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Report of the Working Group on NEA Mackerel Long-Term Management Scientific Evaluations (NEAMACKLTM)

12 - 13 April 2007

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CIEM Conseil International pour l'Exploration de la Mer

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1 Introduction

1.1 Development Participants

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1.2 Background

At the start of 2007, the EU requested ICES to evaluate multi-annual plans for North East Atlantic mackerel (NEA mackerel) in the form of the current coastal states agreement (which is applied annually). This request also suggested that ICES should examine other approaches on its own initiative (see Annex 1). ICES decided to develop the evaluations of potential management plans through consultation with stakeholders and managers in line with the recommendations of SGMAS (ICES, 2007a) and invited a group of scientists to carry out the work.

At a first meeting with some stakeholders in April 2007[1], the industry stakeholders present expressed the view that catch stability, the maintenance of larger size fish in the stock, and the avoidance of stock collapse were objectives they would like included in any plan. The scientists outlined the knowledge base and stock dynamics for NEA mackerel. It was concluded from this meeting that Harvest Control Rules (HCR) that were more diverse than the ones proposed by EU for evaluation, should be explored.

Following this meeting simulations were undertaken to explore the trade-offs under three strategies. A target total allowable catch (TAC) strategy (Section 2.3.2) and 2 harvest rate strategies, one where the TAC is a fraction of the estimated current spawning-stock biomass (SSB) and a second, F-rule, where the TAC is derived by projecting the stock forwards and applying an F in line with the current coastal states agreement (Sections 2.3.1 and 2.3.3). In all three cases the TAC, the harvest rate, or the F were fixed when the assessed stock was above the trigger point, and reduced proportionally when the stock was below the trigger point. Figure 1.2.1 illustrates the HCR used to evaluate the ABC rule for the EU where [A] corresponds to the target F and [C] to the trigger SSB. An equivalent diagram applies to the harvest rate strategy. Figure 1.2.2 illustrates the HCR used for a target TAC strategy. A third parameter

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1 **Participants at the meeting:** Michala Ovens (ICES Secretariat), Invild Harkes (Secretary, Pelagic RAC), Christian Olesen (Denmark, Pelagic RAC), Sean O'Donoghue (Ireland, Killybegs Fishermen's Organisation), Eric Roeleveld (The Netherlands, Industry), Iain McSween, Scottish Industry, Gerard van Balsfoort, Dutch Industry, Martin Pastoors (Chair of ACFM), Mark Dickey-Collas (IMARES), Leif Nøttestad (IMR, Norway), Ciaran Kelly (Marine Lab, Ireland), John Simmonds (FRS, UK Scotland), Dimitri Vasilyev (Russia), Beatriz Roel, Chair (CEFAS, UK England).

([B], for the EU proposed rule) determines the extent the TAC is allowed to vary from one year to the next.

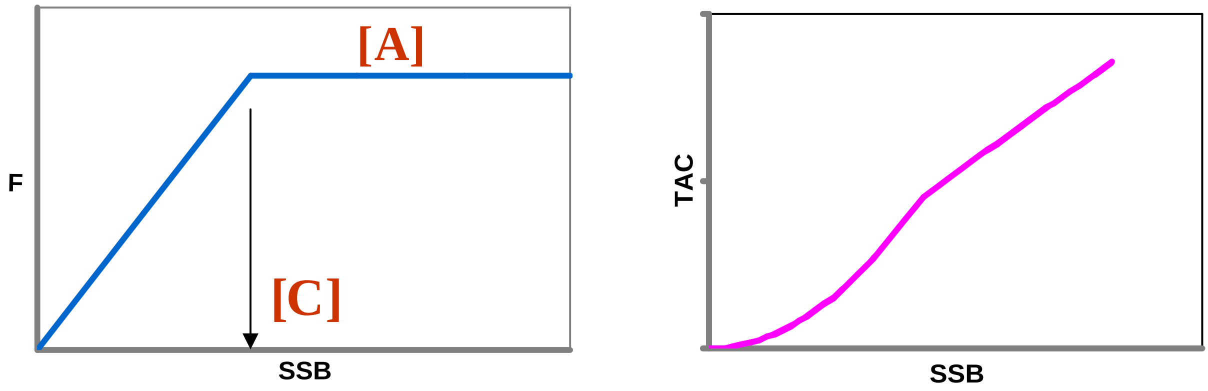


Figure 1.2.1. Harvest control rules (HCR). F-rule and resulting TAC.

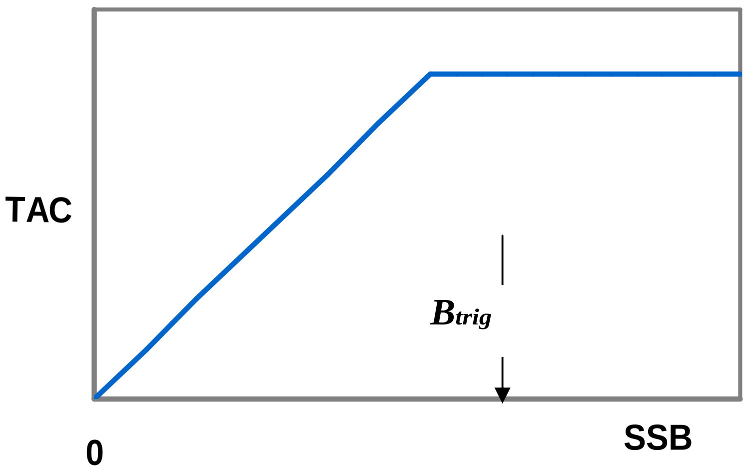


Figure 1.2.2. Harvest control rules (HCR). Fixed TAC strategy.

The strategies described above were tested for annual and 3-year TAC regimes.

At a second meeting in September stakeholders asked for an additional evaluation of the risks in all HCRs when a 15% TAC change limitation was applied irrespective of the stock condition (i.e. whether the stock was above or below B_{trig}). Simulation testing of this option was performed in the case of the constant TAC and the harvest rate rules.

This document describes the technical basis and the results from the simulations in order that they may be evaluated by ACOM, and provide an answer to the EU request (see Section 3.3 and 4.2). It should be recognized that these simulations, while they may form the basis for a putative management plan, do not in themselves constitute such plan. If a management plan is to be developed, it will require a clarification of objectives, and a full consideration of review period, performance monitoring, and actions to be taken in exceptional circumstances. This will require further interaction with stakeholders.

2 Methods

2.1 Model Conditioning

2.1.1 Simulation Set-up and Initialization

The quantitative evaluation of the proposed HCR are all based on the assessment dataset for NEA Atlantic mackerel (ICES 2007b). The simulation period is 21 years (i.e. up to and including 2027). 1000 iterations are run and statistics calculated for the simulation period 2017–2027. This period was selected to reduce the influence of the initial stock condition on the results of the HCRs.

In HCM and F-PRESS, the initial population vector is taken from the short-term prediction input table in the WGMHSA report for 2007. For ages 2 and above these figures are derived from the final ICA assessment. For ages 0 and 1 values are derived from the geometric mean of the recruitment time-series up to 2003 (for age 0) and the geometric mean brought forward one year by the total mortality-at-age 0 (age 1). Uncertainty in initial stock size reflecting a CV of 29% on the SSB, was implemented as a log-normally distributed age-specific CV (taken from ICA) with a log-normally distributed year error scaled to give an overall CV of 29% on the SSB. Stock and catch weights, maturities, natural mortality, the F-at-age vector, and the proportions of mortality prior to spawning are also as per the ICA assessment. See Annex 4 (F-PRESS results) for the actual values used.

FLR was conditioned on the data and then populations were created using ICA with specific settings. However, as this was done before the 2007 assessment, the simulations were conditioned on data and an assessment that in all respects were similar to the 2006 assessment (ICES 2006), except for the selection pattern on oldest age (and plus group) which was changed from 1.2 to 1.34 to reduce bias in the simulations. This change in selection is similar to the change subsequently selected in the 2007 assessment (ICES, 2007b).

2.1.2 Recruitment

The possibility of implementing a single model was examined but it was found that the results were very sensitive to the choice of model, which was not well founded. This was due to the small historical range of SSB. Therefore, a probabilistic hybrid model was used to generate recruitment as a function of SSB (Michielsens and McAllister, 2004). To estimate the probability of different functional forms of the S/R relationship a Bayesian analysis was used to evaluate the combined uncertainty in parameter estimates and probability of the different functional models and distributions (see Annex 6: Mackerel stock recruit models for a full description of the methodology used). A collection of 1000 sets of stock–recruitment model parameters was provided. Each set specifies a stock–recruit relation (Ricker or hockey stick), parameters a and b of the relation, the distribution (normal or log-normal) with a variance parameter and truncation limits. These sets were used in sequence, one for each of the 1000 iterations in each run. Plots comparing observed and simulated recruitment for each of the simulation frameworks used can be found in Annexes 2–4.

The historical time-series was tested for autocorrelation in deviations between years. This was found to be slightly negative <0.075 and well below significant. Inclusion of a negative correlation would have slightly reduced estimated risks, but because the level is well below significant it was decided not to include it and not considered further.

The resulting distribution of simulated recruitment for different SSB levels is illustrated in Figure 2.1.2a. A comparison of the cumulative distributions of observed and simulated recruitment values for the observed SSB is given in Figure 2.1.2b. The match is a good compromise, better than the one achieved by any single model (see Annex 6, Figures 6 and 7). The mean simulated recruitment is less than 3% greater than the observed value and the distribution of deviations is a good match to the observed deviations as described either through a comparison of cumulative distributions (Figure 2.1.2b) or a Q Q plot (Figure 2.1.2c).

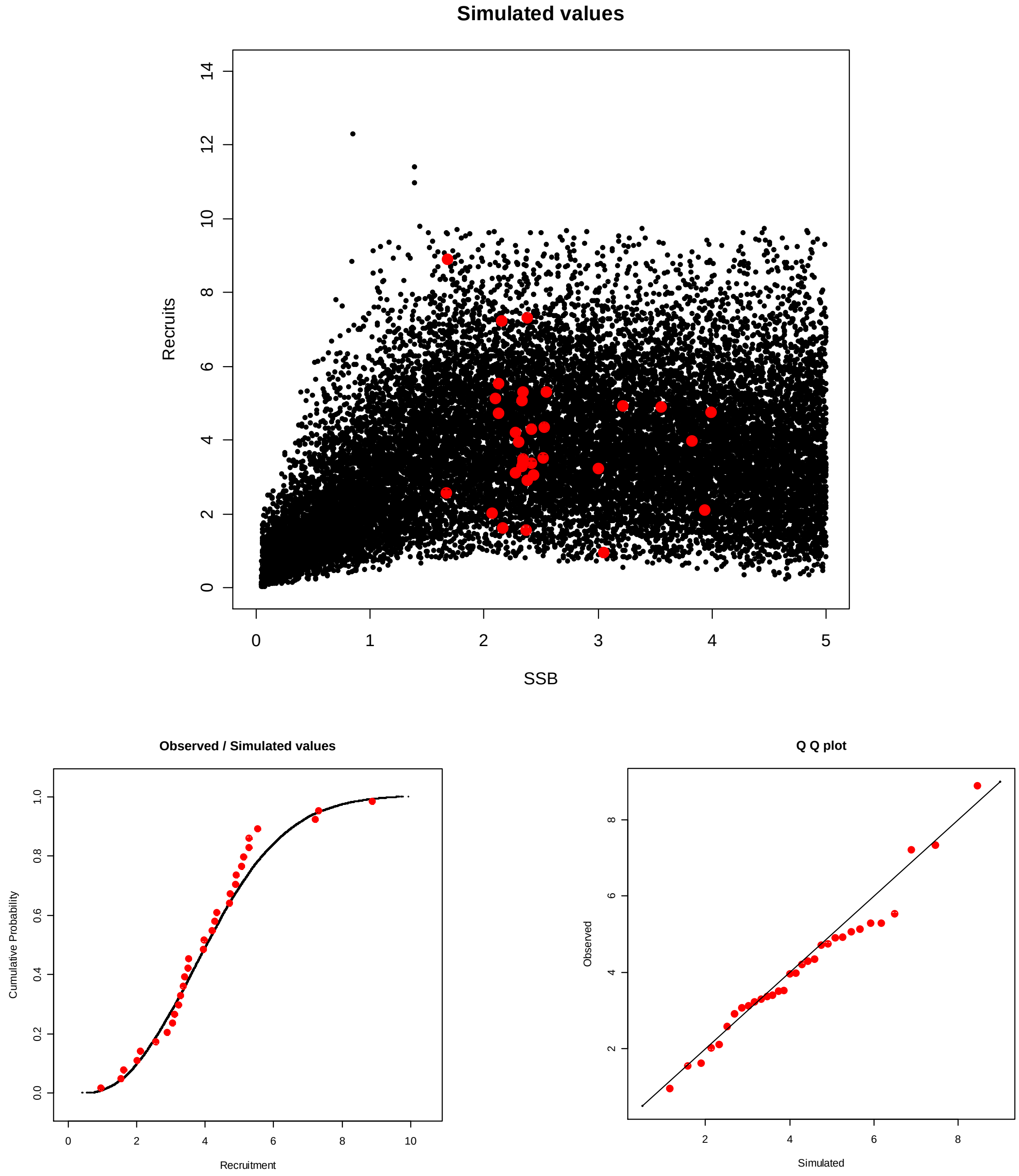


Figure 2.1.2. Comparison of observed (red) and simulated (black) recruitment for a) SSB from 100 000 to 5M tonnes SSB, b) cumulative probability distributions of observed and simulated values for observed SSB, and c) Q Q plot of observed and simulated values for observed SSB. Simulated values derived from 1000 models with hockey stick and Ricker functional forms and Normal or Log-normal stochastic deviation.

2.1.3 Weight- and Maturity-at-age

These are fixed values, taken from Table 10.2.1 (input from short-term prediction) in the WGMHSA report for 2007. Variability in mean weights-at-age in the catch observed in the dataset was included in the simulations by adding a 2% error to the implementation error (see Annex 4 for a detailed explanation).

There is some evidence of spatial variability in maturity-at-age (ICES 2007b) which gives rise to <1% variability in proportion mature in the population (by biomass). However, this may underestimate the true variability. There is very little information on variability of maturity-at-age by year. Most pelagic stocks show limited variability in maturation-at-size, and thus variability in weight-at-age is a good surrogate for variability in maturity and has been shown to be small (see above). So it is expected that true variability in maturity will be similar to the variation in mean weight and be of the order of a few per cent.

Variability in maturity- and weight-at-age in the stock would add to the variability in relation to the egg survey SSB. With variability in the egg survey estimated as a CV of 22.4%, adding variability at the upper end of the potential range at around 5% would increase the CV of 22.4% to 24.9%. This change in variability is negligible and has been ignored.

2.1.4 Selection

Selectivity-at-age was based on the 2007 WGMHSA report. In F-PRESS, stochastic F-at-age was derived by combining the ICA errors for the F in the terminal year and the selection-at-age vector (Annex 4). In HCM, the implemented selection results from including an implementation error when deriving the actual removals from the stock (see corresponding section in Annex 3).

2.1.5 Observation model

The simulation frameworks differ in the way the observed population is generated.

In the case of FLR the uncertainty in the assessed population was generated by fitting the ICA assessment to the simulated observations of catch and egg survey SSB. The uncertainty estimates used in the other simulation tools were generated from the fit assuming that the magnitude and autocorrelation of the observation errors were independent of the HCR implemented. The magnitude of the observation error depends on the relative position of assessment year and Egg survey. The value for the CV of SSB to be used in HCM and F-PRESS was 29%, which corresponds to the middle year of the 3-year Egg survey cycle (Kienzle and Simmonds, 2005, Annex 7).

Using FLR, an autoregressive coefficient α of 0.84 was derived for a lag of one year (Simmonds, Exploration of some issues with ICA.WD). A simple autoregressive model with this value of α gave a higher autocorrelation at 3-year lag, while an alternative α of 0.75 returns a compromise fit at one and at three years. The difference between these two approaches is negligible.

With HCM, error is introduced to the stock numbers-at-age with 2 log-normal distributed random multipliers: one is a year factor (which may include bias) and the other is an age factor. A one-year autoregressive model was applied to the combined errors above (Annex 3). Alpha value was 0.84. The year factor standard deviation was chosen at 0.27, providing a CV of approximately 29% for the resulting distribution of SSBs in the intermediate year.

In the F-PRESS model, the error in the observation (assessment) model is assumed to exhibit autocorrelation with $\alpha = 0.75$. In order to simplify matters, the error term has been generated in advance of the simulation, which randomly selects from the generated error time-series for each iteration. The form of the annual error is described in Annex 4.

2.1.6 The Implementation Model

These were derived by an algorithm similar to that in the observation model, but applied to the catch-at-age, and autocorrelation was not included. A 5% implementation bias based on historical reported overshoot of the TAC (ICES WG Reports 1995 to date) was used in the simulations as base case. Additional levels of 0%, 15%, and 25% were also tested in F-PRESS (Annex 4). Effects of implementation error (5%, 15%, 25%, and 50%) on the mean realized fishing mortality were explored in HCM for the F-rule (Annex 3).

2.2 Simulation tools

Simulations were carried out using three different tools:

- FLR (http://flr-project.org/doku.php?id=doc:biblio:evaluation);
- F-PRESS (http://www.marine.ie/NR/rdonlyres/8442D077–7E7B-4679-AF0F-CAD7A1B9B2C9/0/FPRESSCodlingKelly2006MIFisheriesInvestigationSeriesNo171.pdf);
- HCM (Harvest Control rule evaluation for Mackerel) (Skagen 2008, Annex 5).

A brief description of each tool follows.

2.2.1 FLR

A simulated population measurement and HCR loop was set up in R using FLR. The loop consists of the current management cycle that for NEA mackerel is a three-year cycle: assessment data year, intermediate year, and TAC year. The assessment is tuned using a triennial survey in from 1992 to 2007 and every subsequent third year.

The simulation framework attempts to include a more realistic evaluation loop involving a simulated survey, data collection from the fishery, assessment, and short-term forecast. The simulated population index is based on an Egg survey every 3 years with a CV of 22.4%, which is the average of the survey CVs. Simulated catch measurement is annual with the correlated errors documented in the error section above. The assessment package ICA and short-term forecasts were implemented using FLICA and FLSTF.ad. The population model is necessarily simpler than the ones used in the other frameworks and consists of a single hockey stick stock–recruit relationship parameterized on the 2006 ICES assessment. FLR simulations take much longer to carry out than those reported in other sections and more restricted exploration was possible. In addition to full analysis, two management variants were tested: one with the short-term forecast omitted and TAC set on the basis of the terminal year assessment, and the second omitting subsequent assessments and using only the survey every three years. This simulation is not used to test the full extent of yield, interannual variability, and risk. It has been used to provide information on the statistical properties of the observation model used in the other frameworks. Further, it has been used to compare the F-rule and the harvest rate rule under more realistic error conditions. The flow diagram illustrating the main elements in the framework is given in Figure 2.2.1.

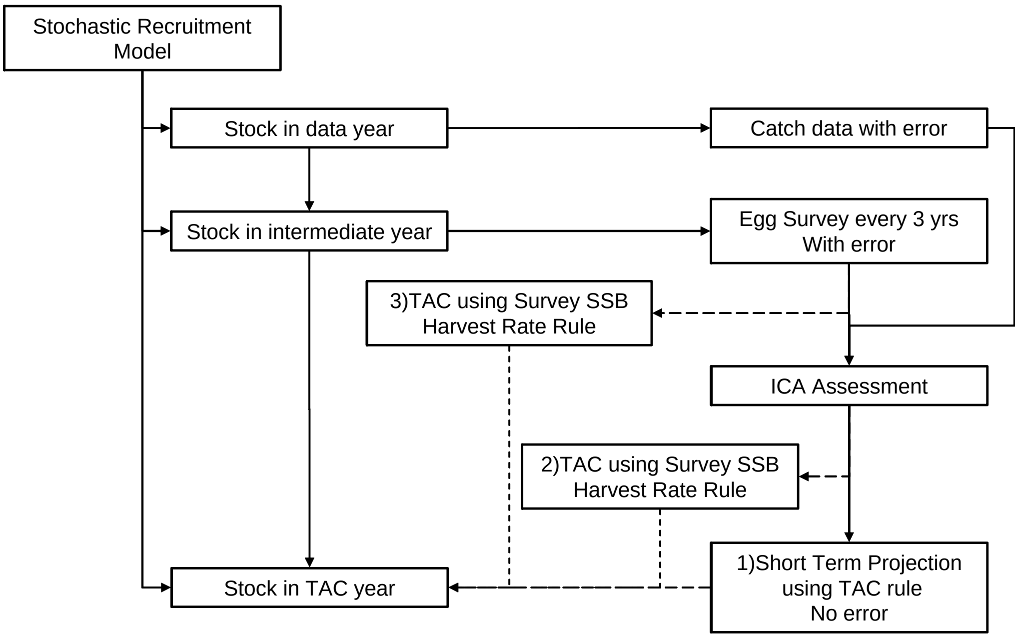


Figure 2.2.1. Standard management cycle implemented in FLR shown for 3 methods: 1) Short-term forecast (STF), 2) Assessment-based harvest rate (AHR), and 3) Survey-based harvest rate SHR.

2.2.2 HCM

The program is run as a bootstrap, with the following stochastic elements:

- Initial numbers
- Recruitments
- Observation noise
- Implementation noise

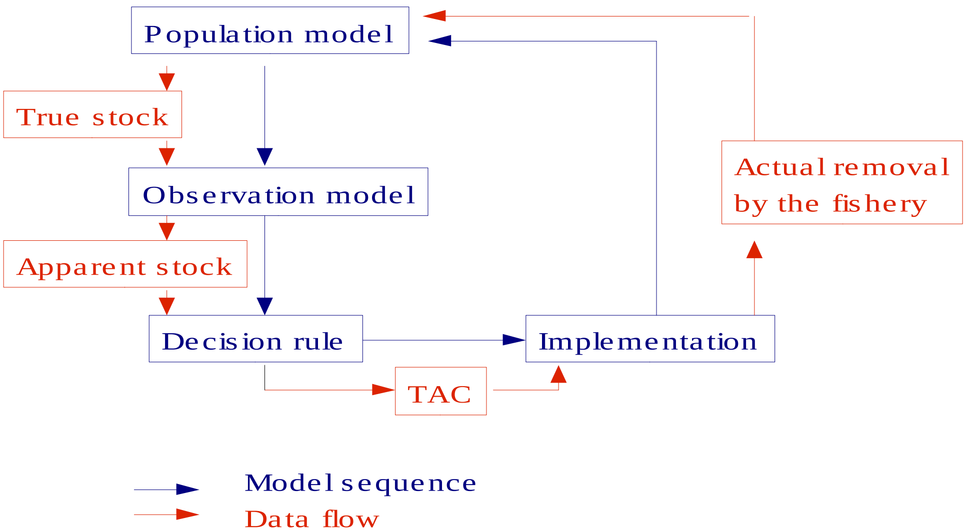


Figure 2.2.2. Outline of the HCM program.

A more detailed description of the model can be found in Annex 5 "HCS and HCM: Outline of program and subroutines".

2.2.3 F-PRESS (Fisheries Projection and Evaluation by Stochastic Simulation)

The design of the F-PRESS model is based on the work of WGMG (ICES, 2004) and SGMAS (ICES, 2005a) which identified an appropriate framework for the evaluation of management strategies by simulation. The model is designed as a stochastic simulation tool for evaluating fisheries management strategies and developing management advice. The framework is programmed in the open source R language (R Development Core Team, 2003).

F-PRESS is designed as a population projection model with the following characteristics and limitations:

- Stochastic,
- Single species,
- Non-spatial,
- Age-structured population,
- Exponential mortality,
- F or TAC controlled fishery,
- Various recruitment models, and
- Various harvest control strategies.

The coding structure used for F-PRESS (open source, modular programming) means that the model can be readily adapted to incorporate specific recruitment models or harvest control rules.

The F-PRESS operating model uses the standard single-species age-structured population with an exponential mortality model (as used in most virtual population analyses). It does not include any spatial elements or allow for mixed species interactions. Noise and bias can be added to the population vectors (initial numbers, weights, maturities, fishing and natural mortalities). These stochastic elements are implemented as multipliers for bias and random draws from a normal distribution for noise. Implementation errors are incorporated in a similar fashion via a CV and bias on F or TAC.

In addition to the operating model, F-PRESS includes an observation (assessment) model where the stock assessment process can be simulated and a management and decision-making model will apply the prescribed harvest control rule. Both of these model elements can include stochastic behaviour via a prescribed noise and bias. In this way, it is possible to parameterize the effects of uncertainty in the stock assessment process and phenomena such as TAC non-compliance and data errors. The model (deliberately) avoids a complex "assessment feedback" model so that all bias and noise introduced in the assessment process can be qualitatively controlled.

F-PRESS inputs are the stock and fishery parameter data with appropriate CV values. These values are often derived from recent stock assessments and studies of parameter accuracy. The model output is configurable and is saved as FLR FLQuant objects. In this way, the functionality offered by the FLR library (Kell *et al.*, 2007) can be used to explore the model output. Included in the F-PRESS model are a number of functions for graphing and analysing model output.

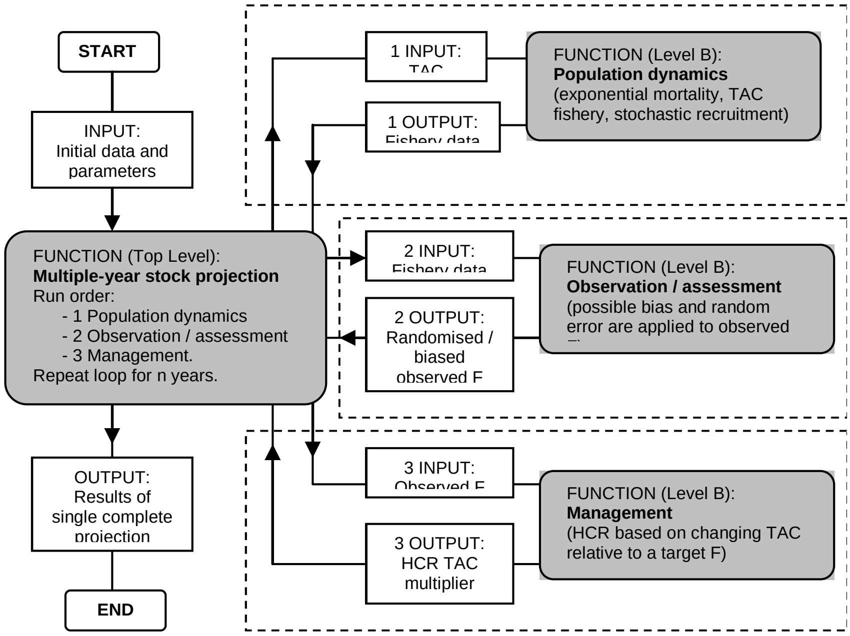


Figure 2.1.3 Flow diagram of the structure of the F-PRESS programme.

F-PRESS was implemented to test forms of the fixed TAC strategy only. The intention of doing this in parallel with FLR and HCM was to verify the results between simulation platforms.

2.3 Harvest Control Rules

2.3.1 F- rule proposed by the EU Commission

This rule sets the TAC according to an F-value that is derived as follows:

If SSB > B_{trig} (parameter B), F= F_{targ} (parameter A), but TAC in year y shall at most deviate by C% from the TAC in year y-1.

If SSB < B_{trig}, the F is set at F= F_{targ} *SSB/ B_{trig}, and the constraint on TAC change does not apply.

Points of interpretation.

1) The action below B_{trig} is a simplification of the request, which required rebuilding to above B_{trig} within an unspecified time.
2) The SSB that is used for decision was the SSB projected through the intermediate year and into the TAC year.

2.3.2 Fixed TAC rule

This is a rule where the TAC is set as a function of the SSB in the year before the TAC year. The rule has 3 parameters, C_{target}, Btrig, and $C_{constraint}$. It has the following form, where SSB always is the estimated SSB in the year before the TAC year:

If SSB > B_{trig}, TAC = C_{target}

*If SSB < B_{trig}, TAC = C_{target}*SSB/ B_{trig}*

If

$abs\{(TAC(y-1)-TAC(y))/TAC(y-1)\} > C_{constraint}$

and (optionally) $SSB > B_{trig}$

$TAC(y)= TAC(y-1)*(1+C_{constraint})$ *if* $TAC(y)>TAC(y-1)$

$TAC(y)= TAC(y-1)*(1-C_{constraint})$ *if* $TAC(y)<TAC(y-1)$

The rule was applied either each year or every three years. In the latter case, the same TAC was applied unchanged for the whole three-year period (HCM), but the approach with F-PRESS was to allow a maximum of 15% change in each year. The rule was tested with and without the option to apply the TAC constraint only at SSB > B_{trig}.

2.3.3 Fixed Harvest Rate (HR) rule

This is another rule where the TAC is set as a function of the SSB and the TAC in the year before the TAC year. Basically, the TAC is set as a fraction (the HR) of the observed SSB. The rule has 3 parameters, HR_{target}, B_{trig}, and Cconstraint. It has the following form, where SSB always is the estimated SSB in the year before the TAC year:

If $SSB > B_{trig}$, $TAC = HR_{target}*SSB$

If $SSB < B_{trig}$, $TAC = HR_{target}*SSB*SSB/B_{trig}$

If

$abs\{(TAC(y-1)-TAC(y))/TAC(y-1)\} > C_{constraint}$

and (optionally) $SSB > B_{trig}$

then

$TAC(y)= TAC(y-1)*(1+C_{constraint})$ *if* $TAC(y)>TAC(y-1)$

$TAC(y)= TAC(y-1)*(1-C_{constraint})$ *if* $TAC(y)<TAC(y-1)$

2.4 Model validation

The main idea of testing HCR with different frameworks was to demonstrate that the results are reliable and that there are no programming mistakes. Also, it may be useful for the individual labs involved in this exercise to validate the software they have developed. However, there are alternative formulations for modelling some aspects of the dynamics with different tools. The approach taken was to minimize the differences where possible and compare models with the same settings to validate the coding and evaluate the impact of any differences.

2.5 Management scenarios

The HCRs described in the previous section were explored under the following conditions:

- A one- or three-year management cycle on decision-making and implementation of the TAC;
- B_{trig} between 2.0 Mt and 3.5 Mt;
- Year-on-year constraint on change in TAC included or excluded. In cases where 15% year-on-year restrictions were allowed these were

implemented for all years irrespective of the SSB in relation to the trigger biomass. For the three-year regime, two approaches were taken: A) The TAC was fixed during the period (HCM) and the constraint was only applied at the beginning. B) The 15% constraint was implemented over the period until the required reduction or increment was achieved (up to a maximum of 45% over 3 years, i.e. 20% reduction implies an initial 15% constraint followed by 5% 1 year later (F-PRESS and FLR)).

A summary of the conditioning options considered in each simulation tool is provided in the following table:

Table 2.2.1 Conditioning options applied under each HCR strategy simulated by tool type.

Sim Tool	HCR Strategy	Population model	SSB measure from	Constraint above Trigger	Period of rule	Correl Errors	SSB trig	TAC Bias	Iterations
F-PRESS	*Target TAC* 400-750 in steps of 50	*Recruitment:* Ricker/hockey stick with normal/log-normal *errors* *Initial N* from 2007 assessm.	Assessment	none or 15%	1 & 3	yes	2000-3500 steps 500	5, 15, 25%	1000
HCM	*Target TAC* 400-750 in steps of 50		Assessment	range 0, 5, 15, 25; gradual change or abrupt.	1 & 3	yes	2000-3500 steps 500	5, 15, 25%	1000
	F-based 0.14 - 0.22 in steps of 0.02		Assessment Short-term forecast Survey		1				
	Harvest rate 0.14 - 0.22 in steps of 0.02		Assessment		1 & 3				
FLR	*F-based*	Conditioned on the data *R* hockey-stick	Short-term forecast Assessment Survey	none or 15%	1 & 3	full feed-back	2300 or 3000	5%	100

2.6 Performance Statistics

In the initial phase, it is assumed that the first TAC decision is made some time during the initial year, so that the first decided TAC applies to the year after (counted as year 1). In year 0, which corresponds to 2007, a fixed catch of 499 kt is assumed. The summary statistics are presented for years 10 to 20 (2017–2027), so that the effect of the assumptions in the initial phase is small.

The output statistics presented apply to years 10–20 in the simulations:

- Yr/Yr limit; yes means a maximum of 15% change annually (implies a maximum 45% change over 3 years where HCR(yr) =3), no means no limit on the TAC change.
- SSBtrig is the trigger point below which the HCR changes.
- HCR(yr) is the period of the HCR. This refers to the management cycle.
- Catch is reported as average and percentiles in kt. This is calculated as a median for HCM.
- IAV is Interannual variability, calculated as the mean absolute change in TAC from year to year, relative to the previous year's TAC. This is calculated as a mean and expressed in percent.
- F is reported as average and percentiles.
- 2017–2027 is the average SSB over this period.
- 2027 is the average SSB in this year (the terminal year of the simulations).
- TAC variation; Evts is the average number of times the TAC is changed.
- TAC variation; Evts+ is the average number of times the TAC is increased.
- TAC variation; Evts− is the average number of times the TAC is decreased.
- TAC variation; Avg Inc is the average increase in the TAC in kt (when the TAC is increased).

- TAC variation; Avg Dec is the average decrease in the TAC in kt (when the TAC is decreased).
- Risk is the average number of times where SSB is below the reference level expressed as a percentage.
- Percentage catch is the fraction by number-at-age and above (these are proxies for the proportion of the population in commercial grades G4 and G6).
- Risk of depletion: Fraction of iterations where at some time the decided TAC could not be taken with a fishing mortality of 3.0 (reported for HCM only).
- LimOnce: Probability that the SSB will be below the limit at least once in the time period year 10-20. Added to some runs with HCM.

2.7 Reference points

The group examined the justification of existing reference points and recognized that the existing biomass reference point (B_{pa}) was based on assessments performed prior to recent major revisions of the perception of the stock. Examination of the existing reference points in the light of the most recent benchmark assessment indicated a minor revision. However, based on criteria for revision of reference points, the group agreed that a minor revision was not appropriate.

To be in accordance with the basis for the advise, the risk associated with the harvest rules in selected cases is presented as the probability that SSB will be below the lowest observed level of 1.67 ~ i.7 Mt.

The present fishing mortality limit reference point is based on a previous estimate of F_{loss}. A deterministic $F_{loss} = F_{lim} = 0.42$ was estimated by the group based on 1972–2003 data. This estimate was based on a segmented regression fit to stock and recruitment data and Spawning Biomass per Recruit calculations. The estimate was sensitive to the 2002 data pair and that is reflected in the estimates obtained by bootstrapping.

The estimate of F_{pa} is currently derived from F_{lim} taking into account the error in the F estimate, which is estimated poorly (particularly the most recent F). Work carried out in 2005 and reported at the WGMHSA that year (ICES 2005b) looked at the precision of the assessments under a variety of assumptions. Estimates of the variability in F in the terminal year expressed as standard deviation of $\ln(F_{assess}/F_{true})$ resulted in a standard deviation of 0.36, (Simmonds, 2007). Taking that into account would result in F_{pa}= 0.23, implying a substantial revision to the existing F_{pa}. There are indications provided below in Section 3.2 that this value is consistent with the precautionary approach. It is suggested that the WGWIDE examines existing F reference points in the light of these findings.

THERE IS NO BIOLOGICAL BASIS FOR DEFINING B_{LIM}.	B_{PA} BE SET AT 2.3 MILLION T.
F_{lim} is 0.26, the fishing mortality estimated to lead to potential stock collapse.	F_{pa} be set at 0.17. This F is considered to provide approximately 95% probability of avoiding F_{lim}, taking into account the uncertainty in the assessments.

3 Results

3.1 Model validation

The results for the unconstrained fixed TAC rule from the HCM and F-PRESS models are compared (Figure 3.1.1) for 3- and 1-year TAC periods, showing that the differences between frameworks are negligible.

Figure 3.1.2 compares associated risks for the unconstrained target TAC rule. Small differences in conditioning between models reflect in differences in risk of the order of 2–3% on average when options resulting in risks of <50% were considered.

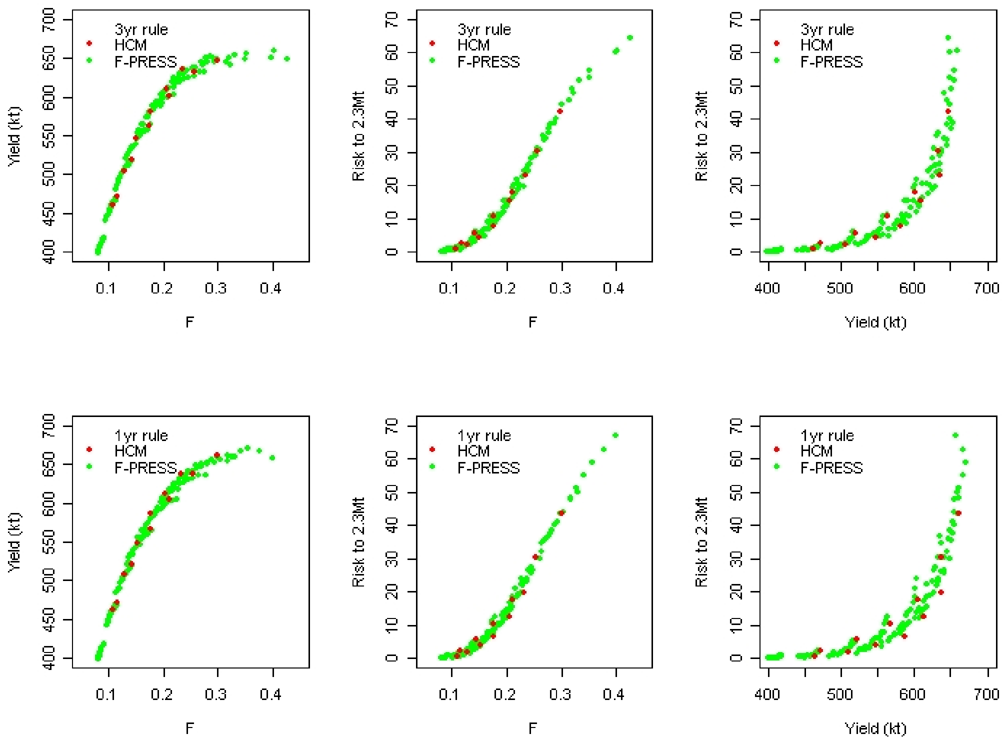


Figure 3.1.1. Fixed TAC strategy. Comparison of performance between F-PRESS and HCM.

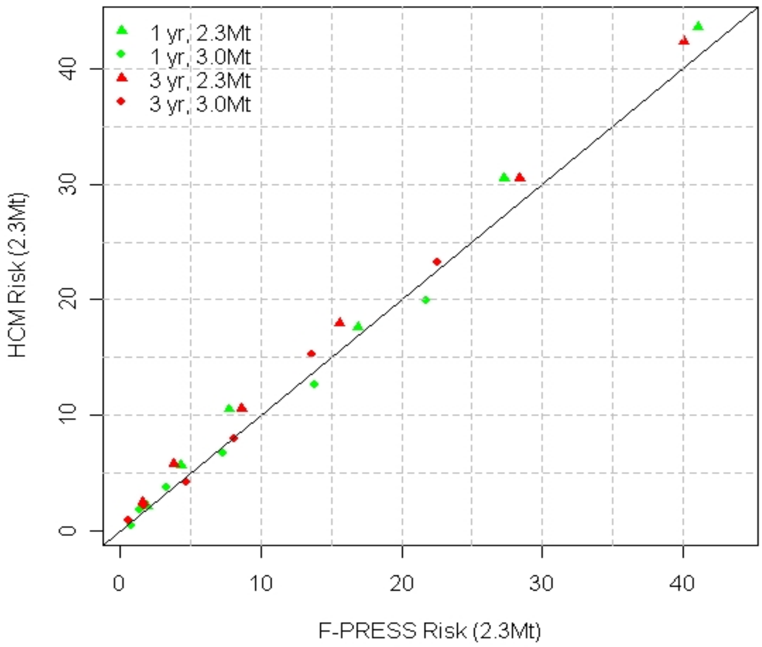


Figure 3.1.2. Fixed TAC strategy. F-PRESS vs. HCM associated risk to SSB = 2.3 million tonnes for the HCR evaluated.

Performance statistics corresponding to the three HCRs evaluated are presented in Tables 3.1 to 3.8 for a range of targets and trigger SSB 2.3 and 3 million tonnes. For the fixed TAC rule, results from F-PRESS and HCM are presented in Tables 3.5 to 3.8. These results are strictly comparable and were intended for validation of the simulation tools used.

3.2 Interpretation of acceptable risk

The EU request requires strategies that conform to the precautionary approach and have a low risk of stock depletion along with criteria on maximizing and stabilizing yield. In selecting strategies, we need to identify those that would conform to these precautionary requirements. ICES normally advises that the precautionary approach implies avoidance of the point at which recruitment is impaired (B_{lim}) with a high probability (95%). For NEA mackerel, B_{lim} is not defined and only B_{pa} is available as an SSB reference point. Avoiding B_{pa} with a 95% probability would ensure a low risk of depletion and would be precautionary but would also be more restrictive than ICES has previously advised for other stocks. The NEA mackerel stock has not exhibited reduced recruitment for SSBs down to 1.67 Mt; however, recruitment below this level is unknown. It could be considered precautionary to avoid this biomass with a high probability, thus avoiding depletion with a high probability. The relationship between the probability of SSB being below 1.67 Mt, the probability of SSB being below B_{pa}, and equilibrium biomass can be established by taking into account the distribution of an assessment error with a CV of 29%. Some selected values of probability are given in the table below.

% Probability SSB < B_{PA} = 2.3 Mt	**5%**	**15%**	**20%**	**50%**
% Probability SSB <1.67 Mt	1.6	4.5	6.0	17.2
Equilibrium SSB	4.40	3.29	3.04	2.30

The above text table shows that to avoid 1.67 Mt with a 95% probability requires an equilibrium biomass of around 3.1 Mt and a probability of avoiding B_{pa} close to 15%. Figure 3.2.1 shows the relationship between mean SSB, catch, and realized F at different probabilities and shows that long-term mean Fs below the putative F_{pa} of 0.23 are compatible with avoidance of B_{pa} at this level of probability.

It is suggested that strategies that have probabilities of SSB < B_{pa} lower that 15% would be regarded as precautionary and should provide a high probability of avoiding stock depletion.

Another option is to consider the probability that SSB 1.67 Mt at least once in the 10 year period under consideration. The value 1.67 Mt is he lowest SSB in the time series in the estimate by the 2007 WGMHSA.

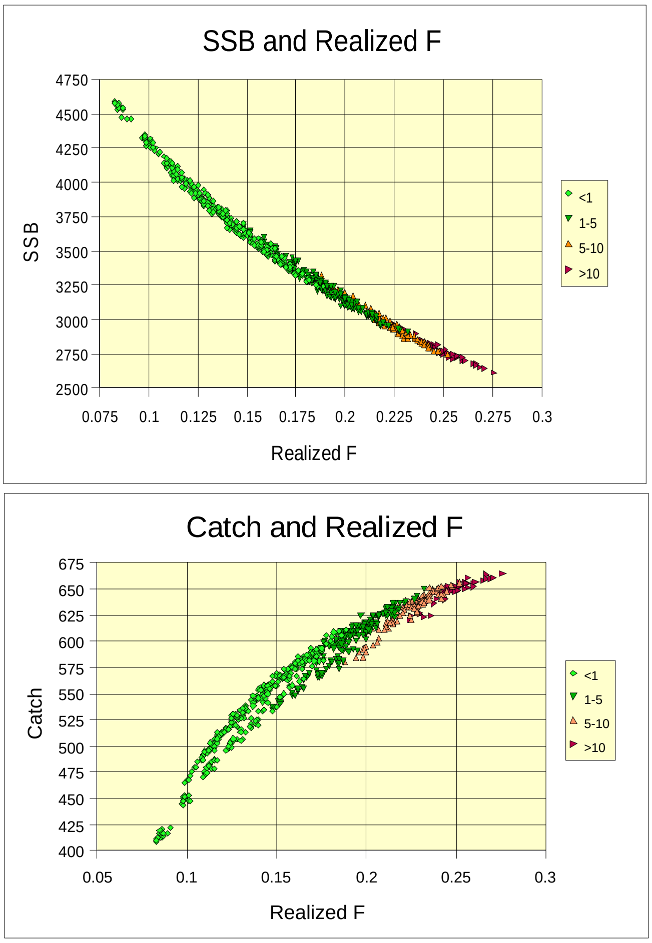


Figure 3.2.1 Relationship between mean SSB, mean Catch, and mean realized F for strategies with different probabilities (as indicated with colors) of falling below 1.67Mt at least once during the time period from year 10 to year 20. Strategies with low probability of SSB <1.67 Mt)lead to realized F less than 0.23 .

3.3 F-rule

Results of simulations with the F-rule as proposed by the EU Commission.

HCM was used to screen over ranges of values for the parameters Target F (A), Trigger SSB (C), and Percentage constraint on TAC variation (B). The constraint on TAC variation was only applied when it led to an SSB above the trigger biomass.

The results are presented as means over the years 10–20 and over 1000 iterations for each combination of the parameters. These results are presented in Table 3.9. The results are illustrated graphically in Figures 3.3.1–3.3.3. The main trends in these results can be summarized as follows:

The risk to B_{pa} increases with increasing Target F, and is reduced with increasing Trigger SSB. A stronger constraint reduces the risk. The realized catch increases with increasing Target F, and with increasing Trigger SSB. A stronger constraint on the TAC variation decreases the catch. The interannual variation increases with increasing Trigger SSB and with increasing Target F. A stronger constraint on the IAV variation reduces the interannual variation.

Hence, to obtain maximum mean catch, a high target F, a high trigger biomass, and a weak constraint on TAC variation will be required. This will lead to a high risk and a high interannual variation of the TACs. The maximum stability is achieved with a low trigger SSB, a low Target F, and a strong constraint on TAC variation. This will also lead to a low risk, but the catches will be low.

Figure 3.3.1. Realized catch with F-rule.

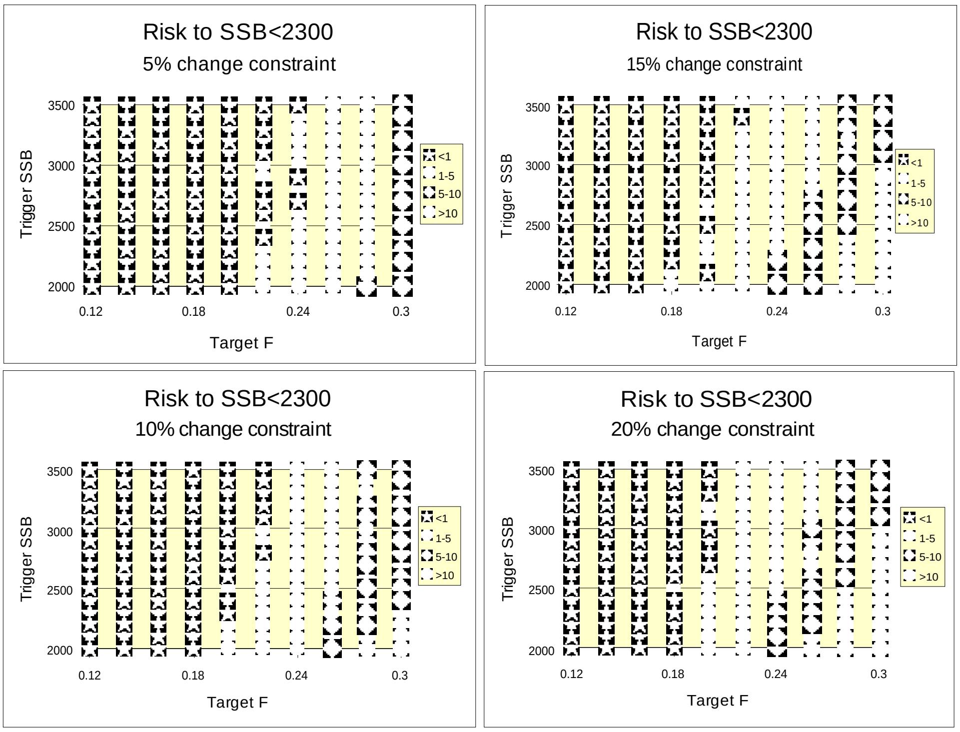


Figure 3.3.2. Risk with F-rule.

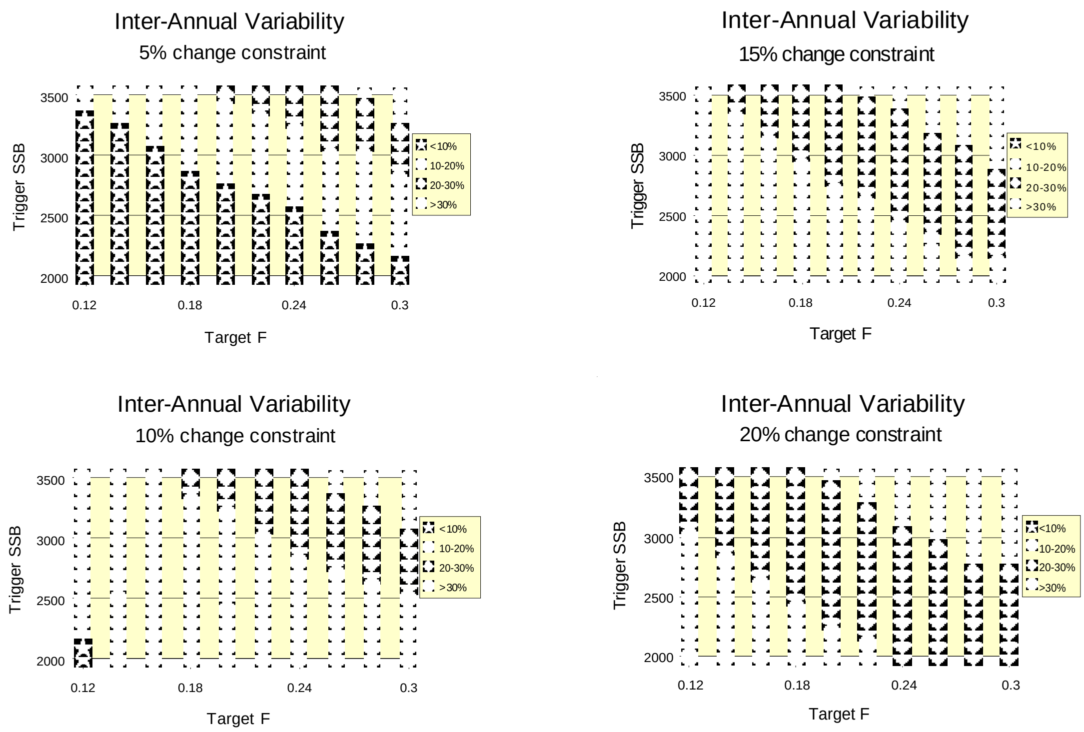


Figure 3.3.3. Interannual TAC variability.

To show the trade-off between stable catches and sustained yield, the subset of the parameter options that was associated with a risk to B_{pa} in the range 10–15% was considered further (Figures 3.3.4 to 3.3.6). This procedure selects options with high catches that conform to the precautionary approach. Options with lower risks are associated with lower catches. With this level of risk, catches are in the range of 580–640 thousand tonnes and the IAV between 10% and 30%. The target F is in the range of 0.24–0.30. The figure should allow managers to select the parameter option according to their preferred trade-off between stability and catch, with this level of risk. Some examples of parameter choices are given in the text table below. One outstanding result is that to have a catch near the maximum, the IAV has to be quite high, well above 15%. More stability requires substantial reduction in catch, which in general also will imply a lower risk.

A complete list of the HCR parameters explored and associated performance statistics is shown in Table 8.9.

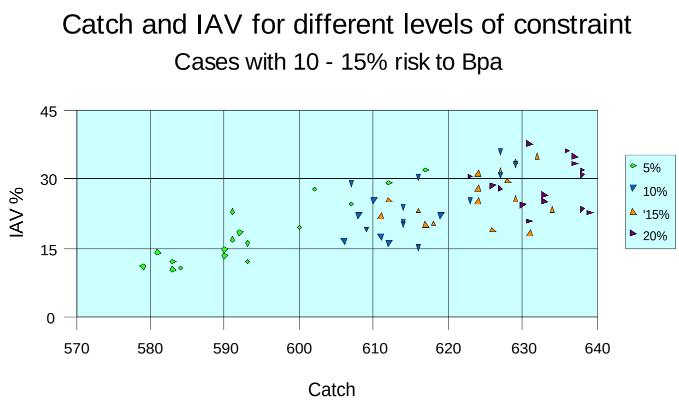


Figure 3.3.4. Mean catch and interannual variability for all F-rule options that lead to a risk to B_{pa} between 10% and 15%. The colours indicate the level of the constraint on TAC variation in the F-rule.

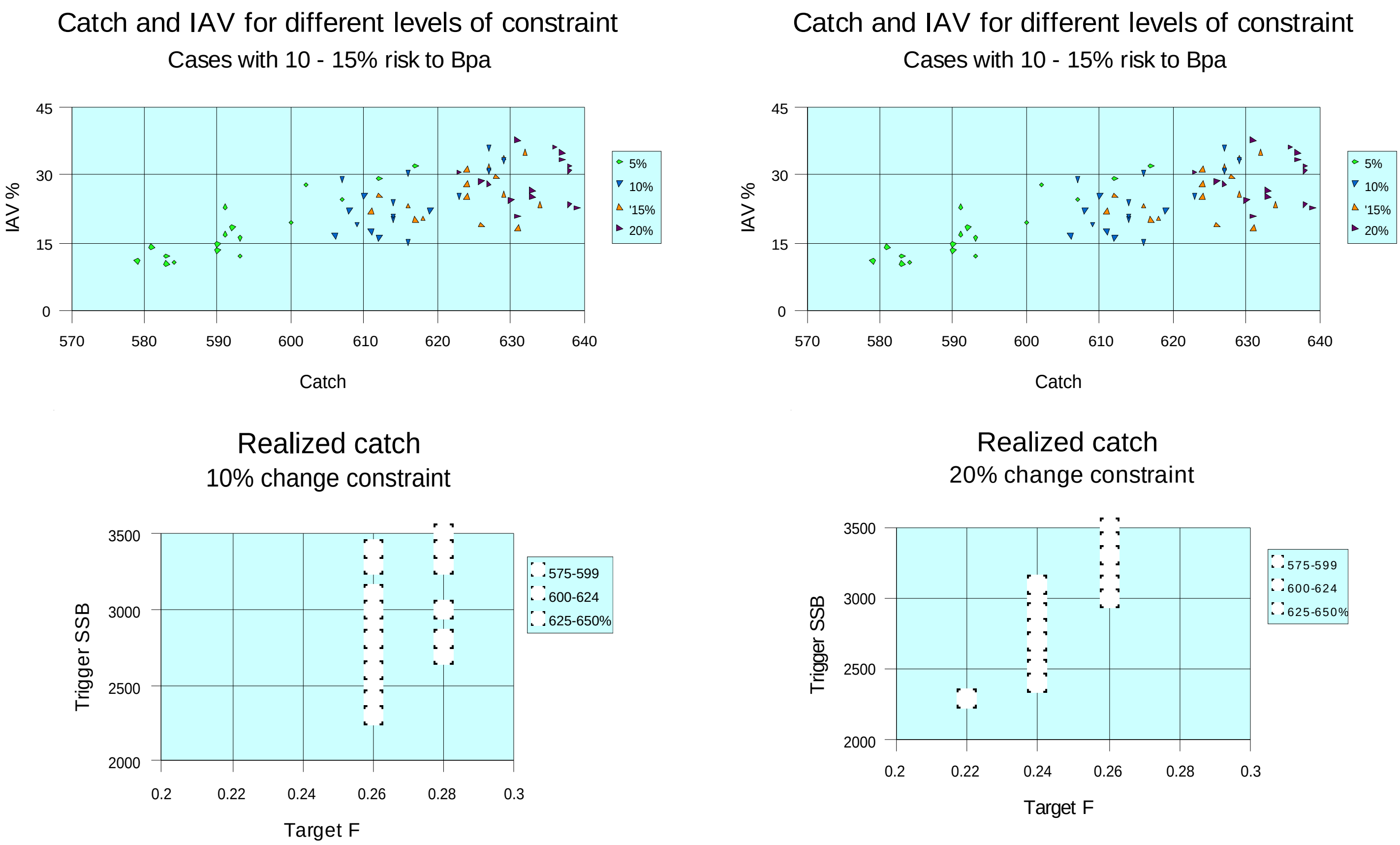


Figure 3.3.5. Mean catch as a function of Trigger SSB, Target F, and the level of constraints for the range of F-rule options that lead to a risk to B_{pa} between 10% and 15%. The colours indicate the level of the mean catch.

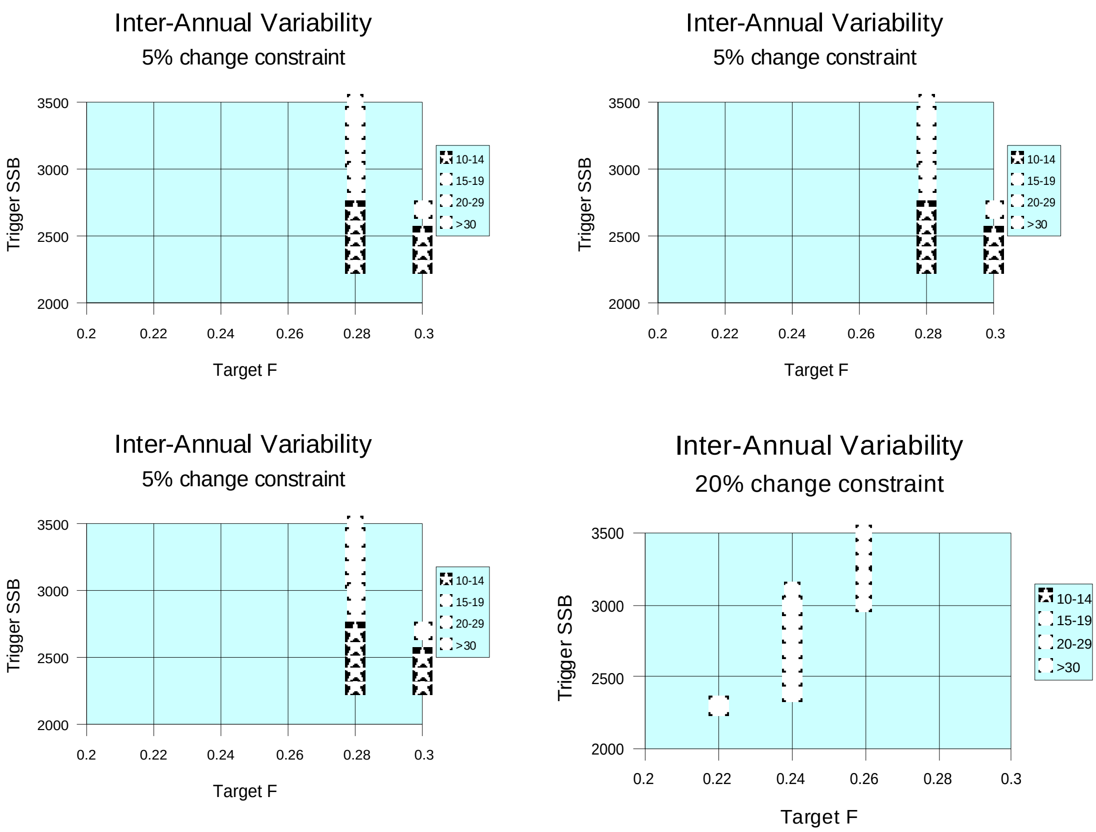


Figure 3.3.6. Interannual variability as a function of Trigger SSB, Target F, and the level of constraints for the range of F-rule options that lead to a risk to B_{pa} between 10% and 15%. The colours indicate the level of actual interannual variation (IAV).

Table 3.3.1. F-rule. Set of HCR parameters that result in highest average catch, lowest IAV and highest catch with a moderate IAV. The associated risk to B_{pa} is always below 15%.

	PERC (B)	TARG F (A)	TRIG. SSB(C)	C MEAN	C10	C50	C90	FMEAN	F10	F50	F90	SSB MEAN	IAV	4+	7+
Minimum IAV	5	0.28	2300	583	406	579	755	0.19	0.10	0.19	0.26	3313	10.3	85	44
High catch with IAV<15%	5	0.30	2400	593	413	593	755	0.20	0.11	0.20	0.28	3202	12.1	84	42
High catch with IAV<20%	15	0.24	2300	631	493	626	788	0.21	0.16	0.21	0.27	3046	18.4	84	41
Max. catch	20	0.24	2400	639	495	634	787	0.22	0.17	0.22	0.28	2969	22.7	83	40

The IAV is a measure of the mean relative change in TAC. The actual development of the catches is more variable, depending on variations in the natural conditions. To illustrate the link between IAV and possible trajectories of the catch, the evolution of the first 20 out of 1000 iterations is shown in Figure 3.3.7 for each of the examples shown in the Table above. Typically, scenarios with a low IAV have a gradual increase in the TAC until it has reached a stage where a drastic reduction is needed (and allowed). This is a result of a relatively high target F that is counteracted by the constraint, but tends to force the TACs upwards. The asymmetry in the performance, i. e. a gradual increase and an abrupt decrease leads to a moderate risk despite the high target F.

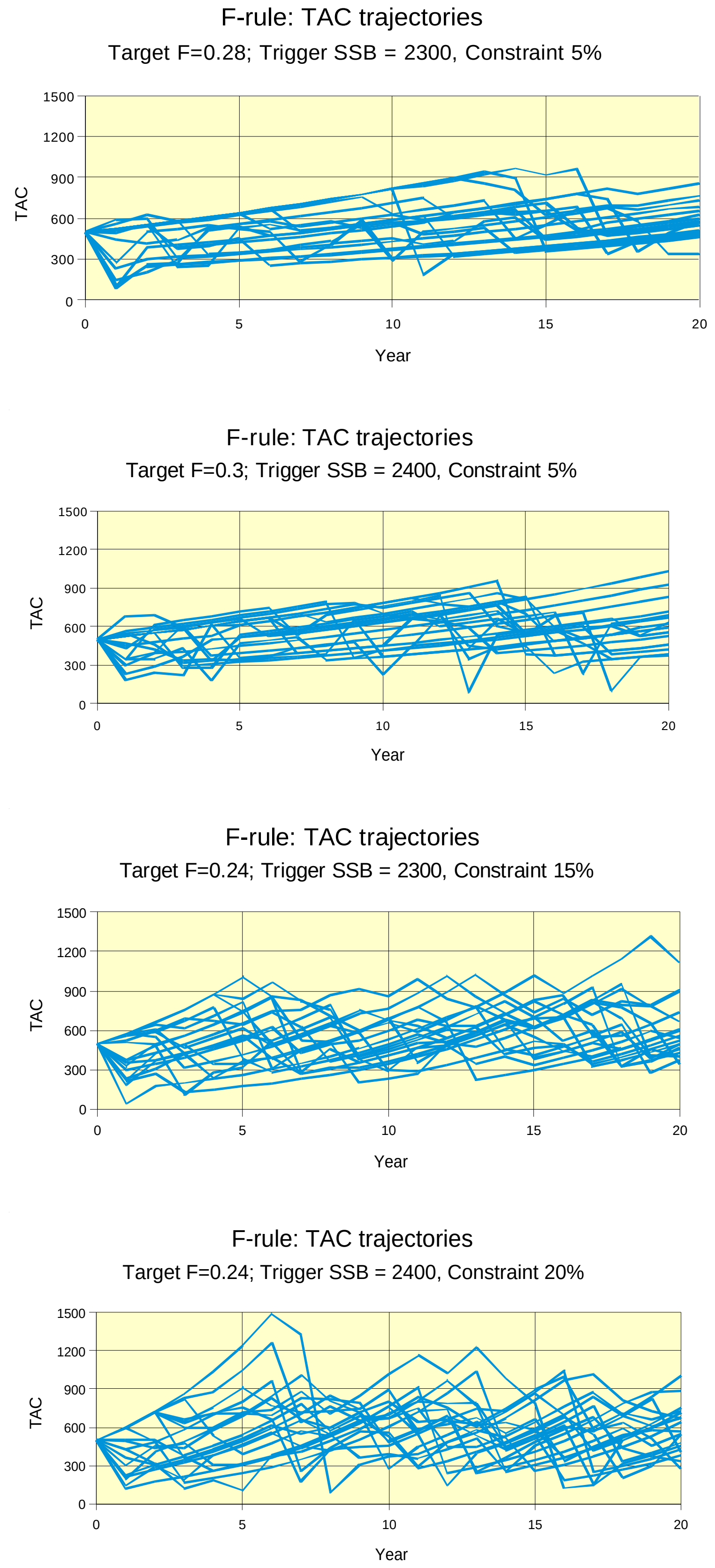


Figure 3.3.7. TAC trajectories corresponding to four sets of parameters A, B, and C in the F-rule. The first 20 of 1000 realizations of the rule are shown in each panel.

3.4 Harvest rate rule

This rule was explored by both HCM and FLR. The rule was applied either each year or every three years. For the 3-year TACs, HCM implemented the constraint in the first year and then the TAC remained unchanged for the whole three-year period, while FLR allowed a 15% change every year. The rule was tested with and without the option to apply the TAC constraint only at SSB > $SSB_{trigger}$.

The exploration with HCM suggested that harvest rates (HR) associated with risk to B_{pa} between 10 and 15% are generally between 0.30–0.20 if the TAC is revised every year and 0.10–0.24 if it is revised only every three years (Figures corresponding to these results are shown in Annex 3). A strong constraint requires a lower HR, and correspondingly lower catches to keep the risk low, in particular if the constraint applies at all levels of SSB. The catches associated with a low risk are lower with a 3-year rule than with a one-year rule. There is a trade-off between stability and average catch across all options; if more year-to year variation is acceptable, the average catch can be higher.

Figures 3.4.1 to 3.4.6 illustrate the performance of harvest rate rules for a range of trigger SSB, TAC constraints, and harvest rates. Also shown are results for:

1- and 3-year TAC periods,

TAC constraint applied only when SSB > B_{trig} and

TAC constraint applied at all levels of SSB.

When the constraint is applied only when SSB>$SSB_{trigger}$, the realized catch is generally higher than when the constraint is applied at all levels of SSB (Figures 3.4.1 and 3.4.4). Similarly, the associated risk is higher when the constraint is applied always (Figs. 3.4.2 and 3.4.5). These effects are more pronounced when the constraint is strong and for 3-year TACs. With a 15% constraint and risk to B_{pa} between 10–15%, the average catch is in the order of 620–640 thousand tonnes for an annual rule and between 590 and 560 thousand tonnes for a tri-annual rule. The trade-offs between catch and stability in a HR-rule are illustrated in Figure 3.4.7 for selected scenarios. The selection results in a risk to B_{pa} between 10% and 15%. The performance statistics associated with the full range of HCR parameters explored are shown in Annex 8.

The exploration with FLR was used to compare performance with the F-rule. Results are discussed in Section 4.1.

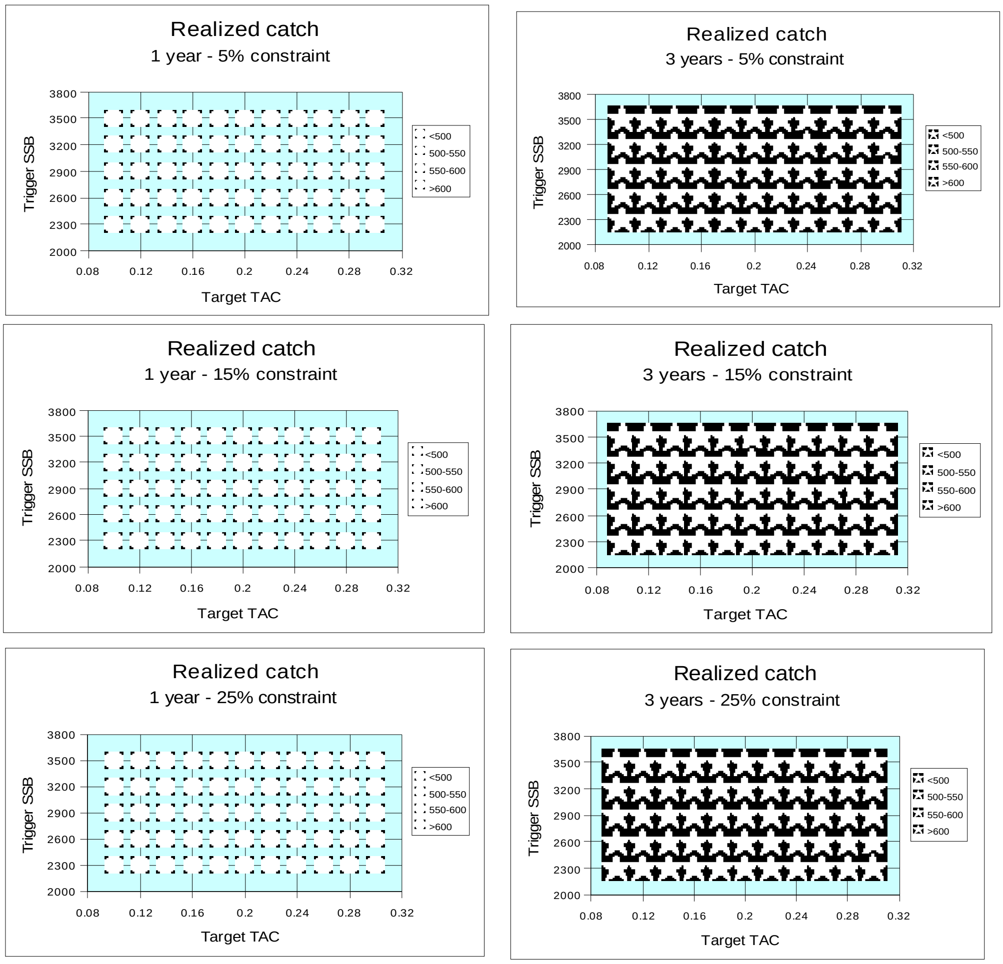


Figure 3.4.1 Realized catch.

Results (average over the years 10–20 and over 1000 iterations) of simulation of HR rules, with constraints on year-to-year variations in TAC that applies **only at SSB > trigger biomass**. Results are shown for a range of target HRs and Trigger SSBs, for annual TAC decisions (left) and triennial TAC decisions (right), and for maximum percentage change in TAC as indicated.

Figure 3.4.2. Risk of SSB<1.67Mt at least once in years 10 - 20.

Results (average over 1000 iterations) of simulation of HR rules, with constraints on year-to-year variations in TAC that applies **only at SSB > trigger biomass**. Results are shown for a range of target HRs and Trigger SSBs, for annual TAC decisions (left) and triennial TAC decisions (right), and for maximum percentage change in TAC as indicated.

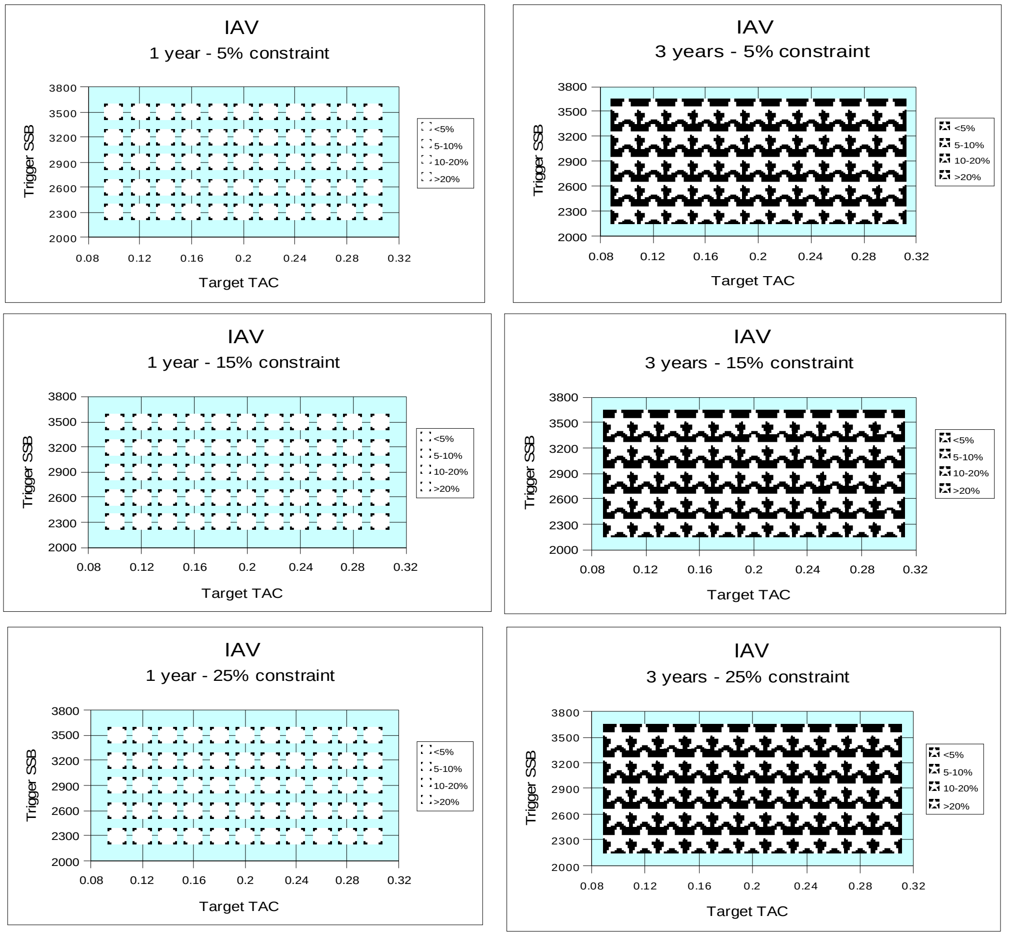


Figure 3.4.3. Interannual variation (IAV) in TAC.

Results (average over the years 10–20 and over 1000 iterations) of simulation of HR rules, with constraints on year-to-year variations in TAC that applies **only at SSB > trigger biomass**. Results are shown for a range of target HRs and Trigger SSBs, for annual TAC decisions (left) and triennial TAC decisions (right), and for maximum percentage change in TAC as indicated. Note that the average interannual variation is lower with a triennial rule because the TAC remains unchanged in 2 out of 3 years.

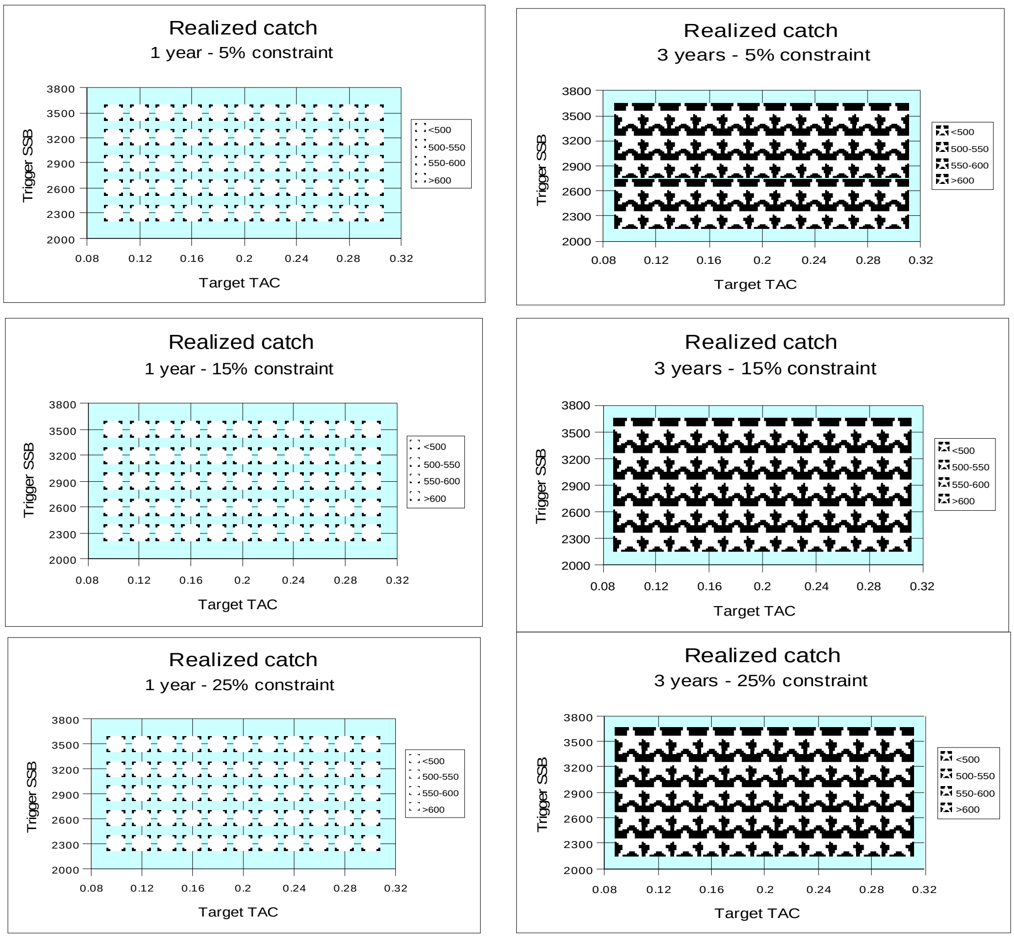


Figure 3.4.4. Realized catch.

Results (average over the years 10–20 and over 1000 iterations) of simulation of HR rules, with constraints on year-to-year variations in TAC that applies **at all levels of SSB**. Results are shown for a range of target HRs and Trigger SSBs, for annual TAC decisions (left) and triennial TAC decisions (right), and for maximum percentage change in TAC as indicated.

Figure 3.4.5. Risk to B_{pa}.

Results (average over the years 10–20 and over 1000 iterations) of simulation of HR rules, with constraints on year-to-year variations in TAC that applies **at all levels of SSB**. Results are shown for a range of target HRs and Trigger SSBs, for annual TAC decisions (left) and triennial TAC decisions (right), and for maximum percentage change in TAC as indicated.

Figure 3.4.6. Interannual variation (IAV) in TAC.

Results (average over the years 10–20 and over 1000 iterations) of simulation of HR rules, with constraints on year-to-year variations in TAC that applies **at all levels of SSB**. Results are shown for a range of target HRs and Trigger SSBs, for annual TAC decisions (left) and triennial TAC decisions (right), and for maximum percentage change in TAC as indicated. Note that the average interannual variation is lower with a triennial rule because the TAC remains unchanged in 2 out of 3 years.

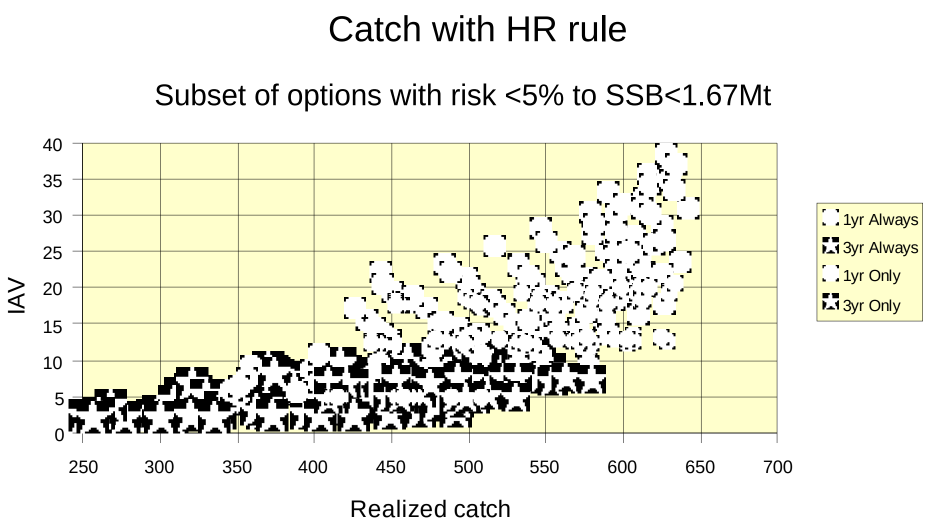


Figure 3.4.7. The trade-off between catch and stability in a HR-rule. The points represent the outcome of scenarios for various combinations of trigger SSB and target HR, having in common that they imply a risk less than 5% The type of symbol indicates when the constraint is applied, either only when SSB is above trigger or always irrespective of the level of SSB, and the length of the interval between TAC change (1- or 3-year TAC).

3.5 Target TAC rule

F-PRESS and HCM were both used to test target TAC harvest control rules (see Section 2.3.2). The F-PRESS model was run over a wide range of target TACs, SSB trigger points, HCR conditions (period and change restrictions), and implementation model biases (see Table 2.2.1). For parameter combinations that resulted in optimal stock exploitation i.e. risks to B_{pa} of 10–15%, additional runs were undertaken, with target TAC increment reduced from 50 kt to 10 kt.

Selected results from the analysis of the model output are given in Tables 3.7 (15% annual TAC restriction) and 3.8 (unrestricted annual TAC variation). Full results are given in Annex 4. The shaded entries in the complete table (Annex 4) correspond to simulation parameter combinations that give rise to B_{pa} risks of 10–15%. The statistics presented are derived from 1000 model iterations and apply to the period 2017–2027 (i.e. years 10–20).

Figure 3.5.1 shows the results for the 3-year, 15% harvest control rule for the full range of target TACs and SSB trigger points.

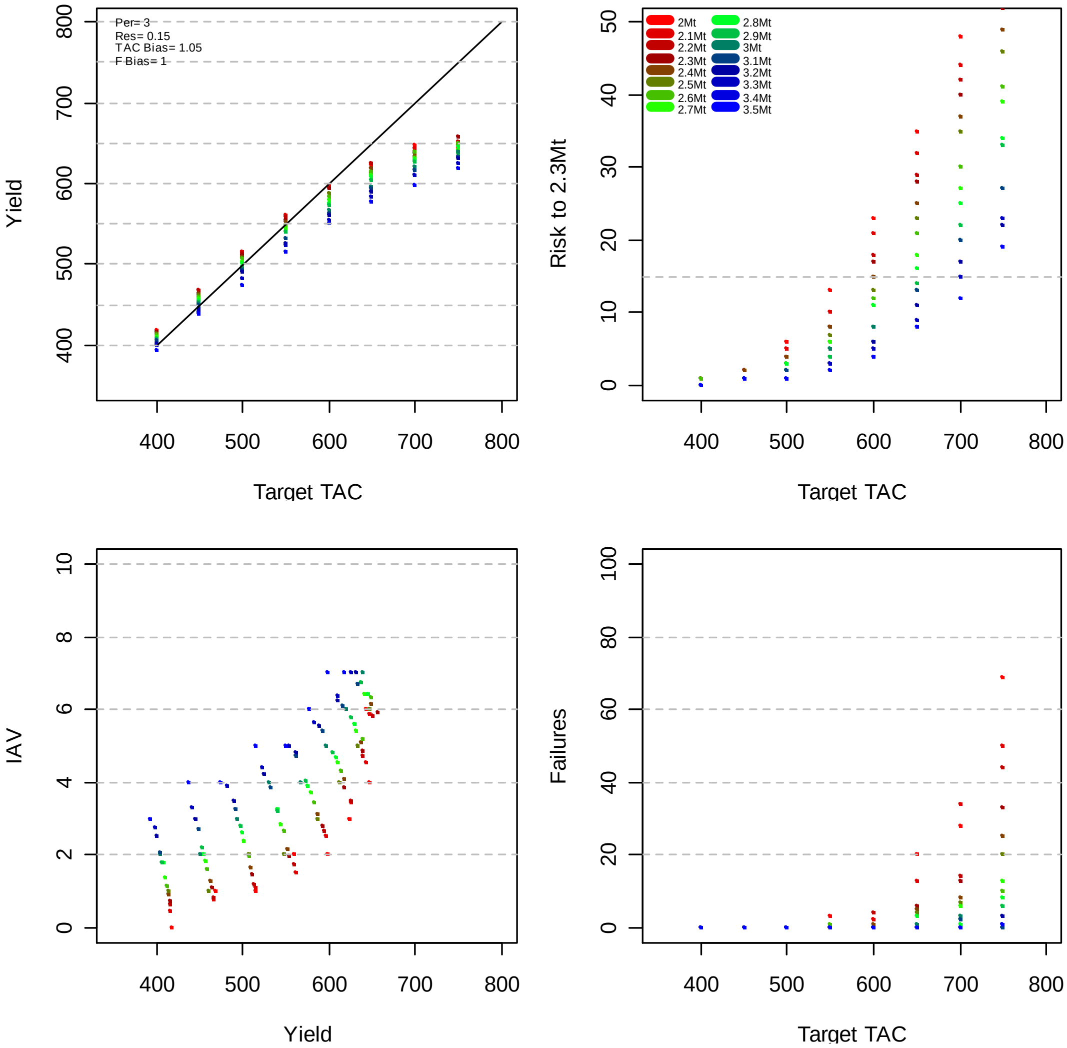


Figure 3.5.1. Yield, Risk, IAV, and failures for the 3-year, 15% target TAC harvest control rule.

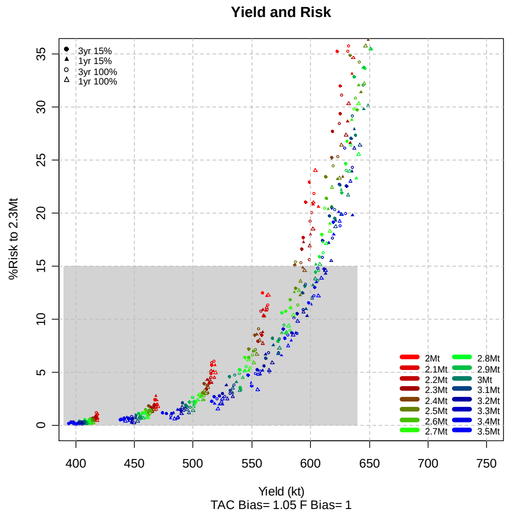
As would be expected, yield, risk to B_{pa} and failures (where SSB falls below 10% of B_{pa} at any time during the simulation period) all increase with increasing target TAC. The rate of increase of yield is reduced above target TACs of approximately 600 kt.

For the other HCR parameter combinations, there is relatively little change in yields and risks with slight increases in yields associated with the shorter cycle, unconstrained rules. This is accompanied by a slight increase in risk.

IAV is strongly linked to the HCR conditioning. The more conservative parameter combinations increase the IAV significantly so that there is a trade-off between stability and the period and severity of management decisions.

Model failures are only a feature of the highest target TAC/ lowest SSB trigger point simulations. The more punitive HCRs reduce the number of failures, with the 1-year unrestricted HCR almost eliminating them.

Figure 3.5.2 compares the relationships between yield and risk and between IAV and yield for all combinations of HCR parameters.



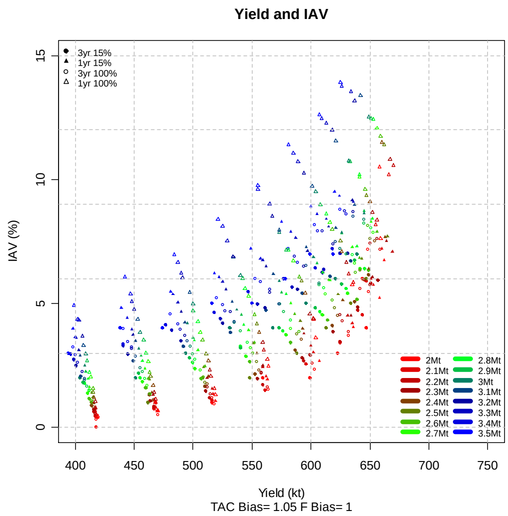


Figure 3.5.2. Yield vs. Risk and Yield vs. IAV for all target TAC HCRs.

At yields of 550 kt and above, the risk to B_{pa} increases dramatically indicating that any rule designed to produce yields greater than this (maintaining an acceptable risk level) would require strong protection rules.

For any given target TAC, risks increase with reducing $SSB_{trigger}$ point as the HCR protective measure is delayed until lower SSB levels are reached. This is offset by the increased yields available at the lower trigger points.

Table 3.5.1 shows a subset of model results that maximize yields and correspond to a risk to B_{pa} <10%. Yields of 560–620 kt are available for risks in the 10–15% range. The selection of the other model parameters reflects trade-offs.

Table 3.5.1. Target TAC. Performance statistics for HCR parameters: Target TAC, TAC period and interannual constraint and SSB trigger that maximize yields while risk <10%.

Targ TAC	HCR Per	HCR Chg	SSB Trig	Yield	IAV
560	3	15%	2.3Mt	563	2%
620	3	15%	3.0Mt	583	5%
550	1	15%	2.3Mt	557	3%
630	1	15%	3.0Mt	592	6%
570	3	-	2.3Mt	578	2%
620	3	-	3.0Mt	586	5%
550	1	-	2.3Mt	560	3%
630	1	-	3.0Mt	593	9%

This table illustrates the relative importance of the SSB trigger point. For equivalent risk, the highest yields are associated with the 3.0 Mt trigger point, although they are accompanied by higher annual TAC variations. The effect of constraining the HCR to a 15% annual TAC variation and the period of the rule are not as significant as the choice of trigger point.

Figure 3.5.3 illustrates the trade-offs in terms of interannual variability and mean catch for a selection of parameter scenarios corresponding to a risk to B_{pa} between 10 and 15%.

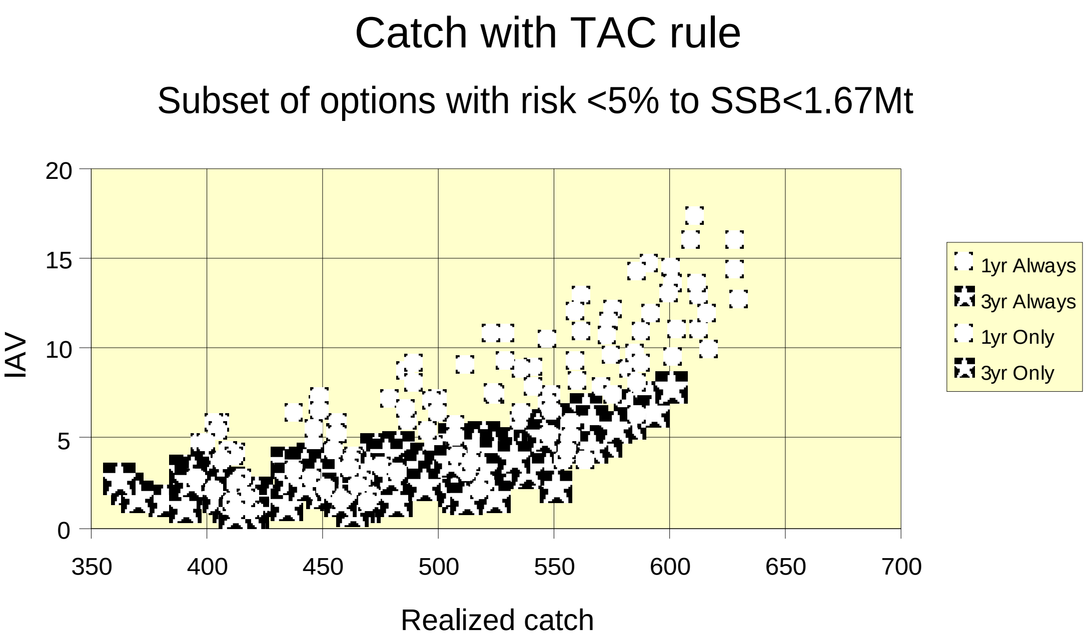


Figure 3.5.3. The trade-off between catch and stability in a TAC-rule. The points represent outcome of scenarios for various combinations of trigger SSB and target TAC, having in common that they imply a risk less than 5%. The type of symbol indicates when the TAC constraint is applied, either only when the SSB is above the trigger or always irrespective of the level of SSB, and the time duration of the TAC decisions, 1- or 3-year TAC.

4 Discussion

This section discusses the results of implementing different ways of determining the TAC (based on SSB in the assessment or the TAC year), of annual and three-year TAC periods and the range of trigger biomass and constraints explored.

4.1 SSB year used to set the TAC

Simulations conducted in FLR looked specifically at the difference between two approaches:

- setting the TAC based on the traditional approach used within the Coastal states agreement, short-term forecast (STF) (i.e. projecting the stock with assumed recruitment and using the SSB in the TAC year as the parameter for the HCR), and
- setting the TAC based on the SSB in the assessment year implying no projection, assessment harvest rate (AHR).

Figure 4.1 provides a representation of yield, risk, and an indication of interannual variability. In the four graphs, the size of the dot represents average interannual variability in catch, smaller dots indicating smaller interannual change. In Figure 3.1a, the differences between the use of the STF and the AHR are apparent. This shows lower risks and often higher yield when AHR is used instead of STF. This is thought to be due to the amplification of errors by a short-term forecast (at least at the exploitation levels examined). This implies that an HCR for NEA mackerel is more optimally conditioned with a direct estimate of the stock, even if this is in the past, than the use of a short-term forecast used to “project” the stock to the year in which the decision is implemented.

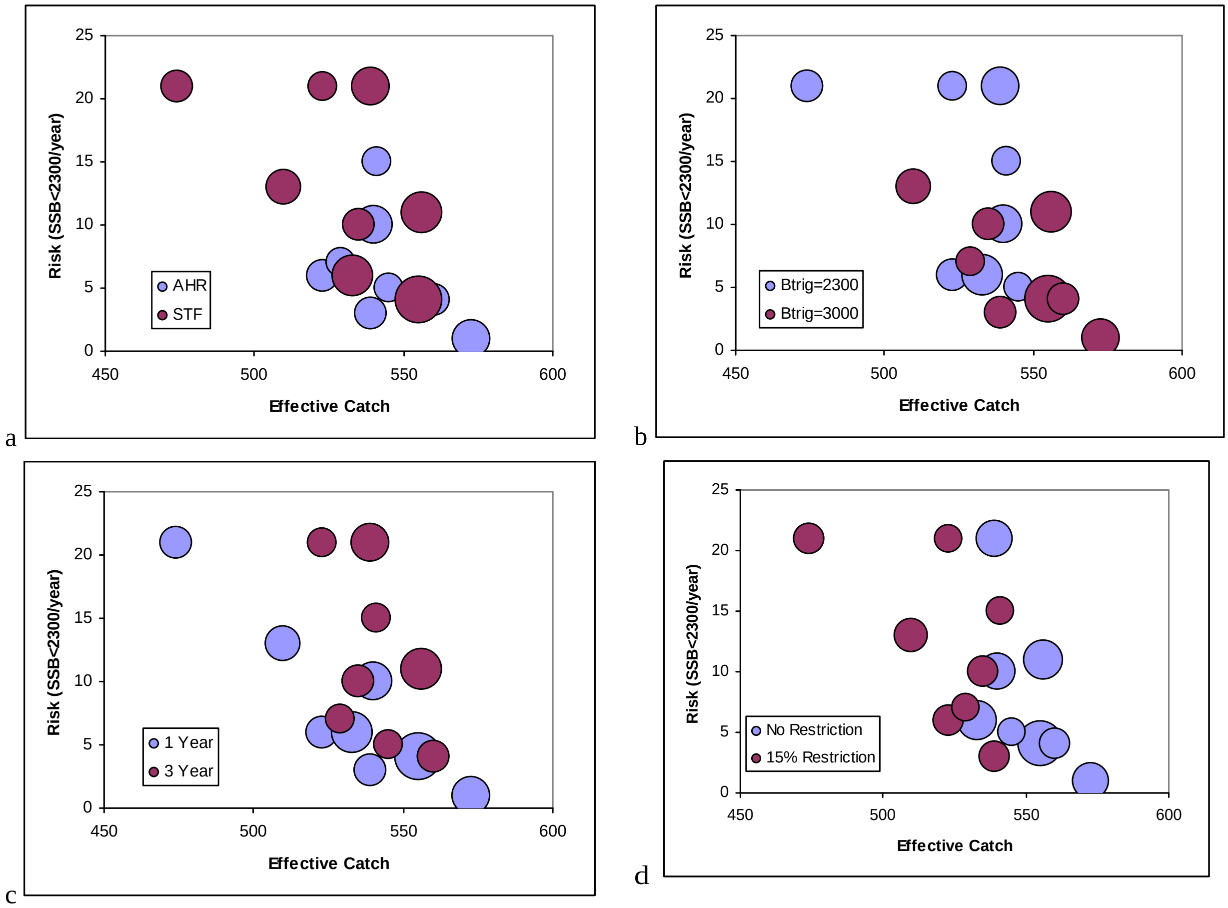


Figure 4.1 Annual catch against risk of SSB<2300 and Interannual variability in catch. a) by measurement method, b) by method and biomass catch reduction trigger limit of 2600 and 3000, c) by annual or triennial management, and d) with no interannual or 10% (30% after 3 years) interannual limit on change in TAC. The size of the dots relates to IAV.

4.2 Period of HCR setting

It has long been argued that due to a lack of fishery-independent information the assessment of NEA mackerel becomes less precise (and potentially biased) in the years between egg surveys (Simmonds *et al.*, 2003). For this reason, a multi-annual management regime has been advocated. In the simulations, the difference between the implementation of an HCR on a 1- and a 3-year cycle was examined. However, only in the FLR implementation was the effect of increasing noise in the 2 years between egg surveys taken into account.

In all cases, irrespective of the simulation framework and the HCR implemented, the differences in yield and risk were small. In many cases risk increased for a 3-year TAC cycle while average catch decreased for a given risk. If a three-year rule were to be seriously considered further, more detailed evaluation would be required.

4.3 Trigger biomass

F-PRESS and HCM are likely to provide the best frameworks to evaluate this effect. The general effect of raising the trigger biomass in a HCR is to decrease the risk of the stock becoming recruitment impaired; however, this comes at the cost of higher variability in yield. The effect on the catch is variable, but it generally results in a decrease.

4.4 Constraining TAC variability

Interannual variability is a key concern for the industry. The EU request also asked this factor to be investigated. Constraints of 5%, 10%, 15%, and 20% were examined. A surprising finding was that a strong constraint on year-to-year variation in the TACs in general leads to a lower risk at similar target Fs. This is linked to a lower realized catch resulting from implementing the constraint only when SSB is above the trigger.

The effect of a 15% constraint on the annual TAC change was examined, following a request from the industry in a follow-up meeting on 3 September. Whereas an inter-annual TAC limitation would normally only be applied when the protection rule is not invoked in a HCR, the industry asked for the 15% annual TAC limitation to be applied irrespective of stock status. Qualitatively, this kind of restriction is a high risk strategy as it restricts the HCR's ability to reduce exploitation when the stock is over-exploited. It does, however, have the symmetric effect of restricting exploitation if the stock increases rapidly. The influence of the 15% constraint on interannual variability is illustrated in Figure 4.1d, suggesting that such constraint generally results in lower catch and increased risk. In addition to yield and risk, the most informative diagnostic for this condition is the magnitude of the average TAC change (Avg. Inc. or Dec.)

4.5 Missing catches

The evaluations carried out here are based on the population assessment of ICES. This is based on ICES WG catch and survey data. This catch data contains some catches in addition to the official catches. However, ICES is aware of the possibility that there may be additional catches that are not reported. An investigation of the potential levels of uncertainty in NEA mackerel stock and removals has been presented at the ICES WG (ICES 2007b). There are significant differences in SSB and catch between those given in the ICES assessment and the ones presented in the WD, probably due to unaccounted removals. With the limited knowledge of the extent of under-reporting over the whole exploitation history, it has not been possible to estimate a population including these unreported removals with sufficient accuracy to use these in the exploration of HCR.

Recent changes in enforcement in particular in UK and Ireland suggest that the extent of unreported removals has reduced in recent years. Thus the magnitude of unreported removals may be lower now than in some periods in the past.

The consequences of the uncertainty in unreported removals from the population are the unknown levels of uncertainty in the parameterization of the population model. However, simulations show that if enforcement was to be maintained at the current effectiveness or improved further, the potential yields would be expected to be higher and the real risks would be lower than the ones expressed in this report. However, as outlined above ICES is unable to estimate by how much these might differ. Thus, the estimates presented in this report form a minimum potential for yield and maximum risk. However, it must be remembered that, as in other management situations, if the current level of enforcement deteriorates risks will rise above current levels.

5 Conclusions

5.1 F-rule as proposed by the EU Commission

We provided diagrams (Section 3.3) that could be used as a map of the performance of a wide range of A, B, and C options. To select an appropriate strategy we advice choosing a matching set of A, B, and C from the diagrams and/or the tables provided as Annex. Small changes to parameters may have important implications for risk and interannual variability. Therefore, minor adjustments to parameter values are discouraged unless the implications are checked by consulting the tables included in this report. Following that, the general principles apply to all rules investigated.

These simulations indicated that high catch precautionary options associated with a risk between 10% and 15% led to catches in the range 580–640 thousand tonnes and the IAV in the range 10–30%. The target F would be in the range 0.24–0.30.

An outstanding result is that to have a catch near the maximum, the IAV has to be quite high, well above 15%. More stability requires substantial reduction in catch, which in general will also imply a lower risk.

5.2 Harvest Rate rule

With the HR rule, the average long-term catch, the risk, and the variability will all increase with increasing target HR. The impact of the trigger biomass is small on risk and catch, but the variability increases with increasing trigger biomass, in particular with a weak constraint on TAC change. A strong constraint on TAC variation leads to lower catches.

The difference between the option to constrain the catches at all levels of SSB or only at SSB above the trigger biomass is small except when the constraint is very strong. Likewise, the difference between annual and triennial advise is small except with a very strong constraint. With a strong constraint, both catches and risk are higher with the 'Always' option, and the catch is higher with a one-year rule than with a 3-year rule, in particular if the constraint only applies above the trigger. These effects are illustrated in Figure 3.4.7.

These simulations indicated that high catch precautionary options associated with a risk between 10% and 15%, with the constraint only applied above SSB trigger, led to catches in the range of 518–645 thousand tonnes and IAV in the range of 3–35%. The target harvest rate would be in the range of 0.20–0.30.

5.3 Fixed TAC rule

Section 3.5 and Annexes 3 and 4 provide a wide range of options for the possible implementation of a target TAC strategy for the exploitation of the fishery. There are a range of options that lead to risks to B_{pa} within the range of 10–15%. As advised for the F rule, it would be inappropriate to select a combination of HCR parameters that are not detailed in this report as minor changes in parameters values would require further investigation.

For the harvest rules tested, the F-PRESS results demonstrate the strong influence of the SSB trigger parameter. Assuming a maximum acceptable risk to 2.3 Mt of 15% the maximum yields available for low trigger points (i.e. 2.5 Mt) are of the order of 590 kt with an associated F of 0.19–0.20. If the stock was to be exploited using a higher trigger biomass (i.e. 3 Mt), then target TACs of up to 680 kt are feasible although average yields are unlikely to exceed 610 kt. Further, IAV increases with increasing SSB trig. This is consistent with the HCR being implemented more frequently as the trigger point is increased to stock levels well above the current level.

The effects of the HCR period and limiting annual TAC changes to +- 15% are less pronounced than variation in the target TAC or SSB trigger parameter.

The average catch in the long term increases with increasing target TAC, and decreases with increasing trigger biomass. The risk to B_{pa} increases with increasing target TAC and decreases with increasing trigger biomass. The variability, expressed as IAV, increases with increasing target TAC and with increasing trigger biomass. The level of constraint on TAC variation matters little for the average catch and for the risk, but the IAV increases with a weaker constraint. At the risk level that may be acceptable (<15%), catches up to about 600 000 tonnes can be achieved with low interannual variability (See Figure 3.5.3). Attempting to get higher average catches with an acceptable risk requires much higher interannual variability.

The difference between the option to constrain the catches at all levels of SSB or only at SSB above the trigger biomass is small except when the constraint is very strong. Likewise, the difference between annual and triennial advice is small except with a very strong constraint, although the risk is generally somewhat higher with a triennial regime. With a strong constraint, both catches and risk are higher with the 'Always' option.

Absolute values of caches and associated risks would be sensitive to the assumed level of recruitment. Since the real recruitment is uncertain due to under-reporting of the catches in the past. The impact of other recruitment and of other implementation errors has not been explored.

5.4 Summary Conclusions

We have provided an answer to the Commission request using HCM. This framework does not perform an assessment. This was overcome by performing a limited number of FLR evaluations including the full feedback assessment model. The error structures, including autocorrelation determined in these evaluations were used in the F-rule evaluations. Further, two alternative HCR were evaluated.

Different frameworks accounted for variability in the population dynamics and the fishery to a high standard. Where the different frameworks were used to evaluate the same HCR the results were practically identical. HCM and F-PRESS were used as the primary tools for the HCR evaluation due to speed considerations allowing a broad range of parameter screening and scenario testing. The use of a full feedback method (FLR) to characterize errors and high speed HCR evaluation tools was considered an optimal approach. Because of the limited range of estimated stock biomass in the historical series the information on stock recruitment relationship is sparse. To account for this the evaluations have used stochastic variability around a range of functional forms with parameter uncertainty.

The results indicate that an HCR for NEA mackerel would be more optimally conditioned by not using a short-term forecast, as is currently the case in the coastal states agreement.

The effect of limiting the annual change in TAC is a reduction in interannual TAC variability and risk, but that is at expense of a lower mean realized catches. When the constraint is implemented irrespective of the stock condition the effect is lower catch and increased risk.

The explorations of different HCRs in this document suggest that the introduction of a maximum TAC change constraint implies a trade-off between yield magnitude and variability, and risk to the stock. If such a condition were to be applied to the TAC setting arrangements for the stock it should be done in the context of an agreement between all stakeholders on where the trade-offs should lie. In addition such a constraint should only be applied in the context of a management plan based on an HCR in which maximum TAC change has been explicitly considered and risk evaluated.

The consequences of the uncertainty in unreported removals from the population are that there is an unknown uncertainty in the parameterization of the population model. The estimates presented in this report form a minimum potential for yield and maximum risk provided that current enforcement is maintained or improved.

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Table 2.1.1 Coefficient of variation and covariance matrix used for simulating sampling catch.

