602 0.0999336 0.0999113 0.0998927 #selex for gender,fleet: 2 / 9

0.0122201 0.0229691 0.155629 0.284695 0.409868 0.541637 0.674171 0.797991 0.919847 1.05439 1.21544 1.40076 1.58494 1.74374 1.8719 1.9748 2.0588 2.12848 2.18691 2.2362 2.2779 2.31321 2.34313 2.36848 2.38993 2.40809 2.42345 2.43644 2.44741 2.45668 2.46451 2.47111 2.47669 2.4814 2.48537 2.48871 2.49154 2.49392 2.49593 2.49762 2.49905 #bodywt for gender,fleet: 2 / 10

0 8.21851e-005 0.00562598 0.159064 0.60089 0.875651 0.808378 0.569002 0.337579 0.187021 0.107853 0.0706768 0.0540605 0.0466886 0.0433523 0.0417857 0.041015 0.040616 0.0403983 0.0402735 0.0401984 0.0401513 0.0401204 0.0400996 0.040085 0.0400746 0.0400669 0.0400611 0.0400568 0.0400534 0.0400507 0.0400486 0.0400469 0.0400455 0.0400444 0.0400435 0.0400428 0.0400422 0.0400417 0.0400412 0.0400409 #selex for gender,fleet: 2 / 10

0.0122201 0.0225152 0.0868548 0.2246 0.586063 0.809735 0.98502 1.14222 1.28559 1.41713 1.53829 1.65018 1.75346 1.8484 1.93492 2.01288 2.0823 2.14343 2.19675 2.24291 2.28264 2.31668 2.34575 2.37051 2.39155 2.40941 2.42455 2.43738 2.44822 2.4574 2.46515 2.47169 2.47722 2.48189 2.48583 2.48915 2.49196 2.49432 2.49631 2.49799 2.49941 #bodywt for gender,fleet: 2 / 11

0 8.11863e-005 0.000122918 0.000137746 0.000880402 0.00938921 0.0474113 0.139126 0.284494 0.455765 0.61835 0.749796 0.844063 0.905967 0.944177 0.966841 0.979999 0.987589 0.99199 0.994575 0.996122 0.997067 0.997656 0.998032 0.998276 0.998437 0.998546 0.99862 0.998671 0.998707 0.998733 0.998751 0.998764 0.998774 0.998781 0.998787 0.998791 0.998794 0.998796 0.998798 0.998799 #selex for gender,fleet: 2 / 11

0.0122201 0.0225152 0.0868365 0.202323 0.357973 0.544017 0.747057 0.948721 1.13617 1.30544 1.45708 1.59277 1.714 1.82194 1.91752 2.00156 2.07494 2.13861 2.19356 2.24076 2.28116 2.31565 2.34502 2.36999 2.39119 2.40916 2.42438 2.43726 2.44815 2.45736 2.46514 2.47171 2.47726 2.48194 2.48589 2.48922 2.49203 2.4944 2.4964 2.49809 2.49951 #bodywt for gender,fleet: 2 / 12

0 0.290138 0.439221 0.441754 0.448548 0.474561 0.530958 0.614235 0.708312 0.795865 0.866323 0.917026 0.950489 0.971179 0.983391 0.990393 0.994355 0.996596 0.997878 0.998627 0.999074 0.99935 0.999526 0.999641 0.999718 0.999772 0.99981 0.999837 0.999858 0.999873 0.999885 0.999895 0.999902 0.999908 0.999912 0.999916 0.999919 0.999922 0.999924 0.999925 0.999927 #selex for gender,fleet: 2 / 12

0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.0650157 0.0700314 0.075047 0.0800627 0.0850784 0.0900941 0.0951097 0.100125 #mean M for year Yinit: 2009 sex: 1

317.821 141.924 317.111 228.09 72.563 50.1154 135.592 112.698 213.467 89.5341 172.491 75.6495 67.2754 91.6569 79.3298 99.0907 71.5632 62.9504 80.6225 57.4353 53.6941 35.8779 24.8102 15.8374 7.49959 23.6106 4.23345 4.63992 7.39187 2.28447 1.91463 3.3469 2.18981 0.950255 2.09178 0.799107 0.913908 0.897398 0.625342 0.36345 3.67659 #numbers for year Yinit: 2009 sex: 1

0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 0.06 #mean M for year Yinit: 2009 sex: 2