Age	0	1	2	3	4	5	6	7	8	9	10	11	12+
CV-at-age	0.127	0.099	0.081	0.070	0.068	0.074	0.088	0.111	0.142	0.181	0.229	0.285	0.349
Covariance	0	1	2	3	4	5	6	7	8	9	10	11	12+
0	1.000	-0.216	-0.049	-0.049	-0.041	0.012	0.047	0.058	0.054	0.076	0.076	0.076	0.076
1	-0.216	1.000	-0.250	-0.126	-0.051	-0.054	-0.008	-0.011	0.029	0.038	0.038	0.038	0.038
2	-0.049	-0.250	1.000	-0.035	-0.443	-0.359	-0.325	-0.287	-0.294	-0.321	-0.321	-0.321	-0.321
3	-0.049	-0.126	-0.035	1.000	-0.104	-0.277	-0.324	-0.236	-0.191	-0.257	-0.078	-0.076	-0.069
4	-0.041	-0.051	-0.443	-0.104	1.000	0.140	0.052	0.026	0.038	0.002	-0.187	-0.123	-0.119
5	0.012	-0.054	-0.359	-0.277	0.140	1.000	0.276	0.202	0.084	0.091	-0.159	-0.246	-0.174
6	0.047	-0.008	-0.325	-0.324	0.052	0.276	1.000	0.205	0.170	0.339	-0.036	-0.116	-0.230
7	0.058	-0.011	-0.287	-0.236	0.026	0.202	0.205	1.000	0.183	0.403	0.149	0.031	-0.091
8	0.054	0.029	-0.294	-0.191	0.038	0.084	0.170	0.183	1.000	0.237	0.258	0.190	0.029
9	0.076	0.038	-0.321	-0.257	0.002	0.091	0.339	0.403	0.237	1.000	0.208	0.277	0.226
10	0.076	0.038	-0.321	-0.078	-0.187	-0.159	-0.036	0.149	0.258	0.208	1.000	0.209	0.313
11	0.076	0.038	-0.321	-0.076	-0.123	-0.246	-0.116	0.031	0.190	0.277	0.209	1.000	0.218
12+	0.076	0.038	-0.321	-0.069	-0.119	-0.174	-0.230	-0.091	0.029	0.226	0.313	0.218	1.000

Table 3.1. FLR Results of different management approach options. Statistics reported over the last 11 years of the simulation. Methods are Short-Term Forecast (STF), Assessment-based harvest ratio based on SSB (AHR) and Survey-based harvest ratio based on SSB (SHR). TAC Change restriction; yes means a maximum of 15% change annually (implies a maximum 45% change over 3 years where HCR(yr) =3), 0 means no limit on the TAC change. SSBtrig is the trigger point below which the HCR changes. HCR(yr) is the period of the HCR. Catch is reported as average and percentiles in kt. IAV is Interannual variability calculated as the mean absolute change in TAC from year to year in kt. F is reported as average and percentiles. 2017–2027 is the average SSB over this period. 2027 is the average SSB in this year. TAC variation; Evts is the average number of times the TAC is changed. + is the average number of times the TAC is changed upwards, − is the average number of times the TAC is changed downwards. Avg Inc is the average increase in the TAC in kt (when the TAC is increased), Avg Dec is the average decrease in the TAC in kt (when the TAC is decreased). Risk is the average number of times where SSB is below the reference level expressed as a percentage. Percentage catch is the fraction by number-at-age and above.

Method	Yr/Yr limit	SSB trig	HCR (yr)	Catch (kt)					F				SSB (Mt)		TAC variation (11 year period)					% Risk		% Catch	
				Mean	10%	50%	90%	IAV	Mean	10%	50%	90%	2017-2027	2027	Evts	+	-	Avg Inc (kt)	Avg Dec (kt)	2.3	2.6	4+	7+
AHR	no	2.3	1	540	356	551	711	57	0.166	0.095	0.159	0.243	3.50	3.53	11.0	7.5	3.5	60	-51	10	15	0.68	0.29
STF	no	2.3	1	533	344	547	717	68	0.172	0.1	0.171	0.251	3.33	3.32	11.0	6.3	4.7	72	-63	6	19	0.67	0.27
AHR	yes	2.3	1	523	251	535	744	38	0.138	0.078	0.139	0.2	3.86	3.79	11.0	6.4	4.6	36	-41	6	11	0.69	0.30
STF	yes	2.3	1	520	280	525	739	45	0.187	0.092	0.165	0.268	3.30	3.36	11.0	5.8	5.2	45	-45	19	26	0.67	0.27
AHR	no	2.3	3	545	382	558	706	35	0.146	0.086	0.140	0.21	3.95	4.11	4.4	2.9	1.5	105	-55	5	6	0.67	0.30
SHR	no	2.3	3	548	376	545	735	48	0.149	0.089	0.146	0.212	3.84	3.87	3.3	2.3	1.0	181	-110	3	6	0.68	0.29
STF	no	2.3	3	539	351	540	761	53	0.170	0.104	0.172	0.236	3.44	3.67	4.4	2.6	1.8	136	-125	21	25	0.67	0.27
AHR	yes	2.3	3	541	278	543	814	33	0.156	0.074	0.140	0.252	3.86	3.86	7.6	4.0	3.7	50	-43	15	20	0.67	0.30
SHR	yes	2.3	3	499	284	502	693	37	0.135	0.074	0.130	0.203	3.86	4.13	7.8	3.8	4.1	57	-48	6	10	0.67	0.30
STF	yes	2.3	3	523	308	534	753	36	0.167	0.098	0.160	0.241	3.51	3.70	7.3	3.3	4.0	59	-52	21	24	0.67	0.28
AHR	no	3.0	1	573	388	566	762	59	0.159	0.092	0.155	0.229	3.79	3.59	11.0	7.5	3.5	65	-47	1	5	0.68	0.29
STF	no	3.0	1	555	331	572	746	80	0.170	0.096	0.168	0.251	3.48	3.39	11.0	6.7	4.3	82	-78	4	11	0.67	0.27
AHR	yes	3.0	1	539	245	547	754	41	0.136	0.068	0.137	0.201	4.06	3.83	11.0	5.7	5.3	42	-40	3	5	0.69	0.31
STF	yes	3.0	1	510	229	530	733	47	0.168	0.077	0.152	0.247	3.45	3.55	11.0	5.7	5.3	48	-47	13	20	0.67	0.28
AHR	no	3.0	3	560	387	564	770	43	0.148	0.087	0.142	0.213	4.01	4.10	4.4	2.9	1.5	132	-61	4	5	0.67	0.30
SHR	no	3.0	3	553	361	557	726	54	0.143	0.086	0.143	0.201	3.97	3.92	3.3	2.4	0.9	204	-121	1	3	0.68	0.30
STF	no	3.0	3	556	337	551	763	63	0.168	0.102	0.166	0.237	3.56	3.77	4.4	2.9	1.5	154	-167	11	23	0.67	0.27
AHR	yes	3.0	3	529	257	529	806	35	0.140	0.057	0.126	0.235	4.11	3.83	8.1	3.5	4.6	48	-48	7	12	0.67	0.31
SHR	yes	3.0	3	489	275	497	697	36	0.124	0.062	0.118	0.191	4.11	4.00	8.3	3.4	4.8	51	-46	2	5	0.68	0.32
STF	yes	3.0	3	535	329	537	743	39	0.159	0.09	0.154	0.239	3.71	3.85	7.6	3.5	4.1	62	-53	10	20	0.67	0.28

Table 3.2. HCM Results of different F rule simulations. Statistics reported over the last 11 years of the simulation. Target TAC is the TAC which applies when SSB>Btrig. SSBtrig is the trigger point below which the HCR changes. HCR(per) is the period of the HCR. Catch is reported as average and percentiles in kt. IAV is Interannual variability calculated as the mean absolute change in TAC from year to year in kt. F is reported as average and percentiles. 2017–2027 is the average SSB over this period. 2027 is the average SSB in this year. TAC variation; Evts is the average number of times the TAC is changed. + is the average number of times the TAC is changed upwards, − is the average number of times the TAC is changed downwards. Avg Inc is the average increase in the TAC in kt (when the TAC is increased), Avg Dec is the average decrease in the TAC in kt (when the TAC is decreased). Risk is the average number of times where SSB is below the reference level expressed as a percentage. Percentage catch is the fraction by number-at-age and above.

HCM F Rule

Perc	Dur	Targ	Trig	Cmean	C10	C50	C90	Fmean	F10	F50	F90	Smean	S20	Nchange	Nup	Ndown	Cup	Cdown	Ris
10	1	0.16	2300	550	408	543	700	0.142	0.099	0.141	0.187	3743	3653	11	7.9	3.1	44.7	-90.2	
15	1	0.16	2300	573	441	564	718	0.154	0.12	0.153	0.19	3585	3528	11	7.3	3.7	64.9	-113.4	
20	1	0.16	2300	585	447	575	726	0.162	0.128	0.162	0.196	3479	3452	11	6.8	4.2	81.9	-127.8	
10	1	0.16	3000	527	394	521	667	0.132	0.098	0.133	0.167	3807	3789	11	8.4	2.6	49.9	-138.5	
15	1	0.16	3000	555	417	547	708	0.144	0.112	0.143	0.178	3672	3645	11	7.6	3.4	70.2	-146.4	
20	1	0.16	3000	570	437	558	717	0.15	0.121	0.148	0.183	3618	3613	11	7.3	3.7	86.9	-162.9	
10	1	0.18	2300	569	422	566	719	0.156	0.107	0.157	0.202	3594	3523	11	8.1	2.9	47.1	-109.5	
20	1	0.18	2300	606	468	598	755	0.178	0.137	0.177	0.218	3338	3317	11	7	4	86.4	-144.1	
15	1	0.18	2300	587	444	579	747	0.168	0.126	0.168	0.213	3415	3360	11	7.4	3.6	67.5	-129.5	
10	1	0.18	3000	554	423	545	700	0.145	0.105	0.145	0.184	3683	3602	11	8.3	2.7	55	-151.5	
15	1	0.18	3000	567	429	560	711	0.155	0.116	0.156	0.193	3529	3516	11	7.7	3.3	75.9	-171.2	
20	1	0.18	3000	578	445	568	723	0.164	0.128	0.163	0.201	3428	3424	11	7.3	3.7	92.7	-177.5	
10	1	0.2	2300	582	430	574	736	0.168	0.111	0.168	0.221	3464	3431	11	8.2	2.8	49.2	-128.9	
15	1	0.2	2300	607	469	601	759	0.185	0.138	0.185	0.231	3289	3252	11	7.6	3.4	70.8	-141.6	
20	1	0.2	2300	615	488	612	750	0.194	0.15	0.193	0.239	3166	3177	11	7.2	3.8	88.8	-159.5	
15	1	0.2	3000	590	453	586	730	0.172	0.133	0.17	0.213	3373	3347	11	7.8	3.2	82.5	-187.7	
10	1	0.2	3000	564	431	552	708	0.157	0.114	0.157	0.2	3531	3498	11	8.3	2.7	61.4	-173	
20	1	0.2	3000	605	476	601	748	0.181	0.142	0.18	0.224	3301	3290	11	7.3	3.7	101.7	-195.4	

Table 3.3. HCM Results of different Harvest rate simulations. Statistics reported over the last 11 years of the simulation. Target TAC is the TAC which applies when SSB>Btrig. SSBtrig is the trigger point below which the HCR changes. HCR(per) is the period of the HCR. Catch is reported as average and percentiles in kt. IAV is Interannual variability calculated as the mean absolute change in TAC from year to year in kt. F is reported as average and percentiles. 2017–2027 is the average SSB over this period. 2027 is the average SSB in this year. TAC variation; Evts is the average number of times the TAC is changed. + is the average number of times the TAC is changed upwards, − is the average number of times the TAC is changed downwards. Avg Inc is the average increase in the TAC in kt (when the TAC is increased), Avg Dec is the average decrease in the TAC in kt (when the TAC is decreased). Risk is the average number of times where SSB is below the reference level expressed as a percentage. Percentage catch is the fraction by number-at-age and above.

HCM Harvest Rate with 15% constraint applied always.

Dur	Targ	Trig	Cmean	C10	C50	C90	IAV	Fmean	F10	F50	F90	Smean	S20	Nchange	Nup	Ndown	Cup	Cdown	Risklim
1	0.12	2300	495	394	492	610	12.2	0.115	0.096	0.114	0.135	3983	3986	11	6.3	4.7	53.6	-58.2	1.6
1	0.13	2300	517	411	515	633	12.3	0.128	0.104	0.125	0.147	3836	3853	11	6.4	4.6	56.1	-62.2	1.5
1	0.14	2300	537	426	534	658	12.4	0.14	0.113	0.137	0.163	3694	3698	11	6.3	4.7	58.2	-66.1	2.1
1	0.15	2300	556	442	555	676	12.4	0.147	0.12	0.146	0.175	3594	3570	11	6.3	4.7	60.4	-67.9	2.6
1	0.16	2300	577	458	573	702	12.4	0.161	0.132	0.16	0.194	3459	3426	11	6.2	4.8	62.7	-70.9	4
1	0.17	2300	594	475	589	724	12.4	0.172	0.14	0.172	0.207	3376	3320	11	6.2	4.8	65.2	-72.6	5.7
1	0.18	2300	604	478	603	736	12.5	0.186	0.147	0.183	0.224	3254	3198	11	6.2	4.8	66.5	-74	7.9
1	0.12	3000	493	386	487	614	12.4	0.115	0.091	0.112	0.134	4039	4015	11	6.4	4.6	53.9	-59.7	0.9
1	0.13	3000	511	394	509	640	12.7	0.121	0.096	0.122	0.147	3914	3856	11	6.5	4.5	56.6	-63.6	1.3
1	0.14	3000	535	419	536	662	12.6	0.133	0.105	0.134	0.162	3778	3738	11	6.4	4.6	58.2	-66.4	2.1
1	0.15	3000	555	427	554	689	12.7	0.146	0.112	0.143	0.174	3691	3641	11	6.4	4.6	61.2	-69.3	2.4
1	0.16	3000	565	434	563	701	12.8	0.153	0.116	0.152	0.188	3565	3520	11	6.4	4.6	62.3	-71.7	3.7
1	0.17	3000	584	447	582	723	12.8	0.165	0.124	0.165	0.202	3472	3357	11	6.4	4.6	64.8	-74.4	4.3
1	0.18	3000	602	468	599	745	12.9	0.176	0.131	0.175	0.222	3377	3273	11	6.3	4.7	67	-77	6.2
3	0.12	2300	457	345	454	578	4.8	0.13	0.081	0.106	0.142	3981	4097	4	2.6	1.5	53.1	-51.6	4
3	0.13	2300	483	367	480	605	4.8	0.137	0.09	0.118	0.156	3860	3922	4	2.6	1.5	55.1	-55.1	4.6
3	0.14	2300	501	380	501	624	4.9	0.146	0.094	0.124	0.173	3765	3836	4	2.6	1.5	58.4	-59.4	4.8
3	0.15	2300	515	372	522	650	5.1	0.178	0.1	0.135	0.187	3616	3631	4.1	2.5	1.5	60.4	-57.3	7.1
3	0.16	2300	539	424	541	676	4.9	0.168	0.107	0.145	0.198	3589	3591	4	2.6	1.4	61.9	-63.8	6.9
3	0.17	2300	555	433	558	686	4.8	0.167	0.11	0.156	0.215	3488	3497	4	2.7	1.4	63.2	-67.5	7.3
3	0.18	2300	563	435	571	699	5	0.19	0.115	0.166	0.233	3376	3380	4	2.6	1.4	65.6	-67.6	10
3	0.12	3000	455	337	454	576	5	0.136	0.08	0.105	0.142	3992	4132	4.1	2.5	1.6	54.1	-52.9	4.1
3	0.13	3000	478	346	477	605	4.9	0.136	0.084	0.114	0.152	3923	4004	4	2.5	1.5	56.1	-57.6	4.3
3	0.14	3000	489	341	490	625	4.9	0.141	0.088	0.121	0.169	3772	3854	4	2.6	1.5	57.5	-59.4	5.5
3	0.15	3000	507	361	507	642	5	0.159	0.089	0.131	0.186	3701	3777	4.1	2.6	1.5	59.6	-61.6	5.7
3	0.16	3000	524	372	527	663	5	0.158	0.096	0.138	0.201	3655	3683	4	2.6	1.4	61.8	-62.9	7.1
3	0.17	3000	538	400	543	681	5	0.167	0.1	0.147	0.22	3523	3546	4	2.6	1.4	64	-67.2	8.4
3	0.18	3000	547	372	555	714	5.2	0.186	0.098	0.151	0.232	3498	3506	4.1	2.6	1.4	65.4	-68.4	8.6

Table 3.4. HCM Results of different Harvest Rate simulations. Statistics reported over the last 11 years of the simulation. Target TAC is the TAC which applies when SSB>Btrig. SSBtrig is the trigger point below which the HCR changes. HCR(per) is the period of the HCR. Catch is reported as average and percentiles in kt. IAV is Interannual variability calculated as the mean absolute change in TAC from year to year in kt. F is reported as average and percentiles. 2017–2027 is the average SSB over this period. 2027 is the average SSB in this year. TAC variation; Evts is the average number of times the TAC is changed. + is the average number of times the TAC is changed upwards, − is the average number of times the TAC is changed downwards. Avg Inc is the average increase in the TAC in kt (when the TAC is increased), Avg Dec is the average decrease in the TAC in kt (when the TAC is decreased). Risk is the average number of times where SSB is below the reference level expressed as a percentage. Percentage catch is the fraction by number-at-age and above.

HCM Harvest Rate with no constraint.

Dur	Targ	Trig	Cmean	C10	C50	C90	IAV	Fmean	F10	F50	F90	Smean	S20	Nchange	Nup	Ndown	Cup	Cdown	Risklim	4
1	0.12	2300	515	413	510	622	27.5	0.122	0.106	0.122	0.14	3895	3941	11	5.7	5.3	124	-129.4	0.3	0
1	0.13	2300	539	435	532	659	28	0.134	0.116	0.133	0.154	3749	3745	11	5.7	5.3	130.5	-137.5	0.6	0
1	0.14	2300	559	449	555	676	28.9	0.147	0.128	0.147	0.169	3587	3601	11	5.7	5.3	138.6	-145.5	1.1	0
1	0.15	2300	575	470	566	688	29.3	0.159	0.137	0.157	0.183	3466	3474	11	5.7	5.3	144.4	-150.8	1.5	0
1	0.16	2300	591	481	584	704	30.6	0.171	0.146	0.17	0.198	3342	3346	11	5.7	5.3	152.1	-162.5	2.3	0
1	0.17	2300	607	490	603	724	31.5	0.184	0.155	0.182	0.216	3223	3227	11	5.7	5.3	157.9	-167.9	4	0
1	0.18	2300	616	511	609	731	32.6	0.196	0.167	0.195	0.227	3110	3123	11	5.7	5.3	164.5	-174.1	6.3	0
1	0.12	3000	512	401	508	623	31.8	0.122	0.105	0.121	0.139	3875	3896	11	5.7	5.3	134	-141.2	0.2	0
1	0.13	3000	535	422	533	649	32.6	0.133	0.113	0.131	0.153	3761	3774	11	5.7	5.3	142.1	-150.4	0.4	0
1	0.14	3000	554	443	550	673	34.6	0.143	0.121	0.142	0.165	3660	3657	11	5.7	5.3	154.8	-160	0.7	0
1	0.15	3000	574	452	569	690	35.7	0.155	0.131	0.154	0.181	3529	3523	11	5.7	5.3	161.6	-170	1.1	0
1	0.16	3000	582	461	573	714	38.1	0.164	0.138	0.164	0.191	3399	3425	11	5.7	5.3	171.7	-184.1	1.8	0
1	0.17	3000	598	485	593	721	39.4	0.175	0.147	0.175	0.205	3314	3326	11	5.8	5.2	180.1	-193.6	2.9	0
1	0.18	3000	612	486	604	749	41	0.187	0.156	0.185	0.219	3207	3212	11	5.7	5.3	191.2	-204.9	3.8	0
3	0.12	2300	520	405	513	648	13.5	0.124	0.101	0.123	0.149	3916	3936	4	2	2	161.7	-165.2	1.1	0
3	0.13	2300	534	418	526	660	13.9	0.135	0.108	0.132	0.166	3743	3778	4	2.1	1.9	168.5	-178.9	1.4	0
3	0.14	2300	558	439	552	688	14.7	0.148	0.118	0.146	0.18	3614	3643	4	2	2	184.9	-190.4	2.9	0
3	0.15	2300	577	455	567	710	15.1	0.163	0.129	0.159	0.202	3445	3450	4	2.1	1.9	193	-209	4.1	0
3	0.16	2300	586	453	577	719	16.6	0.17	0.132	0.166	0.213	3379	3406	4	2	2	209.2	-218.5	5.4	0
3	0.17	2300	605	475	599	750	17.1	0.186	0.146	0.182	0.231	3242	3224	4	2.1	1.9	219	-228.9	7.9	0
3	0.18	2300	618	480	617	755	18.3	0.2	0.155	0.195	0.252	3115	3128	4	2.1	1.9	227.5	-244.7	10	0
3	0.12	3000	509	390	503	630	15.9	0.121	0.095	0.118	0.15	3923	3969	4	2.1	1.9	171.7	-177.5	1	0
3	0.13	3000	537	405	528	678	17	0.133	0.104	0.13	0.165	3800	3798	4	2	2	192.6	-198.6	1.3	0
3	0.14	3000	552	419	544	686	17.5	0.144	0.112	0.141	0.178	3661	3668	4	2	2	196.2	-213.7	2.5	0
3	0.15	3000	567	430	566	703	19.3	0.156	0.123	0.153	0.196	3520	3542	4	2	2	221.3	-230.8	3.7	0
3	0.16	3000	585	443	579	738	20.4	0.168	0.127	0.164	0.21	3416	3404	4	2	2	233.6	-248	5.1	0
3	0.17	3000	593	461	585	744	23.1	0.177	0.135	0.174	0.222	3309	3327	4	2	2	261.1	-270.9	7.2	0
3	0.18	3000	605	463	598	751	24.3	0.191	0.145	0.186	0.245	3180	3189	4	2	2	273.1	-298.9	9.4	0

Table 3.5. HCM Results of different Target TAC simulations. Statistics reported over the last 11 years of the simulation. Target TAC is the TAC which applies when SSB>Btrig. SSBtrig is the trigger point below which the HCR changes. HCR(per) is the period of the HCR. Catch is reported as average and percentiles in kt. IAV is Interannual variability calculated as the mean absolute change in TAC from year to year in kt. F is reported as average and percentiles. 2017–2027 is the average SSB over this period. 2027 is the average SSB in this year. TAC variation; Evts is the average number of times the TAC is changed. + is the average number of times the TAC is changed upwards, − is the average number of times the TAC is changed downwards. Avg Inc is the average increase in the TAC in kt (when the TAC is increased), Avg Dec is the average decrease in the TAC in kt (when the TAC is decreased). Risk is the average number of times where SSB is below the reference level expressed as a percentage. Percentage catch is the fraction by number-at-age and above.

HCR Target TAC 15% constraint

Dur	Targ	Trig	Cmean	C10	C50	C90	IAV	Fmean	F10	F50	F90	Smean	S20	Nchange	Nup	Ndowr	Cup	Cdown	Risklim
1	450	2300	470	448	472	494	1.4	0.116	0.08	0.117	0.153	3980	4170	1.7	1.1	0.6	34.4	-41.1	2.8
1	500	2300	518	488	524	548	2.2	0.143	0.099	0.141	0.189	3661	3775	2.4	1.5	0.9	38.8	-45.5	6.3
1	550	2300	563	520	573	600	3	0.178	0.122	0.173	0.23	3324	3434	3.3	2	1.3	43.6	-50	11
1	600	2300	602	545	616	648	4.2	0.212	0.147	0.207	0.272	3056	3122	4.5	2.6	1.8	47.7	-58	17.7
1	650	2300	634	555	655	696	5.6	0.256	0.18	0.25	0.324	2753	2779	5.7	3.2	2.5	53.2	-63.1	29.9
1	700	2300	658	539	687	745	7	0.312	0.216	0.294	0.383	2483	2483	6.8	3.7	3.2	56.8	-66.8	42.6
1	450	3000	460	425	465	490	3.6	0.109	0.082	0.109	0.135	4041	4188	4	2.4	1.5	35.6	-42.4	1.4
1	500	3000	506	462	514	540	4.3	0.129	0.096	0.13	0.159	3821	3919	4.8	2.9	1.9	39.5	-46.9	2.5
1	550	3000	543	489	552	590	5.6	0.153	0.115	0.149	0.185	3584	3671	5.8	3.5	2.3	45.1	-53.4	4.7
1	600	3000	582	509	593	640	6.6	0.174	0.134	0.174	0.212	3354	3389	6.7	4	2.8	49.9	-59.1	7.2
1	650	3000	611	527	624	684	7.8	0.204	0.158	0.202	0.243	3106	3124	7.8	4.4	3.4	54.4	-63.2	12.8
1	700	3000	633	532	647	722	9	0.228	0.18	0.227	0.277	2896	2925	8.7	5	3.8	58.4	-68.7	20.1
3	450	2300	463	436	471	495	1.1	0.131	0.084	0.116	0.157	3887	4074	1.1	0.8	0.3	35.7	-37.6	4.8
3	500	2300	510	468	521	546	1.4	0.158	0.098	0.138	0.196	3653	3813	1.4	0.9	0.4	41	-42.7	7.9
3	550	2300	548	478	569	601	2	0.204	0.122	0.169	0.235	3274	3394	1.8	1.2	0.7	45.7	-46.4	12.8
3	600	2300	589	512	614	651	2.5	0.244	0.142	0.201	0.286	3046	3120	2.2	1.4	0.9	50.8	-53.2	19.2
3	650	2300	624	518	652	702	3.1	0.31	0.166	0.242	0.369	2751	2742	2.7	1.6	1.1	55.1	-64.6	29.7
3	700	2300	643	489	685	748	3.6	0.372	0.191	0.279	0.463	2520	2467	2.9	1.6	1.4	61.6	-68.3	40.3
3	450	3000	447	401	461	488	2.2	0.132	0.079	0.107	0.142	4010	4178	2.1	1.4	0.7	37.7	-39.4	4.1
3	500	3000	489	430	504	540	2.6	0.141	0.094	0.126	0.164	3746	3915	2.6	1.7	0.9	42.7	-45.5	4.5
3	550	3000	524	440	549	593	3	0.174	0.106	0.145	0.193	3559	3655	2.8	1.8	1	48.4	-50.4	8
3	600	3000	556	454	583	640	3.6	0.206	0.121	0.167	0.225	3330	3379	3.1	2	1.1	54.2	-55	11.1
3	650	3000	585	462	609	684	4	0.245	0.137	0.194	0.272	3098	3113	3.5	2.1	1.3	57.9	-61.1	17.1
3	700	3000	616	481	636	730	4.2	0.265	0.153	0.22	0.324	2927	2923	3.6	2.2	1.4	63.5	-67.9	23.3

Table 3.6. HCM Results of different Target TAC simulations. Statistics reported over the last 11 years of the simulation. Target TAC is the TAC which applies when SSB>Btrig. SSBtrig is the trigger point below which the HCR changes. HCR(per) is the period of the HCR. Catch is reported as average and percentiles in kt. IAV is Interannual variability calculated as the mean absolute change in TAC from year to year in kt. F is reported as average and percentiles. 2017–2027 is the average SSB over this period. 2027 is the average SSB in this year. TAC variation; Evts is the average number of times the TAC is changed. + is the average number of times the TAC is changed upwards, − is the average number of times the TAC is changed downwards. Avg Inc is the average increase in the TAC in kt (when the TAC is increased), Avg Dec is the average decrease in the TAC in kt (when the TAC is decreased). Risk is the average number of times where SSB is below the reference level expressed as a percentage. Percentage catch is the fraction by number-at-age and above.

HCR Target TAC no constraint

Dur	Targ	Trig	Cmean	C10	C50	C90	IAV	Fmean	F10	F50	F90	Smean	S20	Nchang	Nup	Ndown	Cup	Cdown	Risklim	4+
1	450	2300	472	451	472	494	1.8	0.116	0.08	0.116	0.153	4000	4184	1.3	0.7	0.6	57.3	-58.1	2.1	0.8
1	500	2300	521	493	524	549	3	0.143	0.1	0.142	0.19	3671	3785	2	1	0.9	69.8	-66	5.7	0.8
1	550	2300	567	527	572	600	4.6	0.176	0.123	0.175	0.229	3326	3437	2.8	1.5	1.4	79.2	-75.3	10.5	0.8
1	600	2300	605	551	615	648	6.7	0.211	0.149	0.209	0.272	3049	3120	4	2.1	1.9	86.9	-88.8	17.6	0.8
1	650	2300	637	564	653	695	9.7	0.253	0.182	0.252	0.327	2743	2781	5.2	2.7	2.5	100.6	-103.9	30.5	0.8
1	700	2300	661	557	683	743	12.9	0.3	0.219	0.297	0.383	2471	2485	6.3	3.2	3.1	112	-116	43.6	0
1	450	3000	463	430	466	491	4.8	0.109	0.082	0.11	0.135	4060	4202	3.3	1.7	1.5	59.1	-61.3	0.5	0.8
1	500	3000	509	470	514	541	6.3	0.129	0.096	0.13	0.16	3823	3926	4.1	2.1	2	68	-69.7	1.8	0.8
1	550	3000	548	496	553	591	8.6	0.152	0.117	0.152	0.186	3576	3670	5.1	2.6	2.4	82.1	-81.7	3.8	0.8
1	600	3000	587	520	595	640	10.6	0.177	0.136	0.179	0.214	3336	3378	6.1	3.2	2.9	90.2	-91.5	6.7	0.8
1	650	3000	613	533	622	684	13.6	0.204	0.164	0.205	0.242	3079	3115	7.2	3.7	3.5	101.6	-105.1	12.6	0.8
1	700	3000	638	549	647	720	16.1	0.233	0.191	0.231	0.278	2860	2903	8.1	4.3	3.8	110.6	-116.6	19.9	0.8
3	450	2300	472	446	474	495	1	0.117	0.083	0.115	0.153	3971	4129	0.6	0.3	0.3	70.4	-58.3	2.5	0.8
3	500	2300	520	491	524	547	1.5	0.142	0.098	0.139	0.192	3710	3850	0.8	0.5	0.3	80.6	-68.6	5.8	0.8
3	550	2300	563	517	572	602	2.5	0.175	0.123	0.171	0.23	3327	3440	1.2	0.7	0.6	97.9	-84.3	10.6	0.8
3	600	2300	602	540	615	652	3.6	0.211	0.147	0.206	0.276	3053	3144	1.6	0.9	0.8	110.1	-108.1	18	0.8
3	650	2300	633	538	652	703	5.1	0.256	0.179	0.248	0.338	2740	2770	2.1	1.1	1	128	-129	30.5	0.8
3	700	2300	647	500	673	747	7	0.298	0.213	0.287	0.391	2484	2507	2.5	1.3	1.3	144.9	-144.7	42.4	0
3	450	3000	461	425	466	490	2.5	0.107	0.079	0.105	0.136	4140	4266	1.4	0.8	0.6	72.8	-67.1	0.9	0.8
3	500	3000	505	458	511	543	3.3	0.129	0.099	0.127	0.161	3807	3938	1.7	0.9	0.8	85.7	-76.2	2.2	0.8
3	550	3000	547	483	557	597	4.1	0.15	0.111	0.149	0.188	3611	3685	2	1.1	0.9	97.4	-89.4	4.2	0.8
3	600	3000	581	507	591	644	5.4	0.176	0.133	0.175	0.218	3334	3389	2.4	1.3	1.1	112.8	-108.8	8	0.8
3	650	3000	610	521	619	688	6.9	0.205	0.158	0.202	0.257	3078	3129	2.8	1.4	1.4	132.5	-124.6	15.3	0.8
3	700	3000	635	532	645	731	8.3	0.235	0.179	0.233	0.295	2865	2903	3.1	1.6	1.5	145.1	-143.5	23.3	0.8

Table 3.7. F-PRESS Results of different Target TAC simulations. Statistics reported over the last 11 years of the simulation. Target TAC is the TAC which applies when SSB>Btrig. SSBtrig is the trigger point below which the HCR changes. HCR(per) is the period of the HCR. Catch is reported as average and percentiles in kt. IAV is Interannual variability calculated as the mean absolute change in TAC from year to year in kt. F is reported as average and percentiles. 2017–2027 is the average SSB over this period. 2027 is the average SSB in this year. TAC variation; Evts is the average number of times the TAC is changed. + is the average number of times the TAC is changed upwards, − is the average number of times the TAC is changed downwards. Avg Inc is the average increase in the TAC in kt (when the TAC is increased), Avg Dec is the average decrease in the TAC in kt (when the TAC is decreased). Risk is the average number of times where SSB is below the reference level expressed as a percentage. Percentage catch is the fraction by number-at-age and above.

15% change restriction.

TAC	SSBtrig	HCRper	MnYld	0.1Yld	0.5Yld	0.9Yld	MnIAV	MnF	0.1F	0.5F	0.9F	MnSSB	MnTermSSB	SSB20/10	TACYrs	TACinc	TACdec	AvgTACInc	AvgTACDec	Rsk2
400	2.3	1	416	408	419	422	11	0.09	0.07	0.09	0.12	4.29	4.45	1.1	1.5	0.9	0.6	27	-27	
450	2.3	1	465	447	471	475	15	0.11	0.08	0.11	0.15	3.91	4.08	1.1	2.3	1.3	1.1	30	-32	
500	2.3	1	514	492	522	528	19	0.14	0.1	0.14	0.17	3.69	3.81	1.07	2.9	1.6	1.3	36	-38	
550	2.3	1	558	527	570	579	24	0.17	0.12	0.16	0.21	3.37	3.46	1.06	3.4	2	1.4	43	-52	
600	2.3	1	597	539	617	631	30	0.2	0.14	0.2	0.26	3.09	3.11	1.01	4.4	2.5	1.9	47	-56	1
650	2.3	1	630	553	650	682	38	0.24	0.17	0.23	0.3	2.8	2.82	1.01	5.8	3.1	2.7	52	-61	2
700	2.3	1	655	562	676	733	46	0.32	0.2	0.27	0.37	2.56	2.54	0.98	7	3.7	3.3	56	-66	3
750	2.3	1	665	520	692	778	54	0.4	0.24	0.32	0.44	2.27	2.22	0.94	8	4.1	3.9	59	-68	5
400	2.3	3	415	402	419	423	11	0.09	0.07	0.09	0.11	4.28	4.45	1.09	1.2	0.7	0.5	27	-22	
450	2.3	3	464	443	471	475	13	0.11	0.08	0.11	0.14	4.02	4.14	1.08	1.8	1.1	0.7	31	-26	
500	2.3	3	510	473	523	528	17	0.13	0.1	0.13	0.17	3.66	3.79	1.07	2.2	1.3	0.9	36	-36	
550	2.3	3	555	509	573	580	20	0.16	0.12	0.16	0.21	3.4	3.47	1.05	2.4	1.5	0.9	44	-52	
600	2.3	3	589	515	612	632	25	0.68	0.14	0.19	0.26	3.1	3.12	1.02	3.3	2	1.3	47	-57	1
650	2.3	3	624	541	648	683	31	0.31	0.16	0.23	0.31	2.85	2.83	0.98	4	2.3	1.7	52	-64	2
700	2.3	3	645	525	675	735	37	1.1	0.19	0.27	0.39	2.55	2.5	0.96	4.8	2.5	2.2	54	-70	3
750	2.3	3	653	491	681	782	44	1.68	0.23	0.32	0.51	2.27	2.2	0.93	5.9	2.9	3	58	-72	5
400	3	1	407	381	414	421	17	0.09	0.06	0.09	0.11	4.36	4.52	1.09	3.9	2.2	1.6	29	-30	
450	3	1	454	419	463	474	22	0.1	0.08	0.1	0.13	4.07	4.19	1.07	4.8	2.7	2.1	33	-35	
500	3	1	496	452	506	525	28	0.12	0.09	0.12	0.15	3.79	3.9	1.07	5.7	3.2	2.5	38	-42	
550	3	1	538	484	548	576	34	0.14	0.11	0.14	0.18	3.6	3.65	1.05	6	3.4	2.5	45	-53	
600	3	1	571	497	583	627	40	0.17	0.13	0.17	0.2	3.35	3.41	1.04	6.8	3.8	3	50	-57	
650	3	1	602	513	611	674	47	0.19	0.15	0.19	0.24	3.11	3.12	0.98	7.8	4.3	3.5	53	-62	1
700	3	1	628	528	637	720	54	0.22	0.17	0.22	0.27	2.93	2.91	1	8.6	4.8	3.9	57	-66	1
750	3	1	646	539	651	753	62	0.25	0.19	0.24	0.31	2.72	2.7	0.99	9.3	5	4.3	61	-70	2
400	3	3	405	372	416	422	15	0.08	0.06	0.08	0.11	4.39	4.53	1.08	3	1.9	1.1	28	-28	
450	3	3	450	404	464	474	18	0.1	0.08	0.1	0.13	4.15	4.24	1.04	3.3	2.1	1.3	33	-34	
500	3	3	490	432	505	526	22	0.12	0.09	0.12	0.15	3.89	3.96	1.04	4.1	2.5	1.6	36	-40	
550	3	3	531	465	544	578	27	0.14	0.11	0.14	0.18	3.65	3.68	1.03	4.3	2.7	1.6	44	-53	
600	3	3	563	485	575	628	33	0.16	0.12	0.16	0.21	3.39	3.4	1	5.1	3	2.1	48	-60	
650	3	3	595	500	607	679	37	0.19	0.14	0.18	0.24	3.18	3.16	0.99	5.5	3.3	2.3	51	-66	1
700	3	3	619	506	630	719	42	1.15	0.16	0.21	0.28	2.98	2.95	1	6.2	3.6	2.6	54	-69	1
750	3	3	636	500	648	760	47	0.24	0.18	0.24	0.33	2.78	2.76	0.98	6.7	3.8	2.9	57	-74	2

Table 3.8. F-PRESS Results of different Target TAC simulations. Statistics reported over the last 11 years of the simulation. Target TAC is the TAC which applies when SSB>Btrig. SSBtrig is the trigger point below which the HCR changes. HCR(per) is the period of the HCR. Catch is reported as average and percentiles in kt. IAV is Interannual variability calculated as the mean absolute change in TAC from year to year in kt. F is reported as average and percentiles. 2017–2027 is the average SSB over this period. 2027 is the average SSB in this year. TAC variation; Evts is the average number of times the TAC is changed. + is the average number of times the TAC is changed upwards, − is the average number of times the TAC is changed downwards. Avg Inc is the average increase in the TAC in kt (when the TAC is increased), Avg Dec is the average decrease in the TAC in kt (when the TAC is decreased). Risk is the average number of times where SSB is below the reference level expressed as a percentage. Percentage catch is the fraction by number-at-age and above.

No change restriction.

TAC	SSBtrig	HCRp	MnYld	0.1Yld	0.5Yld	0.9Yld	MnIAV	MnF	0.1F	0.5F	0.9F	MnSSB	MnTerm	SSB20/10	AvgTACInc	AvgTACDe	Rsk2.3	F
400	2.3	1	416	406	419	422	13	0.09	0.07	0.09	0.12	4.24	4.43	1.11	42	-39	1	
450	2.3	1	467	453	471	475	16	0.11	0.08	0.11	0.14	3.96	4.1	1.08	49	-45	1	
500	2.3	1	514	489	522	527	22	0.14	0.1	0.13	0.18	3.67	3.78	1.07	57	-52	4	
550	2.3	1	559	522	571	580	29	0.17	0.12	0.16	0.21	3.38	3.46	1.05	74	-73	8	
600	2.3	1	596	539	612	631	40	0.2	0.15	0.2	0.26	3.04	3.1	1.03	81	-83	17	
650	2.3	1	631	552	647	682	53	0.24	0.18	0.24	0.31	2.79	2.81	1.01	91	-91	27	
700	2.3	1	655	558	675	732	68	0.29	0.21	0.28	0.37	2.51	2.48	0.96	97	-101	40	
750	2.3	1	665	527	682	770	85	0.33	0.25	0.33	0.42	2.24	2.2	0.96	109	-110	56	
400	2.3	3	416	405	419	423	11	0.09	0.07	0.09	0.12	4.27	4.45	1.09	48	-37	1	
450	2.3	3	466	447	472	476	13	0.11	0.08	0.11	0.14	3.96	4.09	1.07	57	-45	2	
500	2.3	3	513	483	523	528	17	0.14	0.1	0.13	0.18	3.66	3.77	1.06	66	-55	4	
550	2.3	3	558	516	574	580	21	0.17	0.12	0.16	0.21	3.38	3.45	1.06	91	-92	8	
600	2.3	3	599	541	617	633	28	0.2	0.14	0.2	0.26	3.09	3.14	1.04	105	-105	15	
650	2.3	3	628	546	648	684	36	0.24	0.17	0.24	0.32	2.78	2.8	1	122	-119	27	
700	2.3	3	649	538	668	734	45	0.29	0.21	0.28	0.39	2.5	2.48	0.97	134	-142	42	
750	2.3	3	654	513	677	780	57	0.34	0.24	0.32	0.45	2.23	2.19	0.94	146	-167	55	
400	3	1	409	386	416	421	20	0.08	0.06	0.08	0.11	4.4	4.53	1.09	47	-45	0	
450	3	1	456	426	464	474	26	0.1	0.08	0.1	0.13	4.08	4.21	1.06	55	-50	1	
500	3	1	498	453	508	526	35	0.12	0.09	0.12	0.15	3.83	3.94	1.06	62	-58	1	
550	3	1	537	482	548	577	45	0.15	0.11	0.14	0.18	3.54	3.62	1.06	77	-74	3	
600	3	1	576	510	588	627	55	0.17	0.14	0.17	0.21	3.33	3.37	1.03	83	-84	6	
650	3	1	601	520	610	673	71	0.2	0.15	0.2	0.24	3.06	3.1	1.02	95	-95	13	
700	3	1	629	539	637	712	85	0.22	0.18	0.22	0.27	2.87	2.87	0.99	103	-105	18	
750	3	1	645	538	652	748	99	0.25	0.2	0.25	0.31	2.68	2.69	1.01	112	-114	28	
400	3	3	408	381	417	422	15	0.09	0.06	0.08	0.11	4.37	4.52	1.08	57	-51	0	
450	3	3	455	418	466	474	19	0.1	0.08	0.1	0.13	4.1	4.24	1.06	68	-57	1	
500	3	3	497	447	510	527	24	0.12	0.09	0.12	0.15	3.84	3.92	1.04	81	-71	2	
550	3	3	536	470	549	579	30	0.14	0.11	0.14	0.18	3.59	3.65	1.04	98	-98	3	
600	3	3	570	493	582	629	38	0.17	0.13	0.17	0.21	3.31	3.33	1.03	112	-114	8	
650	3	3	601	514	610	680	46	0.19	0.15	0.19	0.24	3.1	3.11	1.02	130	-137	12	
700	3	3	624	520	634	723	54	0.22	0.17	0.22	0.29	2.89	2.88	0.99	141	-146	20	
750	3	3	638	518	645	749	63	0.25	0.19	0.24	0.33	2.69	2.72	1	151	-169	31	

Table 3.9. Performance statistics for all F-rule options tested (HCM).

METHOD	PERC	DUR	TARG	TRIG	CMEAN	C10	C50	C90	FMEAN	F10	F50	F90	SMEAN	S20	NCHANGE	NUP	NDOWN	CUP	CDOWN	RISKLIM	RISKTRIG	DEPL	4+	7+
TargF	5.0	1	0.120	2000.	422.	261.	416.	588.	0.091	0.042	0.090	0.139	4463.	4488.	11.0	8.7	2.3	17.6	-36.2	0.5	0.1	0.000	0.90	0.57
TargF	5.0	1	0.120	2100.	416.	266.	411.	568.	0.089	0.044	0.087	0.134	4468.	4470.	11.0	9.1	1.9	17.6	-39.4	0.3	0.1	0.000	0.90	0.58
TargF	5.0	1	0.120	2200.	414.	265.	407.	579.	0.087	0.045	0.085	0.131	4528.	4497.	11.0	9.1	1.9	17.6	-42.0	0.4	0.3	0.000	0.90	0.58
TargF	5.0	1	0.120	2300.	416.	270.	408.	580.	0.087	0.044	0.086	0.132	4538.	4503.	11.0	9.3	1.7	17.7	-46.4	0.3	0.3	0.000	0.90	0.58
TargF	5.0	1	0.120	2400.	413.	271.	409.	559.	0.086	0.047	0.085	0.125	4545.	4531.	11.0	9.4	1.6	17.9	-52.8	0.2	0.5	0.000	0.90	0.58
TargF	5.0	1	0.120	2500.	408.	276.	401.	548.	0.083	0.047	0.082	0.119	4595.	4586.	11.0	9.5	1.5	18.1	-53.3	0.1	0.6	0.000	0.90	0.59
TargF	5.0	1	0.120	2600.	413.	287.	400.	552.	0.085	0.048	0.084	0.122	4551.	4532.	11.0	9.5	1.5	18.3	-61.7	0.2	0.8	0.000	0.90	0.59
TargF	5.0	1	0.120	2700.	416.	286.	407.	553.	0.085	0.048	0.085	0.120	4581.	4536.	11.0	9.5	1.5	19.0	-62.7	0.2	1.2	0.000	0.90	0.59
TargF	5.0	1	0.120	2800.	410.	288.	407.	539.	0.083	0.049	0.084	0.114	4574.	4544.	11.0	9.6	1.4	19.2	-73.0	0.1	2.1	0.000	0.90	0.59
TargF	5.0	1	0.120	2900.	412.	288.	405.	543.	0.084	0.049	0.086	0.115	4561.	4543.	11.0	9.5	1.5	20.0	-79.3	0.2	3.6	0.000	0.90	0.59
TargF	5.0	1	0.120	3000.	411.	284.	407.	542.	0.083	0.049	0.084	0.112	4574.	4560.	11.0	9.6	1.5	20.2	-82.0	0.2	4.1	0.000	0.90	0.59
TargF	5.0	1	0.120	3100.	412.	289.	405.	546.	0.084	0.051	0.084	0.113	4553.	4577.	11.0	9.5	1.5	21.4	-87.6	0.2	5.8	0.000	0.90	0.59
TargF	5.0	1	0.120	3200.	411.	291.	404.	536.	0.084	0.052	0.086	0.112	4537.	4556.	11.0	9.4	1.6	22.1	-92.5	0.3	8.4	0.000	0.90	0.59
TargF	5.0	1	0.120	3300.	419.	302.	416.	541.	0.085	0.057	0.086	0.113	4541.	4515.	11.0	9.4	1.6	23.7	-91.0	0.1	9.9	0.000	0.90	0.59
TargF	5.0	1	0.120	3400.	420.	303.	413.	547.	0.086	0.054	0.087	0.113	4542.	4550.	11.0	9.3	1.7	25.0	-99.5	0.2	13.0	0.000	0.90	0.59
TargF	5.0	1	0.120	3500.	416.	308.	412.	530.	0.086	0.057	0.087	0.111	4476.	4519.	11.0	9.2	1.8	26.9	-104.0	0.2	15.0	0.000	0.90	0.58
TargF	5.0	1	0.140	2000.	447.	282.	443.	608.	0.102	0.050	0.099	0.156	4292.	4283.	11.0	9.1	1.9	18.9	-44.6	0.8	0.2	0.000	0.89	0.55
TargF	5.0	1	0.140	2100.	453.	299.	443.	620.	0.101	0.052	0.098	0.154	4319.	4295.	11.0	9.1	1.9	19.3	-49.0	0.8	0.3	0.000	0.89	0.56
TargF	5.0	1	0.140	2200.	448.	297.	443.	610.	0.101	0.053	0.098	0.151	4309.	4316.	11.0	9.1	1.9	19.3	-54.2	0.9	0.6	0.000	0.89	0.56
TargF	5.0	1	0.140	2300.	443.	294.	436.	604.	0.098	0.052	0.096	0.146	4343.	4330.	11.0	9.3	1.7	19.3	-58.9	0.6	0.6	0.000	0.89	0.56
TargF	5.0	1	0.140	2400.	449.	304.	445.	600.	0.099	0.055	0.098	0.144	4316.	4275.	11.0	9.4	1.6	19.8	-64.6	0.5	0.9	0.000	0.89	0.56
TargF	5.0	1	0.140	2500.	447.	307.	439.	594.	0.098	0.053	0.099	0.140	4331.	4316.	11.0	9.5	1.5	20.1	-71.3	0.3	1.4	0.000	0.89	0.56
TargF	5.0	1	0.140	2600.	448.	313.	440.	599.	0.098	0.057	0.097	0.139	4323.	4317.	11.0	9.5	1.5	20.6	-79.4	0.5	1.9	0.000	0.89	0.57
TargF	5.0	1	0.140	2700.	447.	304.	443.	590.	0.098	0.055	0.100	0.135	4338.	4335.	11.0	9.5	1.5	21.4	-81.5	0.4	3.2	0.000	0.89	0.56
TargF	5.0	1	0.140	2800.	450.	308.	443.	589.	0.098	0.058	0.100	0.136	4332.	4281.	11.0	9.5	1.5	21.8	-87.8	0.4	3.4	0.000	0.90	0.57
TargF	5.0	1	0.140	2900.	445.	320.	440.	580.	0.097	0.058	0.098	0.133	4326.	4337.	11.0	9.5	1.5	22.4	-95.0	0.3	4.7	0.000	0.89	0.56
TargF	5.0	1	0.140	3000.	448.	315.	440.	587.	0.098	0.059	0.099	0.132	4313.	4300.	11.0	9.4	1.6	23.6	-100.0	0.3	6.3	0.000	0.89	0.57
TargF	5.0	1	0.140	3100.	451.	324.	448.	582.	0.099	0.062	0.100	0.131	4287.	4276.	11.0	9.3	1.7	24.8	-103.3	0.4	8.9	0.000	0.89	0.56
TargF	5.0	1	0.140	3200.	451.	326.	448.	584.	0.099	0.061	0.101	0.130	4306.	4309.	11.0	9.3	1.7	26.3	-108.3	0.4	11.9	0.000	0.89	0.56
TargF	5.0	1	0.140	3300.	452.	325.	442.	590.	0.098	0.060	0.101	0.129	4313.	4311.	11.0	9.3	1.7	28.1	-117.7	0.2	14.2	0.000	0.90	0.56
TargF	5.0	1	0.140	3400.	453.	330.	447.	585.	0.099	0.066	0.101	0.129	4270.	4298.	11.0	9.2	1.8	30.4	-118.9	0.3	18.0	0.000	0.89	0.56
TargF	5.0	1	0.140	3500.	453.	341.	447.	582.	0.099	0.066	0.101	0.129	4270.	4276.	11.0	9.0	2.0	33.5	-122.1	0.3	21.8	0.000	0.89	0.56
TargF	5.0	1	0.160	2000.	478.	309.	467.	669.	0.115	0.056	0.111	0.176	4097.	4082.	11.0	9.1	1.9	20.4	-57.9	1.3	0.2	0.000	0.88	0.53
TargF	5.0	1	0.160	2100.	486.	326.	481.	650.	0.117	0.061	0.115	0.171	4072.	4052.	11.0	9.1	1.9	20.9	-63.6	1.2	0.5	0.000	0.88	0.53
TargF	5.0	1	0.160	2200.	478.	320.	473.	645.	0.114	0.059	0.112	0.169	4107.	4098.	11.0	9.3	1.7	20.9	-68.7	1.0	0.6	0.000	0.88	0.54

Method	Perc	Dur	Targ	Trig	Cmean	C10	C50	C90	Fmean	F10	F50	F90	Smean	S20	Nchange	Nup	Ndown	Cup	Cdown	Risklim	Risktrig	Depl	4+	7+
TargF	5.0	1	0.160	2300.	486.	333.	477.	648.	0.115	0.064	0.113	0.166	4113.	4090.	11.0	9.3	1.7	21.5	-68.9	1.1	1.1	0.000	0.89	0.54
TargF	5.0	1	0.160	2400.	474.	312.	474.	633.	0.111	0.059	0.112	0.158	4147.	4108.	11.0	9.4	1.6	21.5	-81.9	1.1	1.6	0.000	0.89	0.54
TargF	5.0	1	0.160	2500.	475.	323.	467.	637.	0.110	0.063	0.110	0.155	4137.	4121.	11.0	9.5	1.5	21.9	-88.1	0.9	2.1	0.000	0.89	0.54
TargF	5.0	1	0.160	2600.	472.	336.	468.	612.	0.110	0.063	0.110	0.155	4165.	4136.	11.0	9.6	1.4	22.5	-94.7	1.0	3.5	0.000	0.89	0.55
TargF	5.0	1	0.160	2700.	479.	337.	469.	628.	0.111	0.066	0.113	0.153	4126.	4087.	11.0	9.5	1.5	23.3	-102.7	0.9	4.2	0.000	0.89	0.54
TargF	5.0	1	0.160	2800.	470.	336.	464.	612.	0.109	0.064	0.110	0.153	4145.	4143.	11.0	9.5	1.5	24.3	-106.5	0.7	6.4	0.000	0.89	0.55
TargF	5.0	1	0.160	2900.	482.	346.	475.	626.	0.112	0.067	0.114	0.151	4120.	4095.	11.0	9.4	1.6	25.6	-113.4	0.6	7.7	0.000	0.89	0.54
TargF	5.0	1	0.160	3000.	474.	330.	474.	612.	0.110	0.064	0.113	0.150	4153.	4154.	11.0	9.4	1.6	26.8	-114.6	0.8	9.8	0.000	0.89	0.54
TargF	5.0	1	0.160	3100.	480.	355.	476.	617.	0.113	0.070	0.115	0.150	4087.	4136.	11.0	9.2	1.8	30.4	-129.1	1.0	15.0	0.000	0.89	0.54
TargF	5.0	1	0.160	3200.	485.	357.	474.	619.	0.114	0.073	0.115	0.151	4058.	4050.	11.0	9.1	1.9	31.4	-127.3	0.8	17.7	0.000	0.89	0.54
TargF	5.0	1	0.160	3300.	481.	351.	475.	620.	0.112	0.070	0.114	0.147	4103.	4137.	11.0	9.0	2.0	34.4	-135.0	0.7	20.7	0.000	0.89	0.54
TargF	5.0	1	0.160	3400.	482.	361.	478.	608.	0.113	0.074	0.115	0.148	4044.	4105.	11.0	8.9	2.1	36.5	-136.5	0.8	25.6	0.000	0.89	0.54
TargF	5.0	1	0.160	3500.	487.	372.	482.	603.	0.115	0.078	0.117	0.148	4027.	4060.	11.0	8.8	2.2	40.4	-142.7	0.8	30.9	0.000	0.89	0.54
TargF	5.0	1	0.180	2000.	506.	327.	500.	682.	0.131	0.065	0.131	0.195	3884.	3844.	11.0	9.0	2.0	21.9	-67.0	2.6	0.5	0.000	0.88	0.51
TargF	5.0	1	0.180	2100.	505.	336.	497.	679.	0.130	0.065	0.129	0.196	3911.	3920.	11.0	9.1	1.9	21.9	-69.2	2.5	1.0	0.000	0.88	0.51
TargF	5.0	1	0.180	2200.	506.	344.	498.	668.	0.128	0.068	0.128	0.186	3950.	3940.	11.0	9.3	1.7	22.2	-85.7	2.2	1.4	0.000	0.88	0.52
TargF	5.0	1	0.180	2300.	502.	348.	491.	671.	0.125	0.068	0.126	0.181	3979.	3949.	11.0	9.4	1.6	22.8	-89.6	1.6	1.6	0.000	0.88	0.52
TargF	5.0	1	0.180	2400.	496.	332.	495.	660.	0.122	0.066	0.125	0.174	3993.	3970.	11.0	9.5	1.5	23.0	-94.7	1.5	2.3	0.000	0.88	0.53
TargF	5.0	1	0.180	2500.	499.	349.	496.	648.	0.125	0.074	0.125	0.175	3915.	3923.	11.0	9.4	1.6	24.2	-104.4	1.7	3.4	0.000	0.88	0.52
TargF	5.0	1	0.180	2600.	498.	355.	492.	653.	0.123	0.068	0.125	0.169	3969.	3973.	11.0	9.5	1.5	24.8	-110.4	1.4	5.0	0.000	0.88	0.52
TargF	5.0	1	0.180	2700.	503.	356.	496.	653.	0.124	0.071	0.126	0.171	3944.	3968.	11.0	9.3	1.7	26.1	-113.2	1.2	5.8	0.000	0.88	0.52
TargF	5.0	1	0.180	2800.	500.	351.	499.	644.	0.123	0.072	0.126	0.167	3966.	3942.	11.0	9.5	1.5	27.2	-126.1	1.6	8.8	0.000	0.88	0.53
TargF	5.0	1	0.180	2900.	505.	373.	502.	644.	0.125	0.076	0.127	0.168	3921.	3931.	11.0	9.3	1.7	30.0	-131.5	1.5	12.6	0.000	0.88	0.52
TargF	5.0	1	0.180	3000.	503.	367.	503.	630.	0.124	0.079	0.126	0.165	3922.	3951.	11.0	9.3	1.7	31.1	-141.8	1.2	14.1	0.000	0.88	0.52
TargF	5.0	1	0.180	3100.	505.	366.	503.	649.	0.126	0.079	0.129	0.167	3905.	3954.	11.0	9.1	1.9	33.8	-143.2	1.4	18.6	0.000	0.88	0.52
TargF	5.0	1	0.180	3200.	505.	380.	502.	636.	0.126	0.078	0.130	0.166	3887.	3934.	11.0	9.0	2.0	37.5	-150.8	1.2	23.7	0.000	0.88	0.52
TargF	5.0	1	0.180	3300.	507.	383.	502.	637.	0.126	0.080	0.129	0.167	3917.	3957.	11.0	9.0	2.0	39.7	-154.0	1.6	28.8	0.000	0.88	0.52
TargF	5.0	1	0.180	3400.	516.	399.	514.	646.	0.130	0.088	0.132	0.168	3856.	3858.	11.0	8.7	2.3	45.4	-155.7	1.1	34.3	0.000	0.88	0.52
TargF	5.0	1	0.180	3500.	513.	383.	508.	645.	0.130	0.089	0.132	0.169	3832.	3850.	11.0	8.6	2.4	48.0	-161.4	1.3	40.0	0.000	0.88	0.52
TargF	5.0	1	0.200	2000.	520.	355.	517.	702.	0.140	0.072	0.141	0.211	3773.	3778.	11.0	9.3	1.7	22.8	-85.5	3.8	1.0	0.000	0.87	0.50
TargF	5.0	1	0.200	2100.	525.	360.	520.	697.	0.140	0.073	0.139	0.203	3796.	3752.	11.0	9.4	1.6	23.2	-89.4	3.2	1.4	0.000	0.87	0.50
TargF	5.0	1	0.200	2200.	517.	355.	512.	676.	0.136	0.075	0.137	0.196	3792.	3784.	11.0	9.4	1.6	23.7	-99.1	3.1	1.8	0.000	0.87	0.50
TargF	5.0	1	0.200	2300.	525.	365.	520.	691.	0.139	0.076	0.140	0.197	3791.	3761.	11.0	9.4	1.6	24.3	-108.9	3.4	3.4	0.000	0.87	0.50
TargF	5.0	1	0.200	2400.	519.	352.	521.	685.	0.136	0.072	0.140	0.193	3803.	3778.	11.0	9.4	1.6	24.6	-112.7	2.6	4.0	0.000	0.87	0.50
TargF	5.0	1	0.200	2500.	524.	378.	519.	677.	0.138	0.083	0.139	0.188	3772.	3759.	11.0	9.4	1.6	26.3	-123.9	2.6	5.6	0.000	0.87	0.50
TargF	5.0	1	0.200	2600.	519.	373.	514.	670.	0.135	0.076	0.137	0.187	3823.	3798.	11.0	9.5	1.5	27.6	-129.5	2.7	7.9	0.000	0.87	0.51
TargF	5.0	1	0.200	2700.	513.	363.	505.	665.	0.133	0.072	0.135	0.189	3865.	3896.	11.0	9.4	1.6	28.3	-133.0	2.4	10.4	0.000	0.87	0.51

Method	Perc	Dur	Targ	Trig	Cmean	C10	C50	C90	Fmean	F10	F50	F90	Smean	S20	Nchange	Nup	Ndown	Cup	Cdown	Risklim	Risktrig	Depl	4+	7+
TargF	5.0	1	0.200	2800.	526.	385.	525.	670.	0.136	0.080	0.140	0.188	3818.	3809.	11.0	9.4	1.6	30.9	-139.6	2.5	12.2	0.000	0.87	0.50
TargF	5.0	1	0.200	2900.	521.	384.	516.	666.	0.136	0.081	0.140	0.182	3781.	3808.	11.0	9.2	1.8	33.4	-142.5	2.5	16.2	0.000	0.87	0.50
TargF	5.0	1	0.200	3000.	521.	375.	523.	667.	0.138	0.082	0.141	0.185	3751.	3788.	11.0	9.1	1.9	36.7	-152.8	2.6	21.1	0.000	0.87	0.50
TargF	5.0	1	0.200	3100.	533.	403.	527.	668.	0.142	0.091	0.146	0.185	3710.	3745.	11.0	9.0	2.0	40.4	-162.4	2.7	26.1	0.000	0.87	0.50
TargF	5.0	1	0.200	3200.	533.	405.	525.	678.	0.140	0.091	0.144	0.184	3729.	3750.	11.0	8.9	2.1	44.8	-166.2	2.5	30.3	0.000	0.87	0.50
TargF	5.0	1	0.200	3300.	535.	413.	532.	666.	0.143	0.094	0.145	0.185	3702.	3752.	11.0	8.7	2.3	48.4	-165.7	2.2	35.7	0.000	0.87	0.49
TargF	5.0	1	0.200	3400.	535.	406.	529.	674.	0.143	0.091	0.146	0.184	3696.	3730.	11.0	8.5	2.5	53.3	-173.8	2.2	41.3	0.000	0.87	0.50
TargF	5.0	1	0.200	3500.	541.	422.	536.	664.	0.145	0.095	0.148	0.188	3682.	3724.	11.0	8.4	2.6	59.6	-181.8	2.1	47.0	0.000	0.87	0.49
TargF	5.0	1	0.220	2000.	551.	362.	554.	731.	0.159	0.081	0.158	0.236	3597.	3574.	11.0	9.1	1.9	24.2	-94.0	6.1	2.2	0.000	0.86	0.48
TargF	5.0	1	0.220	2100.	540.	367.	535.	711.	0.152	0.081	0.153	0.220	3634.	3666.	11.0	9.3	1.7	24.5	-103.4	4.9	2.4	0.000	0.86	0.48
TargF	5.0	1	0.220	2200.	541.	371.	545.	708.	0.152	0.077	0.152	0.221	3649.	3659.	11.0	9.3	1.7	24.7	-112.2	5.0	3.6	0.000	0.87	0.48
TargF	5.0	1	0.220	2300.	535.	361.	531.	705.	0.148	0.074	0.152	0.212	3687.	3713.	11.0	9.4	1.6	26.0	-116.6	4.6	4.6	0.000	0.87	0.49
TargF	5.0	1	0.220	2400.	537.	382.	536.	696.	0.150	0.082	0.152	0.209	3616.	3637.	11.0	9.4	1.6	27.1	-128.2	3.7	5.6	0.000	0.87	0.48
TargF	5.0	1	0.220	2500.	537.	375.	538.	693.	0.148	0.082	0.151	0.206	3673.	3672.	11.0	9.5	1.5	28.7	-141.2	4.1	8.1	0.000	0.87	0.49
TargF	5.0	1	0.220	2600.	533.	373.	532.	692.	0.148	0.080	0.151	0.209	3652.	3681.	11.0	9.4	1.6	29.6	-147.9	3.9	10.2	0.000	0.87	0.49
TargF	5.0	1	0.220	2700.	547.	397.	539.	707.	0.152	0.093	0.153	0.208	3618.	3653.	11.0	9.2	1.8	33.2	-152.0	4.5	14.4	0.000	0.87	0.48
TargF	5.0	1	0.220	2800.	537.	394.	535.	691.	0.149	0.089	0.153	0.201	3633.	3661.	11.0	9.2	1.8	35.5	-162.1	4.0	17.1	0.000	0.87	0.48
TargF	5.0	1	0.220	2900.	544.	400.	538.	697.	0.152	0.092	0.156	0.204	3591.	3632.	11.0	9.0	2.0	39.9	-164.9	4.0	22.6	0.000	0.87	0.48
TargF	5.0	1	0.220	3000.	543.	399.	545.	689.	0.151	0.091	0.154	0.205	3634.	3641.	11.0	9.0	2.0	42.0	-167.4	4.0	26.6	0.000	0.87	0.48
TargF	5.0	1	0.220	3100.	550.	416.	543.	690.	0.154	0.101	0.157	0.203	3587.	3620.	11.0	8.8	2.2	47.5	-178.3	4.5	32.6	0.000	0.87	0.48
TargF	5.0	1	0.220	3200.	556.	427.	555.	686.	0.157	0.098	0.159	0.205	3579.	3617.	11.0	8.6	2.4	53.1	-181.6	3.9	38.6	0.000	0.86	0.48
TargF	5.0	1	0.220	3300.	556.	428.	552.	691.	0.157	0.104	0.160	0.202	3561.	3564.	11.0	8.5	2.5	57.1	-187.6	3.5	43.1	0.000	0.86	0.48
TargF	5.0	1	0.220	3400.	557.	425.	555.	697.	0.157	0.104	0.161	0.202	3576.	3640.	11.0	8.4	2.6	62.2	-184.8	3.9	48.6	0.000	0.86	0.48
TargF	5.0	1	0.220	3500.	558.	433.	557.	686.	0.159	0.110	0.163	0.204	3501.	3548.	11.0	8.0	3.0	71.9	-192.0	4.0	57.1	0.000	0.86	0.47
TargF	5.0	1	0.240	2000.	555.	371.	554.	736.	0.165	0.085	0.168	0.241	3521.	3542.	11.0	9.2	1.8	25.2	-113.8	7.7	2.4	0.000	0.86	0.46
TargF	5.0	1	0.240	2100.	556.	372.	550.	734.	0.164	0.087	0.165	0.240	3526.	3561.	11.0	9.3	1.7	26.5	-124.0	7.4	3.7	0.000	0.86	0.46
TargF	5.0	1	0.240	2200.	548.	374.	547.	715.	0.160	0.083	0.162	0.232	3540.	3561.	11.0	9.4	1.6	26.5	-133.4	7.1	5.3	0.000	0.86	0.47
TargF	5.0	1	0.240	2300.	548.	381.	542.	715.	0.159	0.087	0.161	0.223	3562.	3585.	11.0	9.4	1.6	27.5	-137.2	6.0	6.0	0.000	0.86	0.47
TargF	5.0	1	0.240	2400.	554.	399.	552.	713.	0.162	0.093	0.162	0.232	3534.	3570.	11.0	9.3	1.7	29.2	-145.4	6.4	8.9	0.000	0.86	0.47
TargF	5.0	1	0.240	2500.	563.	402.	560.	721.	0.165	0.095	0.168	0.229	3496.	3503.	11.0	9.2	1.8	31.2	-150.4	5.7	10.7	0.000	0.86	0.47
TargF	5.0	1	0.240	2600.	555.	396.	548.	718.	0.161	0.092	0.162	0.223	3530.	3568.	11.0	9.2	1.8	34.1	-160.7	5.4	14.3	0.000	0.86	0.47
TargF	5.0	1	0.240	2700.	562.	411.	557.	725.	0.163	0.091	0.169	0.222	3519.	3516.	11.0	9.1	1.9	36.9	-166.1	5.8	18.3	0.000	0.86	0.47
TargF	5.0	1	0.240	2800.	552.	402.	551.	687.	0.162	0.095	0.164	0.221	3489.	3564.	11.0	9.1	1.9	39.2	-181.4	6.4	23.4	0.000	0.86	0.46
TargF	5.0	1	0.240	2900.	564.	428.	557.	714.	0.165	0.099	0.169	0.219	3462.	3490.	11.0	8.9	2.1	43.7	-178.2	5.3	27.1	0.000	0.86	0.46
TargF	5.0	1	0.240	3000.	567.	426.	564.	711.	0.166	0.104	0.169	0.222	3473.	3469.	11.0	8.9	2.1	49.3	-185.9	5.7	33.2	0.000	0.86	0.47
TargF	5.0	1	0.240	3100.	565.	431.	562.	702.	0.167	0.110	0.169	0.220	3439.	3492.	11.0	8.7	2.3	53.2	-189.7	5.7	38.1	0.000	0.86	0.46
TargF	5.0	1	0.240	3200.	570.	429.	572.	713.	0.168	0.109	0.173	0.223	3455.	3513.	11.0	8.5	2.5	59.9	-196.0	5.9	44.1	0.000	0.86	0.46

METHOD	PERC	DUR	TARG	TRIG	CMEAN	C10	C50	C90	FMEAN	F10	F50	F90	SMEAN	S20	NCHANGE	NUP	NDOWN	CUP	CDOWN	RISKLIM	RISKTRIG	DEPL	4+	7+
TargF	5.0	1	0.240	3300.	572.	436.	572.	719.	0.172	0.113	0.176	0.224	3393.	3458.	11.0	8.3	2.7	66.8	-198.3	5.8	53.2	0.000	0.86	0.45
TargF	5.0	1	0.240	3400.	580.	456.	580.	707.	0.174	0.121	0.176	0.226	3388.	3399.	11.0	8.1	2.9	74.4	-205.6	5.7	58.6	0.000	0.86	0.45
TargF	5.0	1	0.240	3500.	582.	459.	580.	714.	0.176	0.123	0.180	0.224	3363.	3406.	11.0	7.9	3.1	83.9	-208.4	6.2	64.2	0.000	0.85	0.45
TargF	5.0	1	0.260	2000.	569.	381.	572.	748.	0.176	0.085	0.178	0.256	3426.	3442.	11.0	9.3	1.7	26.7	-123.0	10.0	3.9	0.000	0.85	0.45
TargF	5.0	1	0.260	2100.	567.	382.	568.	753.	0.175	0.090	0.174	0.257	3419.	3442.	11.0	9.4	1.6	27.0	-131.3	9.6	5.1	0.000	0.85	0.45
TargF	5.0	1	0.260	2200.	570.	385.	572.	754.	0.175	0.094	0.177	0.251	3427.	3453.	11.0	9.3	1.7	28.7	-142.6	9.4	7.1	0.000	0.85	0.45
TargF	5.0	1	0.260	2300.	570.	398.	565.	749.	0.174	0.089	0.177	0.247	3411.	3409.	11.0	9.3	1.7	29.8	-147.1	8.9	8.9	0.000	0.85	0.45
TargF	5.0	1	0.260	2400.	568.	394.	559.	746.	0.173	0.095	0.174	0.244	3449.	3477.	11.0	9.3	1.7	31.9	-161.1	8.9	11.6	0.000	0.85	0.45
TargF	5.0	1	0.260	2500.	573.	406.	570.	733.	0.178	0.106	0.181	0.242	3350.	3392.	11.0	9.3	1.7	35.1	-172.1	9.5	16.5	0.000	0.85	0.45
TargF	5.0	1	0.260	2600.	565.	414.	562.	723.	0.174	0.100	0.175	0.237	3370.	3449.	11.0	9.1	1.9	38.1	-172.9	7.9	19.2	0.000	0.85	0.45
TargF	5.0	1	0.260	2700.	565.	407.	564.	716.	0.173	0.104	0.177	0.236	3390.	3467.	11.0	9.1	1.9	40.6	-183.8	8.5	22.8	0.000	0.85	0.45
TargF	5.0	1	0.260	2800.	580.	440.	579.	724.	0.181	0.112	0.184	0.243	3320.	3377.	11.0	8.8	2.2	46.2	-185.7	9.6	30.2	0.000	0.85	0.44
TargF	5.0	1	0.260	2900.	576.	434.	572.	722.	0.179	0.107	0.184	0.239	3346.	3400.	11.0	8.8	2.2	50.7	-193.5	9.2	34.8	0.000	0.85	0.44
TargF	5.0	1	0.260	3000.	581.	436.	576.	734.	0.180	0.114	0.182	0.240	3347.	3383.	11.0	8.7	2.3	55.9	-200.6	8.2	39.5	0.000	0.85	0.44
TargF	5.0	1	0.260	3100.	586.	445.	584.	736.	0.184	0.117	0.188	0.242	3300.	3332.	11.0	8.5	2.5	63.3	-207.3	9.2	47.1	0.000	0.85	0.44
TargF	5.0	1	0.260	3200.	583.	441.	581.	719.	0.183	0.121	0.187	0.241	3283.	3356.	11.0	8.2	2.8	71.6	-210.6	9.6	52.9	0.000	0.85	0.44
TargF	5.0	1	0.260	3300.	591.	461.	589.	716.	0.187	0.125	0.192	0.245	3277.	3288.	11.0	8.1	2.9	79.3	-216.1	8.9	59.5	0.000	0.85	0.44
TargF	5.0	1	0.260	3400.	591.	467.	588.	731.	0.186	0.122	0.190	0.238	3280.	3309.	11.0	7.9	3.1	85.6	-218.1	9.0	62.2	0.000	0.85	0.44
TargF	5.0	1	0.260	3500.	595.	464.	592.	732.	0.189	0.137	0.190	0.240	3228.	3249.	11.0	7.8	3.2	96.0	-227.6	9.3	69.9	0.000	0.85	0.43
TargF	5.0	1	0.280	2000.	580.	399.	583.	753.	0.188	0.095	0.190	0.273	3326.	3349.	11.0	9.4	1.6	27.8	-141.3	12.1	5.0	0.000	0.85	0.43
TargF	5.0	1	0.280	2100.	573.	382.	572.	767.	0.185	0.090	0.188	0.270	3320.	3360.	11.0	9.3	1.7	28.4	-147.6	12.1	6.6	0.000	0.85	0.44
TargF	5.0	1	0.280	2200.	579.	399.	577.	763.	0.185	0.104	0.187	0.265	3299.	3329.	11.0	9.3	1.7	30.7	-160.5	11.4	8.9	0.000	0.85	0.44
TargF	5.0	1	0.280	2300.	583.	406.	579.	755.	0.185	0.103	0.189	0.256	3313.	3354.	11.0	9.3	1.7	32.7	-168.6	10.6	10.6	0.000	0.85	0.44
TargF	5.0	1	0.280	2400.	579.	410.	579.	741.	0.184	0.098	0.190	0.255	3348.	3409.	11.0	9.3	1.7	34.4	-172.4	10.6	13.7	0.000	0.85	0.44
TargF	5.0	1	0.280	2500.	583.	422.	583.	746.	0.185	0.105	0.189	0.257	3326.	3379.	11.0	9.2	1.8	38.2	-178.1	11.4	18.7	0.000	0.85	0.44
TargF	5.0	1	0.280	2600.	581.	425.	576.	749.	0.187	0.107	0.192	0.258	3263.	3340.	11.0	9.0	2.0	43.4	-186.8	11.6	24.2	0.000	0.85	0.43
TargF	5.0	1	0.280	2700.	590.	431.	590.	746.	0.190	0.113	0.193	0.259	3269.	3301.	11.0	8.9	2.1	46.5	-189.9	11.4	28.3	0.000	0.85	0.43
TargF	5.0	1	0.280	2800.	591.	441.	591.	749.	0.190	0.115	0.195	0.254	3251.	3299.	11.0	8.8	2.2	52.5	-194.7	11.0	33.9	0.000	0.85	0.43
TargF	5.0	1	0.280	2900.	592.	438.	590.	740.	0.193	0.113	0.196	0.259	3238.	3277.	11.0	8.6	2.4	56.8	-200.6	12.5	40.6	0.000	0.85	0.43
TargF	5.0	1	0.280	3000.	600.	464.	597.	748.	0.194	0.121	0.198	0.259	3243.	3291.	11.0	8.5	2.5	62.9	-210.3	11.2	44.4	0.000	0.84	0.42
TargF	5.0	1	0.280	3100.	591.	452.	589.	730.	0.195	0.121	0.198	0.258	3197.	3244.	11.0	8.3	2.7	72.4	-215.7	12.6	52.9	0.000	0.84	0.43
TargF	5.0	1	0.280	3200.	607.	469.	604.	748.	0.200	0.134	0.204	0.260	3167.	3186.	11.0	8.1	2.9	80.9	-220.4	11.7	59.5	0.000	0.84	0.42
TargF	5.0	1	0.280	3300.	602.	472.	600.	732.	0.200	0.137	0.203	0.258	3150.	3186.	11.0	7.9	3.1	91.3	-223.2	12.4	65.2	0.000	0.84	0.42
TargF	5.0	1	0.280	3400.	612.	483.	609.	739.	0.205	0.145	0.207	0.264	3115.	3177.	11.0	7.7	3.3	99.9	-231.8	12.7	70.6	0.000	0.84	0.41
TargF	5.0	1	0.280	3500.	617.	491.	619.	742.	0.205	0.146	0.207	0.261	3133.	3150.	11.0	7.6	3.4	111.9	-239.5	11.6	73.8	0.000	0.84	0.42
TargF	5.0	1	0.300	2000.	596.	411.	599.	784.	0.204	0.105	0.208	0.290	3169.	3207.	11.0	9.3	1.7	29.7	-153.6	16.8	7.2	0.000	0.84	0.42
TargF	5.0	1	0.300	2100.	585.	402.	583.	760.	0.198	0.101	0.204	0.284	3195.	3254.	11.0	9.3	1.7	30.9	-167.8	15.2	9.1	0.000	0.84	0.42

Method	Perc	Dur	Targ	Trig	Cmean	C10	C50	C90	Fmean	F10	F50	F90	Smean	S20	Nchange	Nup	Ndown	Cup	Cdown	Risklim	Risktrig	Depl	4+	7+
TargF	5.0	1	0.300	2200.	590.	416.	585.	766.	0.200	0.102	0.202	0.287	3196.	3245.	11.0	9.2	1.8	32.9	-163.9	15.0	11.9	0.000	0.84	0.42
TargF	5.0	1	0.300	2300.	584.	407.	581.	754.	0.194	0.102	0.199	0.277	3234.	3321.	11.0	9.3	1.7	33.6	-180.2	13.9	13.9	0.000	0.84	0.42
TargF	5.0	1	0.300	2400.	593.	413.	593.	755.	0.198	0.108	0.202	0.275	3202.	3276.	11.0	9.1	1.9	38.2	-186.1	13.9	18.0	0.000	0.84	0.42
TargF	5.0	1	0.300	2500.	590.	416.	592.	755.	0.196	0.104	0.202	0.273	3224.	3279.	11.0	9.1	1.9	41.9	-196.3	14.5	22.3	0.000	0.84	0.42
TargF	5.0	1	0.300	2600.	595.	445.	595.	745.	0.200	0.120	0.204	0.273	3170.	3197.	11.0	8.9	2.1	47.0	-196.2	15.0	28.0	0.000	0.84	0.42
TargF	5.0	1	0.300	2700.	593.	430.	600.	748.	0.199	0.116	0.204	0.271	3170.	3240.	11.0	8.8	2.2	50.6	-201.8	14.7	32.4	0.000	0.84	0.42
TargF	5.0	1	0.300	2800.	599.	438.	601.	755.	0.206	0.120	0.212	0.279	3116.	3186.	11.0	8.5	2.5	59.2	-208.0	16.7	41.7	0.000	0.84	0.41
TargF	5.0	1	0.300	2900.	603.	448.	603.	754.	0.207	0.125	0.213	0.275	3119.	3172.	11.0	8.5	2.5	66.7	-228.4	16.0	46.7	0.000	0.84	0.41
TargF	5.0	1	0.300	3000.	611.	464.	611.	760.	0.210	0.136	0.212	0.282	3101.	3155.	11.0	8.3	2.7	73.2	-218.8	15.3	52.5	0.000	0.84	0.41
TargF	5.0	1	0.300	3100.	612.	478.	612.	752.	0.212	0.141	0.218	0.279	3060.	3101.	11.0	8.0	3.0	85.3	-227.8	15.9	58.7	0.000	0.83	0.40
TargF	5.0	1	0.300	3200.	617.	473.	618.	759.	0.215	0.143	0.218	0.279	3049.	3103.	11.0	8.0	3.0	93.6	-240.6	17.1	65.0	0.000	0.83	0.40
TargF	5.0	1	0.300	3300.	619.	488.	618.	753.	0.217	0.149	0.222	0.278	3013.	3064.	11.0	7.7	3.3	105.1	-239.9	16.4	70.7	0.000	0.83	0.40
TargF	5.0	1	0.300	3400.	630.	500.	629.	761.	0.221	0.157	0.223	0.285	3009.	3033.	11.0	7.6	3.4	111.5	-250.2	16.5	75.1	0.000	0.83	0.40
TargF	5.0	1	0.300	3500.	632.	499.	630.	776.	0.223	0.166	0.222	0.286	2986.	3007.	11.0	7.4	3.6	123.8	-251.8	16.8	79.4	0.000	0.83	0.40
TargF	10.0	1	0.120	2000.	496.	370.	499.	625.	0.113	0.079	0.115	0.143	4122.	4001.	11.0	7.5	3.5	39.2	-53.9	0.6	0.1	0.000	0.89	0.55
TargF	10.0	1	0.120	2100.	496.	360.	496.	629.	0.112	0.077	0.113	0.144	4124.	4017.	11.0	7.6	3.4	39.0	-58.1	0.9	0.3	0.000	0.89	0.55
TargF	10.0	1	0.120	2200.	496.	361.	497.	635.	0.112	0.079	0.112	0.143	4136.	3987.	11.0	7.7	3.3	39.2	-61.0	0.6	0.4	0.000	0.89	0.56
TargF	10.0	1	0.120	2300.	495.	366.	491.	627.	0.110	0.081	0.110	0.139	4157.	4014.	11.0	7.8	3.2	39.7	-66.1	0.5	0.5	0.000	0.89	0.56
TargF	10.0	1	0.120	2400.	489.	359.	484.	625.	0.108	0.078	0.110	0.136	4192.	4055.	11.0	7.8	3.2	39.1	-66.9	0.3	0.6	0.000	0.89	0.56
TargF	10.0	1	0.120	2500.	487.	357.	486.	620.	0.109	0.079	0.110	0.138	4174.	4096.	11.0	7.9	3.1	39.2	-73.8	0.3	1.2	0.000	0.89	0.56
TargF	10.0	1	0.120	2600.	485.	353.	482.	622.	0.106	0.076	0.107	0.136	4224.	4065.	11.0	8.1	2.9	39.4	-74.8	0.5	1.8	0.000	0.89	0.56
TargF	10.0	1	0.120	2700.	480.	356.	475.	609.	0.105	0.077	0.106	0.131	4212.	4129.	11.0	8.1	2.9	39.4	-80.4	0.3	2.1	0.000	0.89	0.56
TargF	10.0	1	0.120	2800.	480.	348.	475.	618.	0.105	0.075	0.106	0.133	4214.	4133.	11.0	8.2	2.8	39.8	-87.0	0.3	3.4	0.000	0.89	0.56
TargF	10.0	1	0.120	2900.	480.	358.	469.	627.	0.104	0.076	0.104	0.131	4250.	4152.	11.0	8.2	2.8	40.6	-89.9	0.3	4.0	0.000	0.89	0.57
TargF	10.0	1	0.120	3000.	476.	355.	469.	618.	0.103	0.076	0.104	0.129	4233.	4171.	11.0	8.2	2.8	41.1	-93.0	0.2	5.8	0.000	0.89	0.57
TargF	10.0	1	0.120	3100.	468.	343.	461.	603.	0.101	0.073	0.101	0.128	4259.	4182.	11.0	8.3	2.7	41.4	-99.2	0.1	7.8	0.000	0.90	0.57
TargF	10.0	1	0.120	3200.	472.	345.	459.	620.	0.102	0.077	0.101	0.127	4252.	4193.	11.0	8.2	2.8	42.6	-105.3	0.3	10.1	0.000	0.90	0.57
TargF	10.0	1	0.120	3300.	467.	347.	458.	605.	0.100	0.076	0.101	0.126	4265.	4251.	11.0	8.3	2.7	43.3	-109.7	0.1	12.6	0.000	0.90	0.57
TargF	10.0	1	0.120	3400.	465.	339.	454.	596.	0.099	0.075	0.099	0.125	4271.	4267.	11.0	8.3	2.7	44.7	-112.5	0.2	15.7	0.000	0.90	0.57
TargF	10.0	1	0.120	3500.	467.	349.	460.	601.	0.100	0.075	0.100	0.124	4284.	4242.	11.0	8.3	2.7	45.8	-114.5	0.2	19.1	0.000	0.90	0.57
TargF	10.0	1	0.140	2000.	532.	382.	534.	668.	0.131	0.090	0.132	0.167	3891.	3777.	11.0	7.6	3.4	42.1	-67.1	1.4	0.2	0.000	0.88	0.53
TargF	10.0	1	0.140	2100.	534.	396.	534.	671.	0.130	0.091	0.132	0.164	3912.	3787.	11.0	7.6	3.4	42.7	-69.4	1.2	0.5	0.000	0.88	0.53
TargF	10.0	1	0.140	2200.	528.	386.	531.	665.	0.129	0.089	0.130	0.167	3917.	3817.	11.0	7.7	3.3	42.2	-71.7	1.3	0.8	0.000	0.88	0.53
TargF	10.0	1	0.140	2300.	520.	382.	513.	666.	0.126	0.089	0.126	0.160	3910.	3820.	11.0	7.9	3.1	41.7	-78.2	0.9	0.9	0.000	0.88	0.53
TargF	10.0	1	0.140	2400.	522.	378.	518.	668.	0.125	0.090	0.125	0.160	3935.	3848.	11.0	8.0	3.0	42.3	-84.2	0.9	1.5	0.000	0.88	0.53
TargF	10.0	1	0.140	2500.	516.	376.	514.	658.	0.123	0.087	0.123	0.157	3959.	3851.	11.0	8.0	3.0	42.1	-90.4	0.9	2.2	0.000	0.89	0.54
TargF	10.0	1	0.140	2600.	515.	376.	507.	660.	0.122	0.085	0.122	0.157	3981.	3910.	11.0	8.1	2.9	42.4	-91.7	0.7	2.8	0.000	0.88	0.53

Method	Perc	Dur	Targ	Trig	Cmean	C10	C50	C90	Fmean	F10	F50	F90	Smean	S20	Nchange	Nup	Ndown	Cup	Cdown	Risklim	Risktrig	Depl	4+	7+
TargF	10.0	1	0.140	2700.	513.	373.	503.	669.	0.121	0.087	0.121	0.155	4010.	3938.	11.0	8.1	2.9	42.8	-99.4	0.7	3.7	0.000	0.89	0.54
TargF	10.0	1	0.140	2800.	512.	374.	504.	658.	0.120	0.088	0.120	0.152	4009.	3938.	11.0	8.2	2.8	43.8	-103.2	0.4	5.2	0.000	0.89	0.54
TargF	10.0	1	0.140	2900.	507.	376.	499.	650.	0.118	0.084	0.119	0.150	4029.	3964.	11.0	8.3	2.7	44.2	-107.1	0.8	7.7	0.000	0.89	0.54
TargF	10.0	1	0.140	3000.	511.	371.	500.	659.	0.119	0.087	0.120	0.150	4006.	3931.	11.0	8.2	2.8	45.8	-114.5	0.6	9.6	0.000	0.89	0.54
TargF	10.0	1	0.140	3100.	503.	369.	489.	657.	0.117	0.085	0.117	0.148	4025.	4000.	11.0	8.3	2.7	46.4	-116.4	0.6	12.4	0.000	0.89	0.54
TargF	10.0	1	0.140	3200.	505.	372.	498.	653.	0.117	0.087	0.117	0.147	4042.	3994.	11.0	8.3	2.7	47.8	-123.5	0.6	15.3	0.000	0.89	0.54
TargF	10.0	1	0.140	3300.	500.	370.	492.	635.	0.115	0.085	0.115	0.145	4049.	4019.	11.0	8.3	2.7	49.2	-130.9	0.6	18.4	0.000	0.89	0.54
TargF	10.0	1	0.140	3400.	498.	374.	487.	633.	0.115	0.086	0.114	0.145	4043.	4026.	11.0	8.2	2.8	50.9	-133.7	0.3	22.5	0.000	0.89	0.54
TargF	10.0	1	0.140	3500.	496.	370.	488.	629.	0.115	0.087	0.116	0.143	4025.	4004.	11.0	8.2	2.8	54.1	-136.3	0.5	28.3	0.000	0.89	0.54
TargF	10.0	1	0.160	2000.	561.	411.	558.	714.	0.148	0.100	0.149	0.192	3701.	3600.	11.0	7.7	3.3	44.8	-79.9	2.1	0.4	0.000	0.87	0.50
TargF	10.0	1	0.160	2100.	555.	409.	553.	698.	0.145	0.101	0.146	0.186	3719.	3582.	11.0	7.9	3.1	44.6	-83.3	2.7	1.1	0.000	0.87	0.51
TargF	10.0	1	0.160	2200.	558.	418.	555.	702.	0.145	0.101	0.146	0.191	3720.	3583.	11.0	7.8	3.2	45.2	-85.9	1.9	1.2	0.000	0.87	0.51
TargF	10.0	1	0.160	2300.	550.	408.	543.	700.	0.142	0.099	0.141	0.187	3743.	3653.	11.0	7.9	3.1	44.7	-90.2	1.6	1.6	0.000	0.87	0.51
TargF	10.0	1	0.160	2400.	545.	396.	541.	696.	0.140	0.097	0.140	0.181	3748.	3672.	11.0	8.1	2.9	44.8	-99.1	1.3	2.3	0.000	0.88	0.51
TargF	10.0	1	0.160	2500.	538.	394.	532.	694.	0.137	0.095	0.136	0.178	3778.	3708.	11.0	8.2	2.8	44.9	-108.7	1.4	3.9	0.000	0.88	0.51
TargF	10.0	1	0.160	2600.	543.	395.	535.	693.	0.137	0.094	0.138	0.179	3812.	3733.	11.0	8.2	2.8	45.8	-111.5	1.5	4.8	0.000	0.88	0.51
TargF	10.0	1	0.160	2700.	533.	392.	523.	679.	0.134	0.094	0.135	0.172	3803.	3721.	11.0	8.3	2.7	46.3	-117.7	1.2	6.4	0.000	0.88	0.52
TargF	10.0	1	0.160	2800.	535.	391.	530.	681.	0.133	0.098	0.133	0.169	3832.	3748.	11.0	8.3	2.7	47.5	-122.3	1.0	8.4	0.000	0.88	0.52
TargF	10.0	1	0.160	2900.	529.	391.	522.	676.	0.131	0.094	0.131	0.166	3849.	3804.	11.0	8.4	2.6	47.8	-130.3	0.8	10.3	0.000	0.88	0.52
TargF	10.0	1	0.160	3000.	527.	394.	521.	667.	0.132	0.098	0.133	0.167	3807.	3789.	11.0	8.4	2.6	49.9	-138.5	1.2	14.4	0.000	0.88	0.52
TargF	10.0	1	0.160	3100.	519.	391.	513.	664.	0.128	0.092	0.129	0.165	3875.	3842.	11.0	8.4	2.6	49.6	-139.3	0.9	16.9	0.000	0.88	0.52
TargF	10.0	1	0.160	3200.	527.	402.	518.	665.	0.130	0.096	0.130	0.164	3851.	3825.	11.0	8.3	2.7	53.4	-143.8	0.9	20.9	0.000	0.88	0.52
TargF	10.0	1	0.160	3300.	525.	402.	520.	659.	0.129	0.096	0.129	0.162	3855.	3837.	11.0	8.2	2.8	55.2	-147.4	0.7	25.7	0.000	0.88	0.52
TargF	10.0	1	0.160	3400.	525.	394.	520.	665.	0.129	0.097	0.130	0.162	3850.	3866.	11.0	8.1	2.9	58.5	-154.9	0.8	30.8	0.000	0.88	0.52
TargF	10.0	1	0.160	3500.	520.	391.	512.	658.	0.127	0.095	0.127	0.160	3865.	3837.	11.0	8.1	2.9	60.9	-156.4	1.0	35.5	0.000	0.88	0.52
TargF	10.0	1	0.180	2000.	582.	426.	576.	747.	0.162	0.111	0.163	0.214	3548.	3400.	11.0	7.8	3.2	46.9	-90.3	4.1	0.9	0.000	0.87	0.48
TargF	10.0	1	0.180	2100.	573.	417.	571.	727.	0.161	0.109	0.160	0.214	3532.	3438.	11.0	7.8	3.2	46.7	-95.9	3.9	1.5	0.000	0.87	0.48
TargF	10.0	1	0.180	2200.	570.	416.	563.	735.	0.158	0.107	0.159	0.206	3567.	3491.	11.0	8.0	3.0	46.5	-104.6	3.0	1.9	0.000	0.87	0.48
TargF	10.0	1	0.180	2300.	569.	422.	566.	719.	0.156	0.107	0.157	0.202	3594.	3523.	11.0	8.1	2.9	47.1	-109.5	2.6	2.6	0.000	0.87	0.49
TargF	10.0	1	0.180	2400.	561.	415.	553.	715.	0.151	0.105	0.152	0.200	3634.	3573.	11.0	8.2	2.8	47.3	-118.0	2.9	4.2	0.000	0.87	0.49
TargF	10.0	1	0.180	2500.	558.	412.	548.	724.	0.150	0.106	0.151	0.193	3624.	3577.	11.0	8.4	2.6	47.7	-129.4	3.0	6.3	0.000	0.87	0.49
TargF	10.0	1	0.180	2600.	557.	416.	548.	709.	0.149	0.106	0.149	0.194	3649.	3608.	11.0	8.3	2.7	49.1	-132.2	2.3	7.7	0.000	0.87	0.49
TargF	10.0	1	0.180	2700.	557.	419.	550.	709.	0.149	0.107	0.147	0.193	3652.	3606.	11.0	8.3	2.7	49.8	-134.5	2.0	9.7	0.000	0.87	0.50
TargF	10.0	1	0.180	2800.	555.	415.	546.	709.	0.146	0.103	0.146	0.187	3677.	3611.	11.0	8.4	2.6	51.5	-139.1	2.2	11.8	0.000	0.87	0.50
TargF	10.0	1	0.180	2900.	556.	421.	549.	691.	0.147	0.105	0.148	0.190	3668.	3604.	11.0	8.3	2.7	53.0	-147.7	1.8	16.2	0.000	0.87	0.50
TargF	10.0	1	0.180	3000.	554.	423.	545.	700.	0.145	0.105	0.145	0.184	3683.	3602.	11.0	8.3	2.7	55.0	-151.5	1.8	18.9	0.000	0.87	0.50
TargF	10.0	1	0.180	3100.	545.	415.	536.	694.	0.144	0.103	0.144	0.183	3668.	3654.	11.0	8.3	2.7	57.3	-157.3	2.0	24.6	0.000	0.87	0.50

Method	Perc	Dur	Targ	Trig	Cmean	C10	C50	C90	Fmean	F10	F50	F90	Smean	S20	Nchange	Nup	Ndown	Cup	Cdown	Risklim	Risktrig	Depl	4+	7+
TargF	10.0	1	0.180	3200.	550.	417.	538.	692.	0.145	0.107	0.146	0.182	3668.	3654.	11.0	8.2	2.8	60.8	-167.1	1.6	30.3	0.000	0.87	0.50
TargF	10.0	1	0.180	3300.	548.	425.	537.	692.	0.143	0.106	0.142	0.179	3697.	3699.	11.0	8.2	2.8	63.7	-169.6	1.5	32.8	0.000	0.87	0.50
TargF	10.0	1	0.180	3400.	545.	417.	534.	685.	0.143	0.107	0.144	0.177	3674.	3687.	11.0	8.0	3.0	67.4	-173.0	1.7	38.8	0.000	0.87	0.50
TargF	10.0	1	0.180	3500.	542.	420.	530.	684.	0.142	0.107	0.142	0.175	3681.	3728.	11.0	8.0	3.0	69.8	-175.5	1.4	44.9	0.000	0.87	0.50
TargF	10.0	1	0.200	2000.	590.	429.	588.	754.	0.175	0.115	0.175	0.234	3416.	3340.	11.0	8.0	3.0	47.5	-102.8	5.8	1.5	0.000	0.86	0.46
TargF	10.0	1	0.200	2100.	585.	433.	580.	748.	0.170	0.112	0.172	0.224	3456.	3374.	11.0	8.2	2.8	47.9	-118.5	5.0	2.1	0.000	0.86	0.47
TargF	10.0	1	0.200	2200.	589.	437.	587.	751.	0.172	0.116	0.174	0.225	3419.	3330.	11.0	8.1	2.9	48.9	-121.1	4.8	3.2	0.000	0.86	0.47
TargF	10.0	1	0.200	2300.	582.	430.	574.	736.	0.168	0.111	0.168	0.221	3464.	3431.	11.0	8.2	2.8	49.2	-128.9	5.3	5.3	0.000	0.86	0.47
TargF	10.0	1	0.200	2400.	573.	422.	566.	733.	0.164	0.113	0.166	0.213	3464.	3424.	11.0	8.2	2.8	49.7	-138.0	4.6	6.5	0.000	0.86	0.47
TargF	10.0	1	0.200	2500.	576.	431.	572.	727.	0.165	0.113	0.165	0.214	3475.	3408.	11.0	8.4	2.6	50.4	-140.9	4.5	8.9	0.000	0.86	0.47
TargF	10.0	1	0.200	2600.	580.	432.	573.	739.	0.164	0.112	0.165	0.214	3517.	3450.	11.0	8.4	2.6	52.4	-146.8	3.9	11.0	0.000	0.86	0.47
TargF	10.0	1	0.200	2700.	567.	429.	564.	709.	0.161	0.115	0.161	0.207	3481.	3464.	11.0	8.4	2.6	53.5	-156.9	4.0	15.2	0.000	0.86	0.48
TargF	10.0	1	0.200	2800.	573.	436.	561.	730.	0.160	0.113	0.158	0.205	3532.	3486.	11.0	8.4	2.6	55.7	-161.8	3.6	16.8	0.000	0.86	0.48
TargF	10.0	1	0.200	2900.	574.	441.	563.	721.	0.161	0.112	0.162	0.205	3528.	3480.	11.0	8.4	2.7	57.5	-168.4	3.0	21.0	0.000	0.86	0.47
TargF	10.0	1	0.200	3000.	564.	431.	552.	708.	0.157	0.114	0.157	0.200	3531.	3498.	11.0	8.3	2.7	61.4	-173.0	3.4	27.2	0.000	0.87	0.48
TargF	10.0	1	0.200	3100.	570.	438.	559.	716.	0.157	0.112	0.156	0.200	3566.	3524.	11.0	8.3	2.7	63.2	-178.8	2.8	29.3	0.000	0.87	0.48
TargF	10.0	1	0.200	3200.	567.	430.	559.	703.	0.157	0.113	0.158	0.202	3548.	3560.	11.0	8.2	2.8	66.0	-182.1	2.7	36.3	0.000	0.86	0.48
TargF	10.0	1	0.200	3300.	567.	451.	559.	700.	0.157	0.117	0.157	0.198	3529.	3518.	11.0	8.1	2.9	71.5	-186.5	2.5	42.4	0.000	0.87	0.48
TargF	10.0	1	0.200	3400.	567.	444.	557.	700.	0.157	0.117	0.158	0.199	3539.	3531.	11.0	8.0	3.0	75.0	-192.5	2.7	47.8	0.000	0.87	0.48
TargF	10.0	1	0.200	3500.	563.	447.	552.	696.	0.156	0.115	0.156	0.195	3533.	3541.	11.0	7.9	3.1	80.6	-191.2	2.6	53.8	0.000	0.87	0.48
TargF	10.0	1	0.220	2000.	604.	440.	598.	772.	0.191	0.129	0.191	0.251	3241.	3175.	11.0	8.0	3.0	49.8	-121.8	10.1	3.5	0.000	0.85	0.44
TargF	10.0	1	0.220	2100.	600.	443.	595.	769.	0.187	0.121	0.189	0.247	3292.	3238.	11.0	8.2	2.8	49.9	-125.3	8.4	3.9	0.000	0.85	0.44
TargF	10.0	1	0.220	2200.	598.	441.	596.	765.	0.185	0.121	0.185	0.245	3302.	3250.	11.0	8.3	2.7	50.6	-135.0	7.8	5.5	0.000	0.85	0.45
TargF	10.0	1	0.220	2300.	593.	433.	589.	751.	0.182	0.122	0.183	0.238	3318.	3275.	11.0	8.3	2.7	51.5	-144.1	7.5	7.5	0.000	0.85	0.45
TargF	10.0	1	0.220	2400.	595.	447.	588.	757.	0.179	0.124	0.179	0.235	3355.	3306.	11.0	8.4	2.6	53.2	-156.4	6.6	9.4	0.000	0.85	0.45
TargF	10.0	1	0.220	2500.	581.	428.	576.	742.	0.176	0.117	0.177	0.229	3329.	3317.	11.0	8.4	2.6	53.3	-159.4	7.0	12.5	0.000	0.86	0.45
TargF	10.0	1	0.220	2600.	586.	442.	578.	736.	0.176	0.120	0.176	0.230	3352.	3327.	11.0	8.4	2.6	55.9	-165.9	6.1	15.9	0.000	0.86	0.46
TargF	10.0	1	0.220	2700.	589.	444.	584.	746.	0.174	0.122	0.177	0.223	3390.	3329.	11.0	8.4	2.6	58.3	-170.9	5.4	18.8	0.000	0.86	0.46
TargF	10.0	1	0.220	2800.	576.	427.	571.	724.	0.170	0.118	0.172	0.220	3382.	3424.	11.0	8.4	2.6	60.1	-177.9	5.4	23.1	0.000	0.86	0.46
TargF	10.0	1	0.220	2900.	579.	447.	570.	724.	0.172	0.124	0.172	0.222	3374.	3381.	11.0	8.3	2.7	63.2	-184.0	5.3	28.9	0.000	0.86	0.46
TargF	10.0	1	0.220	3000.	582.	448.	576.	719.	0.173	0.124	0.174	0.220	3365.	3370.	11.0	8.2	2.8	66.8	-185.6	5.0	34.2	0.000	0.86	0.46
TargF	10.0	1	0.220	3100.	581.	458.	574.	718.	0.174	0.127	0.173	0.220	3339.	3351.	11.0	8.1	2.9	72.7	-198.2	5.3	41.1	0.000	0.86	0.46
TargF	10.0	1	0.220	3200.	587.	458.	575.	730.	0.173	0.128	0.172	0.222	3387.	3368.	11.0	8.1	2.9	75.8	-196.8	5.0	44.7	0.000	0.86	0.46
TargF	10.0	1	0.220	3300.	581.	451.	572.	712.	0.171	0.128	0.172	0.214	3365.	3397.	11.0	7.9	3.1	82.2	-203.3	4.7	51.7	0.000	0.86	0.46
TargF	10.0	1	0.220	3400.	586.	457.	585.	723.	0.172	0.127	0.172	0.218	3401.	3402.	11.0	7.9	3.1	85.7	-200.2	4.2	55.7	0.000	0.86	0.46
TargF	10.0	1	0.220	3500.	587.	457.	580.	727.	0.172	0.126	0.173	0.216	3394.	3365.	11.0	7.7	3.3	92.8	-210.8	4.7	61.4	0.000	0.86	0.46
TargF	10.0	1	0.240	2000.	613.	457.	610.	782.	0.198	0.126	0.199	0.265	3214.	3159.	11.0	8.3	2.7	50.9	-135.9	11.0	3.7	0.000	0.84	0.43

Method	Perc	Dur	Targ	Trig	Cmean	C10	C50	C90	Fmean	F10	F50	F90	Smean	S20	Nchange	Nup	Ndown	Cup	Cdown	Risklim	Risktrig	Depl	4+	7+
TargF	10.0	1	0.240	2100.	609.	447.	607.	775.	0.198	0.125	0.198	0.268	3189.	3177.	11.0	8.3	2.7	51.4	-142.7	11.1	5.5	0.000	0.84	0.43
TargF	10.0	1	0.240	2200.	605.	439.	594.	779.	0.196	0.128	0.195	0.263	3186.	3171.	11.0	8.2	2.8	52.2	-150.9	11.3	8.3	0.000	0.84	0.43
TargF	10.0	1	0.240	2300.	599.	445.	591.	781.	0.190	0.125	0.192	0.250	3249.	3216.	11.0	8.5	2.5	53.8	-163.0	9.8	9.8	0.000	0.85	0.44
TargF	10.0	1	0.240	2400.	604.	449.	596.	768.	0.191	0.130	0.191	0.255	3235.	3210.	11.0	8.5	2.5	55.4	-169.4	9.2	12.6	0.000	0.85	0.44
TargF	10.0	1	0.240	2500.	606.	463.	599.	765.	0.193	0.134	0.192	0.252	3226.	3227.	11.0	8.4	2.6	58.2	-175.9	8.6	16.2	0.000	0.85	0.43
TargF	10.0	1	0.240	2600.	604.	467.	597.	751.	0.188	0.130	0.188	0.244	3272.	3241.	11.0	8.4	2.6	59.3	-181.0	8.1	18.5	0.000	0.85	0.44
TargF	10.0	1	0.240	2700.	597.	462.	585.	752.	0.186	0.128	0.186	0.245	3268.	3236.	11.0	8.4	2.6	61.9	-185.0	7.6	24.5	0.000	0.85	0.44
TargF	10.0	1	0.240	2800.	594.	463.	587.	739.	0.185	0.135	0.187	0.239	3258.	3280.	11.0	8.4	2.6	64.7	-195.6	8.2	29.8	0.000	0.85	0.44
TargF	10.0	1	0.240	2900.	597.	457.	589.	748.	0.184	0.129	0.183	0.237	3291.	3320.	11.0	8.2	2.8	69.9	-197.6	7.2	33.1	0.000	0.85	0.44
TargF	10.0	1	0.240	3000.	597.	460.	588.	756.	0.185	0.131	0.185	0.238	3277.	3272.	11.0	8.2	2.8	73.5	-202.7	7.8	40.5	0.000	0.85	0.44
TargF	10.0	1	0.240	3100.	602.	469.	592.	742.	0.186	0.137	0.187	0.236	3247.	3251.	11.0	8.0	3.0	79.2	-204.3	6.6	46.7	0.000	0.85	0.44
TargF	10.0	1	0.240	3200.	599.	472.	591.	739.	0.187	0.134	0.187	0.236	3246.	3276.	11.0	7.9	3.1	86.6	-211.2	7.4	52.4	0.000	0.85	0.44
TargF	10.0	1	0.240	3300.	597.	465.	593.	738.	0.187	0.134	0.187	0.240	3237.	3259.	11.0	7.8	3.2	90.1	-212.5	7.8	59.4	0.000	0.85	0.44
TargF	10.0	1	0.240	3400.	598.	476.	588.	734.	0.187	0.139	0.185	0.235	3234.	3280.	11.0	7.6	3.4	97.4	-221.3	7.6	65.1	0.000	0.85	0.44
TargF	10.0	1	0.240	3500.	600.	475.	595.	736.	0.186	0.139	0.186	0.231	3249.	3262.	11.0	7.6	3.4	103.6	-224.2	7.4	68.1	0.000	0.85	0.44
TargF	10.0	1	0.260	2000.	627.	463.	623.	787.	0.217	0.142	0.218	0.292	3043.	3014.	11.0	8.3	2.7	53.2	-150.7	15.6	6.1	0.000	0.84	0.41
TargF	10.0	1	0.260	2100.	617.	459.	612.	788.	0.211	0.140	0.211	0.282	3062.	3041.	11.0	8.3	2.7	53.8	-157.8	15.4	8.4	0.000	0.84	0.41
TargF	10.0	1	0.260	2200.	611.	450.	607.	770.	0.207	0.138	0.206	0.277	3099.	3105.	11.0	8.4	2.6	54.7	-171.5	14.0	10.2	0.000	0.84	0.41
TargF	10.0	1	0.260	2300.	616.	459.	613.	773.	0.206	0.135	0.207	0.273	3125.	3095.	11.0	8.5	2.5	57.1	-177.5	13.1	13.1	0.000	0.84	0.42
TargF	10.0	1	0.260	2400.	612.	458.	611.	775.	0.203	0.135	0.203	0.270	3131.	3107.	11.0	8.5	2.5	59.2	-186.8	13.4	17.6	0.000	0.84	0.42
TargF	10.0	1	0.260	2500.	606.	452.	603.	765.	0.198	0.128	0.201	0.259	3188.	3188.	11.0	8.5	2.5	60.3	-186.4	12.4	19.9	0.000	0.84	0.42
TargF	10.0	1	0.260	2600.	611.	461.	610.	767.	0.201	0.140	0.202	0.262	3156.	3174.	11.0	8.4	2.6	63.8	-199.7	12.4	26.1	0.000	0.84	0.42
TargF	10.0	1	0.260	2700.	609.	457.	604.	759.	0.202	0.137	0.203	0.262	3135.	3157.	11.0	8.3	2.7	67.7	-200.1	12.3	30.5	0.000	0.84	0.42
TargF	10.0	1	0.260	2800.	614.	470.	606.	770.	0.203	0.141	0.203	0.259	3127.	3132.	11.0	8.2	2.8	73.6	-206.4	12.1	36.6	0.000	0.84	0.42
TargF	10.0	1	0.260	2900.	608.	467.	604.	753.	0.200	0.141	0.201	0.259	3142.	3179.	11.0	8.2	2.8	76.6	-213.5	11.6	41.6	0.000	0.84	0.42
TargF	10.0	1	0.260	3000.	614.	475.	608.	765.	0.202	0.146	0.204	0.259	3126.	3124.	11.0	8.0	3.0	83.3	-219.4	10.8	48.3	0.000	0.84	0.42
TargF	10.0	1	0.260	3100.	610.	465.	606.	761.	0.201	0.141	0.201	0.259	3122.	3152.	11.0	8.0	3.0	87.9	-225.3	10.8	54.9	0.000	0.84	0.42
TargF	10.0	1	0.260	3200.	612.	482.	604.	746.	0.201	0.149	0.199	0.256	3124.	3130.	11.0	7.8	3.2	94.8	-227.0	9.9	59.5	0.000	0.84	0.42
TargF	10.0	1	0.260	3300.	607.	483.	602.	741.	0.200	0.150	0.200	0.254	3105.	3124.	11.0	7.6	3.4	103.0	-230.6	10.5	66.1	0.000	0.84	0.42
TargF	10.0	1	0.260	3400.	616.	486.	608.	753.	0.203	0.150	0.204	0.256	3104.	3110.	11.0	7.6	3.5	108.7	-234.9	10.1	70.7	0.000	0.84	0.42
TargF	10.0	1	0.260	3500.	618.	489.	613.	752.	0.201	0.153	0.202	0.250	3134.	3152.	11.0	7.5	3.5	118.0	-243.1	9.2	73.4	0.000	0.84	0.42
TargF	10.0	1	0.280	2000.	624.	454.	622.	795.	0.225	0.142	0.226	0.306	2972.	2974.	11.0	8.4	2.6	54.3	-167.9	20.2	8.7	0.000	0.83	0.40
TargF	10.0	1	0.280	2100.	620.	456.	617.	783.	0.224	0.140	0.225	0.304	2965.	2994.	11.0	8.5	2.5	55.5	-187.3	19.8	12.1	0.000	0.83	0.39
TargF	10.0	1	0.280	2200.	624.	466.	622.	787.	0.219	0.143	0.220	0.294	3016.	3001.	11.0	8.5	2.5	57.8	-183.5	17.0	13.2	0.000	0.83	0.40
TargF	10.0	1	0.280	2300.	618.	452.	620.	788.	0.213	0.138	0.212	0.289	3077.	3055.	11.0	8.5	2.5	59.8	-191.2	16.7	16.7	0.000	0.84	0.41
TargF	10.0	1	0.280	2400.	618.	460.	614.	786.	0.215	0.144	0.216	0.286	3034.	3039.	11.0	8.5	2.5	61.9	-197.8	16.4	21.1	0.000	0.83	0.40
TargF	10.0	1	0.280	2500.	620.	476.	620.	772.	0.215	0.143	0.217	0.282	3046.	3033.	11.0	8.4	2.6	66.2	-201.6	16.1	26.2	0.000	0.84	0.41

Method	Perc	Dur	Targ	Trig	Cmean	C10	C50	C90	Fmean	F10	F50	F90	Smean	S20	Nchange	Nup	Ndown	Cup	Cdown	Risklim	Risktrig	Depl	4+	7+
TargF	10.0	1	0.280	2600.	620.	464.	614.	781.	0.214	0.148	0.212	0.282	3033.	3022.	11.0	8.3	2.7	70.1	-212.5	16.0	30.0	0.000	0.84	0.41
TargF	10.0	1	0.280	2700.	614.	482.	613.	760.	0.211	0.145	0.212	0.278	3056.	3063.	11.0	8.3	2.7	71.6	-214.0	14.3	34.6	0.000	0.84	0.41
TargF	10.0	1	0.280	2800.	619.	476.	616.	772.	0.212	0.149	0.212	0.275	3051.	3072.	11.0	8.1	2.9	78.7	-218.9	14.8	41.5	0.000	0.84	0.41
TargF	10.0	1	0.280	2900.	624.	480.	624.	771.	0.215	0.147	0.218	0.274	3033.	3038.	11.0	8.0	3.0	83.5	-227.6	15.2	48.3	0.000	0.84	0.40
TargF	10.0	1	0.280	3000.	623.	490.	620.	769.	0.216	0.155	0.219	0.273	3005.	3023.	11.0	8.0	3.0	90.0	-230.4	14.9	55.2	0.000	0.83	0.40
TargF	10.0	1	0.280	3100.	618.	491.	609.	763.	0.215	0.158	0.215	0.273	2995.	3030.	11.0	7.8	3.2	99.5	-235.8	15.8	62.0	0.000	0.84	0.40
TargF	10.0	1	0.280	3200.	626.	491.	619.	763.	0.218	0.162	0.218	0.275	2995.	3002.	11.0	7.7	3.3	105.7	-238.0	15.3	67.7	0.000	0.83	0.40
TargF	10.0	1	0.280	3300.	627.	495.	622.	763.	0.216	0.158	0.217	0.276	3021.	3023.	11.0	7.6	3.4	112.1	-247.3	14.3	69.9	0.000	0.84	0.40
TargF	10.0	1	0.280	3400.	629.	501.	621.	762.	0.215	0.162	0.214	0.271	3021.	3042.	11.0	7.4	3.6	122.7	-249.5	13.2	75.1	0.000	0.84	0.40
TargF	10.0	1	0.280	3500.	627.	501.	624.	763.	0.217	0.168	0.218	0.268	2980.	3001.	11.0	7.3	3.7	132.3	-255.0	14.1	80.6	0.000	0.83	0.40
TargF	10.0	1	0.300	2000.	625.	437.	625.	791.	0.236	0.145	0.237	0.328	2901.	2925.	11.0	8.4	2.6	56.1	-179.1	24.8	12.1	0.000	0.82	0.38
TargF	10.0	1	0.300	2100.	623.	454.	622.	790.	0.232	0.142	0.232	0.320	2908.	2958.	11.0	8.5	2.5	57.7	-193.0	23.4	14.2	0.000	0.82	0.38
TargF	10.0	1	0.300	2200.	627.	464.	629.	786.	0.230	0.149	0.230	0.306	2927.	2956.	11.0	8.5	2.5	59.7	-202.4	21.1	16.5	0.000	0.83	0.39
TargF	10.0	1	0.300	2300.	626.	462.	631.	793.	0.230	0.149	0.234	0.307	2924.	2978.	11.0	8.4	2.6	62.2	-200.2	21.5	21.5	0.000	0.83	0.38
TargF	10.0	1	0.300	2400.	629.	477.	625.	789.	0.228	0.150	0.229	0.303	2949.	2949.	11.0	8.4	2.6	66.6	-206.4	20.3	25.2	0.000	0.83	0.39
TargF	10.0	1	0.300	2500.	621.	471.	616.	777.	0.225	0.152	0.223	0.300	2953.	2986.	11.0	8.4	2.6	70.3	-215.1	20.3	30.5	0.000	0.83	0.39
TargF	10.0	1	0.300	2600.	630.	478.	628.	785.	0.228	0.152	0.230	0.295	2939.	2973.	11.0	8.2	2.8	74.8	-218.6	19.5	36.4	0.000	0.83	0.39
TargF	10.0	1	0.300	2700.	632.	486.	634.	783.	0.228	0.155	0.230	0.299	2942.	2922.	11.0	8.2	2.8	80.1	-221.7	19.5	42.4	0.000	0.83	0.39
TargF	10.0	1	0.300	2800.	627.	484.	623.	773.	0.228	0.159	0.228	0.295	2921.	2954.	11.0	8.0	3.0	86.7	-231.6	20.6	49.2	0.000	0.83	0.39
TargF	10.0	1	0.300	2900.	624.	487.	621.	767.	0.224	0.157	0.224	0.293	2944.	2933.	11.0	7.9	3.1	91.6	-233.8	19.0	54.1	0.000	0.83	0.39
TargF	10.0	1	0.300	3000.	634.	491.	634.	783.	0.229	0.164	0.230	0.294	2925.	2926.	11.0	7.8	3.2	99.3	-236.0	19.0	59.7	0.000	0.83	0.39
TargF	10.0	1	0.300	3100.	637.	501.	631.	778.	0.232	0.171	0.233	0.293	2890.	2912.	11.0	7.7	3.3	108.5	-244.8	19.4	67.2	0.000	0.83	0.38
TargF	10.0	1	0.300	3200.	639.	507.	632.	776.	0.232	0.170	0.231	0.299	2908.	2932.	11.0	7.5	3.5	118.3	-251.8	19.0	71.2	0.000	0.83	0.38
TargF	10.0	1	0.300	3300.	639.	510.	633.	771.	0.230	0.168	0.231	0.292	2915.	2924.	11.0	7.4	3.6	125.1	-257.1	17.8	76.4	0.000	0.83	0.39
TargF	10.0	1	0.300	3400.	636.	492.	635.	778.	0.231	0.172	0.231	0.294	2891.	2931.	11.0	7.3	3.7	136.1	-265.3	18.4	80.5	0.000	0.83	0.38
TargF	10.0	1	0.300	3500.	638.	504.	634.	776.	0.229	0.171	0.228	0.292	2923.	2947.	11.0	7.2	3.8	142.8	-267.9	17.5	82.2	0.000	0.83	0.39
TargF	15.0	1	0.120	2000.	529.	411.	527.	651.	0.125	0.103	0.125	0.149	3932.	3845.	11.0	6.6	4.4	58.4	-72.6	0.7	0.1	0.000	0.88	0.53
TargF	15.0	1	0.120	2100.	526.	398.	520.	655.	0.125	0.099	0.123	0.150	3934.	3854.	11.0	6.6	4.4	57.7	-74.8	0.9	0.3	0.001	0.89	0.54
TargF	15.0	1	0.120	2200.	516.	392.	513.	644.	0.122	0.094	0.123	0.148	3938.	3887.	11.0	6.8	4.2	56.8	-78.0	0.5	0.3	0.000	0.89	0.54
TargF	15.0	1	0.120	2300.	513.	384.	516.	640.	0.119	0.094	0.120	0.144	3990.	3915.	11.0	6.9	4.1	57.0	-83.2	0.7	0.7	0.000	0.89	0.54
TargF	15.0	1	0.120	2400.	512.	388.	512.	634.	0.119	0.095	0.119	0.143	3993.	3943.	11.0	7.0	4.0	56.8	-85.9	0.5	0.9	0.000	0.89	0.54
TargF	15.0	1	0.120	2500.	511.	385.	506.	648.	0.117	0.091	0.118	0.143	4023.	3946.	11.0	7.1	3.9	56.9	-89.7	0.3	1.2	0.000	0.89	0.54
TargF	15.0	1	0.120	2600.	513.	380.	509.	650.	0.117	0.090	0.118	0.142	4040.	3936.	11.0	7.2	3.8	57.4	-93.2	0.3	1.7	0.000	0.89	0.55
TargF	15.0	1	0.120	2700.	506.	388.	499.	635.	0.116	0.091	0.116	0.142	4026.	3972.	11.0	7.3	3.7	57.4	-97.5	0.4	2.6	0.000	0.89	0.55
TargF	15.0	1	0.120	2800.	505.	376.	502.	640.	0.116	0.092	0.116	0.140	4014.	3977.	11.0	7.3	3.7	57.7	-99.5	0.5	4.4	0.000	0.89	0.55
TargF	15.0	1	0.120	2900.	503.	380.	498.	638.	0.113	0.088	0.113	0.139	4080.	4034.	11.0	7.4	3.6	57.7	-106.4	0.4	4.9	0.000	0.89	0.55
TargF	15.0	1	0.120	3000.	502.	371.	494.	637.	0.114	0.088	0.113	0.140	4056.	4019.	11.0	7.4	3.6	58.3	-106.8	0.3	7.0	0.000	0.89	0.55

Method	Perc	Dur	Targ	Trig	Cmean	C10	C50	C90	Fmean	F10	F50	F90	Smean	S20	Nchange	Nup	Ndown	Cup	Cdown	Risklim	Risktrig	Depl	4+	7+
TargF	15.0	1	0.120	3100.	493.	368.	485.	631.	0.111	0.087	0.111	0.135	4075.	4048.	11.0	7.5	3.5	58.5	-112.7	0.2	9.3	0.000	0.89	0.55
TargF	15.0	1	0.120	3200.	494.	365.	483.	637.	0.110	0.087	0.109	0.134	4114.	4078.	11.0	7.5	3.5	59.8	-113.2	0.2	11.1	0.000	0.89	0.55
TargF	15.0	1	0.120	3300.	491.	366.	483.	627.	0.109	0.086	0.109	0.133	4103.	4051.	11.0	7.6	3.4	60.9	-119.0	0.2	15.0	0.000	0.89	0.55
TargF	15.0	1	0.120	3400.	492.	358.	489.	624.	0.109	0.085	0.109	0.133	4115.	4065.	11.0	7.5	3.5	62.5	-123.1	0.2	18.3	0.000	0.89	0.56
TargF	15.0	1	0.120	3500.	487.	359.	478.	631.	0.108	0.083	0.107	0.134	4139.	4111.	11.0	7.6	3.4	63.5	-130.7	0.2	21.4	0.000	0.89	0.55
TargF	15.0	1	0.140	2000.	558.	434.	557.	687.	0.143	0.112	0.144	0.174	3700.	3608.	11.0	6.7	4.3	61.3	-85.4	1.5	0.4	0.000	0.88	0.51
TargF	15.0	1	0.140	2100.	555.	428.	550.	686.	0.142	0.112	0.142	0.173	3693.	3613.	11.0	6.8	4.2	61.4	-88.2	1.3	0.5	0.000	0.88	0.51
TargF	15.0	1	0.140	2200.	554.	421.	551.	692.	0.140	0.108	0.141	0.171	3744.	3652.	11.0	6.9	4.1	61.6	-92.7	1.4	0.8	0.000	0.88	0.51
TargF	15.0	1	0.140	2300.	556.	426.	555.	681.	0.141	0.110	0.141	0.171	3737.	3648.	11.0	6.9	4.1	61.7	-93.0	1.1	1.1	0.000	0.88	0.51
TargF	15.0	1	0.140	2400.	548.	415.	539.	690.	0.137	0.109	0.136	0.167	3758.	3673.	11.0	7.2	3.8	61.5	-101.8	1.3	2.0	0.000	0.88	0.52
TargF	15.0	1	0.140	2500.	544.	412.	537.	690.	0.136	0.106	0.136	0.166	3773.	3700.	11.0	7.2	3.8	61.5	-106.3	1.0	2.4	0.000	0.88	0.52
TargF	15.0	1	0.140	2600.	536.	404.	528.	675.	0.133	0.102	0.133	0.166	3784.	3762.	11.0	7.3	3.7	61.0	-110.1	0.9	3.7	0.000	0.88	0.52
TargF	15.0	1	0.140	2700.	537.	412.	529.	676.	0.133	0.103	0.132	0.163	3812.	3751.	11.0	7.4	3.6	62.0	-113.4	0.8	4.8	0.000	0.88	0.52
TargF	15.0	1	0.140	2800.	533.	400.	523.	674.	0.130	0.099	0.130	0.161	3841.	3800.	11.0	7.5	3.5	62.6	-116.9	0.6	6.2	0.000	0.88	0.52
TargF	15.0	1	0.140	2900.	529.	399.	525.	669.	0.128	0.100	0.128	0.158	3867.	3840.	11.0	7.6	3.4	62.5	-126.1	0.7	8.3	0.000	0.88	0.53
TargF	15.0	1	0.140	3000.	530.	400.	523.	675.	0.127	0.098	0.127	0.156	3882.	3837.	11.0	7.6	3.4	64.2	-130.4	0.7	11.2	0.000	0.88	0.53
TargF	15.0	1	0.140	3100.	523.	390.	513.	667.	0.126	0.096	0.126	0.158	3875.	3856.	11.0	7.7	3.3	64.2	-136.6	0.8	15.2	0.000	0.88	0.53
TargF	15.0	1	0.140	3200.	528.	397.	523.	676.	0.127	0.098	0.126	0.156	3903.	3887.	11.0	7.7	3.3	66.8	-139.2	0.5	17.4	0.000	0.88	0.53
TargF	15.0	1	0.140	3300.	523.	394.	513.	667.	0.125	0.097	0.124	0.156	3904.	3869.	11.0	7.7	3.3	67.4	-141.3	0.5	21.2	0.000	0.88	0.53
TargF	15.0	1	0.140	3400.	518.	392.	511.	650.	0.124	0.097	0.124	0.151	3893.	3882.	11.0	7.7	3.3	69.3	-145.3	0.5	25.6	0.000	0.88	0.53
TargF	15.0	1	0.140	3500.	517.	392.	505.	655.	0.122	0.094	0.121	0.150	3957.	3960.	11.0	7.6	3.4	71.5	-152.3	0.2	29.8	0.000	0.88	0.53
TargF	15.0	1	0.160	2000.	579.	443.	577.	721.	0.160	0.121	0.161	0.198	3510.	3467.	11.0	6.9	4.1	64.4	-97.4	3.1	0.7	0.000	0.87	0.48
TargF	15.0	1	0.160	2100.	576.	442.	572.	714.	0.159	0.121	0.159	0.196	3511.	3480.	11.0	7.0	4.0	63.8	-102.3	2.8	0.9	0.000	0.87	0.48
TargF	15.0	1	0.160	2200.	574.	432.	572.	719.	0.156	0.120	0.156	0.193	3547.	3442.	11.0	7.2	3.8	64.1	-110.0	2.3	1.5	0.000	0.87	0.49
TargF	15.0	1	0.160	2300.	573.	441.	564.	718.	0.154	0.120	0.153	0.190	3585.	3528.	11.0	7.3	3.7	64.9	-113.4	2.1	2.1	0.000	0.87	0.49
TargF	15.0	1	0.160	2400.	568.	425.	560.	716.	0.152	0.114	0.151	0.189	3589.	3532.	11.0	7.4	3.6	64.7	-121.8	2.1	3.2	0.000	0.87	0.49
TargF	15.0	1	0.160	2500.	566.	427.	559.	720.	0.151	0.114	0.150	0.189	3601.	3556.	11.0	7.4	3.6	65.5	-123.4	1.7	4.2	0.000	0.87	0.49
TargF	15.0	1	0.160	2600.	567.	434.	560.	708.	0.149	0.113	0.149	0.186	3649.	3574.	11.0	7.6	3.4	65.8	-131.7	1.5	5.3	0.000	0.87	0.49
TargF	15.0	1	0.160	2700.	561.	424.	555.	712.	0.148	0.112	0.148	0.184	3619.	3567.	11.0	7.6	3.4	66.5	-138.1	1.6	8.9	0.000	0.87	0.50
TargF	15.0	1	0.160	2800.	552.	416.	547.	701.	0.145	0.108	0.145	0.182	3636.	3628.	11.0	7.6	3.4	67.2	-141.8	1.6	11.4	0.000	0.87	0.50
TargF	15.0	1	0.160	2900.	557.	423.	553.	697.	0.145	0.112	0.144	0.181	3656.	3608.	11.0	7.6	3.4	69.1	-144.6	1.4	14.1	0.000	0.87	0.50
TargF	15.0	1	0.160	3000.	555.	417.	547.	708.	0.144	0.112	0.143	0.178	3672.	3645.	11.0	7.6	3.4	70.2	-146.4	1.2	17.0	0.000	0.87	0.50
TargF	15.0	1	0.160	3100.	550.	418.	543.	685.	0.142	0.109	0.142	0.175	3678.	3665.	11.0	7.7	3.3	71.2	-152.3	1.0	21.1	0.000	0.87	0.50
TargF	15.0	1	0.160	3200.	546.	421.	538.	684.	0.140	0.108	0.140	0.173	3708.	3698.	11.0	7.7	3.3	73.2	-155.8	1.0	24.5	0.000	0.88	0.50
TargF	15.0	1	0.160	3300.	546.	425.	536.	678.	0.140	0.108	0.139	0.171	3717.	3731.	11.0	7.6	3.4	75.0	-161.1	1.2	30.3	0.000	0.88	0.50
TargF	15.0	1	0.160	3400.	544.	419.	535.	681.	0.139	0.109	0.137	0.171	3725.	3716.	11.0	7.7	3.3	78.5	-168.6	0.9	35.0	0.000	0.88	0.51
TargF	15.0	1	0.160	3500.	541.	413.	529.	686.	0.137	0.105	0.136	0.170	3757.	3764.	11.0	7.7	3.3	79.8	-170.3	1.1	38.5	0.000	0.88	0.51

Method	Perc	Dur	Targ	Trig	Cmean	C10	C50	C90	Fmean	F10	F50	F90	Smean	S20	Nchange	Nup	Ndown	Cup	Cdown	Risklim	Risktrig	Depl	4+	7+
TargF	15.0	1	0.180	2000.	600.	454.	598.	748.	0.177	0.133	0.176	0.221	3352.	3334.	11.0	7.1	3.9	67.2	-111.0	5.1	1.5	0.000	0.86	0.46
TargF	15.0	1	0.180	2100.	599.	463.	593.	748.	0.176	0.136	0.176	0.218	3342.	3296.	11.0	7.2	3.8	67.1	-113.8	4.3	2.0	0.000	0.86	0.46
TargF	15.0	1	0.180	2200.	592.	454.	584.	732.	0.172	0.133	0.173	0.213	3376.	3353.	11.0	7.3	3.7	67.4	-122.7	4.3	2.8	0.000	0.86	0.46
TargF	15.0	1	0.180	2300.	587.	444.	579.	747.	0.168	0.126	0.168	0.213	3415.	3360.	11.0	7.4	3.6	67.5	-129.5	4.2	4.2	0.000	0.86	0.47
TargF	15.0	1	0.180	2400.	593.	458.	587.	742.	0.169	0.125	0.168	0.214	3445.	3376.	11.0	7.5	3.5	68.9	-135.4	3.4	5.1	0.000	0.86	0.47
TargF	15.0	1	0.180	2500.	583.	451.	575.	725.	0.166	0.125	0.164	0.209	3439.	3396.	11.0	7.6	3.4	68.6	-142.5	3.4	7.2	0.000	0.86	0.47
TargF	15.0	1	0.180	2600.	579.	439.	571.	730.	0.163	0.121	0.163	0.205	3467.	3430.	11.0	7.7	3.3	69.3	-147.6	3.4	9.9	0.000	0.86	0.47
TargF	15.0	1	0.180	2700.	577.	437.	567.	725.	0.161	0.122	0.162	0.200	3473.	3454.	11.0	7.7	3.3	70.6	-150.3	2.6	11.4	0.000	0.86	0.47
TargF	15.0	1	0.180	2800.	576.	441.	568.	717.	0.160	0.122	0.160	0.202	3489.	3460.	11.0	7.7	3.3	72.6	-155.5	2.6	15.4	0.000	0.87	0.48
TargF	15.0	1	0.180	2900.	575.	438.	570.	717.	0.159	0.123	0.158	0.196	3505.	3483.	11.0	7.7	3.3	73.7	-163.6	2.5	18.6	0.000	0.87	0.48
TargF	15.0	1	0.180	3000.	567.	429.	560.	711.	0.155	0.116	0.156	0.193	3529.	3516.	11.0	7.7	3.3	75.9	-171.2	2.0	23.9	0.000	0.87	0.48
TargF	15.0	1	0.180	3100.	566.	441.	557.	706.	0.154	0.119	0.154	0.192	3539.	3495.	11.0	7.8	3.2	77.3	-175.0	2.6	28.5	0.000	0.87	0.49
TargF	15.0	1	0.180	3200.	564.	432.	552.	712.	0.153	0.114	0.152	0.190	3559.	3555.	11.0	7.7	3.3	81.4	-179.8	2.0	32.9	0.000	0.87	0.48
TargF	15.0	1	0.180	3300.	568.	438.	559.	706.	0.155	0.117	0.154	0.191	3549.	3553.	11.0	7.7	3.3	83.1	-185.4	2.1	39.0	0.000	0.87	0.48
TargF	15.0	1	0.180	3400.	566.	440.	553.	705.	0.153	0.118	0.151	0.190	3574.	3506.	11.0	7.6	3.4	87.8	-184.9	2.1	44.3	0.000	0.87	0.49
TargF	15.0	1	0.180	3500.	565.	442.	554.	703.	0.153	0.120	0.151	0.188	3554.	3545.	11.0	7.5	3.5	91.0	-185.7	2.0	50.7	0.000	0.87	0.48
TargF	15.0	1	0.200	2000.	605.	460.	601.	757.	0.190	0.140	0.190	0.238	3210.	3180.	11.0	7.3	3.7	68.3	-126.3	7.6	2.4	0.000	0.85	0.44
TargF	15.0	1	0.200	2100.	611.	466.	599.	767.	0.189	0.142	0.190	0.239	3247.	3193.	11.0	7.4	3.6	69.9	-134.8	7.1	3.0	0.000	0.85	0.44
TargF	15.0	1	0.200	2200.	608.	464.	601.	758.	0.186	0.139	0.187	0.231	3262.	3213.	11.0	7.5	3.5	69.7	-137.5	5.7	3.8	0.000	0.85	0.44
TargF	15.0	1	0.200	2300.	607.	469.	601.	759.	0.185	0.138	0.185	0.231	3289.	3252.	11.0	7.6	3.4	70.8	-141.6	6.1	6.1	0.000	0.85	0.44
TargF	15.0	1	0.200	2400.	607.	468.	604.	762.	0.183	0.135	0.183	0.229	3302.	3216.	11.0	7.6	3.4	71.5	-150.4	5.5	7.7	0.000	0.85	0.45
TargF	15.0	1	0.200	2500.	598.	454.	591.	749.	0.178	0.135	0.178	0.223	3325.	3287.	11.0	7.7	3.3	72.1	-158.8	5.0	10.5	0.000	0.86	0.45
TargF	15.0	1	0.200	2600.	596.	452.	592.	750.	0.180	0.135	0.178	0.228	3298.	3276.	11.0	7.7	3.3	74.5	-163.8	5.9	15.4	0.000	0.85	0.45
TargF	15.0	1	0.200	2700.	594.	450.	589.	742.	0.175	0.132	0.175	0.222	3348.	3335.	11.0	7.8	3.2	75.3	-171.1	4.5	17.1	0.000	0.86	0.45
TargF	15.0	1	0.200	2800.	591.	460.	579.	737.	0.175	0.133	0.174	0.219	3331.	3333.	11.0	7.8	3.2	77.3	-180.6	4.6	22.0	0.000	0.86	0.46
TargF	15.0	1	0.200	2900.	589.	450.	580.	736.	0.172	0.129	0.171	0.218	3374.	3385.	11.0	7.8	3.2	79.1	-185.0	4.1	26.0	0.000	0.86	0.46
TargF	15.0	1	0.200	3000.	590.	453.	586.	730.	0.172	0.133	0.170	0.213	3373.	3347.	11.0	7.8	3.2	82.5	-187.7	3.3	31.4	0.000	0.86	0.46
TargF	15.0	1	0.200	3100.	589.	461.	575.	735.	0.170	0.131	0.169	0.209	3400.	3404.	11.0	7.7	3.3	85.1	-189.6	3.8	35.9	0.000	0.86	0.46
TargF	15.0	1	0.200	3200.	588.	452.	579.	739.	0.170	0.128	0.169	0.209	3395.	3371.	11.0	7.7	3.3	88.0	-195.7	3.3	42.9	0.000	0.86	0.46
TargF	15.0	1	0.200	3300.	590.	452.	586.	729.	0.169	0.130	0.168	0.210	3422.	3432.	11.0	7.6	3.4	92.7	-200.5	3.1	46.1	0.000	0.86	0.46
TargF	15.0	1	0.200	3400.	582.	452.	573.	725.	0.167	0.128	0.166	0.207	3414.	3426.	11.0	7.5	3.5	95.9	-200.7	3.2	53.7	0.000	0.86	0.46
TargF	15.0	1	0.200	3500.	584.	464.	574.	724.	0.167	0.131	0.165	0.207	3417.	3407.	11.0	7.5	3.5	100.4	-204.4	3.3	59.1	0.000	0.86	0.46
TargF	15.0	1	0.220	2000.	624.	473.	624.	774.	0.207	0.154	0.207	0.263	3078.	3030.	11.0	7.4	3.6	71.1	-138.9	11.5	3.7	0.000	0.84	0.42
TargF	15.0	1	0.220	2100.	624.	480.	615.	774.	0.204	0.148	0.203	0.258	3128.	3085.	11.0	7.5	3.5	72.6	-150.6	10.5	4.9	0.000	0.84	0.42
TargF	15.0	1	0.220	2200.	617.	473.	613.	774.	0.202	0.146	0.203	0.260	3115.	3111.	11.0	7.6	3.4	72.2	-155.7	10.6	7.3	0.000	0.84	0.42
TargF	15.0	1	0.220	2300.	618.	477.	614.	762.	0.199	0.145	0.200	0.252	3151.	3112.	11.0	7.7	3.3	74.1	-164.3	9.7	9.7	0.000	0.85	0.43
TargF	15.0	1	0.220	2400.	610.	472.	605.	756.	0.195	0.145	0.195	0.245	3163.	3136.	11.0	7.7	3.3	75.2	-169.6	8.7	11.8	0.000	0.85	0.43

Method	Perc	Dur	Targ	Trig	Cmean	C10	C50	C90	Fmean	F10	F50	F90	Smean	S20	Nchange	Nup	Ndown	Cup	Cdown	Risklim	Risktrig	Depl	4+	7+
TargF	15.0	1	0.220	2500.	607.	470.	600.	749.	0.194	0.144	0.194	0.245	3165.	3159.	11.0	7.8	3.2	76.0	-172.3	8.7	16.3	0.000	0.85	0.43
TargF	15.0	1	0.220	2600.	614.	471.	610.	763.	0.192	0.142	0.191	0.243	3225.	3194.	11.0	7.9	3.1	78.8	-185.8	7.9	18.8	0.000	0.85	0.44
TargF	15.0	1	0.220	2700.	605.	469.	601.	754.	0.189	0.139	0.189	0.239	3231.	3199.	11.0	7.9	3.1	80.1	-190.6	7.6	23.8	0.000	0.85	0.44
TargF	15.0	1	0.220	2800.	604.	462.	597.	753.	0.188	0.139	0.185	0.238	3223.	3227.	11.0	7.8	3.2	82.9	-192.7	6.9	27.7	0.000	0.85	0.44
TargF	15.0	1	0.220	2900.	600.	466.	594.	748.	0.186	0.141	0.185	0.235	3232.	3201.	11.0	7.8	3.2	86.1	-200.8	7.1	34.5	0.000	0.85	0.44
TargF	15.0	1	0.220	3000.	610.	472.	603.	761.	0.188	0.142	0.186	0.234	3255.	3255.	11.0	7.7	3.3	89.6	-199.8	6.5	38.5	0.000	0.85	0.44
TargF	15.0	1	0.220	3100.	596.	464.	593.	740.	0.182	0.133	0.181	0.226	3282.	3289.	11.0	7.7	3.3	92.8	-206.5	6.5	43.9	0.000	0.85	0.45
TargF	15.0	1	0.220	3200.	601.	461.	595.	746.	0.183	0.136	0.183	0.232	3284.	3263.	11.0	7.6	3.4	95.5	-207.3	5.9	50.0	0.000	0.85	0.44
TargF	15.0	1	0.220	3300.	600.	473.	592.	741.	0.183	0.141	0.182	0.228	3268.	3272.	11.0	7.5	3.5	102.4	-214.6	5.3	56.7	0.000	0.85	0.45
TargF	15.0	1	0.220	3400.	599.	468.	591.	736.	0.181	0.137	0.179	0.224	3300.	3302.	11.0	7.4	3.5	106.7	-215.4	5.1	60.2	0.000	0.85	0.45
TargF	15.0	1	0.220	3500.	598.	470.	588.	736.	0.181	0.142	0.178	0.225	3274.	3267.	11.0	7.4	3.6	113.0	-226.0	5.1	67.1	0.000	0.85	0.45
TargF	15.0	1	0.240	2000.	632.	484.	631.	789.	0.221	0.159	0.222	0.282	2964.	2973.	11.0	7.6	3.4	73.2	-157.0	15.4	5.7	0.000	0.83	0.40
TargF	15.0	1	0.240	2100.	632.	477.	632.	783.	0.220	0.157	0.222	0.281	2981.	2957.	11.0	7.5	3.5	74.0	-156.8	15.4	8.1	0.000	0.84	0.40
TargF	15.0	1	0.240	2200.	630.	478.	621.	783.	0.216	0.151	0.215	0.276	3030.	3022.	11.0	7.8	3.2	75.7	-169.5	13.8	10.5	0.000	0.84	0.41
TargF	15.0	1	0.240	2300.	631.	493.	626.	788.	0.214	0.155	0.211	0.273	3046.	3016.	11.0	7.9	3.1	76.8	-178.6	11.8	11.8	0.000	0.84	0.41
TargF	15.0	1	0.240	2400.	626.	480.	624.	777.	0.209	0.153	0.209	0.266	3084.	3072.	11.0	7.8	3.2	78.6	-182.7	11.2	15.3	0.000	0.84	0.41
TargF	15.0	1	0.240	2500.	617.	479.	609.	768.	0.205	0.152	0.205	0.262	3079.	3065.	11.0	7.8	3.2	80.3	-190.7	11.6	20.7	0.001	0.84	0.42
TargF	15.0	1	0.240	2600.	618.	477.	612.	770.	0.204	0.148	0.203	0.261	3120.	3090.	11.0	7.9	3.1	81.1	-195.3	10.7	24.1	0.000	0.84	0.42
TargF	15.0	1	0.240	2700.	611.	471.	609.	756.	0.201	0.147	0.200	0.257	3110.	3106.	11.0	7.8	3.2	84.7	-205.5	10.8	29.6	0.000	0.84	0.42
TargF	15.0	1	0.240	2800.	616.	482.	611.	756.	0.203	0.151	0.200	0.259	3086.	3118.	11.0	7.8	3.2	89.6	-209.0	10.8	36.2	0.000	0.84	0.42
TargF	15.0	1	0.240	2900.	618.	480.	614.	764.	0.200	0.149	0.201	0.253	3135.	3120.	11.0	7.8	3.2	93.6	-213.2	9.2	40.4	0.000	0.84	0.42
TargF	15.0	1	0.240	3000.	612.	483.	603.	759.	0.200	0.150	0.201	0.248	3107.	3114.	11.0	7.6	3.4	96.6	-208.5	10.3	48.1	0.000	0.84	0.42
TargF	15.0	1	0.240	3100.	616.	479.	604.	764.	0.199	0.149	0.199	0.247	3128.	3112.	11.0	7.6	3.4	102.3	-218.6	9.5	53.0	0.000	0.84	0.42
TargF	15.0	1	0.240	3200.	616.	487.	607.	764.	0.199	0.149	0.198	0.251	3126.	3097.	11.0	7.5	3.5	107.7	-226.2	9.0	58.5	0.000	0.85	0.42
TargF	15.0	1	0.240	3300.	615.	487.	606.	751.	0.196	0.150	0.195	0.244	3172.	3181.	11.0	7.5	3.5	110.4	-228.3	7.3	62.8	0.000	0.85	0.43
TargF	15.0	1	0.240	3400.	614.	489.	605.	750.	0.197	0.150	0.197	0.247	3146.	3147.	11.0	7.4	3.6	116.8	-235.9	8.2	69.0	0.000	0.85	0.43
TargF	15.0	1	0.240	3500.	614.	487.	605.	745.	0.195	0.148	0.193	0.244	3171.	3179.	11.0	7.3	3.7	121.7	-232.0	7.7	73.2	0.000	0.85	0.43
TargF	15.0	1	0.260	2000.	640.	473.	634.	809.	0.235	0.165	0.235	0.306	2883.	2880.	11.0	7.7	3.3	76.0	-169.6	20.4	8.1	0.000	0.83	0.38
TargF	15.0	1	0.260	2100.	640.	488.	634.	794.	0.229	0.166	0.229	0.292	2925.	2930.	11.0	7.8	3.2	77.1	-174.2	17.2	9.1	0.000	0.83	0.39
TargF	15.0	1	0.260	2200.	632.	482.	626.	783.	0.225	0.163	0.225	0.285	2935.	2934.	11.0	7.9	3.1	78.8	-187.8	17.9	13.5	0.000	0.83	0.39
TargF	15.0	1	0.260	2300.	639.	489.	638.	790.	0.226	0.165	0.225	0.290	2962.	2915.	11.0	7.8	3.2	80.3	-192.3	17.4	17.4	0.000	0.83	0.40
TargF	15.0	1	0.260	2400.	635.	485.	628.	784.	0.224	0.160	0.222	0.291	2958.	2939.	11.0	7.8	3.2	82.6	-197.3	16.9	22.0	0.000	0.83	0.39
TargF	15.0	1	0.260	2500.	627.	483.	624.	770.	0.220	0.162	0.220	0.280	2956.	2982.	11.0	7.8	3.2	84.9	-203.6	16.3	26.0	0.000	0.83	0.40
TargF	15.0	1	0.260	2600.	625.	485.	620.	775.	0.217	0.162	0.217	0.275	2978.	2986.	11.0	7.9	3.1	87.3	-212.7	15.8	31.9	0.000	0.84	0.40
TargF	15.0	1	0.260	2700.	634.	495.	625.	786.	0.218	0.160	0.217	0.276	3000.	2970.	11.0	7.8	3.2	91.9	-213.5	13.8	35.8	0.000	0.84	0.40
TargF	15.0	1	0.260	2800.	624.	491.	617.	765.	0.214	0.161	0.210	0.272	2999.	2989.	11.0	7.8	3.2	96.1	-226.7	13.2	41.4	0.000	0.84	0.41
TargF	15.0	1	0.260	2900.	629.	490.	625.	773.	0.214	0.161	0.213	0.269	3030.	3022.	11.0	7.7	3.3	98.9	-224.8	12.9	46.3	0.000	0.84	0.41

Method	Perc	Dur	Targ	Trig	Cmean	C10	C50	C90	Fmean	F10	F50	F90	Smean	S20	Nchange	Nup	Ndown	Cup	Cdown	Risklim	Risktrig	Depl	4+	7+
TargF	15.0	1	0.260	3000.	624.	491.	623.	763.	0.212	0.160	0.211	0.269	3033.	3035.	11.0	7.6	3.4	106.0	-229.7	13.6	53.6	0.000	0.84	0.41
TargF	15.0	1	0.260	3100.	628.	493.	618.	780.	0.215	0.160	0.213	0.271	3002.	2999.	11.0	7.5	3.5	111.8	-237.6	13.3	60.6	0.000	0.84	0.41
TargF	15.0	1	0.260	3200.	624.	492.	616.	762.	0.211	0.160	0.210	0.262	3026.	3033.	11.0	7.4	3.6	118.1	-236.0	12.7	65.3	0.000	0.84	0.41
TargF	15.0	1	0.260	3300.	627.	492.	623.	766.	0.211	0.160	0.210	0.263	3038.	3039.	11.0	7.3	3.7	121.6	-238.4	11.2	69.3	0.000	0.84	0.41
TargF	15.0	1	0.260	3400.	629.	499.	623.	760.	0.212	0.165	0.210	0.266	3022.	3036.	11.0	7.1	3.9	130.6	-239.6	10.7	75.9	0.000	0.84	0.41
TargF	15.0	1	0.260	3500.	632.	507.	625.	770.	0.212	0.164	0.210	0.262	3041.	3045.	11.0	7.2	3.8	135.4	-246.1	10.7	78.9	0.000	0.84	0.41
TargF	15.0	1	0.280	2000.	648.	485.	646.	806.	0.247	0.169	0.249	0.323	2813.	2804.	11.0	7.8	3.2	78.1	-181.9	24.0	10.3	0.000	0.82	0.37
TargF	15.0	1	0.280	2100.	650.	498.	647.	804.	0.245	0.174	0.244	0.320	2817.	2806.	11.0	7.9	3.1	80.7	-195.9	23.1	13.4	0.000	0.82	0.37
TargF	15.0	1	0.280	2200.	636.	481.	639.	795.	0.238	0.170	0.236	0.308	2842.	2860.	11.0	7.9	3.1	80.7	-203.3	22.1	17.5	0.000	0.82	0.38
TargF	15.0	1	0.280	2300.	641.	486.	636.	802.	0.239	0.170	0.239	0.306	2852.	2869.	11.0	7.9	3.1	83.9	-213.1	22.6	22.6	0.000	0.82	0.38
TargF	15.0	1	0.280	2400.	636.	493.	629.	792.	0.233	0.168	0.233	0.300	2877.	2878.	11.0	8.0	3.0	86.5	-215.8	20.1	25.3	0.000	0.83	0.38
TargF	15.0	1	0.280	2500.	643.	490.	640.	797.	0.235	0.171	0.231	0.307	2884.	2840.	11.0	7.9	3.1	90.5	-215.6	19.7	30.8	0.000	0.83	0.38
TargF	15.0	1	0.280	2600.	639.	489.	635.	784.	0.233	0.166	0.232	0.296	2890.	2868.	11.0	7.9	3.1	93.6	-227.7	19.5	36.8	0.000	0.83	0.39
TargF	15.0	1	0.280	2700.	638.	498.	632.	786.	0.231	0.169	0.229	0.296	2903.	2912.	11.0	7.8	3.2	98.0	-231.7	18.3	41.9	0.000	0.83	0.39
TargF	15.0	1	0.280	2800.	634.	497.	625.	783.	0.227	0.171	0.224	0.286	2907.	2922.	11.0	7.8	3.2	101.8	-235.8	17.6	47.0	0.000	0.83	0.39
TargF	15.0	1	0.280	2900.	641.	507.	631.	793.	0.228	0.169	0.226	0.291	2938.	2954.	11.0	7.7	3.3	106.5	-240.9	15.2	52.7	0.000	0.83	0.38
TargF	15.0	1	0.280	3000.	631.	501.	628.	766.	0.227	0.173	0.226	0.282	2896.	2956.	11.0	7.5	3.5	112.2	-240.2	17.9	61.7	0.000	0.83	0.39
TargF	15.0	1	0.280	3100.	638.	503.	629.	782.	0.226	0.171	0.225	0.285	2933.	2945.	11.0	7.4	3.6	121.5	-247.4	16.4	63.9	0.000	0.83	0.39
TargF	15.0	1	0.280	3200.	643.	509.	637.	793.	0.228	0.171	0.228	0.287	2924.	2925.	11.0	7.3	3.7	126.1	-248.7	15.8	70.7	0.000	0.83	0.39
TargF	15.0	1	0.280	3300.	639.	507.	633.	781.	0.227	0.176	0.222	0.286	2926.	2898.	11.0	7.2	3.8	133.7	-252.4	16.4	74.8	0.000	0.83	0.39
TargF	15.0	1	0.280	3400.	637.	509.	628.	775.	0.225	0.171	0.224	0.282	2931.	2936.	11.0	7.2	3.8	141.6	-262.0	15.4	79.3	0.000	0.83	0.39
TargF	15.0	1	0.280	3500.	638.	512.	631.	780.	0.225	0.175	0.223	0.280	2929.	2930.	11.0	7.1	3.9	150.0	-263.3	15.1	82.9	0.000	0.83	0.39
TargF	15.0	1	0.300	2000.	652.	489.	651.	815.	0.260	0.178	0.259	0.341	2724.	2709.	11.0	7.9	3.1	81.2	-197.8	29.4	14.0	0.000	0.81	0.36
TargF	15.0	1	0.300	2100.	651.	493.	653.	801.	0.257	0.180	0.258	0.335	2736.	2748.	11.0	8.0	3.0	82.8	-209.4	27.8	17.4	0.000	0.81	0.36
TargF	15.0	1	0.300	2200.	650.	490.	646.	813.	0.255	0.180	0.253	0.332	2745.	2719.	11.0	8.0	3.0	85.1	-209.5	27.3	21.8	0.000	0.82	0.36
TargF	15.0	1	0.300	2300.	649.	493.	638.	811.	0.251	0.183	0.248	0.327	2781.	2788.	11.0	8.0	3.0	87.9	-225.7	26.5	26.5	0.000	0.82	0.37
TargF	15.0	1	0.300	2400.	647.	491.	643.	804.	0.250	0.175	0.246	0.324	2774.	2792.	11.0	7.9	3.1	92.1	-229.1	26.0	31.5	0.000	0.82	0.37
TargF	15.0	1	0.300	2500.	640.	495.	638.	794.	0.244	0.173	0.245	0.315	2807.	2790.	11.0	7.9	3.1	94.1	-231.0	24.7	36.1	0.000	0.82	0.37
TargF	15.0	1	0.300	2600.	651.	507.	650.	799.	0.247	0.181	0.245	0.318	2814.	2820.	11.0	7.9	3.1	98.6	-242.4	23.3	41.6	0.000	0.82	0.37
TargF	15.0	1	0.300	2700.	647.	502.	643.	801.	0.243	0.174	0.242	0.308	2829.	2840.	11.0	7.9	3.1	102.1	-246.0	22.4	47.3	0.000	0.82	0.37
TargF	15.0	1	0.300	2800.	646.	504.	645.	785.	0.244	0.181	0.242	0.308	2810.	2808.	11.0	7.7	3.3	109.1	-247.7	22.8	53.7	0.000	0.82	0.37
TargF	15.0	1	0.300	2900.	642.	496.	639.	791.	0.243	0.175	0.243	0.312	2818.	2842.	11.0	7.6	3.4	116.3	-248.2	23.0	58.8	0.000	0.82	0.37
TargF	15.0	1	0.300	3000.	646.	505.	639.	796.	0.242	0.180	0.240	0.310	2822.	2844.	11.0	7.5	3.5	122.4	-253.6	22.1	64.6	0.000	0.82	0.37
TargF	15.0	1	0.300	3100.	645.	513.	640.	790.	0.243	0.185	0.242	0.306	2789.	2814.	11.0	7.3	3.7	132.0	-259.8	22.4	72.7	0.000	0.82	0.37
TargF	15.0	1	0.300	3200.	645.	507.	639.	785.	0.242	0.185	0.238	0.307	2813.	2828.	11.0	7.3	3.7	137.0	-263.2	21.8	75.3	0.000	0.82	0.37
TargF	15.0	1	0.300	3300.	650.	515.	647.	792.	0.241	0.185	0.238	0.299	2824.	2827.	11.0	7.2	3.8	145.0	-268.0	20.0	79.9	0.000	0.82	0.38
TargF	15.0	1	0.300	3400.	647.	515.	643.	782.	0.239	0.181	0.239	0.298	2828.	2824.	11.0	7.0	4.0	154.4	-267.5	19.4	83.4	0.000	0.82	0.38

METHOD	PERC	DUR	TARG	TRIG	CMEAN	C10	C50	C90	FMEAN	F10	F50	F90	SMEAN	S20	NCHANGE	NUP	NDOWN	CUP	CDOWN	RISKLIM	RISKTRIG	DEPL	4+	7+
TargF	15.0	1	0.300	3500.	648.	510.	642.	785.	0.237	0.180	0.236	0.297	2857.	2880.	11.0	7.0	4.0	160.2	-272.7	19.1	85.3	0.000	0.82	0.38
TargF	20.0	1	0.120	2000.	529.	413.	527.	647.	0.128	0.105	0.128	0.152	3841.	3830.	11.0	6.4	4.6	71.5	-89.2	0.7	0.1	0.000	0.88	0.53
TargF	20.0	1	0.120	2100.	528.	420.	523.	641.	0.127	0.107	0.126	0.149	3859.	3829.	11.0	6.4	4.6	71.5	-89.5	0.8	0.2	0.000	0.88	0.53
TargF	20.0	1	0.120	2200.	530.	416.	523.	653.	0.126	0.104	0.125	0.148	3899.	3872.	11.0	6.4	4.6	72.7	-93.5	0.5	0.3	0.000	0.88	0.53
TargF	20.0	1	0.120	2300.	530.	404.	528.	654.	0.126	0.103	0.126	0.148	3907.	3871.	11.0	6.5	4.5	71.9	-96.0	0.8	0.8	0.000	0.88	0.53
TargF	20.0	1	0.120	2400.	524.	405.	520.	652.	0.125	0.101	0.126	0.147	3887.	3866.	11.0	6.6	4.4	71.9	-100.3	0.3	0.7	0.000	0.88	0.53
TargF	20.0	1	0.120	2500.	516.	394.	514.	638.	0.123	0.099	0.123	0.145	3891.	3869.	11.0	6.7	4.3	70.5	-102.3	0.5	1.3	0.000	0.89	0.53
TargF	20.0	1	0.120	2600.	516.	396.	513.	641.	0.122	0.098	0.121	0.145	3924.	3919.	11.0	6.8	4.2	72.1	-107.8	0.5	2.1	0.000	0.89	0.53
TargF	20.0	1	0.120	2700.	515.	393.	513.	645.	0.121	0.098	0.121	0.144	3938.	3901.	11.0	6.8	4.2	71.8	-108.6	0.3	2.8	0.000	0.89	0.53
TargF	20.0	1	0.120	2800.	512.	390.	503.	644.	0.119	0.095	0.119	0.142	3967.	3949.	11.0	6.9	4.1	71.9	-113.9	0.2	3.4	0.000	0.89	0.54
TargF	20.0	1	0.120	2900.	509.	377.	506.	639.	0.118	0.095	0.118	0.142	3958.	3931.	11.0	7.0	4.0	72.1	-117.1	0.3	6.0	0.000	0.89	0.54
TargF	20.0	1	0.120	3000.	507.	380.	504.	637.	0.117	0.093	0.117	0.141	3973.	3968.	11.0	7.0	4.0	72.6	-122.6	0.4	7.4	0.000	0.89	0.54
TargF	20.0	1	0.120	3100.	506.	383.	497.	639.	0.115	0.093	0.115	0.139	4020.	4006.	11.0	7.0	4.0	73.9	-123.4	0.3	9.6	0.000	0.89	0.54
TargF	20.0	1	0.120	3200.	504.	376.	498.	637.	0.115	0.092	0.115	0.139	4008.	4016.	11.0	7.1	3.9	74.5	-129.3	0.3	13.8	0.000	0.89	0.54
TargF	20.0	1	0.120	3300.	497.	371.	491.	635.	0.113	0.089	0.113	0.135	4018.	4028.	11.0	7.2	3.8	74.4	-129.9	0.3	16.3	0.000	0.89	0.55
TargF	20.0	1	0.120	3400.	501.	374.	494.	638.	0.114	0.091	0.113	0.136	4040.	4030.	11.0	7.1	3.9	76.7	-133.5	0.4	19.4	0.000	0.89	0.54
TargF	20.0	1	0.120	3500.	497.	376.	490.	633.	0.112	0.089	0.111	0.137	4053.	4068.	11.0	7.1	3.9	78.5	-138.8	0.1	23.3	0.000	0.89	0.55
TargF	20.0	1	0.140	2000.	567.	439.	564.	693.	0.148	0.123	0.147	0.175	3628.	3581.	11.0	6.5	4.5	76.7	-102.6	1.5	0.3	0.000	0.87	0.50
TargF	20.0	1	0.140	2100.	559.	427.	554.	689.	0.146	0.119	0.146	0.173	3623.	3627.	11.0	6.5	4.5	76.9	-104.1	1.6	0.5	0.000	0.87	0.50
TargF	20.0	1	0.140	2200.	555.	432.	550.	685.	0.144	0.116	0.144	0.172	3643.	3641.	11.0	6.6	4.4	75.8	-106.4	1.0	0.6	0.000	0.87	0.50
TargF	20.0	1	0.140	2300.	557.	434.	551.	689.	0.144	0.117	0.144	0.172	3647.	3618.	11.0	6.6	4.4	76.9	-110.4	0.8	0.8	0.000	0.87	0.50
TargF	20.0	1	0.140	2400.	553.	427.	548.	681.	0.142	0.113	0.142	0.168	3686.	3661.	11.0	6.8	4.2	77.0	-115.0	1.0	1.7	0.000	0.87	0.50
TargF	20.0	1	0.140	2500.	546.	430.	541.	682.	0.140	0.112	0.140	0.167	3667.	3661.	11.0	6.8	4.2	76.2	-117.6	1.1	2.6	0.000	0.88	0.51
TargF	20.0	1	0.140	2600.	553.	428.	547.	688.	0.141	0.112	0.140	0.169	3701.	3657.	11.0	6.9	4.1	77.4	-123.5	0.9	3.7	0.000	0.88	0.51
TargF	20.0	1	0.140	2700.	548.	421.	540.	686.	0.139	0.110	0.138	0.167	3724.	3720.	11.0	7.0	4.0	77.9	-126.1	0.8	5.5	0.000	0.88	0.51
TargF	20.0	1	0.140	2800.	544.	415.	535.	684.	0.137	0.107	0.136	0.167	3748.	3755.	11.0	7.0	4.0	77.9	-132.3	0.7	7.9	0.000	0.88	0.51
TargF	20.0	1	0.140	2900.	544.	420.	539.	679.	0.136	0.109	0.135	0.164	3769.	3773.	11.0	7.1	3.9	79.4	-137.8	0.5	9.4	0.000	0.88	0.51
TargF	20.0	1	0.140	3000.	538.	404.	528.	678.	0.133	0.106	0.133	0.160	3778.	3786.	11.0	7.2	3.8	80.1	-140.7	0.7	12.5	0.000	0.88	0.51
TargF	20.0	1	0.140	3100.	532.	411.	527.	669.	0.132	0.105	0.131	0.160	3772.	3790.	11.0	7.2	3.8	80.1	-145.7	0.6	15.6	0.000	0.88	0.52
TargF	20.0	1	0.140	3200.	533.	407.	528.	667.	0.131	0.105	0.131	0.159	3799.	3805.	11.0	7.2	3.8	83.3	-150.0	0.7	19.8	0.000	0.88	0.51
TargF	20.0	1	0.140	3300.	536.	407.	522.	683.	0.131	0.103	0.130	0.159	3840.	3847.	11.0	7.2	3.8	84.4	-152.1	0.6	23.7	0.000	0.88	0.52
TargF	20.0	1	0.140	3400.	527.	399.	516.	677.	0.128	0.100	0.127	0.156	3829.	3824.	11.0	7.3	3.7	85.7	-156.8	0.5	28.8	0.000	0.88	0.52
TargF	20.0	1	0.140	3500.	528.	399.	522.	663.	0.128	0.102	0.127	0.156	3845.	3835.	11.0	7.2	3.8	87.0	-158.3	0.5	33.6	0.000	0.88	0.52
TargF	20.0	1	0.160	2000.	587.	454.	589.	721.	0.167	0.134	0.167	0.202	3408.	3412.	11.0	6.5	4.5	80.8	-112.2	2.9	0.5	0.000	0.86	0.47
TargF	20.0	1	0.160	2100.	586.	457.	579.	714.	0.165	0.131	0.165	0.197	3434.	3384.	11.0	6.6	4.4	81.2	-116.7	2.5	0.9	0.000	0.86	0.47
TargF	20.0	1	0.160	2200.	583.	456.	579.	720.	0.164	0.131	0.162	0.197	3439.	3433.	11.0	6.7	4.3	81.3	-120.5	2.7	1.7	0.000	0.86	0.47
TargF	20.0	1	0.160	2300.	585.	447.	575.	726.	0.162	0.128	0.162	0.196	3479.	3452.	11.0	6.8	4.2	81.9	-127.8	2.2	2.2	0.000	0.87	0.48

Method	Perc	Dur	Targ	Trig	Cmean	C10	C50	C90	Fmean	F10	F50	F90	Smean	S20	Nchange	Nup	Ndown	Cup	Cdown	Risklim	Risktrig	Depl	4+	7+
TargF	20.0	1	0.160	2400.	580.	453.	574.	716.	0.160	0.127	0.159	0.195	3480.	3445.	11.0	6.9	4.1	81.9	-134.4	2.1	3.5	0.000	0.87	0.48
TargF	20.0	1	0.160	2500.	576.	446.	567.	720.	0.158	0.122	0.159	0.193	3515.	3474.	11.0	7.0	4.0	81.2	-136.9	2.2	5.1	0.000	0.87	0.48
TargF	20.0	1	0.160	2600.	572.	444.	568.	704.	0.156	0.124	0.155	0.190	3522.	3504.	11.0	7.1	3.9	82.4	-138.1	1.8	6.8	0.000	0.87	0.48
TargF	20.0	1	0.160	2700.	572.	439.	566.	717.	0.155	0.123	0.154	0.187	3534.	3511.	11.0	7.1	3.9	83.9	-146.6	1.9	9.1	0.000	0.87	0.48
TargF	20.0	1	0.160	2800.	566.	431.	564.	706.	0.152	0.117	0.151	0.188	3565.	3560.	11.0	7.2	3.8	84.4	-150.8	1.6	11.8	0.000	0.87	0.49
TargF	20.0	1	0.160	2900.	567.	442.	554.	710.	0.152	0.120	0.150	0.187	3564.	3540.	11.0	7.2	3.8	85.6	-153.9	1.3	15.0	0.000	0.87	0.49
TargF	20.0	1	0.160	3000.	570.	437.	558.	717.	0.150	0.121	0.148	0.183	3618.	3613.	11.0	7.3	3.7	86.9	-162.9	1.3	18.4	0.000	0.87	0.49
TargF	20.0	1	0.160	3100.	559.	422.	553.	702.	0.147	0.114	0.146	0.182	3615.	3598.	11.0	7.3	3.7	88.9	-166.9	1.5	23.4	0.000	0.87	0.49
TargF	20.0	1	0.160	3200.	559.	432.	554.	699.	0.148	0.116	0.148	0.181	3599.	3595.	11.0	7.2	3.8	89.8	-167.3	1.6	28.8	0.000	0.87	0.49
TargF	20.0	1	0.160	3300.	554.	425.	546.	692.	0.146	0.113	0.146	0.176	3620.	3628.	11.0	7.3	3.7	92.7	-173.5	1.2	34.3	0.000	0.87	0.50
TargF	20.0	1	0.160	3400.	557.	431.	546.	696.	0.144	0.117	0.142	0.176	3654.	3631.	11.0	7.3	3.7	94.0	-175.2	1.2	37.8	0.000	0.87	0.50
TargF	20.0	1	0.160	3500.	545.	430.	535.	683.	0.141	0.111	0.140	0.173	3661.	3683.	11.0	7.3	3.7	96.3	-181.9	0.9	43.5	0.000	0.87	0.50
TargF	20.0	1	0.180	2000.	610.	480.	604.	750.	0.185	0.146	0.186	0.222	3258.	3238.	11.0	6.7	4.3	84.3	-125.4	4.9	1.2	0.000	0.85	0.44
TargF	20.0	1	0.180	2100.	609.	476.	607.	742.	0.182	0.143	0.182	0.223	3292.	3262.	11.0	6.8	4.2	84.4	-131.0	4.8	2.2	0.000	0.85	0.45
TargF	20.0	1	0.180	2200.	600.	469.	593.	741.	0.180	0.143	0.179	0.216	3279.	3258.	11.0	6.9	4.1	84.7	-137.5	4.8	3.1	0.000	0.86	0.45
TargF	20.0	1	0.180	2300.	606.	468.	598.	755.	0.178	0.137	0.177	0.218	3338.	3317.	11.0	7.0	4.0	86.4	-144.1	4.1	4.1	0.000	0.86	0.45
TargF	20.0	1	0.180	2400.	594.	459.	588.	742.	0.174	0.136	0.173	0.216	3335.	3334.	11.0	7.1	3.9	85.2	-151.5	4.0	5.9	0.000	0.86	0.46
TargF	20.0	1	0.180	2500.	592.	456.	587.	736.	0.173	0.133	0.172	0.214	3346.	3333.	11.0	7.2	3.8	86.4	-156.4	4.0	8.9	0.000	0.86	0.46
TargF	20.0	1	0.180	2600.	589.	456.	584.	729.	0.171	0.134	0.171	0.209	3360.	3370.	11.0	7.2	3.8	87.5	-159.5	4.0	11.8	0.000	0.86	0.46
TargF	20.0	1	0.180	2700.	589.	458.	580.	730.	0.169	0.133	0.167	0.209	3394.	3403.	11.0	7.2	3.8	88.8	-161.7	3.1	13.8	0.000	0.86	0.46
TargF	20.0	1	0.180	2800.	585.	453.	576.	727.	0.168	0.128	0.167	0.206	3400.	3386.	11.0	7.3	3.7	89.7	-172.5	3.3	18.5	0.000	0.86	0.47
TargF	20.0	1	0.180	2900.	584.	451.	579.	729.	0.166	0.128	0.166	0.206	3425.	3421.	11.0	7.3	3.7	91.4	-173.3	3.2	22.9	0.000	0.86	0.47
TargF	20.0	1	0.180	3000.	578.	445.	568.	723.	0.164	0.128	0.163	0.201	3428.	3424.	11.0	7.3	3.7	92.7	-177.5	2.9	28.1	0.000	0.86	0.47
TargF	20.0	1	0.180	3100.	579.	452.	569.	715.	0.164	0.127	0.162	0.202	3423.	3422.	11.0	7.3	3.7	95.6	-187.2	2.9	32.9	0.000	0.86	0.47
TargF	20.0	1	0.180	3200.	576.	455.	565.	713.	0.161	0.126	0.160	0.199	3464.	3475.	11.0	7.3	3.7	97.4	-184.8	2.4	37.6	0.000	0.86	0.47
TargF	20.0	1	0.180	3300.	576.	446.	567.	718.	0.160	0.124	0.159	0.197	3470.	3468.	11.0	7.3	3.7	101.4	-195.7	2.3	42.8	0.000	0.86	0.47
TargF	20.0	1	0.180	3400.	576.	447.	566.	714.	0.160	0.125	0.159	0.195	3475.	3487.	11.0	7.2	3.8	102.2	-195.9	2.1	49.6	0.000	0.86	0.47
TargF	20.0	1	0.180	3500.	573.	451.	566.	706.	0.158	0.124	0.156	0.195	3498.	3513.	11.0	7.3	3.7	108.0	-200.2	1.8	53.8	0.000	0.86	0.48
TargF	20.0	1	0.200	2000.	620.	485.	615.	758.	0.202	0.155	0.201	0.246	3095.	3076.	11.0	6.9	4.1	87.3	-139.9	9.8	2.9	0.000	0.84	0.42
TargF	20.0	1	0.200	2100.	614.	471.	614.	746.	0.198	0.154	0.198	0.242	3099.	3088.	11.0	6.9	4.1	87.4	-145.5	9.2	4.4	0.000	0.85	0.42
TargF	20.0	1	0.200	2200.	624.	487.	614.	775.	0.197	0.151	0.196	0.242	3171.	3154.	11.0	7.1	3.9	89.9	-154.6	7.3	4.9	0.000	0.85	0.43
TargF	20.0	1	0.200	2300.	615.	488.	612.	750.	0.194	0.150	0.193	0.239	3166.	3177.	11.0	7.2	3.8	88.8	-159.5	6.4	6.4	0.000	0.85	0.43
TargF	20.0	1	0.200	2400.	607.	473.	601.	747.	0.191	0.147	0.189	0.236	3169.	3156.	11.0	7.3	3.7	89.2	-165.4	7.2	10.3	0.000	0.85	0.44
TargF	20.0	1	0.200	2500.	609.	484.	599.	745.	0.189	0.148	0.189	0.233	3204.	3183.	11.0	7.3	3.7	91.5	-175.5	6.5	13.1	0.000	0.85	0.44
TargF	20.0	1	0.200	2600.	609.	469.	602.	754.	0.186	0.142	0.186	0.233	3245.	3218.	11.0	7.4	3.6	92.6	-176.8	6.3	15.9	0.000	0.85	0.44
TargF	20.0	1	0.200	2700.	606.	469.	599.	743.	0.186	0.141	0.185	0.230	3241.	3231.	11.0	7.4	3.6	94.1	-183.0	5.7	20.7	0.000	0.85	0.44
TargF	20.0	1	0.200	2800.	608.	478.	599.	747.	0.185	0.144	0.184	0.228	3259.	3227.	11.0	7.4	3.6	96.8	-186.5	5.5	24.7	0.000	0.85	0.44

METHOD	PERC	DUR	TARG	TRIG	CMEAN	C10	C50	C90	FMEAN	F10	F50	F90	SMEAN	S20	NCHANGE	NUP	NDOWN	CUP	CDOWN	RISKLIM	RISKTRIG	DEPL	4+	7+
TargF	20.0	1	0.200	2900.	600.	466.	586.	749.	0.180	0.138	0.179	0.222	3286.	3263.	11.0	7.4	3.6	99.2	-196.0	5.0	29.5	0.000	0.85	0.45
TargF	20.0	1	0.200	3000.	605.	476.	601.	748.	0.181	0.142	0.180	0.224	3301.	3290.	11.0	7.3	3.7	101.7	-195.4	4.5	35.2	0.000	0.85	0.45
TargF	20.0	1	0.200	3100.	596.	467.	590.	738.	0.177	0.137	0.175	0.218	3305.	3307.	11.0	7.4	3.6	105.0	-204.3	3.8	40.1	0.000	0.86	0.45
TargF	20.0	1	0.200	3200.	596.	465.	587.	736.	0.177	0.135	0.176	0.221	3321.	3328.	11.0	7.3	3.7	107.4	-206.1	4.4	45.4	0.000	0.86	0.45
TargF	20.0	1	0.200	3300.	593.	467.	583.	728.	0.175	0.136	0.174	0.218	3320.	3329.	11.0	7.2	3.8	110.8	-204.7	4.5	52.5	0.000	0.86	0.46
TargF	20.0	1	0.200	3400.	591.	469.	584.	720.	0.175	0.137	0.173	0.215	3319.	3353.	11.0	7.2	3.8	113.8	-213.4	4.1	58.4	0.000	0.86	0.45
TargF	20.0	1	0.200	3500.	590.	458.	583.	721.	0.172	0.133	0.170	0.215	3360.	3357.	11.0	7.2	3.8	118.7	-220.3	3.4	61.9	0.000	0.86	0.46
TargF	20.0	1	0.220	2000.	631.	492.	627.	772.	0.216	0.164	0.215	0.267	2989.	3016.	11.0	7.0	4.0	89.7	-154.6	12.7	4.0	0.000	0.84	0.40
TargF	20.0	1	0.220	2100.	633.	497.	627.	784.	0.215	0.161	0.215	0.266	3017.	3012.	11.0	7.2	3.8	90.3	-163.1	12.0	5.8	0.000	0.84	0.40
TargF	20.0	1	0.220	2200.	636.	487.	630.	792.	0.215	0.161	0.214	0.267	3021.	3005.	11.0	7.2	3.8	92.7	-168.5	11.8	8.2	0.000	0.84	0.40
TargF	20.0	1	0.220	2300.	631.	496.	627.	778.	0.211	0.162	0.209	0.263	3044.	3046.	11.0	7.3	3.7	93.4	-176.2	11.3	11.3	0.000	0.84	0.41
TargF	20.0	1	0.220	2400.	625.	490.	619.	775.	0.206	0.159	0.205	0.256	3079.	3076.	11.0	7.4	3.6	93.7	-186.9	9.6	13.8	0.000	0.84	0.42
TargF	20.0	1	0.220	2500.	625.	473.	625.	769.	0.204	0.153	0.204	0.252	3093.	3077.	11.0	7.4	3.6	96.2	-191.0	9.4	17.9	0.000	0.84	0.42
TargF	20.0	1	0.220	2600.	618.	480.	609.	759.	0.200	0.156	0.199	0.249	3109.	3115.	11.0	7.4	3.6	97.7	-193.8	8.8	21.6	0.000	0.84	0.42
TargF	20.0	1	0.220	2700.	618.	481.	608.	766.	0.199	0.152	0.199	0.249	3116.	3109.	11.0	7.4	3.6	99.7	-200.3	9.2	27.2	0.000	0.85	0.42
TargF	20.0	1	0.220	2800.	617.	476.	611.	760.	0.199	0.151	0.198	0.247	3120.	3094.	11.0	7.5	3.5	102.5	-208.0	8.9	32.9	0.000	0.85	0.43
TargF	20.0	1	0.220	2900.	612.	482.	601.	753.	0.195	0.151	0.192	0.239	3147.	3151.	11.0	7.4	3.6	105.3	-210.9	7.5	37.7	0.000	0.85	0.43
TargF	20.0	1	0.220	3000.	615.	484.	603.	772.	0.193	0.147	0.191	0.242	3195.	3184.	11.0	7.4	3.6	107.6	-212.8	7.0	41.6	0.000	0.85	0.43
TargF	20.0	1	0.220	3100.	608.	473.	604.	748.	0.193	0.148	0.191	0.240	3163.	3192.	11.0	7.4	3.6	111.6	-217.6	7.4	49.2	0.000	0.85	0.43
TargF	20.0	1	0.220	3200.	610.	485.	603.	747.	0.191	0.150	0.189	0.238	3187.	3167.	11.0	7.3	3.7	114.8	-216.8	5.9	54.7	0.000	0.85	0.43
TargF	20.0	1	0.220	3300.	609.	475.	607.	750.	0.192	0.148	0.190	0.238	3168.	3169.	11.0	7.2	3.8	120.0	-227.6	7.2	62.3	0.000	0.85	0.43
TargF	20.0	1	0.220	3400.	608.	476.	599.	754.	0.189	0.147	0.187	0.234	3215.	3206.	11.0	7.2	3.8	124.5	-231.7	5.7	65.1	0.000	0.85	0.44
TargF	20.0	1	0.220	3500.	601.	473.	591.	745.	0.186	0.146	0.183	0.232	3203.	3220.	11.0	7.1	3.9	127.4	-229.2	5.4	71.1	0.000	0.85	0.44
TargF	20.0	1	0.240	2000.	645.	493.	638.	797.	0.232	0.178	0.232	0.289	2887.	2884.	11.0	7.3	3.7	93.9	-170.6	17.4	6.0	0.000	0.83	0.39
TargF	20.0	1	0.240	2100.	638.	501.	633.	784.	0.230	0.174	0.229	0.287	2867.	2871.	11.0	7.2	3.8	94.1	-179.1	16.6	8.2	0.000	0.83	0.39
TargF	20.0	1	0.240	2200.	640.	498.	633.	790.	0.226	0.169	0.224	0.282	2934.	2939.	11.0	7.3	3.7	95.6	-183.2	15.8	12.0	0.000	0.83	0.39
TargF	20.0	1	0.240	2300.	635.	496.	630.	776.	0.223	0.168	0.222	0.280	2939.	2916.	11.0	7.4	3.6	96.2	-191.8	15.6	15.6	0.000	0.83	0.40
TargF	20.0	1	0.240	2400.	639.	495.	634.	787.	0.222	0.167	0.221	0.280	2969.	2944.	11.0	7.4	3.6	98.9	-199.6	14.3	18.9	0.000	0.83	0.40
TargF	20.0	1	0.240	2500.	638.	498.	635.	779.	0.222	0.168	0.222	0.275	2949.	2939.	11.0	7.4	3.6	100.7	-203.4	13.7	24.1	0.000	0.83	0.40
TargF	20.0	1	0.240	2600.	630.	501.	629.	767.	0.218	0.166	0.216	0.271	2970.	2985.	11.0	7.4	3.6	102.1	-207.8	13.6	29.4	0.000	0.83	0.40
TargF	20.0	1	0.240	2700.	633.	489.	629.	780.	0.215	0.163	0.213	0.271	3019.	3006.	11.0	7.4	3.6	105.5	-211.0	13.4	33.4	0.000	0.84	0.41
TargF	20.0	1	0.240	2800.	633.	494.	627.	779.	0.212	0.164	0.210	0.264	3050.	3024.	11.0	7.5	3.5	109.7	-221.1	11.3	37.6	0.000	0.84	0.41
TargF	20.0	1	0.240	2900.	627.	490.	622.	769.	0.210	0.159	0.208	0.265	3041.	3053.	11.0	7.4	3.6	113.0	-226.9	11.2	43.5	0.000	0.84	0.41
TargF	20.0	1	0.240	3000.	626.	492.	619.	768.	0.208	0.159	0.206	0.260	3063.	3082.	11.0	7.3	3.7	115.9	-227.9	10.8	49.7	0.000	0.84	0.41
TargF	20.0	1	0.240	3100.	623.	489.	615.	777.	0.207	0.161	0.206	0.258	3055.	3056.	11.0	7.4	3.6	120.8	-234.2	10.0	56.8	0.000	0.84	0.41
TargF	20.0	1	0.240	3200.	623.	491.	617.	757.	0.204	0.158	0.202	0.251	3082.	3075.	11.0	7.3	3.7	125.8	-242.4	8.5	62.0	0.000	0.84	0.42
TargF	20.0	1	0.240	3300.	624.	499.	621.	756.	0.205	0.158	0.203	0.254	3077.	3064.	11.0	7.2	3.8	128.7	-237.5	9.1	67.1	0.000	0.84	0.42

Method	Perc	Dur	Targ	Trig	Cmean	C10	C50	C90	Fmean	F10	F50	F90	Smean	S20	Nchange	Nup	Ndown	Cup	Cdown	Risklim	Risktrig	Depl	4+	7+
TargF	20.0	1	0.240	3400.	621.	496.	616.	759.	0.203	0.157	0.201	0.249	3085.	3082.	11.0	7.2	3.8	134.6	-244.0	9.0	72.1	0.000	0.84	0.42
TargF	20.0	1	0.240	3500.	617.	492.	609.	755.	0.201	0.157	0.200	0.246	3092.	3109.	11.0	7.0	4.0	140.3	-245.5	8.5	76.4	0.000	0.84	0.42
TargF	20.0	1	0.260	2000.	651.	507.	648.	797.	0.248	0.188	0.247	0.311	2766.	2780.	11.0	7.3	3.7	95.7	-182.8	23.1	9.6	0.000	0.82	0.37
TargF	20.0	1	0.260	2100.	653.	509.	652.	797.	0.246	0.184	0.246	0.309	2799.	2767.	11.0	7.4	3.6	97.5	-195.5	22.5	13.4	0.000	0.82	0.37
TargF	20.0	1	0.260	2200.	653.	508.	649.	798.	0.242	0.182	0.239	0.305	2822.	2807.	11.0	7.4	3.6	99.5	-198.9	20.5	15.6	0.000	0.82	0.37
TargF	20.0	1	0.260	2300.	651.	501.	643.	807.	0.240	0.181	0.237	0.305	2839.	2844.	11.0	7.5	3.5	100.6	-205.9	19.7	19.7	0.000	0.82	0.38
TargF	20.0	1	0.260	2400.	646.	504.	644.	782.	0.235	0.177	0.234	0.295	2873.	2848.	11.0	7.6	3.4	103.0	-215.5	18.6	23.9	0.000	0.83	0.38
TargF	20.0	1	0.260	2500.	639.	502.	632.	780.	0.231	0.172	0.230	0.291	2880.	2901.	11.0	7.5	3.5	104.6	-221.7	17.3	28.8	0.000	0.83	0.38
TargF	20.0	1	0.260	2600.	638.	496.	634.	796.	0.229	0.172	0.229	0.286	2885.	2898.	11.0	7.5	3.5	108.9	-225.5	17.9	35.3	0.000	0.83	0.39
TargF	20.0	1	0.260	2700.	650.	513.	642.	791.	0.232	0.179	0.231	0.284	2906.	2868.	11.0	7.4	3.6	113.0	-228.3	16.5	39.7	0.000	0.83	0.39
TargF	20.0	1	0.260	2800.	640.	501.	632.	789.	0.227	0.169	0.224	0.284	2932.	2928.	11.0	7.5	3.5	115.0	-237.9	15.8	46.0	0.000	0.83	0.39
TargF	20.0	1	0.260	2900.	636.	504.	629.	782.	0.224	0.172	0.223	0.280	2927.	2953.	11.0	7.4	3.6	119.8	-239.1	15.5	52.9	0.000	0.83	0.39
TargF	20.0	1	0.260	3000.	638.	511.	630.	778.	0.224	0.174	0.222	0.278	2936.	2908.	11.0	7.4	3.6	124.3	-249.6	14.7	57.4	0.000	0.83	0.40
TargF	20.0	1	0.260	3100.	638.	503.	629.	779.	0.222	0.172	0.221	0.277	2950.	2964.	11.0	7.3	3.7	130.4	-245.7	14.6	63.7	0.000	0.83	0.40
TargF	20.0	1	0.260	3200.	637.	509.	634.	769.	0.221	0.170	0.218	0.272	2961.	2959.	11.0	7.2	3.8	134.4	-252.2	13.1	68.2	0.000	0.83	0.40
TargF	20.0	1	0.260	3300.	637.	506.	634.	769.	0.219	0.171	0.216	0.271	2981.	2969.	11.0	7.2	3.8	139.9	-256.1	12.3	73.0	0.000	0.83	0.40
TargF	20.0	1	0.260	3400.	636.	503.	632.	777.	0.216	0.169	0.214	0.267	3001.	3007.	11.0	7.1	3.9	146.1	-258.0	11.6	76.7	0.000	0.84	0.40
TargF	20.0	1	0.260	3500.	631.	508.	626.	765.	0.218	0.172	0.216	0.264	2949.	2971.	11.0	6.9	4.1	153.0	-253.5	12.9	83.0	0.000	0.83	0.40
TargF	20.0	1	0.280	2000.	658.	505.	660.	818.	0.265	0.189	0.263	0.340	2674.	2687.	11.0	7.4	3.6	97.7	-195.9	29.5	13.2	0.000	0.81	0.35
TargF	20.0	1	0.280	2100.	655.	503.	657.	806.	0.260	0.194	0.256	0.331	2707.	2740.	11.0	7.5	3.5	99.7	-207.3	27.0	16.5	0.000	0.81	0.35
TargF	20.0	1	0.280	2200.	655.	510.	651.	816.	0.256	0.191	0.253	0.324	2728.	2742.	11.0	7.5	3.5	102.5	-210.8	26.7	21.1	0.000	0.82	0.36
TargF	20.0	1	0.280	2300.	653.	501.	650.	799.	0.252	0.185	0.250	0.316	2751.	2754.	11.0	7.6	3.4	104.2	-221.9	25.7	25.7	0.000	0.82	0.36
TargF	20.0	1	0.280	2400.	649.	508.	646.	793.	0.249	0.187	0.247	0.313	2762.	2773.	11.0	7.6	3.4	107.2	-227.5	24.6	31.1	0.000	0.82	0.37
TargF	20.0	1	0.280	2500.	651.	505.	641.	802.	0.248	0.192	0.245	0.308	2761.	2792.	11.0	7.5	3.5	111.0	-236.7	23.7	35.7	0.000	0.82	0.37
TargF	20.0	1	0.280	2600.	641.	502.	640.	782.	0.242	0.183	0.240	0.301	2796.	2822.	11.0	7.5	3.5	113.1	-236.1	21.2	41.3	0.000	0.82	0.37
TargF	20.0	1	0.280	2700.	651.	511.	646.	805.	0.245	0.181	0.240	0.315	2804.	2791.	11.0	7.5	3.5	119.2	-246.1	22.1	46.4	0.000	0.82	0.37
TargF	20.0	1	0.280	2800.	645.	501.	638.	796.	0.240	0.182	0.238	0.300	2816.	2818.	11.0	7.4	3.6	122.8	-245.8	20.9	53.4	0.000	0.82	0.38
TargF	20.0	1	0.280	2900.	650.	514.	643.	792.	0.239	0.182	0.237	0.304	2844.	2831.	11.0	7.3	3.7	126.1	-247.9	19.6	57.9	0.000	0.82	0.38
TargF	20.0	1	0.280	3000.	649.	516.	639.	799.	0.239	0.183	0.239	0.298	2842.	2835.	11.0	7.2	3.8	132.7	-252.4	19.1	64.1	0.000	0.82	0.38
TargF	20.0	1	0.280	3100.	648.	515.	643.	782.	0.238	0.184	0.236	0.293	2843.	2854.	11.0	7.1	3.9	140.5	-256.3	19.4	69.3	0.000	0.82	0.38
TargF	20.0	1	0.280	3200.	650.	520.	641.	790.	0.237	0.185	0.233	0.296	2854.	2890.	11.0	7.1	3.9	146.5	-265.1	18.2	73.8	0.000	0.82	0.38
TargF	20.0	1	0.280	3300.	640.	513.	633.	774.	0.232	0.180	0.232	0.286	2861.	2891.	11.0	7.0	4.0	150.3	-261.0	18.2	78.0	0.000	0.83	0.38
TargF	20.0	1	0.280	3400.	651.	521.	640.	798.	0.235	0.185	0.233	0.293	2864.	2847.	11.0	6.9	4.1	160.6	-268.1	17.3	82.2	0.000	0.83	0.38
TargF	20.0	1	0.280	3500.	643.	507.	635.	778.	0.231	0.181	0.228	0.286	2869.	2864.	11.0	6.9	4.1	163.9	-273.0	15.6	86.9	0.000	0.83	0.38
TargF	20.0	1	0.300	2000.	665.	514.	663.	814.	0.276	0.204	0.275	0.355	2615.	2604.	11.0	7.6	3.4	101.3	-213.6	33.4	16.9	0.000	0.81	0.34
TargF	20.0	1	0.300	2100.	661.	508.	654.	824.	0.271	0.194	0.269	0.347	2644.	2642.	11.0	7.6	3.4	104.0	-221.6	31.4	20.0	0.000	0.81	0.34
TargF	20.0	1	0.300	2200.	660.	496.	662.	823.	0.269	0.200	0.267	0.343	2650.	2636.	11.0	7.5	3.5	105.9	-226.1	31.5	25.4	0.000	0.81	0.34

Method	Perc	Dur	Targ	Trig	Cmean	C10	C50	C90	Fmean	F10	F50	F90	Smean	S20	Nchange	Nup	Ndown	Cup	Cdown	Risklim	Risktrig	Depl	4+	7+
TargF	20.0	1	0.300	2300.	660.	516.	653.	807.	0.267	0.193	0.264	0.345	2669.	2680.	11.0	7.5	3.5	108.8	-233.7	30.0	30.0	0.000	0.81	0.35
TargF	20.0	1	0.300	2400.	664.	516.	663.	811.	0.267	0.197	0.261	0.345	2680.	2686.	11.0	7.6	3.4	113.4	-239.7	29.9	36.2	0.000	0.81	0.35
TargF	20.0	1	0.300	2500.	657.	507.	654.	806.	0.261	0.193	0.258	0.334	2701.	2719.	11.0	7.5	3.5	116.2	-243.5	27.9	40.5	0.000	0.81	0.35
TargF	20.0	1	0.300	2600.	655.	515.	644.	812.	0.257	0.191	0.254	0.325	2722.	2732.	11.0	7.5	3.5	120.6	-252.6	27.1	46.1	0.000	0.82	0.36
TargF	20.0	1	0.300	2700.	661.	517.	657.	805.	0.257	0.192	0.255	0.326	2737.	2743.	11.0	7.5	3.5	124.6	-256.4	26.0	51.6	0.000	0.82	0.36
TargF	20.0	1	0.300	2800.	656.	522.	647.	802.	0.255	0.196	0.251	0.323	2718.	2737.	11.0	7.4	3.6	131.9	-261.9	25.6	58.5	0.000	0.82	0.36
TargF	20.0	1	0.300	2900.	653.	519.	645.	800.	0.253	0.193	0.252	0.315	2730.	2717.	11.0	7.3	3.7	136.9	-263.3	25.7	64.7	0.000	0.82	0.36
TargF	20.0	1	0.300	3000.	657.	524.	647.	798.	0.252	0.192	0.249	0.314	2755.	2764.	11.0	7.2	3.8	141.8	-267.2	24.0	68.6	0.000	0.82	0.36
TargF	20.0	1	0.300	3100.	656.	522.	650.	796.	0.252	0.194	0.248	0.316	2753.	2743.	11.0	7.2	3.8	148.8	-270.8	24.1	74.0	0.000	0.82	0.36
TargF	20.0	1	0.300	3200.	653.	516.	650.	790.	0.250	0.193	0.247	0.310	2752.	2769.	11.0	7.0	4.0	155.1	-271.9	23.1	79.3	0.000	0.82	0.36
TargF	20.0	1	0.300	3300.	653.	518.	644.	797.	0.248	0.195	0.243	0.310	2766.	2775.	11.0	6.9	4.1	163.7	-277.4	22.9	82.6	0.000	0.82	0.37
TargF	20.0	1	0.300	3400.	654.	522.	648.	793.	0.247	0.192	0.244	0.307	2775.	2772.	11.0	6.9	4.1	169.1	-280.8	21.0	86.0	0.000	0.82	0.37
TargF	20.0	1	0.300	3500.	648.	514.	642.	787.	0.245	0.187	0.243	0.305	2770.	2800.	11.0	6.8	4.2	180.7	-285.7	21.3	89.0	0.000	0.82	0.37

Annex 1: EU Request

DRAFT REQUEST TO ICES

ICES is requested to identify multi-annual plans of the following form, and assuming that egg surveys of mackerel continue on a tri-annual basis:

1. The sum of the regulated catches for the combined stock of NEA mackerel (covering all areas where mackerel are caught) shall be set according to a fishing mortality of **[A]**.
2. Notwithstanding paragraph 1 above, the sum of the regulated catches for the combined stock of mackerel shall not be altered by more than **[B]** % with respect to the sum of the regulated catches for the combined stock of the previous year.
3. Notwithstanding paragraphs 1 and 2, in the event that the spawning stock size for mackerel shall be estimated at less than **[C tonnes / appropriate model-specific units]**, the sum of the regulated catches for the combined stock of mackerel, and other conservation measures as appropriate, shall be adapted to assure rebuilding of the spawning stock size to above **[C]** without incurring the restriction referred to in Paragraph 2.

ICES is asked to identify combinations of values for A, B and C that would assure management of the mackerel stock that would conform to the precautionary approach, i.e. a low risk of stock depletion, stable catches and sustained high yield.

Values of A in the range 0.15 to 0.2, values of B in the range 5% to 20% and values of C above the present B_{pa} are of particular interest to managers but ICES should explore other relevant scenarios on its own initiative as appropriate.

ICES are also invited to suggest other approaches to the multi-annual management of mackerel on its own initiative.

DRAFT REQUEST TO ICES

ICES is requested.to identify multi-annuaI plans of the following form, and assuming that egg surveys of mackeral continue on a tn-annual basis:

1) The sum of the regulated catches for the combined stock of NEA mackerel (covering all areas where mackerel are caught) shall be set according to a fishing modality of [A].

2) Notwithstanding paragraph I above, the sum of the regulated catches for the combined stock of mackerel shall not be altered by more than [B] % with respect to the sum of the regulated catches for the combined stock of the previous year.

3) Notwithstanding paragraphs I and Z in the event that the spawning stock size for mackereT shall be estimated at less than [C tonnes I appropriate model-specific Units], the sum of the regulated catches for the combined stock of mackerel, and other conservation measures as appropriate, shall be adapted to assure rebuilding of the spawning stock size to above [C] without incurring the restriction referred to in Paragraph 2.

ICES is asked to identity combinations of values for A, B and C that would assure management of the mackerel stock that would conform to the precautionary approach1 i.e. a low risk of stock depletion, stable catches and sustained high yield.

Values of A in the range 0.15 to 0.2, values of S in the range 5% to 20% and values of. C above the present Rpa are of partIcular interest to managers but iCES should explore other relevant scenarios on its own initiative as appropriate.

ICLS are also invited to suggest other approaches to the multi-annual mariaement of mackerel on its own initiative

Annex 2: Exploration of exploitation with different measurement methods

John Simmonds

A simulated population measurement and HCR loop was set up in R using FLR. The loop consists of the classic EU/Norway management cycle of three year cycle, catch data year assessment / intermediate year with triennial egg survey and TAC year. The assessment is tuned using a triennial survey in from 1992 to 2004 and every subsequent 3rd year.

The population model was based on the same population basic parameters as other simulations but attempts to include a more realistic evaluation loop involving a simulated survey, data collection from the fishery, assessment and short term forecast. The population is obtained by fitting lognormal error with FLSR and simulated using fbOM. The values from the fit with the limits to the simulated recruits limited to +- 3 standard deviations. The comparison of observed and simulated distributions of log residuals around the stock recruit relationship is shown in Figure 1.

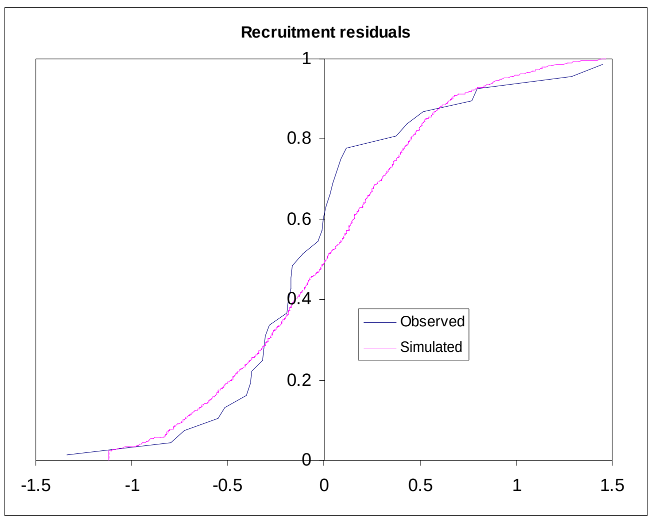


Figure 1 Comparison between observed and simulated recruitment using FLR components FLSR and fbOM

The simulated population index using FLObsIndex is based on estimates of SSB from an egg survey every 3 years with a CV of 22.4% which is the average of the survey CVs. Simulated catch measurement is annual with the correlated errors documented taken from detailed evaluation of herring fishery, as no comparable analysis is available for mackerel. The covariance matrix is given in Table 1. Some small error elements such as mean weights and maturities in the stock that have around 4% variability are not included, because in the context of the precision of the egg surveys as this would increase the CV on the SSB estimate by less than 0.5%.

Table 1 Coefficient of variation and covariance matrix used for simulating sampling catch.

Age	0	1	2	3	4	5	6	7	8	9	10	11	12+
CV at age	0.127	0.099	0.081	0.070	0.068	0.074	0.088	0.111	0.142	0.181	0.229	0.285	0.349
Covariance	0	1	2	3	4	5	6	7	8	9	10	11	12+
0	1.000	-0.216	-0.049	-0.049	-0.041	0.012	0.047	0.058	0.054	0.076	0.076	0.076	0.076
1	-0.216	1.000	-0.250	-0.126	-0.051	-0.054	-0.008	-0.011	0.029	0.038	0.038	0.038	0.038
2	-0.049	-0.250	1.000	-0.035	-0.443	-0.359	-0.325	-0.287	-0.294	-0.321	-0.321	-0.321	-0.321
3	-0.049	-0.126	-0.035	1.000	-0.104	-0.277	-0.324	-0.236	-0.191	-0.257	-0.078	-0.076	-0.069
4	-0.041	-0.051	-0.443	-0.104	1.000	0.140	0.052	0.026	0.038	0.002	-0.187	-0.123	-0.119
5	0.012	-0.054	-0.359	-0.277	0.140	1.000	0.276	0.202	0.084	0.091	-0.159	-0.246	-0.174
6	0.047	-0.008	-0.325	-0.324	0.052	0.276	1.000	0.205	0.170	0.339	-0.036	-0.116	-0.230
7	0.058	-0.011	-0.287	-0.236	0.026	0.202	0.205	1.000	0.183	0.403	0.149	0.031	-0.091
8	0.054	0.029	-0.294	-0.191	0.038	0.084	0.170	0.183	1.000	0.237	0.258	0.190	0.029
9	0.076	0.038	-0.321	-0.257	0.002	0.091	0.339	0.403	0.237	1.000	0.208	0.277	0.226
10	0.076	0.038	-0.321	-0.078	-0.187	-0.159	-0.036	0.149	0.258	0.208	1.000	0.209	0.313
11	0.076	0.038	-0.321	-0.076	-0.123	-0.246	-0.116	0.031	0.190	0.277	0.209	1.000	0.218
12+	0.076	0.038	-0.321	-0.069	-0.119	-0.174	-0.230	-0.091	0.029	0.226	0.313	0.218	1.000

The assessment package ICA and short tem forecasts were implemented in FLR using FLICA and FLSTF.ad. This simulation takes much longer to carry out than those reported in other sections and more restricted exploration is possible. In addition to full analysis two management variants were tested: one with the short term forecast omitted and TAC set on the basis of the terminal year assessment, and the second omitting subsequent assessments and using only the survey every three years. The flow diagram illustrating all three is given in Figure 1. For initial exploration a series of harvest rules were implemented without error following the rules given below.

Exploration

Btrig =2600 t

Fpa =0.16

Flim (to get slope) =0.016

Alpha = 2 (the rate of decrease in TAC below Btrig)

Blim = 1430 (where F=Flim given Alpha above)

Recruitment in 0 and 1 replaced with geometric mean of the simulated series.

Following the exploration several aspects were varied

One or three year decision making

Bpa at 2300 and 3000

Year on year constraint on change in TAC of 15% included or excluded.

3 Methods:- Short term Forecast as currently used by ICES (STF),

Harvest rate based on the terminal year SSB estimated by the assessment; implying a 2 year lag between SSB used and TAC year (AHR)

Harvest rate based on Egg survey only; implying a single year lag between SSB used and TAC year operational only triennially (SHR)

In all these cases 100 populations were simulated for a period of over 20 year period. In all cases the initial population history and numbers were taken from an ICA assessment, based on recorded catches. The assessment was redone to match a slightly different selection pattern with no possibility of reducing F at the oldest ages, this was done to allow assessment and simulated populations to match. In all cases the simulated egg survey values for the 5 triennial surveys from 1992 to 2004 were re-simulated from the underlying 'true population' with 22.4% CV, to ensure that elements of uncertainty of history was included in the simulation. These populations were projected forwards for 20 years. The assessment included the estimation of survey Q as currently done in the WG. The setting used were:-

STF: Short Term Forecast; TAC estimated annually using FLSTF, implemented for 1 or 3 years ahead.

ICA assessment giving SSB and F in assessment year

In all cases F as Fbar ages 4-8

Intermediate year TAC already set – (2006 set to 470t taken from WG catch)

Short term forecast with TAC constraint in intermediate year. Selected F in TAC year based on calculating TAC using the following ABC based HCR based on projected SSB in the TAC year and target F:-

Btrig	=2300 or 3000t
Fpa	=0.16
Flim (to get slope)	=0.016
Alpha	= 1

Blim (where F=Flim) = 230 or 300t

Recruitment in 0 and 1 replaced with geometric mean of the simulated series.

This is calculated in practice by three stage projection,

Project at Fpa	if SSB >= Btrig use catch as TAC
If SSB< Btrig Project at Flim	if SSB <=Blim use catch as TAC

If SSB>Blim Project at F level assuming linear approximation F-SSB relationship between Flim and Fpa use

For 1 year management regime TAC set for single year, for 3 year regime TAC set to the same value as 1 year but held for 3 years.

AHR: Harvest Rate based on Assessment; TAC estimated annually harvest rate, based on SSB in assessment year implemented for 1 or 3 years ahead

ICA assessment giving SSB and F in assessment year

In all cases F as Fbar ages 2-8

Intermediate year TAC already set – (2006 set to 428.491)

Harvest rate selected on the basis of the SSB in the terminal year of the assessment using a ABC rule analogous to the ABC F rule above in STF (Setting TAC one year ahead based on SSB one year behind)

Harvest Rate used = 1-exp(-F) where F is the F in the ABC rule

The leads to an ABC rule in harvest rate

Btrig	=2300 or 3000t	
Fpa	=0.16	an effective Hpa 0.148
Flim (to get slope)	=0.016	an effective Hlim 0.0159
Alpha	= 1	

Blim (where F=Flim) = 230 or 300t

In practice for coding the following three a condition formula based on the ABC formula depending on estimated SSB and the Fpa and Flim and the slope between Blim and Bpa.

HR=1-exp(-fpa*(ssb>=bpa)-flim*(ssb<=blim)

-(flim+(ssb-Blim)/slope)*(ssb>blim)*(ssb<bpa))

SHR: Harvest Rate based on Survey Index; TAC estimated annually harvest rate, based on SSB from the simulated survey, implemented for the 3 years ahead .

For this function scaling of the survey is required for consistency with the present 2007 TAC and because assuming zero bias on the survey is not a good assumption, the basic harvest scaling is based on the current assessment. The Q for the survey is estimated by comparing the 5 simulated egg survey values 1992 to 2004 with SSB in the assessment 1991 to 2005. This factor (different in each simulation) is used to scale the survey subsequently. Its effectively scaled to the past catch 1992-2004 through the assessment. Subsequently assessments 2006 onwards are not carried out.

Harvest rate selected on the basis of Q times the SSB in the year of the egg survey using a ABC rule analogous to the ABC F rule above in STF (Setting TAC one year ahead based on SSB in the current year)

As with AHR above the practical implementation follows Harvest Rate used = 1-exp(-F) where F is the F in the ABC rule The leads to an ABC rule in harvest rate

Btrig	=2300 or 3000t	
Fpa	=0.16	an effective Hpa 0.148
Flim (to get slope)	=0.016	an effective Hlim 0.0159
Alpha	= 1	
Blim (where F=Flim)	= 260 or 300t	

In practice for coding the following three condition formula based on the F based ABC formula depending on estimated SSB and the Fpa and Flim and the slope between Blim and Bpa.

HR=1-exp(-fpa*(ssb>=bpa)-flim*(ssb<=blim)-(flim+(ssb-Blim)/slope)*(ssb>blim)*(ssb<bpa))

This is only operational on a 3 year basis because the survey is only available triennially, TAC set for next year is held for 3 years.

In all cases if year on year restrictions were included at 15% these were implemented for all years and not removed below the trigger biomass. For the 3 year regime the 15% per year limit was implemented over the three year period until the required reduction or increment was achieved. (20% reduction implies 15% followed by 5% 1 year later)

Results

The results for 10 runs are shown in Figure 2, one of which crashed the stock, which is typical for these settings when no year on year constraint is included. Each run is shown with the underlying stock, the egg survey estimates with error (cv=22.4%), the point observations using ICA with each assessment, the projected stock in the TAC year and the resulting TAC. The log residuals between true stock and ICA assessment and the projection are plotted as two histograms in Figure 3. The standard deviation of assessment and prediction are 29 and 33% respectively. The bias is 2 and 12% respectively. However, in addition the errors are highly correlated, with a lag 1 correlation coefficient of 84 and 76% and a lag 3 correlation of 42 and 54% respectively. These results suggest that the use of the simple independent annual errors in the simulated assessments may underestimate the resulting dangers to some extent. The higher standard deviation, bigger bias, and higher correlation in the short term forecast indicate that it is worth investigating the use of a simple biomass factor. The three year effect in the data is seen as a ripple in the projections, most clearly in example 2 in Figure 3, indicates that investigation of a three year rule is important.

Ten different combinations of method and length of period for fixed harvest were tested (Table 1 rows 1-10) all with the same nominal harvest rule, the Btrig was set to 2300. Where annual restrictions on change in TAC were include, the values used were 15% per year for 1 year management rules and a comparable limit once every three years. These were repeated for Btrig at 3000. (Table 1 rows 11-20)

Figure 4 provides a representation of yield, risk and an indication of inter-annual variability. The four graphs plot the data from Table 1 with different colours assigned in each panel to separate the measurement method, and the major parameters of HCR control. The size of the dot represents average inter-annual variability in catch, smaller dots indicating smaller inter-annual change. In Figure 4a the differences between the use of the STF, the AHR. This shows lower risks and often higher yield when AHR is used in stead of STF. This is thought to be due to the amplification of errors by a short term forecast at the exploitation levels examined. Figure 4b shows that increasing the trigger level for reduced harvesting to 3 from 2.3 Mt both reduces risk and increases yields. This is due to the increase in recruitment caused by elevating Btrig, which exceeds the reduced catches due to lower fishing mortality below 3Mt. Figure 4c contrasts the difference between 3 year management and 1 year regimes, with 3 year regimes giving mostly higher risks with similar catches over the annual regimes. Figure 4d shows the influence of a 15% restriction on inter-annual variability. The result of this is generally reduced catch and a slight elevation in risk with increased restriction on inter-annual change.

Year on year variability is reduced by either 3 year regimes or 15% year on year restrictions in change in catch. The 15% restriction changes a number of aspects : interannual variability in catch is reduced by 30%, mean catch decreases by 7% and risks increase by about 75%. SSB levels are broadly unaffected. The 3 year regime reduces interannual variability in catch by 22%, mean catch is unaffected and risks increase by about 75%. Average SSB levels increase slightly.

Conclusions

Given the higher standard deviation, bigger bias, and higher correlation in the short term forecast the use of SSB based harvest rates should be seriously considered as a replacement for the use of the traditional short term forecast to set TACs. The 15% restriction reduces catch and yield while increasing risk, the 3 year regime has similar increases of risk, maintains yield but the year on year variability is reduced. The annual regime gives highest yields and lowest risks.

Table 2 Results of different management approach options. One or three year cycles, 0, 15% annual change, a SSB trigger of 2300t or 3000t. Methods are Short Term Forecast (STF), Assessment based harvest ratio based on SSB (AHR) and Survey based harvest ratio based on SSB (SHR).Mean TAC in last 11 years of the forward projection. Inter-annual variability is the mean absolute change in TAC from year to year for years 10 to 20. Mean SSB in last 11 years of simulation. Mean F in last 11 years of simulation. Mean SSB in final year of simulation. Risk is the percentage of cases where SSB is below the reference level in last 10 year of the simulation. Percentage catch is the fraction by number at age and above.