317.821 141.924 317.108 228.07 72.4728 49.9742 135.099 112.352 213.944 90.4997 176.8 78.9605 71.6128 100.119 89.6841 116.161 86.8784 79.4783 106.784 80.7143 80.4103 56.9298 41.0972 26.9858 13.075 42.425 7.93257 9.09974 15.0736 4.783 4.04863 7.06867 4.59575 1.97706 4.31997 1.64462 1.88166 1.85124 1.29011 0.747118 8.43723 #numbers for year Yinit: 2009 sex: 2

167.292 332.333 151.475 142.543 209.427 191.944 247.612 182.315 162.726 211.547 153.004 145 97.9336 68.1993 43.6581 20.6407 64.9049 11.6273 12.735 20.2775 6.26422 5.24836 9.17206 5.99977 2.60309 5.72925 2.18842 2.50254 2.45709 1.71206 0.99498 0.7585 0.750743 1.90494 0.576844 0.450291 0.395849 0.392152 0.440157 0.608534 3.78473 #numbers for year Ydeclare: 2000 sex: 1

167.292 332.333 151.475 142.487 208.148 189.394 242.873 178.182 160.043 212.083 158.802 157.21 110.826 79.7614 52.2568 25.2761 81.9065 15.2988 17.5353 29.0277 9.20587 7.78902 13.5943 8.83589 3.80022 8.30203 3.16008 3.61505 3.5562 2.47805 1.43495 1.08658 1.06679 2.68557 0.808489 0.629369 0.553416 0.550065 0.621461 0.867828 7.33137 #numbers for year Ydeclare: 2000 sex: 2

#R0 1916 1917 1918 1919 1920 1921 1922 1923 1924 1925 1926 1927 1928 1929 1930 1931 1932 1933 1934 1935 1936 1937 1938 1939 1940 1941 1942 1943 1944 1945 1946 1947 1948 1949 1950 1951 1952 1953 1954 1955 1956 1957 1958 1959 1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 #years

3528.71 3528.77 3527.92 3526.57 3525.19 3524.37 3523.53 3522.87 3522.32 3521.66 3521 3520.22 3519.1 3518.16 3517.09 3515.78 3514.4 3512.88 3511.99 3511.22 3510.46 3509.48 3508.66 3507.67 3506.69 3505.61 3503.22 3499.28 3493.03 3469.22 3433.19 3354.86 3308.57 3288.48 3272.27 3255.87 3238.02 3226.34 3217.09 3216.01 3210.72 3204.4 3202.73 3185.42 3170.59 3054.9 4377.58 2852.92 2289.83 2077.1 2112.95 2404.74 7003.37 2412.98 2103.36 2339.44 3346.67 3920.94 3219.5 2257.88 4730.41 1711.81 3108.14 3679.05 1602.16 1429.92 3353.68 1477.37 929.974 3596.57 814.3 1262.07 1457.81 1524.58 1616.51 1229.32 1268.27 764.87 702.874 808.399 547.081 537.966 341.455 341.584 705.767 334.583 735.405 359.27 399.974 136.997 185.02 546.37 715.185 301.4 635.642 #Recruits

26574.8 26574.8 26561 26539.2 26516.8 26503.5 26490 26479.3 26470.4 26459.8 26449.1 26436.6 26418.5 26403.3 26386 26365 26342.9 26318.5 26304.1 26291.7 26279.7 26264 26250.8 26234.9 26219.2 26201.9 26163.9 26101 26001.7 25627.4 25071.4 23905.5 23242.9 22961 22736 22510.8 22267.9 22110.5 21986.6 21972.1 21901.6 21817.7 21795.6 21567.4 21373.8 21165 20907.2 20682.4 20413.2 20272.2 20202 20035 19136.2 18900.8 18607.5 18324.2 18011.5 17615.5 17194.1 16579.8 16245.4 15948.1 15796 15381 14622.2 13722.6 12658.2 11816.1 10185.8 8813.57 8497.36 8056.07

7734.45 7000.4 6255.62 5368.5 4678.15 3791.01 3038.5 2520.32 2418.46 2363.66 2144.75 1916.25 1619.9 1507.12
1639.14 1773.98 1899.47 2023.48 2131.5 2221.96 2305.04 2386.45 2458.94 #SpawnBio
0.35 0.5 0 # spawn-recr steepness, sigmaR, autocorr