Method	Yr/Yr limit	SSB trig	HCR (yr)	Catch (kt)					F				SSB (Mt)		TAC variation (11 year period)					% Risk		% Catch	
				Mean	10%	50%	90%	IAV	Mean	10%	50%	90%	2017-2027	2027	Evts	+	-	Avg Inc (kt)	Avg Dec (kt)	2.3	2.6	4+	7+
AHR	no	2.3	1	540	356	551	711	57	0.166	0.095	0.159	0.243	3.50	3.53	11.0	7.5	3.5	60	-51	10	15	0.68	0.29
STF	no	2.3	1	533	344	547	717	68	0.172	0.1	0.171	0.251	3.33	3.32	11.0	6.3	4.7	72	-63	6	19	0.67	0.27
AHR	yes	2.3	1	523	251	535	744	38	0.138	0.078	0.139	0.2	3.86	3.79	11.0	6.4	4.6	36	-41	6	11	0.69	0.30
STF	yes	2.3	1	520	280	525	739	45	0.187	0.092	0.165	0.268	3.30	3.36	11.0	5.8	5.2	45	-45	19	26	0.67	0.27
AHR	no	2.3	3	545	382	558	706	35	0.146	0.086	0.140	0.21	3.95	4.11	4.4	2.9	1.5	105	-55	5	6	0.67	0.30
SHR	no	2.3	3	548	376	545	735	48	0.149	0.089	0.146	0.212	3.84	3.87	3.3	2.3	1.0	181	-110	3	6	0.68	0.29
STF	no	2.3	3	539	351	540	761	53	0.170	0.104	0.172	0.236	3.44	3.67	4.4	2.6	1.8	136	-125	21	25	0.67	0.27
AHR	yes	2.3	3	541	278	543	814	33	0.156	0.074	0.140	0.252	3.86	3.86	7.6	4.0	3.7	50	-43	15	20	0.67	0.30
SHR	yes	2.3	3	499	284	502	693	37	0.135	0.074	0.130	0.203	3.86	4.13	7.8	3.8	4.1	57	-48	6	10	0.67	0.30
STF	yes	2.3	3	523	308	534	753	36	0.167	0.098	0.160	0.241	3.51	3.70	7.3	3.3	4.0	59	-52	21	24	0.67	0.28
AHR	no	3.0	1	573	388	566	762	59	0.159	0.092	0.155	0.229	3.79	3.59	11.0	7.5	3.5	65	-47	1	5	0.68	0.29
STF	no	3.0	1	555	331	572	746	80	0.170	0.096	0.168	0.251	3.48	3.39	11.0	6.7	4.3	82	-78	4	11	0.67	0.27
AHR	yes	3.0	1	539	245	547	754	41	0.136	0.068	0.137	0.201	4.06	3.83	11.0	5.7	5.3	42	-40	3	5	0.69	0.31
STF	yes	3.0	1	510	229	530	733	47	0.168	0.077	0.152	0.247	3.45	3.55	11.0	5.7	5.3	48	-47	13	20	0.67	0.28
AHR	no	3.0	3	560	387	564	770	43	0.148	0.087	0.142	0.213	4.01	4.10	4.4	2.9	1.5	132	-61	4	5	0.67	0.30
SHR	no	3.0	3	553	361	557	726	54	0.143	0.086	0.143	0.201	3.97	3.92	3.3	2.4	0.9	204	-121	1	3	0.68	0.30
STF	no	3.0	3	556	337	551	763	63	0.168	0.102	0.166	0.237	3.56	3.77	4.4	2.9	1.5	154	-167	11	23	0.67	0.27
AHR	yes	3.0	3	529	257	529	806	35	0.140	0.057	0.126	0.235	4.11	3.83	8.1	3.5	4.6	48	-48	7	12	0.67	0.31
SHR	yes	3.0	3	489	275	497	697	36	0.124	0.062	0.118	0.191	4.11	4.00	8.3	3.4	4.8	51	-46	2	5	0.68	0.32
STF	yes	3.0	3	535	329	537	743	39	0.159	0.09	0.154	0.239	3.71	3.85	7.6	3.5	4.1	62	-53	10	20	0.67	0.28

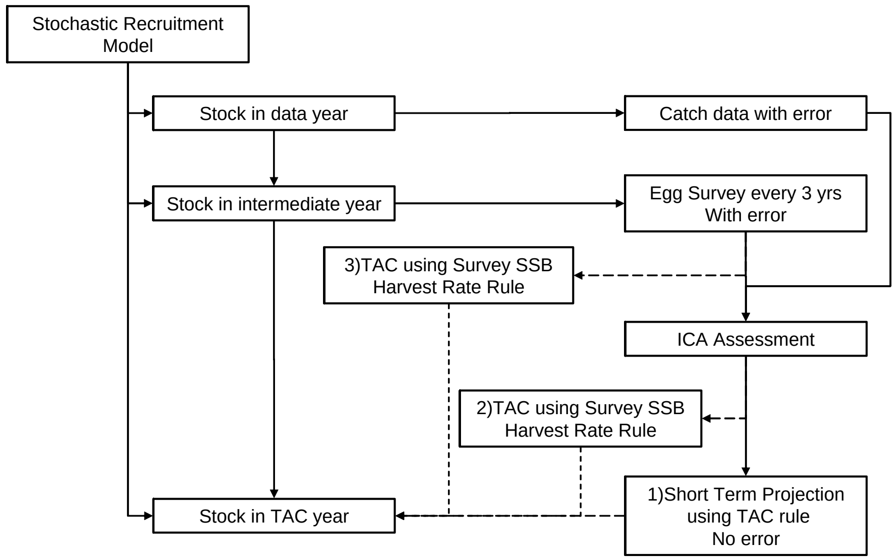
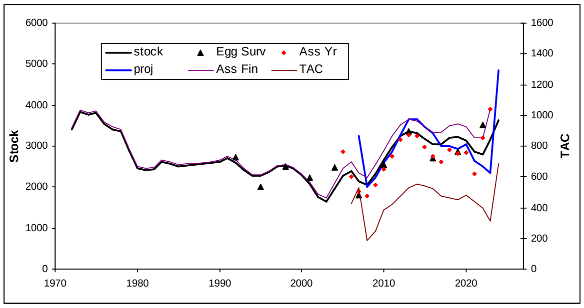


Figure 2 Standard management cycle implemented in FLR shown for 3 methods, 1) Short term forecast (STF), 2) Assessment based harvest rate (AHR) 3) Survey based harvest rate SHR.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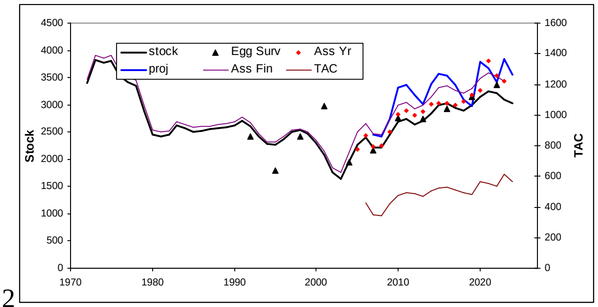
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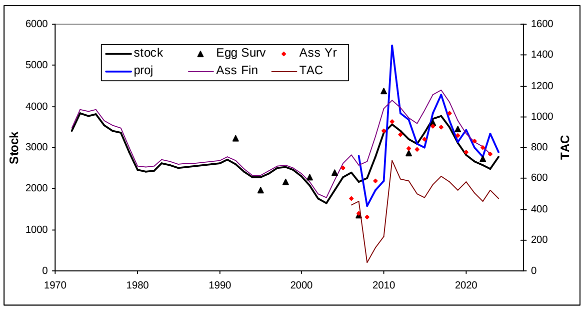
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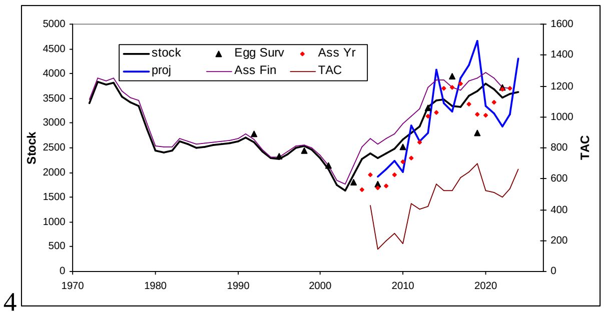
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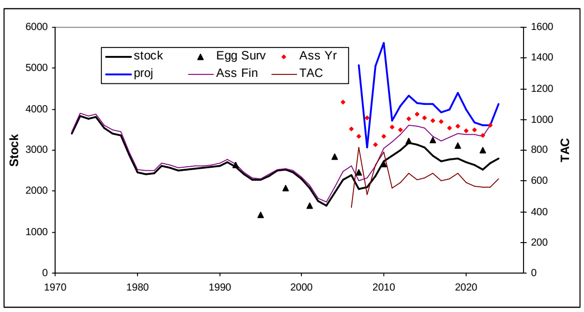
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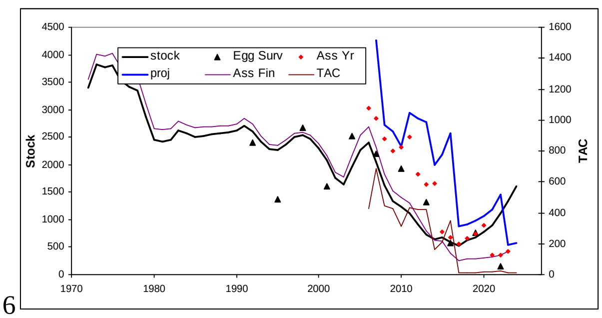
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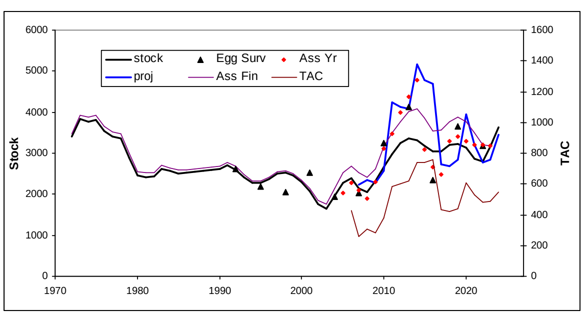
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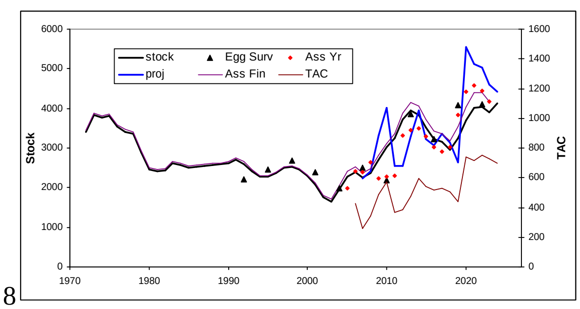
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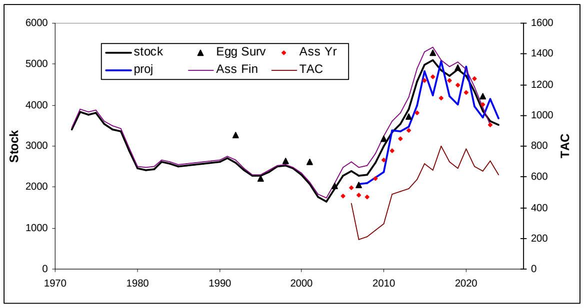

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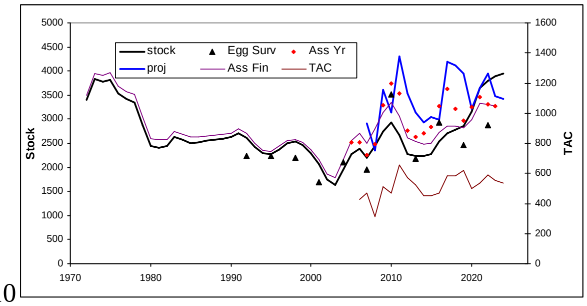

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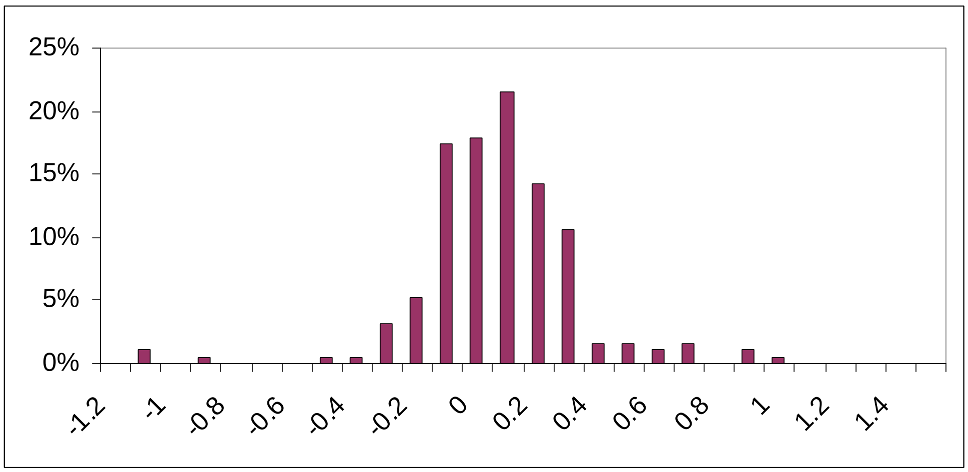
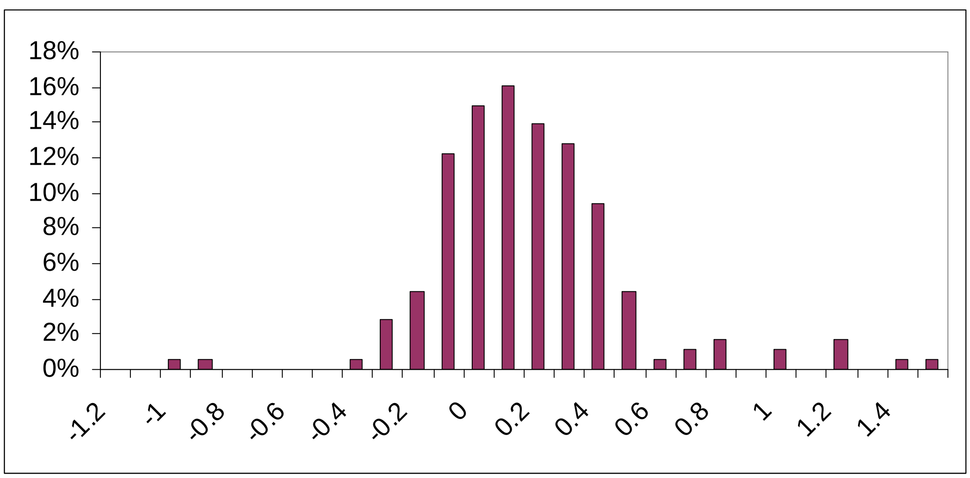
Figure 3 Ten examples of 20 years forward management, True SSB (solid black), Egg survey (black triangles) In year ICA assessment (red diamonds), Projected stock (blue), Final ICA (thin purple), TAC (brown) on different scale to the right.



A)



B)

Figure 4 Distribution of residuals (log scale) between A) ICA assessment and true stock, B) Projection and true stock.

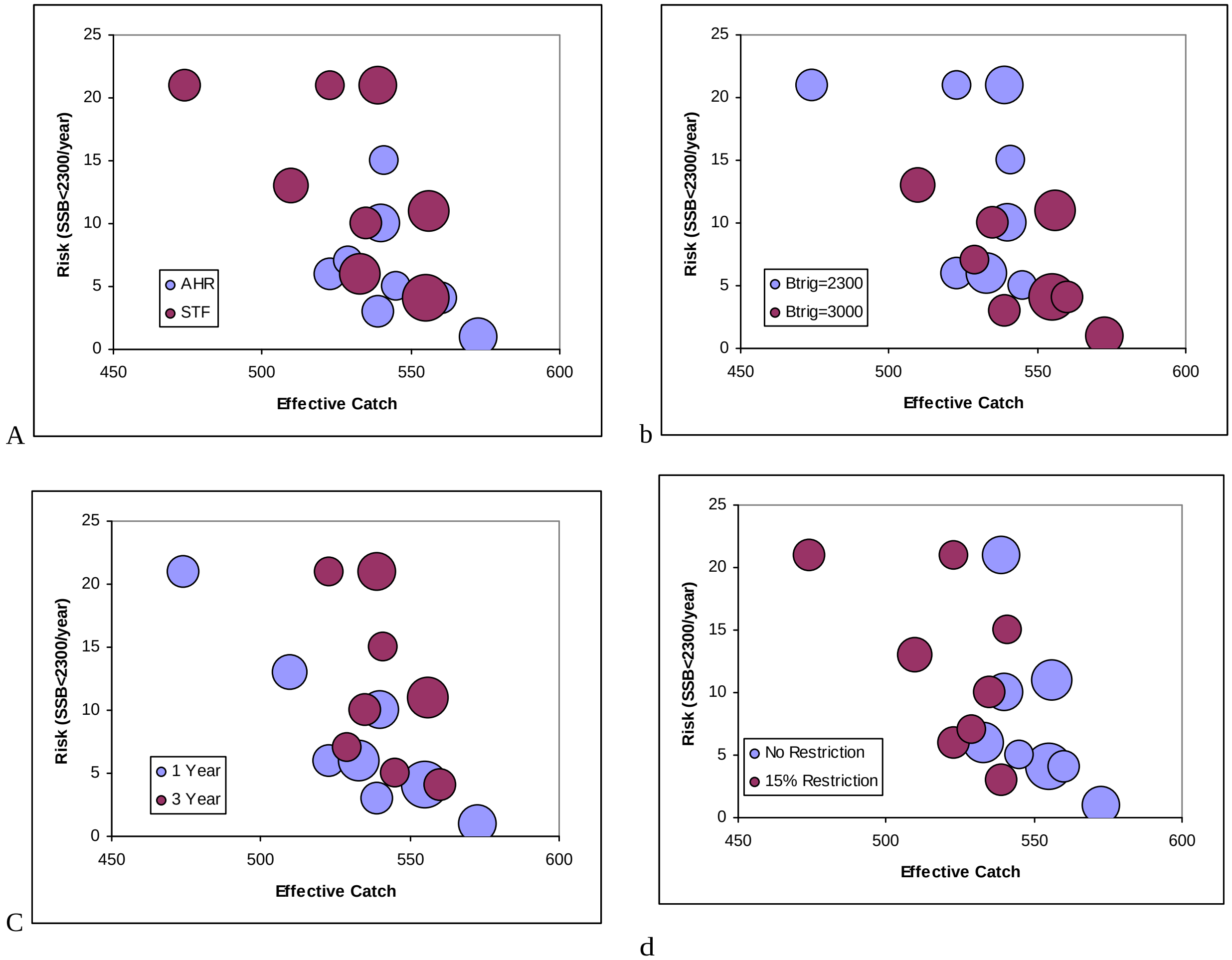


Figure 5 Annual catch against risk of SSB<2300 and Inter-annual variability in catch. a) by measurement method, b) by biomass catch reduction trigger limit of 2300 and 3000, c) by annual or triennial management and d) with or without 15% inter-annual limit on change in TAC.

Annex 3: HCM: Simulations of the harvest rule for mackerel proposed by the EU commision and some alternative rules.

D.W.Skagen, IMR, Bergen, Norway

December 2007-March 2008

Conditioning and model formulations

The simulation program HCM is described in some detail in appendix 3, and the text here refers to that. Here, the conditioning of the model and the choice of model options is described.

The program is designed to screen over a range of options for the harvest rule. Running the model for one particular set of options is called a *run* here. In each run, 1000 *iterations* are made, with stochastic numbers. The outcome of a run is presented as statistics over the 1000 iterations.

Stochastic elements:

2 Initial population numbers at age
3 Recruitment
4 Selection (partly)
5 Observation error
6 Implementation error

Stock biology.

Initial numbers

Initial numbers at age are taken from Table 10.2.1. (input to short term prediction) in the WGMHSA report for 2007. These numbers come from the ICA assessment, except for ages 0 and 1, which are geometric mean recruitments (for age 1 reduced by the presumed total mortality from age 0 to 1) and represent the stock by 1/1-2007. These numbers are passed through the observation model (see below), with the observation errors as used generally, to get initial numbers for each iteration. The resulting distribution of initial SSBs, which has a CV of 29%, is shown in Figure 1:

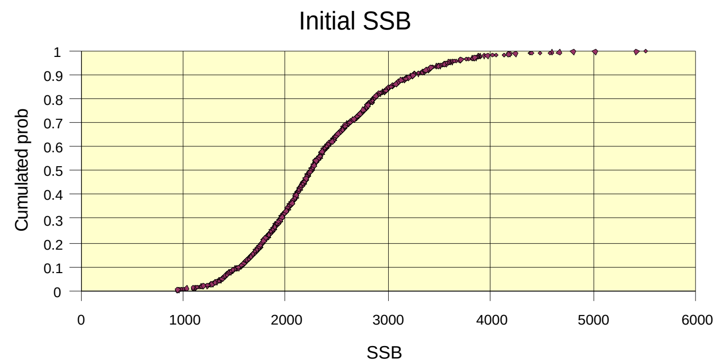


Figure 1. Cumulated distribution of initial numbers

Weights and maturities at age.

These are fixed values, taken from Table 10.2.1. (input to short term prediction) in the WGMHSA report for 2007.

Selection at age.

Two sets of selections at age appear:

1) Standard selection, taken from Table 10.2.1. in the WGMHSA report for 2007. This selection is assumed in all management decision processes, and also for the fishery in the intermediate year (year 0 = 2007), where no implementation error is included.

2) Implemented selection, resulting from including implementation error when deriving the actual removals t age from the stock. This selection is used for the projection of the true stock forwards, and to derive the true SSB.

Recruitments:

The recruitment model itself draws random recruitments with an expectation value that emerges from a deterministic stock-recruit function and a random multiplier with a specified distribution and variance parameter. Recruitments are generated in a 3 steps procedure:

- A value is derived according to the SSB from a stock-recruit function

  Two stock-recruit functions are used:

  1) Hockey stick : *R = min{b, b*SSB/a}*

  2) Ricker: *R = exp{a*SSB*exp(-b*SSB)}*

- This value is modified by random noise, which can have a normal or log-normal distribution.

The noise is implemented by drawing a random number ξ from a standard normal distribution and converting it to a multiplier as:

- Normal dist: xm = 1+CV* ξ
- Log-normal: xm=exp($\sigma * \xi$)

The variance parameter is given as the σ in the log-normal case and a CV in the normal case

- To prevent too unrealistic values, there may be a truncation: If the drawn value is outside some bounds, it is discarded and a new one is drawn. For the mackerel study, the terms $CV^* \xi$ or $\sigma * \xi$ are considered, and an new value drawn if this term is >*trunchigh* or <*trunclow*, *trunclow* typically being a negative number.

In the mackerel study, a collection of 1000 sets of recruitment parameters (in random order) was provided by John Simmonds from the study of stock-recruit relations. Each set specifies a stock recruit relation (Ricker of Hockey stick), parameters *a* and *b* of the relation, the distribution (normal or log-normal) with a variance parameter and the truncation limits *trunclow* and *trunchigh.*

These sets were used in sequence for the 1000 iterations in each run.

An example of stock-recruit pairs and cumulated recruitment distribution for a relatively typical set of parameters is shown in Figure 2.

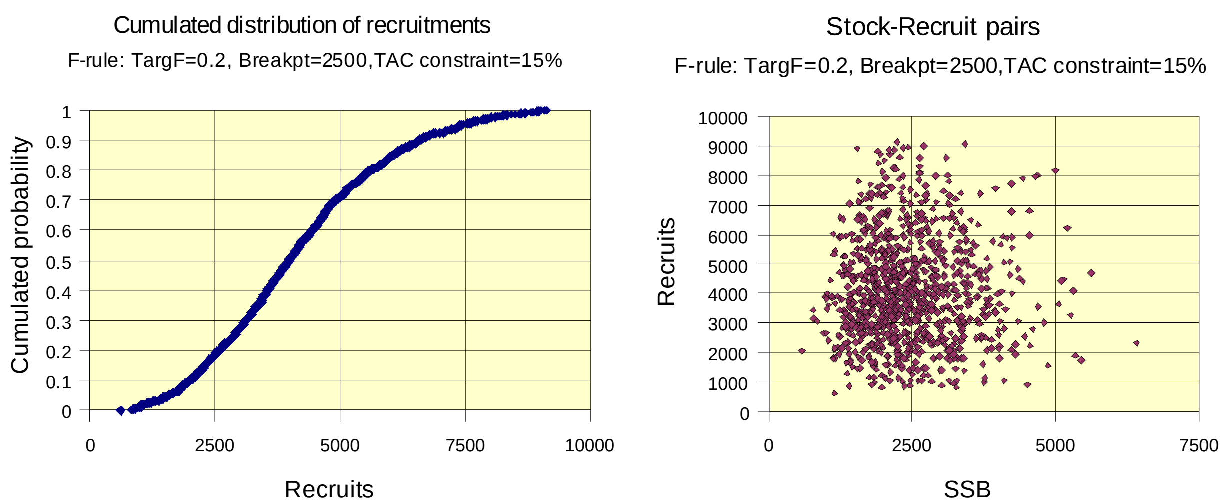


Figure 2. Distribution of recruitments and stock-recruit pairs from an example run.

Observation errors:

Each year, true stock numbers at age *N0(a,y)* were converted to observed stock numbers at age *Nobs(a,y)* trough a log-normally distributed multiplier derived as follows:

1) Draw a random number $\xi 1$ coming from a normal distribution with mean 0 and $SD = \sigma 1$.
2) Include (if appropriate) a bias and derive a common multiplier *btemp* with lognormal distribution for that year: $btemp=(1.0+biasobs)*exp(\xi 1)$
3) For each age *a* in the year *y*:

   I. Generate another random number $\xi 2(a,y)$ from a normal distribution with mean 0 and $SD=\sigma 2(a)$

   II. Get the stochastic multipler at age as $xm(a,y) = btemp*exp(\xi 2(a,y))$

   III. Apply a one-step auto-regressive model to *xm(a)*, using the *xm(a)* values from the year before: $xmnow(a,y)=\alpha*xm(a,y-1)+ (1-\alpha)*xm(a,y)$

The observed stock numbers at age are *Nobs(a,y)=N0(a,y)*xmnow(a,y)*

The $\sigma 2(a)$ were taken as the CVs of the estimates of terminal stock numbers at age in the last ICA assessment by the WGMHSA. For ages 0 and 1, a CV of 0.46 was used, which represents the recruitment variability.

The year factor variance $\sigma 1$ was chosen at 0.27, to give a CV of the resulting distribution of initial SSBs of approximately 29%, which has been the CV of the historical estimates of SSB by ICA. No bias is included unless stated otherwise. For the autoregressive coefficient α, the value 0.84 was used. This was derived from an early study of the assessment error. Later on, revised values have appeared, but the effect of the change was too small (difference in catch, F and SSB in the order of 2-5 %) to justify redoing the work.

Decision rules:

An F-based rule (according to the EU-request), a Fixed TAC rule and a Harvest Rate (HR) rule were explored, as described in detail elsewhere. The underlying conditions were, unless stated otherwise,

for deciding on a TAC for the years (*y, y+duration-1*):

- Starting numbers for projections: Year *y-1*
- Basis for decision of TAC: SSB in year *y* for the F-rule, year *y-1* for the TAC and HR rules
- Basis for decision on constraint on TAC change: SSB in years (*y, y+duration*-1) for the F-rule, year *y-1* for the TAC and HR rules.

Condition for applying the constraint on TAC: Only if SSB > Btrigger for the F-rule. With the TAC and HR-rules, both applying the constraint only if SSB > Btrigger, and applying the constraint always irrespective of SSB, were explored.When applying a constraint that is conditional on the SSB, the constraint is always applied if it leads to an SSB above the trigger, irrespective of what an unconstrained TAC would have led to. This applies in particular to the case where the rule without the constraint would have led to a larger TACif the SSB would have been below the trigger ('the paradox of the constraint rule').

Implementation errors:

These are derived by a similar algorithm to that in the observation model, but applied to the catches at age instead of stock numbers.

Parameters.
Bias: 5% as base case

$\sigma 1$ (variance parameter for the year factor): 0.1

$\sigma 2$ (variance parameter for noise at age): 0.1 for all ages.

These values were set somewhat arbitrarily, but correspond broadly to the variances at age and by year of the catch residuals in ICA.

Depletion:

Sometimes, the stock is too small to allow a TAC or catch from the implementation model to be taken. This can occur when:

- Finding the overall F-value corresponding to a proposed TAC.

- Finding Fs at age corresponding to implemented catch numbers at age and the true stock numbers at age.

In HCM, the following rule applies:

If the catch (at age or overall as applicable) cannot be taken with a fishing mortality of Fmax = 3.0, F is set at Fmax and the corresponding catch derived. A decided TAC is not changed, but the real catch is adjusted. The iteration is continued with the real catches removed from the stock. If constraints to the TACs apply, they refer to the decided TACs, which in some cases may become decoupled from reality. One may discuss how realistic this is in a real management, but at least, in some known stock collapses, part of the story has been a 'too little too late' response.

For output, the stock is regarded as depleted if the true SSB is less than 10% of Bpa.

Exploring the F-rule proposed by the EU commission

This rule sets the TAC according to an F-value that is derived as follows:

If SSB > Btrig (parameter B), F= Ftarg (parameter A), but TAC in year y shall at most deviate by C% from the TAC in year y-1.

If SSB < Btrig, the F is set at F=Ftarg*SSB/Btrig, and the constraint on TAC change does not apply.

Points of interpretation.

- The action below Btrig is a simplification of the request, which required rebuilding to above Btrig within an un-specified time.
- The SSB that is used for decision was the SSB in the TAC year, obtained by projecting the observed stock numbers at age one year forward.

A 5% implementation bias was used in the simulations.

The model was conditioned as described above. Runs were made screening over the rule parameters A, B and C:

A: Target F from 0.12 to 0.30 in steps 0.02

B: Btrig from 2000 Kt to 3500 Kt in steps 100 Kt.

C: Constraint from 5% to 20% in steps 5%

The results of these altogether 640 runs are summarized as means over 1000 iterations over the period year 10 - year 20. Graphs showing the dependence of the main interest parameters realized catch, risk to Bpa (=2300 Kt) and IAV = [TAC(y)-TAC(y-1)]/TAC(y-1)*100 to the rule parameters A, B and C are presented in Figures 3-5. In each figure, there is one panel for each level of constraint. The target F and the Trigger biomass are on the axes and there is a color code for the result as indicated. Some supplementary graphs are presented to highlight points in the discussion.

A summary table of the results for years 10-20 and for the years 1-5 is included in the report as appendices 1-2.

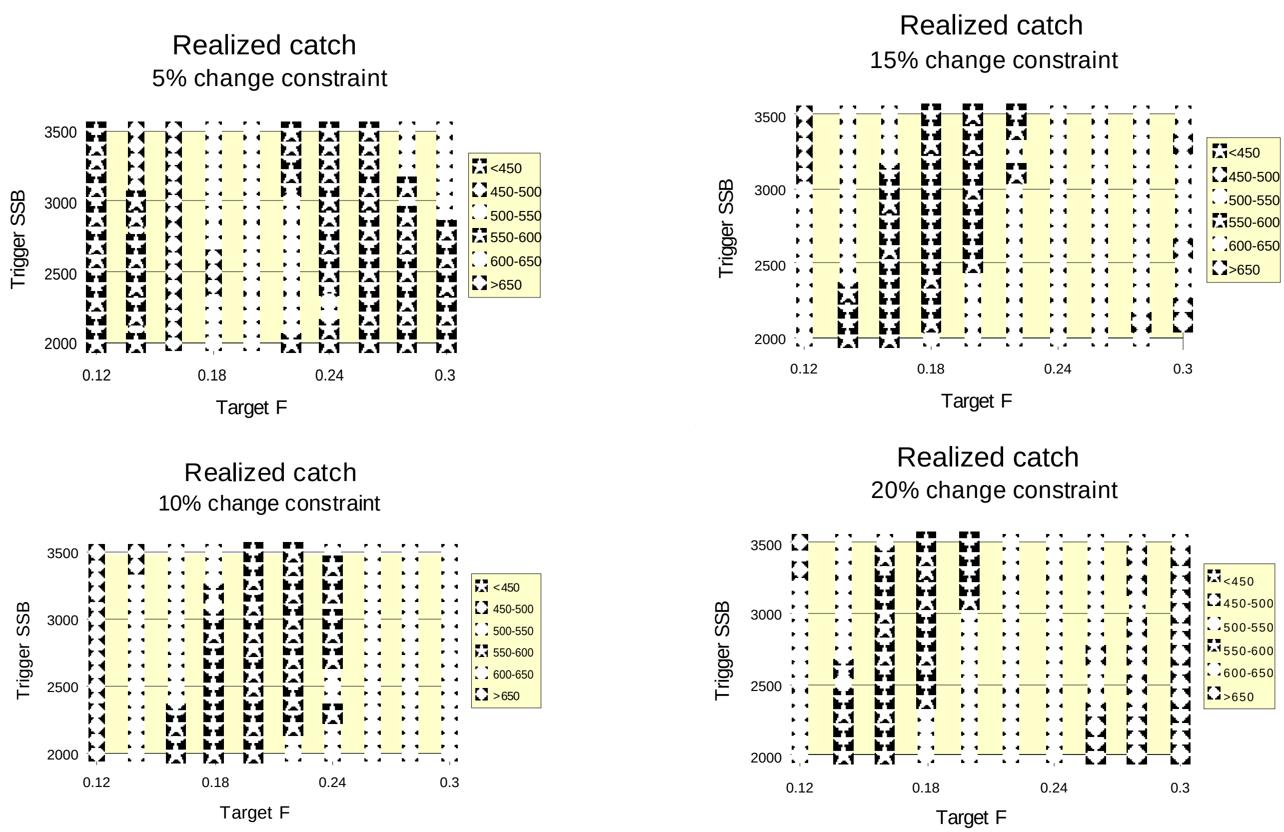


Figure 3. Realized catch with F-rule

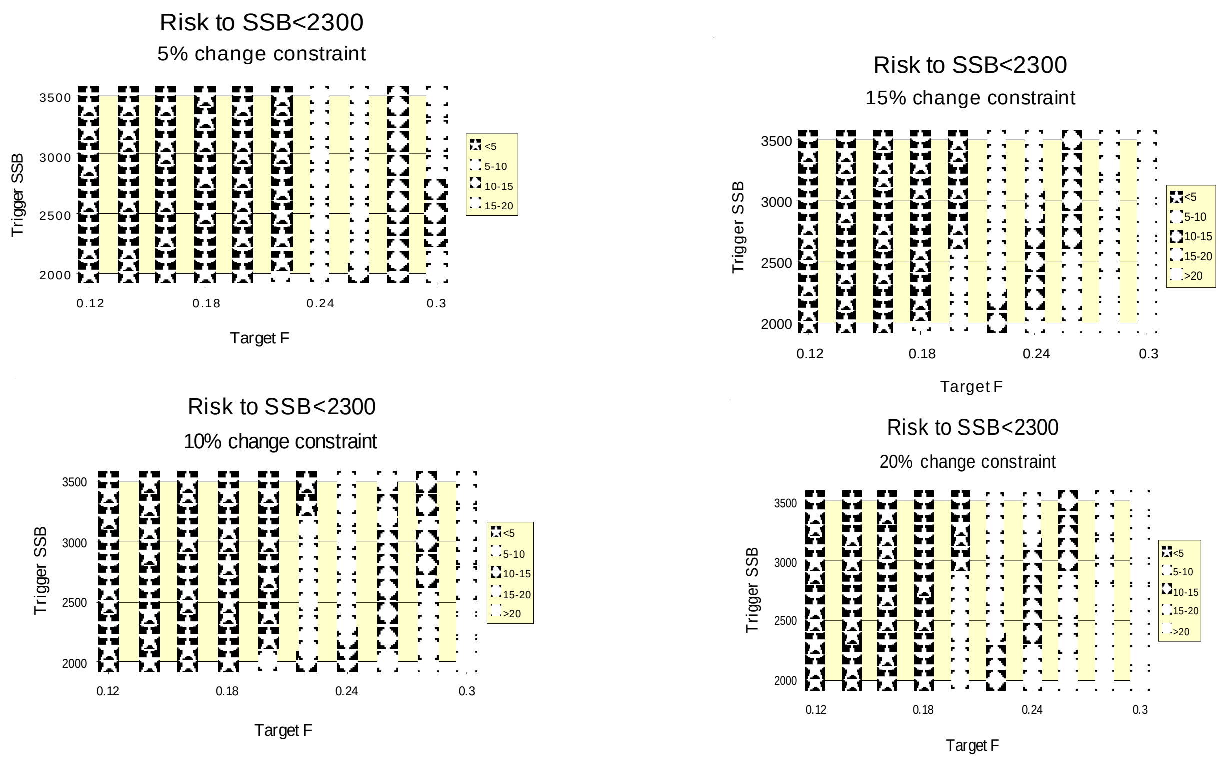


Figure 4. Risk with F-rule

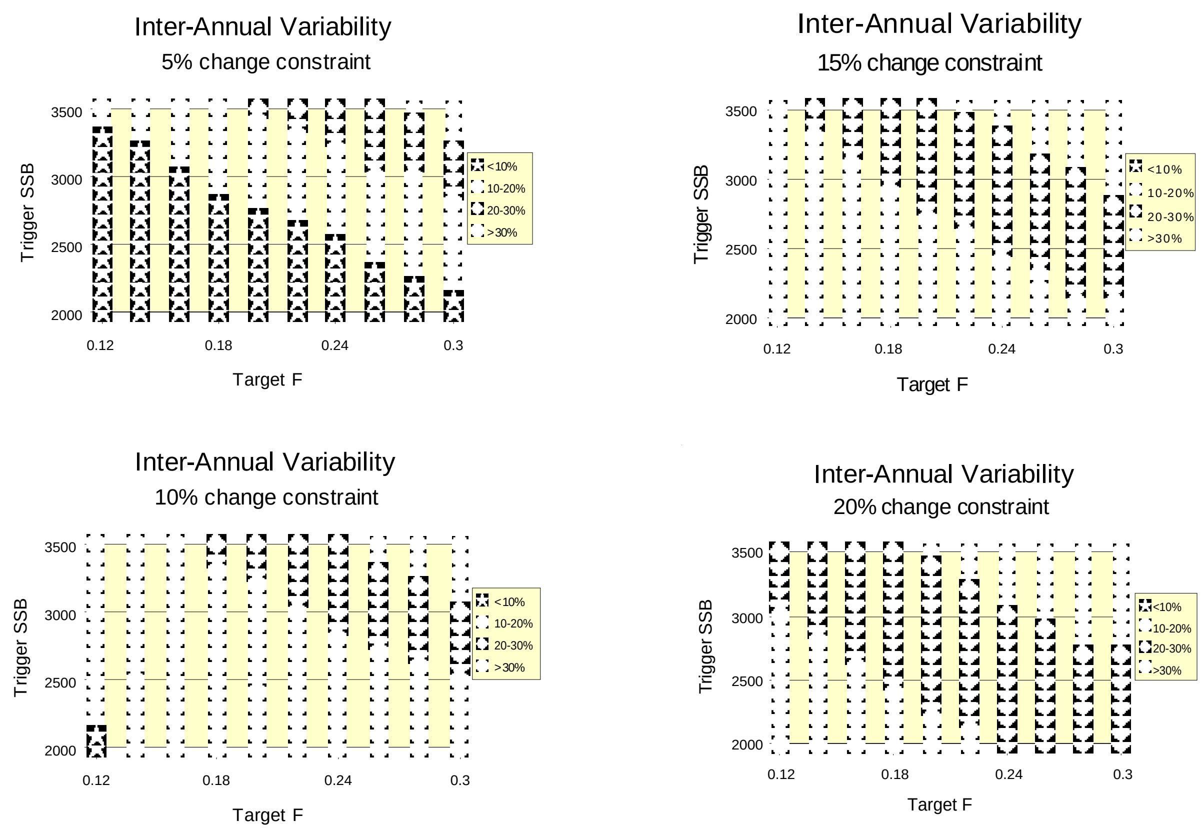


Figure 5. Inter-annual TAC variability.

The realized catch increases with increasing Target F, while the effect of he trigger SSB on he catch is less prominent and less consistent. A stronger constraint on the TAC variation decreases the catch. The risk to Bpa increases with increasing Target F, and is reduced with increasing Trigger SSB . A stronger constraint reduces the risk. This is because the strong constraint results in lower realized catch. It allows for a strong reduction in catch if the stock becomes small, but not for a strong increase in TAC after the stock has recovered. The inter-annual variation increases with increasing trigger SSB and with increasing Target F. A stronger constraint on TAC variation reduces the inter-annual variation.

These graphs show how the rule is expected to perform in practice, i.e. how it responds to fluctuations in the stock induced by a combination of natural events and errors in the assessment. Notice that a quite strict implementation of the TACs is assumed in these runs.

Figure 6 shows the relation between realized fishing mortality and actual catch, and demonstrates that what really matters for the performance is the realized fishing mortality resulting from applying the rule, not the parameters in the rule as such. With a strong constraint on TAC variation, a slightly lower catch ensues from the same F, indicating that this constraint may lead to a slightly lower stock. However, this effect is more apparent under conditions of low realized F where the stock would be likely to be above the threshold while strong constraints would not allow progressing into high TACs in the period considered. Apart from that, the relation between F and catch is quite close.

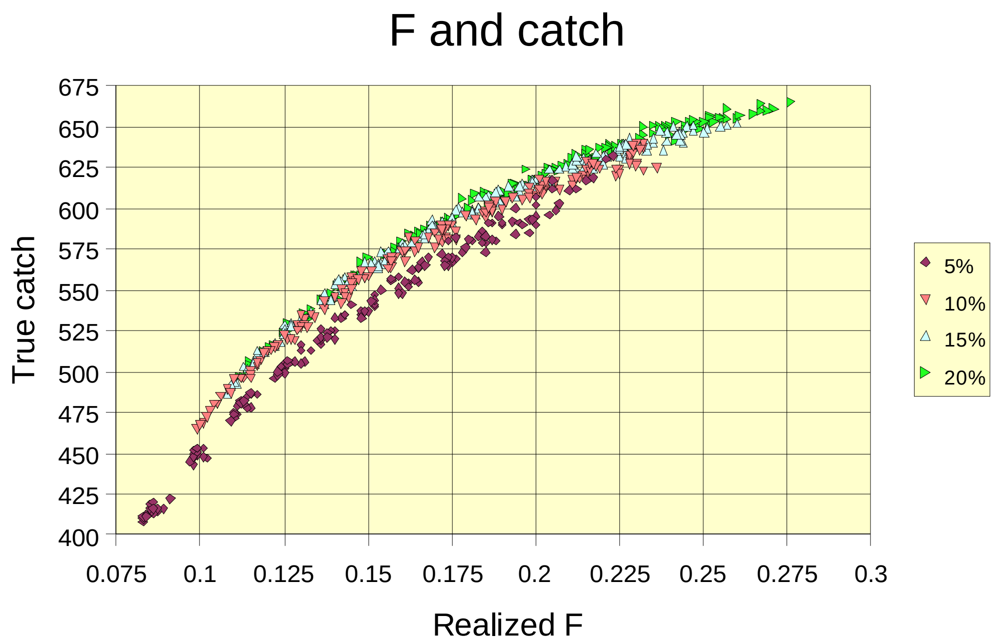


Figure 6. **Relation between realized fishing mortality and the true? Mean annual catch, across all choices of target F and Trigger SSB, and for the various levels of constraint.**

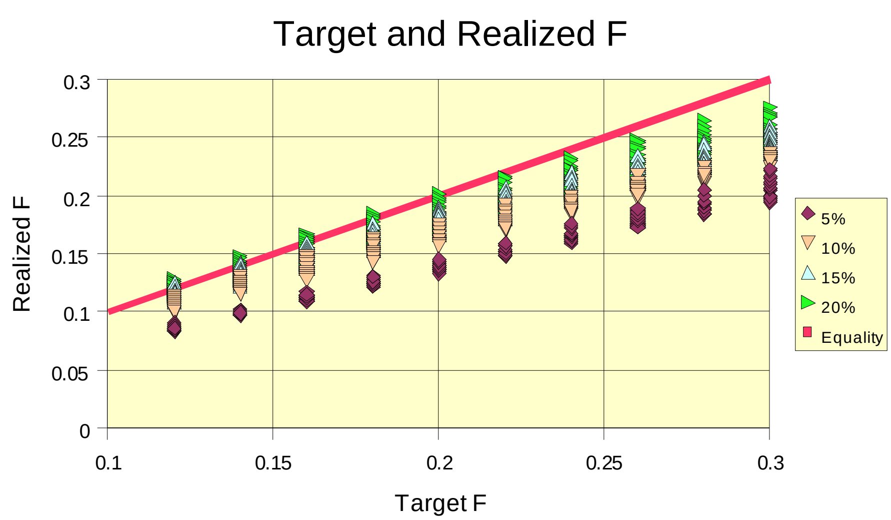


Figure 7. The relation between realized and target fishing mortality, across all rule parameter options. Symbols correspond to the percentage constraint in TAC variation.

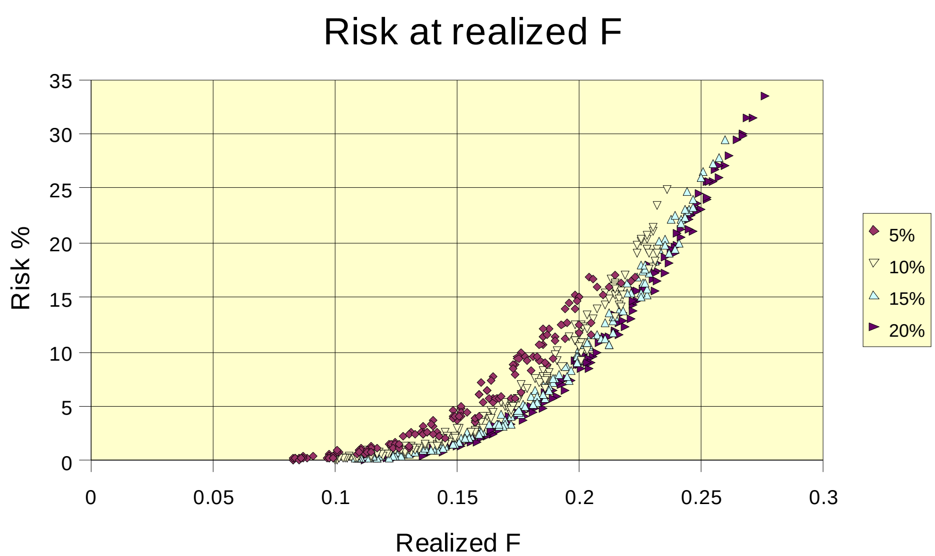


Figure *8*. The relation between risk and realized F, across all rule parameter options.

As shown in Figure 7, the realized fishing mortality is generally lower than the target fishing mortality, and more so with a high target fishing mortality and a strong constraint on the TAC variation. Figure 8 shows that for a given realized F a strong constraint leads to higher risk. However, the strong constraint precludes reaching high fishing mortalities, so the net result is that a strong constraint leads to less risky decisions.

Figure 9 shows the trade-off between catch and year-to-year variation. The catch is to a large extent determined by the target F, and to a lesser extent by the trigger biomass. With a low target F, a high trigger biomass reduces the catch, while at higher target Fs a high trigger biomass increases the catch although the effect here is marginal.

A strong constraint reduces the inter-annual variability particularly when the target F is low and/or the SSB trigger is low.

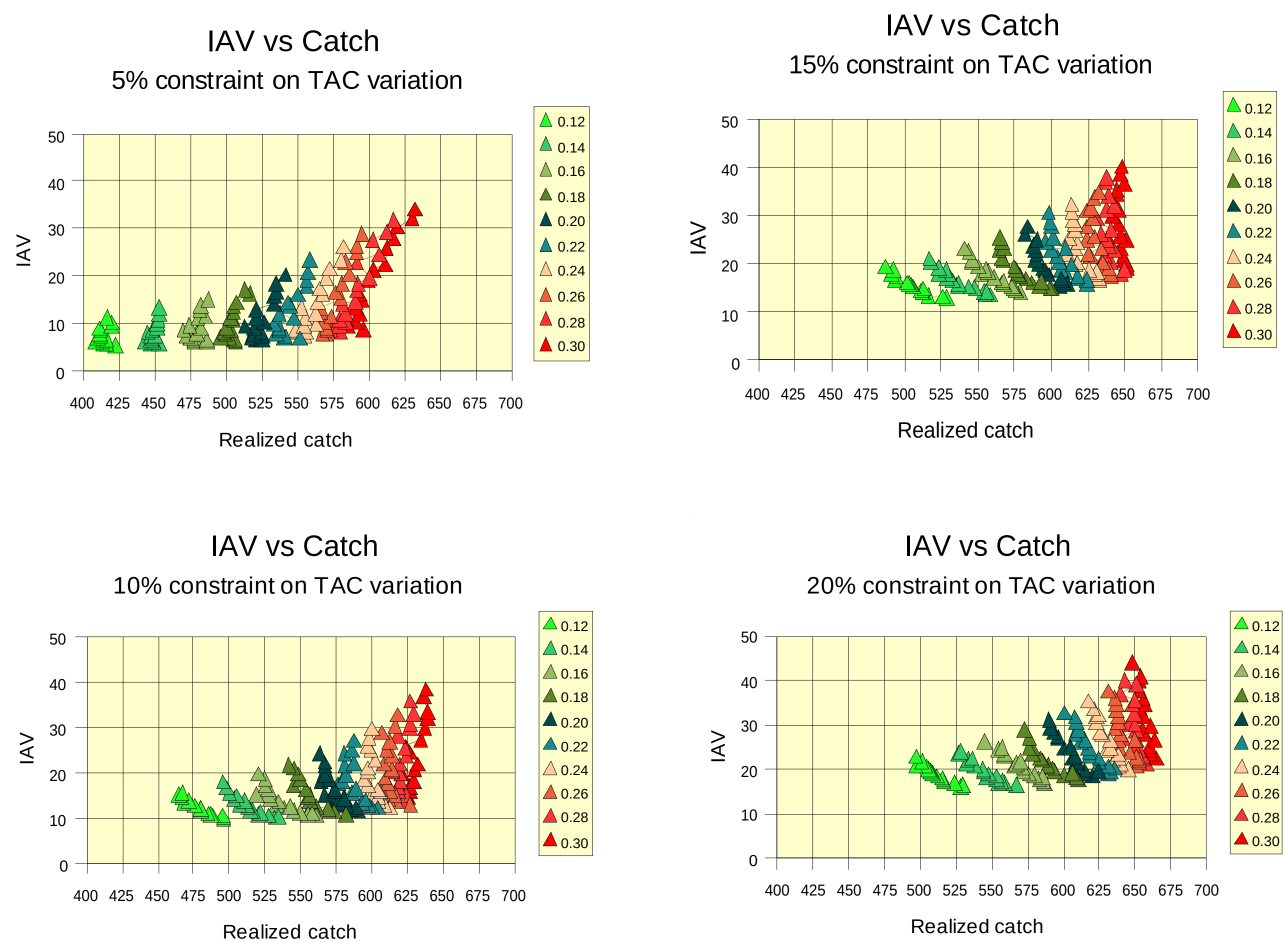


Figure 9. The trade-off between inter-annual variation of the TACs (IAV) and the realized catch. Each panel is for one level of constraint on the year-to-year change in catch, as indicated. Each set of points is for one level of target fishing mortality, and covers a range (2000-3500) of trigger SSBs. The top of each curve corresponds to the highest trigger SSB. The colors give an approximate indication of the risk, cfr. Figure 4.

The trade-off between catch and stability is further illustrated in Figure 10. This figure shows results for just those scenarios that lead to a risk to Bpa between 10 and 15%. With a strong constraint of 5%, it is possible to bring the IAV down between 5 and 10%, but the cost is about 50 thousand tonnes of average catch. With weaker constraints, the actual constraint matters less. With a 10% constraint, a low trigger biomass and a target fishing mortality around 0.18, it should be possible to obtain average catches near the maximum with an IAV of less than 15%. Such results may be quite sensitive to assumptions about assessment and implementation error, however.

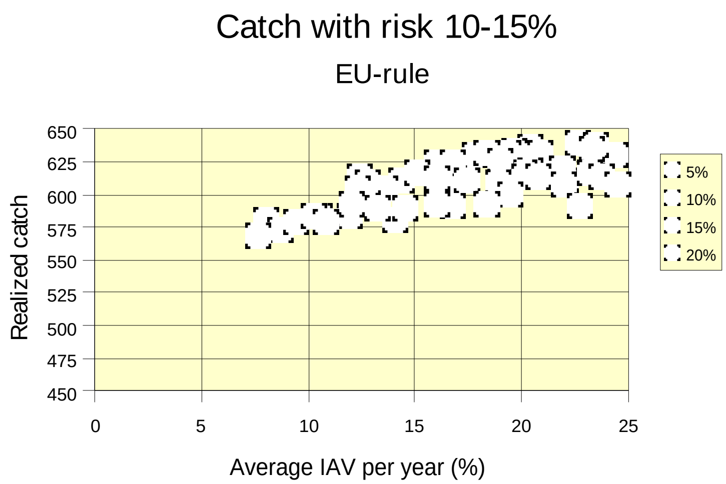


Figure 10. The trade-off between average catch and variability, expressed as IAV. All combinations of rule options that lead to a risk between 10% and 15% have been selected. Different colors represent different levels of constraint on year-to-year variations in TAC. Each point represents one combination of rule options.

Sensitivity of the F-rule to assumptions.

The sensitivity to some of the assumptions made was examined on a subset of the full range of rule options:

- Target F: 0.12, 0.18, 0.24, 0.30
- Trigger biomass 2500 and 3500
- Constraint 5% and 20%

Implementation error

This was examined by running the model with implementation bias at 15, 25 and 50% instead of the normal 5%. The CVs of the implementation errors were unchanged. The crucial question here is whether the rule is able to deliver the 'right' realized fishing mortality despite overfishing of the TACs. This is not the case, the realized fishing mortality increases more or less proportional to the implementation error (Figure 11).

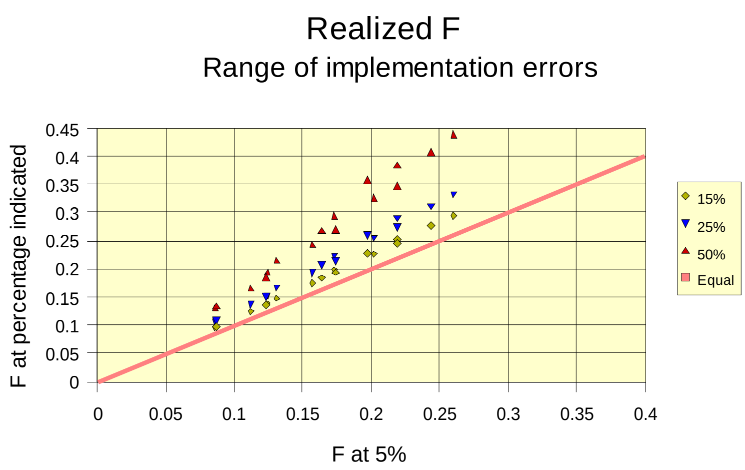


Figure 11. Effect of implementation error on the mean realized fishing mortality for years 10-20 for a range of rule options.

Further examination of the results reveals that the effect that a strong constraint on variation strengthens the reduction in realized F compared to target F, disappears with a high implementation error. Instead, the reduction in realized F is slightly stronger at weak constraints when the implementation error is large. The risk to Bpa increases with increasing implementation error, in line with the increase in realized F. The conclusion from this exercise is that the rule is not able to compensate for implementation error by adjusting the realized fishing mortality.

Auto-correlation in the observation model.

In the conditioning of the model, a strong one-year autocorrelation is assumed in the observation model. That is, if the stock was e.g. underestimated in one year, it will tend to be so in the next year as well. The effect of this assumption was explored by removing the autocorrelation term. The results for a selection of rule options is shown in Figure 12. The general effect of including autocorrelation is to increase predicted catches and fishing mortalities, to increase the risk and to reduce the predicted SSB. The relative increase in risk is quite large, but the risks in these scenarios is quite small. The increase can nevertheless lead outside acceptable levels.

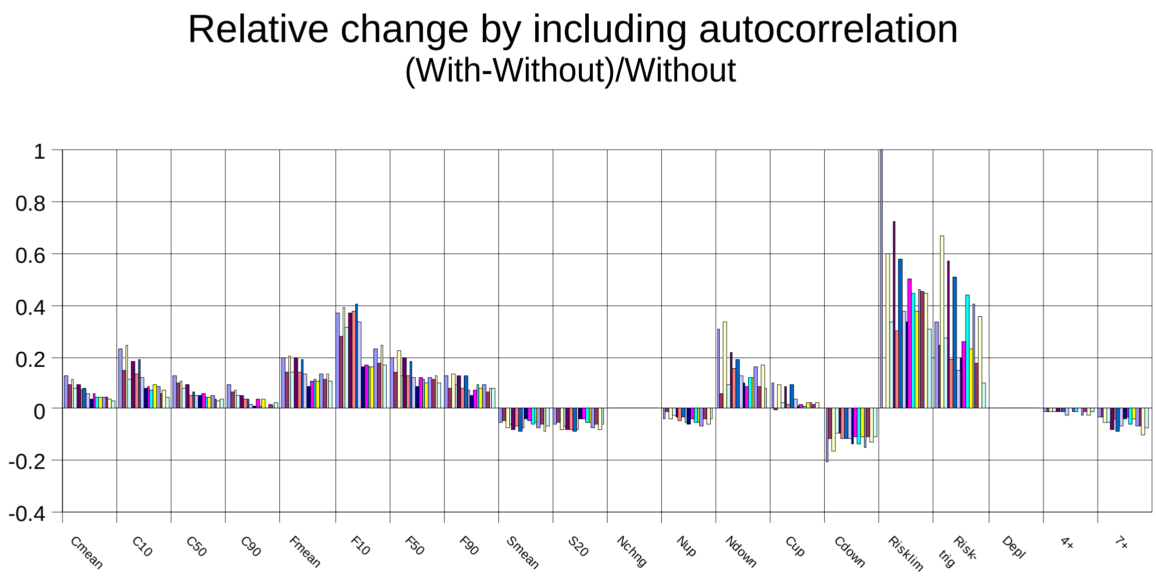


Figure 12. Effect of including autocorrelation in the observation model. The figure shows the relative change (With-Without)/Without for each performance parameter as indicated on the x-axis. Each bar represents one set of rule parameters (target F, trigger biomass and constraint on TAC variation). Note that the large increase in risk in most cases relates to low risks

Sensitivity to observation error.

In the agreed standard runs, a year factor with CV of 27% was applied in the observation model. This was intended to reflect the assessment uncertainty as experienced with ICA. The effect of the assumed CV in the observation model was explored by comparing the results with the standard conditioning with results obtained with half this CV (i.e. 13.5%). The results of the comparison is shown in Figure 12. Reducing the CV leads to increased predicted catches and fishing mortalities, and slightly reduced predicted SSBs. The risk to Bpa is variable, and most of the large relative changes appear at very low risks. However, detailed examination of the results reveal that the low CV leads to a much higher risk when the Target F is high and the Trigger biomass low, which may appear as a paradox.

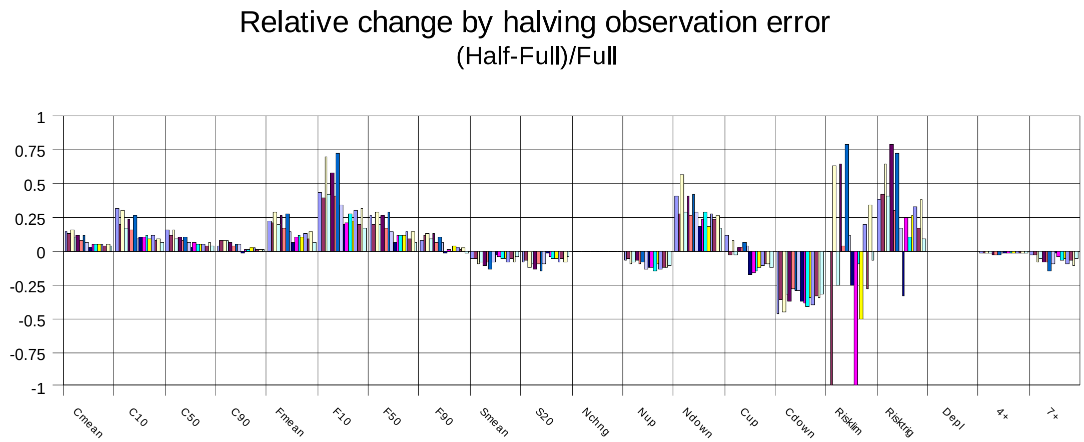


Figure 13. Effect of reducing the assumed uncertainty in the observation model. The figure shows the relative change (Reduced-Full)/Full for each performance parameter as indicated on the x-axis. Each bar represents one set of rule parameters (target F, trigger biomass and constraint on TAC variation).

Sensitivity to timing of the basis for decisions

In the present simulations, it has been assumed that the SSB used to make decisions both on the fishing mortality and on the constraints to TAC-variations is the SSB at spawning time in the TAC year, as it emerges from predicting the observed stock numbers through the intermediate year and into the TAC year. The request is not clear at this point. Hence, an alternative interpretation, that the reference SSB is the SSB in the year before the TAC year was briefly explored for comparison. The comparison is shown in Figure 13. Using the intermediate year for reference, leads to slightly higher Fs and catches, slightly lower SSBs and considerably higher risks.

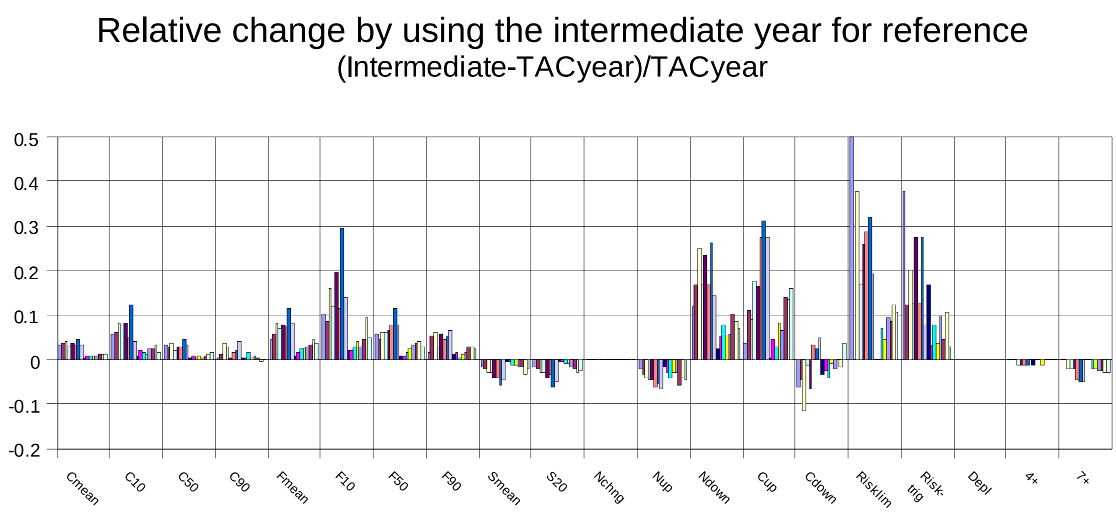


Figure 14. Effect of using the intermediate year as reference year for SSB used in decisions, rather than using the TAC year.. The figure shows the relative change (Intermediate-TACyear)/TACyear for each performance parameter as indicated on the x-axis. Each bar represents one set of rule parameters (target F, trigger biomass and constraint on TAC variation).

Some general conclusions on the F-rule

These simulations indicated that to keep the risk of falling below Bpa < 5%, the target F should not be higher than 0.18 (0.20-0.22 in the case of a 5% constraint). To have stable catches requires a low target F, a strong constraint on TAC variation and a relatively low trigger biomass. The highest average catch with low risk is obtained by a low trigger biomass and a weak constraint, but at the expense of stability, illustrating the trade-off between catch and stability.

The text table below shows some results for options, all with a risk to Bpa between 10 and 15% These are the options with the highest average catch, with the lowest IAV, and two with maximum catch with a moderate IAV.

	Perc (B)	Targ F (A)	Trig. SSB(C)	C mean	C10	C50	C90	Fmean	F10	F50	F90	SSB mean	IAV	4+	7+
Minimum IAV	5	0.28	2300	583	406	579	755	0.19	0.10	0.19	0.26	3313	10.3	85	44
High catch with IAV<15%	5	0.30	2400	593	413	593	755	0.20	0.11	0.20	0.28	3202	12.1	84	42
High catch with IAV<20%	15	0.24	2300	631	493	626	788	0.21	0.16	0.21	0.27	3046	18.4	84	41
Max. catch	20	0.24	2400	639	495	634	787	0.22	0.17	0.22	0.28	2969	22.7	83	40

The rule as it stands is not suited to cope with a substantial implementation problem in terms of overfishing the quotas. The rule does not compensate for the overfishing to bring the realized fishing mortality down to the target level. The risk to Bpa is linked to the realized fishing mortality rather than to the target fishing mortality. This result is in line with the experience from the recent past, where it is likely that the actual removals have been considerably larger than the quotas, and the fishing mortality has been well above what was intended.

The rule, in particular the constraint on year-to-year variation in the TACs, has an element of asymmetry. The rule, including the derogation from the constraint at low SSB, makes it 'harder' to increase the TAC than to decrease it when the SSB fluctuates around the trigger biomass. Some apparent paradoxes are probably caused by this asymmetry, for example the benfical effect on the risk of having a very tight constraint, and the increased risk with more precise assessments in some cases. This asymmetry is not necessarily undesirable - from a precautionary point of view it may be beneficial.

If there has been substantial unaccounted mortality in the past, as it is suspected, the past recruitments are underestimates. The conditioning of the model here assumes that the assessment for the past reflects the actual productivity of the stock. Hence, the level of catches associated with recommended fishing mortalities may be underestimates. Both because the level of unaccounted removals in the past is highly uncertain, and because it is unclear to what extent the problem of unaccounted removals can be amended in the future, no attempt has been made to account for these underestimates.

Simulations with a fixed TAC rule.

This is a rule where the TAC is set as a function of the SSB and the TAC in the year before the TAC year. The rule has 3 parameters, Ctarget, Btrig and Cconstraint. It has the following form, where SSB always is the estimated SSB in the year before the TAC year:

If SSB > Btrig, TAC = Ctarget

*If SSB < Btrig, TAC = Ctarget*SSB/Btrig*

If

abs{(TAC(y-1)-TAC(y))/TAC(y-1)} > Cconstraint

and (optionally) SSB > Btrig

then

TAC(y)= TAC(y-1)(1+Cconstraint)* *if TAC(y)>TAC(y-1)*

TAC(y)= TAC(y-1)(1-Cconstraint)* *if TAC(y)<TAC(y-1)*

Examination of the performance was done with the HCM software, with conditioning as described for the testing of the F-rule proposed by EU. Performance parameters mean catch, mean IAV (inter-annual variation of the TACs) and mean Risk to Blim were explored by scanning over the rule parameters:

Ctarget: 450, 500, 550, 600, 650, 700 thousand tonnes

Btrig: 2300, 2600, 2900, 3200, 3500 thousand tonnes

Cconstraint: 5, 15, 25%

The rule was applied either each year or every three years. In the latter case, the same TAC was applied unchanged for the whole three-year period. The rule was tested with the option to apply the TAC constraint only at SSB > Btrig ('Only'-option) or when applying the constraint at all levels of SSB ('Always'-option).

The results are shown graphically in Figures 15 - 20 and tabulated in annex 2 in this document.

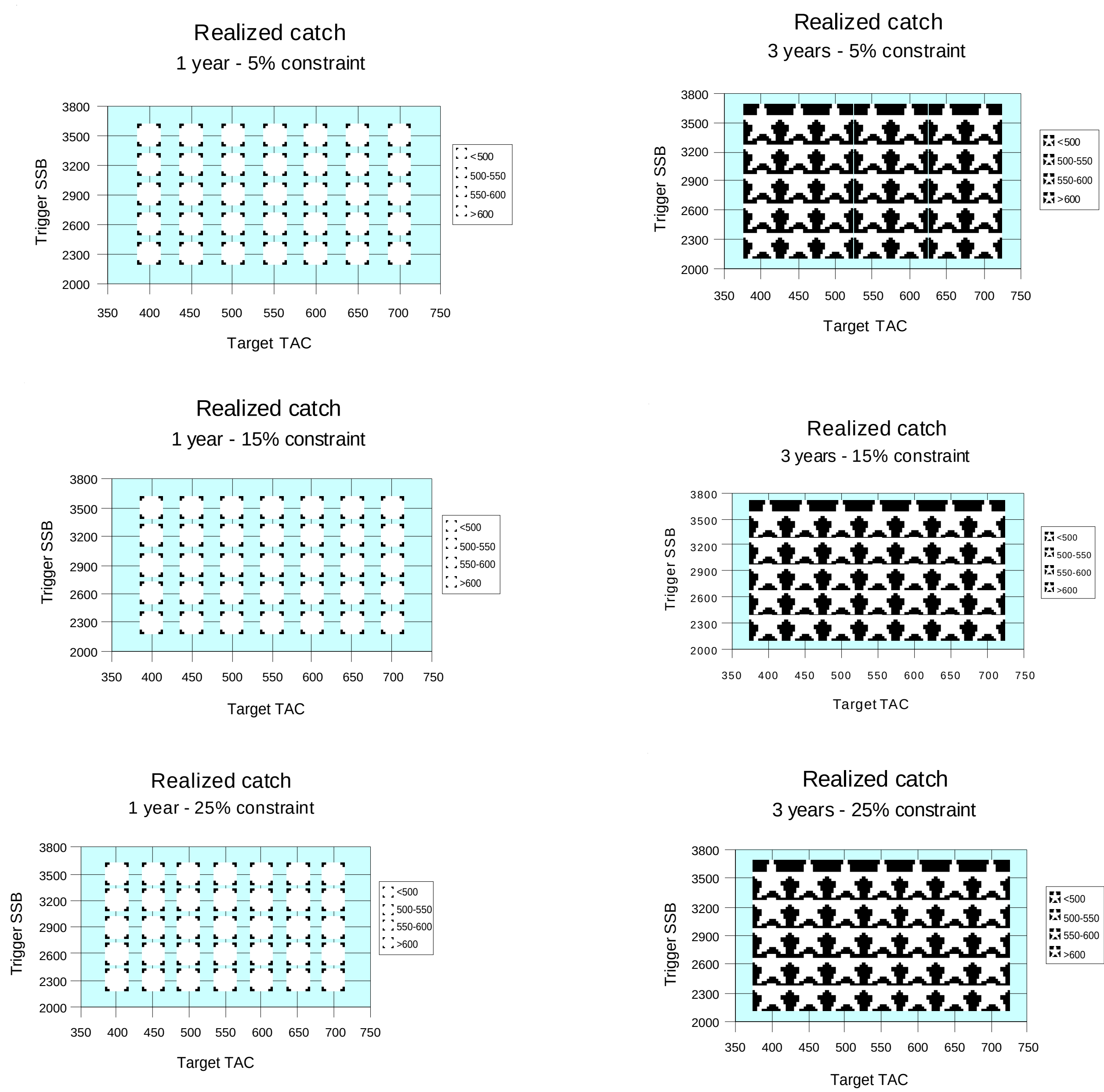


Figure 15. TAC-rule: Realized catch: 'Only'-option

Results (average over the years 10-20 and over 1000 iterations) of simulation of TAC rules, with constraints on year-to-year variations in TAC that applies **only at SSB > trigger biomass**. Results are shown for a range of target TACs and Trigger SSBs, for annual TACdecisions (left) and tri-annual TAC decisions (right), and for maximum percentage change in TAC as indicated.

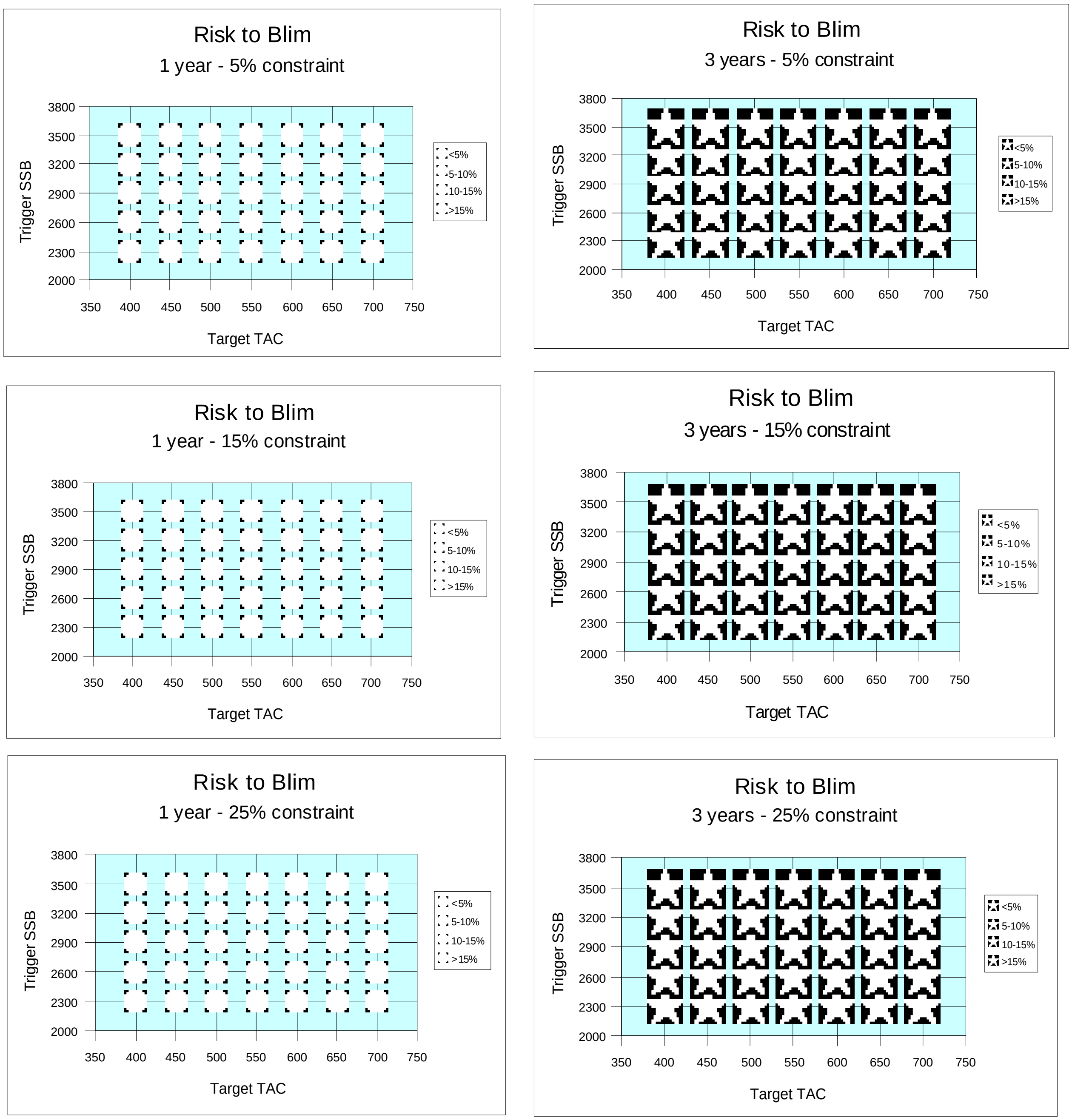


Figure 16. TAC-rule: Risk to Blim: 'Only'-option

Results (average over the years 10-20 and over 1000 iterations) of simulation of TAC rules, with constraints on year-to-year variations in TAC that applies **only at SSB > trigger biomass**. Results are shown for a range of target TACs and Trigger SSBs, for annual TACdecisions (left) and tri-annual TAC decisions (right), and for maximum percentage change in TAC as indicated.

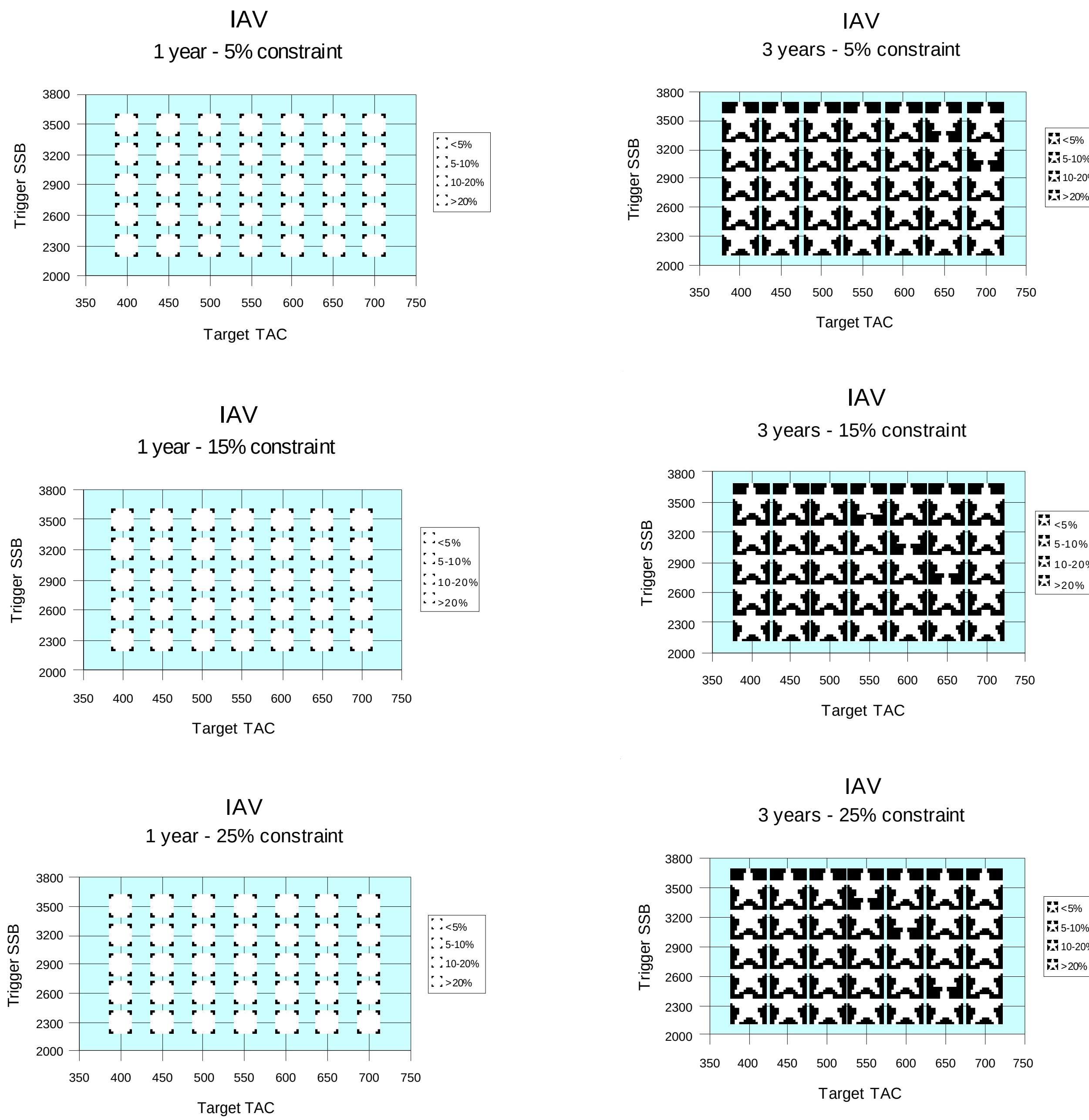


Figure 17. TAC-rule: Inter-annual variation in TAC (IAV): 'Only'-option

Results (average over the years 10-20 and over 1000 iterations) of simulation of TAC rules, with constraints on year-to-year variations in TAC that applies **only at SSB > trigger biomass**. Results are shown for a range of target TACs and Trigger SSBs, for annual TACdecisions (left) and tri-annual TAC decisions (right), and for maximum percentage change in TAC as indicated. Note that the average inter-annual variation is lower with a tri-annual rule because the TAC remains unchanged in 2 out of 3 years.

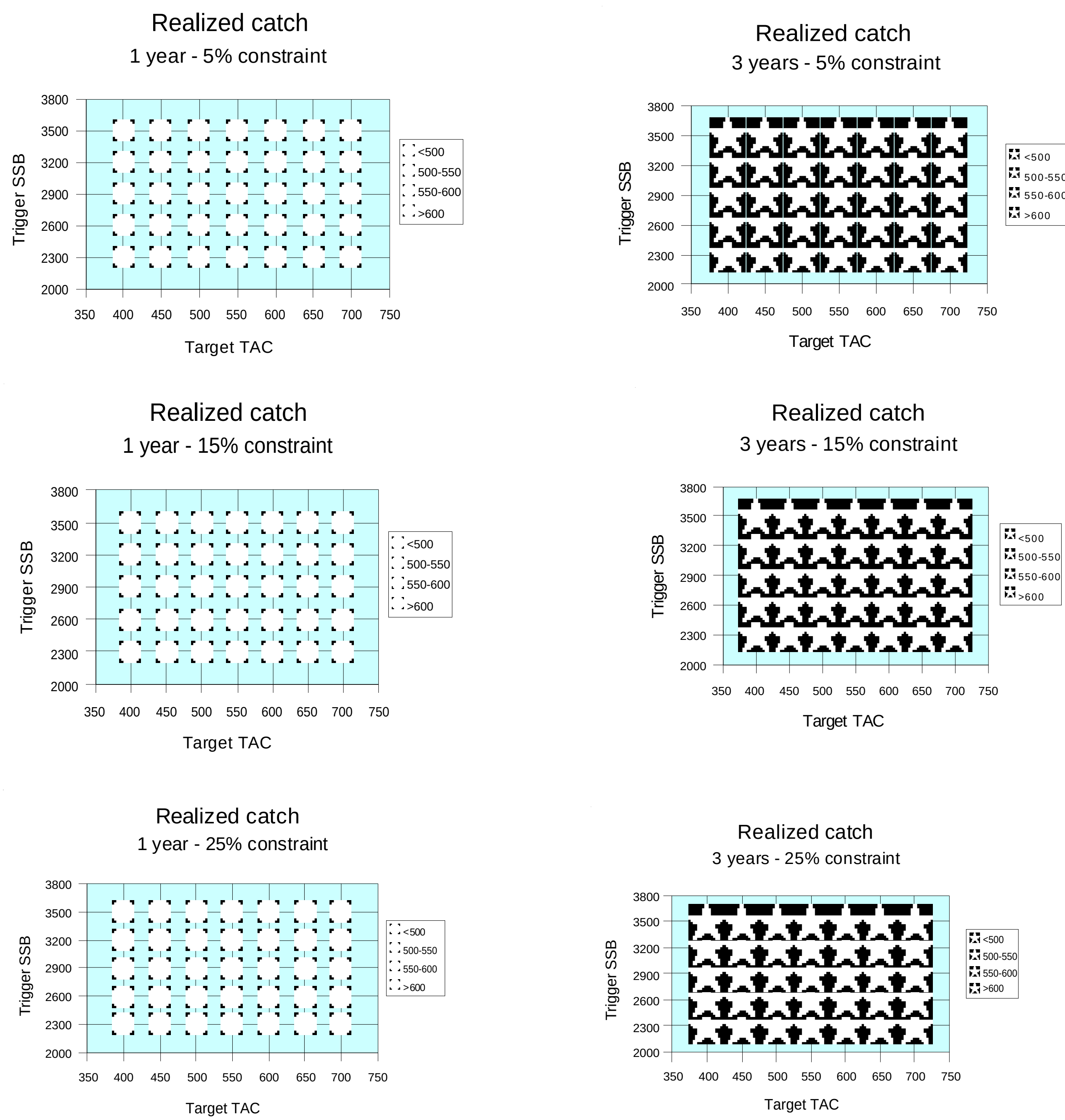


Figure 18. TAC-rule: Realized catch: 'Always'-option.

Results (average over the years 10-20 and over 1000 iterations) of simulation of TAC rules, with constraints on year-to-year variations in TAC that applies **at all levels of SSB**. Results are shown for a range of target TACs and Trigger SSBs, for annual TACdecisions (left) and tri-annual TAC decisions (right), and for maximum percentage change in TAC as indicated.

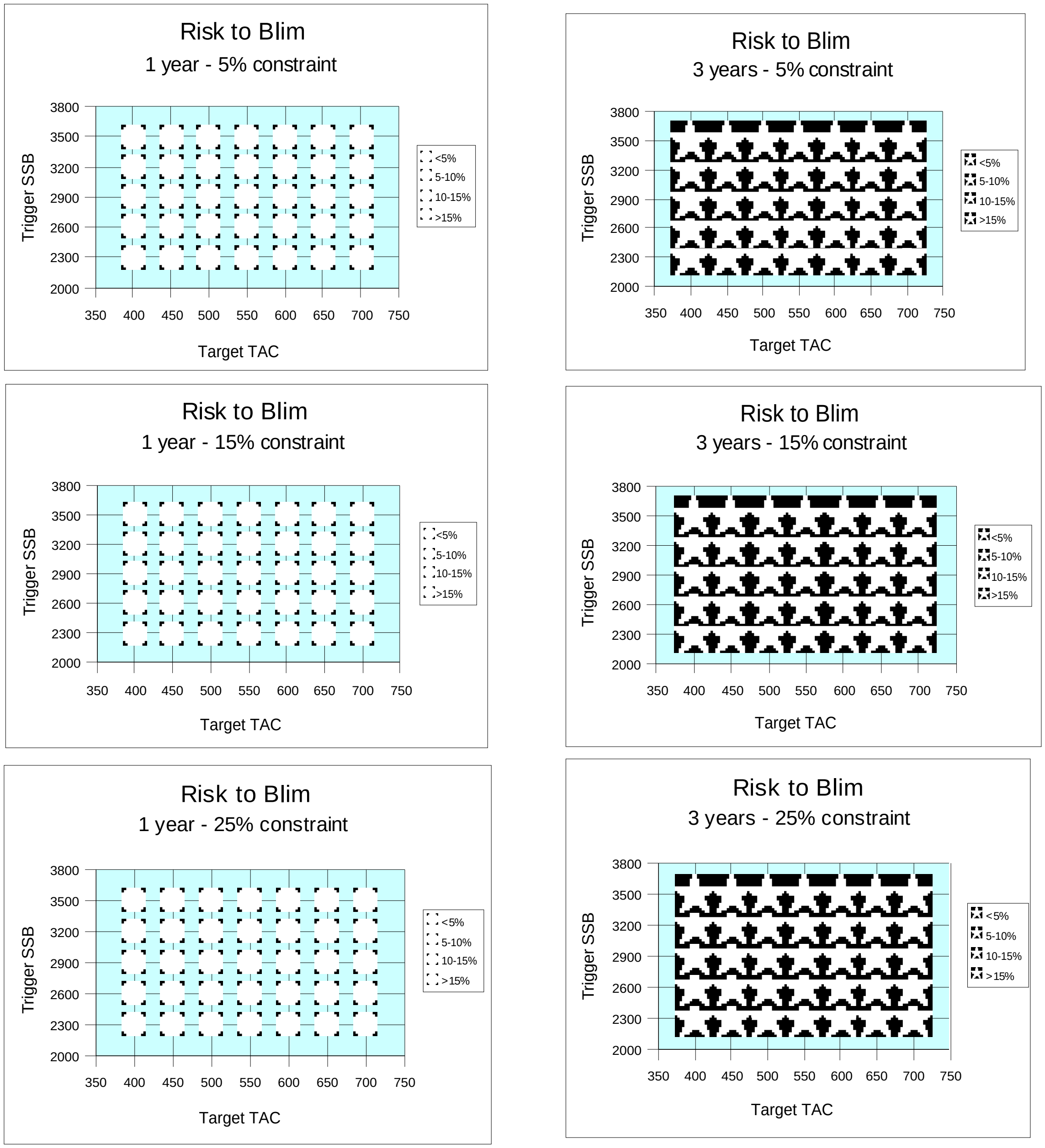


Figure 19. TAC-rule: Risk to Bpa: 'Always'-option.

Results (average over the years 10-20 and over 1000 iterations) of simulation of TAC rules, with constraints on year-to-year variations in TAC that applies **at all levels of SSB**. Results are shown for a range of target TACs and Trigger SSBs, for annual TACdecisions (left) and tri-annual TAC decisions (right), and for maximum percentage change in TAC as indicated.

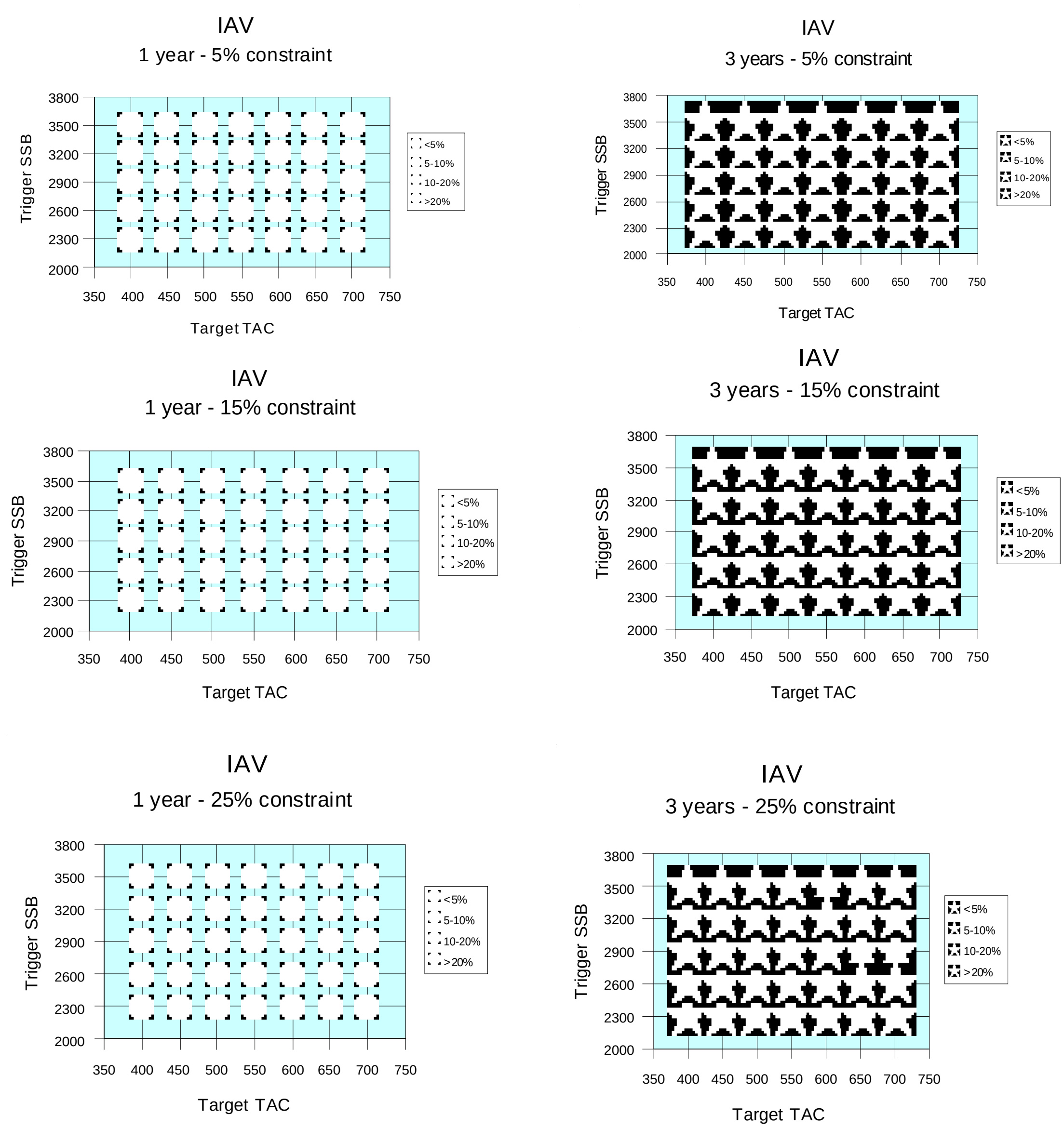


Figure 20. TAC-rule: Inter-annual variation in TAC (IAV): 'Always'-option.

Results (average over the years 10-20 and over 1000 iterations) of simulation of TAC rules, with constraints on year-to-year variations in TAC that applies **at all levels of SSB**. Results are shown for a range of target TACs and Trigger SSBs, for annual TACdecisions (left) and tri-annual TAC decisions (right), and for maximum percentage change in TAC as indicated. Note that the average inter-annual variation is lower with a tri-annual rule because the TAC remains unchanged in 2 out of 3 years.

The tradeoff between catch and variability was further illustrated for the selection of runs which lead to a risk in the range 10% - 15%. Figure 21 shows these results.

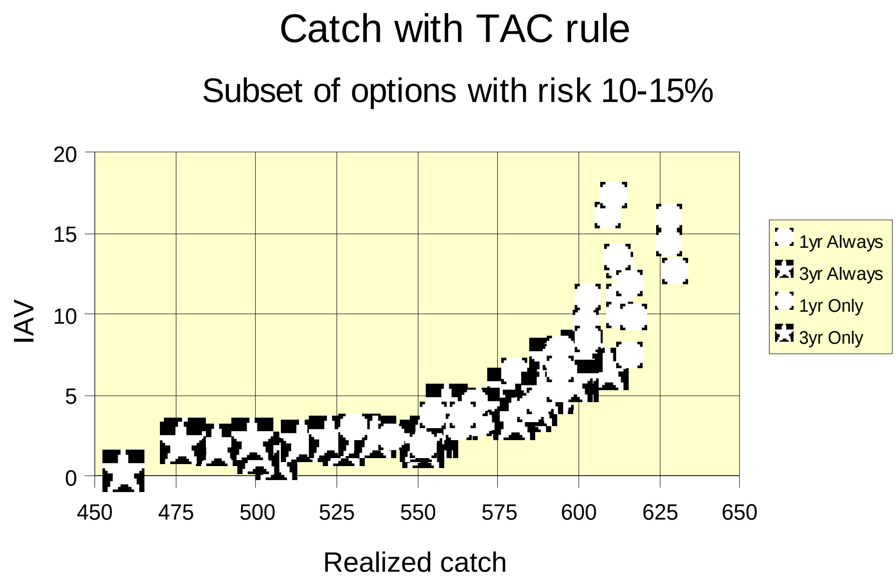


Figure 21. The trade-off between catch and stability in a TAC-rule. The points represent outcome of scenarios for various combinations of trigger SSB and target TAC, having in common that they imply a risk between 10 and 15 %. The types of symbols indicate the the 'Only' - 'Always' options and the time duration of the TAC - decisions.

The impact of the 'Only' and 'Always' options and of the 1 or 3 years decision periods, and of the level of constraint, is further shown in Figures 22 and 23.

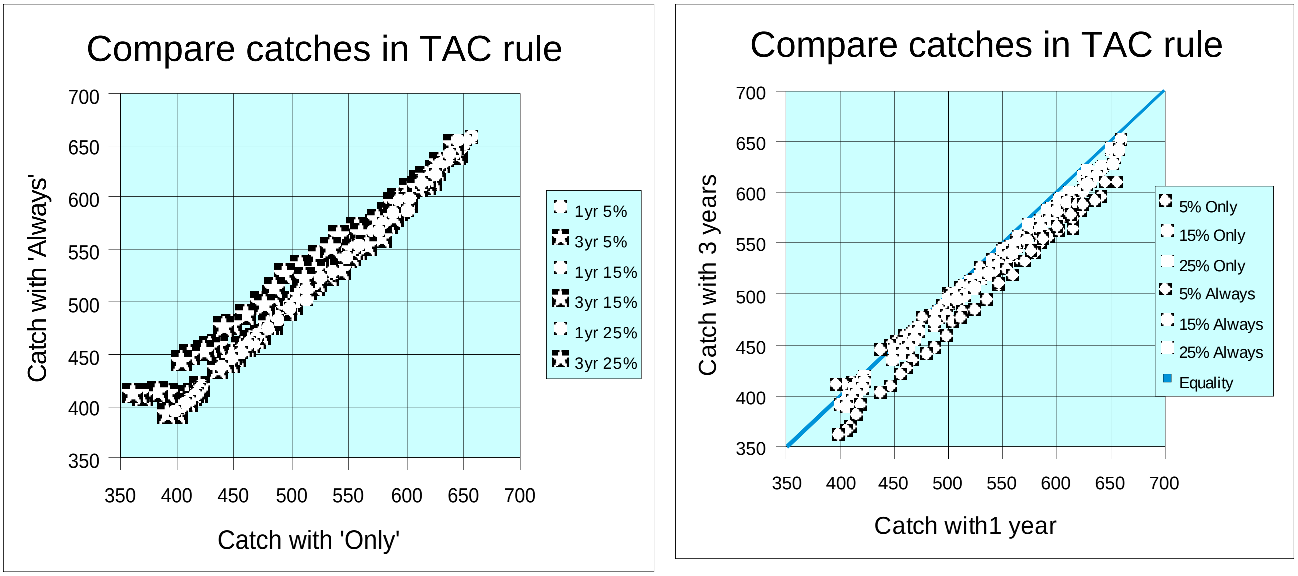


Figure 22. TAC rule. Comparison of 'Only' and 'Always' options, and Annual and tri-annual TAC decisions, with respect to average catch.

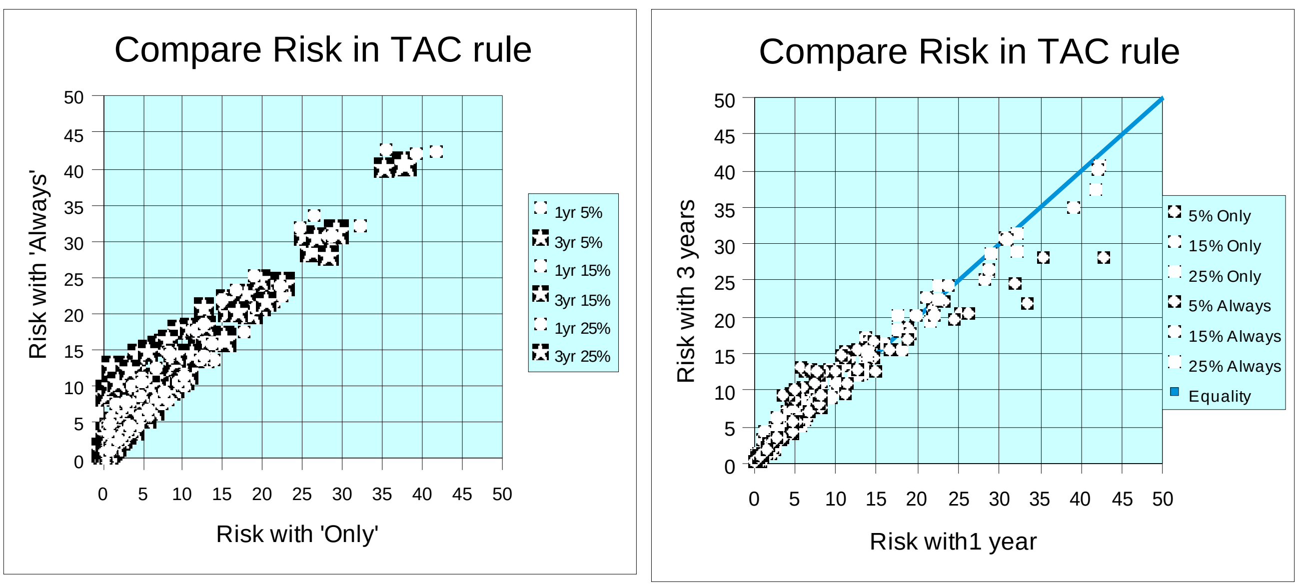


Figure 23. TAC rule. Comparison of 'Only' and 'Always' options, and Annual and tri-annual TAC decisions, with respect to risk to Bpa.

Summary of findings with TAC regimes.

The average catch in the long term increases with increasing target TAC, and decreases with increasing trigger biomass. The risk to Bpa increases with increasing target TAC and decreases with increasing trigger biomass. The variability, expressed as IAV, increases with increasing target TAC and with increasing trigger biomass. The level of constraint on TAC variation matters little for the average catch and for the risk, but the IAV increases with a weaker constraint. At the risk level that may be acceptable (<15%), catches up to about 600 000 tonnes can be achieved with low inter-annual variability. Attempting to get higher average catches with an acceptable risk requires much higher inter-annual variability.

The difference between the option to constrain the catches at all levels of SSB or only at SSB above the trigger biomass is small except when the constraint is very strong. Likewise, the difference between annual and tri-annual advise is small except with a very strong constraint, although the risk is generally somewhat higher with a tri-annual regime. With a strong constraint, both catches and risk are higher with the 'Always' option.

Absolute values of caches and associated risks would be sensitive to the assumed level of recruitment. Since the real recruitment is uncertain due to underreporting of the catches in the past. The impact of other recruitments and of other implementation errors has not been explored.

Simulations with a fixed Harvest Rate (HR) rule.

This is another rule where the TAC is set as a function of the SSB and the TAC in the year before the TAC year. Basically, the TAC is set as a fraction (the HR) of the observed SSB. The rule has 3 parameters, HRtarget, Btrig and Cconstraint. It has the following form, where SSB always is the estimated SSB in the year before the TAC year:

*If SSB > Btrig, TAC = HRtarget*SSB*

*If SSB < Btrig, TAC = HRtarget*SSB*SSB/Btrig*

If

abs{(TAC(y-1)-TAC(y))/TAC(y-1)} > Cconstraint

and (optionally) SSB > Btrig

then

TAC(y)= TAC(y-1)(1+Cconstraint)* *if TAC(y)>TAC(y-1)*

TAC(y)= TAC(y-1)(1-Cconstraint)* *i f TAC(y)<TAC(y-1)*

The rule was applied either each year or every three years. In the latter case, the same TAC was applied unchanged for the whole three-year period. The rule was tested with the option to apply the TAC constraint only at SSB > Btrig ('Only' - option) and when applying the constraint at all levels of SSB ('Always' - option).

Examination of the performance was done with the HCM software, with conditioning as described for the testing of the F-rule proposed by EU. Performance parameters mean catch, mean IAV (inter-annual variation of the TACs) and mean Risk to Blim were explored by scanning over the rule parameters:

- HRtarget: 0.10 - 0.30 in steps of 0.02
- Btrig: 2300, 2600, 2900, 3200, 3500 thousand tonnes
- Cconstraint: 5, 15, 25%

The results are shown graphically in Figures 24-29.

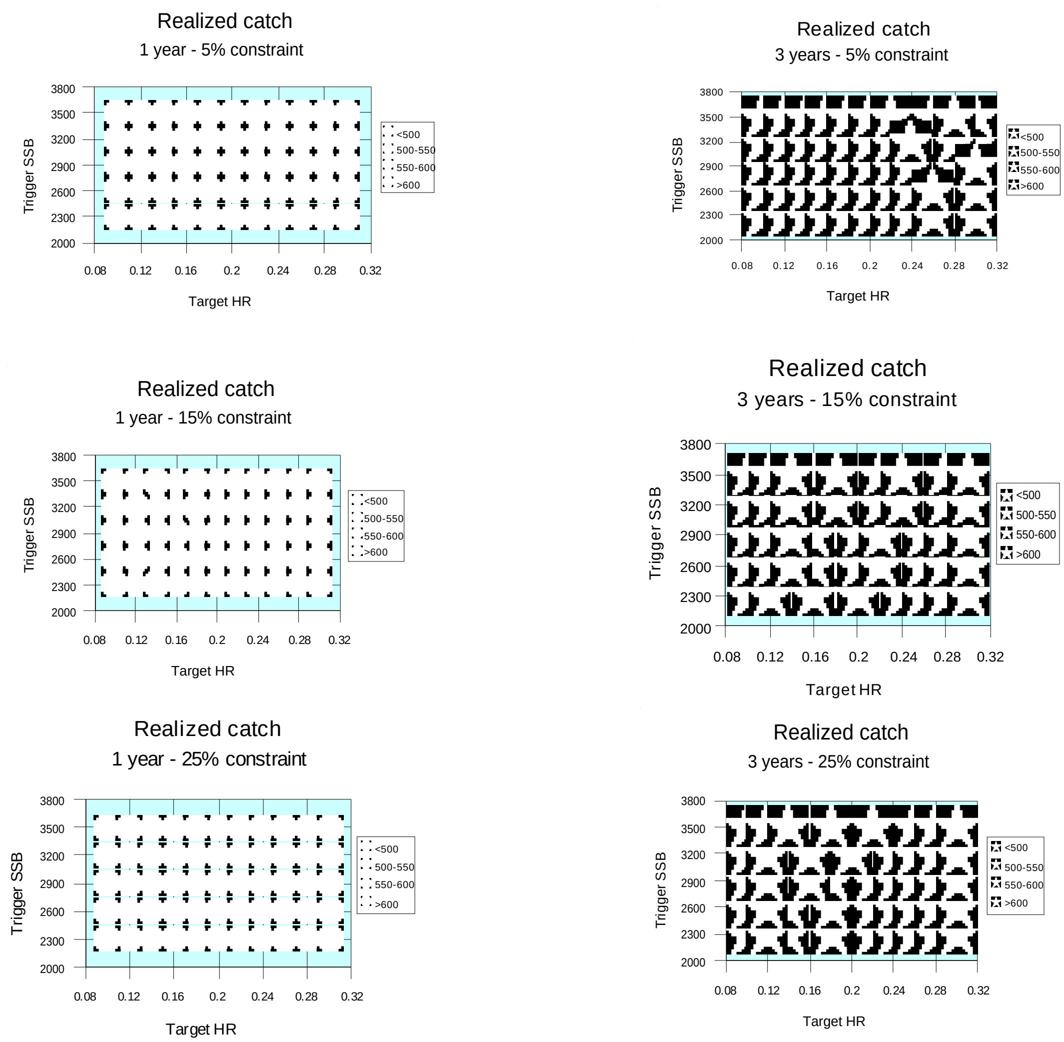


Figure 24. HR-rule: Realized catch with the 'Only'- option.

Results (average over the years 10-20 and over 1000 iterations) of simulation of HR rules, with constraints on year-to-year variations in TAC that applies **only at SSB > trigger biomass**. Results are shown for a range of target HRs and Trigger SSBs, for annual TAC decisions (left) and tri-annual TAC decisions (rig ***HR-rule:*** ht), and for maximum percentage change in TAC as indicated.

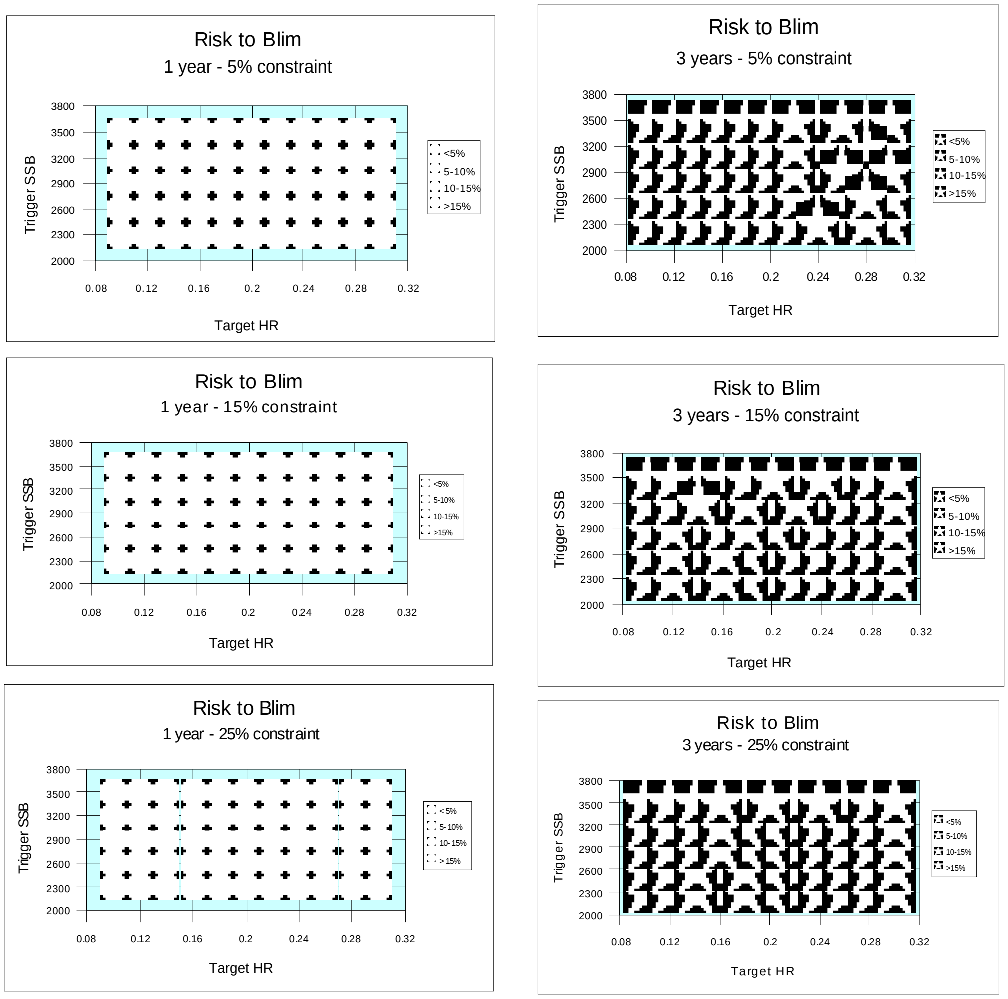


Figure 25. HR-rule: Risk to Bpa with the 'Only'- option

Results (average over the years 10-20 and over 1000 iterations) of simulation of HR rules, with constraints on year-to-year variations in TAC that applies **only at SSB > trigger biomass**. Results are shown for a range of target HRs and Trigger SSBs, for annual TACdecisions (left) and tri-annual TAC decisions (right), and for maximum percentage change in TAC as indicated.

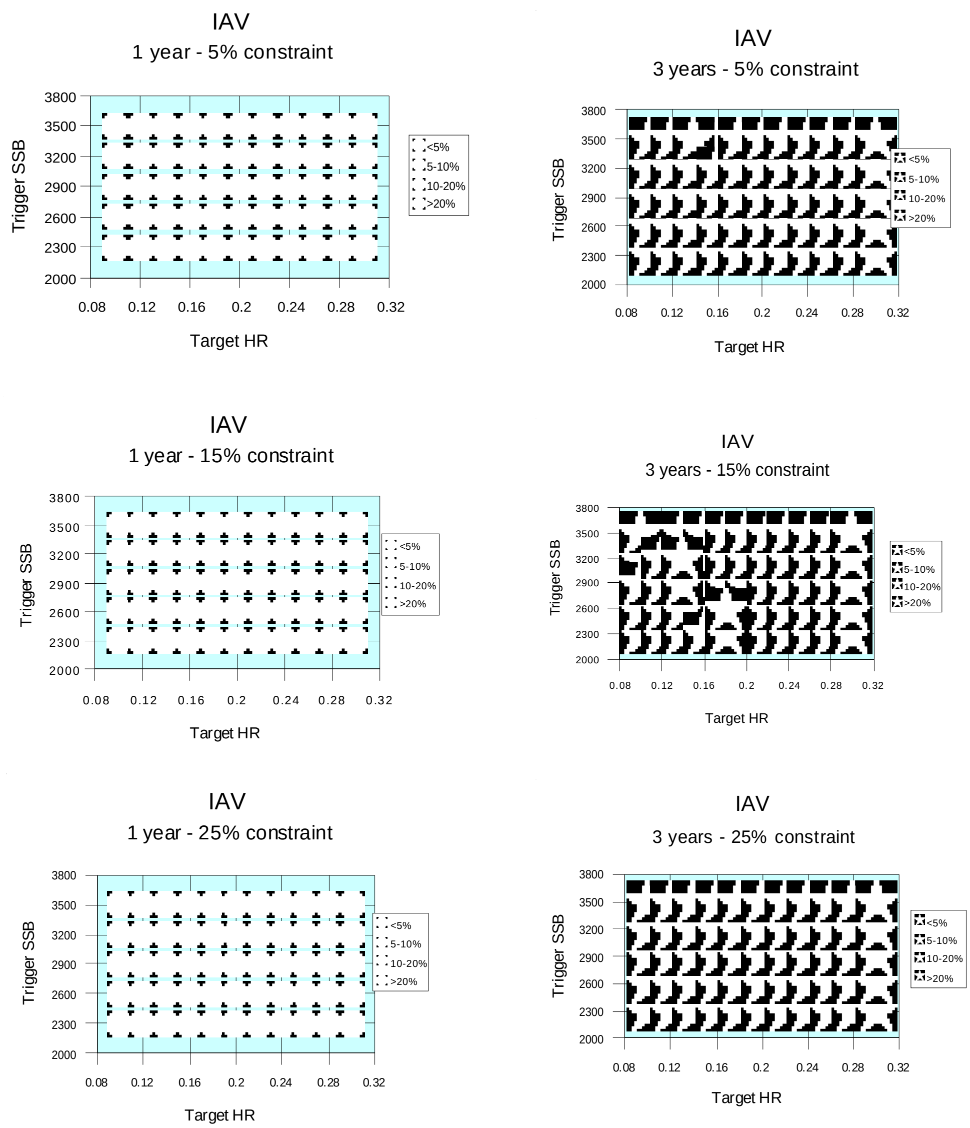


Figure 26. HR-rule: Inter-annual variation (IAV) in TAC with the 'Only'- option

Results (average over the years 10-20 and over 1000 iterations) of simulation of HR rules, with constraints on year-to-year variations in TAC that applies **only at SSB > trigger biomass**. Results are shown for a range of target HRs and Trigger SSBs, for annual TACdecisions (left) and tri-annual TAC decisions (right), and for maximum percentage change in TAC as indicated. Note that the average inter-annual variation is lower with a tri-annual rule because the TAC remains unchanged in 2 out of 3 years.

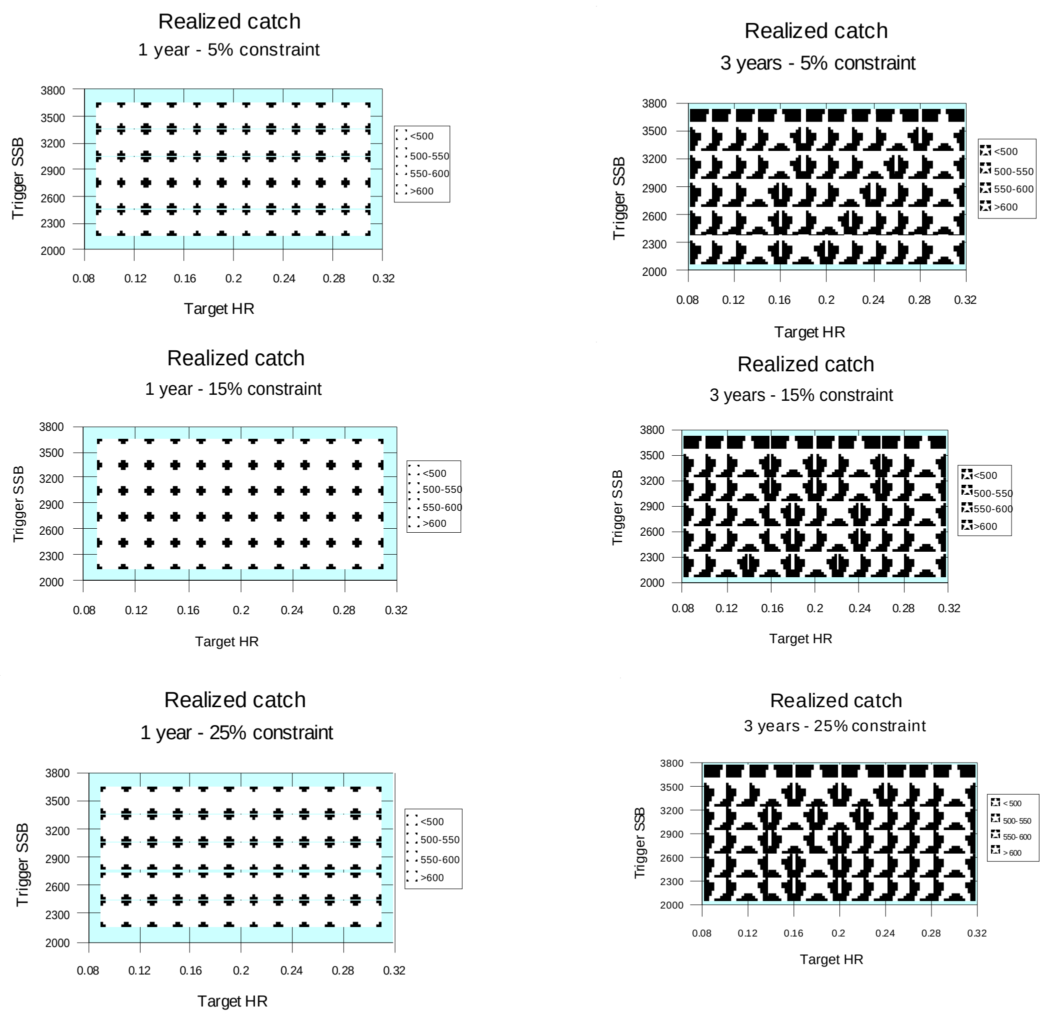


Figure 27. HR-rule: Realized catch with the 'Always'- option.

Results (average over the years 10-20 and over 1000 iterations) of simulation of HR rules, with constraints on year-to-year variations in TAC that applies **at all levels of SSB**. Results are shown for a range of target HRs and Trigger SSBs, for annual TACdecisions (left) and tri-annual TAC decisions (right), and for maximum percentage change in TAC as indicated.

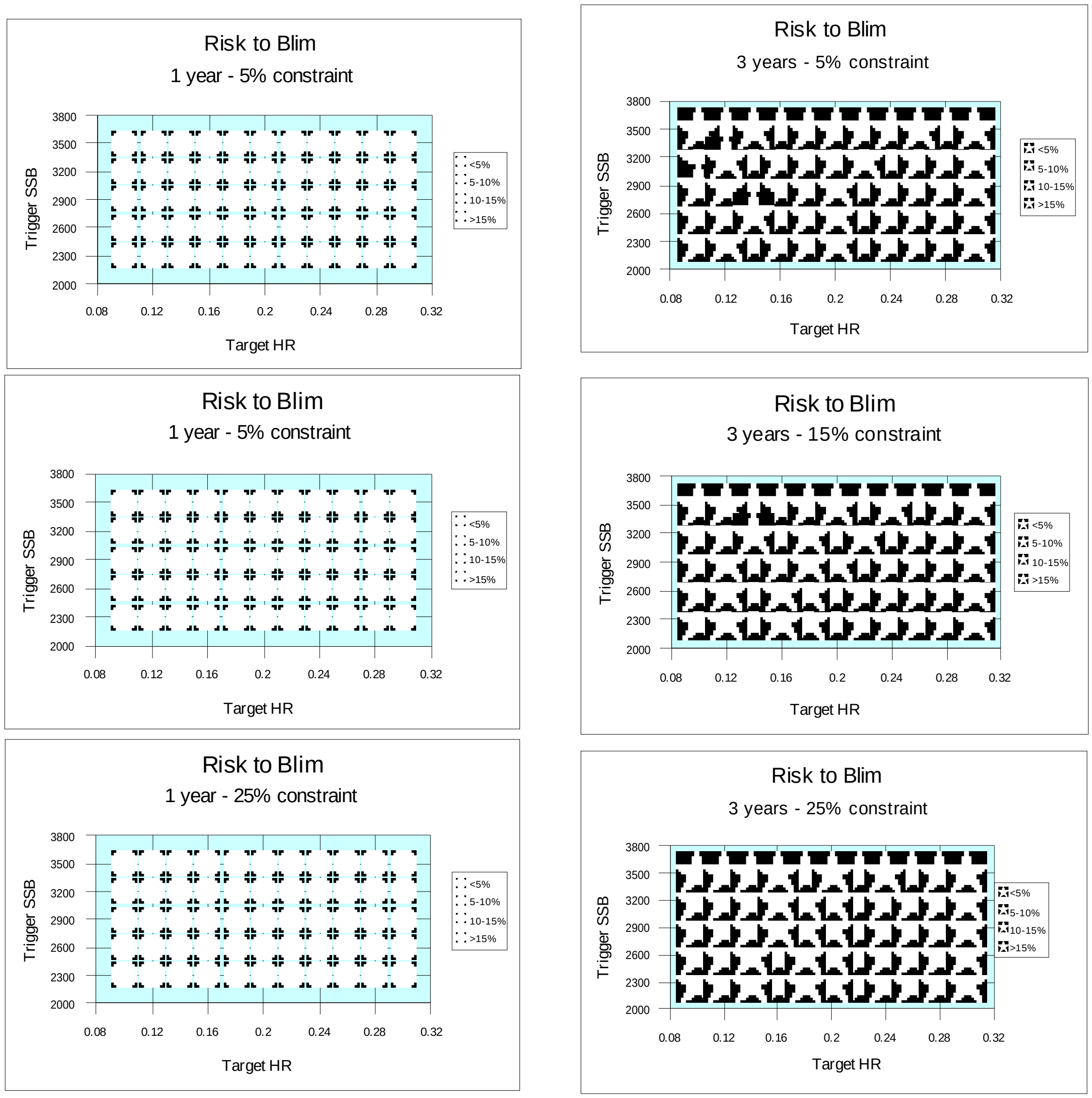


Figure 28. HR-rule: Risk to Bpa with the 'Always'- option.

Results (average over the years 10-20 and over 1000 iterations) of simulation of HR rules, with constraints on year-to-year variations in TAC that applies **at all levels of SSB**. Results are shown for a range of target HRs and Trigger SSBs, for annual TACdecisions (left) and tri-annual TAC decisions (right), and for maximum percentage change in TAC as indicated.

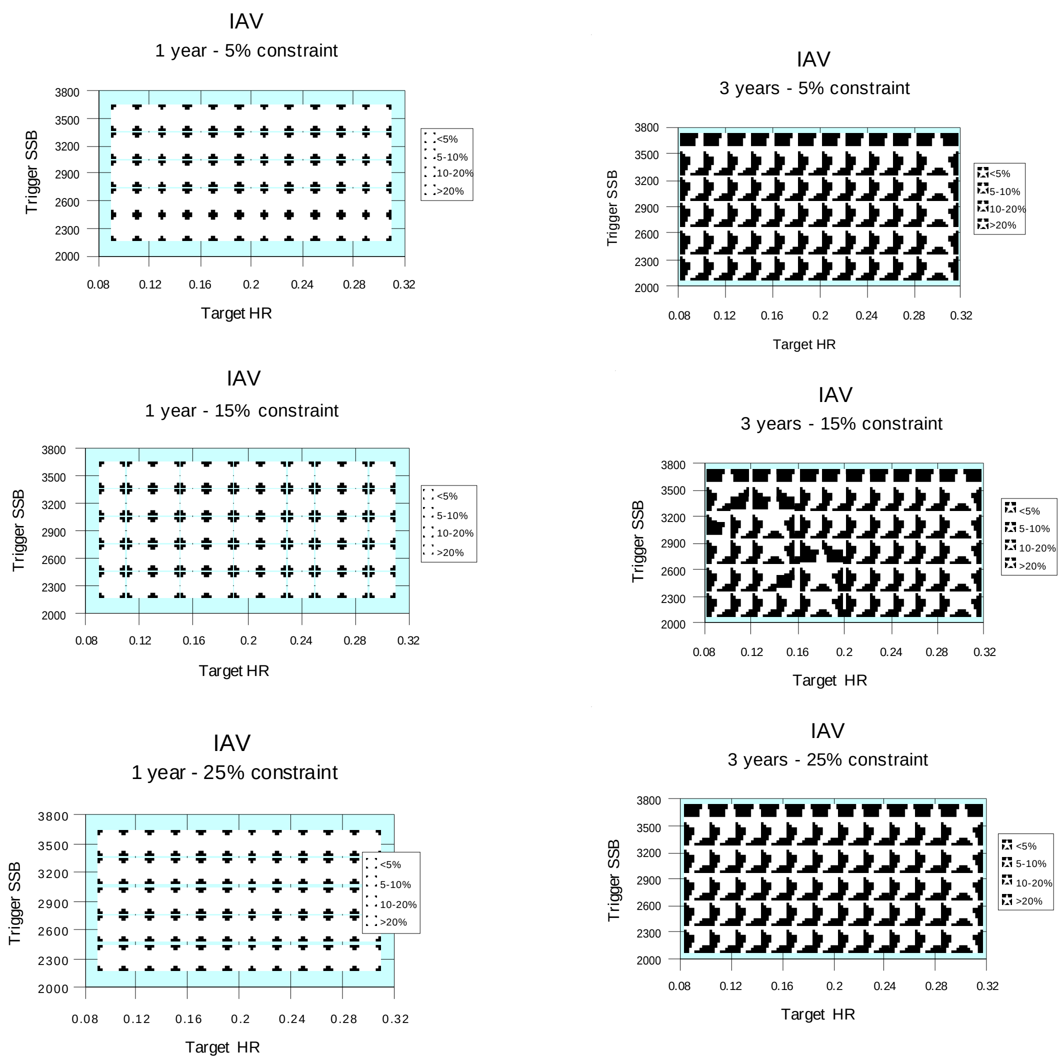


Figure 29. HR-rule: Inter-annual variation (IAV) in TAC with the 'Always'- option.

Results (average over the years 10-20 and over 1000 iterations) of simulation of HR rules, with constraints on year-to-year variations in TAC that applies **at all levels of SSB**. Results are shown for a range of target HRs and Trigger SSBs, for annual TAC decisions (left) and tri-annual TAC decisions (right), and for maximum percentage change in TAC as indicated. Note that the average inter-annual variation is lower with a tri-annual rule because the TAC remains unchanged in 2 out of 3 years.

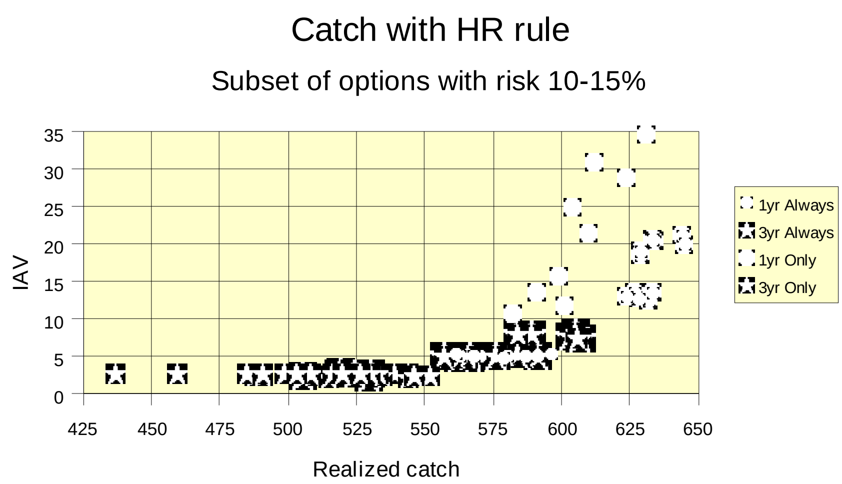


Figure 30. **The trade-off between catch and stability in a HR-rule. The points represent outcome of scenarios for various combinations of trigger SSB and target HR, having in common that they imply a risk between 10 and 15 %. The types of symbols indicate the level of the constraint and the interval between TAC change.**

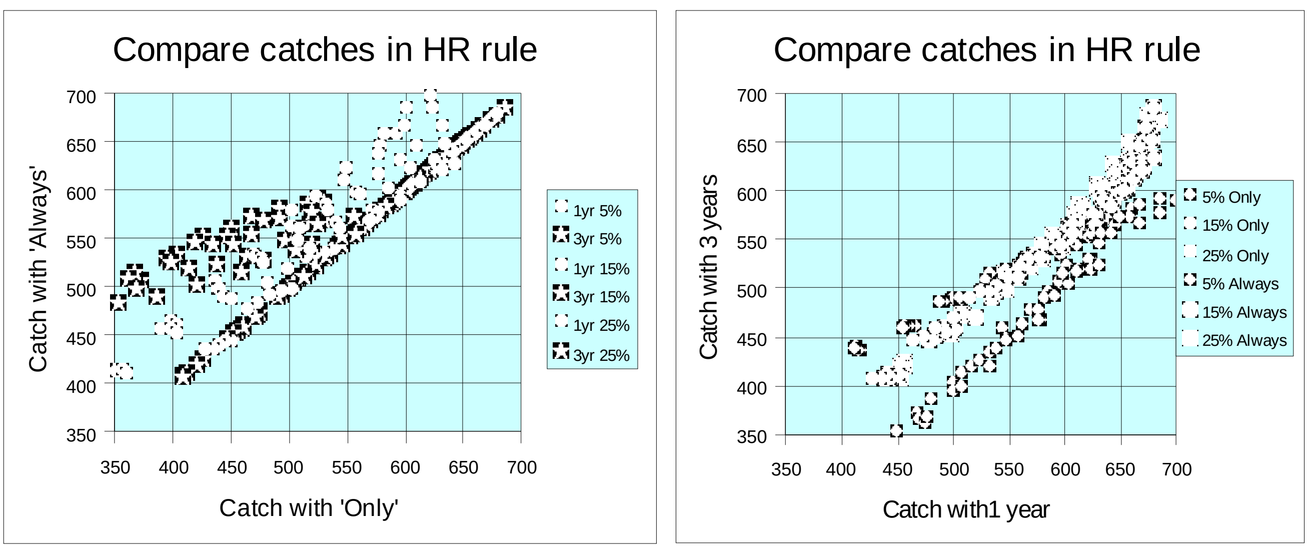
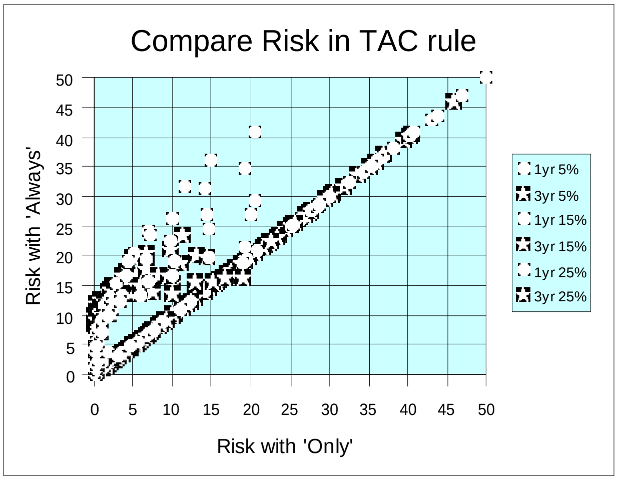


Figure 31. TAC rule. Comparison of 'Only' and 'Always' options, and Annual and tri-annual TAC decisions, with respect to average catch.



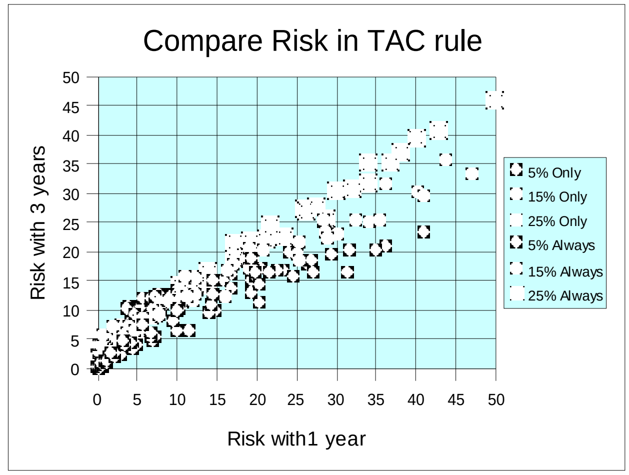


Figure 32. TAC rule. Comparison of 'Only' and 'Always' options, and Annual and tri-annual TAC decisions, with respect to risk to Bpa.

Summary of findings for HR rules.

With the HR rule, the average long term catch, the risk and the variability will all increase with increasing target TAC. The impact of the trigger biomass is small on risk and catch, but the variability increases with increasing trigger biomass, in particular with a weak constraint on TAC change. A strong constraint on TAC variation leads to smaller catches.

The difference between the option to constrain the catches at all levels of SSB or only at SSB above the trigger biomass is small except when the constraint is very strong. Likewise, the difference between annual and tri-annual advice is small except with a very strong constraint. With a strong constraint, both catches and risk are higher with the 'Always' option, and the catch is higher with a one-year rule than with a 3-year rule, in particular if the constraint only applies above the trigger.

Annex 4

NEA Mackerel Management Plan

FPRESS Simulations

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Galway,

Ireland

1 Model Conditioning

1.1 Simulation Setup and Initialisation

The start date for the simulations is Jan 1st 1997. The simulation period is 21 years (i.e. up to and including 2027). 1000 iterations are run and statistics calculated for the simulation time period 2017-2027.

The initial population vector is taken from the short term prediction input table in the WGMHSA report for 2007. For ages 2 and above these figures are derived from the final ICA assessment. For ages 0 and 1 values are derived from the geometric mean of the recruitment time series up to 2003 (for age 0) and the geometric mean brought forward 1 year by the total mortality at age 0 (age 1). Stock and catch weights, maturities, natural mortality and proportions of mortality prior to spawning are also as per the ICA assessment. The initial F at age vector for the model is also taken from the ICA assessment output. The actual values used are given in the table below. For those vectors not listed: natural mortality = 0.15 and the proportions of natural and fishing mortality prior to spawning = 0.4.

Table 1.1: Simulation Initialisation Vectors (1/1/07)

Age	Stock Size	Stock Wgt	Catch Wgt	Maturity	F
0	3,694,105	0.0	0.042	0.0	0.00655
1	3,158,819	0.076	0.099	0.07	0.02449
2	1,349,000	0.178	0.196	0.57	0.05936
3	1,984,600	0.228	0.307	0.89	0.11436
4	1,121,300	0.297	0.357	0.98	0.17440
5	2,677,000	0.345	0.428	0.98	0.22728
6	976,500	0.391	0.480	0.99	0.27410
7	179,600	0.436	0.494	1.00	0.30226
8	204,100	0.458	0.543	1.00	0.31381
9	94,200	0.517	0.584	1.00	0.33612
10	52,500	0.523	0.625	1.00	0.35309
11	36,100	0.578	0.635	1.00	0.34091
12	44,100	0.614	0.690	1.00	0.34091

1.2 The Implementation Model

From a study of the historical weight at age datasets it was noted that neither year nor cohort effects are particularly apparent. It was decided that the variation in catch weights should be included in the simulation as noise in the implementation model. The CVs associated with the weight at age data are

Age	CV (%)
0	17
1	9
2	7
3-12	4

From an analysis of the ICA time series (1980-2006) of the catch weights and numbers at age, the average proportion of each age group in the total catch by weight can be calculated. Using these results to weight the CVs above, a CV of 4.3\ % across all age groups results.

To translate this CV to noise on the TAC (an implementation error), 1000 draws of the average weight at age vector using a CV of 4.3% and assuming a normal distribution were made. The average catch numbers at age over the 1980-2006 period were used to derive an overall yield for each catch weight draw. The resultant CV on the yields is approximately 1.8%, which is subsequently used when drawing a normally distributed implementation error during the simulation.

The base case for TAC bias is considered to be 5\ % (from a historical analysis of the reported vs forecasted catches). Additional values of 0\ %, 15\ % and 25\ % were also tested.

1.3 The Observation (assessment) Model

The error in the observation (assessment) model is assumed to exhibit autocorrelation. In order to simplify matters, the error term has been generated in advance of the simulation which randomly selects from the generated error time series for each iteration.

The error term in year y (ζ_y) has been assumed to be of the form:

$$\zeta_Y = \rho_{ser}\zeta_{y-1} + \sqrt{1-\rho_{ser}^2}\,\xi_y \qquad (1)$$

where

$$\xi_y = N(0;1) \qquad (2)$$

ϱ_{ser} is the serial correlation parameter. Using an initial value for ζ of 0.67 and ϱ_{ser} =0.75, a series of 20000 values were generated. The first 10000 were discarded and from an analysis of the remainder the autocorrelation coefficients are:

Coefficient	Val
ϱ_1	0.75
ϱ_2	0.56
ϱ_3	0.43
ϱ_4	0.33
ϱ_5	0.25
ϱ_6	0.19

Autocorrelation coefficients for observation error

At the start of each model iteration a random continuous block of length y is selected (y = number of years in the simulation) from the available 10000. The observation model is then implemented thus

$$SSB.obs[y] = SSB.true[y] * err[y] \qquad (3)$$

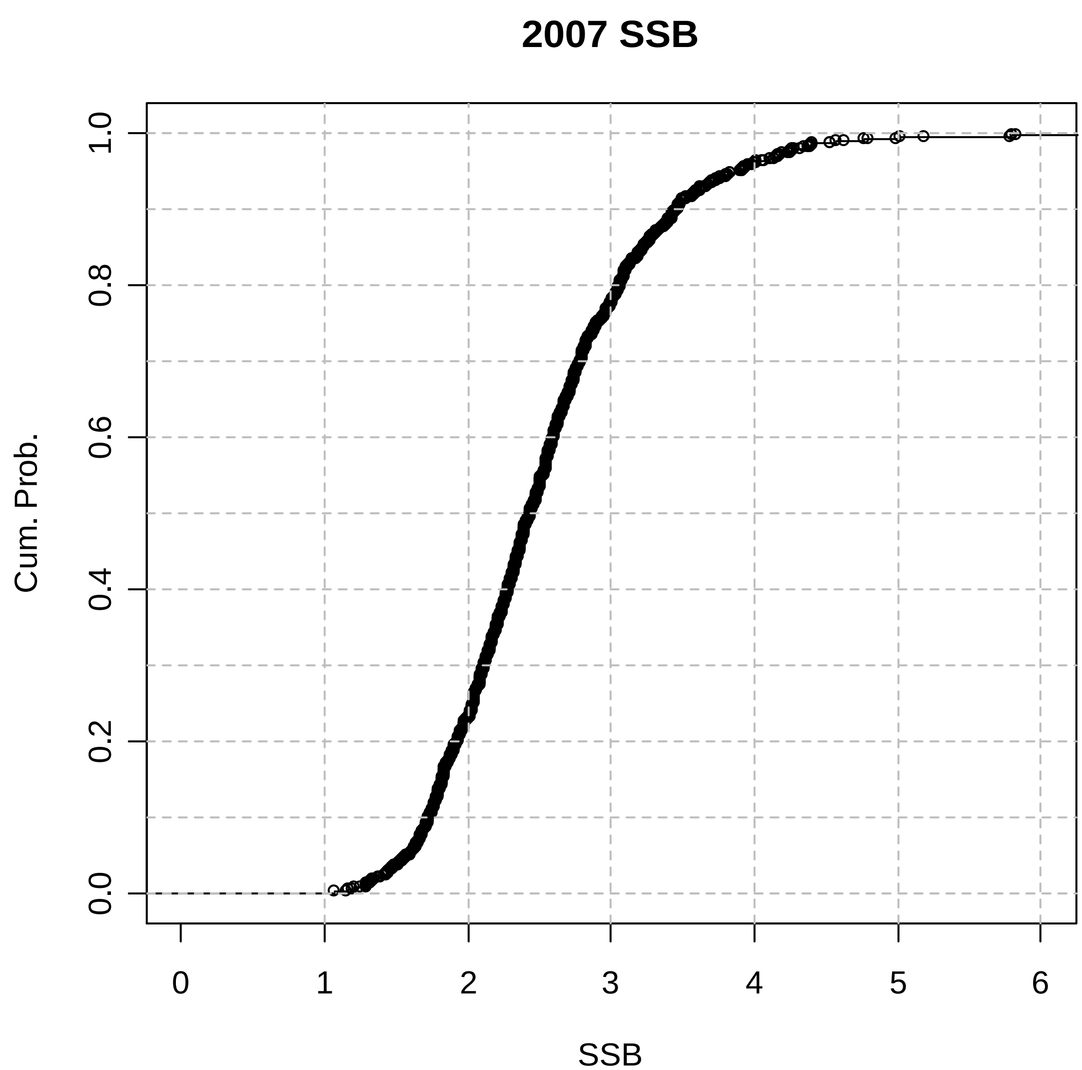
where

$$err[y] = e^{cv*\zeta_y} \qquad (4)$$

with cv = 0.29

1.3.1 Initial SSB

In order that the simulated 2007 SSB has an associated CV of 29%, a log-normally distributed error with an age-dependent CV (derived from ICA) is applied. A noisy year error (again log-normal) is then applied (equally over all ages) with a CV of 52% to give a resultant SSB distribution in 2007 which has a CV of 29%). The figure below shows the distribution of SSBs.



The 10th, 50th and 90th percentiles for initial SSB are 1.74Mt, 2.38Mt and 3.38Mt respectively.

1.4 Selection

The F-PRESS model incorporates selection in the fishing mortality vector. An initial vector is supplied (as described above) and this vector scaled in order that the resultant yield matches the TAC currently in operation. The ICA assessment output, from which the initial fishing mortality is derived is itself derived from the fishing mortality in the terminal year and the selection at age vector. Combining the errors for these two quantities gives the following CVs which area used to draw a stochastic fishing mortality at age for each year of the simulation.

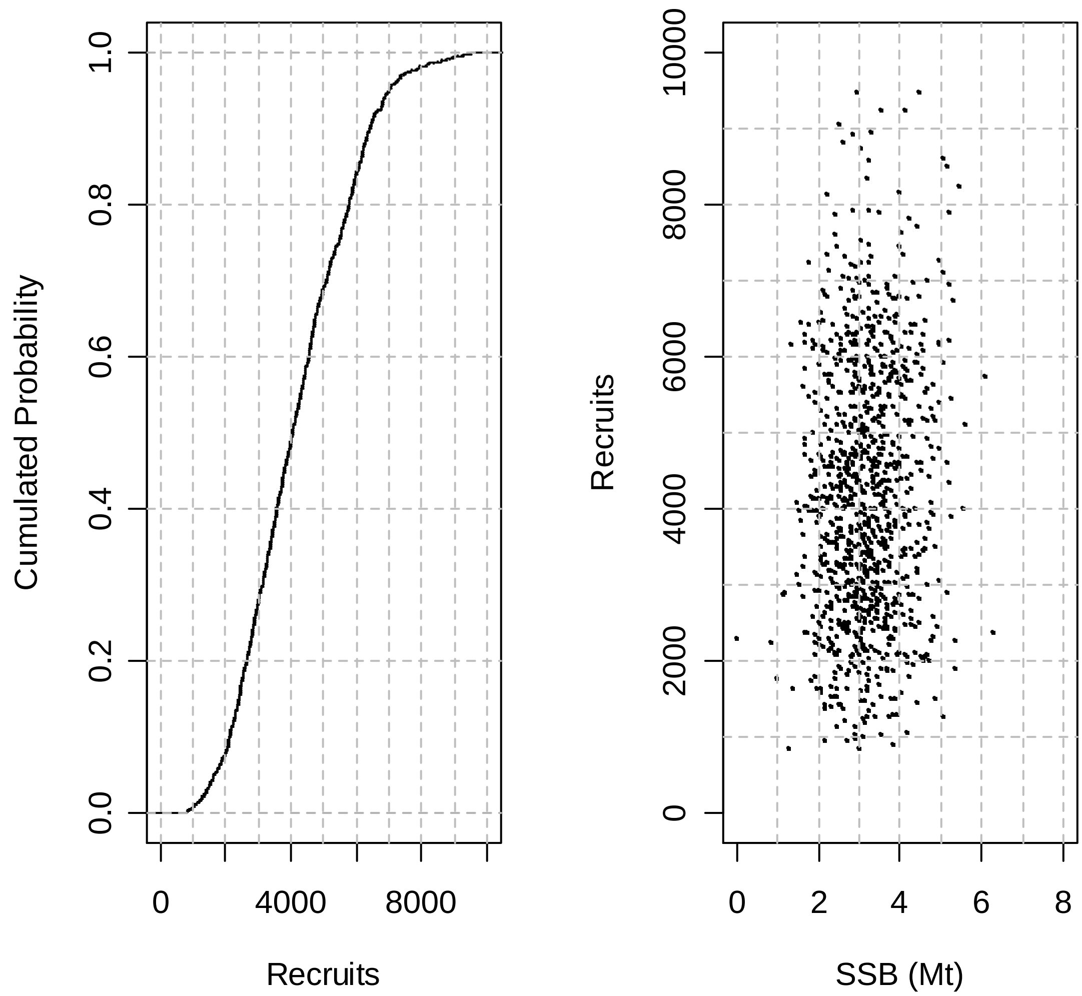
Table 1.2: Fishing Mortality CVs

Age	Selection CV	ICA F_{2007} CV	F-PRESS F CV
0	0.61	0.10	0.61
1	0.20	0.10	0.22
2	0.08	0.10	0.13
3	0.08	0.10	0.13
4	0.08	0.10	0.13
5	0.00	0.10	0.10
6	0.08	0.10	0.13
7	0.07	0.10	0.12
8	0.07	0.10	0.12
9	0.07	0.10	0.12
10	0.07	0.10	0.12
11	0.07	0.10	0.12
12	0.00	0.10	0.10

1.5 Recruitment

Recruitment has been implemented as per the hybrid model (described in annex 6), using the 1000 models provided.

The figure below show the cumulative distribution of recruits and stock-recruit pairs for a typical simulation.



1.6 The Harvest Control Rule

The harvest control rule implements a target TAC strategy. When SSB is above a trigger point (SSB_{trig}) the TAC is set to the target value (TAC_{tgt}). Below the trigger point the TAC is reduced in accordance with:

$$TAC = TAC_{tgt}\left(1-\alpha\left[\frac{\left(SSB_{trig}-SSB\right)}{SSB_{trig}}\right]\right) \tag{5}$$

The α parameter in equation (5) determines the rate of reduction in the TAC when SSB is below the trigger point. For the results presented in this report α=1. Various values for TAC_{tgt} and SSB_{trig} are investigated.

Any changes in TAC as determined by the application of this HCR can be applied in order that the annual change in TAC does not exceed a predetermined limit. Two scenarios have been explored: a 15% restriction on inter-annual TAC changes and an unrestricted rule. In addition, the HCR can be applied for 1 or several years. Periods of 1 and 3 years between HCR decisions have been investigated.

For a 3-year rule with a 15% change restriction the restriction is upon the inter-annual change in TAC. Thus, although the management decisions are made every 3 years, changes in TAC of approximately 45% are possible over the 3-year management cycle.

1.7 Statistical Outputs

Upon completion of the simulation, the following summary statistics are calculated for the period 2017-2027.

Yield

- Mean Yield
- 10th, 50th, 90th percentiles
- Mean Interannual TAC Variability, defined as

$$IAV = \frac{\sum_{y=2017}^{2027} \left| \frac{TAC_y - TAC_{y-1}}{TAC_{y-1}} \right|}{11{,}000} \qquad (6)$$

Fishing Mortality

- Mean F
- 10th, 50th, 90th percentiles

SSB

- Mean SSB
- Mean Terminal SSB
- Ratio of terminal to starting SSB i.e.

$$\frac{SSB_{2027}}{SSB_{2017}} \qquad (7)$$

TAC Variation

- TAC changes (the average number of times the TAC differs from the previous year)
- TAC increases (the average number of times the TAC is greater than that for the previous year)
- TAC decreases (the average number of times the TAC is less than that for the previous year)
- Average TAC increase (the average increase for years where the TAC is increased)
- Average TAC decrease (the average decrease for years where the TAC is decreased)

Risk

- Risk to 2.3Mt
- Risk to 2.6Mt

Catch Proportion

- Proportion by weight of fish aged 4+
- Proportion by weight of fish aged 7+

Risk of Crash

- Count of iterations where SSB falls below 10\ % of Bpa at any time during the statistical period

1.8 Model Configurations

The table below describes the various combinations of model settings explored in this study.

Table 1.3: Model parameter ranges}

TAC (kt)	HCR_{per} (yr)	HCR_{chg} (%)	SSB_{trig} (Mt)	TAC Bias (%)	F Bias (%)
400-750 (step 50)	1,3	15,100	2.0-3.5 (step 0.1)	0,5,15,25	0,25 (ages 0-25)

This represents over 4000 simulations of the HCR under varying model conditioning. Additional simulations have been conducted with a TAC step of 10kt in parameter ranges consistent with optimal exploitation of the stock.

2. Results for the Fixed TAC strategy

2.1 Baseline Runs

There are 4 baseline runs. These runs all assume a 5% bias on the TAC and a zero bias on fishing mortality (in addition to the CV applied to the fishing mortality and TAC as described in 1.2 and 1.4). Each simulation covers the full range of Target TACs (400-750kt) and SSB trigger points (2.0-3.5Mt) and uses different settings for the HCR period and change restriction parameters as outlined in the table below:

Table 2.1: Baseline simulation HCR settings

Run	HCR Period	HCR Change Restriction
Baseline 1	3 years	15% per year
Baseline 2	1 year	15% per year
Baseline 3	3 years	Unrestricted
Baseline 4	1 year	Unrestricted

Results for each of these simulations are shown below

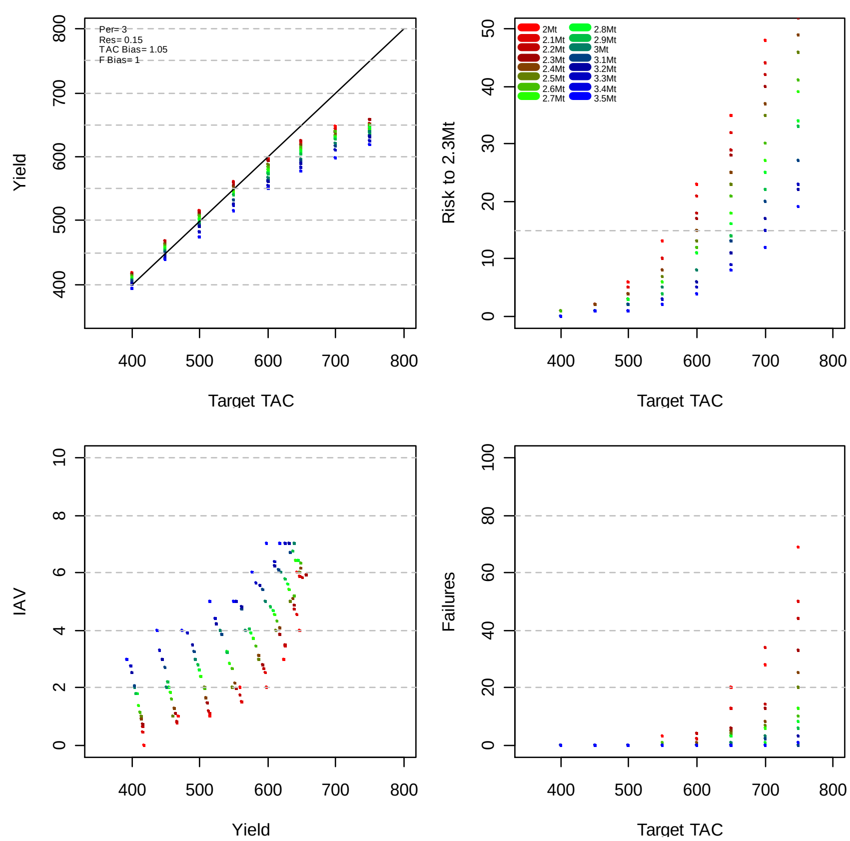


Figure 2.1 Baseline 1 Results. HCR Period 3 yrs; HCR Change Restriction 15%

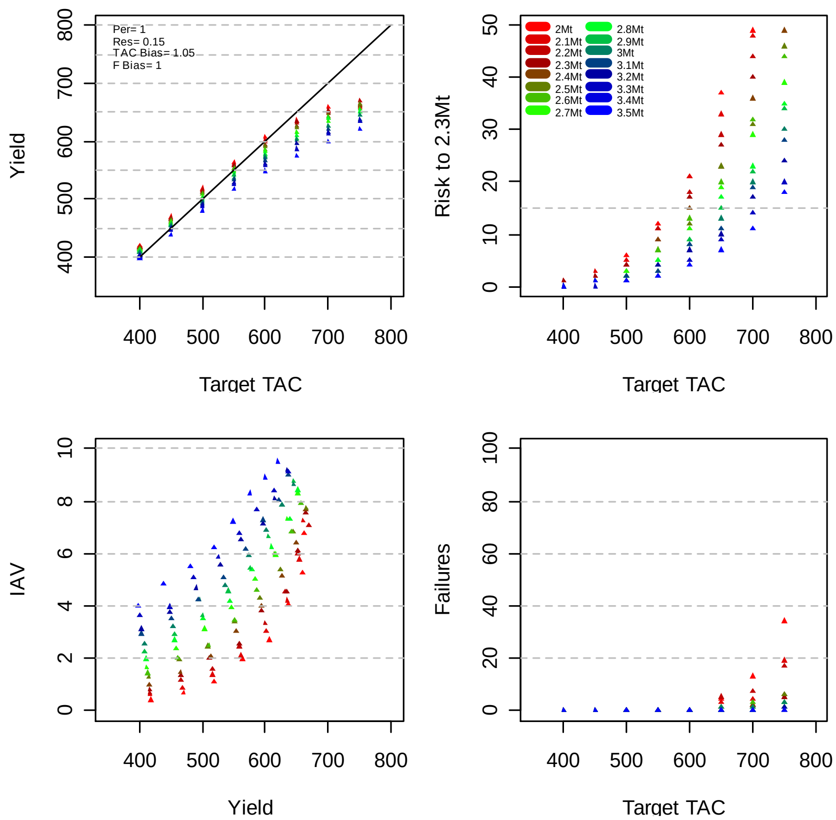


Figure 2.2 Baseline 2 Results. HCR Period 1 yr; HCR Change Restriction 15%

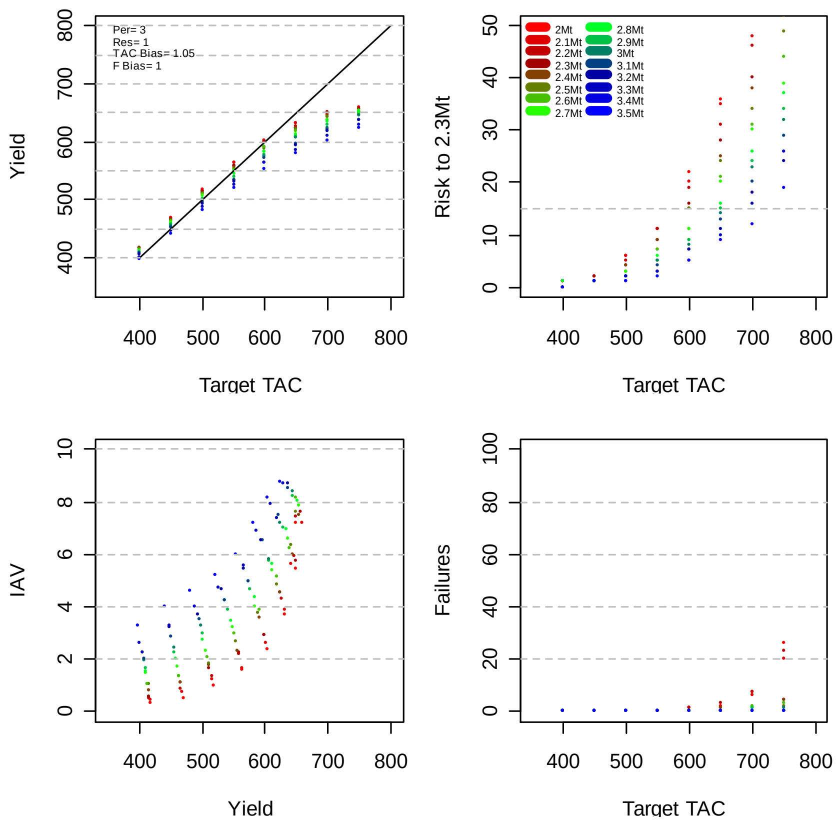


Figure 2.3 Baseline 3 Results. HCR Period 3 yrs; HCR Change Unrestricted

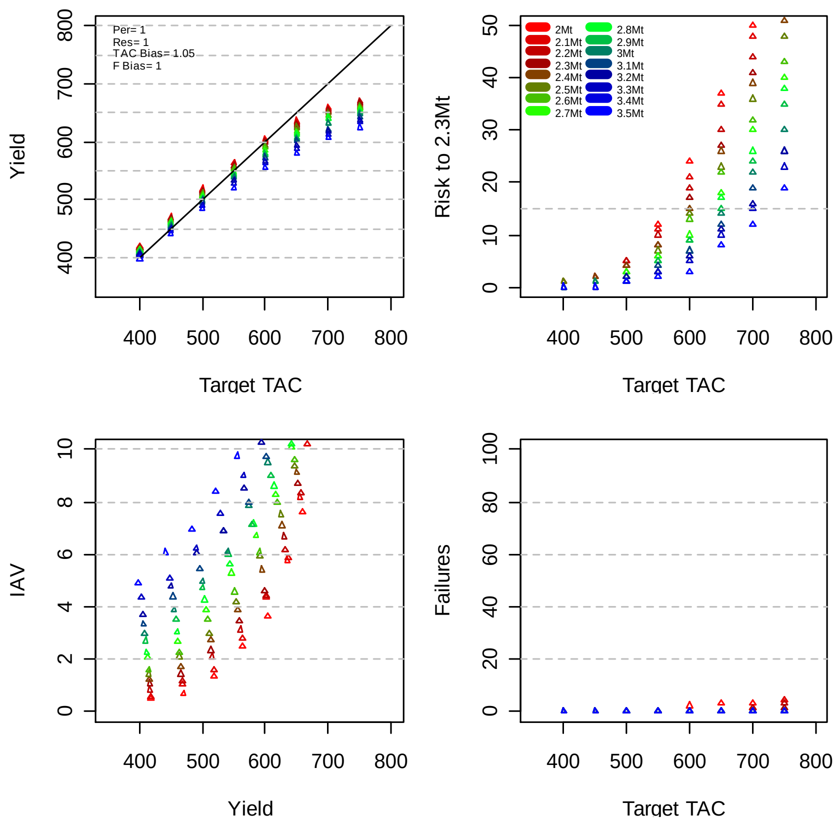


Figure 2.4 Baseline 4 Results. HCR Period 1 yr; HCR Change Unrestricted

The following general trends can be identified, regardless of the specific conditioning around the HCR:

- Yield, Risk and Failures all increase with increasing target TAC. The rate of increase of yield with target TAC is reduced above target TACs of approximately 600kt. Risks increase dramatically with increasing SSB trig for all target TACs above 550kt.
- Any target TACs above 550kt would require very strong protection rules to maintain the risk within precautionary limits.
- Yield, Risk and Failures all decrease with increasing SSB trig
- IAV increases with increasing SSB trig. This is consistent with the HCR being implemented more frequently as the trigger point is increased to stock levels well above the current.
- There exists a trade off between risk and IAV with increasing SSB trigger point leading to lower risk but higher IAV.

Similar risk levels are found to occur across all the baseline runs for common combinations of SSB trigger point and Target TAC. The table below shows several combinations which result in risk in the region of 10% for each of the baseline runs. Also given are the mean yields, inter-annual catch variation and median fishing mortality.

Table 2.2 Statistical outputs for selected simulations

HCR Per	HCR Chg	TAC	SSB Trig	Yld	IAV (%)
3	15%	560	2.3Mt	563	2
3	15%	620	3.0Mt	583	5
1	15%	550	2.3Mt	557	3
1	15%	630	3.0Mt	592	6
3	-	570	2.3Mt	578	2
3	-	620	3.0Mt	586	5
1	-	550	2.3Mt	560	3
1	-	630	3.0Mt	593	9

A common feature of the results is that lower SSB trigger points require lower target TACs if risks are to be kept to 15% or less. The most noticeable variation is seen in the IAV. Lowest IAV values are associated with the most restrictive HCR conditions (highest period, lowest permitted TAC change) and vice versa. There is little variation in yield, risk or fishing mortality.

Greater constrast between the baseline simulations (with varying HCR conditions) can be found at higher target TACs. This is particularly true in relation to IAV (as noted above) and the risk of model failure where the 1 year, unconstrained HCR was successful in all but eliminating the risk of SSB falling below 10% of Bpa during any point in the statistical period. In terms of yield at high target TACs, 1 year HCRs produce greater yields (especially at the lower trigger points).

In terms of management of the stock, the parameters of interest centre on the yield, variability in yield and the frequency, direction and magnitude of any TAC changes brought about by the application of the HCR. Selected run statistics are contained in the table below

HCR Per	HCR Chg	TAC	SSB Trig	Yld	IAV (kT)	TAC Yrs	TAC Inc	TAC Dec	Avg Inc	Avg Dec
3	15%	550	2.3	555	19	2.1	1.3	0.9	+43	-50
3	15%	600	2.8	576	28	4.0	2.4	1.6	+47	-56
3	15%	650	3.3	584	36	5.6	3.3	2.3	+51	-62
1	15%	550	2.3	559	21	2.9	1.6	1.3	+42	-46
1	15%	600	2.8	579	34	6.0	3.3	2.6	+47	-52
1	15%	650	3.3	587	45	8.1	4.4	3.7	+51	-57
3	-	550	2.3	558	20	1.2	0.7	0.6	+87	-85
3	-	600	2.8	583	31	2.2	1.2	1.0	+100	-103
3	-	650	3.3	586	43	3.0	1.6	1.5	+118	-120
1	-	550	2.3	559	26	2.8	1.5	1.3	+61	-61
1	-	600	2.8	581	42	5.5	2.8	2.7	+69	-67
1	-	650	3.3	589	60	7.7	3.9	3.8	+75	-76

Average increases and decreases in the TAC for the unrestricted regimes are higher because the HCR is unconstrained. The 3-year rule TAC changes are the highest and are as a result of the rule being unable to track stock development as closely as a 1 year rule. However, it should be noted that the simulation framework does not account for the varying uncertainty in the assessment (observation) model that is characteristic of the current assessment process (which incorporates a 3 year egg survey).

The following figures illustrate the relationship between yield, fishing mortality and risk for the baseline simulations. The grey areas represent simulations whose output statistics fall within a range of F values from 0.15 to 0.2 and risk values of 15% or lower.

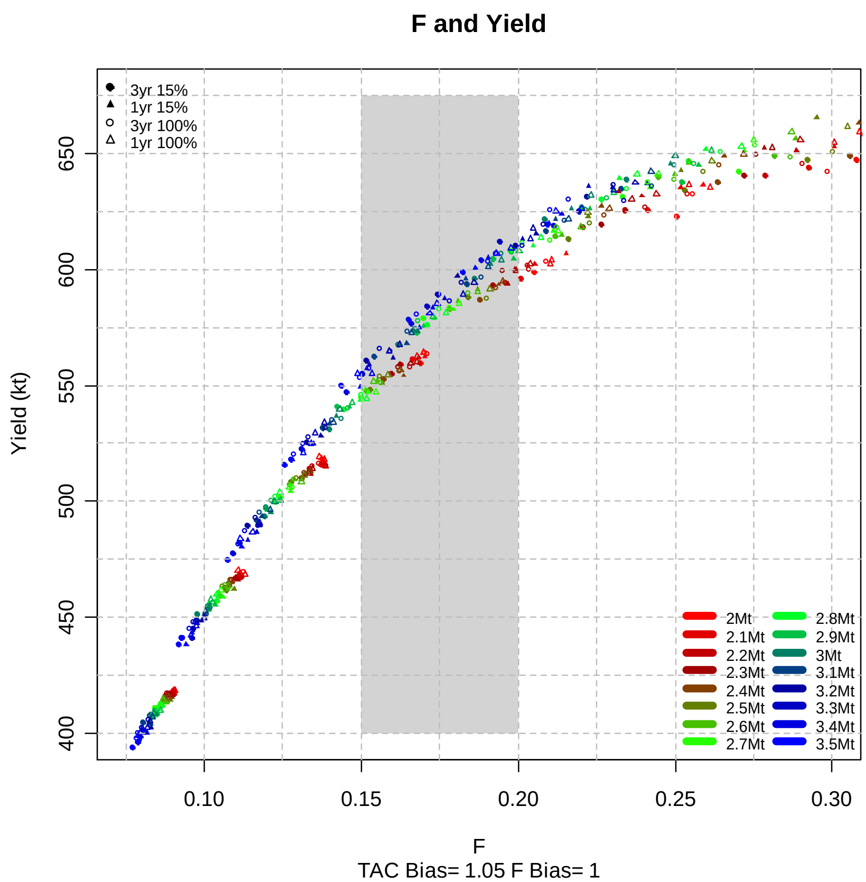


Figure 2.5 Yield versus F for all baseline simulations (Tac Bias 5%, F Bias 0%)

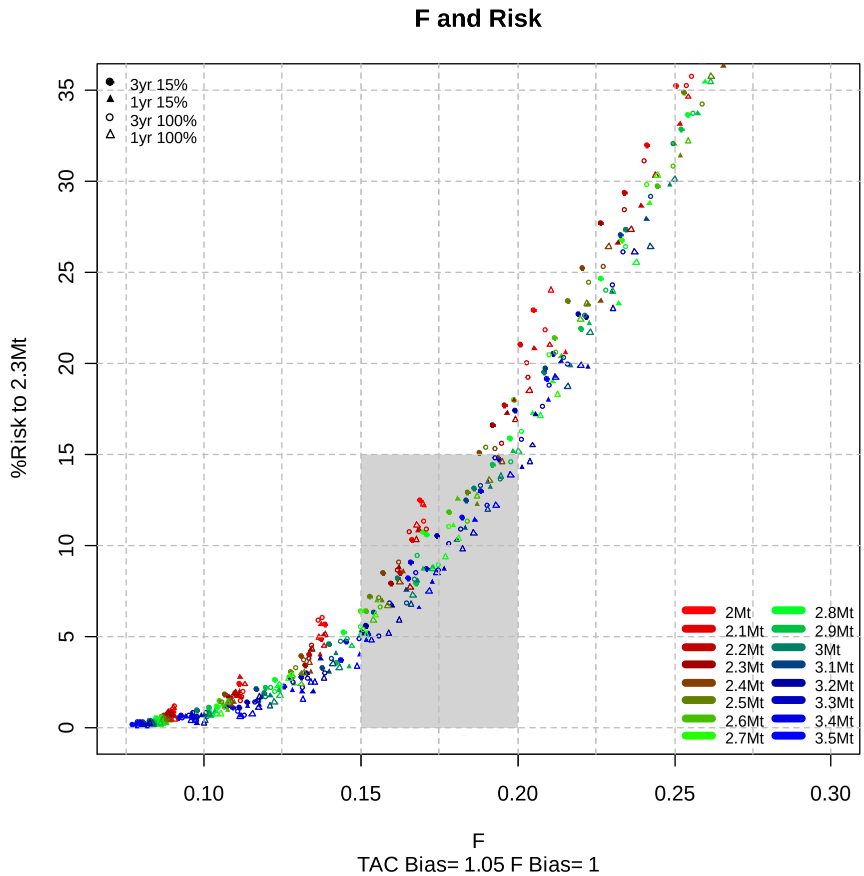


Figure 2.6 Risk versus F for all baseline simulations (Tac Bias 5%, F Bias 0%)

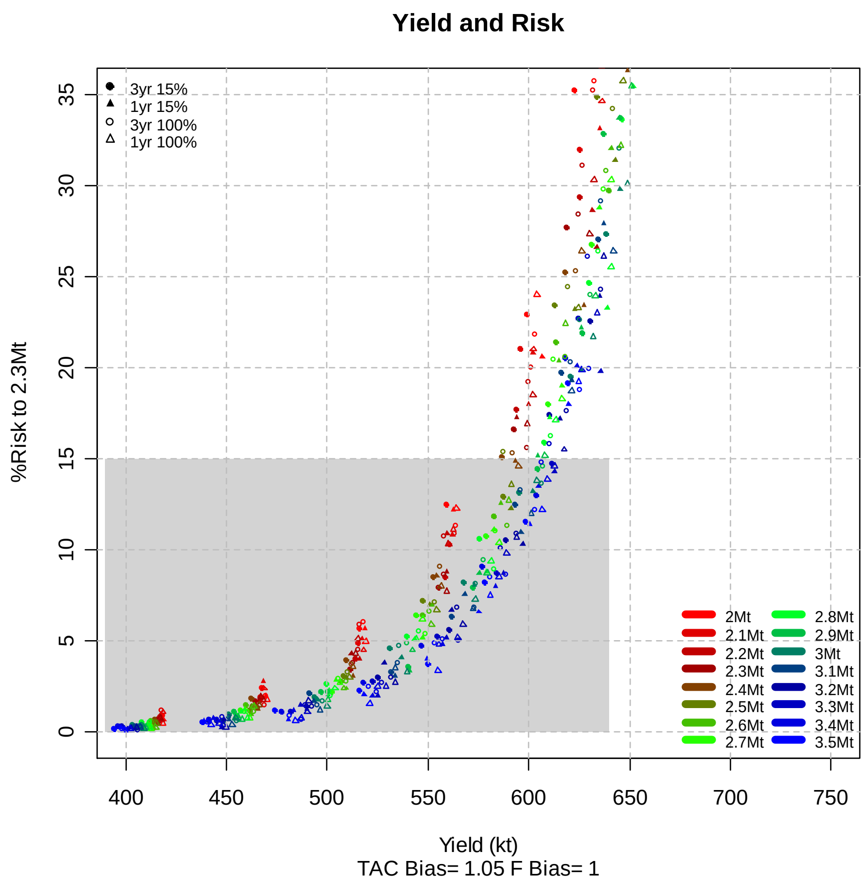


Figure 2.7 Risk versus Yield for all baseline simulations (Tac Bias 5%, F Bias 0%)

These outputs demonstrate the strong influence of the SSB trigger parameter. Assuming a maximum acceptable risk to 2.3Mt of 15% the maximum yields available for low trigger points (<2.5Mt) are of the order of 590kt with an associated F of 0.19-0.20. If the stock was to be exploited using a higher trigger biomass (>=3Mt) then target TACs of up to 680kt are feasible although average yields are unlikely to exceed 610kt.

Full results for the baseline runs can be found in appendix 2.

2.2 Effects of TAC and F (discarding) Bias

The table below compares the risk, yield and IAV statistics for selected simulations with those from runs with a TAC Bias of 15% and with an F Bias of 25%.

Table 2.4 TAC and F Bias results for selected simulations

Per yr	Chg %	TAC kt	Trig Mt	5% TAC Bias			15% TAC Bias			25% F Bias		
				Rsk	Yld	IAV	Rsk	Yld	IAV	Rsk	Yld	IAV
3	15	550	2.3	8%	555	19	17%	593	24	16%	579	24
3	15	600	2.8	11%	576	23	19%	607	34	15%	596	33
3	15	650	3.3	9%	584	36	16%	609	44	16%	596	41
1	15	550	2.3	9%	559	21	16%	599	28	16%	584	28
1	15	600	2.8	9%	579	34	17%	616	41	16%	595	41
1	15	650	3.3	9%	587	45	16%	613	54	17%	598	52
3	-	550	2.3	9%	558	20	18%	598	26	16%	579	24
3	-	600	2.8	9%	583	31	17%	617	39	16%	601	39
3	-	650	3.3	10%	586	43	17%	622	52	16%	606	50
1	-	550	2.3	8%	559	26	17%	600	34	15%	586	33
1	-	600	2.8	9%	581	42	20%	614	56	17%	603	52
1	-	650	3.3	10%	589	60	17%	619	72	15%	607	70

An increase in TAC bias from 5% to 15% is seen to double the risk to 2.3Mt for equivalent harvesting regimes. The bias also leads to higher yields and IAV. Bias of 25% applied to the 5 youngest age groups also approximately doubles the risk to Bpa. However, the increase in yield is less marked than that for the TAC bias. This is because it is only applied to the 5 youngest ages which contribute less proportionately to the yield.

Simulations were also carried out with both TAC and F bias of 25%. These were the highest biases tested and can be considered 'worst-case' scenarios. The following plots describe the results.

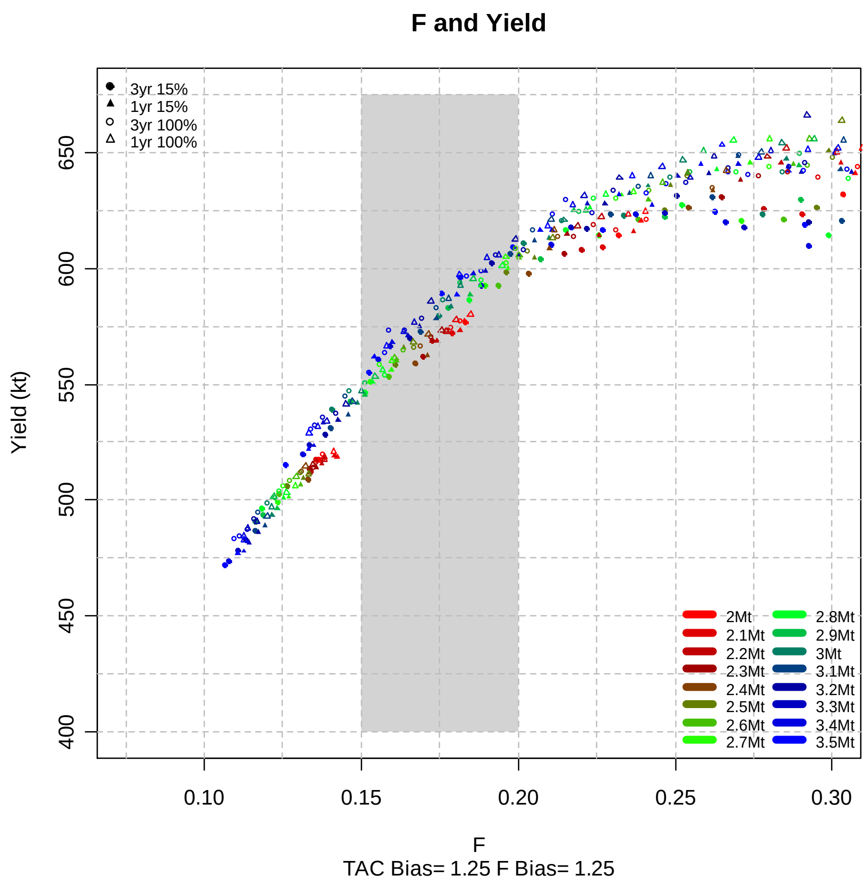


Figure 2.8 Yield versus F for TAC Bias 25%, F Bias 25%

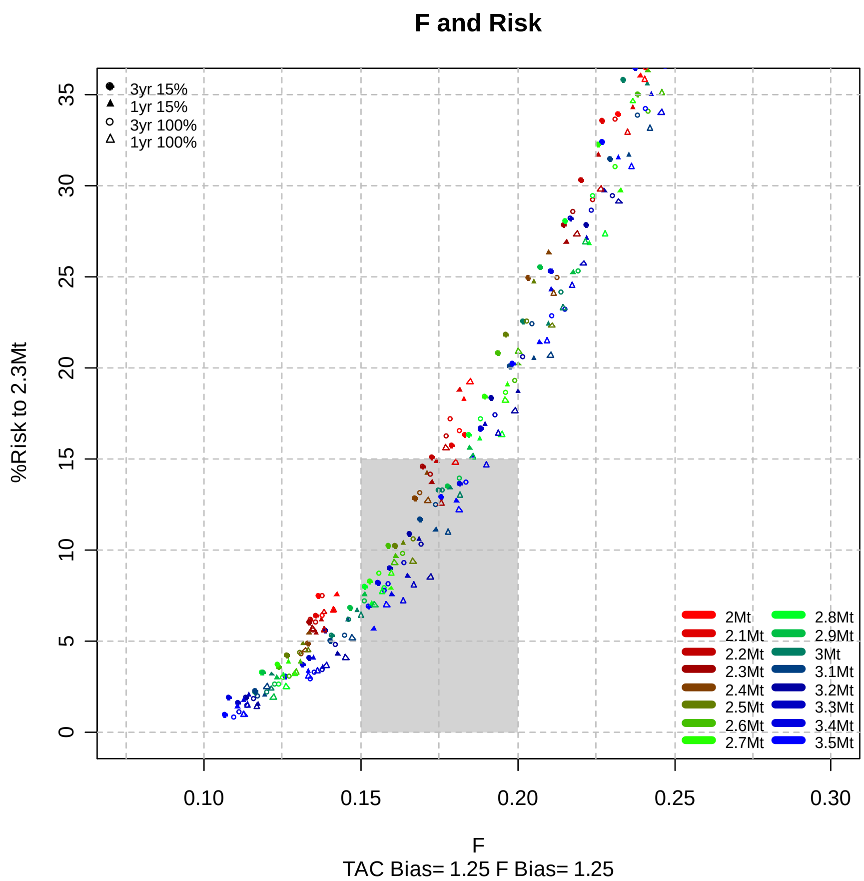


Figure 2.9 Risk versus F for TAC Bias 25%, F Bias 25%

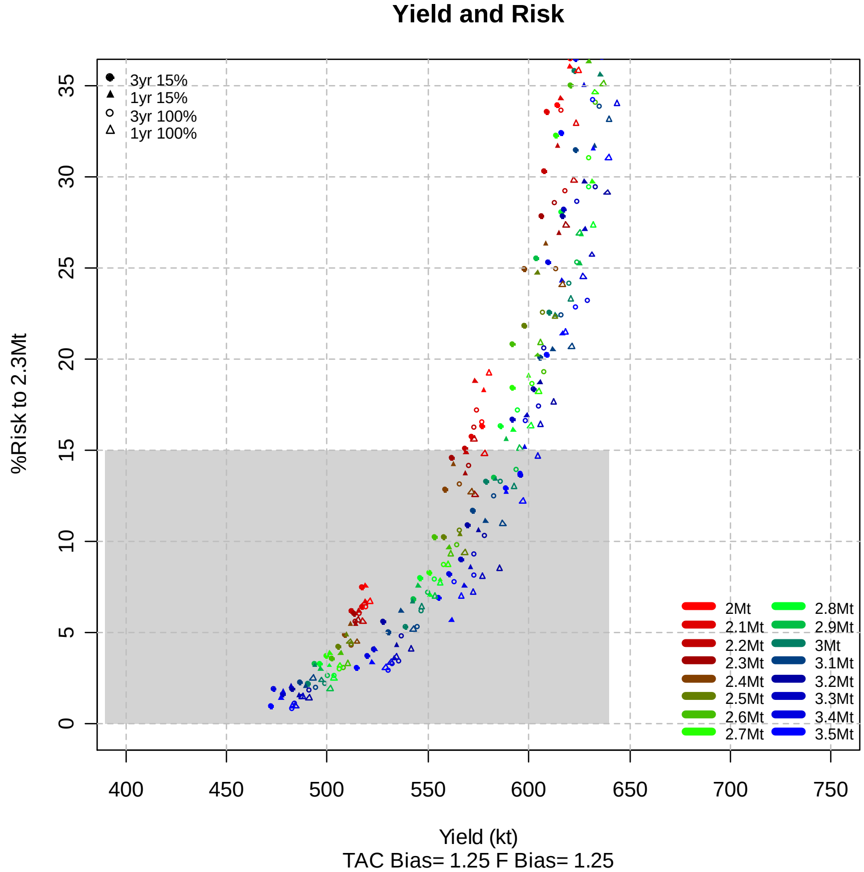


Figure 2.10. Yield versus Risk for TAC Bias 25%, F Bias 25%

2.3 Effects of Varying Observation Error Autocorrelation

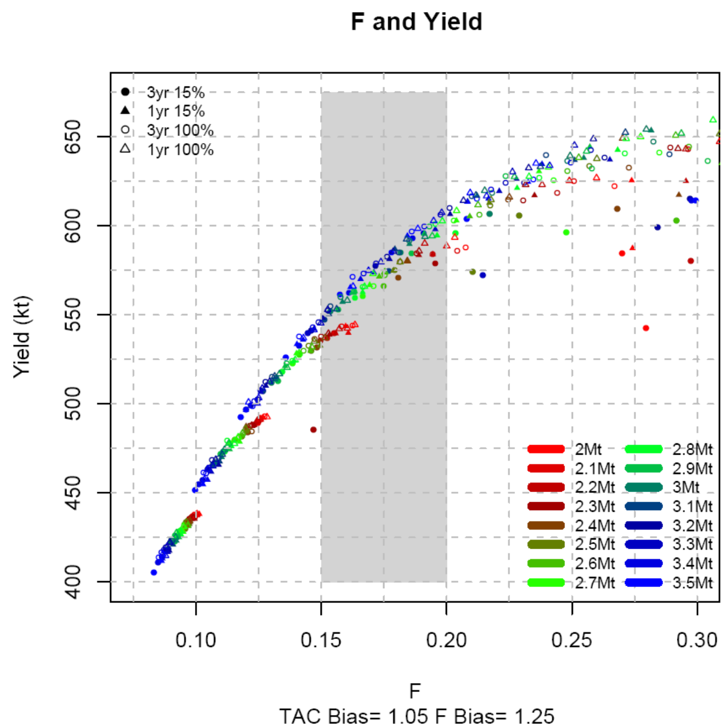
Additional simulations have been undertaken with varying levels of observation error autocorrelation in order to determine the level of sensitivity to the serial correlation parameter. Values of 0, 0.25 and 0.5 have been used for comparison with the baseline value of 0.75.

In general, reducing the levels of autocorrelation reduces the risks.

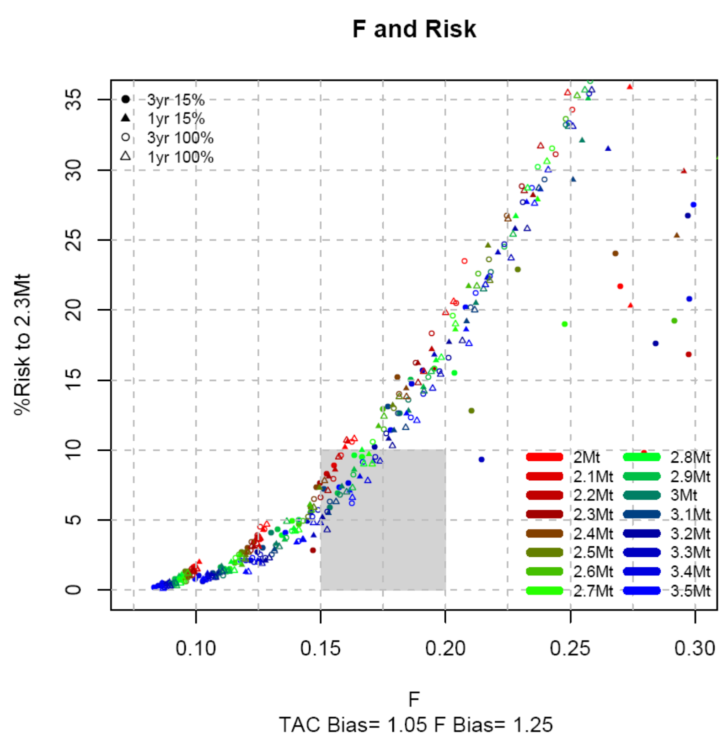
3 Conclusions

- The target TAC and SSB trigger point have a greater effect than HCR period or change restriction (for the values tested)
- For zero F bias and 5% TAC bias, average yields of 550-580 are possible, while keeping the risk to Bpa below 10%. Yields closer to 610kt are possible for risks below 15%.
- For higher biases, target TACs must be reduced to keep the risk within acceptable limits
- The sensitivity to TAC and F bias indicates that any HCR requires strict enforcement

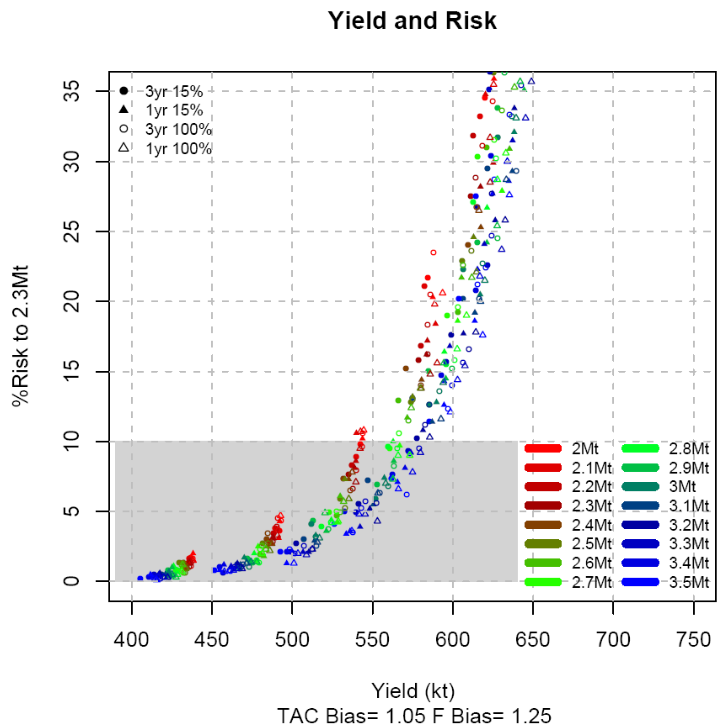
Appendix 1 – Additional Run Plots



Yield versus F for TAC Bias 5%, F Bias 25%



Risk versus F for TAC Bias 5%, F Bias 25%



Yield versus Risk for TAC Bias 5%, F Bias 25%

more to be added...

Appendix 2

Table A2.1 Baseline 1 (3yr, 15%) results. Shaded results represent risks to Bpa in the range 10-15%.

TAC	SSBtrig	MnYld	0.1Yld	0.5Yld	0.9Yld	IAV	MnF	0.1F	0.5F	0.9F	SSB	TSSB	SSB20/10	TACYrs	TACinc	TACdec	AvgInc	AvgDec	Rsk2.3	Rsk2.6	4+	7+	Fail
400	2	418	416	420	423	0	0.09	0.07	0.1	0.1	4.2	4.4	1.09	0.7	0.4	0.3	24	-16	1	3	90	58	0
450	2	470	464	472	476	0	0.11	0.08	0.1	0.2	3.9	4.1	1.1	0.8	0.5	0.3	29	-20	2	5	89	54	0
500	2	519	504	524	528	1	0.14	0.1	0.1	0.2	3.6	3.75	1.08	1.1	0.6	0.5	32	-27	4	11	88	50	0
540	2	553	527	565	570	1	0.17	0.12	0.2	0.2	3.3	3.39	1.04	1.4	0.9	0.5	42	-48	10	20	87	47	0
550	2	562	528	575	581	1	0.18	0.12	0.2	0.2	3.3	3.35	1.03	1.5	0.9	0.6	42	-48	12	22	86	46	0
560	2	572	534	586	591	1	0.19	0.12	0.2	0.3	3.2	3.3	1.04	1.5	0.9	0.6	42	-51	14	25	86	45	1
600	2	601	542	626	633	2	0.22	0.15	0.2	0.3	3	2.98	1.02	2.1	1.2	1	46	-56	22	35	85	41	4
650	2	632	543	667	685	3	1.67	0.17	0.3	0.4	2.7	2.6	0.95	3	1.5	1.5	50	-60	34	49	82	36	16
700	2	647	504	697	737	4	1.8	0.21	0.3	0.5	2.3	2.25	0.92	4	1.8	2.2	53	-66	50	64	80	31	32
750	2	655	463	704	787	6	4.1	0.25	0.4	0.8	2.1	1.93	0.85	5.2	2.2	2.9	57	-69	61	74	77	27	73
400	2.1	418	414	419	422	0	0.09	0.07	0.1	0.1	4.3	4.4	1.09	0.7	0.4	0.3	24	-17	1	2	90	57	0
450	2.1	468	459	472	476	1	0.11	0.08	0.1	0.2	4	4.11	1.09	1.1	0.6	0.4	30	-19	2	5	89	54	0
500	2.1	515	491	524	528	1	0.14	0.1	0.1	0.2	3.6	3.71	1.06	1.5	0.8	0.6	34	-33	5	12	88	50	0
540	2.1	550	511	565	570	2	0.17	0.11	0.2	0.2	3.3	3.46	1.08	1.7	1	0.7	41	-49	11	20	87	46	1
550	2.1	562	524	575	581	1	0.17	0.12	0.2	0.2	3.3	3.41	1.04	1.6	1	0.6	42	-50	10	19	87	46	0
560	2.1	568	523	585	591	2	0.22	0.13	0.2	0.2	3.2	3.27	1.05	1.9	1.1	0.7	43	-50	12	23	86	45	2
600	2.1	598	530	625	633	2	0.25	0.15	0.2	0.3	3	3.02	1.02	2.4	1.3	1	45	-56	21	34	85	42	5
650	2.1	626	527	660	685	3	0.56	0.17	0.2	0.4	2.7	2.69	0.99	3.4	1.8	1.6	49	-60	32	46	83	37	7
700	2.1	646	502	686	736	4	1.62	0.21	0.3	0.5	2.4	2.31	0.94	4.3	2.1	2.1	53	-65	45	60	80	32	25
750	2.1	658	468	703	787	6	3.42	0.24	0.4	0.6	2.1	2.01	0.89	5.1	2.3	2.8	55	-70	58	72	78	28	54

400	2.2	417	410	419	423	1	0.09	0.07	0.1	0.1	4.3	4.4	1.08	0.9	0.5	0.4	25	-18	1	2	90 58	0
450	2.2	467	454	472	476	1	0.11	0.08	0.1	0.2	3.9	4.07	1.08	1.2	0.7	0.5	28	-22	2	5	89 54	0
500	2.2	516	493	523	528	1	0.14	0.1	0.1	0.2	3.7	3.75	1.06	1.6	0.9	0.7	34	-30	4	10	88 51	0
550	2.2	559	521	574	581	2	0.17	0.12	0.2	0.2	3.4	3.43	1.04	1.9	1.1	0.7	41	-47	10	19	87 47	0
560	2.2	564	509	584	591	2	0.23	0.12	0.2	0.2	3.2	3.31	1.05	2.2	1.3	0.9	43	-51	14	24	86 45	1
570	2.2	573	521	595	601	2	0.19	0.13	0.2	0.3	3.2	3.26	1.03	2.2	1.3	0.9	43	-52	13	23	86 45	2
580	2.2	584	530	604	612	2	0.19	0.13	0.2	0.3	3.2	3.23	1.03	2.2	1.3	0.9	44	-53	14	24	86 44	0
600	2.2	596	528	622	633	3	0.39	0.14	0.2	0.3	3	3.07	1.02	2.7	1.6	1.1	47	-55	18	31	85 42	3
650	2.2	626	521	659	684	3	0.5	0.17	0.2	0.4	2.8	2.75	1	3.5	2	1.6	50	-60	29	43	83 38	5
700	2.2	647	506	686	735	5	2.43	0.19	0.3	0.5	2.5	2.4	0.93	4.4	2.2	2.2	54	-65	43	58	81 34	15
750	2.2	656	481	692	785	6	3.4	0.23	0.3	0.6	2.2	2.11	0.9	5.4	2.4	2.9	56	-71	57	70	78 29	34
400	2.3	416	407	419	423	1	0.09	0.07	0.1	0.1	4.3	4.44	1.08	1.1	0.7	0.5	25	-19	1	2	90 58	0
450	2.3	465	445	471	475	1	0.11	0.08	0.1	0.1	4	4.12	1.08	1.5	0.8	0.6	30	-25	2	5	89 54	0
500	2.3	512	481	523	528	1	0.19	0.1	0.1	0.2	3.7	3.79	1.07	1.9	1.1	0.8	35	-32	4	10	88 51	1
550	2.3	555	506	573	580	2	0.17	0.12	0.2	0.2	3.4	3.45	1.05	2.2	1.3	0.9	42	-50	10	19	87 47	0
560	2.3	563	514	581	590	2	0.17	0.12	0.2	0.2	3.3	3.38	1.05	2.4	1.5	1	44	-51	10	20	86 46	0
570	2.3	572	519	593	601	2	0.18	0.13	0.2	0.2	3.2	3.27	1.03	2.4	1.4	1	43	-52	11	22	86 45	0
580	2.3	579	520	603	612	2	0.21	0.13	0.2	0.2	3.2	3.28	1.05	2.6	1.6	1.1	45	-53	12	24	86 45	1
600	2.3	595	530	620	632	3	0.2	0.14	0.2	0.3	3.1	3.11	1.01	2.8	1.6	1.2	47	-57	16	28	85 43	1
650	2.3	622	527	650	684	4	0.38	0.16	0.2	0.3	2.8	2.81	1	3.8	2.1	1.7	50	-60	28	43	83 38	6
700	2.3	645	522	676	735	5	1.32	0.2	0.3	0.4	2.5	2.47	0.95	4.7	2.5	2.2	53	-67	40	56	81 34	15
750	2.3	655	488	688	784	6	5.74	0.22	0.3	0.5	2.2	2.17	0.91	5.5	2.7	2.8	57	-71	52	68	79 30	37
400	2.4	414	400	419	422	1	0.09	0.07	0.1	0.1	4.3	4.46	1.11	1.4	0.8	0.6	26	-21	1	3	90 58	0
450	2.4	464	445	471	475	1	0.11	0.08	0.1	0.1	4	4.11	1.07	1.6	1	0.7	30	-25	1	4	89 54	0

500	2.4	510	473	522	528	2	0.13	0.09	0.1	0.2	3.7	3.79	1.07	2.2	1.3	0.9	35	-34	4	10	88	51	1
550	2.4	554	505	572	580	2	0.16	0.11	0.2	0.2	3.5	3.52	1.05	2.3	1.4	0.9	42	-50	8	16	87	48	0
570	2.4	570	512	591	601	2	0.18	0.12	0.2	0.2	3.3	3.33	1.03	2.6	1.6	1.1	44	-53	11	21	86	46	0
580	2.4	578	517	600	611	3	0.18	0.13	0.2	0.2	3.3	3.26	1	2.7	1.6	1.1	45	-54	12	23	86	46	0
590	2.4	584	521	604	622	3	0.49	0.13	0.2	0.3	3.2	3.24	1.02	3	1.8	1.2	46	-54	13	24	86	45	1
600	2.4	590	522	612	632	3	0.2	0.14	0.2	0.3	3.1	3.13	1.02	3	1.8	1.3	47	-56	16	27	86	44	0
650	2.4	621	533	648	683	4	0.29	0.16	0.2	0.3	2.8	2.85	0.99	4	2.3	1.7	50	-62	25	39	84	39	4
700	2.4	644	520	671	734	5	0.65	0.19	0.3	0.4	2.6	2.56	0.97	4.7	2.5	2.2	54	-68	37	52	82	35	11
750	2.4	653	488	683	783	6	0.82	0.22	0.3	0.5	2.3	2.27	0.94	5.7	2.8	2.9	56	-72	50	65	80	31	19
400	2.5	414	396	419	423	1	0.09	0.06	0.1	0.1	4.3	4.44	1.08	1.5	0.9	0.6	27	-22	1	2	91	58	0
450	2.5	463	439	471	475	1	0.11	0.08	0.1	0.1	4	4.15	1.07	1.8	1	0.7	31	-25	2	5	90	55	0
500	2.5	510	476	522	527	2	0.13	0.09	0.1	0.2	3.8	3.84	1.05	2.3	1.3	1	34	-34	3	8	88	52	0
550	2.5	550	497	570	580	2	0.21	0.12	0.2	0.2	3.4	3.47	1.05	2.7	1.7	1	42	-49	8	17	87	48	1
570	2.5	566	508	584	601	3	0.17	0.12	0.2	0.2	3.3	3.36	1.02	2.9	1.8	1.1	44	-52	10	20	87	46	0
580	2.5	572	503	591	611	3	0.18	0.13	0.2	0.2	3.3	3.3	1.02	3.2	2	1.3	45	-53	10	21	86	46	0
590	2.5	580	516	600	621	3	0.19	0.13	0.2	0.2	3.2	3.24	1.02	3.2	1.9	1.3	46	-56	13	24	86	45	0
600	2.5	587	510	608	632	3	0.19	0.14	0.2	0.2	3.2	3.22	1.02	3.4	2	1.3	47	-56	13	24	86	44	0
610	2.5	593	512	616	642	3	0.2	0.14	0.2	0.3	3.1	3.17	1.03	3.6	2.1	1.5	47	-57	14	26	85	43	0
650	2.5	622	537	643	683	4	0.27	0.16	0.2	0.3	2.9	2.89	1	4.1	2.4	1.7	51	-63	22	36	84	40	2
700	2.5	641	506	669	734	5	12	0.18	0.3	0.4	2.7	2.62	0.94	4.9	2.6	2.3	53	-66	33	48	83	37	8
750	2.5	646	485	673	778	6	0.84	0.21	0.3	0.5	2.4	2.32	0.92	5.9	3	2.9	56	-71	47	63	80	32	10
400	2.6	414	396	419	422	1	0.09	0.07	0.1	0.1	4.3	4.5	1.09	1.6	1	0.6	27	-22	0	2	91	58	0
450	2.6	460	428	470	475	2	0.11	0.08	0.1	0.1	4	4.12	1.08	2.3	1.4	0.9	31	-27	2	5	89	55	0
500	2.6	507	467	521	527	2	0.13	0.09	0.1	0.2	3.8	3.81	1.05	2.6	1.5	1.1	34	-34	3	8	89	52	0

550	2.6	547	486	565	580	3	0.16	0.11	0.2	0.2	3.5	3.53	1.04	2.9	1.8	1.1	43	-51	7	14	87	49	0
580	2.6	570	502	591	611	3	0.17	0.12	0.2	0.2	3.3	3.37	1.03	3.2	2	1.2	45	-54	10	19	87	46	0
590	2.6	577	499	599	621	3	0.18	0.13	0.2	0.2	3.3	3.28	1.03	3.4	2	1.4	46	-55	11	21	86	46	0
600	2.6	583	506	604	632	4	0.19	0.14	0.2	0.2	3.2	3.19	1.01	3.7	2.2	1.5	47	-57	13	24	86	45	0
610	2.6	589	502	613	642	4	0.19	0.14	0.2	0.3	3.2	3.19	1.02	3.7	2.2	1.6	48	-57	14	25	86	44	1
620	2.6	599	514	619	652	4	0.2	0.14	0.2	0.3	3.1	3.11	1.01	3.9	2.4	1.6	48	-58	15	27	85	43	0
650	2.6	617	517	637	683	4	9.2	0.15	0.2	0.3	3	2.96	0.99	4.3	2.5	1.9	51	-62	21	35	84	41	1
700	2.6	636	516	656	733	5	0.48	0.18	0.3	0.3	2.7	2.72	1.01	5.2	2.9	2.3	54	-67	30	46	83	37	3
750	2.6	647	494	668	780	6	0.49	0.2	0.3	0.4	2.4	2.41	0.94	5.9	3	2.9	57	-72	43	58	81	34	14
400	2.7	411	389	418	422	1	0.09	0.07	0.1	0.1	4.3	4.46	1.09	1.9	1.2	0.7	27	-23	0	1	91	58	0
450	2.7	459	425	470	475	2	0.11	0.08	0.1	0.1	4.1	4.2	1.08	2.3	1.4	1	31	-30	1	4	90	55	0
500	2.7	504	458	521	527	2	0.13	0.09	0.1	0.2	3.8	3.87	1.05	2.7	1.6	1.1	36	-35	3	7	89	52	0
550	2.7	547	485	565	579	3	0.15	0.11	0.2	0.2	3.6	3.61	1.03	3	1.9	1.2	42	-50	6	13	88	49	0
590	2.7	575	501	591	620	3	0.18	0.13	0.2	0.2	3.3	3.33	1.02	3.6	2.2	1.4	46	-55	10	20	86	46	0
600	2.7	581	501	602	631	4	0.18	0.13	0.2	0.2	3.3	3.26	1	3.7	2.2	1.5	47	-57	11	21	86	46	0
610	2.7	591	511	609	642	4	0.42	0.13	0.2	0.2	3.2	3.25	1.03	3.9	2.3	1.6	48	-57	11	23	86	45	1
620	2.7	594	505	615	652	4	0.23	0.14	0.2	0.3	3.2	3.16	1	4.1	2.4	1.7	48	-60	14	25	86	44	1
630	2.7	601	512	622	662	4	0.2	0.14	0.2	0.3	3.1	3.13	1.01	4.2	2.4	1.8	50	-60	15	27	85	43	0
650	2.7	608	505	629	682	5	0.23	0.15	0.2	0.3	3	3	1.01	4.6	2.6	2	51	-62	18	32	85	42	1
700	2.7	632	508	650	731	6	0.29	0.17	0.2	0.3	2.8	2.77	1.01	5.4	3	2.4	54	-67	29	44	83	38	3
750	2.7	642	487	665	769	7	0.81	0.19	0.3	0.4	2.5	2.47	0.96	6.2	3.3	2.9	57	-72	40	56	81	34	12
400	2.8	410	385	418	422	2	0.09	0.06	0.1	0.1	4.4	4.52	1.09	2.1	1.3	0.8	28	-23	0	2	91	58	0
450	2.8	457	420	469	475	2	0.11	0.08	0.1	0.1	4.1	4.17	1.06	2.6	1.5	1	32	-29	1	4	90	56	0
500	2.8	501	450	516	527	3	0.13	0.09	0.1	0.2	3.8	3.9	1.05	3.2	1.9	1.3	36	-37	2	6	89	53	0

550	2.8	543	482	559	579	3	0.15	0.11	0.2	0.2	3.5	3.6	1.04	3.3	2	1.3	43	-51	5	13	88	49	0
600	2.8	575	492	594	631	4	0.18	0.13	0.2	0.2	3.3	3.33	1.04	4.2	2.5	1.7	47	-57	10	20	86	46	0
610	2.8	583	499	601	641	4	0.18	0.13	0.2	0.2	3.2	3.26	1.01	4.2	2.4	1.8	48	-58	11	22	86	45	0
620	2.8	590	500	611	651	4	0.19	0.14	0.2	0.2	3.2	3.25	1.01	4.3	2.5	1.8	49	-59	12	23	86	45	0
630	2.8	599	502	623	662	4	0.19	0.14	0.2	0.3	3.2	3.18	1	4.2	2.5	1.7	49	-60	13	24	86	44	1
650	2.8	605	511	623	681	5	0.21	0.15	0.2	0.3	3	3.05	1.01	4.8	2.8	2	51	-61	18	30	85	42	0
700	2.8	627	507	649	732	6	2.09	0.17	0.2	0.3	2.8	2.8	1	5.4	3	2.4	54	-66	26	40	84	39	2
750	2.8	641	500	662	768	7	0.6	0.18	0.3	0.4	2.6	2.58	1	6.2	3.3	2.9	57	-72	35	51	82	36	5
400	2.9	408	381	417	422	2	0.09	0.07	0.1	0.1	4.3	4.51	1.08	2.3	1.5	0.9	29	-26	0	2	91	58	0
450	2.9	456	422	469	474	2	0.1	0.08	0.1	0.1	4.1	4.18	1.06	2.7	1.6	1.1	31	-29	1	3	90	56	0
500	2.9	498	444	514	527	3	0.12	0.09	0.1	0.2	3.8	3.9	1.05	3.3	2	1.4	36	-37	2	6	89	53	0
550	2.9	540	471	558	579	3	0.15	0.11	0.1	0.2	3.6	3.63	1.02	3.5	2.2	1.3	43	-51	4	11	88	50	0
600	2.9	573	486	591	631	4	0.17	0.13	0.2	0.2	3.3	3.36	1.02	4.2	2.5	1.7	47	-57	9	18	87	47	0
610	2.9	579	491	597	641	4	0.18	0.13	0.2	0.2	3.3	3.26	0.98	4.4	2.6	1.8	47	-57	11	21	87	46	0
620	2.9	585	493	603	651	5	0.18	0.13	0.2	0.2	3.2	3.21	1	4.6	2.7	1.9	49	-59	11	22	86	45	0
630	2.9	589	491	608	660	5	0.19	0.13	0.2	0.2	3.2	3.2	1.01	4.7	2.8	1.9	49	-60	13	25	86	44	0
640	2.9	601	500	622	671	4	0.19	0.14	0.2	0.3	3.2	3.14	0.98	4.6	2.7	2	50	-59	12	25	86	44	0
650	2.9	609	507	627	682	5	0.2	0.14	0.2	0.3	3.1	3.09	0.97	4.7	2.7	2	51	-62	14	26	85	44	0
660	2.9	608	506	623	691	5	0.2	0.15	0.2	0.3	3.1	3.1	1	5.1	2.9	2.2	51	-64	15	27	85	43	0
700	2.9	626	498	646	730	6	0.23	0.16	0.2	0.3	2.9	2.87	0.98	5.7	3.3	2.4	54	-66	23	37	84	40	0
750	2.9	646	505	661	770	6	0.27	0.18	0.3	0.4	2.7	2.64	0.96	6.2	3.4	2.8	57	-71	33	49	82	37	2
400	3	407	377	417	422	2	0.08	0.06	0.1	0.1	4.4	4.53	1.08	2.5	1.5	1	28	-26	0	1	91	59	0
450	3	453	409	467	475	2	0.1	0.08	0.1	0.1	4.1	4.23	1.06	3	1.9	1.1	32	-31	1	3	90	56	0
500	3	495	441	512	526	3	0.12	0.09	0.1	0.2	3.9	3.96	1.05	3.6	2.1	1.4	36	-38	2	5	89	54	0

550	3	537	466	555	579	3	0.14	0.11	0.1	0.2	3.7	3.7	1.02	3.6	2.2	1.4	42	-50	4	9	88	50	0
600	3	569	492	585	629	4	0.17	0.12	0.2	0.2	3.4	3.4	1.02	4.5	2.7	1.8	47	-58	7	17	87	47	0
620	3	583	489	601	651	5	0.18	0.13	0.2	0.2	3.3	3.29	1	4.7	2.8	2	49	-59	10	19	87	46	0
630	3	589	500	602	661	5	0.18	0.13	0.2	0.2	3.2	3.21	0.98	4.8	2.8	2	49	-60	11	21	86	46	0
640	3	594	498	609	671	5	0.41	0.13	0.2	0.3	3.2	3.19	1	5	2.9	2.1	50	-61	13	24	86	45	1
650	3	601	502	618	680	5	0.2	0.14	0.2	0.3	3.1	3.13	0.99	5.1	3	2.1	51	-62	14	26	86	44	0
700	3	626	510	638	727	6	0.24	0.16	0.2	0.3	2.9	2.88	0.96	5.8	3.3	2.5	54	-67	21	36	85	41	2
750	3	634	492	653	759	7	0.34	0.17	0.2	0.3	2.7	2.76	1	6.6	3.7	2.9	57	-72	30	45	83	38	1
400	3.1	405	373	416	422	2	0.08	0.06	0.1	0.1	4.4	4.52	1.06	2.8	1.8	1	29	-26	0	1	91	59	0
450	3.1	450	404	465	474	3	0.1	0.08	0.1	0.1	4.1	4.22	1.05	3.3	2	1.3	32	-32	1	3	90	57	0
500	3.1	492	434	507	526	3	0.12	0.09	0.1	0.2	3.9	3.97	1.03	3.8	2.3	1.5	36	-38	2	5	89	54	0
550	3.1	532	462	548	578	4	0.14	0.1	0.1	0.2	3.6	3.67	1.02	3.9	2.4	1.5	42	-50	4	9	88	51	1
600	3.1	568	481	582	630	4	0.16	0.12	0.2	0.2	3.4	3.44	1	4.6	2.7	1.8	47	-57	7	15	87	48	0
620	3.1	582	492	598	650	5	0.18	0.13	0.2	0.2	3.3	3.31	1	4.8	2.8	2	49	-58	10	19	87	47	0
640	3.1	587	486	602	670	5	0.18	0.13	0.2	0.2	3.2	3.22	0.99	5.3	3.2	2.1	50	-61	11	22	86	45	0
650	3.1	600	498	616	679	5	0.19	0.14	0.2	0.3	3.2	3.17	0.98	5.2	3.2	2	51	-63	11	23	86	45	0
660	3.1	601	495	612	690	5	0.19	0.14	0.2	0.3	3.2	3.15	0.98	5.3	3.1	2.2	51	-64	13	25	86	44	0
670	3.1	605	495	621	700	6	0.2	0.14	0.2	0.3	3.1	3.14	0.99	5.6	3.2	2.4	52	-64	14	26	85	44	0
700	3.1	621	500	636	723	6	0.26	0.15	0.2	0.3	3	2.95	0.97	5.9	3.4	2.5	54	-66	19	33	85	41	3
750	3.1	641	506	655	759	7	0.29	0.17	0.2	0.3	2.8	2.75	0.96	6.5	3.6	2.9	58	-72	27	42	84	39	2
400	3.2	402	363	413	422	2	0.08	0.06	0.1	0.1	4.4	4.52	1.07	3.1	1.9	1.2	29	-28	0	1	91	59	0
450	3.2	444	396	457	474	3	0.1	0.07	0.1	0.1	4.1	4.23	1.06	3.8	2.3	1.5	33	-34	1	3	90	57	0
500	3.2	490	433	504	526	3	0.12	0.09	0.1	0.2	3.9	3.96	1.04	4	2.4	1.6	37	-39	2	5	89	54	0
550	3.2	526	456	539	578	4	0.14	0.1	0.1	0.2	3.7	3.71	1.02	4.3	2.7	1.6	43	-52	3	9	88	52	0

600	3.2	563	474	579	629	5	0.16	0.12	0.2	0.2	3.5	3.45	1	4.8	2.9	1.9	47	-57	6	14	87	48	0
650	3.2	588	477	602	678	6	0.18	0.13	0.2	0.2	3.2	3.22	0.98	5.6	3.2	2.3	51	-62	11	22	86	45	0
660	3.2	595	496	605	687	6	0.22	0.13	0.2	0.2	3.2	3.22	0.98	5.6	3.3	2.3	52	-64	12	22	86	45	1
670	3.2	600	487	610	697	6	0.19	0.14	0.2	0.3	3.2	3.13	0.99	5.8	3.5	2.3	52	-64	13	25	86	44	0
680	3.2	606	492	619	706	6	0.2	0.14	0.2	0.3	3.1	3.09	0.98	5.8	3.3	2.5	52	-65	14	26	86	44	0
700	3.2	621	506	632	726	6	0.21	0.15	0.2	0.3	3	2.99	0.97	6	3.5	2.5	55	-68	18	30	85	43	0
750	3.2	630	495	641	755	7	0.24	0.16	0.2	0.3	2.9	2.81	0.96	6.7	3.8	2.8	57	-73	24	39	84	40	1
400	3.3	402	367	413	422	2	0.08	0.06	0.1	0.1	4.4	4.54	1.06	3.1	1.9	1.2	29	-28	0	1	91	59	0
450	3.3	445	395	459	474	3	0.1	0.07	0.1	0.1	4.2	4.26	1.04	3.6	2.2	1.4	33	-33	1	2	90	57	0
500	3.3	488	427	502	526	4	0.12	0.09	0.1	0.2	3.9	3.97	1.03	4.2	2.6	1.6	36	-39	1	4	89	54	0
550	3.3	525	448	540	577	4	0.13	0.1	0.1	0.2	3.7	3.73	1.02	4.4	2.7	1.7	43	-51	3	7	88	52	0
600	3.3	557	464	570	628	5	0.15	0.11	0.2	0.2	3.5	3.51	1	5	3.1	2	46	-58	5	12	88	49	0
650	3.3	586	480	599	677	6	0.18	0.13	0.2	0.2	3.3	3.27	1	5.5	3.3	2.3	50	-61	9	19	86	46	0
660	3.3	590	484	599	688	6	0.22	0.13	0.2	0.2	3.2	3.24	0.99	5.7	3.3	2.3	52	-63	11	21	86	46	1
670	3.3	597	489	608	692	6	0.19	0.14	0.2	0.3	3.2	3.16	0.99	5.8	3.3	2.5	52	-64	12	23	86	45	0
680	3.3	602	492	611	704	6	0.19	0.14	0.2	0.3	3.2	3.15	0.97	5.9	3.4	2.5	53	-66	12	24	86	44	0
690	3.3	607	492	618	712	6	0.2	0.15	0.2	0.3	3.1	3.08	0.96	6	3.4	2.6	54	-66	14	26	85	44	0
700	3.3	608	493	620	717	6	0.33	0.14	0.2	0.3	3.1	3.05	0.98	6.2	3.5	2.7	54	-67	17	29	85	43	3
750	3.3	629	501	639	749	7	0.24	0.16	0.2	0.3	2.9	2.89	0.97	6.8	3.8	3	58	-72	22	36	84	40	2
400	3.4	397	354	409	421	3	0.08	0.06	0.1	0.1	4.5	4.63	1.07	3.5	2.2	1.3	29	-29	0	1	91	60	0
450	3.4	441	389	453	473	3	0.1	0.07	0.1	0.1	4.2	4.29	1.04	4.1	2.6	1.5	33	-34	1	2	90	58	0
500	3.4	484	422	497	525	4	0.11	0.09	0.1	0.1	4	4.05	1.03	4.5	2.8	1.6	36	-40	1	3	90	55	0
550	3.4	521	442	535	577	4	0.13	0.1	0.1	0.2	3.7	3.75	1	4.5	2.7	1.8	42	-52	2	7	89	52	0
600	3.4	554	464	569	628	5	0.15	0.11	0.2	0.2	3.5	3.52	1.01	5.1	3	2.1	47	-56	4	11	88	49	0

650	3.4	582	474	595	677	6	0.17	0.12	0.2	0.2	3.3	3.31	1	5.7	3.4	2.3	50	-63	9	18	87	46	0
670	3.4	592	483	601	692	6	0.21	0.14	0.2	0.3	3.2	3.22	0.99	6	3.5	2.5	52	-64	11	22	86	45	1
680	3.4	596	479	607	700	6	0.19	0.13	0.2	0.3	3.2	3.17	0.98	6.2	3.6	2.6	53	-65	13	23	86	45	1
690	3.4	601	491	606	712	6	0.25	0.14	0.2	0.3	3.2	3.16	0.99	6.1	3.5	2.6	53	-67	12	23	86	45	1
700	3.4	606	487	618	720	6	0.2	0.14	0.2	0.3	3.2	3.12	0.98	6.2	3.5	2.7	54	-67	13	25	86	44	0
750	3.4	623	489	635	750	7	0.26	0.15	0.2	0.3	3	2.91	0.97	6.8	3.9	2.9	57	-71	21	34	84	41	1
400	3.5	395	350	407	421	3	0.08	0.06	0.1	0.1	4.5	4.6	1.07	3.7	2.4	1.4	30	-29	0	1	91	59	0
450	3.5	438	383	451	473	4	0.09	0.07	0.1	0.1	4.3	4.34	1.05	4.3	2.6	1.6	33	-35	0	2	90	58	0
500	3.5	478	410	492	525	4	0.11	0.08	0.1	0.1	4	4.05	1.03	4.8	2.9	1.9	37	-41	1	4	90	55	0
550	3.5	516	433	529	577	5	0.13	0.1	0.1	0.2	3.8	3.85	1.02	4.8	3	1.8	43	-52	3	7	89	53	0
600	3.5	550	453	561	627	5	0.15	0.11	0.2	0.2	3.6	3.54	0.98	5.3	3.2	2.1	47	-57	4	11	88	50	0
650	3.5	574	467	582	670	6	0.17	0.12	0.2	0.2	3.4	3.4	1	6	3.6	2.4	51	-63	8	16	87	47	0
670	3.5	584	474	593	688	6	0.18	0.13	0.2	0.2	3.3	3.28	0.98	6.1	3.6	2.5	52	-64	10	20	87	47	0
680	3.5	590	475	596	701	6	0.18	0.13	0.2	0.2	3.3	3.26	0.98	6.2	3.6	2.6	52	-65	10	20	86	46	0
690	3.5	595	476	604	704	7	0.2	0.13	0.2	0.3	3.2	3.21	1	6.3	3.7	2.7	53	-65	12	22	86	45	1
700	3.5	597	478	606	711	7	0.2	0.13	0.2	0.3	3.2	3.17	0.98	6.5	3.8	2.7	54	-67	13	24	86	45	1
710	3.5	604	493	610	719	7	0.48	0.14	0.2	0.3	3.2	3.11	0.98	6.5	3.7	2.8	55	-68	13	24	86	44	1
720	3.5	610	489	617	728	7	0.2	0.14	0.2	0.3	3.1	3.07	0.98	6.5	3.7	2.8	55	-68	15	27	85	43	0
750	3.5	618	487	631	746	7	0.24	0.15	0.2	0.3	3	2.95	0.95	6.8	3.9	2.9	56	-72	19	33	85	42	1

Table A2.2 Baseline 2 (1yr, unrestricted) results. Shaded results represent risks to Bpa in the range 10-15%.

TAC	SSBtrig	MnYld	0.1Yld	0.5Yld	0.9Yld	IAV	MnF	0.1F	0.5F	0.9F	SSB	TSSB	SSB20/10	TACYrs	TACinc	TACdec	AvgInc	AvgDec	Rsk2.3	Rsk2.6	4+	7+	Fail
400	2	419	415	420	423	0	0.09	0.07	0.1	0.1	4.23	4.41	1.12	0.6	0.3	0.3	25	-23	1	2	90	57	0
450	2	469	465	472	476	1	0.12	0.08	0.1	0.2	3.93	4.08	1.09	0.9	0.5	0.4	29	-28	3	6	89	54	0
500	2	518	503	524	528	1	0.14	0.1	0.1	0.2	3.6	3.71	1.07	1.6	0.9	0.7	35	-34	6	14	88	50	0
540	2	557	538	565	570	1	0.17	0.12	0.2	0.2	3.3	3.39	1.04	1.8	1	0.8	40	-44	11	21	87	46	0
550	2	564	536	575	580	2	0.18	0.12	0.2	0.2	3.25	3.32	1.04	2.1	1.2	0.9	41	-46	12	23	86	45	0
560	2	573	542	585	591	2	0.18	0.12	0.2	0.3	3.21	3.29	1.04	2.2	1.2	1	43	-47	13	24	86	45	0
570	2	583	548	595	601	2	0.19	0.13	0.2	0.3	3.15	3.23	1.05	2.4	1.3	1.1	44	-48	15	27	86	44	0
600	2	603	548	625	633	3	0.25	0.15	0.2	0.3	2.91	2.98	1.05	3.3	1.8	1.5	45	-51	23	37	84	40	1
650	2	634	545	667	685	4	0.5	0.18	0.3	0.4	2.64	2.63	0.99	4.4	2.3	2.2	48	-55	34	50	82	36	9
700	2	654	526	693	735	6	0.85	0.22	0.3	0.5	2.31	2.26	0.94	5.9	2.9	3	53	-59	51	66	80	31	13
750	2	664	460	709	785	7	1.17	0.26	0.4	0.6	2.04	1.92	0.86	7	3.2	3.8	56	-62	64	77	77	26	31
400	2.1	418	415	420	423	0	0.09	0.07	0.1	0.1	4.25	4.41	1.09	0.7	0.4	0.3	25	-24	1	3	90	57	0
450	2.1	468	461	472	475	1	0.11	0.08	0.1	0.2	3.94	4.09	1.11	1.2	0.6	0.5	30	-29	2	6	89	54	0
500	2.1	518	502	523	528	1	0.14	0.1	0.1	0.2	3.61	3.75	1.08	1.8	1	0.8	33	-32	6	12	88	50	0
540	2.1	555	530	565	570	2	0.17	0.12	0.2	0.2	3.35	3.43	1.04	2.1	1.2	0.9	42	-46	10	19	87	47	0
550	2.1	561	525	575	580	2	0.18	0.12	0.2	0.2	3.3	3.37	1.05	2.5	1.4	1.1	41	-47	13	22	86	46	0
560	2.1	570	537	584	591	2	0.18	0.13	0.2	0.2	3.2	3.28	1.06	2.7	1.5	1.2	41	-47	13	25	86	44	0
570	2.1	580	543	595	601	2	0.19	0.13	0.2	0.3	3.15	3.23	1.06	2.8	1.5	1.3	43	-47	15	26	86	44	0
600	2.1	602	553	622	632	3	0.22	0.15	0.2	0.3	2.93	2.96	1.02	3.5	1.9	1.6	45	-52	21	36	84	41	2
650	2.1	636	554	664	684	4	0.29	0.18	0.3	0.4	2.67	2.66	0.99	4.6	2.4	2.2	49	-56	32	49	82	36	1
700	2.1	652	523	688	735	6	1.07	0.21	0.3	0.5	2.36	2.3	0.94	6	3	3.1	52	-60	49	64	80	31	14
750	2.1	665	483	700	785	7	1.72	0.25	0.4	0.6	2.12	2.03	0.9	7.3	3.5	3.8	57	-64	61	74	78	27	28

400	2.2	417	412	419	423	1	0.09	0.06	0.1	0.1	4.27	4.43	1.09	1	0.5	0.4	26	-26	1	3	90	57	0
450	2.2	467	458	472	475	1	0.11	0.08	0.1	0.2	3.92	4.09	1.09	1.5	0.8	0.7	29	-30	2	5	89	54	0
500	2.2	516	496	523	528	2	0.14	0.1	0.1	0.2	3.6	3.72	1.07	2.2	1.2	1	34	-33	5	11	88	50	0
550	2.2	562	526	574	580	2	0.17	0.12	0.2	0.2	3.34	3.37	1.03	2.6	1.4	1.1	41	-46	9	19	87	46	0
560	2.2	569	528	584	591	3	0.18	0.13	0.2	0.2	3.25	3.31	1.06	2.9	1.7	1.3	43	-48	11	21	86	45	0
570	2.2	576	529	593	601	3	0.19	0.13	0.2	0.3	3.18	3.26	1.05	3.2	1.7	1.4	44	-48	15	26	86	44	0
600	2.2	602	543	622	632	3	0.21	0.14	0.2	0.3	3.02	3.03	1.01	3.6	1.9	1.6	45	-53	19	32	85	42	0
650	2.2	632	550	658	684	5	0.29	0.18	0.2	0.4	2.69	2.69	1	5.2	2.7	2.4	49	-56	31	47	83	37	1
700	2.2	651	536	682	734	6	1.07	0.21	0.3	0.4	2.41	2.36	0.95	6.4	3.2	3.2	52	-60	45	61	81	32	9
750	2.2	672	517	698	785	7	0.55	0.24	0.3	0.5	2.2	2.13	0.91	7.3	3.6	3.7	57	-66	58	72	78	28	13
400	2.3	417	412	419	423	1	0.09	0.07	0.1	0.1	4.23	4.39	1.11	1.2	0.6	0.5	26	-24	1	2	90	57	0
450	2.3	467	453	471	475	1	0.11	0.08	0.1	0.2	3.94	4.08	1.07	1.8	1	0.8	30	-29	2	6	89	54	0
500	2.3	514	489	523	528	2	0.14	0.1	0.1	0.2	3.65	3.76	1.07	2.4	1.3	1.1	35	-34	4	10	88	51	0
550	2.3	557	513	573	580	3	0.17	0.12	0.2	0.2	3.34	3.42	1.06	3.1	1.8	1.3	42	-47	10	19	87	46	0
560	2.3	568	524	582	590	3	0.18	0.12	0.2	0.2	3.27	3.34	1.06	3.2	1.8	1.4	43	-48	11	21	86	45	0
570	2.3	575	528	591	601	3	0.18	0.13	0.2	0.2	3.18	3.25	1.04	3.5	2	1.6	43	-49	12	24	86	45	0
580	2.3	585	532	603	612	3	0.19	0.13	0.2	0.2	3.18	3.24	1.05	3.4	1.9	1.5	44	-48	13	25	86	44	0
590	2.3	590	532	609	622	3	0.2	0.14	0.2	0.3	3.1	3.17	1.05	3.9	2.1	1.8	45	-51	15	27	85	43	1
600	2.3	597	540	617	632	4	0.22	0.15	0.2	0.3	3	3.04	1.02	4.2	2.3	1.9	45	-51	18	32	85	42	2
650	2.3	629	544	654	684	5	0.3	0.17	0.2	0.3	2.77	2.78	1	5.3	2.8	2.5	49	-55	28	44	83	38	4
700	2.3	651	533	675	734	6	0.54	0.2	0.3	0.4	2.48	2.45	0.97	6.6	3.4	3.2	54	-60	42	59	81	34	6
750	2.3	665	524	691	781	8	1.13	0.23	0.3	0.5	2.25	2.18	0.93	7.7	3.8	3.9	58	-65	54	70	79	29	8
400	2.4	416	408	419	423	1	0.09	0.07	0.1	0.1	4.28	4.42	1.09	1.4	0.7	0.6	27	-26	1	2	90	58	0
450	2.4	466	451	471	475	1	0.11	0.08	0.1	0.1	3.95	4.08	1.07	1.9	1	0.9	30	-29	2	4	89	54	0

500	2.4	513	486	522	528	2	0.14	0.1	0.1	0.2	3.62	3.72	1.06	2.8	1.5	1.2	35	-35	4	10	88	50	0
550	2.4	556	514	572	580	3	0.16	0.12	0.2	0.2	3.4	3.46	1.05	3.3	1.8	1.5	42	-47	8	17	87	47	0
570	2.4	573	524	590	601	3	0.18	0.13	0.2	0.2	3.27	3.32	1.04	3.7	2.1	1.6	43	-48	10	20	86	45	0
580	2.4	580	526	598	611	4	0.18	0.13	0.2	0.2	3.2	3.29	1.05	4	2.2	1.8	45	-50	13	25	86	44	0
590	2.4	588	525	606	621	4	0.19	0.14	0.2	0.3	3.16	3.2	1.01	4.2	2.2	1.9	46	-51	13	25	86	44	0
600	2.4	596	535	615	632	4	0.2	0.14	0.2	0.3	3.11	3.15	1.03	4.4	2.4	2	46	-51	15	28	85	43	0
650	2.4	629	544	649	683	5	0.24	0.17	0.2	0.3	2.8	2.78	0.98	5.6	3	2.6	51	-56	26	43	84	39	0
700	2.4	650	532	676	734	6	0.45	0.2	0.3	0.4	2.55	2.54	0.97	6.9	3.5	3.3	54	-61	38	55	82	34	5
750	2.4	665	538	691	781	8	1.09	0.23	0.3	0.5	2.3	2.25	0.93	7.8	3.9	3.9	57	-65	51	68	79	31	8
400	2.5	416	406	419	422	1	0.09	0.06	0.1	0.1	4.32	4.49	1.09	1.6	0.8	0.7	26	-26	1	2	90	57	0
450	2.5	465	448	471	475	2	0.11	0.08	0.1	0.1	4	4.14	1.09	2.2	1.2	1	30	-30	1	4	89	54	0
500	2.5	511	477	521	527	2	0.13	0.1	0.1	0.2	3.67	3.8	1.08	3.2	1.7	1.5	35	-34	3	9	88	51	0
550	2.5	555	508	570	579	3	0.16	0.12	0.2	0.2	3.37	3.46	1.06	3.6	2	1.6	43	-48	7	16	87	47	0
580	2.5	580	527	598	611	4	0.18	0.13	0.2	0.2	3.25	3.29	1.03	4	2.2	1.8	45	-49	10	21	86	45	1
590	2.5	585	530	604	621	4	0.19	0.13	0.2	0.2	3.2	3.25	1.04	4.4	2.4	2	45	-50	12	24	86	44	0
600	2.5	589	520	608	631	4	0.2	0.14	0.2	0.3	3.08	3.12	1.04	5	2.7	2.2	46	-52	15	27	85	43	0
610	2.5	600	532	623	641	4	0.2	0.15	0.2	0.3	3.08	3.1	1.02	4.8	2.6	2.2	47	-51	15	28	85	43	0
650	2.5	626	543	646	683	5	0.23	0.17	0.2	0.3	2.87	2.87	1.01	5.8	3.1	2.7	50	-56	23	39	84	39	0
700	2.5	645	530	667	731	7	0.3	0.2	0.3	0.4	2.59	2.59	0.98	7.1	3.7	3.4	54	-60	34	52	82	35	3
750	2.5	666	525	683	779	8	0.41	0.22	0.3	0.4	2.42	2.37	0.96	8	4.1	4	58	-65	45	62	80	32	7
400	2.6	414	398	419	422	1	0.09	0.07	0.1	0.1	4.29	4.46	1.09	2	1.1	0.9	28	-27	0	2	90	58	0
450	2.6	462	437	470	475	2	0.11	0.08	0.1	0.1	3.96	4.14	1.09	2.7	1.5	1.2	31	-31	1	4	89	54	0
500	2.6	508	473	520	527	3	0.13	0.1	0.1	0.2	3.7	3.8	1.06	3.6	2	1.6	35	-36	3	8	88	51	0
550	2.6	550	501	566	579	4	0.16	0.12	0.2	0.2	3.42	3.47	1.04	4.1	2.3	1.8	43	-47	6	15	87	48	0

590	2.6	582	518	599	620	4	0.18	0.13	0.2	0.2	3.21	3.26	1.03	4.9	2.7	2.2	45	-50	12	23	86	45	0
600	2.6	590	528	606	631	4	0.19	0.14	0.2	0.2	3.14	3.18	1.03	5.1	2.8	2.3	46	-52	13	26	86	44	0
610	2.6	594	518	613	641	5	0.2	0.14	0.2	0.3	3.08	3.13	1.03	5.4	3	2.4	46	-53	14	27	85	43	0
620	2.6	602	526	619	651	5	0.2	0.15	0.2	0.3	3.05	3.07	1.02	5.7	3.1	2.6	48	-53	15	29	85	42	0
650	2.6	623	536	642	682	6	0.22	0.16	0.2	0.3	2.94	2.96	1.02	6.2	3.4	2.8	50	-56	19	34	84	41	0
700	2.6	644	524	664	732	7	0.3	0.18	0.3	0.3	2.69	2.69	1	7.2	3.9	3.4	55	-60	30	48	83	36	1
750	2.6	656	518	675	772	8	0.31	0.21	0.3	0.4	2.44	2.41	0.96	8.3	4.3	4.1	57	-64	43	60	81	33	5
400	2.7	413	396	418	422	2	0.09	0.07	0.1	0.1	4.26	4.42	1.08	2.3	1.3	1	26	-27	1	2	91	58	0
450	2.7	461	435	470	475	2	0.11	0.08	0.1	0.1	4.01	4.16	1.09	2.9	1.6	1.3	31	-32	1	4	90	55	0
500	2.7	505	463	519	527	3	0.13	0.1	0.1	0.2	3.75	3.85	1.06	3.8	2	1.8	37	-37	3	7	89	52	0
550	2.7	548	500	564	579	4	0.16	0.12	0.2	0.2	3.48	3.53	1.04	4.5	2.5	2	42	-46	5	13	87	48	0
590	2.7	579	513	595	621	5	0.18	0.13	0.2	0.2	3.23	3.29	1.03	5.1	2.8	2.3	46	-52	10	21	86	45	0
600	2.7	588	517	606	631	5	0.18	0.14	0.2	0.2	3.2	3.23	1	5.2	2.8	2.4	46	-52	10	22	86	45	0
610	2.7	590	514	608	640	5	0.19	0.14	0.2	0.3	3.11	3.13	1.01	5.8	3.1	2.7	47	-54	12	25	86	44	0
620	2.7	598	523	613	651	5	0.2	0.15	0.2	0.3	3.08	3.12	1.03	5.9	3.2	2.8	49	-53	14	27	85	43	0
630	2.7	607	529	625	661	5	0.2	0.15	0.2	0.3	3.1	3.11	1.02	5.9	3.2	2.7	49	-54	13	26	85	43	0
650	2.7	615	522	633	681	6	0.22	0.16	0.2	0.3	2.94	2.97	1.02	6.5	3.5	3.1	51	-57	18	34	84	41	0
700	2.7	643	539	660	731	7	0.41	0.18	0.2	0.3	2.73	2.71	0.98	7.4	4	3.4	54	-60	28	45	83	37	1
750	2.7	658	524	676	769	8	0.35	0.21	0.3	0.4	2.51	2.47	0.97	8.4	4.4	4	58	-65	39	57	81	34	3
400	2.8	411	389	418	422	2	0.09	0.07	0.1	0.1	4.31	4.49	1.09	2.7	1.5	1.2	27	-27	0	2	90	58	0
450	2.8	459	430	469	474	2	0.11	0.08	0.1	0.1	4.05	4.17	1.07	3.3	1.8	1.5	32	-32	1	3	90	55	0
500	2.8	505	466	517	527	3	0.13	0.1	0.1	0.2	3.74	3.83	1.05	4.2	2.3	1.9	36	-36	2	5	89	52	0
550	2.8	547	496	562	579	4	0.15	0.11	0.2	0.2	3.51	3.57	1.04	4.6	2.6	2	43	-47	5	11	87	49	0
600	2.8	582	506	597	630	5	0.18	0.13	0.2	0.2	3.26	3.29	1.03	5.8	3.1	2.6	47	-52	10	20	86	45	0

610	2.8	590	517	606	640	5	0.19	0.14	0.2	0.2	3.19	3.24	1.03	6	3.3	2.7	47	-53	11	23	86	44	0
620	2.8	594	512	610	650	6	0.19	0.14	0.2	0.3	3.12	3.14	1.01	6.1	3.3	2.9	48	-54	13	26	86	44	0
630	2.8	600	518	617	661	6	0.2	0.15	0.2	0.3	3.06	3.09	1.02	6.5	3.5	3	49	-54	14	28	85	43	0
650	2.8	615	528	629	681	6	0.21	0.16	0.2	0.3	3	3	1.02	6.8	3.6	3.2	51	-56	17	31	85	42	0
700	2.8	636	526	651	728	7	0.27	0.18	0.2	0.3	2.76	2.75	0.98	7.7	4.1	3.6	54	-61	26	44	83	38	3
750	2.8	653	522	666	771	8	0.31	0.2	0.3	0.4	2.58	2.57	0.98	8.6	4.5	4.1	57	-64	35	53	82	35	2
400	2.9	411	390	418	422	2	0.09	0.06	0.1	0.1	4.34	4.49	1.07	2.8	1.6	1.2	28	-28	0	1	91	58	0
450	2.9	457	427	467	475	3	0.11	0.08	0.1	0.1	4.06	4.2	1.08	3.7	2	1.7	32	-32	1	3	90	55	0
500	2.9	502	459	516	527	3	0.13	0.09	0.1	0.2	3.78	3.87	1.04	4.4	2.3	2	36	-37	2	6	89	52	0
550	2.9	542	483	557	578	4	0.15	0.11	0.2	0.2	3.51	3.59	1.06	5	2.8	2.2	42	-47	5	11	88	49	0
600	2.9	581	513	596	630	5	0.18	0.13	0.2	0.2	3.26	3.3	1.02	5.8	3.1	2.7	46	-51	9	20	86	46	0
610	2.9	582	504	597	640	6	0.18	0.14	0.2	0.2	3.22	3.25	1.02	6.3	3.5	2.9	47	-54	10	22	86	45	0
620	2.9	593	513	608	650	6	0.19	0.14	0.2	0.2	3.19	3.22	1.02	6.3	3.4	2.9	48	-54	10	21	86	44	0
630	2.9	597	515	611	659	6	0.19	0.15	0.2	0.3	3.13	3.14	1.02	6.6	3.6	3	49	-55	12	24	86	44	0
640	2.9	602	517	615	670	6	0.2	0.15	0.2	0.3	3.1	3.13	1.02	6.9	3.7	3.2	50	-55	13	26	85	43	0
650	2.9	609	515	623	680	6	0.2	0.15	0.2	0.3	3.06	3.08	1.01	7	3.8	3.2	51	-56	14	28	85	43	0
700	2.9	634	533	646	727	7	0.28	0.17	0.2	0.3	2.84	2.82	1	8	4.2	3.7	54	-61	23	39	84	40	1
750	2.9	648	525	660	764	9	0.36	0.19	0.3	0.4	2.63	2.63	0.99	8.8	4.6	4.2	58	-64	33	51	82	36	3
400	3	408	383	417	422	2	0.09	0.06	0.1	0.1	4.37	4.5	1.06	3.2	1.8	1.4	29	-28	0	1	91	58	0
450	3	453	410	466	474	3	0.1	0.08	0.1	0.1	4.08	4.22	1.08	4.1	2.3	1.8	32	-33	1	3	90	56	0
500	3	498	447	513	526	4	0.12	0.09	0.1	0.2	3.83	3.94	1.06	4.8	2.6	2.2	37	-36	2	5	89	53	0
550	3	538	477	553	578	5	0.15	0.11	0.1	0.2	3.55	3.61	1.04	5.4	3	2.4	42	-47	4	11	88	49	0
600	3	572	490	589	629	6	0.17	0.13	0.2	0.2	3.31	3.32	1.02	6.4	3.5	2.9	47	-52	8	18	87	47	0
630	3	592	501	606	659	6	0.19	0.14	0.2	0.2	3.19	3.19	1.02	6.9	3.7	3.1	49	-54	11	22	86	45	0

640	3	597	511	611	668	7	0.19	0.14	0.2	0.3	3.12	3.14	1.02	7.2	3.9	3.3	50	-56	13	24	86	44	0
650	3	605	510	617	679	7	0.2	0.15	0.2	0.3	3.11	3.13	1.02	7.2	3.9	3.3	51	-57	13	26	85	43	0
660	3	610	513	624	688	7	0.2	0.15	0.2	0.3	3.06	3.07	1	7.3	3.9	3.4	52	-56	14	27	85	43	0
670	3	617	522	628	699	7	0.21	0.15	0.2	0.3	3.02	3.04	1.01	7.6	4.1	3.5	53	-59	15	30	85	42	0
700	3	630	524	642	725	8	0.23	0.17	0.2	0.3	2.88	2.87	0.98	8.2	4.3	3.9	54	-60	20	36	84	40	0
750	3	647	528	658	764	9	0.5	0.18	0.3	0.3	2.7	2.65	0.96	8.9	4.6	4.3	57	-65	29	46	83	37	3
400	3.1	406	378	415	422	3	0.09	0.07	0.1	0.1	4.32	4.48	1.09	3.8	2.1	1.6	28	-29	0	1	91	58	0
450	3.1	452	411	465	474	3	0.1	0.08	0.1	0.1	4.08	4.21	1.07	4.3	2.4	2	33	-33	1	2	90	56	0
500	3.1	497	450	510	526	4	0.12	0.09	0.1	0.2	3.84	3.93	1.04	5.1	2.8	2.3	37	-37	2	5	89	53	0
550	3.1	535	467	548	577	5	0.14	0.11	0.1	0.2	3.59	3.63	1.02	5.6	3.1	2.4	43	-48	4	9	88	50	0
600	3.1	569	488	583	628	6	0.17	0.13	0.2	0.2	3.32	3.37	1.03	6.6	3.6	3	47	-52	7	16	87	47	0
630	3.1	587	492	601	659	7	0.18	0.14	0.2	0.2	3.24	3.28	1.02	7.1	3.9	3.2	49	-55	10	21	86	45	0
640	3.1	594	499	605	669	7	0.19	0.14	0.2	0.2	3.17	3.19	1	7.3	4	3.4	50	-56	10	22	86	45	0
650	3.1	598	509	610	678	7	0.19	0.14	0.2	0.3	3.11	3.14	1.01	7.6	4	3.6	51	-56	13	25	86	44	0
660	3.1	606	513	618	687	7	0.2	0.15	0.2	0.3	3.05	3.06	1	7.7	4.2	3.5	51	-57	13	27	85	43	0
670	3.1	608	499	618	695	7	0.2	0.15	0.2	0.3	3.09	3.1	1.02	8	4.3	3.7	52	-57	12	26	85	43	0
700	3.1	626	519	635	721	8	0.23	0.16	0.2	0.3	2.94	2.93	1	8.4	4.5	3.9	54	-61	18	34	84	41	1
750	3.1	644	521	657	761	9	0.25	0.18	0.2	0.3	2.73	2.7	0.97	9.1	4.8	4.3	57	-65	27	44	83	38	1
400	3.2	405	370	415	421	3	0.08	0.06	0.1	0.1	4.39	4.51	1.07	3.9	2.1	1.8	29	-29	0	1	91	59	0
450	3.2	450	407	463	474	4	0.1	0.08	0.1	0.1	4.12	4.23	1.07	4.6	2.6	2.1	33	-34	1	3	90	56	0
500	3.2	491	434	506	525	5	0.12	0.09	0.1	0.2	3.85	3.93	1.04	5.6	3	2.6	38	-39	2	5	89	54	0
550	3.2	529	462	541	577	6	0.14	0.11	0.1	0.2	3.59	3.64	1.04	6.2	3.4	2.8	43	-47	3	8	88	51	0
600	3.2	566	486	579	628	6	0.16	0.12	0.2	0.2	3.41	3.43	1.01	7	3.8	3.1	46	-52	5	13	87	48	0
640	3.2	589	498	601	667	7	0.18	0.14	0.2	0.2	3.2	3.21	1.02	7.6	4.1	3.5	50	-56	10	21	86	45	0

650	3.2	595	502	606	676	7	0.19	0.14	0.2	0.2	3.15	3.17	1.02	7.8	4.2	3.6	51	-56	12	23	86	44	0
660	3.2	599	498	612	685	8	0.19	0.14	0.2	0.3	3.12	3.12	1.02	8	4.3	3.7	52	-56	12	24	86	44	0
670	3.2	605	506	615	694	8	0.2	0.15	0.2	0.3	3.1	3.11	1.01	8.2	4.4	3.8	53	-58	12	24	86	44	0
680	3.2	612	512	624	702	8	0.2	0.15	0.2	0.3	3.05	3.06	0.98	8.3	4.5	3.8	53	-60	14	27	85	43	0
690	3.2	614	509	625	711	8	0.21	0.16	0.2	0.3	3	3.01	0.99	8.5	4.5	3.9	53	-60	15	30	85	42	0
700	3.2	619	512	628	717	8	0.21	0.16	0.2	0.3	2.96	2.97	1.01	8.6	4.6	4	55	-60	16	30	85	41	0
750	3.2	636	507	643	755	9	0.28	0.17	0.2	0.3	2.79	2.77	0.98	9.3	4.9	4.3	57	-64	25	42	83	39	1
400	3.3	404	371	414	421	3	0.08	0.07	0.1	0.1	4.36	4.52	1.08	4.1	2.3	1.8	29	-29	0	1	91	58	0
450	3.3	446	397	458	473	4	0.1	0.08	0.1	0.1	4.09	4.22	1.07	5.3	3	2.3	33	-33	0	2	90	56	0
500	3.3	488	427	502	525	5	0.12	0.09	0.1	0.2	3.9	3.97	1.05	6	3.3	2.7	37	-38	1	4	89	54	0
550	3.3	525	455	539	577	6	0.14	0.11	0.1	0.2	3.62	3.68	1.04	6.4	3.5	2.9	43	-48	3	9	88	51	0
600	3.3	564	481	575	627	7	0.16	0.12	0.2	0.2	3.43	3.47	1.04	7	3.8	3.2	47	-53	5	13	87	48	0
650	3.3	592	498	601	674	7	0.18	0.14	0.2	0.2	3.24	3.24	0.99	8	4.3	3.7	51	-55	9	19	86	46	0
670	3.3	601	500	608	692	8	0.19	0.14	0.2	0.2	3.16	3.15	1.01	8.3	4.4	3.8	52	-58	10	22	86	45	0
680	3.3	604	503	617	699	8	0.2	0.15	0.2	0.3	3.09	3.11	1.01	8.5	4.6	4	53	-59	12	25	85	44	0
690	3.3	610	500	618	705	8	0.2	0.15	0.2	0.3	3.08	3.07	0.99	8.6	4.6	4	53	-60	12	26	85	44	0
700	3.3	616	507	629	715	8	0.21	0.16	0.2	0.3	3.01	3.01	1	8.7	4.6	4.1	54	-61	15	29	85	42	0
750	3.3	634	508	640	752	9	0.23	0.17	0.2	0.3	2.85	2.83	0.99	9.4	5	4.4	57	-63	22	37	84	40	0
400	3.4	399	358	412	421	4	0.08	0.06	0.1	0.1	4.41	4.56	1.09	4.6	2.6	2	29	-29	0	1	91	59	0
450	3.4	444	394	457	473	4	0.1	0.08	0.1	0.1	4.14	4.25	1.06	5.5	3	2.5	32	-33	1	3	90	57	0
500	3.4	488	431	500	525	5	0.12	0.09	0.1	0.1	3.93	4.02	1.07	6.1	3.4	2.7	37	-39	1	4	89	53	0
550	3.4	523	448	538	576	6	0.14	0.1	0.1	0.2	3.66	3.72	1.03	6.5	3.6	2.9	43	-48	3	7	88	51	0
600	3.4	557	475	568	624	7	0.16	0.12	0.2	0.2	3.44	3.46	1.02	7.4	4.1	3.3	47	-52	5	11	87	49	0
650	3.4	585	488	589	674	8	0.18	0.13	0.2	0.2	3.25	3.29	1.02	8.3	4.5	3.8	51	-56	8	18	86	46	0

660	3.4	591	490	600	678	8	0.18	0.14	0.2	0.2	3.2	3.21	1	8.5	4.6	3.9	52	-57	10	21	86	45	0
670	3.4	592	493	600	688	8	0.19	0.14	0.2	0.2	3.15	3.19	1.03	8.6	4.6	4	53	-58	11	23	86	45	0
680	3.4	601	499	608	698	8	0.19	0.14	0.2	0.3	3.16	3.16	1.02	8.7	4.7	4	52	-58	11	22	86	44	0
690	3.4	602	492	610	703	9	0.2	0.15	0.2	0.3	3.06	3.07	1.01	8.8	4.7	4.2	53	-60	13	27	85	43	0
700	3.4	615	510	618	714	8	0.2	0.15	0.2	0.3	3.06	3.06	1	8.7	4.7	4.1	54	-60	13	26	85	43	0
710	3.4	615	509	622	720	9	0.21	0.15	0.2	0.3	3.02	3.04	1	9.1	4.8	4.3	55	-61	14	28	85	42	0
750	3.4	626	509	629	748	9	0.22	0.17	0.2	0.3	2.88	2.9	0.99	9.5	5	4.5	57	-63	20	36	84	40	0
400	3.5	397	357	410	421	4	0.08	0.06	0.1	0.1	4.42	4.53	1.07	5	2.8	2.2	29	-29	0	1	91	59	0
450	3.5	442	391	456	473	5	0.1	0.08	0.1	0.1	4.13	4.25	1.06	5.7	3.1	2.5	32	-34	1	2	90	57	0
500	3.5	484	421	497	525	5	0.11	0.09	0.1	0.1	3.93	4.01	1.05	6.3	3.4	2.9	38	-38	1	4	89	54	0
550	3.5	518	442	530	575	6	0.13	0.1	0.1	0.2	3.7	3.77	1.04	7	3.9	3.1	43	-47	2	7	88	52	0
600	3.5	555	465	567	625	7	0.15	0.12	0.2	0.2	3.52	3.54	1.01	7.5	4.2	3.4	47	-52	5	11	88	49	0
650	3.5	583	484	592	671	8	0.17	0.13	0.2	0.2	3.32	3.32	1.01	8.3	4.4	3.8	51	-56	6	15	87	47	0
690	3.5	600	489	608	702	9	0.19	0.14	0.2	0.2	3.15	3.16	1.01	9	4.8	4.2	54	-59	10	22	86	44	0
700	3.5	605	500	610	707	9	0.2	0.15	0.2	0.3	3.1	3.11	1.01	9.1	4.9	4.3	54	-59	11	23	86	44	0
710	3.5	606	497	612	709	9	0.2	0.15	0.2	0.3	3.04	3.06	1.01	9.3	4.9	4.4	55	-61	13	27	85	43	0
720	3.5	618	507	625	720	9	0.21	0.15	0.2	0.3	3.04	3.02	0.98	9.3	5	4.3	56	-61	14	27	85	43	0
730	3.5	623	508	629	731	9	0.21	0.15	0.2	0.3	3.03	2.98	0.97	9.3	5	4.3	57	-62	14	27	85	42	0
740	3.5	626	506	632	743	9	0.21	0.16	0.2	0.3	3	2.97	0.99	9.4	5	4.3	57	-63	15	29	85	42	0
750	3.5	620	499	625	737	10	0.22	0.16	0.2	0.3	2.94	2.93	0.99	9.7	5.2	4.5	56	-65	18	33	85	41	0

Table A2.3 Baseline 3 (3yr, unrestricted) results. Shaded results represent risks to Bpa in the range 10-15%.

TAC	SSBtrig	MnYld	0.1Yld	0.5Yld	0.9Yld	IAV	MnF	0.1F	0.5F	0.9F	SSB	TSSB	SSB20/10	TACYrs	TACinc	TACdec	AvgInc	AvgDec	Rsk2.3	Rsk2.6	4+	7+	Fail
400	2	419	416	420	423	0	0.09	0.1	0.1	0.12	4.24	4.4	1.08	0.3	0.1	0.1	40	-23	1	2	90	57	0
450	2	470	463	472	476	1	0.11	0.1	0.1	0.15	3.95	4.08	1.09	0.5	0.3	0.3	54	-34	2	6	89	54	0
500	2	519	503	524	528	1	0.14	0.1	0.1	0.19	3.59	3.69	1.06	0.7	0.3	0.4	66	-48	6	13	88	50	0
540	2	555	525	566	570	1	0.17	0.1	0.2	0.23	3.35	3.44	1.04	0.8	0.5	0.4	84	-82	11	19	87	46	0
550	2	564	531	576	581	2	0.18	0.1	0.2	0.25	3.24	3.3	1.03	0.9	0.5	0.4	83	-83	12	21	87	46	0
560	2	573	544	586	591	1	0.19	0.1	0.2	0.26	3.2	3.27	1.05	0.9	0.5	0.4	79	-83	14	25	86	45	0
600	2	604	550	626	633	2	0.22	0.2	0.2	0.31	2.93	2.97	1.03	1.2	0.7	0.6	95	-95	22	36	84	40	1
650	2	636	545	673	685	4	0.28	0.2	0.3	0.39	2.63	2.63	0.99	1.6	0.8	0.8	112	-118	35	50	82	36	4
700	2	651	503	692	737	5	0.36	0.2	0.3	0.5	2.3	2.23	0.92	2.2	1.1	1.1	117	-139	51	66	79	30	11
750	2	656	436	700	788	7	0.45	0.3	0.4	0.62	2	1.89	0.87	2.7	1.2	1.4	132	-159	65	77	77	25	24
400	2.1	418	415	420	423	0	0.09	0.1	0.1	0.12	4.24	4.4	1.1	0.3	0.2	0.2	49	-30	0	2	90	57	0
450	2.1	469	461	472	475	1	0.11	0.1	0.1	0.15	3.96	4.11	1.1	0.6	0.3	0.3	48	-32	2	6	89	54	0
500	2.1	518	500	524	528	1	0.14	0.1	0.1	0.19	3.61	3.73	1.08	0.9	0.4	0.4	63	-44	5	12	88	50	0
540	2.1	555	524	565	570	1	0.17	0.1	0.2	0.23	3.36	3.41	1.06	0.8	0.4	0.4	83	-76	10	19	87	47	0
550	2.1	563	526	575	581	2	0.18	0.1	0.2	0.23	3.3	3.37	1.05	1	0.5	0.5	81	-77	10	20	87	46	1
560	2.1	569	528	586	591	2	0.18	0.1	0.2	0.24	3.2	3.27	1.04	1.1	0.6	0.5	85	-84	14	25	86	45	0
600	2.1	600	538	626	633	3	0.22	0.2	0.2	0.29	2.96	2.98	1.02	1.4	0.7	0.7	98	-100	21	34	85	41	1
650	2.1	631	529	663	685	4	0.27	0.2	0.3	0.37	2.67	2.68	0.99	1.8	0.9	0.9	107	-117	34	48	83	36	1
700	2.1	651	514	681	736	5	0.34	0.2	0.3	0.47	2.32	2.26	0.94	2.4	1.1	1.2	121	-138	50	65	80	31	8
750	2.1	648	454	691	786	7	0.4	0.3	0.4	0.56	2.08	2.01	0.93	2.9	1.3	1.5	130	-152	61	74	77	27	17
400	2.2	417	414	420	423	1	0.09	0.1	0.1	0.12	4.27	4.45	1.09	0.5	0.2	0.2	47	-32	1	2	90	57	0
450	2.2	468	456	472	476	1	0.11	0.1	0.1	0.15	3.97	4.09	1.07	0.7	0.4	0.3	51	-36	2	5	89	54	0

500	2.2	517	495	524	528	1	0.14	0.1	0.1	0.18	3.64	3.74	1.06	1	0.5	0.5	59	-43	5	11	88	50	0
550	2.2	562	522	575	581	2	0.17	0.1	0.2	0.23	3.35	3.41	1.03	1.1	0.6	0.5	82	-83	10	20	87	47	0
560	2.2	570	530	585	591	2	0.18	0.1	0.2	0.24	3.26	3.33	1.04	1.1	0.6	0.5	84	-78	12	23	86	45	0
570	2.2	579	533	595	601	2	0.18	0.1	0.2	0.24	3.2	3.28	1.05	1.2	0.6	0.6	92	-88	12	23	86	45	0
580	2.2	586	532	606	612	2	0.19	0.1	0.2	0.25	3.14	3.2	1.04	1.3	0.7	0.6	92	-88	14	26	86	44	0
600	2.2	603	550	624	633	3	0.21	0.1	0.2	0.28	3.05	3.08	1.03	1.5	0.8	0.7	94	-94	18	31	85	42	0
650	2.2	627	546	651	684	4	0.26	0.2	0.3	0.36	2.65	2.66	0.99	2.1	1	1.1	110	-109	33	49	83	37	1
700	2.2	651	531	679	736	6	0.34	0.2	0.3	0.44	2.39	2.36	0.96	2.4	1.2	1.2	124	-139	45	61	81	32	6
750	2.2	647	451	677	785	8	0.39	0.3	0.3	0.51	2.11	2.07	0.97	3	1.4	1.5	137	-156	60	74	78	28	10
400	2.3	417	408	420	423	1	0.09	0.1	0.1	0.12	4.26	4.44	1.1	0.6	0.3	0.3	48	-36	1	3	90	57	0
450	2.3	467	449	472	476	1	0.11	0.1	0.1	0.14	4	4.17	1.1	0.8	0.4	0.4	57	-38	2	5	89	54	0
500	2.3	514	488	524	528	1	0.14	0.1	0.1	0.18	3.67	3.77	1.07	1.1	0.5	0.5	67	-52	4	9	88	50	0
550	2.3	559	521	575	580	2	0.17	0.1	0.2	0.22	3.35	3.41	1.05	1.2	0.6	0.5	83	-80	9	19	87	47	0
560	2.3	567	517	585	591	2	0.17	0.1	0.2	0.23	3.28	3.34	1.03	1.3	0.7	0.6	90	-88	10	20	86	46	0
570	2.3	578	529	595	602	2	0.18	0.1	0.2	0.24	3.27	3.33	1.04	1.3	0.7	0.6	93	-90	10	21	86	45	0
580	2.3	584	532	604	612	3	0.19	0.1	0.2	0.25	3.18	3.25	1.04	1.4	0.7	0.6	92	-91	14	25	86	44	0
590	2.3	593	545	614	622	3	0.19	0.1	0.2	0.26	3.15	3.18	1.02	1.5	0.8	0.7	93	-90	14	26	86	44	0
600	2.3	598	533	622	632	3	0.2	0.1	0.2	0.27	3.07	3.11	1.04	1.6	0.9	0.7	103	-98	16	29	85	42	0
650	2.3	629	540	652	685	4	0.26	0.2	0.2	0.33	2.74	2.73	0.99	2.1	1	1.1	110	-114	29	45	83	38	3
700	2.3	651	532	678	736	6	0.3	0.2	0.3	0.4	2.47	2.43	0.97	2.5	1.2	1.3	124	-133	42	58	81	33	3
750	2.3	657	483	690	786	7	0.35	0.2	0.3	0.48	2.23	2.18	0.97	3	1.5	1.5	134	-150	54	70	79	29	10
400	2.4	416	407	419	423	1	0.09	0.1	0.1	0.12	4.3	4.45	1.1	0.6	0.3	0.3	48	-34	0	2	90	58	0
450	2.4	466	447	471	475	1	0.11	0.1	0.1	0.14	4	4.14	1.08	0.9	0.4	0.4	58	-41	2	4	89	55	0
500	2.4	513	480	523	528	2	0.14	0.1	0.1	0.18	3.7	3.81	1.08	1.3	0.6	0.6	66	-51	4	9	88	51	0

550	2.4	557	513	574	581	2	0.16	0.1	0.2	0.22	3.4	3.46	1.03	1.3	0.7	0.6	83	-81	8	17	87	47	0
560	2.4	566	517	584	591	2	0.17	0.1	0.2	0.23	3.31	3.36	1.04	1.4	0.7	0.7	88	-85	10	20	87	46	1
570	2.4	573	518	593	601	3	0.18	0.1	0.2	0.23	3.28	3.33	1.04	1.5	0.8	0.7	91	-92	11	22	86	46	0
580	2.4	580	527	600	612	3	0.19	0.1	0.2	0.24	3.2	3.25	1.03	1.6	0.9	0.8	95	-92	12	24	86	45	0
590	2.4	587	524	610	622	3	0.19	0.1	0.2	0.26	3.15	3.2	1.05	1.6	0.9	0.7	94	-94	15	26	86	43	0
600	2.4	593	526	615	633	3	0.2	0.1	0.2	0.26	3.07	3.13	1.03	1.7	0.9	0.9	98	-96	16	29	85	43	0
650	2.4	627	540	646	684	4	0.24	0.2	0.2	0.32	2.78	2.8	0.99	2.2	1.1	1.1	110	-110	29	44	83	38	0
700	2.4	642	507	665	734	6	0.28	0.2	0.3	0.38	2.54	2.52	0.99	2.6	1.3	1.3	126	-134	39	56	82	34	1
750	2.4	656	490	685	783	7	0.34	0.2	0.3	0.46	2.27	2.25	0.95	3	1.5	1.5	137	-147	52	68	79	30	5
400	2.5	416	404	419	423	1	0.09	0.1	0.1	0.11	4.28	4.46	1.09	0.7	0.4	0.3	46	-32	1	2	90	58	0
450	2.5	464	441	471	475	1	0.11	0.1	0.1	0.14	3.99	4.12	1.08	1	0.5	0.5	57	-42	2	4	90	55	0
500	2.5	511	477	523	528	2	0.13	0.1	0.1	0.17	3.71	3.81	1.06	1.4	0.7	0.7	65	-55	3	8	88	51	0
550	2.5	555	503	573	580	2	0.16	0.1	0.2	0.21	3.4	3.45	1.04	1.4	0.8	0.7	87	-81	8	16	87	47	0
580	2.5	577	517	597	611	3	0.18	0.1	0.2	0.24	3.24	3.28	1.03	1.7	0.9	0.8	93	-92	11	22	86	45	0
590	2.5	587	528	605	622	3	0.19	0.1	0.2	0.25	3.19	3.21	1.03	1.7	0.9	0.8	97	-95	13	24	86	44	0
600	2.5	592	518	614	632	4	0.19	0.1	0.2	0.25	3.14	3.18	1.04	1.8	1	0.9	102	-97	14	26	85	43	0
650	2.5	623	531	640	684	5	0.23	0.2	0.2	0.31	2.84	2.85	1	2.3	1.2	1.1	110	-115	25	40	84	39	0
700	2.5	641	519	662	734	6	0.28	0.2	0.3	0.37	2.56	2.54	0.97	2.7	1.4	1.4	124	-132	37	54	82	35	3
750	2.5	656	517	673	782	8	0.32	0.2	0.3	0.43	2.35	2.33	0.98	3.1	1.6	1.6	139	-153	48	63	80	31	3
400	2.6	414	399	419	423	1	0.09	0.1	0.1	0.11	4.31	4.48	1.08	0.9	0.5	0.4	49	-36	0	2	90	58	0
450	2.6	463	437	471	475	2	0.11	0.1	0.1	0.14	4.03	4.15	1.08	1.2	0.6	0.6	57	-45	1	4	90	55	0
500	2.6	509	473	522	528	2	0.13	0.1	0.1	0.17	3.71	3.81	1.05	1.5	0.8	0.7	65	-52	3	8	88	51	0
550	2.6	551	492	569	580	3	0.16	0.1	0.2	0.21	3.43	3.47	1.04	1.6	0.9	0.7	87	-82	7	16	87	48	0
580	2.6	574	513	594	611	3	0.18	0.1	0.2	0.23	3.26	3.31	1.03	1.8	0.9	0.8	95	-96	10	20	86	46	0

590	2.6	583	522	598	621	4	0.18	0.1	0.2	0.24	3.25	3.3	1.03	1.9	1	0.9	99	-97	11	22	86	45	0
600	2.6	587	514	605	631	4	0.19	0.1	0.2	0.25	3.14	3.19	1.03	2	1.1	1	101	-98	14	26	86	44	0
610	2.6	599	530	617	642	4	0.2	0.2	0.2	0.26	3.11	3.15	1.04	2	1.1	0.9	103	-96	14	26	85	43	0
650	2.6	619	529	638	684	5	0.22	0.2	0.2	0.29	2.89	2.9	1.01	2.4	1.2	1.2	114	-112	22	37	84	40	0
700	2.6	645	530	663	734	6	0.26	0.2	0.3	0.34	2.67	2.64	0.97	2.8	1.4	1.3	124	-130	31	49	83	36	0
750	2.6	654	511	677	781	8	0.32	0.2	0.3	0.41	2.41	2.38	0.96	3.2	1.6	1.6	135	-153	45	61	81	33	4
400	2.7	413	394	419	422	1	0.09	0.1	0.1	0.11	4.37	4.52	1.09	1	0.5	0.5	49	-41	0	1	91	58	0
450	2.7	461	433	470	475	2	0.11	0.1	0.1	0.14	4.04	4.17	1.07	1.3	0.7	0.6	57	-46	1	3	90	55	0
500	2.7	508	467	521	528	2	0.13	0.1	0.1	0.17	3.74	3.83	1.05	1.6	0.8	0.8	66	-54	3	8	88	52	0
550	2.7	550	494	569	580	3	0.15	0.1	0.2	0.2	3.51	3.59	1.05	1.6	0.9	0.8	88	-86	5	12	87	48	0
580	2.7	571	504	587	611	4	0.17	0.1	0.2	0.22	3.29	3.31	1.02	2	1	1	95	-90	10	20	87	46	0
590	2.7	578	510	593	621	4	0.18	0.1	0.2	0.23	3.24	3.29	1.03	2.1	1.1	1	96	-93	10	21	86	46	0
600	2.7	586	518	601	632	4	0.19	0.1	0.2	0.24	3.19	3.26	1.03	2.1	1.1	1	102	-97	11	23	86	44	0
610	2.7	592	516	608	642	4	0.19	0.1	0.2	0.24	3.17	3.25	1.04	2.2	1.1	1	102	-103	12	23	86	44	0
620	2.7	598	516	615	652	5	0.2	0.1	0.2	0.25	3.1	3.11	1.01	2.3	1.2	1.1	108	-107	15	28	86	44	0
650	2.7	617	527	634	683	5	0.22	0.2	0.2	0.29	2.93	2.93	0.99	2.5	1.3	1.2	115	-113	20	35	85	41	0
700	2.7	642	530	659	733	6	0.26	0.2	0.3	0.33	2.7	2.68	0.98	2.8	1.4	1.4	122	-130	30	46	83	37	0
750	2.7	658	532	672	781	8	0.29	0.2	0.3	0.39	2.49	2.47	0.96	3.1	1.6	1.5	136	-147	41	57	81	34	0
400	2.8	411	388	419	422	1	0.09	0.1	0.1	0.11	4.33	4.48	1.08	1.1	0.6	0.5	51	-40	0	2	91	58	0
450	2.8	461	433	470	475	2	0.11	0.1	0.1	0.13	4.06	4.17	1.06	1.4	0.7	0.6	61	-46	1	3	90	55	0
500	2.8	505	459	521	527	3	0.13	0.1	0.1	0.16	3.75	3.84	1.05	1.8	0.9	0.9	70	-58	2	7	89	52	0
550	2.8	545	488	561	580	3	0.15	0.1	0.2	0.2	3.49	3.56	1.04	1.9	1	0.9	87	-89	6	13	87	48	0
590	2.8	576	508	592	621	4	0.17	0.1	0.2	0.23	3.3	3.33	1.02	2.1	1.1	1	93	-95	10	20	87	46	0
600	2.8	580	505	598	631	5	0.18	0.1	0.2	0.23	3.22	3.27	1.03	2.2	1.2	1	106	-104	11	22	86	45	0

610	2.8	588	505	602	642	5	0.19	0.1	0.2	0.24	3.2	3.23	1.01	2.3	1.2	1.1	104	-105	11	23	86	45	0
620	2.8	596	516	612	652	5	0.19	0.1	0.2	0.25	3.18	3.2	1.02	2.4	1.2	1.1	104	-105	12	24	86	44	1
630	2.8	603	513	619	662	5	0.2	0.1	0.2	0.26	3.08	3.12	1.02	2.4	1.2	1.2	108	-108	14	27	85	43	0
640	2.8	609	522	622	672	5	0.2	0.2	0.2	0.26	3.08	3.1	1.02	2.5	1.3	1.2	112	-113	15	28	85	43	0
650	2.8	610	510	630	683	5	0.21	0.2	0.2	0.28	2.99	3.02	1.02	2.6	1.3	1.3	113	-113	18	32	85	42	0
700	2.8	636	525	652	732	7	0.24	0.2	0.2	0.32	2.76	2.77	1.01	2.9	1.5	1.4	125	-132	26	43	83	38	1
750	2.8	648	519	659	772	8	0.28	0.2	0.3	0.37	2.52	2.53	0.99	3.3	1.7	1.6	141	-153	40	56	82	34	0
400	2.9	410	385	418	422	2	0.09	0.1	0.1	0.11	4.34	4.48	1.07	1.3	0.7	0.6	51	-43	0	2	91	59	0
450	2.9	457	420	470	475	2	0.1	0.1	0.1	0.13	4.1	4.21	1.04	1.5	0.8	0.7	62	-52	1	3	90	56	0
500	2.9	504	457	520	527	3	0.13	0.1	0.1	0.16	3.81	3.9	1.06	1.8	0.9	0.9	68	-59	2	6	89	52	0
550	2.9	541	482	558	579	4	0.15	0.1	0.2	0.19	3.54	3.62	1.05	2	1.1	0.9	90	-86	5	12	88	49	0
600	2.9	578	497	593	631	5	0.18	0.1	0.2	0.23	3.27	3.32	1.03	2.3	1.2	1.1	104	-104	10	21	86	46	0
610	2.9	586	503	602	641	5	0.18	0.1	0.2	0.23	3.22	3.25	1	2.3	1.2	1.1	106	-106	10	21	86	46	0
620	2.9	592	507	608	651	5	0.19	0.1	0.2	0.24	3.18	3.23	1.03	2.5	1.3	1.2	104	-109	11	23	86	44	0
630	2.9	594	503	607	662	5	0.19	0.1	0.2	0.25	3.11	3.15	1.03	2.6	1.3	1.2	110	-111	13	25	86	44	0
640	2.9	603	510	620	671	5	0.2	0.2	0.2	0.26	3.07	3.11	1.02	2.7	1.4	1.3	111	-109	14	27	85	43	0
650	2.9	611	521	626	682	6	0.21	0.2	0.2	0.27	3.04	3.06	1.02	2.6	1.3	1.3	115	-114	17	30	85	42	0
700	2.9	633	514	644	732	7	0.24	0.2	0.2	0.32	2.78	2.75	0.97	2.9	1.5	1.4	131	-132	27	42	84	39	0
750	2.9	644	518	660	761	8	0.27	0.2	0.3	0.36	2.58	2.58	1	3.3	1.7	1.7	139	-147	36	54	82	35	1
400	3	409	382	418	422	2	0.09	0.1	0.1	0.11	4.36	4.51	1.08	1.4	0.7	0.6	53	-43	0	1	91	59	0
450	3	456	418	469	475	2	0.1	0.1	0.1	0.13	4.11	4.23	1.06	1.6	0.8	0.8	61	-51	1	2	90	56	0
500	3	499	448	515	527	3	0.12	0.1	0.1	0.16	3.81	3.88	1.04	2	1.1	1	69	-62	2	5	89	53	0
550	3	539	473	554	579	4	0.15	0.1	0.1	0.19	3.6	3.66	1.04	2.1	1.1	1	93	-83	4	10	88	50	0
600	3	574	494	586	631	5	0.17	0.1	0.2	0.22	3.3	3.36	1.03	2.5	1.3	1.2	104	-102	8	18	86	46	0

620	3	586	501	599	651	5	0.18	0.1	0.2	0.23	3.23	3.26	1.02	2.6	1.3	1.2	107	-108	10	21	86	45	0
630	3	589	499	601	661	6	0.19	0.1	0.2	0.24	3.15	3.19	1.02	2.7	1.4	1.3	111	-113	13	25	86	45	0
640	3	599	508	614	672	6	0.19	0.1	0.2	0.25	3.12	3.14	1.01	2.7	1.4	1.3	113	-111	12	25	86	44	0
650	3	606	510	618	681	6	0.2	0.2	0.2	0.26	3.08	3.07	0.99	2.8	1.4	1.3	116	-113	14	26	85	43	0
660	3	612	516	621	691	6	0.2	0.2	0.2	0.26	3.06	3.05	0.99	2.8	1.5	1.4	118	-119	14	28	85	43	0
700	3	630	523	638	729	7	0.23	0.2	0.2	0.3	2.87	2.85	0.98	3.1	1.6	1.5	129	-132	22	38	84	40	0
750	3	640	512	654	767	9	0.26	0.2	0.3	0.35	2.62	2.63	0.99	3.4	1.8	1.7	140	-147	32	51	82	36	0
400	3.1	408	379	418	422	2	0.08	0.1	0.1	0.11	4.41	4.54	1.06	1.4	0.8	0.6	55	-47	0	1	91	59	0
450	3.1	453	413	468	475	3	0.1	0.1	0.1	0.13	4.13	4.22	1.05	1.8	0.9	0.9	64	-56	1	3	90	56	0
500	3.1	496	442	510	527	3	0.12	0.1	0.1	0.16	3.86	3.95	1.06	2.1	1.1	1	71	-65	2	6	89	53	0
550	3.1	535	465	549	579	4	0.14	0.1	0.1	0.18	3.62	3.67	1.03	2.2	1.2	1	91	-89	3	9	88	51	0
600	3.1	571	487	584	630	5	0.17	0.1	0.2	0.21	3.36	3.38	1.01	2.5	1.3	1.2	103	-103	7	17	87	47	0
630	3.1	588	498	599	661	6	0.18	0.1	0.2	0.23	3.22	3.24	1.01	2.8	1.4	1.3	111	-110	10	21	86	45	0
640	3.1	594	505	606	670	6	0.19	0.1	0.2	0.25	3.16	3.22	1.03	2.9	1.5	1.4	112	-113	12	24	86	44	0
650	3.1	599	504	609	681	6	0.19	0.1	0.2	0.24	3.11	3.11	1	2.9	1.5	1.4	115	-119	13	26	86	44	0
660	3.1	600	499	609	691	7	0.2	0.2	0.2	0.25	3.07	3.08	1	3	1.5	1.5	120	-119	14	27	85	43	0
700	3.1	624	512	635	728	7	0.22	0.2	0.2	0.29	2.91	2.9	0.99	3.2	1.6	1.6	129	-129	19	35	84	41	0
750	3.1	634	500	643	762	9	0.25	0.2	0.2	0.33	2.68	2.67	1.01	3.5	1.8	1.7	141	-149	30	47	83	37	0
400	3.2	406	375	417	422	2	0.08	0.1	0.1	0.11	4.41	4.57	1.08	1.5	0.8	0.7	55	-47	0	1	91	59	0
450	3.2	451	406	466	474	3	0.1	0.1	0.1	0.13	4.14	4.26	1.05	1.8	0.9	0.9	68	-57	0	2	90	56	0
500	3.2	495	444	510	527	3	0.12	0.1	0.1	0.15	3.86	3.95	1.05	2.2	1.1	1.1	72	-64	2	5	89	53	0
550	3.2	532	462	544	579	4	0.14	0.1	0.1	0.18	3.61	3.66	1.03	2.3	1.2	1.1	90	-89	3	9	88	50	0
600	3.2	570	493	581	629	5	0.16	0.1	0.2	0.21	3.39	3.43	1.02	2.6	1.4	1.2	102	-102	6	15	87	48	0
640	3.2	590	490	600	671	6	0.18	0.1	0.2	0.24	3.21	3.24	1.02	2.8	1.5	1.4	117	-115	10	21	86	45	0

650	3.2	598	510	609	679	6	0.19	0.1	0.2	0.24	3.15	3.16	1	3	1.5	1.4	118	-117	11	23	86	44	0
660	3.2	603	501	611	691	6	0.19	0.1	0.2	0.25	3.14	3.12	1	3	1.6	1.4	114	-118	13	24	86	44	0
670	3.2	602	500	611	696	7	0.2	0.2	0.2	0.26	3.05	3.1	1.02	3.2	1.7	1.5	121	-123	15	29	85	43	0
680	3.2	611	508	619	709	7	0.2	0.2	0.2	0.26	3.04	3.03	1.01	3.1	1.6	1.5	123	-125	15	29	85	43	0
700	3.2	620	511	629	722	7	0.22	0.2	0.2	0.29	2.95	2.95	0.99	3.2	1.6	1.5	126	-136	19	33	85	42	0
750	3.2	638	516	648	758	9	0.24	0.2	0.2	0.32	2.78	2.76	0.97	3.5	1.8	1.7	138	-146	25	42	83	39	1
400	3.3	403	367	417	422	2	0.08	0.1	0.1	0.1	4.46	4.58	1.06	1.6	0.8	0.8	56	-48	0	1	91	59	0
450	3.3	450	404	466	475	3	0.1	0.1	0.1	0.12	4.16	4.25	1.05	1.9	1	0.9	63	-53	0	2	90	57	0
500	3.3	489	428	503	526	4	0.12	0.1	0.1	0.15	3.9	3.97	1.04	2.4	1.3	1.2	75	-68	1	4	89	54	0
550	3.3	528	453	541	579	5	0.14	0.1	0.1	0.17	3.66	3.72	1.03	2.4	1.2	1.2	92	-92	3	8	88	51	0
600	3.3	562	471	578	630	6	0.16	0.1	0.2	0.2	3.43	3.44	1	2.7	1.4	1.3	105	-101	6	13	87	48	0
640	3.3	590	500	601	670	6	0.18	0.1	0.2	0.23	3.23	3.23	1	3	1.5	1.4	110	-114	10	20	86	46	0
650	3.3	591	491	602	680	7	0.18	0.1	0.2	0.24	3.2	3.24	1.02	3	1.5	1.4	117	-115	10	22	86	45	0
660	3.3	598	495	608	689	7	0.19	0.1	0.2	0.25	3.17	3.18	1.01	3.1	1.6	1.5	118	-118	11	23	86	44	0
670	3.3	602	492	613	696	7	0.19	0.1	0.2	0.25	3.13	3.13	0.99	3.2	1.6	1.6	120	-120	12	25	86	44	0
680	3.3	608	508	612	707	7	0.2	0.2	0.2	0.25	3.1	3.11	1	3.2	1.6	1.5	126	-126	13	25	85	43	0
690	3.3	609	498	617	714	8	0.2	0.2	0.2	0.26	3.06	3.06	1	3.2	1.7	1.6	127	-130	14	27	85	43	0
700	3.3	616	504	624	725	8	0.21	0.2	0.2	0.27	3	3.01	0.99	3.3	1.7	1.6	128	-131	17	30	85	42	0
750	3.3	636	504	642	760	8	0.24	0.2	0.2	0.32	2.79	2.79	1	3.5	1.8	1.7	137	-146	24	41	83	39	0
400	3.4	402	364	414	422	3	0.08	0.1	0.1	0.1	4.43	4.56	1.07	1.8	1	0.8	56	-51	0	1	91	59	0
450	3.4	445	397	458	474	3	0.1	0.1	0.1	0.12	4.18	4.29	1.07	2.1	1.1	1	66	-60	0	2	90	57	0
500	3.4	486	424	499	526	4	0.11	0.1	0.1	0.14	3.94	4.03	1.04	2.5	1.3	1.2	76	-67	1	4	89	54	0
550	3.4	524	449	537	578	5	0.14	0.1	0.1	0.17	3.68	3.74	1.03	2.5	1.3	1.2	96	-91	3	8	88	51	0
600	3.4	562	473	576	630	6	0.16	0.1	0.2	0.2	3.49	3.49	1.01	2.7	1.4	1.3	107	-103	5	12	88	49	0

650	3.4	589	494	600	678	7	0.18	0.1	0.2	0.23	3.23	3.22	0.98	3.1	1.6	1.5	116	-115	10	20	86	46	0
660	3.4	593	493	599	685	7	0.19	0.1	0.2	0.24	3.19	3.2	1	3.1	1.6	1.5	122	-122	11	22	86	45	0
670	3.4	598	493	605	696	7	0.19	0.1	0.2	0.24	3.18	3.18	0.99	3.2	1.6	1.6	117	-123	11	23	86	45	1
680	3.4	603	499	609	703	7	0.19	0.1	0.2	0.25	3.12	3.12	0.99	3.2	1.7	1.6	123	-125	12	24	86	44	0
690	3.4	610	504	619	712	7	0.2	0.2	0.2	0.26	3.1	3.09	0.99	3.3	1.7	1.6	124	-126	13	26	85	44	0
700	3.4	610	500	619	718	8	0.2	0.2	0.2	0.26	3.03	3.01	0.99	3.4	1.8	1.6	130	-132	15	29	85	43	0
710	3.4	613	500	618	720	8	0.21	0.2	0.2	0.27	3.03	3.04	1	3.4	1.8	1.6	131	-135	15	29	85	42	0
750	3.4	632	514	636	749	9	0.23	0.2	0.2	0.3	2.87	2.86	0.99	3.5	1.8	1.8	140	-146	20	36	84	40	0
400	3.5	399	357	413	421	3	0.08	0.1	0.1	0.1	4.46	4.58	1.06	1.9	1	0.9	58	-54	0	0	91	60	0
450	3.5	444	396	457	474	4	0.1	0.1	0.1	0.12	4.19	4.28	1.04	2.2	1.2	1	65	-59	1	2	90	57	0
500	3.5	483	419	495	526	4	0.11	0.1	0.1	0.14	3.94	4	1.04	2.5	1.3	1.3	76	-71	1	4	89	55	0
550	3.5	521	445	533	577	5	0.13	0.1	0.1	0.17	3.72	3.77	1.04	2.6	1.4	1.2	94	-89	2	7	88	52	0
600	3.5	554	465	565	628	6	0.15	0.1	0.2	0.2	3.51	3.55	1.03	2.9	1.5	1.3	102	-103	5	11	88	49	0
650	3.5	585	487	592	679	7	0.17	0.1	0.2	0.22	3.31	3.33	1	3.1	1.5	1.5	120	-118	7	17	87	46	0
680	3.5	602	495	608	699	7	0.19	0.1	0.2	0.25	3.17	3.17	0.99	3.3	1.7	1.6	122	-120	10	22	86	45	0
690	3.5	599	487	607	704	8	0.19	0.2	0.2	0.25	3.11	3.14	1.03	3.4	1.7	1.7	127	-131	12	25	86	44	0
700	3.5	605	501	612	704	8	0.2	0.2	0.2	0.26	3.07	3.06	1	3.5	1.8	1.7	126	-129	13	26	85	43	0
710	3.5	614	501	621	722	8	0.2	0.2	0.2	0.26	3.08	3.06	0.99	3.4	1.8	1.6	129	-133	14	27	85	43	0
750	3.5	624	505	626	745	9	0.22	0.2	0.2	0.29	2.9	2.91	1.02	3.6	1.8	1.8	142	-143	21	35	84	40	0

Table A2.4 Baseline 4 (1yr, unrestricted) results. Shaded results represent risks to Bpa in the range 10-15%.

TAC	SSBtrig	MnYld	0.1Yld	0.5Yld	0.9Yld	IAV	MnF	0.1F	0.5F	0.9F	SSB	TSSB	SSB20/10	TACYrs	TACinc	TACdec	AvgInc	AvgDec	Rsk2.3	Rsk2.6	4+	7+	Fail
400	2	419	416	420	423	0	0.09	0.1	0.1	0.1	4.2	4.42	1.12	0.5	0.3	0.3	34	-27	1	3	90	57	0
450	2	470	464	472	476	1	0.12	0.1	0.1	0.2	3.9	4.07	1.09	0.9	0.4	0.4	41	-35	2	6	89	54	0
500	2	520	510	524	528	1	0.14	0.1	0.1	0.2	3.6	3.73	1.07	1.3	0.7	0.7	45	-40	6	13	88	50	0
540	2	556	535	565	570	2	0.17	0.1	0.2	0.2	3.3	3.43	1.06	1.7	0.9	0.8	55	-54	11	21	86	46	0
550	2	565	541	575	581	2	0.18	0.1	0.2	0.3	3.2	3.33	1.07	1.8	0.9	0.9	59	-57	13	23	86	45	0
560	2	576	545	586	591	2	0.19	0.1	0.2	0.3	3.2	3.24	1.06	1.9	1	1	60	-59	14	26	86	44	0
570	2	585	559	596	602	2	0.19	0.1	0.2	0.3	3.2	3.2	1.04	2	1.1	1	60	-59	14	27	85	43	0
600	2	605	554	625	633	4	0.23	0.2	0.2	0.3	2.9	2.93	1.01	3	1.5	1.5	64	-65	24	38	84	40	1
650	2	633	538	665	684	6	0.28	0.2	0.3	0.4	2.6	2.58	0.99	4.2	2.1	2.2	74	-73	38	52	82	35	0
700	2	657	525	693	735	8	0.34	0.2	0.3	0.5	2.3	2.21	0.94	5.5	2.7	2.9	78	-81	53	68	79	30	0
750	2	663	473	701	784	10	0.4	0.3	0.4	0.6	2	1.92	0.9	6.9	3.3	3.6	84	-89	66	80	77	25	7
400	2.1	418	415	420	423	1	0.09	0.1	0.1	0.1	4.2	4.44	1.11	0.7	0.3	0.3	37	-30	1	3	90	57	0
450	2.1	469	464	472	476	1	0.11	0.1	0.1	0.2	3.9	4.07	1.07	1	0.5	0.5	40	-35	2	6	89	54	0
500	2.1	519	503	524	528	1	0.14	0.1	0.1	0.2	3.6	3.73	1.08	1.6	0.8	0.8	44	-38	5	11	88	50	0
540	2.1	554	524	564	570	2	0.17	0.1	0.2	0.2	3.3	3.39	1.06	2	1	1	57	-55	12	21	87	46	0
550	2.1	563	529	574	580	3	0.18	0.1	0.2	0.2	3.3	3.37	1.07	2.2	1.1	1.1	60	-60	12	23	86	46	0
560	2.1	574	542	585	591	3	0.19	0.1	0.2	0.3	3.2	3.29	1.07	2.2	1.1	1.1	58	-58	13	25	86	44	0
570	2.1	582	548	595	601	3	0.19	0.1	0.2	0.3	3.2	3.2	1.04	2.4	1.2	1.2	59	-60	14	27	86	44	0
600	2.1	605	557	624	633	4	0.22	0.2	0.2	0.3	3	3.03	1.05	3.1	1.6	1.5	68	-66	22	35	84	41	0
650	2.1	636	559	660	684	6	0.26	0.2	0.3	0.4	2.6	2.63	0.99	4.4	2.2	2.2	74	-74	34	50	82	36	0
700	2.1	657	541	683	735	8	0.32	0.2	0.3	0.4	2.4	2.32	0.97	5.9	2.9	3	77	-81	49	65	80	31	1
750	2.1	662	484	701	783	10	0.39	0.3	0.4	0.5	2	1.97	0.9	7.2	3.4	3.8	83	-87	66	80	77	26	4

400	2.2	418	414	420	422	1	0.09	0.1	0.1	0.1	4.3	4.46	1.1	0.7	0.4	0.4	36	-30	1	2	90	57	0
450	2.2	469	459	472	475	1	0.11	0.1	0.1	0.2	3.9	4.06	1.09	1.2	0.6	0.6	42	-36	2	5	89	54	0
500	2.2	517	496	523	528	2	0.14	0.1	0.1	0.2	3.6	3.74	1.07	2	1	1	47	-41	5	11	88	50	0
540	2.2	553	521	564	570	3	0.17	0.1	0.2	0.2	3.3	3.46	1.07	2.3	1.2	1.1	57	-57	10	19	87	46	0
550	2.2	562	524	574	580	3	0.17	0.1	0.2	0.2	3.3	3.37	1.05	2.5	1.3	1.2	58	-57	10	20	86	46	0
560	2.2	571	534	584	591	3	0.18	0.1	0.2	0.2	3.2	3.29	1.04	2.5	1.3	1.2	61	-60	12	23	86	45	0
570	2.2	578	536	594	601	3	0.19	0.1	0.2	0.3	3.1	3.23	1.04	2.8	1.4	1.4	63	-61	14	26	86	44	0
580	2.2	587	543	604	612	4	0.19	0.1	0.2	0.3	3.1	3.19	1.04	3	1.5	1.5	64	-63	15	26	86	44	0
600	2.2	602	547	621	632	4	0.21	0.2	0.2	0.3	3	3.01	1.02	3.5	1.7	1.8	68	-65	20	34	85	41	0
650	2.2	632	547	655	683	6	0.26	0.2	0.3	0.4	2.7	2.68	1	4.8	2.4	2.4	73	-73	33	49	83	37	0
700	2.2	658	537	685	735	8	0.31	0.2	0.3	0.4	2.4	2.41	0.97	5.8	2.8	2.9	81	-83	45	61	80	32	0
750	2.2	672	528	697	782	10	0.36	0.3	0.3	0.5	2.2	2.12	0.95	7.2	3.4	3.7	86	-88	59	73	78	28	2
400	2.3	417	410	419	423	1	0.09	0.1	0.1	0.1	4.3	4.44	1.1	1	0.5	0.5	38	-30	1	3	90	57	0
450	2.3	468	458	471	475	1	0.11	0.1	0.1	0.2	3.9	4.09	1.09	1.5	0.7	0.8	42	-36	1	5	89	54	0
500	2.3	515	496	523	528	2	0.14	0.1	0.1	0.2	3.6	3.74	1.07	2.2	1.1	1.1	47	-42	4	11	88	51	0
550	2.3	560	522	573	580	3	0.17	0.1	0.2	0.2	3.3	3.39	1.05	2.7	1.4	1.3	59	-59	9	19	87	46	0
560	2.3	568	528	582	591	4	0.18	0.1	0.2	0.2	3.3	3.32	1.04	2.9	1.5	1.4	62	-62	12	23	86	45	0
570	2.3	578	535	593	601	4	0.18	0.1	0.2	0.2	3.2	3.25	1.03	3	1.5	1.5	62	-62	11	23	86	44	0
580	2.3	584	536	600	611	4	0.19	0.1	0.2	0.3	3.2	3.23	1.05	3.4	1.7	1.7	64	-63	14	25	86	44	0
600	2.3	598	542	618	632	5	0.2	0.2	0.2	0.3	3	3.09	1.04	3.8	1.9	1.8	67	-66	16	29	85	42	0
650	2.3	631	547	653	684	7	0.25	0.2	0.2	0.3	2.7	2.75	1.01	5	2.5	2.5	73	-74	29	46	83	38	0
700	2.3	652	531	677	734	9	0.3	0.2	0.3	0.4	2.5	2.41	0.96	6.3	3.1	3.2	81	-80	45	62	81	33	0
750	2.3	658	511	685	779	11	0.34	0.2	0.3	0.5	2.2	2.17	0.97	7.7	3.8	3.9	86	-89	57	73	79	29	0
400	2.4	416	409	419	423	1	0.09	0.1	0.1	0.1	4.3	4.43	1.1	1.2	0.6	0.6	36	-33	0	2	90	58	0

450	2.4	466	451	471	475	2	0.11	0.1	0.1	0.1	4	4.11	1.08	1.8	0.9	0.9	42	-37	2	5	89	54	0
500	2.4	514	488	522	528	2	0.14	0.1	0.1	0.2	3.7	3.76	1.07	2.5	1.2	1.3	48	-42	3	9	88	51	0
550	2.4	558	517	572	580	4	0.17	0.1	0.2	0.2	3.3	3.39	1.04	3	1.5	1.5	60	-56	8	18	87	46	0
570	2.4	572	516	589	601	4	0.18	0.1	0.2	0.2	3.2	3.32	1.04	3.5	1.8	1.7	64	-62	11	22	86	45	0
580	2.4	581	530	599	611	5	0.19	0.1	0.2	0.3	3.2	3.24	1.04	3.7	1.8	1.8	65	-63	14	26	86	44	0
590	2.4	590	540	607	622	5	0.19	0.1	0.2	0.3	3.1	3.13	1.03	3.9	2	1.9	63	-63	14	27	86	43	0
600	2.4	597	534	616	632	5	0.2	0.2	0.2	0.3	3.1	3.13	1.03	4	2	2	67	-66	16	29	85	42	0
650	2.4	627	545	647	682	7	0.24	0.2	0.2	0.3	2.8	2.78	1.02	5.4	2.7	2.7	74	-72	27	44	83	38	0
700	2.4	653	540	674	734	9	0.29	0.2	0.3	0.4	2.5	2.51	0.99	6.4	3.2	3.2	80	-82	40	58	81	34	0
750	2.4	664	525	685	778	11	0.33	0.2	0.3	0.4	2.3	2.24	0.97	7.7	3.8	3.9	87	-87	53	70	79	30	1
400	2.5	415	403	419	422	1	0.09	0.1	0.1	0.1	4.3	4.41	1.09	1.6	0.8	0.8	34	-32	0	2	90	58	0
450	2.5	466	448	471	475	2	0.11	0.1	0.1	0.1	4	4.12	1.08	1.9	0.9	1	42	-37	1	4	89	55	0
500	2.5	511	481	521	528	3	0.13	0.1	0.1	0.2	3.7	3.83	1.07	2.9	1.4	1.4	49	-44	3	8	88	51	0
550	2.5	556	510	571	579	4	0.16	0.1	0.2	0.2	3.4	3.48	1.05	3.3	1.7	1.6	60	-58	7	16	87	47	0
580	2.5	581	527	598	611	5	0.18	0.1	0.2	0.2	3.2	3.29	1.03	3.8	1.9	1.9	65	-64	10	22	86	45	0
590	2.5	587	528	603	621	5	0.19	0.1	0.2	0.3	3.1	3.2	1.04	4.3	2.1	2.1	66	-64	13	26	86	44	0
600	2.5	592	528	610	632	6	0.2	0.1	0.2	0.3	3.1	3.11	1.02	4.5	2.3	2.2	68	-66	15	29	85	43	0
610	2.5	602	541	619	642	6	0.2	0.2	0.2	0.3	3.1	3.12	1.04	4.5	2.3	2.3	69	-66	14	28	85	42	0
650	2.5	625	540	641	683	7	0.23	0.2	0.2	0.3	2.8	2.86	1.02	5.5	2.8	2.8	74	-72	23	39	84	39	0
700	2.5	647	536	667	731	9	0.27	0.2	0.3	0.4	2.6	2.57	0.99	6.8	3.3	3.4	81	-80	37	55	82	35	0
750	2.5	664	530	680	777	11	0.32	0.2	0.3	0.4	2.4	2.33	0.96	7.7	3.8	3.9	87	-89	50	67	80	31	0
400	2.6	415	402	419	422	2	0.09	0.1	0.1	0.1	4.3	4.43	1.08	1.7	0.9	0.8	35	-34	0	2	90	58	0
450	2.6	464	441	471	475	2	0.11	0.1	0.1	0.1	4	4.13	1.08	2.2	1.1	1.1	42	-39	1	4	89	55	0
500	2.6	511	478	521	527	3	0.13	0.1	0.1	0.2	3.7	3.83	1.05	2.9	1.4	1.5	49	-46	3	8	88	51	0

550	2.6	553	507	568	580	4	0.16	0.1	0.2	0.2	3.4	3.47	1.04	3.6	1.8	1.8	61	-59	6	14	87	48	0
580	2.6	573	511	590	610	6	0.18	0.1	0.2	0.2	3.2	3.3	1.05	4.4	2.2	2.2	65	-64	10	20	86	45	0
590	2.6	581	515	597	620	6	0.18	0.1	0.2	0.2	3.2	3.25	1.06	4.6	2.3	2.3	65	-63	11	23	86	44	0
600	2.6	594	533	610	631	5	0.19	0.1	0.2	0.2	3.2	3.23	1.04	4.4	2.2	2.2	66	-65	12	23	86	44	0
610	2.6	597	520	613	642	6	0.2	0.2	0.2	0.3	3.1	3.15	1.05	4.9	2.5	2.4	68	-68	14	26	85	43	0
650	2.6	624	545	639	682	7	0.22	0.2	0.2	0.3	2.9	2.91	1.01	5.7	2.9	2.8	73	-73	20	37	84	40	0
700	2.6	648	548	664	731	9	0.27	0.2	0.3	0.4	2.6	2.59	1.01	7	3.5	3.5	80	-79	33	51	82	36	0
750	2.6	661	528	680	775	11	0.3	0.2	0.3	0.4	2.4	2.39	0.97	7.9	3.9	4	86	-87	46	63	81	32	0
400	2.7	413	394	418	422	2	0.09	0.1	0.1	0.1	4.3	4.46	1.1	2.1	1.1	1	38	-35	0	2	90	58	0
450	2.7	463	443	470	475	2	0.11	0.1	0.1	0.1	4	4.14	1.07	2.6	1.3	1.3	42	-37	1	3	90	55	0
500	2.7	508	472	519	527	4	0.13	0.1	0.1	0.2	3.7	3.82	1.06	3.4	1.7	1.7	51	-45	2	7	88	51	0
550	2.7	549	497	564	579	5	0.16	0.1	0.2	0.2	3.5	3.53	1.06	4	2.1	2	61	-59	5	13	87	48	0
600	2.7	586	518	601	630	6	0.19	0.1	0.2	0.2	3.2	3.22	1.04	5	2.5	2.5	68	-67	12	23	86	44	0
610	2.7	592	516	609	640	7	0.19	0.1	0.2	0.2	3.1	3.14	1.01	5.3	2.7	2.6	68	-67	13	25	86	44	0
620	2.7	599	523	614	651	7	0.2	0.2	0.2	0.3	3.1	3.08	1.02	5.5	2.8	2.8	72	-70	14	28	85	43	0
650	2.7	617	530	635	681	8	0.22	0.2	0.2	0.3	2.9	2.97	1.03	6	3	3	76	-75	19	34	84	40	0
700	2.7	642	533	657	730	10	0.25	0.2	0.3	0.3	2.7	2.68	0.98	7.2	3.7	3.6	79	-83	30	47	83	37	0
750	2.7	655	526	667	770	12	0.29	0.2	0.3	0.4	2.5	2.49	1	8.2	4.1	4.1	87	-88	40	59	81	34	0
400	2.8	412	392	418	422	2	0.09	0.1	0.1	0.1	4.3	4.47	1.09	2.2	1.1	1.1	38	-34	0	2	91	58	0
450	2.8	461	435	469	475	3	0.11	0.1	0.1	0.1	4	4.16	1.06	2.8	1.4	1.4	44	-41	1	4	90	55	0
500	2.8	505	464	517	527	4	0.13	0.1	0.1	0.2	3.7	3.82	1.06	3.9	1.9	2	50	-45	2	6	89	52	0
550	2.8	547	497	560	579	5	0.15	0.1	0.2	0.2	3.5	3.61	1.05	4.3	2.2	2.1	61	-59	4	12	87	49	0
600	2.8	582	508	598	630	7	0.18	0.1	0.2	0.2	3.2	3.26	1.03	5.4	2.7	2.7	67	-66	11	22	86	45	0
610	2.8	590	516	604	640	7	0.19	0.1	0.2	0.2	3.2	3.19	1.02	5.6	2.8	2.8	69	-67	12	24	86	44	0

620	2.8	597	522	612	651	7	0.19	0.2	0.2	0.3	3.1	3.13	1.02	5.6	2.9	2.8	71	-69	12	25	86	43	0
630	2.8	601	519	617	660	8	0.2	0.2	0.2	0.3	3.1	3.12	1.02	6	3	3	71	-70	14	27	85	43	0
640	2.8	612	535	624	670	8	0.21	0.2	0.2	0.3	3.1	3.04	1	6	3	3	72	-72	15	28	85	42	0
650	2.8	615	529	629	681	8	0.21	0.2	0.2	0.3	3	3.04	1.02	6.4	3.2	3.2	74	-73	17	32	84	41	0
700	2.8	641	537	653	729	10	0.25	0.2	0.2	0.3	2.8	2.74	0.99	7.4	3.7	3.7	81	-80	26	44	83	38	0
750	2.8	655	540	667	768	12	0.28	0.2	0.3	0.4	2.5	2.47	0.96	8.3	4.1	4.2	86	-88	40	58	82	34	0
400	2.9	412	391	418	422	2	0.09	0.1	0.1	0.1	4.3	4.45	1.07	2.4	1.2	1.2	39	-36	0	1	91	58	0
450	2.9	458	428	468	474	3	0.11	0.1	0.1	0.1	4	4.18	1.08	3.2	1.6	1.6	43	-41	1	3	90	55	0
500	2.9	504	463	516	527	4	0.13	0.1	0.1	0.2	3.8	3.89	1.05	4	2	2.1	50	-46	2	6	89	52	0
550	2.9	543	489	559	578	6	0.15	0.1	0.2	0.2	3.5	3.58	1.04	4.5	2.3	2.2	63	-60	4	10	88	49	0
600	2.9	578	509	591	630	7	0.18	0.1	0.2	0.2	3.3	3.32	1.03	5.7	2.9	2.8	70	-68	8	19	86	46	0
620	2.9	593	506	610	650	8	0.19	0.1	0.2	0.2	3.2	3.19	1.02	5.9	3	2.9	71	-69	11	22	86	44	0
630	2.9	597	515	610	659	8	0.2	0.2	0.2	0.3	3.1	3.13	1.03	6.4	3.2	3.2	71	-70	13	26	85	43	0
640	2.9	603	518	617	670	9	0.2	0.2	0.2	0.3	3.1	3.11	1.03	6.4	3.2	3.2	74	-72	15	28	85	43	0
650	2.9	613	530	626	680	9	0.21	0.2	0.2	0.3	3	3.02	1.01	6.5	3.2	3.3	77	-73	14	29	85	42	0
700	2.9	631	523	644	726	11	0.24	0.2	0.2	0.3	2.8	2.81	1.02	7.6	3.9	3.8	81	-82	25	43	83	38	0
750	2.9	651	531	662	759	12	0.27	0.2	0.3	0.3	2.6	2.6	1	8.6	4.2	4.4	89	-87	33	53	82	35	0
400	3	410	384	417	422	3	0.09	0.1	0.1	0.1	4.3	4.49	1.08	2.6	1.3	1.3	40	-35	0	1	91	59	0
450	3	455	420	468	474	4	0.1	0.1	0.1	0.1	4.1	4.23	1.07	3.5	1.7	1.8	44	-40	0	2	90	55	0
500	3	499	450	511	526	5	0.13	0.1	0.1	0.2	3.8	3.87	1.07	4.5	2.2	2.3	52	-48	2	6	89	52	0
550	3	539	478	551	578	6	0.15	0.1	0.1	0.2	3.6	3.62	1.04	5	2.5	2.5	63	-60	4	10	88	49	0
600	3	574	505	583	629	8	0.17	0.1	0.2	0.2	3.3	3.33	1.04	6.1	3.1	3	69	-68	8	18	87	46	0
630	3	593	513	603	659	9	0.19	0.1	0.2	0.3	3.1	3.14	1.01	6.6	3.3	3.3	73	-73	12	25	86	44	0
640	3	603	525	612	669	9	0.2	0.2	0.2	0.3	3.1	3.14	1.02	6.7	3.4	3.3	72	-73	12	25	86	43	0

650	3	608	515	621	679	9	0.2	0.2	0.2	0.3	3	3.04	1.01	6.8	3.4	3.3	74	-74	14	28	85	43	0
660	3	611	526	621	688	10	0.21	0.2	0.2	0.3	3	3.04	1.01	7	3.5	3.5	77	-75	14	29	85	42	0
700	3	629	528	641	721	11	0.23	0.2	0.2	0.3	2.9	2.88	1.02	7.9	4	3.9	81	-81	21	38	84	40	0
750	3	646	535	653	755	13	0.26	0.2	0.3	0.3	2.6	2.61	0.98	8.8	4.4	4.4	87	-89	32	51	82	36	0
400	3.1	407	380	416	422	3	0.09	0.1	0.1	0.1	4.4	4.52	1.08	3.1	1.6	1.6	40	-37	0	1	91	59	0
450	3.1	454	416	466	475	4	0.1	0.1	0.1	0.1	4.1	4.21	1.06	3.7	1.8	1.9	46	-42	1	2	90	56	0
500	3.1	498	448	511	526	5	0.12	0.1	0.1	0.2	3.9	3.95	1.04	4.6	2.3	2.4	50	-46	1	5	89	53	0
550	3.1	539	478	552	579	6	0.14	0.1	0.1	0.2	3.6	3.65	1.03	5	2.6	2.5	62	-60	3	9	88	50	0
600	3.1	572	494	584	628	8	0.17	0.1	0.2	0.2	3.3	3.35	1.02	6.1	3.1	3.1	69	-66	7	17	87	46	0
640	3.1	596	506	607	667	9	0.19	0.2	0.2	0.2	3.2	3.19	1.02	6.9	3.5	3.4	74	-72	10	22	86	44	0
650	3.1	603	516	616	679	10	0.19	0.2	0.2	0.3	3.1	3.12	1.02	7	3.6	3.4	75	-75	11	24	86	43	0
660	3.1	605	514	613	684	10	0.2	0.2	0.2	0.3	3	3.05	1.02	7.4	3.7	3.7	77	-74	14	28	85	43	0
670	3.1	612	522	623	696	10	0.2	0.2	0.2	0.3	3	3.03	1	7.5	3.8	3.7	78	-78	14	28	85	42	0
700	3.1	624	517	633	718	11	0.22	0.2	0.2	0.3	2.9	2.89	1	8.2	4.1	4.1	82	-80	19	35	84	40	0
750	3.1	641	528	649	752	13	0.25	0.2	0.3	0.3	2.7	2.67	1	8.8	4.3	4.5	89	-88	29	48	83	37	0
400	3.2	406	377	416	422	4	0.08	0.1	0.1	0.1	4.4	4.52	1.08	3.4	1.8	1.7	39	-38	0	1	91	59	0
450	3.2	451	409	464	474	5	0.1	0.1	0.1	0.1	4.1	4.24	1.07	4.1	2.1	2.1	45	-43	0	2	90	56	0
500	3.2	495	440	509	526	6	0.12	0.1	0.1	0.2	3.8	3.94	1.05	5	2.5	2.5	51	-48	1	5	89	53	0
550	3.2	535	470	548	578	7	0.14	0.1	0.1	0.2	3.6	3.67	1.04	5.5	2.8	2.7	60	-60	3	8	88	50	0
600	3.2	565	483	579	627	9	0.17	0.1	0.2	0.2	3.3	3.37	1.03	6.5	3.3	3.2	69	-67	7	16	87	47	0
650	3.2	595	505	604	674	10	0.19	0.1	0.2	0.2	3.1	3.15	1	7.5	3.7	3.8	76	-74	11	24	86	44	0
660	3.2	599	506	608	686	11	0.2	0.2	0.2	0.3	3.1	3.12	1.03	7.5	3.8	3.7	77	-77	12	26	85	43	0
670	3.2	610	513	623	694	10	0.2	0.2	0.2	0.3	3.1	3.08	1	7.6	3.8	3.8	78	-76	12	26	85	43	0
680	3.2	610	508	618	699	11	0.21	0.2	0.2	0.3	3	3.02	1.01	8	4.1	4	79	-79	14	29	85	42	0

700	3.2	621	519	627	717	12	0.21	0.2	0.2	0.3	3	2.97	1	8.2	4.1	4.1	82	-82	16	31	85	42	0
750	3.2	642	528	648	750	13	0.24	0.2	0.2	0.3	2.8	2.78	1	8.9	4.4	4.5	88	-88	24	41	83	38	0
400	3.3	404	368	415	421	4	0.08	0.1	0.1	0.1	4.4	4.56	1.08	3.6	1.8	1.8	41	-38	0	1	91	59	0
450	3.3	451	412	462	474	5	0.1	0.1	0.1	0.1	4.1	4.24	1.06	4.3	2.1	2.2	45	-41	0	2	90	56	0
500	3.3	491	436	504	525	6	0.12	0.1	0.1	0.2	3.9	3.95	1.05	5.3	2.6	2.7	53	-48	1	4	89	54	0
550	3.3	530	465	543	577	7	0.14	0.1	0.1	0.2	3.6	3.71	1.04	5.7	2.9	2.8	62	-61	3	8	88	51	0
600	3.3	567	488	579	627	9	0.16	0.1	0.2	0.2	3.4	3.41	1.02	6.6	3.4	3.2	68	-67	5	13	87	48	0
650	3.3	597	509	607	675	10	0.19	0.1	0.2	0.2	3.2	3.16	1	7.4	3.8	3.7	74	-74	9	20	86	44	0
660	3.3	598	501	607	686	11	0.19	0.2	0.2	0.2	3.1	3.14	1.02	7.7	3.9	3.8	77	-76	12	23	86	44	0
670	3.3	602	503	610	690	11	0.19	0.2	0.2	0.2	3.1	3.13	1.02	7.9	4	3.9	78	-78	11	23	86	43	0
680	3.3	608	507	613	700	11	0.2	0.2	0.2	0.3	3.1	3.1	1.01	8	4.1	3.9	79	-78	13	26	85	43	0
690	3.3	612	508	623	706	12	0.21	0.2	0.2	0.3	3	2.99	1	8.2	4.2	4.1	80	-80	13	28	85	42	0
700	3.3	613	509	618	714	12	0.21	0.2	0.2	0.3	2.9	2.93	0.99	8.5	4.3	4.2	80	-81	17	33	85	42	0
750	3.3	636	523	642	746	13	0.24	0.2	0.2	0.3	2.8	2.83	1.01	9.1	4.5	4.5	88	-87	23	40	84	39	0
400	3.4	403	369	414	421	4	0.08	0.1	0.1	0.1	4.4	4.54	1.05	3.8	1.9	1.9	41	-38	0	1	91	59	0
450	3.4	446	396	459	474	5	0.1	0.1	0.1	0.1	4.2	4.26	1.06	4.9	2.5	2.4	46	-44	0	2	90	56	0
500	3.4	490	439	501	525	6	0.12	0.1	0.1	0.2	3.9	3.99	1.05	5.6	2.8	2.8	52	-49	1	4	89	54	0
550	3.4	523	454	535	576	8	0.14	0.1	0.1	0.2	3.7	3.74	1.04	6.2	3.2	3.1	63	-61	2	6	88	51	0
600	3.4	560	478	570	627	9	0.16	0.1	0.2	0.2	3.4	3.48	1.02	6.8	3.4	3.4	68	-69	4	12	87	48	0
650	3.4	591	498	599	675	10	0.18	0.1	0.2	0.2	3.2	3.23	1	7.6	3.8	3.8	75	-75	9	20	86	45	0
660	3.4	590	496	596	678	11	0.19	0.1	0.2	0.2	3.2	3.17	1.01	8	4.1	3.9	76	-77	10	21	86	45	0
670	3.4	600	501	609	691	11	0.19	0.1	0.2	0.2	3.1	3.12	1.01	8	4	4	77	-77	11	24	86	44	0
680	3.4	607	506	618	697	11	0.2	0.2	0.2	0.3	3.1	3.13	1.01	8.1	4.1	4.1	79	-78	11	24	86	44	0
690	3.4	608	506	616	701	12	0.2	0.2	0.2	0.3	3.1	3.09	1.02	8.5	4.2	4.2	79	-80	13	26	85	43	0

700	3.4	609	503	613	712	12	0.2	0.2	0.2	0.3	3	3.04	1.01	8.6	4.4	4.3	81	-80	14	28	85	43	0
710	3.4	618	514	626	720	12	0.21	0.2	0.2	0.3	3	3.01	1.01	8.6	4.2	4.4	85	-82	14	29	85	42	0
750	3.4	629	514	631	741	14	0.23	0.2	0.2	0.3	2.8	2.84	1.01	9.2	4.6	4.7	88	-87	21	38	84	40	0
400	3.5	401	364	412	421	4	0.08	0.1	0.1	0.1	4.4	4.57	1.06	4	2	2	41	-39	0	1	91	59	0
450	3.5	443	389	455	473	6	0.1	0.1	0.1	0.1	4.2	4.31	1.07	5.1	2.5	2.6	46	-43	0	2	90	57	0
500	3.5	485	422	500	525	7	0.11	0.1	0.1	0.1	3.9	4.04	1.05	5.9	2.9	3	54	-50	1	4	89	54	0
550	3.5	524	453	538	576	8	0.13	0.1	0.1	0.2	3.7	3.75	1.04	6.3	3.2	3.1	62	-59	2	6	88	51	0
600	3.5	553	475	562	622	10	0.15	0.1	0.2	0.2	3.5	3.52	1.03	7.5	3.8	3.7	71	-68	4	11	87	49	0
650	3.5	584	485	592	672	11	0.17	0.1	0.2	0.2	3.3	3.31	1.02	7.9	4	3.9	76	-74	6	16	87	46	0
680	3.5	598	503	597	693	12	0.19	0.1	0.2	0.2	3.2	3.17	1.02	8.4	4.1	4.3	80	-78	10	22	86	44	0
690	3.5	602	498	610	703	12	0.2	0.2	0.2	0.3	3.1	3.08	1	8.6	4.3	4.3	81	-79	11	25	86	43	0
700	3.5	608	509	611	706	12	0.2	0.2	0.2	0.3	3.1	3.05	1	8.7	4.3	4.4	82	-81	13	26	85	43	0
710	3.5	613	505	618	712	13	0.2	0.2	0.2	0.3	3	3.06	1.01	8.8	4.4	4.3	83	-83	12	27	85	42	0
720	3.5	609	497	615	712	13	0.21	0.2	0.2	0.3	3	2.98	1.01	9.1	4.6	4.5	82	-84	15	30	85	42	0
750	3.5	631	525	634	736	14	0.22	0.2	0.2	0.3	2.9	2.89	0.99	9.2	4.6	4.6	89	-87	17	33	84	40	0

Annex 5

HCS and HCM: Outline of program and subroutines.

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The program ***hcs*** ('harvest control simulation') is a general purpose program for stochastic simulation of management decision rules (harvest control rules). For simulating the proposed rules for mackerel, some modifications had to be made to include the agreed conditioning of the model. This version now has the acronym ***hcm***. The description here applies to *hcs*, and notes are made where *hcm* differs.

The program is made to allow screening over a large number of management rule options. For several rule options, a range and step size can be specified, and the program is run automatically for all the options. The results are partly presented as annual means and fractiles, partly as detailed data for generating distributions, but also as assembly tables allowing performance measures to bee compared across options. To serve this purpose the program has to be fast. Typically, 1000 iterations with one choice of rule options takes 10-50 seconds to run, depending on the options. To achieve this, making full assessments as part of the simulation loop is abandoned. Instead, observation errors are specified as distributions and carried forward in predictions to get the numbers that are basis for management decisions. A range of options to imitate the assessment-prediction-decision process is available, as well as implementation error and bias. Hence, the program is intended to imitate the normal advisory process as far as possible without running actual assessments as part of the simulations.

The program consists of a population model that generates stock numbers at age by year, an observation model that transfers the stock numbers into noisy, observed numbers, a decision rule through which a TAC is derived according to the observed stock (projected forward if relevant) and an implementation model that translates the TAC into actual removals. These removals are then input to the population model for the next time step. The outline is shown in Figure 1.

The program is run as a bootstrap, with the following stochastic elements:

1) Initial numbers
2) Recruitments
3) Observation noise
4) Implementation noise

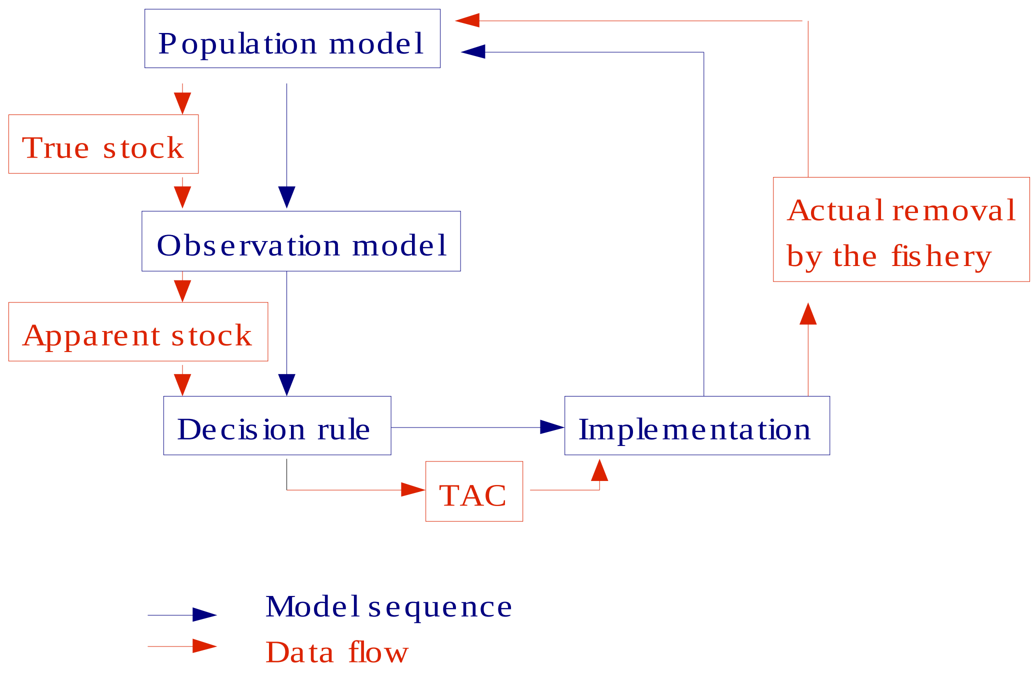

Figure 1. Outline of the hcm program.

Models.

This section gives a brief outline of the main building blocks in the program. Some more details are given in the next section.

Population model:

This model projects the vector of stock numbers at age forwards in yearly time steps with a given fishing mortality and natural mortality: *N(a+1,y+1)=N(a,y)*exp(-M(a,y)-F(a,y))*. The oldest age *A* is a plus-group, modeled as a dynamic pool: *N(A,y+1)=N(A,y)*exp(-M(A,y)-F(A,y))+N(A-1,y)*exp(-M(A-1,y)-F(A-1,y))*. The fishing mortality is separable: *F(a,y) = Fy(y)*Sel(a)*. The selection is normalized so that the *Fy* is scaled as the average F over a standard range of ages. Although the selection at age is assumed to be constant in the decision process, the realized fishing mortalities (and hence the realized selection at age) are derived from the real stock numbers and realized catches in tonnes that are converted with noise to catches in numbers. Each year, a new year class is entered at the youngest age, according to a stock-recruit model. If the youngest age is greater than 0, recruits are still entered at age 0, but projected forward with zero mortality and weight until they reach recruiting age. Initial stock numbers at age can be obtained either by priming the population with a fixed F and stochastic recruitments, or by taking numbers form a file. When taking numbers from the file, there are several options for adding noise to the numbers. *(For the time being, the routine for priming with a fixed F is not well controlled, and should not be trusted uncritically).*

<u>Submodels to the population model</u>

Yield submodel: Calculates yield corresponding to a fishing mortality with the numbers at age at the start of the year, selection at age and weight at age.

FindF submodel: Finds the fishing mortality corresponding to a yield by searching over a progressively narrower range of fishing mortalities and calculating the corresponding yield with the Yield submodel.

Recruitment depends on SSB and random noise, as *R = R0(SSB)*noise_term*. The recruitment function *R0* can be a Hockey-stick, Beverton-Holt or Ricker function. The noise term can be normal or log-normal, with a specified CV. It can be truncated to avoid extreme values, by redrawing the random number if it is outside specified bounds. In hcm, parameters can be read for each iteration from a file.

SSB submodel calculates the SSB at spawning time according to the the numbers at age at the start of the year, mortality until spawning (*f_mortrat and m_mortrat*), stock weights at age and maturity at age:

SSB = $\sum_a$*(N(a)*exp((-F*f_mortrat-M*m_mortrat)*w_stock(a)*prop_mature(a)*

Nextyear submodel: Projects the stock numbers at age forward one year, and adds recruitment.

Obervation model:

This model transforms the vector of true *N*-values at age to observed values at age using two random multipliers, one year factor and one factor on individual ages:

*Nobs(a,y) * Ntrue(a,y)*⊠y(y)*⊠a(a,y).*

Both are log-normally distributed with given CVs. The year factor also has a specified mean value, which, when different from 1 represents systematic bias. The age factor has specific CVs for each age.

Implementation model:

This model transforms a TAC coming from the decision model to an actual catch, both in tonnes and in numbers, and derives the true fishing mortality accordingly. The TAC is first transformed into numbers by finding the corresponding overall F and applying the catch equation with this F and the standard selection at age. Then noise is added to the catch numbers at age as a log-normally distributed year factor, biased if requested, and an age dependent random noise, with CVs specified individually for each age. Realized total catch is the sum of products of the catches and catch weights. Realized fishing mortalities are derived from the resulting catches and the true stock.

Decision model:

This rule decides the TAC for a number of years ahead. The general rule is of the form:

1) Some measure *v* of exploitation is set as a function of SSB in a given year. The measure *v* can be *F*, *TAC* or the harvest rate *HR = TAC/SSB*

2) If this leads to a change in TAC of more than *x*%, the TAC is only changed by *x*% unless (optionally) SSB in some year(s) is below a certain level.

The Rule 1 itself has three parameters:

v_standard

Btrigger

alfa

It has the general form:

If *SSB* > *Btrigger* then *v = v_standard*

If *SSB* < *Btrigger* then *v=v_standard*(1.0-alfa*(Btrigger-SSB)/Btrigger)*

There are several variants of the rule for *SSB < Btrigger*, and new ones are quite simple to implement.

If the TAC is decided for more than one year ahead, the TAC in Rule 2 can be implemented in two ways:

1) Abrupt: The TAC in the first of the years is constrained according to the Rule 2, and is kept for the remaining years.
2) Gradual:The TAC is allowed to change at most *x%* each year in the period, until the TAC according to the rule 1 is reached (if possible)

Timing:

There are 5 reference years when deciding a TAC, here expressed with their variable names in the program code.

- The decision is made for the years *y,...,y+idur-1; idur ≥ 1.*
- When making the decision, the starting point is the stock numbers in year *y+idel; idel ≤ 0*, which presumably is the last year with valid stock estimates.
- The SSB in the decision rule is the SSB in year *y+isd; isd ≥idel*
- If the constraint on TAC change (rule 2) only applies if SSB is above Btrigger, the reference SSB is the smallest SSB in the years {*y+iya1, .., y+iya2*} ; *iya1 ≥idel; iya2 ≥iya1*

To obtain SSBs in the years from *y+idel* and onwards, a deterministic projection is made. The projection starts with the stock numbers at age at the start of year *y+idel*, as they come from the observation model. The removals in the projection period are the decided TACs if such exist (as they should for year *y+idel*), and then the TACs emerging from the decision rule. If years beyond the decision period are needed, the apparent fishing mortality in the last year in the decision period is continued. Recruitments in the projection are the deterministic outcome of the stock-recruitment function. Since SSBs in the projection period may depend on the TACs, deciding the TACs according to SSB is iterated until there is consistency between TACs and SSBs.

This relatively complicated timing rule is made to cover most of the relevant interpretations of legal texts on harvest rules. Under the standard assessment-prediction paradigm, year *y+idel* will be the intermediate year, i.e. *idel=-1*. The rule 1. may refer to the SSB in the intermediate year (*isd=-1*), in the TAC year (*isd=0*) or after the TAC has been taken (*isd=idur*). The constraint on TAC variation (Rule 2) may apply if SSB is above the trigger in the TAC year (*iya1=iya2=0*), but it may also apply only if SSB is above the trigger in two subsequent years (e.g. *iya1=-1, iya2=0*), or if SSB is above the trigger in the whole multi-annual TAC period (*iya1=0, iya2=idur*)

In the case where the stock is improving (apparently), the constraint on TAC may give a lower TAC than the rule without constraint. This leads to the paradox that an SSB just below the trigger may lead to a higher TAC than an SSB just above. If the SSB used for this decision depends on the TAC, applying the constraint may lead to an SSB above the trigger, and thus justify the constraint, while the TAC without the constraint will lead to an SSB below the trigger, and thus justify abandoning the constraint. Hence, in this case there are two valid solutions. The recipe in *hcs* and *hcm* is that if applying the constraint leads to an SSB above the trigger, the constraint is used, disregarding what would happen without the constraint.

There may be cases where the rule lead to a TAC that cannot be taken because the stock is too small. In HCM, this does not alter the TAC, but the real catch is calculated assuming a maximum fishing mortality. This Fmax is input.

Input:

There are two, optionally 3 input files. In the present distribution, all file names are hard-coded.

Biological data (*bio.inn*):

Age span

Natural mortality, selection, catch weight, stock weight, maturity, for each age.

Proportion of F and M before spawning

Parameters for the stock-recruit function (left out in *hcm*)

Age range for average F. The selection is normalized so that the average selection over that age range is 1.

Run options (*opt.inn*):

Code for initial data. Options:

1. Priming with a fixed F
2. Reading stock numbers at age and variance-covariances form a file (*nin.inn*-file)
3. Reading stock numbers and CVs from a file (*nin.num*-file)
4. Reading stock numbers from a file (*nin.obs* - file, and apply the observation model to these stock numbers.

Priming value for F or value of TAC in year 0 (depending on the initial numbers option)

Maximum possible F (to protect the run if there is not enough fish for the TAC)

HCR type (F-rule, TAC-rule, HR-rule)

Delay between last obs. year and decision year (*idel*)

Year used in TAC decision (*isd*)

Constraint rule type (abrupt or gradual) - ignored if irrelevant

When to apply constraint (always or only above Btrigger)

Reference years for decision on constraint (*iya1*, *iya2*)

11 rule parameters, for screening with first value, last value and interval. These parameters are:

	1	2	3	4	5	6
F-rule (opt.1):	Blim(ref)	Fstd	Btrig	Alfa	Duration	Percent
C-rule (opt 2):	Blim(ref)	Cstd	Btrig	Alfa	Duration	Percent
HR-rule (opt 3):	Blim(ref)	HRstd	Btrig	Alfa	Duration	Percent
F1-rule (opt 4):	Blim	HRstd	Btrig	F below Blim	Duration	Percent

	7	8	9	10	11
All rules :	Obs_bias	Impl_bias	ObsCV	Impl_CV	Autoc

Observation noise age factor CV

Implementation noise age factor CV

Keys for printout options

nin-file (optional). There are several options for input of initial numbers, the file depends on the option.

(***nin.inn*** - optional)

Initial stock numbers at age, and a matrix with variances-covariances on the log scale.

Note that the entries for the numbers in the nin-file are plain numbers, which are converted to logs, while the matrix has genuine variance-covariances on the log scale. This format is adapted to taking values from ICA (ica.out for the numbers and ica.vc for the variance-covariances)

If the youngest age is higher than 0, and the initial data are taken from the nin-file, SSBs for the years prior to the initial years are stated at the end of the file, starting with the earliest year. This is to have a basis for drawing recruitments for the ages before the youngest age.

(***nin.num*** - optional)

Initial stock numbers at age and CVs at age, assuming a log-normal distribution. The format is converted internally to the format of the nin.inn - file, with zero covariances and CVs on the diagonal of the variance-covariance matrix.

(***nin.obs*** - optional)

Initial stock numbers at age only. To get random numbers later on, the observation model is used.

Program structure:

This is an overview over the flow in the program, with *subroutine names in italics*:

Open files

Read input

call *getpopinn*

call *getoptinn* - read nin-file if relevant

call *yieldrecr* (Calculate yield/recruit - just for information)

call *optruns*: (Screening loop over management options)

call *bootruns* (1000 iterations for given set of options)

Initialise N (either prime with fixed F or take initial stock from file and apply the required noise)

Year 0:

call *yield* or *findf* (TAC or F assumption) =>true F and catch

call *obsmodel* (get distorted N-values)

if TAC, call *findf* (get distorted F corresp to TAC)

call *SSB* (with distorted values and decided TAC or F)

call *nextyear* (update true N-vector)

call *SSB* (with true N and F)

Loop over years 1 - 20

call *obsmodel* (get distorted Ns)

if TAC not decided, call *HCR**

call *findf* (with distorted Ns and decided TAC)

call *SSB* (with distorted Ns and F)

call *implement* => true catch and F, if the catch cannot be taken, true F=Fmax and true catch is calculated accordingly)

call *SSB* (with true N and F)

call *nextyear* (project N with true values)

end loop

end iteration

call *bootprint*: print results for that set of options

end loop on options

end

*: HCR decides TACs for as many years ahead as required. See below for details

Details of some subroutines:

Decide on TAC according to rule (subroutines *hcr, rule* and *project*)

Input consists of indicators and management parameter values. Indicators are option type choices and timing.

Option types:

- *iopt*: HCR type: 1: F-rule; 2: TAC-rule; 3: Harvest rate rule

Relating to constraint on inter-annual change in TAC (no constraint is negative number for percentage change):

- *icrule*: 1: Abrupt change, 2: Gradual change
- *iarule*: 1: Constrain always; 2: Constrain only above Btrig

Timing options:

The *hcr* routine is called at year *iy,* to set the TAC for the years *iy,..,iy+idur-1*

- *idel*: The starting point for decisions (i.e. the latest trusted assessment) is the distorted *N*s in year *iy +idel; idel* 🖫🖬🗀
- *isd*: The basis for the decision is the observed or predicted SSB in year *iy + isd;*
- *idur*: The decision applies to the years *iy* to *iy+idur-1*, i.e. *idur* is the number of years to be decided now.
- *iya1, iya2*: If constraints on year to year variation is conditional on some SSB values being above the trigger (*iarule=2*), then the requirement in the program is that SSB is predicted to be above Btrig in each of the years *iy+iya1,..,iy+iya2*

The SSBs that are used for decisions are obtained by projecting the stock forward, starting at the beginning of year *iy+idel*, which for example can be *iy-1*. This is done in the subroutine *project.*

Depletion:

The subroutine *findf* is used to convert TACs to fishing mortalities. Technically, this is searching routine. It may happen that the TAC is too large for the stock, and cannot be taken. The criterium is that the TAC cannot be taken with a maximum fishing mortality. The maximum F is input. Typically, one would use a high Fmax, beyond what is realistic in most fisheries.

The problem appears in two situations:

- When projecting the stock forwards with decided catches and distorted Ns. For the manager, this implies that the decided catch apparently will lead to depletion of the stock. No special action is taken in this case, and the decided TAC is maintained.
- When projecting the true stock forwards with implemented TACs. In this case, the real catch is that corresponding to Fmax, and the run is continued assuming Fmax in that year. The TAC, which may be used for reference if constraint on TAC variation is applied, is maintained as decided.

The stock will be registered as depleted if the true SSB turns out to be below 1/10 of Blim.

TAC and Fsq assumptions.

In this program, all projections are made assuming TACs, which differs from common practice for some stocks where Fsq is used. The exception is in the initial year:

- If the initial stock is obtained with a priming F, this F is assumed for the intermediate year.
- If the initial stock is obtained from a nin-file, a TAC constraint is assumed for the intermediate year.

Subroutine hcr.

Input: Year iy, idel, isd, iya1, iya2, distorted N-values in year iy-idel, rule number, duration, constraint.

Output: TACs for the years iy,..,iy+idur-1, SSB that was used to take the decision. Note that this SSB may be different from the SSB derived when applying the observation model to the final true values later on.

First, find the unconstrained TAC in an iterative procedure:

1. Call *project* (project the stock forwards with a temporary TAC as far as needed, to generate SSBs needed for deciding the TAC)
2. Call *rule* and translate if needed, the result to a TAC.
3. If that changes the TAC, goto 1

The iteration in steps 1-3 is a fixed point iteration. This process is fast if well behaved, but may fail. If it has not converged after 10 iterations, a searching routine is applied to find a TAC that leads to the same TAC. This routine assumes that TAC is an upwards monotonous function of the SSB, which normally would be the case.

Next, if constraint is relevant (percent non-negative) and the change from last year is larger than the constraint

derive TACs according to the constraint rule

check if SSB with constrained TACs is above the level for applying the con straint

if yes, adopt the constrained TACs

if no, keep the unconstrained TACs

Finally, transfer the temporary TACs to final TACs for all relevant years, and collect the SSB in year *iy+isd* that was the basis for the decision.

Supporting subroutines for *hcr*:

Subroutine rule: (Find value according to rule, called from *decide*)

I*nput: A value for SSB, parameters (trigger ssb, target value, slope)*

Output: Value (of F, HR, TAC or whatever) according to SSB

With options 1-3, the rule has 3 parameters, Btrig, Standard value and alfa, and with the SSB(isd)=s, the rule is if s>Btrig

value = standard

else

value = standard*{1-alfa*(Btrig-s)/Btrig}

With option 4, the rule is:

if s>Btrig

value = standard

else

value = max[standard*{1-(Btrig-s)/(Btrig-Blim)},F1]

Subroutine project: (deterministic projection of the observed stock numbers with given TACs for the years iy-idel to iy+iproj, derive corresponding SSBs).

Input: N-values at year iy-idel.

TACs for all years iy-idel to iy+iproj.

Output: SSB in year iy+iproj

For each year: get F from TAC

calculate SSB

calculate next N (subroutine *nextyear*, assuming deterministic re cruitments)

The deterministic recruitment is according to the stock-recruit function, without noise.

Other supporting subroutines

Subroutine nextyear:

Input: Array of N at age, F-value, sigma for recruitment

Output: Array of N at age for next year, incl. recruitment

Projects the stock one year forwards. Calls calcssb to get SSB for the recruitment, and recruit.

Subroutine calcssb:

Input: Array of N at age, F-value

Output: SSB

Subroutine recruit

Input: SSB, sigma for recruitment, function & parameters a,b, distribution, truncation type & level

Output: Number of recruits (age 0)

As input, SSB and sigma are dummy parameters, the others are commons.

Functions:

1. Hockey stick
2. Beverton-Holt
3. Ricker

Distributions:

1. Normal
2. Lognormal

Truncation types:

1. c 1: xsi > trunc or xsi < -trunc:
2. c 2: xm > trunc or xm < 1/truncvalues outside the range {1/trunc , trunc} are discarded

Here, xsi is a standard normal distributed random number and xm is the multiplier for the mean:

Normal dist: xm = 1+sd*xsi

Lognormal: xm=exp(sd*xsi)

*In **hcm**, a new set of parameters (function type, a and b - values, distribution type, distribution parameters is applied for each iteration. These parameters are taken from a file that was produced outside the program and agreed for the study of mackerel*

Subroutine yield.

Input: Array of N at age, F-value

Output: Yield

Subroutine findf:

Input: Array of N at age, yield

Output: F-value

This is a fixed point searching routine, searching over the space of F-values to find one that matches the yield. Calls yield. Sets a flag if the yield cannot be obtained at Fmax.

Subroutine obsmodel

Input: N-vector (true), distribution parameters

Output: N-vector (distorted)

Includes random, lognormal noise, as a combination of noise on numbers at age and a common year factor.

1. Draw a random number ⌧🗁 coming from a normal distribution with mean 0 and *SD = ⬧1.*
2. Include (if appropriate) a bias and derive a common multiplier btemp with lognormal distribution for that year: *btemp=(1.0+biasobs)*exp(⌧🗁)*
3. For each age *a* in the year *y*:
   - *I.* Generate a new random number *⌧🗎(a,y)* from a normal distribution with mean 0 and *SD=⬧2(a)*
   - *II.* Get the stochastic multipler at age as *xm(a,y) = btemp*exp(⌧🗎(a,y))*
   - *III.* Apply a one-step auto-regressive model to *xm(a)*, using the *xm(a)* values from the year before: *xmnow(a,y)=♋*xm(a,y-1)+ (1-♋)*xm(a,y)*

The observed stock numbers at age are *N(a,y)=N0(a,y)*xmnow(a,y)*

Subroutine implement

Input: A TAC value, distribution parameters

Output: Realized catch and realized F. True selection at age that year.

1) Find the annual F corresponding to the TAC, when the TAC is applied to the true stock numbers.
2) Derive catches in numbers at age according to that F, with the standard selection, by applying the catch equation
3) Distort these catch numbers at age, with an algorithm similar to that for the observation error, but without autocorrelation:
   a) A log-normal random multiplier, with a mean (bias) and a CV, reflecting the variability in the deviation from the quota. That gives an overall random error with bias
   b) For each age, apply another random multiplier with mean 1 and an age-specific CV
4) Calculate the Fs at age corresponding to these distorted catches, applying them to the true stock numbers. If the caches cannot be taken at Fmax, apply Fmax, and the catch corresponding to Fmax.
5) Calculate the mean F over reference ages, and the selection according to the realized catches.
6) Calculate the SOP to get the true catch in biomass.

Subroutine getactn.

Inn: nin-matrix

Out: N at age vector.

This routine is used when the starting values come from a nin.inn-file or a nin.num -file. It draws random n-values according to specified expectation values and variance-covariances, assuming a lognormal distribution.

In addition, there are routines for generating random numbers, sorting routines, input routines, printout routines, and a routine to calculate yield/recruit from input data.

Output:

The main output is to the file results. It gives the mean, 10, 50 and 90 percentiles for true catch, true F, true SSB and IAV by year.

Summary outputs are to the files y1_5 and y10_20. A range of performance measures are printed as the mean over all the years in the range and all iterations, with one line for each set of rule parameters. *The format in these files is slightly different in **hcm**.*

Individual data (SSB and recruitments, true and decided F, true, observed SSB and the projected SSBs used for decisions) are printed to files, primarily to enable generating distributions. These files will become very large if the run screens over many management options. At the end of the options input file, there is a key to tell which files shall be generated. *This key is not implemented in **hcm**, here these routines are commented out.*

Annex 6:

Mackerel Stock recruit models

John Simmonds

Introduction

The objective is to develop a robust method for simulating recruitment for the NE Atlantic mackerel population. The available data consists of the ICES data on stock and recruitment (ICES 2007). There were a number of criteria, that needed to be met; the models should be taken from an accepted set of functional forms and should explicitly include stochastic deviation from well described random functions that could be simulated. In addition a number of issues were raised for consideration.

Sensitivity to early measures of SSB pre 1979

Choice of functional model type and sensitivity of conclusions to the parameters.

Choice of type of stochastic deviations from functional model and recent increases in the magnitude of variability.

This section explores these issues through

The sensitivity of the model and variance to early values of SSB.

The sensitivity of model parameters to choice of period.

The model choice and parameter range.

The probability of different functional models and uncertainty in model parameters

Data

In all cases the data used are the time series of input data and the accepted 2007 assessment reported from the 2007 WGMHSA (ICES 2007). Recruitment estimates from 2004-2006 are not considered due to the WG and ICES ACFM view that these are uncertain.

Methods

Sensitivity to uncertainty in SSB prior to 1979.

The WG considers that SSB values before 1982 were uncertain due to the catch at age data in 1972 to 1979, which included older ages in a plus group starting at age 4 in 1972 and increasing the plus group annually until 1980 with the plus group at age 12 for this and all subsequent years. There was no available information on recruitment or selection in the fishery for the age-classes 1960-1968 that contribute to the incrementing plus group. These recruits are not used in the S/R relationship as part of the recruitment time series but they do contribute to the SSB in 1972 to 1979. In order to examine the sensitivity of the estimated SSB in these years to the 1960-68 recruitment a range of possible values were simulated by bootstrap from the catch at age data.

The procedure was as follows:-

If y is a randomly selected year 1980 to 1998, L_{1972+j} is the catch in tonnes in the plus group in year 1972+j, and L_{y+j} is the catch in tonnes in the corresponding year and age range. Then the $n_{a,1972+j}$ catch at age a (a>=plus group) in year yr is:-

$$n_{a,1972+j} = n_{a,y+j} L_{1972+j} / L_{y+j} \quad \text{(for j=0:7, and a=4+j to a=12+)}$$

For each new catch matrix (catch at age and weight at age) a FLICA assessment was carried out using the model settings and all other data from 2007 WG (ICES 2007). The FLR function sr was used to fit a hockey-stick stock recruit relationship with log normal deviations.

Sensitivity of fitted models choice of periods.

Different periods were selected,

- Years 2004-6 were always excluded from all analyses due to their uncertainty.
- Years 1972 to 2003 including the whole available time series,
- Years 1979- 2003; removing early ears due to uncertainty in SSB in 1972 1978.
- Years 1978 - 2001 to exclude the large fluctuation in recruitment 2002 to 2004.

Stock Recruit functional Models tested

The models of Recruitment (R) based on SSB (S) considered are:

Ricker (1954)	R= a.S.exp(-bS)	
Beverton /Holt (1957)	R = a.S / (b+S)	
Hockey-stick	R = a.S/b	(S<=b);
	A	(S>b)
Modified Hockey-stick	R = a.S/b	(S<=b);
	a+c(S-b)	(S>b)

Where a and b and c are fitted parameter values. The modified Hockey-stick which has a declining slope independent of slope at the origin was included to accommodate the possible decline in recruitment at higher biomasswithout influencing the slope at the origin. This is in contrast to the Ricker function where fit at high SSB changes the slope at the origin.

Distributions of stochastic deviation tested

For Normal deviations

$$R = f(S).(1+\varepsilon(\text{sigma}))$$

For log Normal deviations

$$R = \exp(f(S)+\varepsilon(\text{sigma}))$$

The same models were fitted in both maximum log likelihood and Bayesian MCMC framework (Gelman 1995) using WINBUGS (Spiegelhalter et al 2003) and data extraction using CODA suite for R (Best 1997) . This framework uses DIC, a Bayesian equivalent to AIC to compare the fit of the same functional models (Gelman 2003 and Spiegelhalter et al 2002).

Different stock perceptions with different models

Rather than choose a single model the population might be considered to have a range of plausible model outcomes with given probability (Michielsens, and McAllister 2004). If a range of potential models give functionally the same management options then there is no need to consider model probability. If however, the different potential models might lead to different advice, then the probability of different models is important and should be considered within the evaluations.

To check the influence of the different models those with the highest probability, the Hockey-stick, and Ricker model sets derived from the Bayes analysis were used in an evaluation for yield verses equilibrium constant F exploitation by simulation. Exploitation at age was taken as average of last 12 years with mean F ages 4-8 varied from 0.1 to 1.2. The population had mean weights and maturites from history with model based recruitment. The models were grouped in to the four functional sets, Hockey-stick ,Ricker, Normal, Lognormal deviations. 1000 years of exploitation were simulated for each set. The results were used to evaluate the equilibrium yield, SSB and risk of SSB below 2.3Mt for different model types.

Probability of models

To estimate the probability of different functional forms of the S/R relationship a Bayesian analysis was used to evaluate the combined uncertainty in parameter estimates and probability of the different functional models and distributions.

The parameter values from the MCMC chain were provided by WINBUGS. To obtain a set of independent model parameter sets 40,000 were initially generated and then thinned to 2,000 to remove correlation between close estimates. This does not alter the distribution parameter values, but reduces the number of models required to give a full coverage of parameter ranges. The probability is calculated from the likelihood given the data on recruitment r_i and the observed SSB S_i

For a Normal distribution

$$\Pi_{ji} = 1\frac{1}{\sigma_j\sqrt{2\pi}}\exp(-\frac{1}{2\sigma_j^{\,2}}(r_i-\mu_{ji})^2)$$

For a Lognormal distribution

$$\Pi_{ji} = 1\frac{1}{r_i\sigma_j\sqrt{2\pi}}\exp(-\frac{1}{2\sigma_j^{\,2}}(\ln(r_i)-\mu_{ji})^2)$$

μ_{ji} is the modelled mean recruitment given the SSB S_j and the model parameters a_j, b_j

The likelihood of the model j given the data r_i is given by

$$\Pi_j = \exp(\sum_i \ln(\Pi_{ji}))$$

The Bayes′ posterior probabilities have been calculated using the harmonic mean of the likelihood (Kass and Raftery 1995). Following the method of Michielsens, and McAllister (2004)

$$\Pi = 1/\sum_j 1/\Pi_j$$

The probability of each model set (assuming only those sets examined are possible) is given by the probability of that model set divided by the sum of the probabilities of all sets, so the probability of the Hockey-stick Normal among the six options is given by

$$P_{HSN} = \Pi_{HSN} / (\Pi_{HSN} + \Pi_{HSL} + \Pi_{RN} + \Pi_{RL} + \Pi_{MHSN} + \Pi_{MHSL})$$

A similar equation is used for each model set.

Some difficulties were encountered with this approach, as the values of Π derived from likelihood of the 2000 models can depended strongly on the likelihood of a very few low probability models. The results stabilize once the lowest 0.5% of values from each functional forms are ignored. Removal of a similar percentage of highly likely models has no influence on model probability.

This method could not incorporate the uncertainty in the SSB from 1972-79, so to check the importance of this aspect a bootstrap of observation data (using the estimates of SSB in 1972-79 detailed above) and using FLR to obtain parameter estimates of S/R models by bootstrapping the SSB/R pairs with replacement. This was done twice, once with fixed and once with variable SSB prior to 1980.

Results

Sensitivity to early uncertainty in SSB 1972-79

The estimated recruitment time-series is not affected by catch at older ages in early years (Figure 1). Only the SSB is affected and only for years 1972 to 1979. The parameter estimates on the hockey-stick model are unaffected by the different values of SSB from 1972 to 1979 (Figure 2a). Mean recruitment and variability in recruitment are all the same (Figure 3b,c). The Hockey-stick models fitted are not sensitive to the SSB values.

The Bootstrap evaluation of model probability choosing between Ricker or Hockey-stick with variability in SSB prior to 1979 included or excluded showed no difference in proportion of model type selected.

No further consideration was given to uncertainty in SSB prior to 1980

Sensitivity of fitted models to years for data.

Hockey-stick, Ricker were fitted to different year ranges. Both models have three parameters (a, b, σ), so the differences among models is dependent only on the likelihood of the values of the residuals around the model, not the number of parameters. The differences in parameter values between year ranges is dominated by the differences in variability during different periods. The difference in modelled values over the range of SSB observed is very small (Figure 5), the lines substantively overlap in regions where the data is common to all periods. The major difference among periods is due in all cases to the estimated σ. Thus the choice of period is informative for variability and not mean recruitment. The longest period with the greatest variability seems most appropriate to use.

Choice of distribution of deviations.

According to AICc (Table 1) the normal distribution appears in all cases to better represent the deviations from the functional model, though the differences are small. The differences in fit between Normal and Log Normal can be seen in Figures 6 and 7 which show the cumulative probability distributions and Q –Q plots for Log Normal and Normal distributions. The most important differences are at the extremes with Log Normal giving an overestimate of occurrence of higher values and underestimate of occurrence of lower ones. This contrasts with the Normal distribution which underestimates the frequency of highest values and overestimates the occurrence lowest values.

Choice of model from information criteria

The maximum likelihood approach uses the AICc criteria and suggests that the best fit is for a Ricker function with Normal deviations (Table 1), but the differences among functional shapes are small. The Beverton and Holt model fits poorly and with the lowest allowed b parameter, so it's fit and slope near the origin is artificial and is not indicative of a useful fit. For practical purposes the Hockey-stick can be considered as a piecewise approximation to Beverton and Holt constraining the point of inflection near the lowest observed SSB. The Beverton and Holt model is not considered further. In all cases the difference in AICc among models are very small suggesting the data is not very informative for selecting a functional model. The Modified Hockey-stick model is gives a better fit for each type of deviation but has the lowest AICc would be rejected under this criteria the extra parameter does not sufficiently improve the fit to justify inclusion.

The model parameters were also estimated using a Bayesian approach. The parameter estimates are broadly similar (Table 2) but give higher standard deviations for the distribution of deviation from the functional model. With log Normal deviations σ is 0.49 compared with 0.46 and for Normal deviations 0.44 compared with 0.41.

For the Hockey-stick model the prior on b limits the lower bound to 1.68Mt .

Uncertainty in model parameters

The Bayesian approach provides distributions of a, b (c) and σ as sets for each model. This information is necessary if a distribution of values is used for future simulation. The ranges of parameters estimates are given in Table 2.

The influence of different models

The stock and yield evaluation for different exploitation rates (Figure 8) shows that there are considerable differences in the equilibrium conditions for a stock under different model assumptions. In particular the Ricker gives much more optimistic results for higher exploitation rates. Most important is the population response. The Hockey-stick leads to Fmsy ~ 0.4 with F crash at about F=0.55 this contrasts with Ricker giving Fmsy at 0.6 and Fcrash at about F=1.2. While the use of AICc could be used to justify the choice of model the inference is weak and the consequences to advice considerable. This indicates that some other the approach such as using different models with appropriate probabilities would be more useful.

The probability of different models

The Bayesian approach incorporating the probability of model types gives a different perspective. The log likelihood of models derived from the MCMC chains for six model types are illustrated for the different model types (Figure 9). The choice among models in a MLL criteria (AICc) depends also on the number of parameters estimated (3 or4) but when determining the probability of a model it is the magnitude of the likelihoods that are of interest. These are plotted in magnitude sequence, lowest (most unlikely) first and highest last for each model type. The maximums obtained in the Bayes analysis substantively agree with the maximum likelihood method with the Ricker with Normal deviations preferred (Table 1).

However, the choice of models is different if you consider not just the most likely model but include parameter uncertainty. For the Bayes method it is not just the maximum likelihood model but the whole distribution that is considered. The Bayes' posterior probabilities of each model type has been calculated using the harmonic mean of the likelihood (Kass and Raftery 1995). However, selecting the correct probabilities is not entirely formulaic. The calculations of model harmonic mean likelihood can be dependant on a very few of the models with low likelihood. The lowest likely10 models corresponding to 0.5% of the least likely parameter sets affects the relative model probabilities. Removing these very improbable models the values remain stable at the following percentages

H-S Normal	41%
H-S Log	29%
Ricker Normal	23%
Ricker Log	8%
Modified H-S Normal	<1%
Modified H-S Log	<1%

As both the Modified Hockey-stick models are selected with very low probability they are not included in any further analysis, leaving 4 functional models to be used for simulation.

Truncation of simulated recruit values

The fitted models may provide recruitment that can considerably exceed the observed historic range of recruitment. The distributions are an approximation and do not fit the distribution well, (Figures 6 and 7). Theoretical distributions give a very small number of high deviation values which are correctly represented mathematically but may be biologically unrealistic. I this case because neither distribution is a good fit some consideration of truncation is essential. The Normal distribution gives too many low values the Lognormal too many very high values. In order to keep simulated recruitment within realistic biological ranges the deviations applied need to be restricted. To do this simulated recruitment was compared to observed recruitment using the range of SSBs observed, there were 32 observed recruit SSB pairs. Three approaches were examined to determine the upper and lower limits to the allowed deviance.

1) Limiting the proportion of simulated values to 1/64th of the total above and below observed min and maximum recruitment
2) Limiting deviance to a single fixed limit in all models
3) Limiting deviance on each model to give an overall limit to observed recruitment (for the range SSB values observed).

Method 1 still gave a small number of unrealistic very high values above 2 times highest previously observed recruitment. Method 2 gave a spread of limits that constrained some model maxima well below observed maxima, while delivering others at 2 times the observed maximum suggesting this was not an effective method. The third method seemed to most realistic but requires selecting model specific limits for recruitment. The limits were estimated for each model to be used at the point corresponding to extending the range by ½ an additional increment to the upper and lower deviations observed (red points in Figures 6 and 7). The increments were estimated for upper and lower tails separately assuming linearly increasing increments. This gives the following estimated values for upper and lower limits to recruitment over the range of observed SSB.

Limit	Observed	Ricker N	Ricker LN	H-S N	H-S LN	Mean
Lower limit	0.96	0.66	0.53	0.77	0.63	0.646
Upper Limit	8.89	10.10	9.54	9.90	9.66	9.803

The mean values of 9.8 and 0.64 are taken as the limits over the range of observed SSB. For SSB outside this range the limits follow the same maximum deviation for each model. The mean upper and lower limits expressed as numbers of standard deviations are given below.

	H-S LN	H-S N	Ricker LN	Ricker N
Lower limit	-3.29	-1.91	-3.31	-1.92
Upper limit	1.88	3.23	1.58	2.90

Very few draws from the Log Normal distribution are discarded at the lower end, similarly for high values from the Normal distributions but significant truncation occurs at high deviation for Log Normal and low values for Normal deviations. Small changes are made to the model parameters to maintain the mean for each model over the observed range of SSBs.

Conclusions

The estimated SSB in 1972 to 1979 depends on the age structure in the catch, plausible age structures based on bootstrap give different SSBs. Recruitment from 1972 to 2006 is unaffected by these differences, and modelled recruitment using a hockey-stick relationship is not influenced by the differences tested (Figure 4). Bootstrap based model probabilities are unaffected by the different SSB values and although there was no simple way to include this in the Bayesian method treating these early SSB values differently was regarded as too complex to manage further and not necessary in this case.

Both Bayes and MLL methods select Ricker over Hockey-stock for a single model though the differences are small. Selecting a single model is has major consequences for advice and is not recommended. Selecting a distribution of models gives a more complete perception of the probability of the dynamics. The Hockey-stick is favoured over the Ricker by 70 to 30%. The balance between stochastic deviation models is 64 to 36%. More complex models are rejected by both methods. In all cases the Bayesian method suggests that σ has higher standard deviations than given by the maximum likelihood method.

The above probabilities were used to define 1000 randomly selected models with the proportions given above and the parameters defined from the MCMC chains of the Bayesian analysis, truncated as described above. The resulting distribution of simulated recruitment for different SSB levels is illustrated in Figure 10a. a comparison of observed values and simulated values on the observed values of SSB is given in Figure 10b. The match is a good compromise, better than any single model shown above in Figures 6 and 7. The mean simulated recruitment is less than 3% greater than the observed value and the distribution of deviations is a good match to the observed deviations as described either through a comparison of cumulative distributions (Figure 10b) or a Q Q plot (Figure 10c). This set of 1000 models is used throughout the main simulations.

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Table 1. Estimates of fitted model parameter using maximum log likelihood method with log-normal and normal deviations. Estimated AICc from maximum log likelihood. For comparison the maximum log likelihood values derived from the Bayesian analysis are also shown.

	Ricker		Beverton /Holt		Hockey-stick		Modified Hockey-stick	
	aSexp(-bS)		aS/(b+S)		aS/b(S<=b); a(S>b)		aS/b(S<=b); a(1+c(S-b))(S>b)	
	Log Dev	Norm Dev	Log Dev	Norm Dev	Log Dev	Norm Dev	Log Dev	Norm Dev
sigma	0.46	0.41	0.46	0.42	0.46	0.42	0.46	0.40
b	0.46	0.53	0.00	0.00	1.68	1.68	1.68	1.68
a	4.81	6.26	3.69	4.07	3.69	4.07	4.00	4.57
c							-0.09	-0.13
AICc	132.28	130.71	132.10	131.45	132.17	131.42	134.29	131.53
AICc Rank	7	1	5	3	6	2	8	4
MLL	-62.71	-61.93	-62.66	-62.29	-62.65	-62.28	-62.40	-61.03
Bayes MLL	-62.80	-61.93			-62.66	-62.29	-62.50	-61.18

Table 2 Parameter estimates for Bayesian models

Node	mean	sd	MC error	2.5%	median	97.5%	start	sample
b HS Norm	1.677	0.03481	2.003E-4	1.672	1.672	1.734	10001	120000
b HS LNorm	1.71	0.1496	0.001241	1.672	1.672	2.19	10001	120000
b M-HS Norm	1.518	0.07401	5.356E-4	1.5	1.5	1.765	10001	120000
b M HS LNorm	1.689	0.8368	0.03006	1.5	1.5	3.293	10001	120000
b Ricker Norm	0.5433	0.09533	0.002711	0.3495	0.5449	0.7233	10001	120000
b Ricker LNorm	0.5353	0.1601	0.005588	0.2642	0.5185	0.8946	10001	120000
a HS Norm	4.07	0.3164	0.002558	3.451	4.071	4.695	10001	120000
a HS LNorm	1.31	0.08913	6.048E-4	1.139	1.31	1.485	10001	120000
a M-HS Norm	4.572	0.5152	0.007179	3.587	4.563	5.609	10001	120000
a M-HS LNorm	1.43	0.3577	0.01189	1.041	1.394	1.868	10001	120000
a Ricker Norm	6.727	1.738	0.04878	3.858	6.528	10.66	10001	120000
a Ricker LNorm	2.177	1.019	0.03591	0.9974	1.944	4.683	10001	120000
sigma HS Norm	0.4373	0.06898	4.062E-4	0.3299	0.4282	0.5979	10001	120000
sigma HS LNorm	0.4847	0.06429	2.224E-4	0.3788	0.4778	0.6289	10001	120000
sigma M-HS Norm	0.428	0.0678	4.27E-4	0.3221	0.4191	0.5857	10001	120000
sigma M-HS LNorm	0.4926	0.06845	6.252E-4	0.3818	0.4849	0.6484	10001	120000
sigma Ricker Norm	0.4386	0.07028	4.425E-4	0.3289	0.4291	0.6016	10001	120000
sigma Ricker LNrm	0.4973	0.06785	6.271E-4	0.3862	0.4899	0.6515	10001	120000
c M-HS Norm	-0.0988	0.07385	0.001018	-0.2125	-0.1097	0.07368	10001	120000
c M-HS LNorm	-0.0557	0.1883	0.001807	-0.2716	-0.0636	0.2309	10001	120000

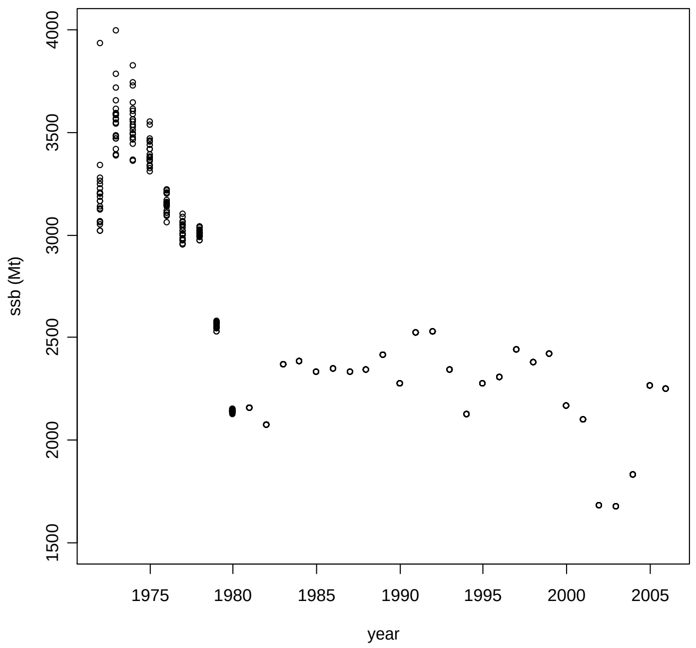


Figure 1. Estimated SSB under different recruitment and exploitation conditions in years 1972-1979. Substituting bootstrap simulated age structure for catch at age 4-12+ in 1972 to 11 to 12+ in 1979.

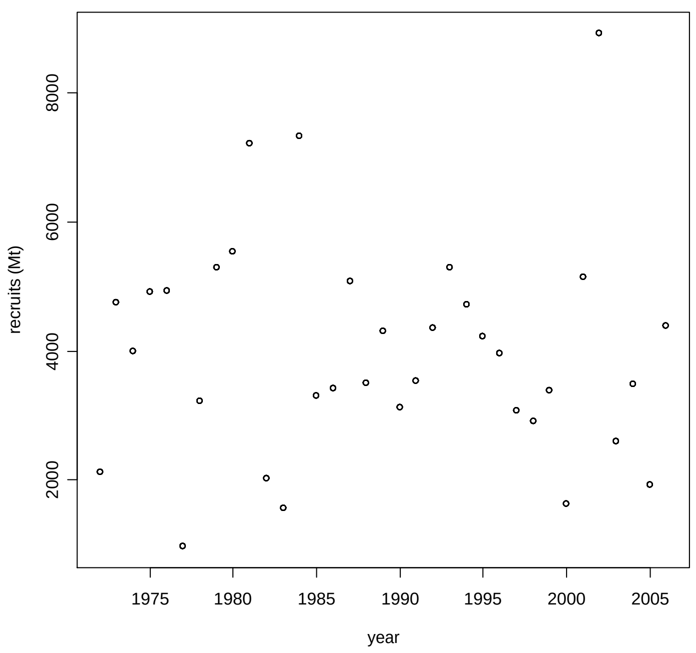


Figure 2. Estimated recruitment under different recruitment and exploitation conditions in years 1972-1979. Substituting bootstrap simulated age structure for catch at age 4-12+ in 1972 to 11 to 12+ in 1979.

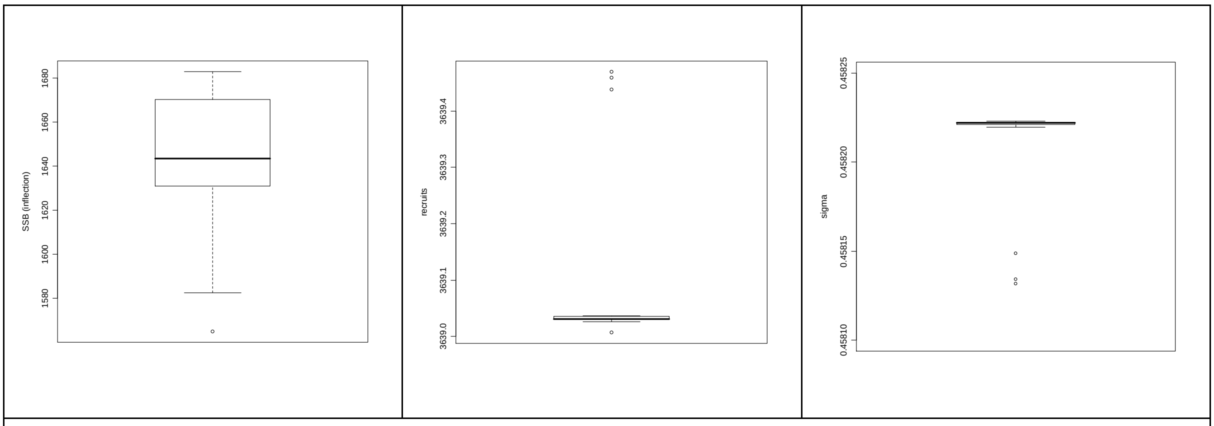


Figure 3 spread of parameter values (SSB, Recruitment and σ) of fitted hockey-stock S-R models for bootstrap substituting simulated age structure for catch at age 4-12+ in 1972 to 11 to 12+ in 1979. Note the negligible changes in recruitment and σ and small range of SSB all below second lowest observed biomass.

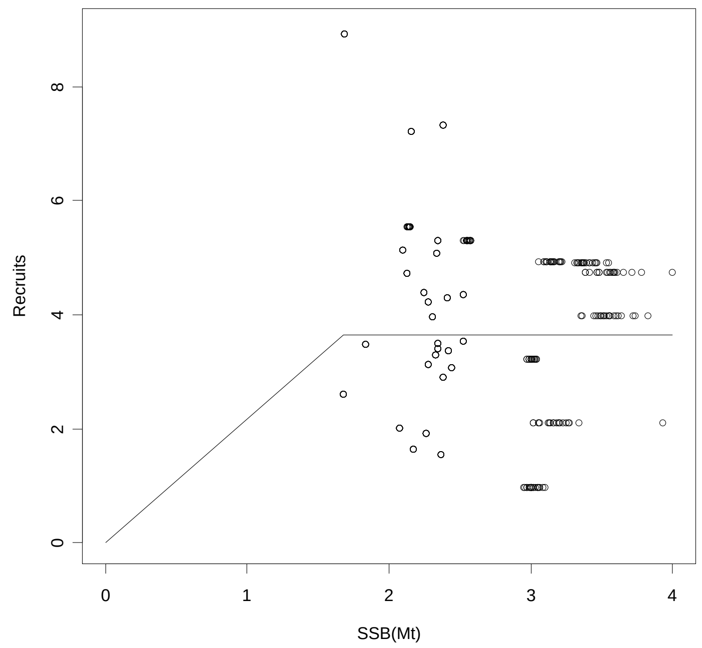
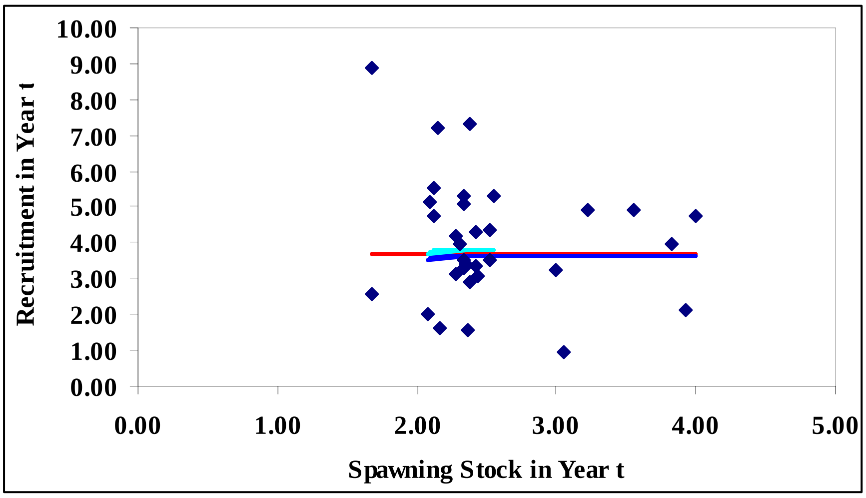
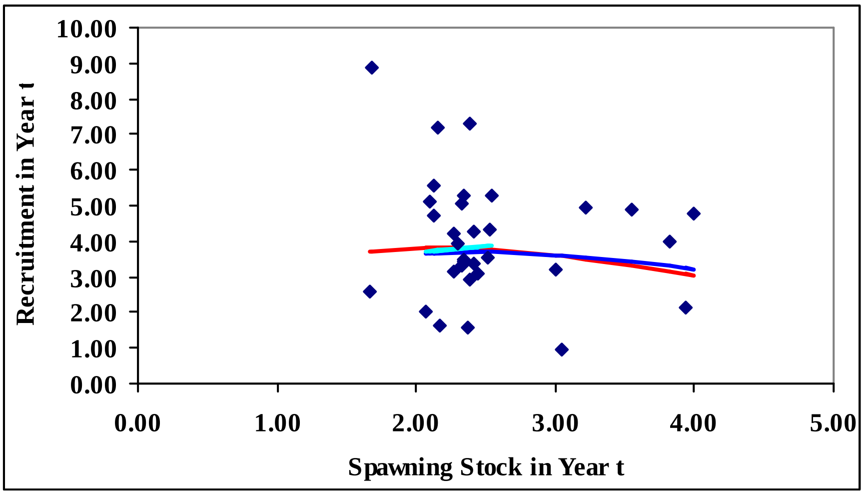


Figure 4 Stock Recruit plot for bootstrap simulated catch at age 4-12+ 1972 to 11-12+ 1979 and fitted hockey-stick model. Recruitment residual remain the same irrespective of the SSB values for the early high values of SSB.



a)



b)

Figure 5 Comparison between models fitted to different time periods, 1979-2001, 1972-2001, 1972-2006. a) Hockey-stick and b) Ricker. Models substantively overlap over common data ranges.

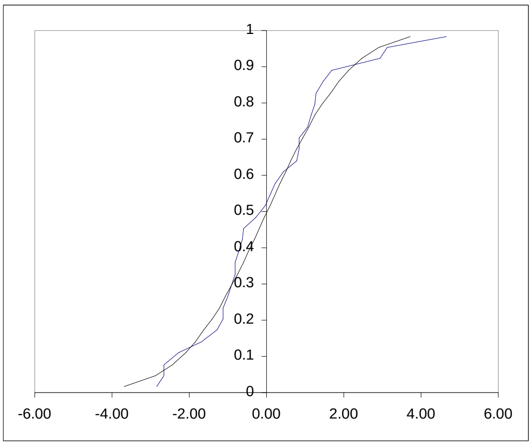
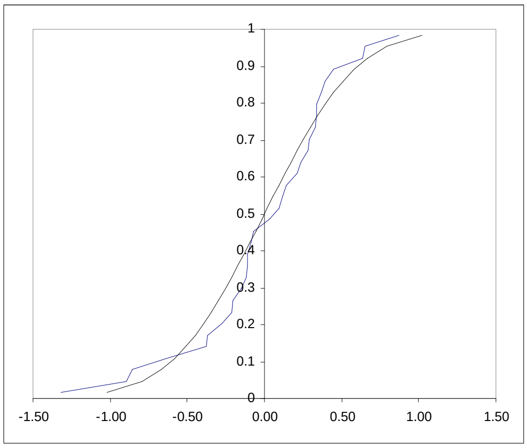
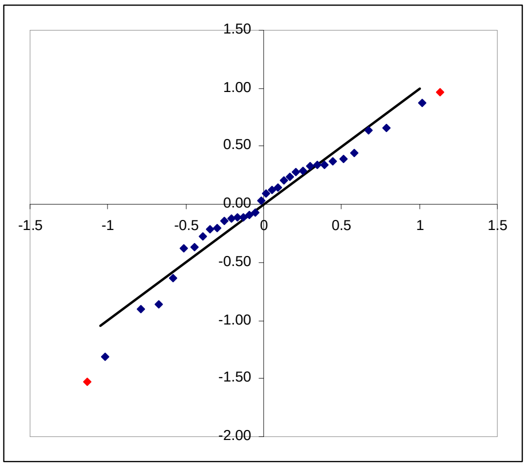
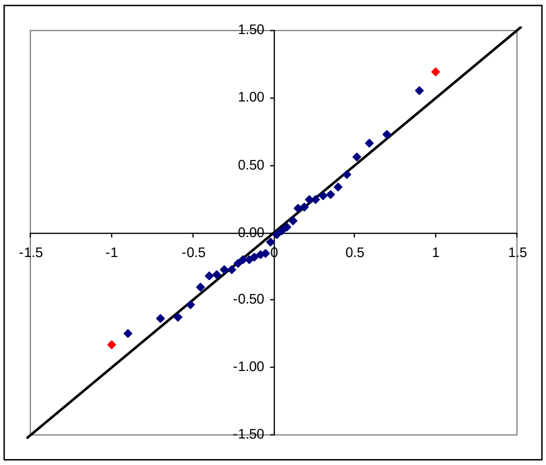
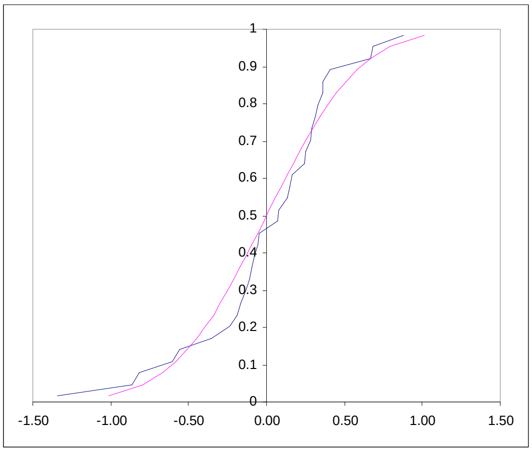
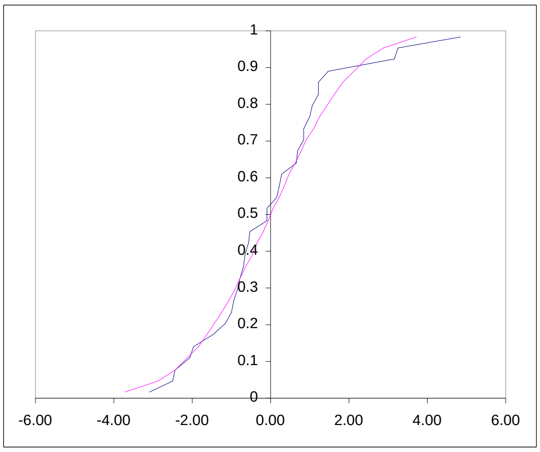
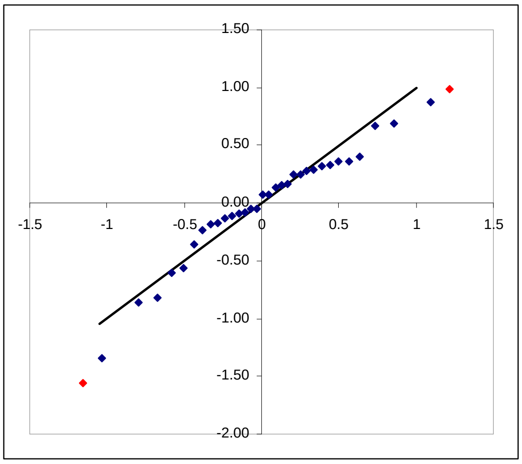
Log Normal Errors	Normal Errors
	
	

Figure 6 Comparison between observed and fitted deviations from the modelled recruitment comparing Log Normal and Normal errors for Ricker model fit (Blue points). Estimated limits to recruitment (red points) based on ½ increment further in each direction.

Log Normal Errors	Normal Errors







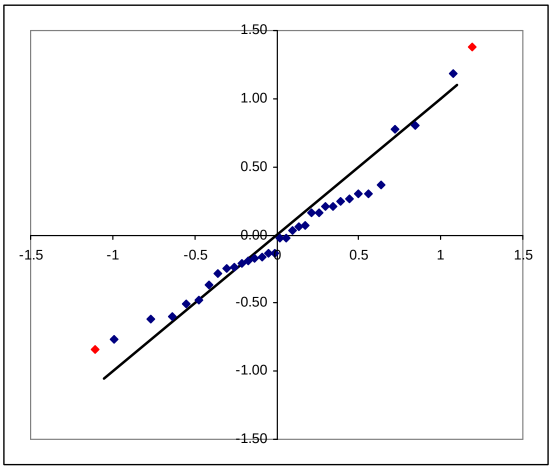
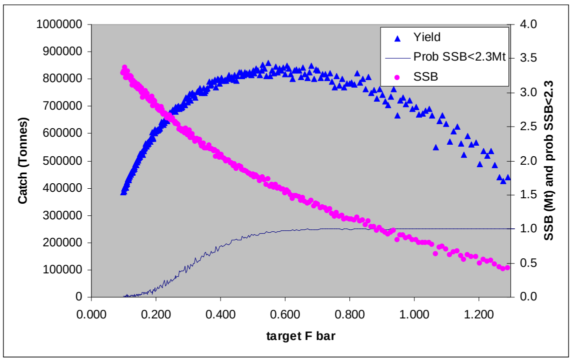
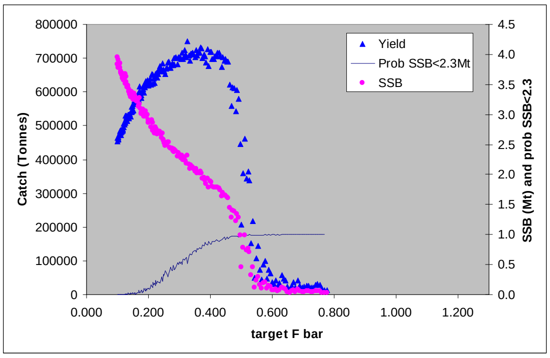
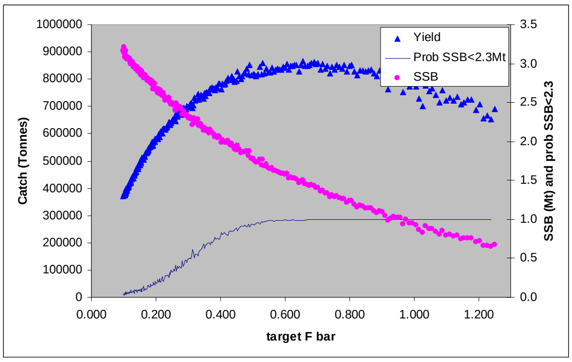


Figure 7 Comparison between observed and fitted deviations from the modelled recruitment comparing Log Normal and Normal errors for Hockey-stick model fit (Blue points). Estimated limits to recruitment (red points) based on ½ increment further in each direction.

	Ricker	Hockey-stick
Log Normal distribution	(chart 1)	(chart 2)
Normal Distribution	(chart 3)	(chart 4)







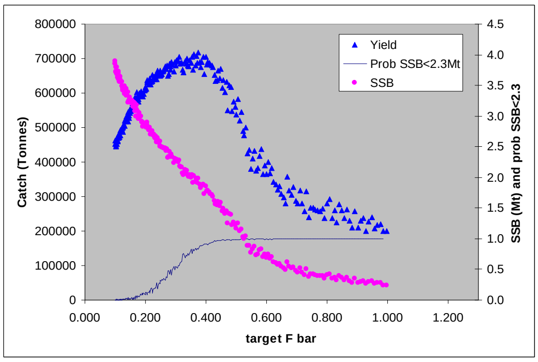


Figure 8 Equilibrium SSB Yield and Risk of SSB below 2.3 Mt for randomly drawn recruitment from randomly drawn models for the four model sets

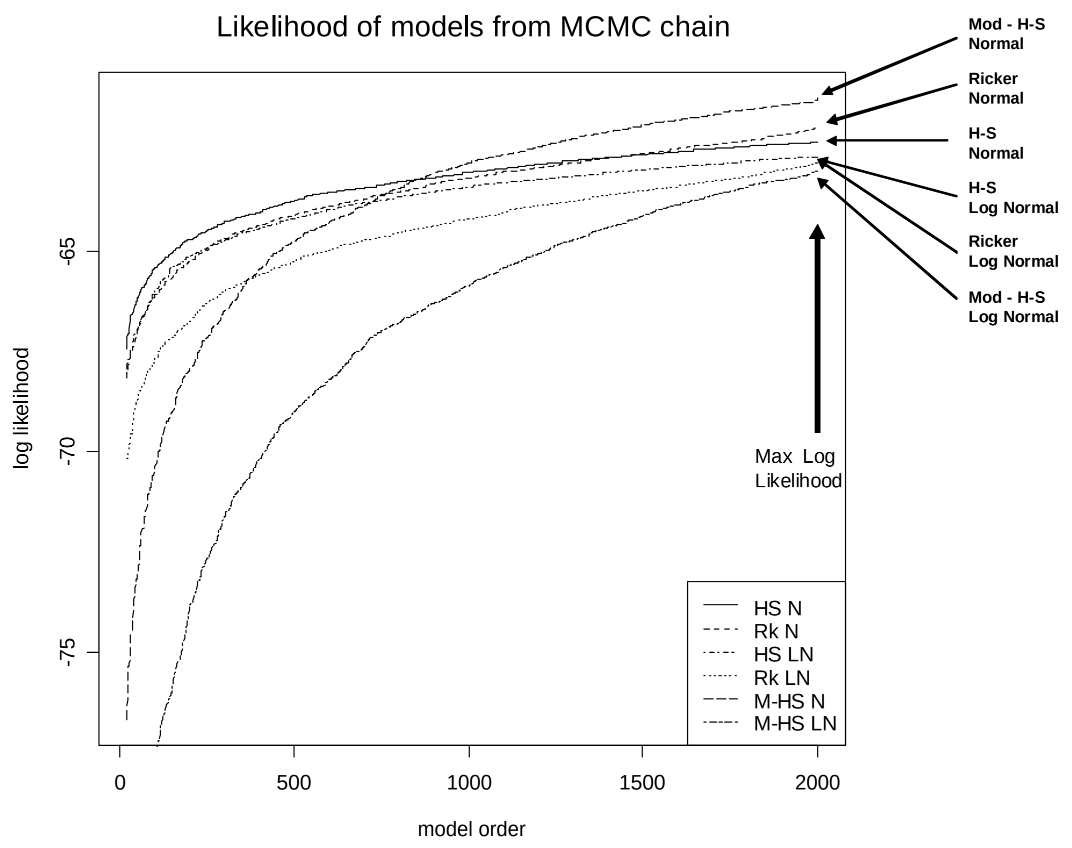


Figure 9 Range of log likelihood values from distribution of models from the MCMC chain derived from Bayesian analysis for six models Hockey-stick Normal (HS N) Hockey-stick Lognormal (HS LN) Ricker Normal (Rk N), Ricker Lognormal (Rk LN) Hockey-stick with slope at high SSB, Normal deviations (M-HS N) and Log Normal (M-HS L). Although the highest likelihood value is for the M-HS with normal deviations, this model set has a large number of very low likelihoods due to higher parameter count and uncertainty is allocated low overall probability. The Ricker with Normal deviations has the highest likelihood with three parameters but because parameter are more certain the HS with Normal deviations the highest ranking overall.

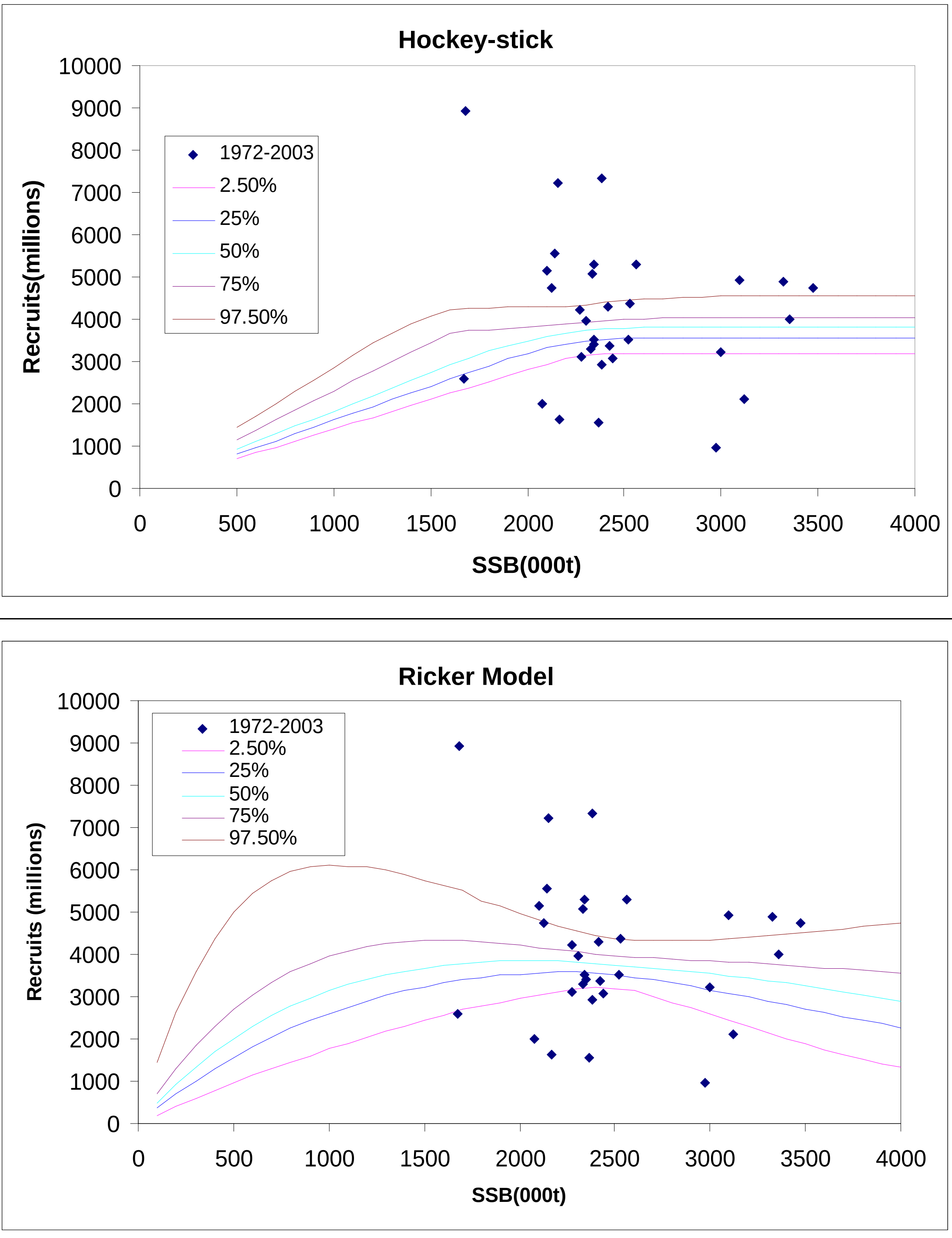


Figure 10. Comparison of data and distribution mean recruitment (2.5%, 25%, 50%, 75% and 97.5%) against SSB of functional forms for Hockey-stick and Ricker with Normal deviations obtained from the Bayesian analysis. These underlying functions are used to draw recruits.

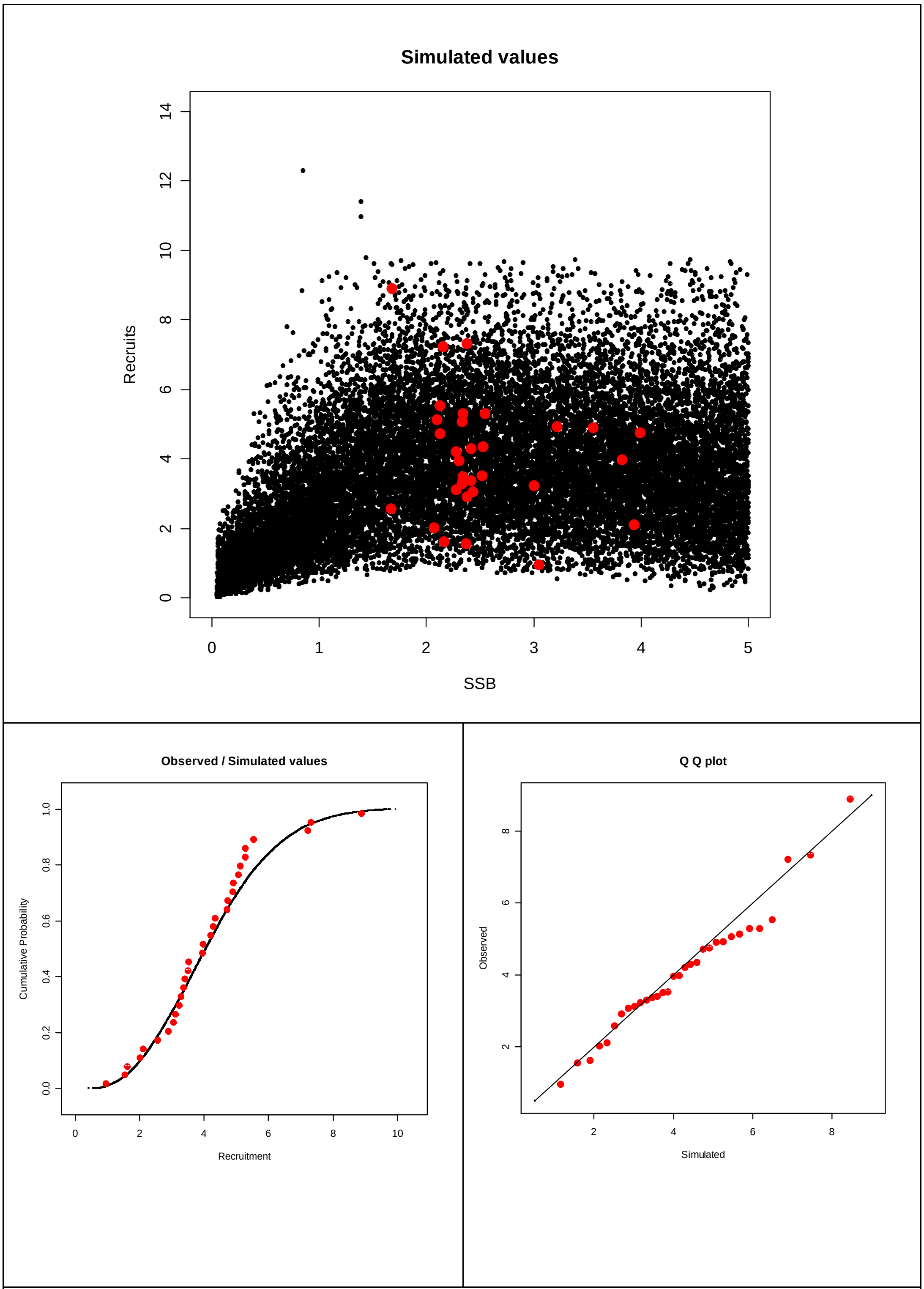


Figure 11 comparison of observed (red) and simulated (black) recruitment for a) SSB from 100,000 to 5M tonnes SSB, b) cumulative probability distributions of observed and simulated values for observed SSB and c) Q Q plot of observed and simulated values for observed SSB. Simulated values derived from 1000 models with Hockey-stick and Ricker functional forms and Normal or Log Normal stochastic deviation

Investigating the implication of fitting ICA using the egg survey as an absolute or relative measurement of the SSB

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1 Introduction

Last year we presented, in front of this working group (WG), the results of a fishery dynamic simulation investigating the effect on our perception of the status of the North East Atlantic mackerel stock of using the the spawning stock biomass (SSB) survey index as an absolute or a relative measurement of the abundance of the spawners [Kienzle and Simmonds, 2005]. This study concluded that (a) the outcome of ICA depends on whether the SSB index is fitted as an absolute or a relative measurement of the size of the spawning stock biomass (b) absolute fitting should only be considered if there is evidence that the egg survey provides an un-biased estimation of the SSB.

Following the comments from our colleagues at the WG and some modifications we wished to make, we improved the programs used to generate the simulated sets of data. This year, we present the results of an investigation of the influence of under-reporting of catches on the perception of the stock as well as their interaction with a biased index of the SSB.

2 Method

2.1 Fishery dynamic simulation

The simulated data are generated with a modified version of the programs presented in [Kienzle and Simmonds, 2005]. The modifications take into account the comments made by the members of last year WG are presented in this section. We refer the reader to the document cited above for a full description of the simulation.

Natural mortality, which was fixed to 0.15 years^{-1}, is now varying randomly according to a normal distribution with mean 0.15 years^{-1} and standard deviation 0.01 in order to obtain a yearly natural mortality that varies between 0.1 and 0.2 years^{-1}.

Catch bias were introduced into the simulation in order to determine how under-reported catch influence ICA's estimations. The magnitude of the bias is expressed as a proportion of the simulated value: it varies between 0.2 and 1 by steps of 0.1 in order to simulate an under-estimation of the variable by a factor of up to 5 times.

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2.2 Validation of the implementation

A validation[3] of the implementation of the deterministic model was conducted to verify that it was performing properly and that it generated an underlying population that respected ICA's assumptions assuming a perfect reported separable fishery and a perfect SSB index derived from a survey. This validation consists of comparing the simulated values to ICA estimation of the following 5 fishery variables

1. average fishing mortality between age group 4 to 7 ($\bar{F}_{4\text{–}7}$)
2. number of recruits
3. number at age in the final year of the simulation
4. spawning stock biomass (SSB)
5. total stock biomass (TSB)

The agreement between the simulated and the estimated fishery parameters is evaluated using 3 measurements for each of the 5 variables presented above. The first (Eq. 1) measures the average distance between the simulated and the estimated value in unit of the variable.

$$M_1 = \frac{1}{n} \times \sqrt{\sum_{i=1}^{n} (S_i - E_i)^2} \qquad (1)$$

The second (Eq. 2) measures the average bias of the estimated variable.

$$M_2 = \frac{1}{n} \times \sum_{i=1}^{n} S_i - E_i \qquad (2)$$

The third (Eq. 3) measures the average percentage of deviation between the estimated and simulated values.

$$M_3 = \frac{1}{n} \times \sum_{i=1}^{n} |S_i - E_i| / S_i \qquad (3)$$

3 Stochastic simulation and stock assessment

3.1 Case studies

[Kienzle and Simmonds, 2005] investigated how ICA results were influenced by applying stochastic fishing mortality on 2 different compartments of the simulation, namely the dynamic of the

[3] **Validation** "denotes the establishment of legitimacy, typically given in terms of contracts, arguments, and methods. A valid argument is one that does not contain obvious error of logic. By analogy, a model that does not contain known or detectable flaws and is internally consistent can be said to be valid" taken from [Oreskes et al., 1994]

population and the exploitation rate. Their results shows that in both cases ICA gives the same qualitative results but these are less variable when the stochastic fishing mortalities are applied to the exploitation rate. Therefore in this work, we applied the stochastic fishing mortalities to the dynamic of the population in order to study the more variable situation.

The following cases studies are investigated

- biased SSB index
- biased catches
- biased SSB index and catch

Furthermore since the egg survey is carried every 3 years while the assessment of the NEA stock is performed annually, we investigate the influence of the availability of the SSB index

- the year of the assessment
- the year previous to the assessment
- 2 years previous to the assessment

3.2 ICA parameters

Two runs of ICA were performed to analyse each simulated set of data: the first fits the SSB index as an absolute measurement of the amount of spawners whereas the second fits it as a relative measurement. The ICA parameters are reported in the annexe (p. 21).

4 Results

After running ICA on the simulated sets of data, it appears in some rare cases that the estimation of the SSB and TSB provided by this stock assessment method were large over-estimation of the simulated value. Since we chose to represent the distribution of the results, these are distorted by the large over-estimations. Therefore the results of each case studies are presented by 2 graphics: the first present all the results while the second present only the 10–90% quantile of the distribution in order to remove the outliers. We hope and expect that these types of outliers would be detectable by scrutinising ICA output.

4.1 Assessment during the year of the egg survey

4.1.1 SSB bias -catch bias

In the case of un-biased catches, fitting ICA with the assumption that the SSB index is an absolute measurement of the stock of spawners produces an over-estimation of the fishing mortality and an under-estimation of the SSB and TSB (Fig. 1). While assuming that the SSB survey is a relative measurement of the SSB allows for un-biased estimation of fishing mortality, SSB and TSB (Fig. 4).

Using the SSE to compare the varaibility of the estimates obtained with ICA reveals that a relative fit will provide less variable results than an absolute fit for all level of bias of the SSB index but the un-biased case (*i.e.* bias=1) (Fig. 6).

4.1.2 No SSB bias - catch bias

Using under-reported catches and an unbiased estimation of the spawning stock biomass fitted as an absolute measurement produces an under-estimation of the fishing mortality, an over-estimation of the SSB and a slight over-estimation of the TSB (Fig. 7). While a relative fit of the same datasets produces an un-biased estimation of the fishing mortality and an under-estimation of the SSB and TSB (Fig. 10).

The way in which catch and survey biases create bias in the estimates of terminal, historic and trend estimates of SSB and F in the assessment are shown in Table 4.1. If the recorded catch is biased then ICA estimates of SSB and F will always show some bias though in some cases the bias may be small. However, in the case of either survey or catch bias in the data unbiased trends may be estimated with ICA using the Egg Survey as a relative index.

Table 4.1 Summary of the influence of bias in either catch or SSB index from the Egg survey on parameters in the assessment. For SSB and F estimated for the terminal year, historically (“1982”) and the trend (Terminal –“1982”), estimated by ICA with the use of the Egg Survey as either a relative or absolute measure of abundance.

		Source of Bias			
		Catch Bias		Survey Bias	
ICA Assessment Method	**Parameter Estimated**	**SSB**	**F**	**SSB**	**F**
Absolute Fit	**Terminal**	Small Bias	Biased	Biased	Biased
	Historic	Biased	Small Bias	Small Bias	Small Bias
	Trend	Biased	Biased	Biased	Biased
Relative Fit	**Terminal**	Biased	Unbiased	Unbiased	Unbiased
	Historic	Biased	Small Bias	Unbiased	Unbiased
	Trend	Unbiased	Unbiased	Unbiased	Unbiased

Analysis of these simulations was developed further to establish what level of bias in catch and survey would be required for either relative or absolute tuning to out-perform the other. For each set of simulated data the error in the two assessments, relative and absolute, was estimated. Then from the full set of simulations the probability of which method would give the more accurate estimate of trend was estimated for the different levels of bias. Figure 11 illustrates the results for catch and survey bias independently. Trend in SSB and F are estimated more accurately more frequently by the absolute method if bias in either catch of survey is less than 0.85 (-15%). Conversely the relative method gives a higher probability of a more accurate estimate if the biases in either catch or survey is greater than 0.85 (-15%).

4.1.3 SSB bias - catch bias

As discussed above, the information we have on survey and catch suggests that both are biased. Unaccounted egg mortality in processing the survey data to estimate the SSB may under-estimate it by a factor 1.3. Different independent magnitudes of bias in both survey and catch were simulated simultaneously. The results show the absolute fit still gives biased results in SSB and F if catch is biased, but if the biases in the survey and the catch are equal the trends in SSB and F are correctly estimated with an absolute assessment. This is illustrated in Figure 12 which shows estimates of trend in SSB from “1982” to the present. In this figure bias in catches changes in the horizontal direction and bias in the survey changes vertically. The diagonal represents the case when both parameters are biased to the same extent. The diagonal shows than the trend is estimated correctly. The current situation is uncertain but the estimates of bias we do have suggest the panel 0.6-0.4 in row 5 column 3 (-40% survey and -60% catch bias) may be a one possible situation. If a relative fit is used the trend is both F and SSB is estimated without bias but with greater variability (see Figure 13 for the example of estimated SSB trend with the relative method).

For each set of simulated data with bias in both survey and catch the error in the assessment was estimated using both methods. Then from the full set the probability of which method would give the more accurate estimate of trend was estimated for different levels of bias in both parameters. Figure 14 illustrates the results for catch and survey bias together. The data to support the figure is insufficient to obtain precise results for every combination, as this would require far greater numbers if simulations, but the general conclusions are very similar to those when bias in catch or survey are examined independently. As illustrated in Figure 12 and 13 equal bias in each source of data allows the more accurate estimate of trend using the absolute method. Trend is more accurately estimated more frequently by the absolute method if bias in both catch and survey is less than 10% different. The relative method gives a higher probability of a more accurate estimate if the biases in both catch or survey is greater than 10% different.

These simulations provide a basis for deciding which method to use. They have been developed specifically for a single triennial SSB index used with ICA and the conclusions cannot necessarily be generalized to other situations. The simulations may slightly over estimate the variability due to the treatment of catch at age estimates, which have been used in a ‘worse case’ method, as discussed above. But they are also conditional on the choice of variability in M, greater variability will add to the variability in both methods of estimation, however, the conclusions are not heavily dependent on this variability. More importantly biases are assumed to be constant over time, this will not necessarily be the case though currently we have no way to estimate this. Strong trends in survey or catch bias will exacerbate the problems.

5 Conclusion

In the presence of catch bias advice on the correct levels of catch can only be given in a relative sense, projections should be treated as providing advice on change in catch not absolute levels.
If the bias in the catch is more than -15% relative tuning gives a higher probability of obtaining more accurate estimate of F and trend but the estimates of SSB will be biased. If there is bias in both Egg Survey and catch the relative tuning will give a higher probability of obtaining more accurate estimates of F and trend if the difference in the bias is greater than about 10%. These results coupled with the information on Egg Survey bias (-40%) and the estimated Q in the relative assessment suggesting greater bias in the catch or other unaccounted mortality (54%) support the use of relative tuning, and suggesting that this method will give a higher probability of obtaining the more accurate estimates of F and trend.

References

[ICES, 2003] ICES (2003). report of the working group on the assessment of mackerel, horse mackerel, sardine and anchovy. Technical Report CM 2004/ACFM:08.

[Kienzle and Simmonds, 2005] Kienzle, M. and Simmonds, J. (2005). Simulating the dynamic of a fishery to discriminate between different stock assessment options application to the nea mackerel. Technical Report CM 2005/ACFM:08, ICES.

[Oreskes et al., 1994] Oreskes, N., Shrader-Frechette, K., and Belitz, K. (1994). Verification, validation, and confirmation of numerical models in the earth sciences. *science*, 263:641–647.

[Simmonds et al., 2003] Simmonds, E. J., Beare, D., and Reid, D. G. (2003). Sensitivity of the current ICA assessment of western mackerel and short term predictions to the sampling error in the egg survey parameters. Technical Report CM 2003/X:10, ICES.

Figures

Assessment during the year of the egg survey

SSB bias - No catch bias simulation - Absolute fit

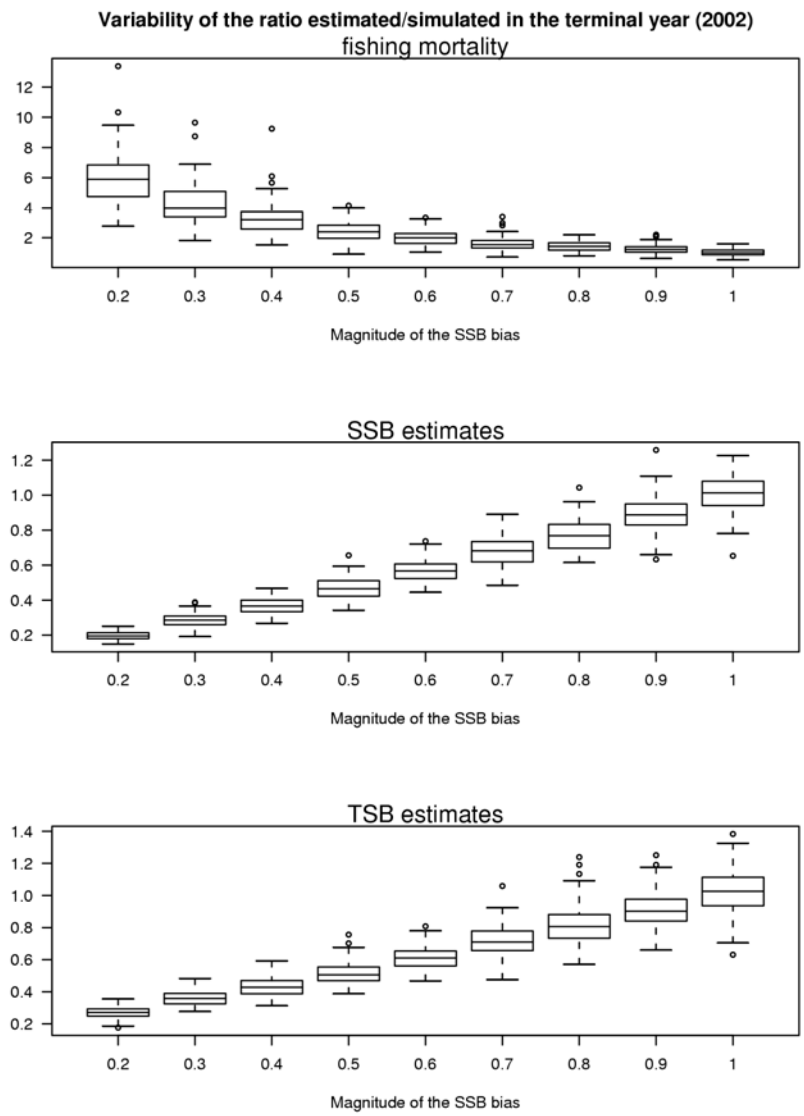

Figure 1: SSB index fitted as absolute.
[population variability - SSB bias - No catch bias - SSB survey NANACS]

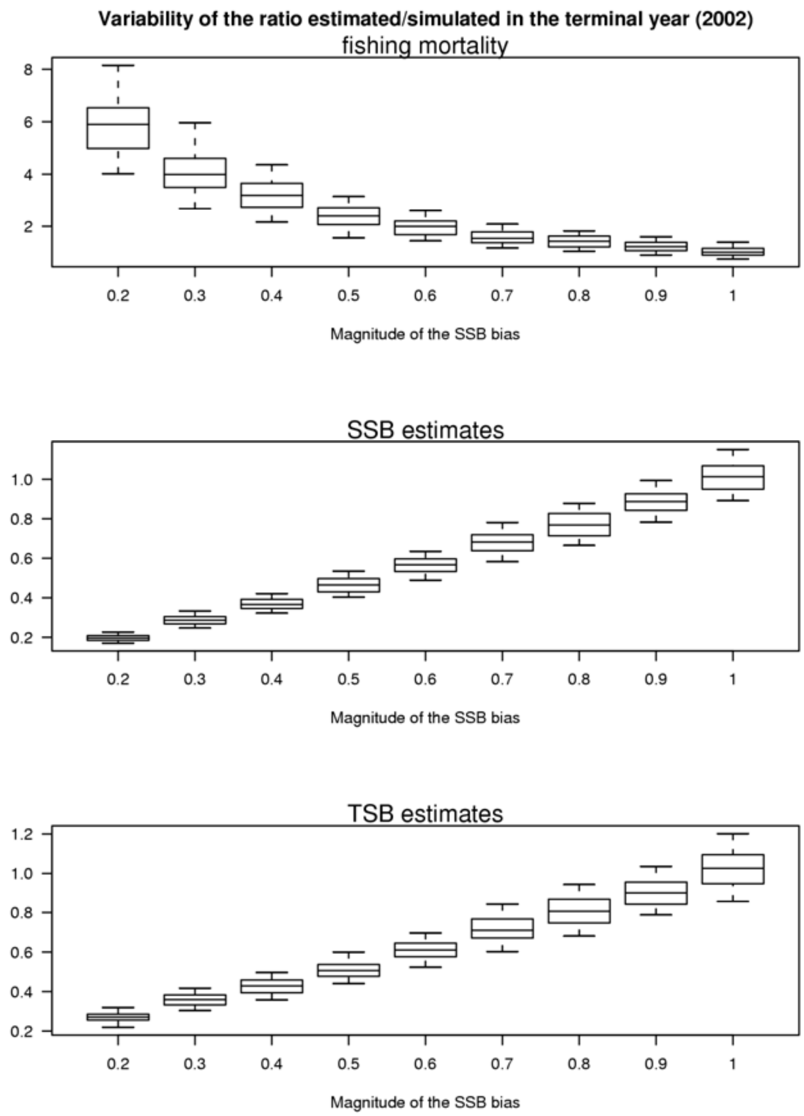

Figure 2: SSB index fitted as absolute. (10-90% quantiles of the distribution)
[population variability - SSB bias - No catch bias - SSB survey NANACS]

SSB bias - No catch bias simulation - Relative fit

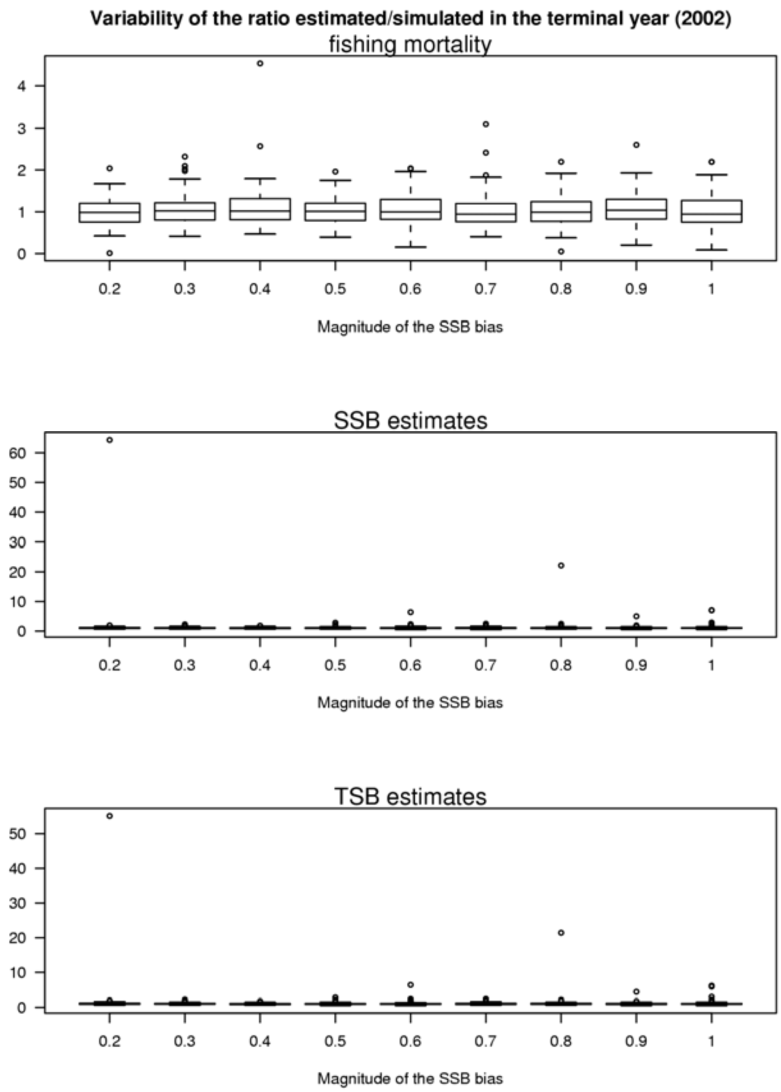

Figure 3: SSB index fitted as relative.
[population variability - SSB bias - No Catch bias - SSB survey NANACS]

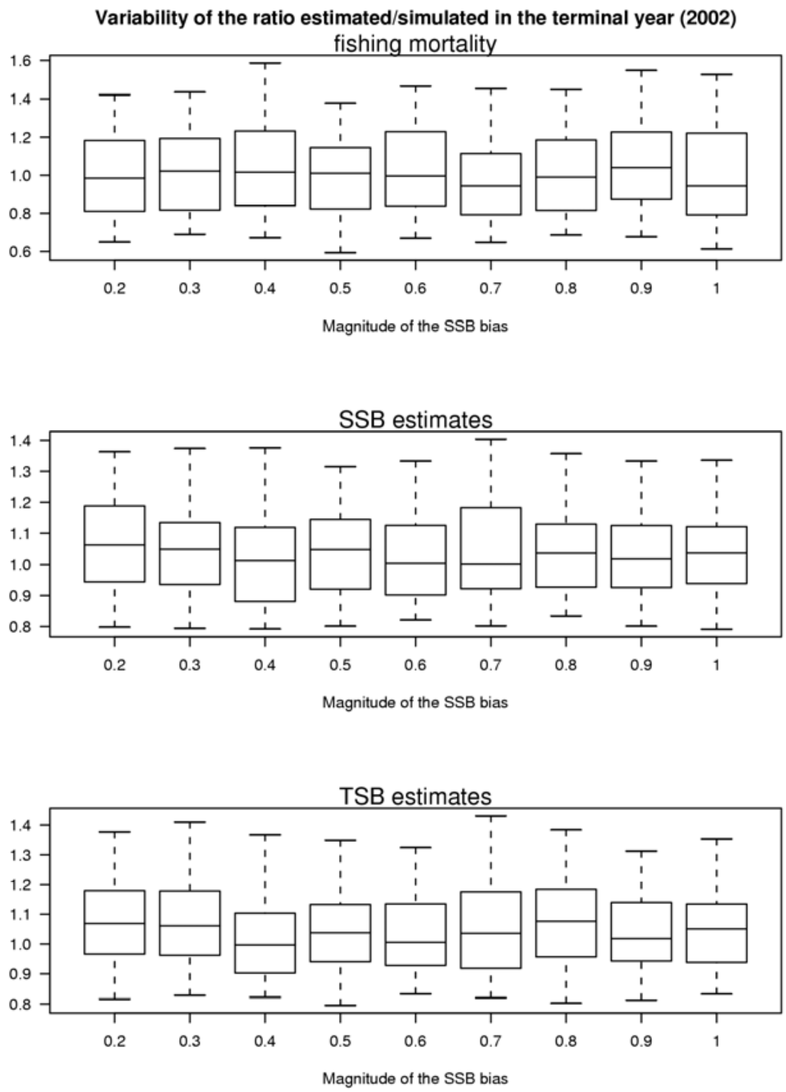

Figure 4: SSB index fitted as relative. (10-90% quantiles of the distribution) [population variability - SSB bias - No Catch bias - SSB survey NANACS]

SSB bias - No catch bias simulation - comparison absolute vs relative

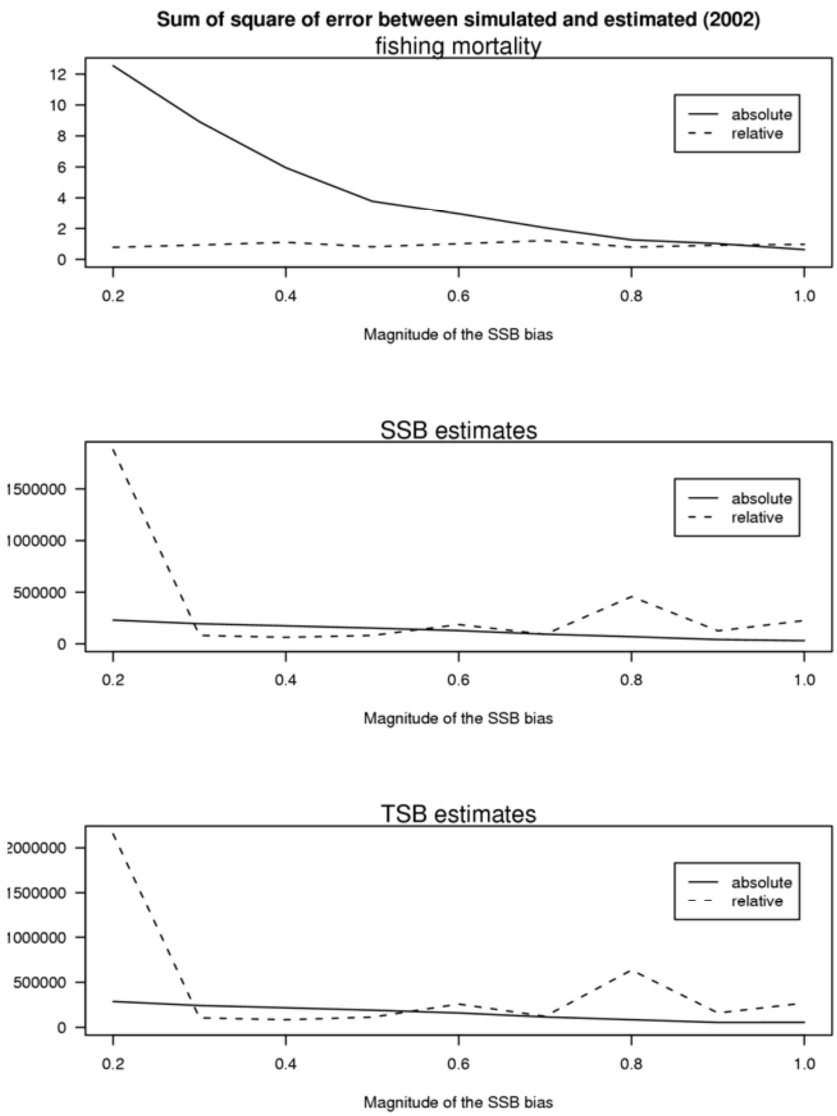

Figure 5: Comparison of the absolute and relative fit.
[population variability - SSB bias - No Catch bias - SSB survey NANACS]

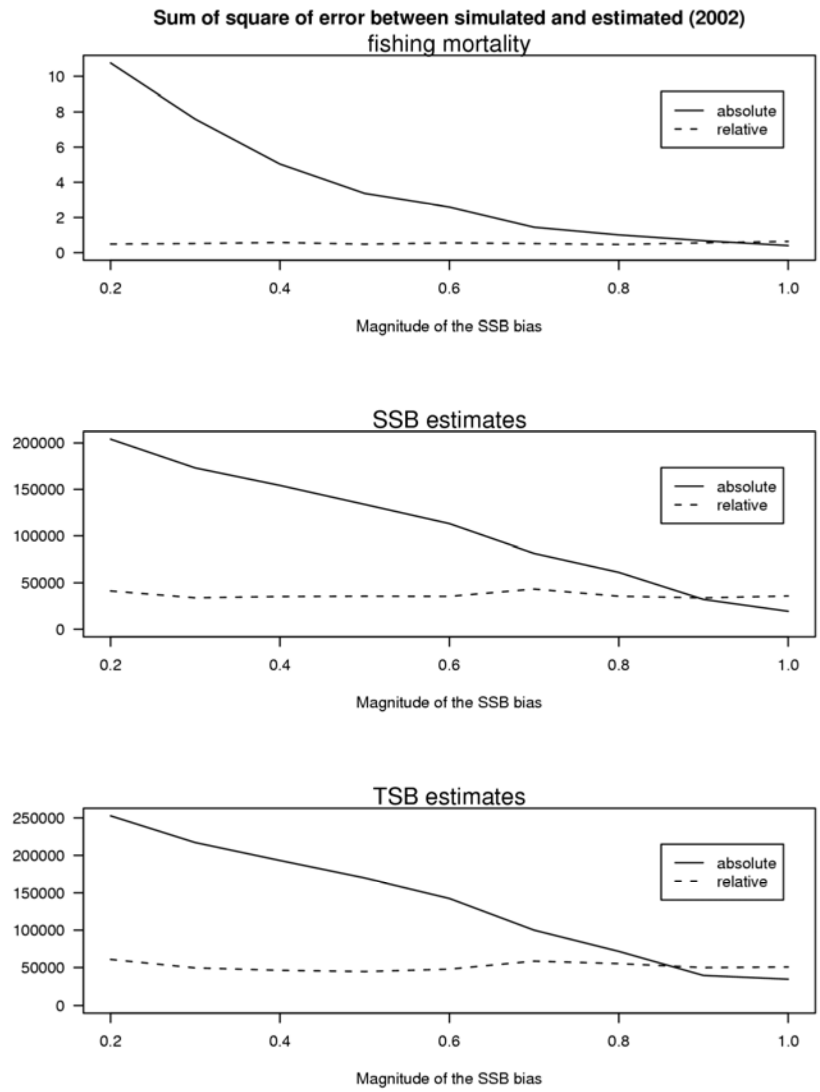

Figure 6: Comparison of the absolute and relative fit. (10-90% quantiles of the distribution)
[population variability - SSB bias - No Catch bias - SSB survey NANACS]

No SSB bias - Catch bias simulation - Absolute fit

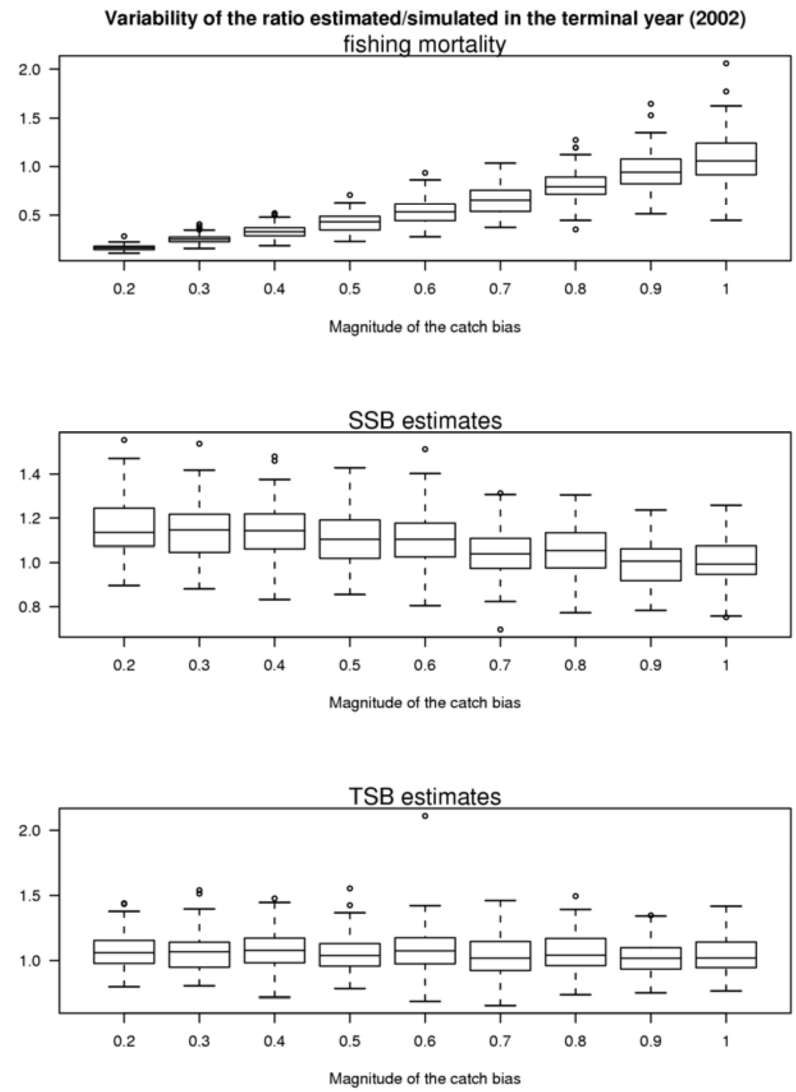

Figure 7: SSB index fitted as absolute.
[population variability - No SSB bias - Catch bias - SSB survey NANACS]

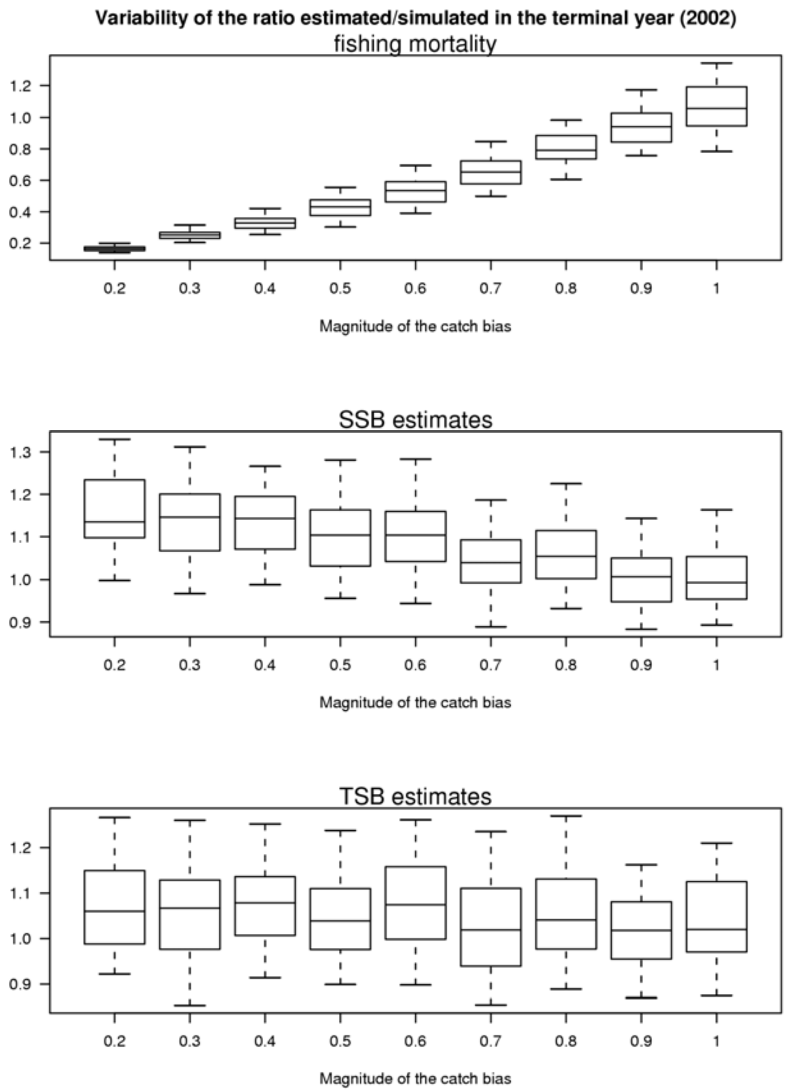

Figure 8: SSB index fitted as absolute. (10-90% quantiles of the distribution)
[population variability - No SSB bias - Catch bias - SSB survey NANACS]

No SSB bias - Catch bias simulation - Relative fit

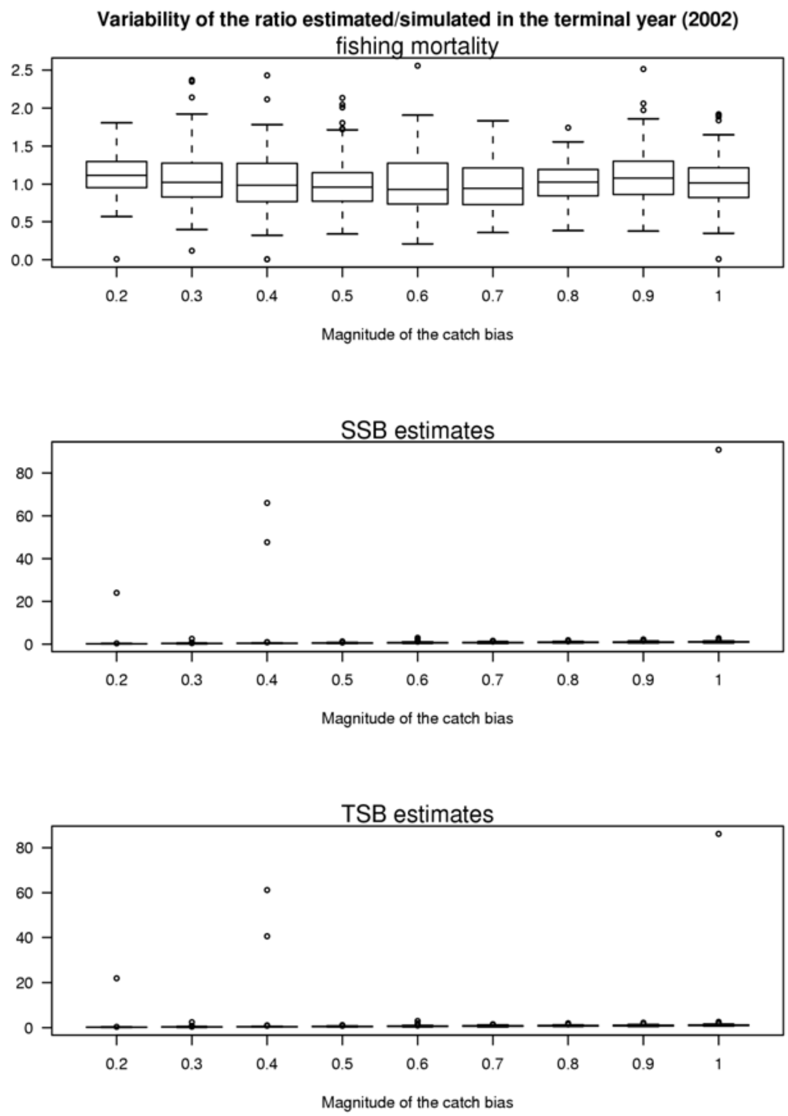

Figure 9: SSB index fitted as relative.
[population variability - No SSB bias - Catch bias - SSB survey NANACS]

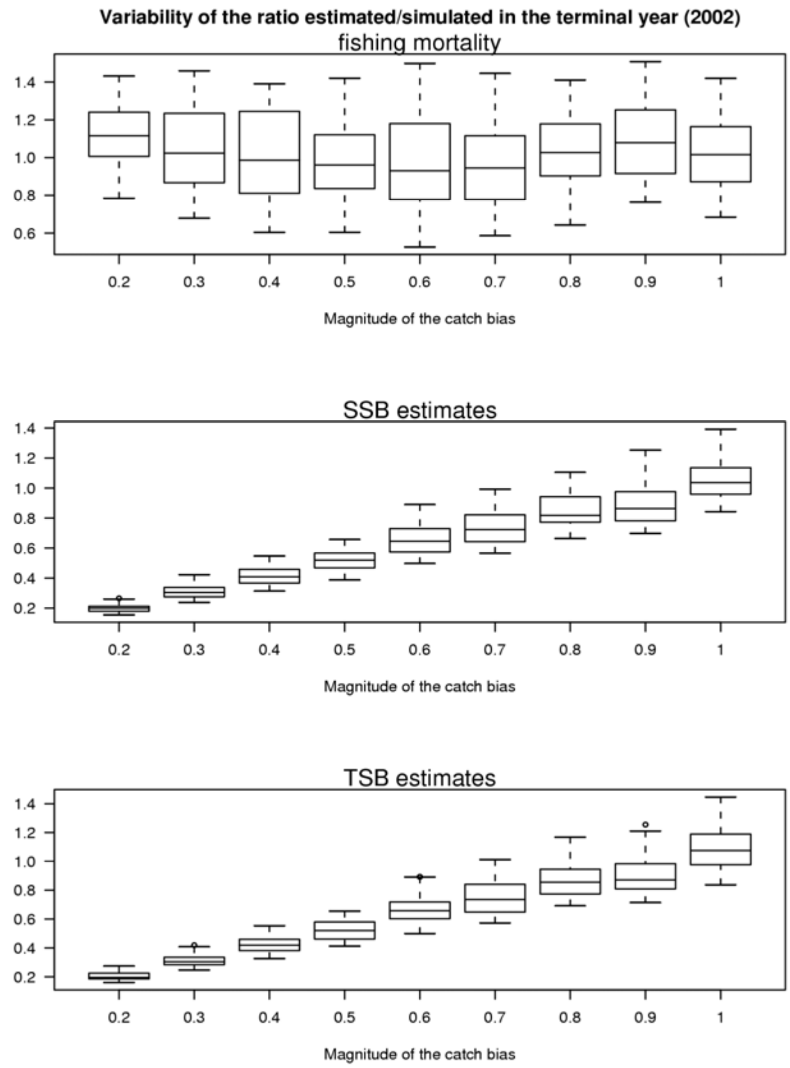

Figure 10: SSB index fitted as relative. (10-90% quantiles of the distribution)
[population variability - No SSB bias - Catch bias - SSB survey NANACS]

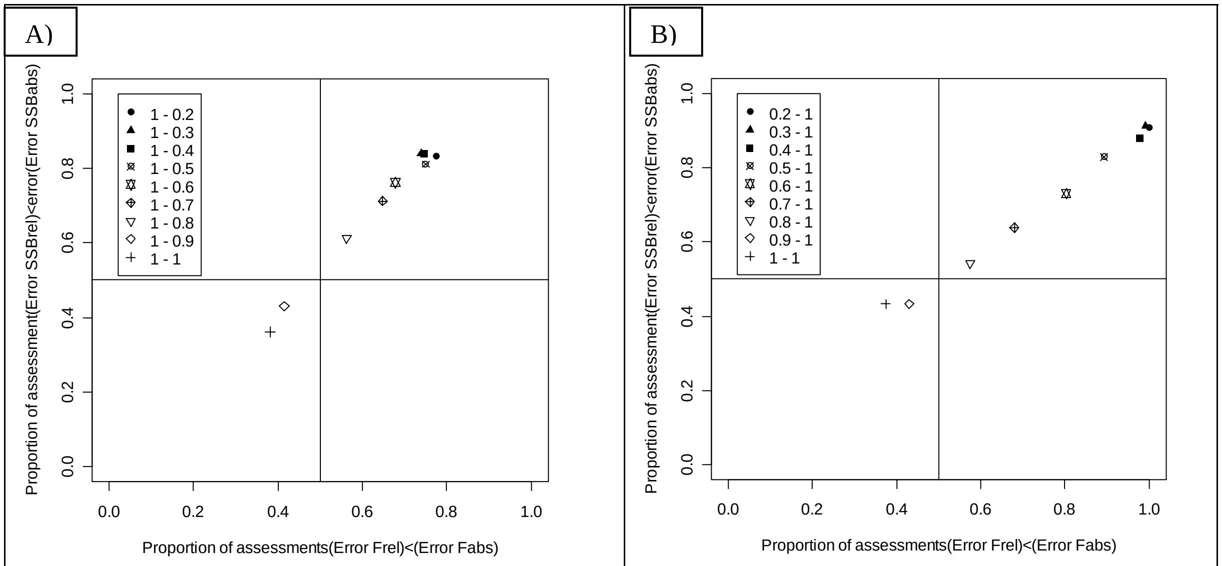

Figure 11 Proportion assessments with a more accurate estimate of either SSB or F trend in the presence of either A) catch bias and B) Survey bias. Trend is more accurately estimated more frequently by the absolute method if bias in either catch of survey is less than 0.85 (-15%). The relative method gives a higher probability of a the more accurate estimate if the biases in either catch or survey is greater than 0.85 (-15%).

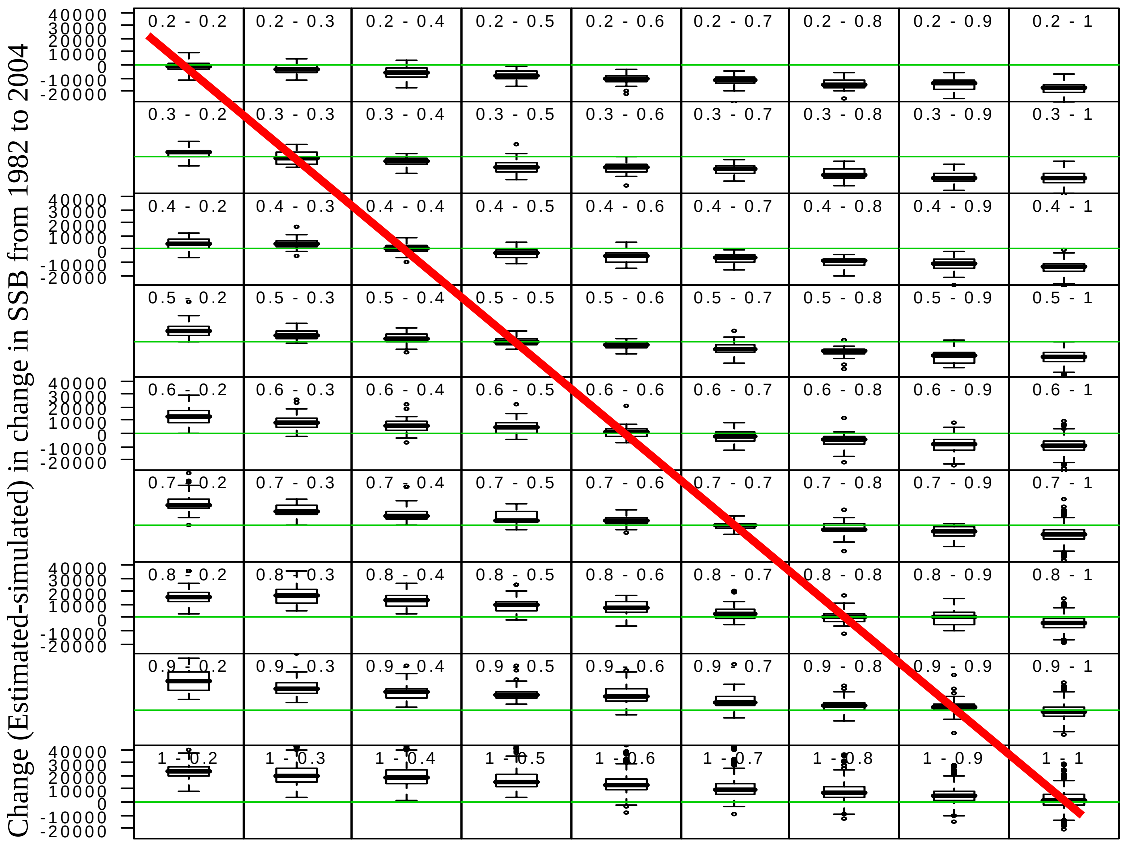

Figure 12 Box and whisker plots of estimated trend in SSB from "1982" to the present using ICA with an absolute fit with both catch and survey biased. Bias in catches changes on the horizontal direction and bias in the survey vertically and is given by the figures in the top of each panel. If the bias in both parameters is the same, the diagonal (shown by the red line), the trend is estimated correctly. The current situation is uncertain but the available estimates suggest the panel 0.6-0.4 (40% survey and 60% catch bias) may be a possibility.

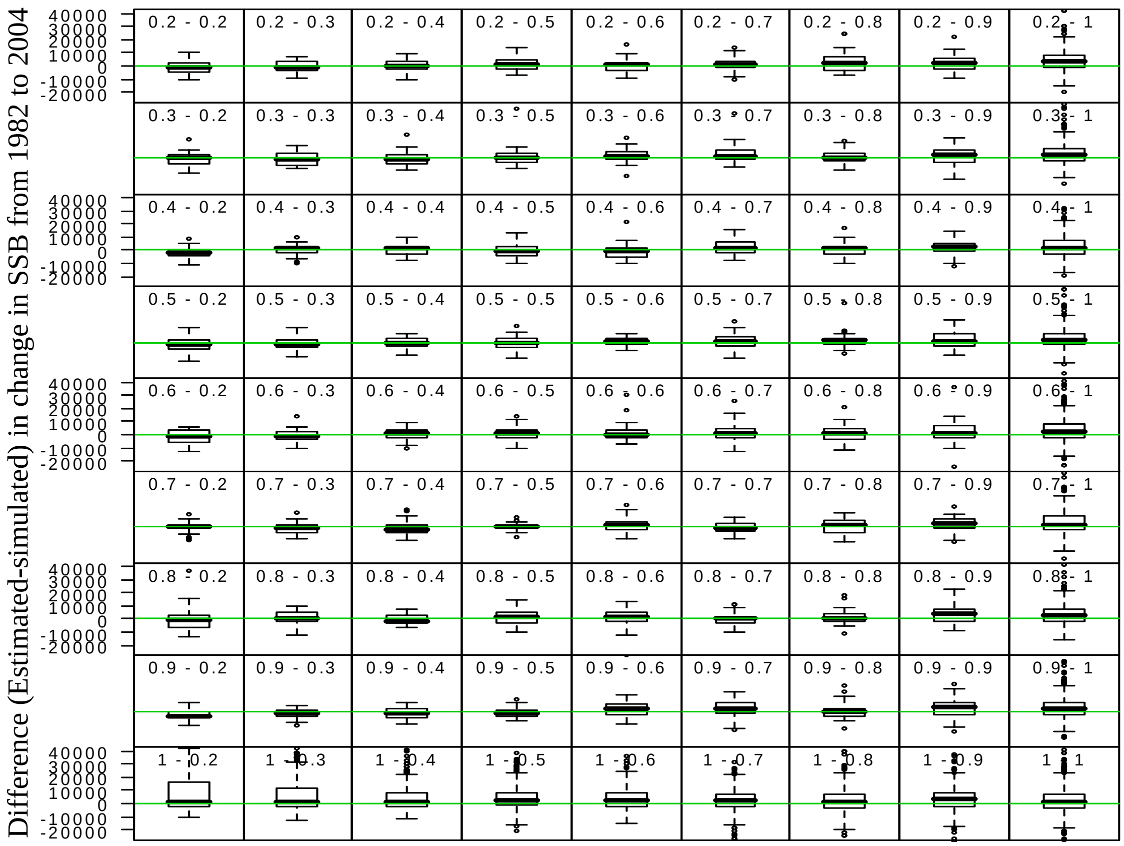

Figure 13 Box and whisker plots of estimated trend in SSB from “1982” to the present using ICA with an relative fit with both catch and survey biased. Bias in catches changes on the horizontal direction and bias in the survey vertically and is given by the figures in the top of each panel. Trend is estimated as unbiased but less precisely than for the absolute fit, see figure 2.??.4

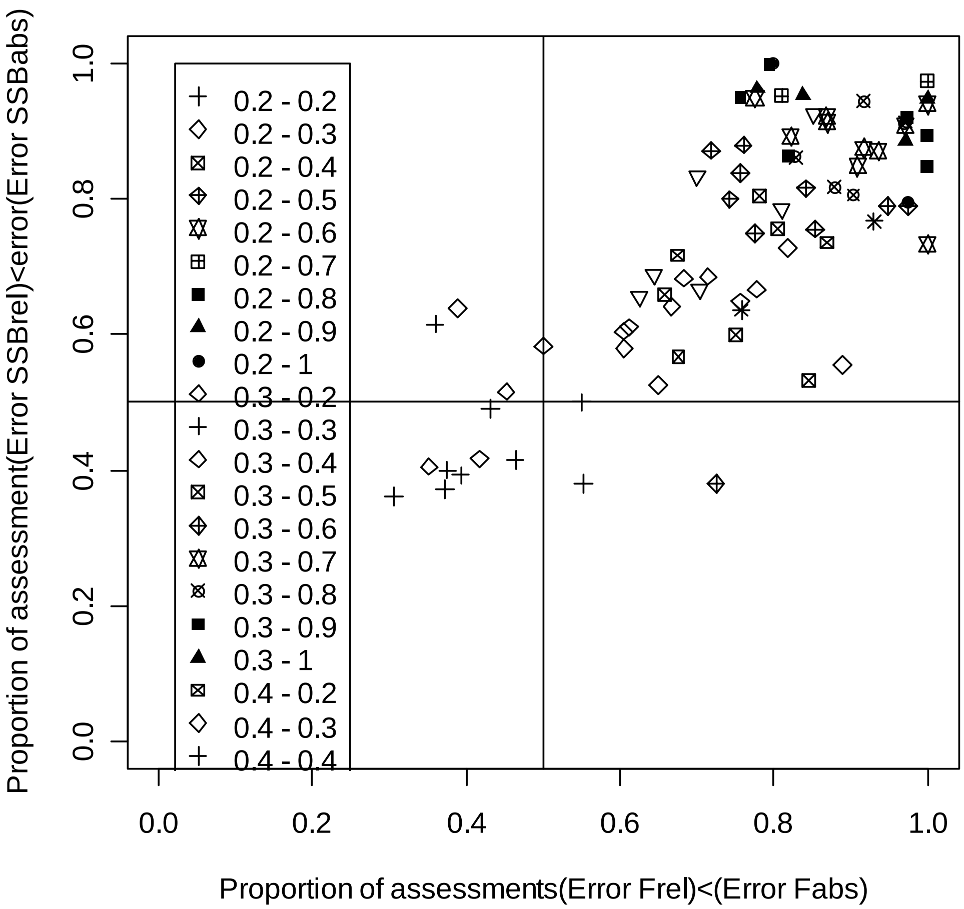

Figure 14 Proportion assessments with a more accurate estimate of either SSB or F trend in the presence of both catch bias and survey bias. The same symbol is used for the same magnitude of difference in bias between catch and survey, see truncated legend. (+ represents equal bias, diamond 10%, crossed square 20% difference etc. Trend is more accurately estimated more frequently by the absolute method if the difference in bias in either catch of survey is less than 10%. The relative method gives a higher probability of a the more accurate estimate if the biases in both catch or survey is different by greater than 10%.

Annexes

ICA parameters

index	
fleet	
ssb	
11	number of years for the separable constraint
5	reference mortality age
y	fixed
1.2	Selectivity of the gear on last age
4	lower age for the calculus of mean F
7	higher age for the calculus of mean F
n	not default
0.02	0 group down weight then 11 more ages 8 years
1	
1	
1	
1	
1	
1	
1	
1	
1	
1	
1	
1	
1	
1	
1	
1	
1	
1	
1	
1	
-1,-1,-1	
y	plus group yes no
l	linear or absolute fit of the SSB index
l	linear fit for dummy fleet
n	stock/recruitment relation ship (yes/no)
m	manual weights
5	5 for SSB
.01	low weight for dummy fleet
.01	
.01	
.01	

.01	
.01	
.01	
.01	
.01	
1	correlate errors for dummy fleet
d	details option
132	columns

Annex 8: EU rule

Method	Perc	Dur	Targ	Trig	Cmean	C10	C50	C90	IAV	Fmean	F10	F50	F90	Smean	S20	Nchange	Nup	Ndown	Cup	Cdown	Risk 4+ lim	Risk 7+ trig	Depl
TargF	5.0	1	0.120	2000.	422.	261.	416.	588.	5.4	0.091	0.042	0.090	0.139	4463.	4488.	11.0	8.7	2.3	17.6	-36.2	0.5	0.1	0.000 0.90 0.57
TargF	5.0	1	0.120	2100.	416.	266.	411.	568.	5.5	0.089	0.044	0.087	0.134	4468.	4470.	11.0	9.1	1.9	17.6	-39.4	0.3	0.1	0.000 0.90 0.58
TargF	5.0	1	0.120	2200.	414.	265.	407.	579.	5.6	0.087	0.045	0.085	0.131	4528.	4497.	11.0	9.1	1.9	17.6	-42.0	0.4	0.3	0.000 0.90 0.58
TargF	5.0	1	0.120	2300.	416.	270.	408.	580.	5.7	0.087	0.044	0.086	0.132	4538.	4503.	11.0	9.3	1.7	17.7	-46.4	0.3	0.3	0.000 0.90 0.58
TargF	5.0	1	0.120	2400.	413.	271.	409.	559.	5.9	0.086	0.047	0.085	0.125	4545.	4531.	11.0	9.4	1.6	17.9	-52.8	0.2	0.5	0.000 0.90 0.58
TargF	5.0	1	0.120	2500.	408.	276.	401.	548.	6.1	0.083	0.047	0.082	0.119	4595.	4586.	11.0	9.5	1.5	18.1	-53.3	0.1	0.6	0.000 0.90 0.59
TargF	5.0	1	0.120	2600.	413.	287.	400.	552.	6.3	0.085	0.048	0.084	0.122	4551.	4532.	11.0	9.5	1.5	18.3	-61.7	0.2	0.8	0.000 0.90 0.59
TargF	5.0	1	0.120	2700.	416.	286.	407.	553.	6.6	0.085	0.048	0.085	0.120	4581.	4536.	11.0	9.5	1.5	19.0	-62.7	0.2	1.2	0.000 0.90 0.59
TargF	5.0	1	0.120	2800.	410.	288.	407.	539.	6.9	0.083	0.049	0.084	0.114	4574.	4544.	11.0	9.6	1.4	19.2	-73.0	0.1	2.1	0.000 0.90 0.59
TargF	5.0	1	0.120	2900.	412.	288.	405.	543.	7.5	0.084	0.049	0.086	0.115	4561.	4543.	11.0	9.5	1.5	20.0	-79.3	0.2	3.6	0.000 0.90 0.59
TargF	5.0	1	0.120	3000.	411.	284.	407.	542.	7.7	0.083	0.049	0.084	0.112	4574.	4560.	11.0	9.6	1.5	20.2	-82.0	0.2	4.1	0.000 0.90 0.59
TargF	5.0	1	0.120	3100.	412.	289.	405.	546.	8.4	0.084	0.051	0.084	0.113	4553.	4577.	11.0	9.5	1.5	21.4	-87.6	0.2	5.8	0.000 0.90 0.59
TargF	5.0	1	0.120	3200.	411.	291.	404.	536.	9.0	0.084	0.052	0.086	0.112	4537.	4556.	11.0	9.4	1.6	22.1	-92.5	0.3	8.4	0.000 0.90 0.59
TargF	5.0	1	0.120	3300.	419.	302.	416.	541.	9.3	0.085	0.057	0.086	0.113	4541.	4515.	11.0	9.4	1.6	23.7	-91.0	0.1	9.9	0.000 0.90 0.59
TargF	5.0	1	0.120	3400.	420.	303.	413.	547.	10.1	0.086	0.054	0.087	0.113	4542.	4550.	11.0	9.3	1.7	25.0	-99.5	0.2	13.0	0.000 0.90 0.59
TargF	5.0	1	0.120	3500.	416.	308.	412.	530.	11.3	0.086	0.057	0.087	0.111	4476.	4519.	11.0	9.2	1.8	26.9	-104.0	0.2	15.0	0.000 0.90 0.58
TargF	5.0	1	0.140	2000.	447.	282.	443.	608.	5.6	0.102	0.050	0.099	0.156	4292.	4283.	11.0	9.1	1.9	18.9	-44.6	0.8	0.2	0.000 0.89 0.55
TargF	5.0	1	0.140	2100.	453.	299.	443.	620.	5.7	0.101	0.052	0.098	0.154	4319.	4295.	11.0	9.1	1.9	19.3	-49.0	0.8	0.3	0.000 0.89 0.56
TargF	5.0	1	0.140	2200.	448.	297.	443.	610.	5.9	0.101	0.053	0.098	0.151	4309.	4316.	11.0	9.1	1.9	19.3	-54.2	0.9	0.6	0.000 0.89 0.56
TargF	5.0	1	0.140	2300.	443.	294.	436.	604.	6.1	0.098	0.052	0.096	0.146	4343.	4330.	11.0	9.3	1.7	19.3	-58.9	0.6	0.6	0.000 0.89 0.56
TargF	5.0	1	0.140	2400.	449.	304.	445.	600.	6.2	0.099	0.055	0.098	0.144	4316.	4275.	11.0	9.4	1.6	19.8	-64.6	0.5	0.9	0.000 0.89 0.56
TargF	5.0	1	0.140	2500.	447.	307.	439.	594.	6.5	0.098	0.053	0.099	0.140	4331.	4316.	11.0	9.5	1.5	20.1	-71.3	0.3	1.4	0.000 0.89 0.56
TargF	5.0	1	0.140	2600.	448.	313.	440.	599.	6.9	0.098	0.057	0.097	0.139	4323.	4317.	11.0	9.5	1.5	20.6	-79.4	0.5	1.9	0.000 0.89 0.57
TargF	5.0	1	0.140	2700.	447.	304.	443.	590.	7.3	0.098	0.055	0.100	0.135	4338.	4335.	11.0	9.5	1.5	21.4	-81.5	0.4	3.2	0.000 0.89 0.56
TargF	5.0	1	0.140	2800.	450.	308.	443.	589.	7.4	0.098	0.058	0.100	0.136	4332.	4281.	11.0	9.5	1.5	21.8	-87.8	0.4	3.4	0.000 0.90 0.57
TargF	5.0	1	0.140	2900.	445.	320.	440.	580.	8.0	0.097	0.058	0.098	0.133	4326.	4337.	11.0	9.5	1.5	22.4	-95.0	0.3	4.7	0.000 0.89 0.56
TargF	5.0	1	0.140	3000.	448.	315.	440.	587.	8.7	0.098	0.059	0.099	0.132	4313.	4300.	11.0	9.4	1.6	23.6	-100.0	0.3	6.3	0.000 0.89 0.57
TargF	5.0	1	0.140	3100.	451.	324.	448.	582.	9.2	0.099	0.062	0.100	0.131	4287.	4276.	11.0	9.3	1.7	24.8	-103.3	0.4	8.9	0.000 0.89 0.56
TargF	5.0	1	0.140	3200.	451.	326.	448.	584.	9.9	0.099	0.061	0.101	0.130	4306.	4309.	11.0	9.3	1.7	26.3	-108.3	0.4	11.9	0.000 0.89 0.56
TargF	5.0	1	0.140	3300.	452.	325.	442.	590.	10.8	0.098	0.060	0.101	0.129	4313.	4311.	11.0	9.3	1.7	28.1	-117.7	0.2	14.2	0.000 0.90 0.56
TargF	5.0	1	0.140	3400.	453.	330.	447.	585.	11.9	0.099	0.066	0.101	0.129	4270.	4298.	11.0	9.2	1.8	30.4	-118.9	0.3	18.0	0.000 0.89 0.56
TargF	5.0	1	0.140	3500.	453.	341.	447.	582.	13.3	0.099	0.066	0.101	0.129	4270.	4276.	11.0	9.0	2.0	33.5	-122.1	0.3	21.8	0.000 0.89 0.56
TargF	5.0	1	0.160	2000.	478.	309.	467.	669.	5.9	0.115	0.056	0.111	0.176	4097.	4082.	11.0	9.1	1.9	20.4	-57.9	1.3	0.2	0.000 0.88 0.53
TargF	5.0	1	0.160	2100.	486.	326.	481.	650.	6.1	0.117	0.061	0.115	0.171	4072.	4052.	11.0	9.1	1.9	20.9	-63.6	1.2	0.5	0.000 0.88 0.53
TargF	5.0	1	0.160	2200.	478.	320.	473.	645.	6.3	0.114	0.059	0.112	0.169	4107.	4098.	11.0	9.3	1.7	20.9	-68.7	1.0	0.6	0.000 0.89 0.54
TargF	5.0	1	0.160	2300.	486.	333.	477.	648.	6.4	0.115	0.064	0.113	0.166	4113.	4090.	11.0	9.3	1.7	21.5	-68.9	1.1	1.1	0.000 0.89 0.54
TargF	5.0	1	0.160	2400.	474.	312.	474.	633.	6.8	0.111	0.059	0.112	0.158	4147.	4108.	11.0	9.4	1.6	21.5	-81.9	1.1	1.6	0.000 0.89 0.54
TargF	5.0	1	0.160	2500.	475.	323.	467.	637.	6.9	0.110	0.063	0.110	0.155	4137.	4121.	11.0	9.5	1.5	21.9	-88.1	0.9	2.1	0.000 0.89 0.54
TargF	5.0	1	0.160	2600.	472.	336.	468.	612.	7.3	0.110	0.063	0.110	0.155	4165.	4136.	11.0	9.6	1.4	22.5	-94.7	1.0	3.5	0.000 0.89 0.55
TargF	5.0	1	0.160	2700.	479.	337.	469.	628.	7.8	0.111	0.066	0.113	0.153	4126.	4087.	11.0	9.5	1.5	23.3	-102.7	0.9	4.2	0.000 0.89 0.54
TargF	5.0	1	0.160	2800.	470.	336.	464.	612.	8.4	0.109	0.064	0.110	0.153	4145.	4143.	11.0	9.5	1.5	24.3	-106.5	0.7	6.4	0.000 0.89 0.55
TargF	5.0	1	0.160	2900.	482.	346.	475.	626.	8.9	0.112	0.067	0.114	0.151	4120.	4095.	11.0	9.4	1.6	25.6	-113.4	0.6	7.7	0.000 0.89 0.54
TargF	5.0	1	0.160	3000.	474.	330.	474.	612.	9.5	0.110	0.064	0.113	0.150	4153.	4154.	11.0	9.4	1.6	26.8	-114.6	0.8	9.8	0.000 0.89 0.54
TargF	5.0	1	0.160	3100.	480.	355.	476.	617.	11.2	0.113	0.070	0.115	0.150	4087.	4136.	11.0	9.2	1.8	30.4	-129.1	1.0	15.0	0.000 0.89 0.54
TargF	5.0	1	0.160	3200.	485.	357.	474.	619.	11.5	0.114	0.073	0.115	0.151	4058.	4050.	11.0	9.1	1.9	31.4	-127.3	0.8	17.7	0.000 0.89 0.54
TargF	5.0	1	0.160	3300.	481.	351.	475.	620.	13.0	0.112	0.070	0.114	0.147	4103.	4137.	11.0	9.0	2.0	34.4	-135.0	0.7	20.7	0.000 0.89 0.54
TargF	5.0	1	0.160	3400.	482.	361.	478.	608.	13.7	0.113	0.074	0.115	0.148	4044.	4105.	11.0	8.9	2.1	36.5	-136.5	0.8	25.6	0.000 0.89 0.54
TargF	5.0	1	0.160	3500.	487.	372.	482.	603.	15.0	0.115	0.078	0.117	0.148	4027.	4060.	11.0	8.8	2.2	40.4	-142.7	0.8	30.9	0.000 0.89 0.54
TargF	5.0	1	0.180	2000.	506.	327.	500.	682.	6.2	0.131	0.065	0.131	0.195	3884.	3844.	11.0	9.0	2.0	21.9	-67.0	2.6	0.5	0.000 0.88 0.51
TargF	5.0	1	0.180	2100.	505.	336.	497.	679.	6.3	0.130	0.065	0.129	0.196	3911.	3920.	11.0	9.1	1.9	21.9	-69.2	2.5	1.0	0.000 0.88 0.51
TargF	5.0	1	0.180	2200.	506.	344.	498.	668.	6.5	0.128	0.068	0.128	0.186	3950.	3940.	11.0	9.3	1.7	22.2	-85.7	2.2	1.4	0.000 0.88 0.52
TargF	5.0	1	0.180	2300.	502.	348.	491.	671.	6.9	0.125	0.068	0.126	0.181	3979.	3949.	11.0	9.4	1.6	22.8	-89.6	1.6	1.6	0.000 0.88 0.52
TargF	5.0	1	0.180	2400.	496.	332.	495.	660.	7.1	0.122	0.066	0.125	0.174	3993.	3970.	11.0	9.5	1.5	23.0	-94.7	1.5	2.3	0.000 0.88 0.53
TargF	5.0	1	0.180	2500.	499.	349.	496.	648.	7.8	0.125	0.074	0.125	0.175	3915.	3923.	11.0	9.4	1.6	24.2	-104.4	1.7	3.4	0.000 0.88 0.52
TargF	5.0	1	0.180	2600.	498.	355.	492.	653.	8.1	0.123	0.068	0.125	0.169	3969.	3973.	11.0	9.5	1.5	24.8	-110.4	1.4	5.0	0.000 0.88 0.52

Method Perc Dur Targ Trig Cmean C10 C50 C90 IAV Fmean F10 F50 F90 Smean S20 Nchange Nup
Ndown Cup Cdown Risk Risk Depl 4+ 7+lim trig

TargF	5.0	1	0.180	2700.	503.	356.	496.	653.	8.6	0.124	0.071	0.126	0.171	3944.	3968.	11.0	9.3	1.7	26.1	-113.2	1.2	5.8	0.000	0.88	0.52
TargF	5.0	1	0.180	2800.	500.	351.	499.	644.	9.1	0.123	0.072	0.126	0.167	3966.	3942.	11.0	9.5	1.5	27.2	-126.1	1.6	8.8	0.000	0.88	0.53
TargF	5.0	1	0.180	2900.	505.	373.	502.	644.	10.5	0.125	0.076	0.127	0.168	3921.	3931.	11.0	9.3	1.7	30.0	-131.5	1.5	12.6	0.000	0.88	0.52
TargF	5.0	1	0.180	3000.	503.	367.	503.	630.	11.1	0.124	0.079	0.126	0.165	3922.	3951.	11.0	9.3	1.7	31.1	-141.8	1.2	14.1	0.000	0.88	0.52
TargF	5.0	1	0.180	3100.	505.	366.	503.	649.	12.2	0.126	0.079	0.129	0.167	3905.	3954.	11.0	9.1	1.9	33.8	-143.2	1.4	18.6	0.000	0.88	0.52
TargF	5.0	1	0.180	3200.	505.	380.	502.	636.	13.6	0.126	0.078	0.130	0.166	3887.	3934.	11.0	9.0	2.0	37.5	-150.8	1.2	23.7	0.000	0.88	0.52
TargF	5.0	1	0.180	3300.	507.	383.	502.	637.	14.4	0.126	0.080	0.129	0.167	3917.	3957.	11.0	9.0	2.0	39.7	-154.0	1.6	28.8	0.000	0.88	0.52
TargF	5.0	1	0.180	3400.	516.	399.	514.	646.	16.2	0.130	0.088	0.132	0.168	3856.	3858.	11.0	8.7	2.3	45.4	-155.7	1.1	34.3	0.000	0.88	0.52
TargF	5.0	1	0.180	3500.	513.	383.	508.	645.	17.2	0.130	0.089	0.132	0.169	3832.	3850.	11.0	8.6	2.4	48.0	-161.4	1.3	40.0	0.000	0.88	0.52
TargF	5.0	1	0.200	2000.	520.	355.	517.	702.	6.5	0.140	0.072	0.141	0.211	3773.	3778.	11.0	9.3	1.7	22.8	-85.5	3.8	1.0	0.000	0.87	0.50
TargF	5.0	1	0.200	2100.	525.	360.	520.	697.	6.6	0.140	0.073	0.139	0.203	3796.	3752.	11.0	9.4	1.6	23.2	-89.4	3.2	1.4	0.000	0.87	0.50
TargF	5.0	1	0.200	2200.	517.	355.	512.	676.	7.1	0.136	0.075	0.137	0.196	3792.	3784.	11.0	9.4	1.6	23.7	-99.1	3.1	1.8	0.000	0.87	0.50
TargF	5.0	1	0.200	2300.	525.	365.	520.	691.	7.4	0.139	0.076	0.140	0.197	3791.	3761.	11.0	9.4	1.6	24.3	-108.9	3.4	3.4	0.000	0.87	0.50
TargF	5.0	1	0.200	2400.	519.	352.	521.	685.	7.6	0.136	0.072	0.140	0.193	3803.	3778.	11.0	9.4	1.6	24.6	-112.7	2.6	4.0	0.000	0.87	0.50
TargF	5.0	1	0.200	2500.	524.	378.	519.	677.	8.3	0.138	0.083	0.139	0.188	3772.	3759.	11.0	9.4	1.6	26.3	-123.9	2.6	5.6	0.000	0.87	0.50
TargF	5.0	1	0.200	2600.	519.	373.	514.	670.	8.9	0.135	0.076	0.137	0.187	3823.	3798.	11.0	9.5	1.5	27.6	-129.5	2.7	7.9	0.000	0.87	0.51
TargF	5.0	1	0.200	2700.	513.	363.	505.	665.	9.4	0.133	0.072	0.135	0.189	3865.	3896.	11.0	9.4	1.6	28.3	-133.0	2.4	10.4	0.000	0.87	0.51
TargF	5.0	1	0.200	2800.	526.	385.	525.	670.	10.2	0.136	0.080	0.140	0.188	3818.	3809.	11.0	9.4	1.6	30.9	-139.6	2.5	12.2	0.000	0.87	0.50
TargF	5.0	1	0.200	2900.	521.	384.	516.	666.	11.3	0.136	0.081	0.140	0.182	3781.	3808.	11.0	9.2	1.8	33.4	-142.5	2.5	16.2	0.000	0.87	0.50
TargF	5.0	1	0.200	3000.	521.	375.	523.	667.	12.9	0.138	0.082	0.141	0.185	3751.	3788.	11.0	9.1	1.9	36.7	-152.8	2.6	21.1	0.000	0.87	0.50
TargF	5.0	1	0.200	3100.	533.	403.	527.	668.	14.0	0.142	0.091	0.146	0.185	3710.	3745.	11.0	9.0	2.0	40.4	-162.4	2.7	26.1	0.000	0.87	0.50
TargF	5.0	1	0.200	3200.	533.	405.	525.	678.	15.7	0.140	0.091	0.144	0.184	3729.	3750.	11.0	8.9	2.1	44.8	-166.2	2.5	30.3	0.000	0.87	0.50
TargF	5.0	1	0.200	3300.	535.	413.	532.	666.	16.7	0.143	0.094	0.145	0.185	3702.	3752.	11.0	8.7	2.3	48.4	-165.7	2.2	35.7	0.000	0.87	0.49
TargF	5.0	1	0.200	3400.	535.	406.	529.	674.	18.3	0.143	0.091	0.146	0.184	3696.	3730.	11.0	8.5	2.5	53.3	-173.8	2.2	41.3	0.000	0.87	0.50
TargF	5.0	1	0.200	3500.	541.	422.	536.	664.	20.3	0.145	0.095	0.148	0.188	3682.	3724.	11.0	8.4	2.6	59.6	-181.8	2.1	47.0	0.000	0.87	0.49
TargF	5.0	1	0.220	2000.	551.	362.	554.	731.	6.8	0.159	0.081	0.158	0.236	3597.	3574.	11.0	9.1	1.9	24.2	-94.0	6.1	2.2	0.000	0.86	0.48
TargF	5.0	1	0.220	2100.	540.	367.	535.	711.	7.1	0.152	0.081	0.153	0.220	3634.	3666.	11.0	9.3	1.7	24.5	-103.4	4.9	2.4	0.000	0.86	0.48
TargF	5.0	1	0.220	2200.	541.	371.	545.	708.	7.3	0.152	0.077	0.152	0.221	3649.	3659.	11.0	9.3	1.7	24.7	-112.2	5.0	3.6	0.000	0.87	0.48
TargF	5.0	1	0.220	2300.	535.	361.	531.	705.	7.9	0.148	0.074	0.152	0.212	3687.	3713.	11.0	9.4	1.6	26.0	-116.6	4.6	4.6	0.000	0.87	0.49
TargF	5.0	1	0.220	2400.	537.	382.	536.	696.	8.4	0.150	0.082	0.152	0.209	3616.	3637.	11.0	9.4	1.6	27.1	-128.2	3.7	5.6	0.000	0.87	0.48
TargF	5.0	1	0.220	2500.	537.	375.	538.	693.	9.1	0.148	0.082	0.151	0.206	3673.	3672.	11.0	9.5	1.5	28.7	-141.2	4.1	8.1	0.000	0.87	0.49
TargF	5.0	1	0.220	2600.	533.	373.	532.	692.	9.7	0.148	0.080	0.151	0.209	3652.	3681.	11.0	9.4	1.6	29.6	-147.9	3.9	10.2	0.000	0.87	0.49
TargF	5.0	1	0.220	2700.	547.	397.	539.	707.	11.0	0.152	0.093	0.153	0.208	3618.	3653.	11.0	9.2	1.8	33.2	-152.0	4.5	14.4	0.000	0.87	0.48
TargF	5.0	1	0.220	2800.	537.	394.	535.	691.	12.0	0.149	0.089	0.153	0.201	3633.	3661.	11.0	9.2	1.8	35.5	-162.1	4.0	17.1	0.000	0.87	0.48
TargF	5.0	1	0.220	2900.	544.	400.	538.	697.	13.8	0.152	0.092	0.156	0.204	3591.	3632.	11.0	9.0	2.0	39.9	-164.9	4.0	22.6	0.000	0.87	0.48
TargF	5.0	1	0.220	3000.	543.	399.	545.	689.	14.4	0.151	0.091	0.154	0.205	3634.	3641.	11.0	9.0	2.0	42.0	-167.4	4.0	26.6	0.000	0.87	0.48
TargF	5.0	1	0.220	3100.	550.	416.	543.	690.	16.1	0.154	0.101	0.157	0.203	3587.	3620.	11.0	8.8	2.2	47.5	-178.3	4.5	32.6	0.000	0.87	0.48
TargF	5.0	1	0.220	3200.	556.	427.	555.	686.	17.8	0.157	0.098	0.159	0.205	3579.	3617.	11.0	8.6	2.4	53.1	-181.6	3.9	38.6	0.000	0.86	0.48
TargF	5.0	1	0.220	3300.	556.	428.	552.	691.	19.0	0.157	0.104	0.160	0.202	3561.	3564.	11.0	8.5	2.5	57.1	-187.6	3.5	43.1	0.000	0.86	0.48
TargF	5.0	1	0.220	3400.	557.	425.	555.	697.	20.6	0.157	0.104	0.161	0.202	3576.	3640.	11.0	8.4	2.6	62.2	-184.8	3.9	48.6	0.000	0.86	0.48
TargF	5.0	1	0.220	3500.	558.	433.	557.	686.	23.3	0.159	0.110	0.163	0.204	3501.	3548.	11.0	8.0	3.0	71.9	-192.0	4.0	57.1	0.000	0.86	0.47
TargF	5.0	1	0.240	2000.	555.	371.	554.	736.	7.3	0.165	0.085	0.168	0.241	3521.	3542.	11.0	9.2	1.8	25.2	-113.8	7.7	2.4	0.000	0.86	0.46
TargF	5.0	1	0.240	2100.	556.	372.	550.	734.	8.0	0.164	0.087	0.165	0.240	3526.	3561.	11.0	9.3	1.7	26.5	-124.0	7.4	3.7	0.000	0.86	0.46
TargF	5.0	1	0.240	2200.	548.	374.	547.	715.	8.2	0.160	0.083	0.162	0.232	3540.	3561.	11.0	9.4	1.6	26.5	-133.4	7.1	5.3	0.000	0.86	0.47
TargF	5.0	1	0.240	2300.	548.	381.	542.	715.	8.6	0.159	0.087	0.161	0.223	3562.	3585.	11.0	9.4	1.6	27.5	-137.2	6.0	6.0	0.000	0.86	0.47
TargF	5.0	1	0.240	2400.	554.	399.	552.	713.	9.3	0.162	0.093	0.162	0.232	3534.	3570.	11.0	9.3	1.7	29.2	-145.4	6.4	8.9	0.000	0.86	0.47
TargF	5.0	1	0.240	2500.	563.	402.	560.	721.	9.8	0.165	0.095	0.168	0.229	3496.	3503.	11.0	9.2	1.8	31.2	-150.4	5.7	10.7	0.000	0.86	0.47
TargF	5.0	1	0.240	2600.	555.	396.	548.	718.	11.2	0.161	0.092	0.162	0.223	3530.	3568.	11.0	9.2	1.8	34.1	-160.7	5.4	14.3	0.000	0.86	0.47
TargF	5.0	1	0.240	2700.	562.	411.	557.	725.	12.1	0.163	0.091	0.169	0.222	3519.	3516.	11.0	9.1	1.9	36.9	-166.1	5.8	18.3	0.000	0.86	0.47
TargF	5.0	1	0.240	2800.	552.	402.	551.	687.	13.3	0.162	0.095	0.164	0.221	3489.	3564.	11.0	9.1	1.9	39.2	-181.4	6.4	23.4	0.000	0.86	0.46
TargF	5.0	1	0.240	2900.	564.	428.	557.	714.	14.3	0.165	0.099	0.169	0.219	3462.	3490.	11.0	8.9	2.1	43.7	-178.2	5.3	27.1	0.000	0.86	0.46
TargF	5.0	1	0.240	3000.	567.	426.	564.	711.	16.2	0.166	0.104	0.169	0.222	3473.	3469.	11.0	8.9	2.1	49.3	-185.9	5.7	33.2	0.000	0.86	0.47
TargF	5.0	1	0.240	3100.	565.	431.	562.	702.	17.3	0.167	0.110	0.169	0.220	3439.	3492.	11.0	8.7	2.3	53.2	-189.7	5.7	38.1	0.000	0.86	0.46
TargF	5.0	1	0.240	3200.	570.	429.	572.	713.	19.7	0.168	0.109	0.173	0.223	3455.	3513.	11.0	8.5	2.5	59.9	-196.0	5.9	44.1	0.000	0.86	0.46
TargF	5.0	1	0.240	3300.	572.	436.	572.	719.	21.5	0.172	0.113	0.176	0.224	3393.	3458.	11.0	8.3	2.7	66.8	-198.3	5.8	53.2	0.000	0.86	0.45
TargF	5.0	1	0.240	3400.	580.	456.	580.	707.	23.4	0.174	0.121	0.176	0.226	3388.	3399.	11.0	8.1	2.9	74.4	-205.6	5.7	58.6	0.000	0.86	0.45
TargF	5.0	1	0.240	3500.	582.	459.	580.	714.	26.1	0.176	0.123	0.180	0.224	3363.	3406.	11.0	7.9	3.1	83.9	-208.4	6.2	64.2	0.000	0.85	0.45
TargF	5.0	1	0.260	2000.	569.	381.	572.	748.	7.7	0.176	0.085	0.178	0.256	3426.	3442.	11.0	9.3	1.7	26.7	-123.0	10.0	3.9	0.000	0.85	0.45

Method	Perc	Dur	Targ	Trig	Cmean	C10	C50	C90	IAV	Fmean	F10	F50	F90	Smean	S20	Nchange	Nup	Ndown	Cup	Cdown	Risk	Risk	Depl	4+	7+
TargF	5.0	1	0.260	2100.	567.	382.	568.	753.	7.8	0.175	0.090	0.174	0.257	3419.	3442.	11.0	9.4	1.6	27.0	-131.3	9.6	5.1	0.000	0.85	0.45
TargF	5.0	1	0.260	2200.	570.	385.	572.	754.	8.7	0.175	0.094	0.177	0.251	3427.	3453.	11.0	9.3	1.7	28.7	-142.6	9.4	7.1	0.000	0.85	0.45
TargF	5.0	1	0.260	2300.	570.	398.	565.	749.	9.1	0.174	0.089	0.177	0.247	3411.	3409.	11.0	9.3	1.7	29.8	-147.1	8.9	8.9	0.000	0.85	0.45
TargF	5.0	1	0.260	2400.	568.	394.	559.	746.	10.4	0.173	0.095	0.174	0.244	3449.	3477.	11.0	9.3	1.7	31.9	-161.1	8.9	11.6	0.000	0.85	0.45
TargF	5.0	1	0.260	2500.	573.	406.	570.	733.	11.4	0.178	0.106	0.181	0.242	3350.	3392.	11.0	9.3	1.7	35.1	-172.1	9.5	16.5	0.000	0.85	0.45
TargF	5.0	1	0.260	2600.	565.	414.	562.	723.	12.5	0.174	0.100	0.175	0.237	3370.	3449.	11.0	9.1	1.9	38.1	-172.9	7.9	19.2	0.000	0.85	0.45
TargF	5.0	1	0.260	2700.	565.	407.	564.	716.	13.4	0.173	0.104	0.177	0.236	3390.	3467.	11.0	9.1	1.9	40.6	-183.8	8.5	22.8	0.000	0.85	0.45
TargF	5.0	1	0.260	2800.	580.	440.	579.	724.	15.2	0.181	0.112	0.184	0.243	3320.	3377.	11.0	8.8	2.2	46.2	-185.7	9.6	30.2	0.000	0.85	0.44
TargF	5.0	1	0.260	2900.	576.	434.	572.	722.	16.5	0.179	0.107	0.184	0.239	3346.	3400.	11.0	8.8	2.2	50.7	-193.5	9.2	34.8	0.000	0.85	0.44
TargF	5.0	1	0.260	3000.	581.	436.	576.	734.	18.4	0.180	0.114	0.182	0.240	3347.	3383.	11.0	8.7	2.3	55.9	-200.6	8.2	39.5	0.000	0.85	0.44
TargF	5.0	1	0.260	3100.	586.	445.	584.	736.	20.3	0.184	0.117	0.188	0.242	3300.	3332.	11.0	8.5	2.5	63.3	-207.3	9.2	47.1	0.000	0.85	0.44
TargF	5.0	1	0.260	3200.	583.	441.	581.	719.	23.1	0.183	0.121	0.187	0.241	3283.	3356.	11.0	8.2	2.8	71.6	-210.6	9.6	52.9	0.000	0.85	0.44
TargF	5.0	1	0.260	3300.	591.	461.	589.	716.	24.8	0.187	0.125	0.192	0.245	3277.	3288.	11.0	8.1	2.9	79.3	-216.1	8.9	59.5	0.000	0.85	0.44
TargF	5.0	1	0.260	3400.	591.	467.	588.	731.	26.4	0.186	0.122	0.190	0.238	3280.	3309.	11.0	7.9	3.1	85.6	-218.1	9.0	62.2	0.000	0.85	0.44
TargF	5.0	1	0.260	3500.	595.	464.	592.	732.	28.8	0.189	0.137	0.190	0.240	3228.	3249.	11.0	7.8	3.2	96.0	-227.6	9.3	69.9	0.000	0.85	0.43
TargF	5.0	1	0.280	2000.	580.	399.	583.	753.	8.1	0.188	0.095	0.190	0.273	3326.	3349.	11.0	9.4	1.6	27.8	-141.3	12.1	5.0	0.000	0.85	0.43
TargF	5.0	1	0.280	2100.	573.	382.	572.	767.	8.7	0.185	0.090	0.188	0.270	3320.	3360.	11.0	9.3	1.7	28.4	-147.6	12.1	6.6	0.000	0.85	0.44
TargF	5.0	1	0.280	2200.	579.	399.	577.	763.	9.5	0.185	0.104	0.187	0.265	3299.	3329.	11.0	9.3	1.7	30.7	-160.5	11.4	8.9	0.000	0.85	0.44
TargF	5.0	1	0.280	2300.	583.	406.	579.	755.	10.3	0.185	0.103	0.189	0.256	3313.	3354.	11.0	9.3	1.7	32.7	-168.6	10.6	10.6	0.000	0.85	0.44
TargF	5.0	1	0.280	2400.	579.	410.	579.	741.	10.9	0.184	0.098	0.190	0.255	3348.	3409.	11.0	9.3	1.7	34.4	-172.4	10.6	13.7	0.000	0.85	0.44
TargF	5.0	1	0.280	2500.	583.	422.	583.	746.	12.0	0.185	0.105	0.189	0.257	3326.	3379.	11.0	9.2	1.8	38.2	-178.1	11.4	18.7	0.000	0.85	0.44
TargF	5.0	1	0.280	2600.	581.	425.	576.	749.	14.1	0.187	0.107	0.192	0.258	3263.	3340.	11.0	9.0	2.0	43.4	-186.8	11.6	24.2	0.000	0.85	0.43
TargF	5.0	1	0.280	2700.	590.	431.	590.	746.	14.6	0.190	0.113	0.193	0.259	3269.	3301.	11.0	8.9	2.1	46.5	-189.9	11.4	28.3	0.000	0.85	0.43
TargF	5.0	1	0.280	2800.	591.	441.	591.	749.	16.8	0.190	0.115	0.195	0.254	3251.	3299.	11.0	8.8	2.2	52.5	-194.7	11.0	33.9	0.000	0.85	0.43
TargF	5.0	1	0.280	2900.	592.	438.	590.	740.	18.4	0.193	0.113	0.196	0.259	3238.	3277.	11.0	8.6	2.4	56.8	-200.6	12.5	40.6	0.000	0.85	0.43
TargF	5.0	1	0.280	3000.	600.	464.	597.	748.	19.5	0.194	0.121	0.198	0.259	3243.	3291.	11.0	8.5	2.5	62.9	-210.3	11.2	44.4	0.000	0.84	0.42
TargF	5.0	1	0.280	3100.	591.	452.	589.	730.	22.8	0.195	0.121	0.198	0.258	3197.	3244.	11.0	8.3	2.7	72.4	-215.7	12.6	52.9	0.000	0.84	0.43
TargF	5.0	1	0.280	3200.	607.	469.	604.	748.	24.5	0.200	0.134	0.204	0.260	3167.	3186.	11.0	8.1	2.9	80.9	-220.4	11.7	59.5	0.000	0.84	0.42
TargF	5.0	1	0.280	3300.	602.	472.	600.	732.	27.7	0.200	0.137	0.203	0.258	3150.	3186.	11.0	7.9	3.1	91.3	-223.2	12.4	65.2	0.000	0.84	0.42
TargF	5.0	1	0.280	3400.	612.	483.	609.	739.	29.2	0.205	0.145	0.207	0.264	3115.	3177.	11.0	7.7	3.3	99.9	-231.8	12.7	70.6	0.000	0.84	0.41
TargF	5.0	1	0.280	3500.	617.	491.	619.	742.	31.9	0.205	0.146	0.207	0.261	3133.	3150.	11.0	7.6	3.4	111.9	-239.5	11.6	73.8	0.000	0.84	0.42
TargF	5.0	1	0.300	2000.	596.	411.	599.	784.	8.8	0.204	0.105	0.208	0.290	3169.	3207.	11.0	9.3	1.7	29.7	-153.6	16.8	7.2	0.000	0.84	0.42
TargF	5.0	1	0.300	2100.	585.	402.	583.	760.	9.6	0.198	0.101	0.204	0.284	3195.	3254.	11.0	9.3	1.7	30.9	-167.8	15.2	9.1	0.000	0.84	0.42
TargF	5.0	1	0.300	2200.	590.	416.	585.	766.	10.2	0.200	0.102	0.202	0.287	3196.	3245.	11.0	9.2	1.8	32.9	-163.9	15.0	11.9	0.000	0.84	0.42
TargF	5.0	1	0.300	2300.	584.	407.	581.	754.	10.6	0.194	0.102	0.199	0.277	3234.	3321.	11.0	9.3	1.7	33.6	-180.2	13.9	13.9	0.000	0.84	0.42
TargF	5.0	1	0.300	2400.	593.	413.	593.	755.	12.1	0.198	0.108	0.202	0.275	3202.	3276.	11.0	9.1	1.9	38.2	-186.1	13.9	18.0	0.000	0.84	0.42
TargF	5.0	1	0.300	2500.	590.	416.	592.	755.	13.3	0.196	0.104	0.202	0.273	3224.	3279.	11.0	9.1	1.9	41.9	-196.3	14.5	22.3	0.000	0.84	0.42
TargF	5.0	1	0.300	2600.	595.	445.	595.	745.	14.9	0.200	0.120	0.204	0.273	3170.	3197.	11.0	8.9	2.1	47.0	-196.2	15.0	28.0	0.000	0.84	0.42
TargF	5.0	1	0.300	2700.	593.	430.	600.	748.	16.1	0.199	0.116	0.204	0.271	3170.	3240.	11.0	8.8	2.2	50.6	-201.8	14.7	32.4	0.000	0.84	0.42
TargF	5.0	1	0.300	2800.	599.	438.	601.	755.	18.9	0.206	0.120	0.212	0.279	3116.	3186.	11.0	8.5	2.5	59.2	-208.0	16.7	41.7	0.000	0.84	0.41
TargF	5.0	1	0.300	2900.	603.	448.	603.	754.	21.4	0.207	0.125	0.213	0.275	3119.	3172.	11.0	8.5	2.5	66.7	-228.4	16.0	46.7	0.000	0.84	0.41
TargF	5.0	1	0.300	3000.	611.	464.	611.	760.	22.4	0.210	0.136	0.212	0.282	3101.	3155.	11.0	8.3	2.7	73.2	-218.8	15.3	52.5	0.000	0.84	0.41
TargF	5.0	1	0.300	3100.	612.	478.	612.	752.	25.9	0.212	0.141	0.218	0.279	3060.	3101.	11.0	8.0	3.0	85.3	-227.8	15.9	58.7	0.000	0.83	0.40
TargF	5.0	1	0.300	3200.	617.	473.	618.	759.	28.1	0.215	0.143	0.218	0.279	3049.	3103.	11.0	8.0	3.0	93.6	-240.6	17.1	65.0	0.000	0.83	0.40
TargF	5.0	1	0.300	3300.	619.	488.	618.	753.	30.3	0.217	0.149	0.222	0.278	3013.	3064.	11.0	7.7	3.3	105.1	-239.9	16.4	70.7	0.000	0.83	0.40
TargF	5.0	1	0.300	3400.	630.	500.	629.	761.	32.2	0.221	0.157	0.223	0.285	3009.	3033.	11.0	7.6	3.4	111.5	-250.2	16.5	75.1	0.000	0.83	0.40
TargF	5.0	1	0.300	3500.	632.	499.	630.	776.	34.2	0.223	0.166	0.222	0.286	2986.	3007.	11.0	7.4	3.6	123.8	-251.8	16.8	79.4	0.000	0.83	0.40
TargF	10.0	1	0.120	2000.	496.	370.	499.	625.	9.7	0.113	0.079	0.115	0.143	4122.	4001.	11.0	7.5	3.5	39.2	-53.9	0.6	0.1	0.000	0.89	0.55
TargF	10.0	1	0.120	2100.	496.	360.	496.	629.	9.9	0.112	0.077	0.113	0.144	4124.	4017.	11.0	7.6	3.4	39.0	-58.1	0.9	0.3	0.000	0.89	0.55
TargF	10.0	1	0.120	2200.	496.	361.	497.	635.	10.1	0.112	0.079	0.112	0.143	4136.	3987.	11.0	7.7	3.3	39.2	-61.0	0.6	0.4	0.000	0.89	0.56
TargF	10.0	1	0.120	2300.	495.	366.	491.	627.	10.5	0.110	0.081	0.110	0.139	4157.	4014.	11.0	7.8	3.2	39.7	-66.1	0.5	0.5	0.000	0.89	0.56
TargF	10.0	1	0.120	2400.	489.	359.	484.	625.	10.5	0.108	0.078	0.110	0.136	4192.	4055.	11.0	7.8	3.2	39.1	-66.9	0.3	0.6	0.000	0.89	0.56
TargF	10.0	1	0.120	2500.	487.	357.	486.	620.	10.9	0.109	0.079	0.110	0.138	4174.	4096.	11.0	7.9	3.1	39.2	-73.8	0.3	1.2	0.000	0.89	0.56
TargF	10.0	1	0.120	2600.	485.	353.	482.	622.	11.1	0.106	0.076	0.107	0.136	4224.	4065.	11.0	8.1	2.9	39.4	-74.8	0.5	1.8	0.000	0.89	0.56
TargF	10.0	1	0.120	2700.	480.	356.	475.	609.	11.5	0.105	0.077	0.106	0.131	4212.	4129.	11.0	8.1	2.9	39.4	-80.4	0.3	2.1	0.000	0.89	0.56
TargF	10.0	1	0.120	2800.	480.	348.	475.	618.	12.0	0.105	0.075	0.106	0.133	4214.	4133.	11.0	8.2	2.8	39.8	-87.0	0.3	3.4	0.000	0.89	0.56
TargF	10.0	1	0.120	2900.	480.	358.	469.	627.	12.2	0.104	0.076	0.104	0.131	4250.	4152.	11.0	8.2	2.8	40.6	-89.9	0.3	4.0	0.000	0.89	0.57
TargF	10.0	1	0.120	3000.	476.	355.	469.	618.	12.8	0.103	0.076	0.104	0.129	4233.	4171.	11.0	8.2	2.8	41.1	-93.0	0.2	5.8	0.000	0.89	0.57

Method Perc Dur Targ Trig Cmean C10 C50 C90 IAV Fmean F10 F50 F90 Smean S20 Nchange Nup
Ndown Cup Cdown Risk Risk Depl 4+ 7+ lim trig

TargF	10.0	1	0.120	3100.	468.	343.	461.	603.	13.3	0.101	0.073	0.101	0.128	4259.	4182.	11.0	8.3	2.7	41.4	-99.2	0.1	7.8	0.000	0.90	0.57
TargF	10.0	1	0.120	3200.	472.	345.	459.	620.	13.9	0.102	0.077	0.101	0.127	4252.	4193.	11.0	8.2	2.8	42.6	-105.3	0.3	10.1	0.000	0.90	0.57
TargF	10.0	1	0.120	3300.	467.	347.	458.	605.	14.5	0.100	0.076	0.101	0.126	4265.	4251.	11.0	8.3	2.7	43.3	-109.7	0.1	12.6	0.000	0.90	0.57
TargF	10.0	1	0.120	3400.	465.	339.	454.	596.	15.2	0.099	0.075	0.099	0.125	4271.	4267.	11.0	8.3	2.7	44.7	-112.5	0.2	15.7	0.000	0.90	0.57
TargF	10.0	1	0.120	3500.	467.	349.	460.	601.	15.5	0.100	0.075	0.100	0.124	4284.	4242.	11.0	8.3	2.7	45.8	-114.5	0.2	19.1	0.000	0.90	0.57
TargF	10.0	1	0.140	2000.	532.	382.	534.	668.	10.2	0.131	0.090	0.132	0.167	3891.	3777.	11.0	7.6	3.4	42.1	-67.1	1.4	0.2	0.000	0.88	0.53
TargF	10.0	1	0.140	2100.	534.	396.	534.	671.	10.4	0.130	0.091	0.132	0.164	3912.	3787.	11.0	7.6	3.4	42.7	-69.4	1.2	0.5	0.000	0.88	0.53
TargF	10.0	1	0.140	2200.	528.	386.	531.	665.	10.5	0.129	0.089	0.130	0.167	3917.	3817.	11.0	7.7	3.3	42.2	-71.7	1.3	0.8	0.000	0.88	0.53
TargF	10.0	1	0.140	2300.	520.	382.	513.	666.	10.9	0.126	0.089	0.126	0.160	3910.	3820.	11.0	7.9	3.1	41.7	-78.2	0.9	0.9	0.000	0.88	0.53
TargF	10.0	1	0.140	2400.	522.	378.	518.	668.	11.2	0.125	0.090	0.125	0.160	3935.	3848.	11.0	8.0	3.0	42.3	-84.2	0.9	1.5	0.000	0.88	0.53
TargF	10.0	1	0.140	2500.	516.	376.	514.	658.	11.7	0.123	0.087	0.123	0.157	3959.	3851.	11.0	8.0	3.0	42.1	-90.4	0.9	2.2	0.000	0.89	0.54
TargF	10.0	1	0.140	2600.	515.	376.	507.	660.	11.7	0.122	0.085	0.122	0.157	3981.	3910.	11.0	8.1	2.9	42.4	-91.7	0.7	2.8	0.000	0.88	0.53
TargF	10.0	1	0.140	2700.	513.	373.	503.	669.	12.3	0.121	0.087	0.121	0.155	4010.	3938.	11.0	8.1	2.9	42.8	-99.4	0.7	3.7	0.000	0.89	0.54
TargF	10.0	1	0.140	2800.	512.	374.	504.	658.	12.7	0.120	0.088	0.120	0.152	4009.	3938.	11.0	8.2	2.8	43.8	-103.2	0.4	5.2	0.000	0.89	0.54
TargF	10.0	1	0.140	2900.	507.	376.	499.	650.	13.1	0.118	0.084	0.119	0.150	4029.	3964.	11.0	8.3	2.7	44.2	-107.1	0.8	7.7	0.000	0.89	0.54
TargF	10.0	1	0.140	3000.	511.	371.	500.	659.	13.8	0.119	0.087	0.120	0.150	4006.	3931.	11.0	8.2	2.8	45.8	-114.5	0.6	9.6	0.000	0.89	0.54
TargF	10.0	1	0.140	3100.	503.	369.	489.	657.	14.4	0.117	0.085	0.117	0.148	4025.	4000.	11.0	8.3	2.7	46.4	-116.4	0.6	12.4	0.000	0.89	0.54
TargF	10.0	1	0.140	3200.	505.	372.	498.	653.	14.9	0.117	0.087	0.117	0.147	4042.	3994.	11.0	8.3	2.7	47.8	-123.5	0.6	15.3	0.000	0.89	0.54
TargF	10.0	1	0.140	3300.	500.	370.	492.	635.	15.7	0.115	0.085	0.115	0.145	4049.	4019.	11.0	8.3	2.7	49.2	-130.9	0.6	18.4	0.000	0.89	0.54
TargF	10.0	1	0.140	3400.	498.	374.	487.	633.	16.7	0.115	0.086	0.114	0.145	4043.	4026.	11.0	8.2	2.8	50.9	-133.7	0.3	22.5	0.000	0.89	0.54
TargF	10.0	1	0.140	3500.	496.	370.	488.	629.	18.0	0.115	0.087	0.116	0.143	4025.	4004.	11.0	8.2	2.8	54.1	-136.3	0.5	28.3	0.000	0.89	0.54
TargF	10.0	1	0.160	2000.	561.	411.	558.	714.	10.6	0.148	0.100	0.149	0.192	3701.	3600.	11.0	7.7	3.3	44.8	-79.9	2.1	0.4	0.000	0.87	0.50
TargF	10.0	1	0.160	2100.	555.	409.	553.	698.	10.9	0.145	0.101	0.146	0.186	3719.	3582.	11.0	7.9	3.1	44.6	-83.3	2.7	1.1	0.000	0.87	0.51
TargF	10.0	1	0.160	2200.	558.	418.	555.	702.	11.1	0.145	0.101	0.146	0.191	3720.	3583.	11.0	7.8	3.2	45.2	-85.9	1.9	1.2	0.000	0.87	0.51
TargF	10.0	1	0.160	2300.	550.	408.	543.	700.	11.3	0.142	0.099	0.141	0.187	3743.	3653.	11.0	7.9	3.1	44.7	-90.2	1.6	1.6	0.000	0.87	0.51
TargF	10.0	1	0.160	2400.	545.	396.	541.	696.	11.8	0.140	0.097	0.140	0.181	3748.	3672.	11.0	8.1	2.9	44.8	-99.1	1.3	2.3	0.000	0.88	0.51
TargF	10.0	1	0.160	2500.	538.	394.	532.	694.	12.3	0.137	0.095	0.136	0.178	3778.	3708.	11.0	8.2	2.8	44.9	-108.7	1.4	3.9	0.000	0.88	0.51
TargF	10.0	1	0.160	2600.	543.	395.	535.	693.	12.5	0.137	0.094	0.138	0.179	3812.	3733.	11.0	8.2	2.8	45.8	-111.5	1.5	4.8	0.000	0.88	0.51
TargF	10.0	1	0.160	2700.	533.	392.	523.	679.	13.1	0.134	0.094	0.135	0.172	3803.	3721.	11.0	8.3	2.7	46.3	-117.7	1.2	6.4	0.000	0.88	0.52
TargF	10.0	1	0.160	2800.	535.	391.	530.	681.	13.6	0.133	0.098	0.133	0.169	3832.	3748.	11.0	8.3	2.7	47.5	-122.3	1.0	8.4	0.000	0.88	0.52
TargF	10.0	1	0.160	2900.	529.	391.	522.	676.	14.0	0.131	0.094	0.131	0.166	3849.	3804.	11.0	8.4	2.6	47.8	-130.3	0.8	10.3	0.000	0.88	0.52
TargF	10.0	1	0.160	3000.	527.	394.	521.	667.	15.1	0.132	0.098	0.133	0.167	3807.	3789.	11.0	8.4	2.6	49.9	-138.5	1.2	14.4	0.000	0.88	0.52
TargF	10.0	1	0.160	3100.	519.	391.	513.	664.	15.2	0.128	0.092	0.129	0.165	3875.	3842.	11.0	8.4	2.6	49.6	-139.3	0.9	16.9	0.000	0.88	0.52
TargF	10.0	1	0.160	3200.	527.	402.	518.	665.	16.4	0.130	0.096	0.130	0.164	3851.	3825.	11.0	8.3	2.7	53.4	-143.8	0.9	20.9	0.000	0.88	0.52
TargF	10.0	1	0.160	3300.	525.	402.	520.	659.	17.2	0.129	0.096	0.129	0.162	3855.	3837.	11.0	8.2	2.8	55.2	-147.4	0.7	25.7	0.000	0.88	0.52
TargF	10.0	1	0.160	3400.	525.	394.	520.	665.	18.6	0.129	0.097	0.130	0.162	3850.	3866.	11.0	8.1	2.9	58.5	-154.9	0.8	30.8	0.000	0.88	0.52
TargF	10.0	1	0.160	3500.	520.	391.	512.	658.	19.7	0.127	0.095	0.127	0.160	3865.	3837.	11.0	8.1	2.9	60.9	-156.4	1.0	35.5	0.000	0.88	0.52
TargF	10.0	1	0.180	2000.	582.	426.	576.	747.	10.9	0.162	0.111	0.163	0.214	3548.	3400.	11.0	7.8	3.2	46.9	-90.3	4.1	0.9	0.000	0.87	0.48
TargF	10.0	1	0.180	2100.	573.	417.	571.	727.	11.4	0.161	0.109	0.160	0.214	3532.	3438.	11.0	7.8	3.2	46.7	-95.9	3.9	1.5	0.000	0.87	0.48
TargF	10.0	1	0.180	2200.	570.	416.	563.	735.	11.8	0.158	0.107	0.159	0.206	3567.	3491.	11.0	8.0	3.0	46.5	-104.6	3.0	1.9	0.000	0.87	0.48
TargF	10.0	1	0.180	2300.	569.	422.	566.	719.	12.1	0.156	0.107	0.157	0.202	3594.	3523.	11.0	8.1	2.9	47.1	-109.5	2.6	2.6	0.000	0.87	0.49
TargF	10.0	1	0.180	2400.	561.	415.	553.	715.	12.5	0.151	0.105	0.152	0.200	3634.	3573.	11.0	8.2	2.8	47.3	-118.0	2.9	4.2	0.000	0.87	0.49
TargF	10.0	1	0.180	2500.	558.	412.	548.	724.	13.0	0.150	0.106	0.151	0.193	3624.	3577.	11.0	8.4	2.6	47.7	-129.4	3.0	6.3	0.000	0.87	0.49
TargF	10.0	1	0.180	2600.	557.	416.	548.	709.	13.7	0.149	0.106	0.149	0.194	3649.	3608.	11.0	8.3	2.7	49.1	-132.2	2.3	7.7	0.000	0.87	0.49
TargF	10.0	1	0.180	2700.	557.	419.	550.	709.	13.9	0.149	0.107	0.147	0.193	3652.	3606.	11.0	8.3	2.7	49.8	-134.5	2.0	9.7	0.000	0.87	0.50
TargF	10.0	1	0.180	2800.	555.	415.	546.	709.	14.7	0.146	0.103	0.146	0.187	3677.	3611.	11.0	8.4	2.6	51.5	-139.1	2.2	11.8	0.000	0.87	0.50
TargF	10.0	1	0.180	2900.	556.	421.	549.	691.	15.2	0.147	0.105	0.148	0.190	3668.	3604.	11.0	8.3	2.7	53.0	-147.7	1.8	16.2	0.000	0.87	0.50
TargF	10.0	1	0.180	3000.	554.	423.	545.	700.	16.2	0.145	0.105	0.145	0.184	3683.	3602.	11.0	8.3	2.7	55.0	-151.5	1.8	18.9	0.000	0.87	0.50
TargF	10.0	1	0.180	3100.	545.	415.	536.	694.	17.3	0.144	0.103	0.144	0.183	3668.	3654.	11.0	8.3	2.7	57.3	-157.3	2.0	24.6	0.000	0.87	0.50
TargF	10.0	1	0.180	3200.	550.	417.	538.	692.	18.5	0.145	0.107	0.146	0.182	3668.	3654.	11.0	8.2	2.8	60.8	-167.1	1.6	30.3	0.000	0.87	0.50
TargF	10.0	1	0.180	3300.	548.	425.	537.	692.	19.8	0.143	0.106	0.142	0.179	3697.	3699.	11.0	8.2	2.8	63.7	-169.6	1.5	32.8	0.000	0.87	0.50
TargF	10.0	1	0.180	3400.	545.	417.	534.	685.	21.0	0.143	0.107	0.144	0.177	3674.	3687.	11.0	8.0	3.0	67.4	-173.0	1.7	38.8	0.000	0.87	0.50
TargF	10.0	1	0.180	3500.	542.	420.	530.	684.	21.8	0.142	0.107	0.142	0.175	3681.	3728.	11.0	8.0	3.0	69.8	-175.5	1.4	44.9	0.000	0.87	0.50
TargF	10.0	1	0.200	2000.	590.	429.	588.	754.	11.4	0.175	0.115	0.175	0.234	3416.	3340.	11.0	8.0	3.0	47.5	-102.8	5.8	1.5	0.000	0.86	0.46
TargF	10.0	1	0.200	2100.	585.	433.	580.	748.	12.0	0.170	0.112	0.172	0.224	3456.	3374.	11.0	8.2	2.8	47.9	-118.5	5.0	2.1	0.000	0.86	0.47
TargF	10.0	1	0.200	2200.	589.	437.	587.	751.	12.3	0.172	0.116	0.174	0.225	3419.	3330.	11.0	8.1	2.9	48.9	-121.1	4.8	3.2	0.000	0.86	0.47
TargF	10.0	1	0.200	2300.	582.	430.	574.	736.	12.8	0.168	0.111	0.168	0.221	3464.	3431.	11.0	8.2	2.8	49.2	-128.9	5.3	5.3	0.000	0.86	0.47
TargF	10.0	1	0.200	2400.	573.	422.	566.	733.	13.6	0.164	0.113	0.166	0.213	3464.	3424.	11.0	8.2	2.8	49.7	-138.0	4.6	6.5	0.000	0.86	0.47

Method Perc Dur Targ Trig Cmean C10 C50 C90 IAV Fmean F10 F50 F90 Smean S20 Nchange
Nup Ndown Cup Cdown Risk Risk Depl 4+ 7+ lim trig

TargF	10.0	1	0.200	2500.	576.	431.	572.	727.	13.5	0.165	0.113	0.165	0.214	3475.	3408.	11.0	8.4	2.6	50.4	-140.9	4.5	8.9	0.000	0.86	0.47
TargF	10.0	1	0.200	2600.	580.	432.	573.	739.	14.2	0.164	0.112	0.165	0.214	3517.	3450.	11.0	8.4	2.6	52.4	-146.8	3.9	11.0	0.000	0.86	0.47
TargF	10.0	1	0.200	2700.	567.	429.	564.	709.	15.2	0.161	0.115	0.161	0.207	3481.	3464.	11.0	8.4	2.6	53.5	-156.9	4.0	15.2	0.000	0.86	0.48
TargF	10.0	1	0.200	2800.	573.	436.	561.	730.	15.8	0.160	0.113	0.158	0.205	3532.	3486.	11.0	8.4	2.6	55.7	-161.8	3.6	16.8	0.000	0.86	0.48
TargF	10.0	1	0.200	2900.	574.	441.	563.	721.	16.4	0.161	0.112	0.162	0.205	3528.	3480.	11.0	8.4	2.7	57.5	-168.4	3.0	21.0	0.000	0.86	0.47
TargF	10.0	1	0.200	3000.	564.	431.	552.	708.	18.3	0.157	0.114	0.157	0.200	3531.	3498.	11.0	8.3	2.7	61.4	-173.0	3.4	27.2	0.000	0.87	0.48
TargF	10.0	1	0.200	3100.	570.	438.	559.	716.	18.6	0.157	0.112	0.156	0.200	3566.	3524.	11.0	8.3	2.7	63.2	-178.8	2.8	29.3	0.000	0.87	0.48
TargF	10.0	1	0.200	3200.	567.	430.	559.	703.	19.6	0.157	0.113	0.158	0.202	3548.	3560.	11.0	8.2	2.8	66.0	-182.1	2.7	36.3	0.000	0.86	0.48
TargF	10.0	1	0.200	3300.	567.	451.	559.	700.	21.5	0.157	0.117	0.157	0.198	3529.	3518.	11.0	8.1	2.9	71.5	-186.5	2.5	42.4	0.000	0.87	0.48
TargF	10.0	1	0.200	3400.	567.	444.	557.	700.	22.3	0.157	0.117	0.158	0.199	3539.	3531.	11.0	8.0	3.0	75.0	-192.5	2.7	47.8	0.000	0.87	0.48
TargF	10.0	1	0.200	3500.	563.	447.	552.	696.	24.2	0.156	0.115	0.156	0.195	3533.	3541.	11.0	7.9	3.1	80.6	-191.2	2.6	53.8	0.000	0.87	0.48
TargF	10.0	1	0.220	2000.	604.	440.	598.	772.	12.3	0.191	0.129	0.191	0.251	3241.	3175.	11.0	8.0	3.0	49.8	-121.8	10.1	3.5	0.000	0.85	0.44
TargF	10.0	1	0.220	2100.	600.	443.	595.	769.	12.4	0.187	0.121	0.189	0.247	3292.	3238.	11.0	8.2	2.8	49.9	-125.3	8.4	3.9	0.000	0.85	0.44
TargF	10.0	1	0.220	2200.	598.	441.	596.	765.	12.8	0.185	0.121	0.185	0.245	3302.	3250.	11.0	8.3	2.7	50.6	-135.0	7.8	5.5	0.000	0.85	0.45
TargF	10.0	1	0.220	2300.	593.	433.	589.	751.	13.5	0.182	0.122	0.183	0.238	3318.	3275.	11.0	8.3	2.7	51.5	-144.1	7.5	7.5	0.000	0.85	0.45
TargF	10.0	1	0.220	2400.	595.	447.	588.	757.	14.1	0.179	0.124	0.179	0.235	3355.	3306.	11.0	8.4	2.6	53.2	-156.4	6.6	9.4	0.000	0.85	0.45
TargF	10.0	1	0.220	2500.	581.	428.	576.	742.	14.8	0.176	0.117	0.177	0.229	3329.	3317.	11.0	8.4	2.6	53.3	-159.4	7.0	12.5	0.000	0.86	0.45
TargF	10.0	1	0.220	2600.	586.	442.	578.	736.	15.6	0.176	0.120	0.176	0.230	3352.	3327.	11.0	8.4	2.6	55.9	-165.9	6.1	15.9	0.000	0.86	0.46
TargF	10.0	1	0.220	2700.	589.	444.	584.	746.	16.4	0.174	0.122	0.177	0.223	3390.	3329.	11.0	8.4	2.6	58.3	-170.9	5.4	18.8	0.000	0.86	0.46
TargF	10.0	1	0.220	2800.	576.	427.	571.	724.	17.5	0.170	0.118	0.172	0.220	3382.	3424.	11.0	8.4	2.6	60.1	-177.9	5.4	23.1	0.000	0.86	0.46
TargF	10.0	1	0.220	2900.	579.	447.	570.	724.	18.3	0.172	0.124	0.172	0.222	3374.	3381.	11.0	8.3	2.7	63.2	-184.0	5.3	28.9	0.000	0.86	0.46
TargF	10.0	1	0.220	3000.	582.	448.	576.	719.	19.5	0.173	0.124	0.174	0.220	3365.	3370.	11.0	8.2	2.8	66.8	-185.6	5.0	34.2	0.000	0.86	0.46
TargF	10.0	1	0.220	3100.	581.	458.	574.	718.	21.6	0.174	0.127	0.173	0.220	3339.	3351.	11.0	8.1	2.9	72.7	-198.2	5.3	41.1	0.000	0.86	0.46
TargF	10.0	1	0.220	3200.	587.	458.	575.	730.	22.1	0.173	0.128	0.172	0.222	3387.	3368.	11.0	8.1	2.9	75.8	-196.8	5.0	44.7	0.000	0.86	0.46
TargF	10.0	1	0.220	3300.	581.	451.	572.	712.	24.4	0.171	0.128	0.172	0.214	3365.	3397.	11.0	7.9	3.1	82.2	-203.3	4.7	51.7	0.000	0.86	0.46
TargF	10.0	1	0.220	3400.	586.	457.	585.	723.	24.9	0.172	0.127	0.172	0.218	3401.	3402.	11.0	7.9	3.1	85.7	-200.2	4.2	55.7	0.000	0.86	0.46
TargF	10.0	1	0.220	3500.	587.	457.	580.	727.	27.2	0.172	0.126	0.173	0.216	3394.	3365.	11.0	7.7	3.3	92.8	-210.8	4.7	61.4	0.000	0.86	0.46
TargF	10.0	1	0.240	2000.	613.	457.	610.	782.	12.4	0.198	0.126	0.199	0.265	3214.	3159.	11.0	8.3	2.7	50.9	-135.9	11.0	3.7	0.000	0.84	0.43
TargF	10.0	1	0.240	2100.	609.	447.	607.	775.	12.8	0.198	0.125	0.198	0.268	3189.	3177.	11.0	8.3	2.7	51.4	-142.7	11.1	5.5	0.000	0.84	0.43
TargF	10.0	1	0.240	2200.	605.	439.	594.	779.	13.6	0.196	0.128	0.195	0.263	3186.	3171.	11.0	8.2	2.8	52.2	-150.9	11.3	8.3	0.000	0.84	0.43
TargF	10.0	1	0.240	2300.	599.	445.	591.	781.	14.3	0.190	0.125	0.192	0.250	3249.	3216.	11.0	8.5	2.5	53.8	-163.0	9.8	9.8	0.000	0.85	0.44
TargF	10.0	1	0.240	2400.	604.	449.	596.	768.	14.7	0.191	0.130	0.191	0.255	3235.	3210.	11.0	8.5	2.5	55.4	-169.4	9.2	12.6	0.000	0.85	0.44
TargF	10.0	1	0.240	2500.	606.	463.	599.	765.	15.8	0.193	0.134	0.192	0.252	3226.	3227.	11.0	8.4	2.6	58.2	-175.9	8.6	16.2	0.000	0.85	0.43
TargF	10.0	1	0.240	2600.	604.	467.	597.	751.	16.2	0.188	0.130	0.188	0.244	3272.	3241.	11.0	8.4	2.6	59.3	-181.0	8.1	18.5	0.000	0.85	0.44
TargF	10.0	1	0.240	2700.	597.	462.	585.	752.	17.4	0.186	0.128	0.186	0.245	3268.	3236.	11.0	8.4	2.6	61.9	-185.0	7.6	24.5	0.000	0.85	0.44
TargF	10.0	1	0.240	2800.	594.	463.	587.	739.	18.4	0.185	0.135	0.187	0.239	3258.	3280.	11.0	8.4	2.6	64.7	-195.6	8.2	29.8	0.000	0.85	0.44
TargF	10.0	1	0.240	2900.	597.	457.	589.	748.	20.1	0.184	0.129	0.183	0.237	3291.	3320.	11.0	8.2	2.8	69.9	-197.6	7.2	33.1	0.000	0.85	0.44
TargF	10.0	1	0.240	3000.	597.	460.	588.	756.	21.0	0.185	0.131	0.185	0.238	3277.	3272.	11.0	8.2	2.8	73.5	-202.7	7.8	40.5	0.000	0.85	0.44
TargF	10.0	1	0.240	3100.	602.	469.	592.	742.	22.7	0.186	0.137	0.187	0.236	3247.	3251.	11.0	8.0	3.0	79.2	-204.3	6.6	46.7	0.000	0.85	0.44
TargF	10.0	1	0.240	3200.	599.	472.	591.	739.	25.1	0.187	0.134	0.187	0.236	3246.	3276.	11.0	7.9	3.1	86.6	-211.2	7.4	52.4	0.000	0.85	0.44
TargF	10.0	1	0.240	3300.	597.	465.	593.	738.	25.8	0.187	0.134	0.187	0.240	3237.	3259.	11.0	7.8	3.2	90.1	-212.5	7.8	59.4	0.000	0.85	0.44
TargF	10.0	1	0.240	3400.	598.	476.	588.	734.	27.9	0.187	0.139	0.185	0.235	3234.	3280.	11.0	7.6	3.4	97.4	-221.3	7.6	65.1	0.000	0.85	0.44
TargF	10.0	1	0.240	3500.	600.	475.	595.	736.	29.7	0.186	0.139	0.186	0.231	3249.	3262.	11.0	7.6	3.4	103.6	-224.2	7.4	68.1	0.000	0.85	0.44
TargF	10.0	1	0.260	2000.	627.	463.	623.	787.	13.1	0.217	0.142	0.218	0.292	3043.	3014.	11.0	8.3	2.7	53.2	-150.7	15.6	6.1	0.000	0.84	0.41
TargF	10.0	1	0.260	2100.	617.	459.	612.	788.	13.9	0.211	0.140	0.211	0.282	3062.	3041.	11.0	8.3	2.7	53.8	-157.8	15.4	8.4	0.000	0.84	0.41
TargF	10.0	1	0.260	2200.	611.	450.	607.	770.	14.4	0.207	0.138	0.206	0.277	3099.	3105.	11.0	8.4	2.6	54.7	-171.5	14.0	10.2	0.000	0.84	0.41
TargF	10.0	1	0.260	2300.	616.	459.	613.	773.	15.1	0.206	0.135	0.207	0.273	3125.	3095.	11.0	8.5	2.5	57.1	-177.5	13.1	13.1	0.000	0.84	0.42
TargF	10.0	1	0.260	2400.	612.	458.	611.	775.	16.1	0.203	0.135	0.203	0.270	3131.	3107.	11.0	8.5	2.5	59.2	-186.8	13.4	17.6	0.000	0.84	0.42
TargF	10.0	1	0.260	2500.	606.	452.	603.	765.	16.4	0.198	0.128	0.201	0.259	3188.	3188.	11.0	8.5	2.5	60.3	-186.4	12.4	19.9	0.000	0.84	0.42
TargF	10.0	1	0.260	2600.	611.	461.	610.	767.	17.5	0.201	0.140	0.202	0.262	3156.	3174.	11.0	8.4	2.6	63.8	-199.7	12.4	26.1	0.000	0.84	0.42
TargF	10.0	1	0.260	2700.	609.	457.	604.	759.	18.9	0.202	0.137	0.203	0.262	3135.	3157.	11.0	8.3	2.7	67.7	-200.1	12.3	30.5	0.000	0.84	0.42
TargF	10.0	1	0.260	2800.	614.	470.	606.	770.	20.8	0.203	0.141	0.203	0.259	3127.	3132.	11.0	8.2	2.8	73.6	-206.4	12.1	36.6	0.000	0.84	0.42
TargF	10.0	1	0.260	2900.	608.	467.	604.	753.	22.0	0.200	0.141	0.201	0.259	3142.	3179.	11.0	8.2	2.8	76.6	-213.5	11.6	41.6	0.000	0.84	0.42
TargF	10.0	1	0.260	3000.	614.	475.	608.	765.	23.8	0.202	0.146	0.204	0.259	3126.	3124.	11.0	8.0	3.0	83.3	-219.4	10.8	48.3	0.000	0.84	0.42
TargF	10.0	1	0.260	3100.	610.	465.	606.	761.	25.2	0.201	0.141	0.201	0.259	3122.	3152.	11.0	8.0	3.0	87.9	-225.3	10.8	54.9	0.000	0.84	0.42
TargF	10.0	1	0.260	3200.	612.	482.	604.	746.	26.9	0.201	0.149	0.199	0.256	3124.	3130.	11.0	7.8	3.2	94.8	-227.0	9.9	59.5	0.000	0.84	0.42
TargF	10.0	1	0.260	3300.	607.	483.	602.	741.	28.9	0.200	0.150	0.200	0.254	3105.	3124.	11.0	7.6	3.4	103.0	-230.6	10.5	66.1	0.000	0.84	0.42
TargF	10.0	1	0.260	3400.	616.	486.	608.	753.	30.3	0.203	0.150	0.204	0.256	3104.	3110.	11.0	7.6	3.5	108.7	-234.9	10.1	70.7	0.000	0.84	0.42

Method Perc Dur Targ Trig Cmean C10 C50 C90 IAV Fmean F10 F50 F90 Smean S20 Nchange
Nup Ndown Cup Cdown Risk Risk Depl 4+ 7+ lim trig

TargF	10.0	1	0.260	3500.	618.	489.	613.	752.	32.8	0.201	0.153	0.202	0.250	3134.	3152.	11.0	7.5	3.5	118.0	-243.1	9.2	73.4	0.000	0.84 0.42
TargF	10.0	1	0.280	2000.	624.	454.	622.	795.	13.9	0.225	0.142	0.226	0.306	2972.	2974.	11.0	8.4	2.6	54.3	-167.9	20.2	8.7	0.000	0.83 0.40
TargF	10.0	1	0.280	2100.	620.	456.	617.	783.	15.1	0.224	0.140	0.225	0.304	2965.	2994.	11.0	8.5	2.5	55.5	-187.3	19.8	12.1	0.000	0.83 0.39
TargF	10.0	1	0.280	2200.	624.	466.	622.	787.	15.1	0.219	0.143	0.220	0.294	3016.	3001.	11.0	8.5	2.5	57.8	-183.5	17.0	13.2	0.000	0.83 0.40
TargF	10.0	1	0.280	2300.	618.	452.	620.	788.	16.1	0.213	0.138	0.212	0.289	3077.	3055.	11.0	8.5	2.5	59.8	-191.2	16.7	16.7	0.000	0.84 0.41
TargF	10.0	1	0.280	2400.	618.	460.	614.	786.	16.9	0.215	0.144	0.216	0.286	3034.	3039.	11.0	8.5	2.5	61.9	-197.8	16.4	21.1	0.000	0.83 0.40
TargF	10.0	1	0.280	2500.	620.	476.	620.	772.	18.2	0.215	0.143	0.217	0.282	3046.	3033.	11.0	8.4	2.6	66.2	-201.6	16.1	26.2	0.000	0.84 0.41
TargF	10.0	1	0.280	2600.	620.	464.	614.	781.	19.8	0.214	0.148	0.212	0.282	3033.	3022.	11.0	8.3	2.7	70.1	-212.5	16.0	30.0	0.000	0.84 0.41
TargF	10.0	1	0.280	2700.	614.	482.	613.	760.	20.2	0.211	0.145	0.212	0.278	3056.	3063.	11.0	8.3	2.7	71.6	-214.0	14.3	34.6	0.000	0.84 0.41
TargF	10.0	1	0.280	2800.	619.	476.	616.	772.	21.9	0.212	0.149	0.212	0.275	3051.	3072.	11.0	8.1	2.9	78.7	-218.9	14.8	41.5	0.000	0.84 0.41
TargF	10.0	1	0.280	2900.	624.	480.	624.	771.	23.7	0.215	0.147	0.218	0.274	3033.	3038.	11.0	8.0	3.0	83.5	-227.6	15.2	48.3	0.000	0.84 0.40
TargF	10.0	1	0.280	3000.	623.	490.	620.	769.	25.3	0.216	0.155	0.219	0.273	3005.	3023.	11.0	8.0	3.0	90.0	-230.4	14.9	55.2	0.000	0.83 0.40
TargF	10.0	1	0.280	3100.	618.	491.	609.	763.	28.1	0.215	0.158	0.215	0.273	2995.	3030.	11.0	7.8	3.2	99.5	-235.8	15.8	62.0	0.000	0.84 0.40
TargF	10.0	1	0.280	3200.	626.	491.	619.	763.	29.7	0.218	0.162	0.218	0.275	2995.	3002.	11.0	7.7	3.3	105.7	-238.0	15.3	67.7	0.000	0.83 0.40
TargF	10.0	1	0.280	3300.	627.	495.	622.	763.	30.9	0.216	0.158	0.217	0.276	3021.	3023.	11.0	7.6	3.4	112.1	-247.3	14.3	69.9	0.000	0.84 0.40
TargF	10.0	1	0.280	3400.	629.	501.	621.	762.	33.1	0.215	0.162	0.214	0.271	3021.	3042.	11.0	7.4	3.6	122.7	-249.5	13.2	75.1	0.000	0.84 0.40
TargF	10.0	1	0.280	3500.	627.	501.	624.	763.	35.8	0.217	0.168	0.218	0.268	2980.	3001.	11.0	7.3	3.7	132.3	-255.0	14.1	80.6	0.000	0.83 0.40
TargF	10.0	1	0.300	2000.	625.	437.	625.	791.	14.6	0.236	0.145	0.237	0.328	2901.	2925.	11.0	8.4	2.6	56.1	-179.1	24.8	12.1	0.000	0.82 0.38
TargF	10.0	1	0.300	2100.	623.	454.	622.	790.	15.5	0.232	0.142	0.232	0.320	2908.	2958.	11.0	8.5	2.5	57.7	-193.0	23.4	14.2	0.000	0.82 0.38
TargF	10.0	1	0.300	2200.	627.	464.	629.	786.	16.0	0.230	0.149	0.230	0.306	2927.	2956.	11.0	8.5	2.5	59.7	-202.4	21.1	16.5	0.000	0.83 0.39
TargF	10.0	1	0.300	2300.	626.	462.	631.	793.	16.8	0.230	0.149	0.234	0.307	2924.	2978.	11.0	8.4	2.6	62.2	-200.2	21.5	21.5	0.000	0.83 0.38
TargF	10.0	1	0.300	2400.	629.	477.	625.	789.	18.1	0.228	0.150	0.229	0.303	2949.	2949.	11.0	8.4	2.6	66.6	-206.4	20.3	25.2	0.000	0.83 0.39
TargF	10.0	1	0.300	2500.	621.	471.	616.	777.	19.7	0.225	0.152	0.223	0.300	2953.	2986.	11.0	8.4	2.6	70.3	-215.1	20.3	30.5	0.000	0.83 0.39
TargF	10.0	1	0.300	2600.	630.	478.	628.	785.	20.8	0.228	0.152	0.230	0.295	2939.	2973.	11.0	8.2	2.8	74.8	-218.6	19.5	36.4	0.000	0.83 0.39
TargF	10.0	1	0.300	2700.	632.	486.	634.	783.	22.0	0.228	0.155	0.230	0.299	2942.	2922.	11.0	8.2	2.8	80.1	-221.7	19.5	42.4	0.000	0.83 0.39
TargF	10.0	1	0.300	2800.	627.	484.	623.	773.	24.5	0.228	0.159	0.228	0.295	2921.	2954.	11.0	8.0	3.0	86.7	-231.6	20.6	49.2	0.000	0.83 0.39
TargF	10.0	1	0.300	2900.	624.	487.	621.	767.	25.9	0.224	0.157	0.224	0.293	2944.	2933.	11.0	7.9	3.1	91.6	-233.8	19.0	54.1	0.000	0.83 0.39
TargF	10.0	1	0.300	3000.	634.	491.	634.	783.	27.4	0.229	0.164	0.230	0.294	2925.	2926.	11.0	7.8	3.2	99.3	-236.0	19.0	59.7	0.000	0.83 0.39
TargF	10.0	1	0.300	3100.	637.	501.	631.	778.	30.0	0.232	0.171	0.233	0.293	2890.	2912.	11.0	7.7	3.3	108.5	-244.8	19.4	67.2	0.000	0.83 0.38
TargF	10.0	1	0.300	3200.	639.	507.	632.	776.	32.1	0.232	0.170	0.231	0.299	2908.	2932.	11.0	7.5	3.5	118.3	-251.8	19.0	71.2	0.000	0.83 0.38
TargF	10.0	1	0.300	3300.	639.	510.	633.	771.	33.5	0.230	0.168	0.231	0.292	2915.	2924.	11.0	7.4	3.6	125.1	-257.1	17.8	76.4	0.000	0.83 0.39
TargF	10.0	1	0.300	3400.	636.	492.	635.	778.	36.9	0.231	0.172	0.231	0.294	2891.	2931.	11.0	7.3	3.7	136.1	-265.3	18.4	80.5	0.000	0.83 0.38
TargF	10.0	1	0.300	3500.	638.	504.	634.	776.	38.4	0.229	0.171	0.228	0.292	2923.	2947.	11.0	7.2	3.8	142.8	-267.9	17.5	82.2	0.000	0.83 0.39
TargF	15.0	1	0.120	2000.	529.	411.	527.	651.	13.2	0.125	0.103	0.125	0.149	3932.	3845.	11.0	6.6	4.4	58.4	-72.6	0.7	0.1	0.000	0.88 0.53
TargF	15.0	1	0.120	2100.	526.	398.	520.	655.	13.3	0.125	0.099	0.123	0.150	3934.	3854.	11.0	6.6	4.4	57.7	-74.8	0.9	0.3	0.001	0.89 0.54
TargF	15.0	1	0.120	2200.	516.	392.	513.	644.	13.6	0.122	0.094	0.123	0.148	3938.	3887.	11.0	6.8	4.2	56.8	-78.0	0.5	0.3	0.000	0.89 0.54
TargF	15.0	1	0.120	2300.	513.	384.	516.	640.	14.1	0.119	0.094	0.120	0.144	3990.	3915.	11.0	6.9	4.1	57.0	-83.2	0.7	0.7	0.000	0.89 0.54
TargF	15.0	1	0.120	2400.	512.	388.	512.	634.	14.3	0.119	0.095	0.119	0.143	3993.	3943.	11.0	7.0	4.0	56.8	-85.9	0.5	0.9	0.000	0.89 0.54
TargF	15.0	1	0.120	2500.	511.	385.	506.	648.	14.5	0.117	0.091	0.118	0.143	4023.	3946.	11.0	7.1	3.9	56.9	-89.7	0.3	1.2	0.000	0.89 0.54
TargF	15.0	1	0.120	2600.	513.	380.	509.	650.	14.9	0.117	0.090	0.118	0.142	4040.	3936.	11.0	7.2	3.8	57.4	-93.2	0.3	1.7	0.000	0.89 0.55
TargF	15.0	1	0.120	2700.	506.	388.	499.	635.	15.3	0.116	0.091	0.116	0.142	4026.	3972.	11.0	7.3	3.7	57.4	-97.5	0.4	2.6	0.000	0.89 0.55
TargF	15.0	1	0.120	2800.	505.	376.	502.	640.	15.8	0.116	0.092	0.116	0.140	4014.	3977.	11.0	7.3	3.7	57.7	-99.5	0.5	4.4	0.000	0.89 0.55
TargF	15.0	1	0.120	2900.	503.	380.	498.	638.	16.0	0.113	0.088	0.113	0.139	4080.	4034.	11.0	7.4	3.6	57.7	-106.4	0.4	4.9	0.000	0.89 0.55
TargF	15.0	1	0.120	3000.	502.	371.	494.	637.	16.3	0.114	0.088	0.113	0.140	4056.	4019.	11.0	7.4	3.6	58.3	-106.8	0.3	7.0	0.000	0.89 0.55
TargF	15.0	1	0.120	3100.	493.	368.	485.	631.	16.9	0.111	0.087	0.111	0.135	4075.	4048.	11.0	7.5	3.5	58.5	-112.7	0.2	9.3	0.000	0.89 0.55
TargF	15.0	1	0.120	3200.	494.	365.	483.	637.	17.5	0.110	0.087	0.109	0.134	4114.	4078.	11.0	7.5	3.5	59.8	-113.2	0.2	11.1	0.000	0.89 0.55
TargF	15.0	1	0.120	3300.	491.	366.	483.	627.	18.2	0.109	0.086	0.109	0.133	4103.	4051.	11.0	7.6	3.4	60.9	-119.0	0.2	15.0	0.000	0.89 0.55
TargF	15.0	1	0.120	3400.	492.	358.	489.	624.	18.9	0.109	0.085	0.109	0.133	4115.	4065.	11.0	7.5	3.5	62.5	-123.1	0.2	18.3	0.000	0.89 0.56
TargF	15.0	1	0.120	3500.	487.	359.	478.	631.	19.6	0.108	0.083	0.107	0.134	4139.	4111.	11.0	7.6	3.4	63.5	-130.7	0.2	21.4	0.000	0.89 0.55
TargF	15.0	1	0.140	2000.	558.	434.	557.	687.	13.7	0.143	0.112	0.144	0.174	3700.	3608.	11.0	6.7	4.3	61.3	-85.4	1.5	0.4	0.000	0.88 0.51
TargF	15.0	1	0.140	2100.	555.	428.	550.	686.	14.0	0.142	0.112	0.142	0.173	3693.	3613.	11.0	6.8	4.2	61.4	-88.2	1.3	0.5	0.000	0.88 0.51
TargF	15.0	1	0.140	2200.	554.	421.	551.	692.	14.3	0.140	0.108	0.141	0.171	3744.	3652.	11.0	6.9	4.1	61.6	-92.7	1.4	0.8	0.000	0.88 0.51
TargF	15.0	1	0.140	2300.	556.	426.	555.	681.	14.3	0.141	0.110	0.141	0.171	3737.	3648.	11.0	6.9	4.1	61.7	-93.0	1.1	1.1	0.000	0.88 0.51
TargF	15.0	1	0.140	2400.	548.	415.	539.	690.	15.1	0.137	0.109	0.136	0.167	3758.	3673.	11.0	7.2	3.8	61.5	-101.8	1.3	2.0	0.000	0.88 0.52
TargF	15.0	1	0.140	2500.	544.	412.	537.	690.	15.3	0.136	0.106	0.136	0.166	3773.	3700.	11.0	7.2	3.8	61.5	-106.3	1.0	2.4	0.000	0.88 0.52
TargF	15.0	1	0.140	2600.	536.	404.	528.	675.	15.7	0.133	0.102	0.133	0.166	3784.	3762.	11.0	7.3	3.7	61.0	-110.1	0.9	3.7	0.000	0.88 0.52
TargF	15.0	1	0.140	2700.	537.	412.	529.	676.	16.1	0.133	0.103	0.132	0.163	3812.	3751.	11.0	7.4	3.6	62.0	-113.4	0.8	4.8	0.000	0.88 0.52
TargF	15.0	1	0.140	2800.	533.	400.	523.	674.	16.6	0.130	0.099	0.130	0.161	3841.	3800.	11.0	7.5	3.5	62.6	-116.9	0.6	6.2	0.000	0.88 0.52

Method Perc Dur Targ Trig Cmean C10 C50 C90 IAV Fmean F10 F50 F90 Smean S20 Nchange
Nup Ndown Cup Cdown Risk Risk Depl 4+ 7+ lim trig

TargF	15.0	1	0.140	2900.	529.	399.	525.	669.	17.0	0.128	0.100	0.128	0.158	3867.	3840.	11.0	7.6	3.4	62.5	-126.1	0.7	8.3	0.000	0.88	0.53
TargF	15.0	1	0.140	3000.	530.	400.	523.	675.	17.9	0.127	0.098	0.127	0.156	3882.	3837.	11.0	7.6	3.4	64.2	-130.4	0.7	11.2	0.000	0.88	0.53
TargF	15.0	1	0.140	3100.	523.	390.	513.	667.	18.2	0.126	0.096	0.126	0.158	3875.	3856.	11.0	7.7	3.3	64.2	-136.6	0.8	15.2	0.000	0.88	0.53
TargF	15.0	1	0.140	3200.	528.	397.	523.	676.	18.9	0.127	0.098	0.126	0.156	3903.	3887.	11.0	7.7	3.3	66.8	-139.2	0.5	17.4	0.000	0.88	0.53
TargF	15.0	1	0.140	3300.	523.	394.	513.	667.	19.3	0.125	0.097	0.124	0.156	3904.	3869.	11.0	7.7	3.3	67.4	-141.3	0.5	21.2	0.000	0.88	0.53
TargF	15.0	1	0.140	3400.	518.	392.	511.	650.	20.3	0.124	0.097	0.124	0.151	3893.	3882.	11.0	7.7	3.3	69.3	-145.3	0.5	25.6	0.000	0.88	0.53
TargF	15.0	1	0.140	3500.	517.	392.	505.	655.	21.3	0.122	0.094	0.121	0.150	3957.	3960.	11.0	7.6	3.4	71.5	-152.3	0.2	29.8	0.000	0.88	0.53
TargF	15.0	1	0.160	2000.	579.	443.	577.	721.	14.3	0.160	0.121	0.161	0.198	3510.	3467.	11.0	6.9	4.1	64.4	-97.4	3.1	0.7	0.000	0.87	0.48
TargF	15.0	1	0.160	2100.	576.	442.	572.	714.	14.5	0.159	0.121	0.159	0.196	3511.	3480.	11.0	7.0	4.0	63.8	-102.3	2.8	0.9	0.000	0.87	0.48
TargF	15.0	1	0.160	2200.	574.	432.	572.	719.	15.1	0.156	0.120	0.156	0.193	3547.	3442.	11.0	7.2	3.8	64.1	-110.0	2.3	1.5	0.000	0.87	0.49
TargF	15.0	1	0.160	2300.	573.	441.	564.	718.	15.4	0.154	0.120	0.153	0.190	3585.	3528.	11.0	7.3	3.7	64.9	-113.4	2.1	2.1	0.000	0.87	0.49
TargF	15.0	1	0.160	2400.	568.	425.	560.	716.	15.8	0.152	0.114	0.151	0.189	3589.	3532.	11.0	7.4	3.6	64.7	-121.8	2.1	3.2	0.000	0.87	0.49
TargF	15.0	1	0.160	2500.	566.	427.	559.	720.	16.3	0.151	0.114	0.150	0.189	3601.	3556.	11.0	7.4	3.6	65.5	-123.4	1.7	4.2	0.000	0.87	0.49
TargF	15.0	1	0.160	2600.	567.	434.	560.	708.	16.6	0.149	0.113	0.149	0.186	3649.	3574.	11.0	7.6	3.4	65.8	-131.7	1.5	5.3	0.000	0.87	0.49
TargF	15.0	1	0.160	2700.	561.	424.	555.	712.	17.3	0.148	0.112	0.148	0.184	3619.	3567.	11.0	7.6	3.4	66.5	-138.1	1.6	8.9	0.000	0.87	0.50
TargF	15.0	1	0.160	2800.	552.	416.	547.	701.	17.9	0.145	0.108	0.145	0.182	3636.	3628.	11.0	7.6	3.4	67.2	-141.8	1.6	11.4	0.000	0.87	0.50
TargF	15.0	1	0.160	2900.	557.	423.	553.	697.	18.4	0.145	0.112	0.144	0.181	3656.	3608.	11.0	7.6	3.4	69.1	-144.6	1.4	14.1	0.000	0.87	0.50
TargF	15.0	1	0.160	3000.	555.	417.	547.	708.	18.9	0.144	0.112	0.143	0.178	3672.	3645.	11.0	7.6	3.4	70.2	-146.4	1.2	17.0	0.000	0.87	0.50
TargF	15.0	1	0.160	3100.	550.	418.	543.	685.	19.5	0.142	0.109	0.142	0.175	3678.	3665.	11.0	7.7	3.3	71.2	-152.3	1.0	21.1	0.000	0.87	0.50
TargF	15.0	1	0.160	3200.	546.	421.	538.	684.	20.6	0.140	0.108	0.140	0.173	3708.	3698.	11.0	7.7	3.3	73.2	-155.8	1.0	24.5	0.000	0.88	0.50
TargF	15.0	1	0.160	3300.	546.	425.	536.	678.	21.1	0.140	0.108	0.139	0.171	3717.	3731.	11.0	7.6	3.4	75.0	-161.1	1.2	30.3	0.000	0.88	0.50
TargF	15.0	1	0.160	3400.	544.	419.	535.	681.	22.7	0.139	0.109	0.137	0.171	3725.	3716.	11.0	7.7	3.3	78.5	-168.6	0.9	35.0	0.000	0.88	0.51
TargF	15.0	1	0.160	3500.	541.	413.	529.	686.	23.2	0.137	0.105	0.136	0.170	3757.	3764.	11.0	7.7	3.3	79.8	-170.3	1.1	38.5	0.000	0.88	0.51
TargF	15.0	1	0.180	2000.	600.	454.	598.	748.	14.9	0.177	0.133	0.176	0.221	3352.	3334.	11.0	7.1	3.9	67.2	-111.0	5.1	1.5	0.000	0.86	0.46
TargF	15.0	1	0.180	2100.	599.	463.	593.	748.	15.0	0.176	0.136	0.176	0.218	3342.	3296.	11.0	7.2	3.8	67.1	-113.8	4.3	2.0	0.000	0.86	0.46
TargF	15.0	1	0.180	2200.	592.	454.	584.	732.	15.7	0.172	0.133	0.173	0.213	3376.	3353.	11.0	7.3	3.7	67.4	-122.7	4.3	2.8	0.000	0.86	0.46
TargF	15.0	1	0.180	2300.	587.	444.	579.	747.	16.2	0.168	0.126	0.168	0.213	3415.	3360.	11.0	7.4	3.6	67.5	-129.5	4.2	4.2	0.000	0.86	0.47
TargF	15.0	1	0.180	2400.	593.	458.	587.	742.	16.4	0.169	0.125	0.168	0.214	3445.	3376.	11.0	7.5	3.5	68.9	-135.4	3.4	5.1	0.000	0.86	0.47
TargF	15.0	1	0.180	2500.	583.	451.	575.	725.	17.0	0.166	0.125	0.164	0.209	3439.	3396.	11.0	7.6	3.4	68.6	-142.5	3.4	7.2	0.000	0.86	0.47
TargF	15.0	1	0.180	2600.	579.	439.	571.	730.	17.7	0.163	0.121	0.163	0.205	3467.	3430.	11.0	7.7	3.3	69.3	-147.6	3.4	9.9	0.000	0.86	0.47
TargF	15.0	1	0.180	2700.	577.	437.	567.	725.	18.0	0.161	0.122	0.162	0.200	3473.	3454.	11.0	7.7	3.3	70.6	-150.3	2.6	11.4	0.000	0.86	0.47
TargF	15.0	1	0.180	2800.	576.	441.	568.	717.	18.9	0.160	0.122	0.160	0.202	3489.	3460.	11.0	7.7	3.3	72.6	-155.5	2.6	15.4	0.000	0.87	0.48
TargF	15.0	1	0.180	2900.	575.	438.	570.	717.	19.5	0.159	0.123	0.158	0.196	3505.	3483.	11.0	7.7	3.3	73.7	-163.6	2.5	18.6	0.000	0.87	0.48
TargF	15.0	1	0.180	3000.	567.	429.	560.	711.	20.9	0.155	0.116	0.156	0.193	3529.	3516.	11.0	7.7	3.3	75.9	-171.2	2.0	23.9	0.000	0.87	0.48
TargF	15.0	1	0.180	3100.	566.	441.	557.	706.	21.2	0.154	0.119	0.154	0.192	3539.	3495.	11.0	7.8	3.2	77.3	-175.0	2.6	28.5	0.000	0.87	0.49
TargF	15.0	1	0.180	3200.	564.	432.	552.	712.	22.9	0.153	0.114	0.152	0.190	3559.	3555.	11.0	7.7	3.3	81.4	-179.8	2.0	32.9	0.000	0.87	0.48
TargF	15.0	1	0.180	3300.	568.	438.	559.	706.	23.3	0.155	0.117	0.154	0.191	3549.	3553.	11.0	7.7	3.3	83.1	-185.4	2.1	39.0	0.000	0.87	0.48
TargF	15.0	1	0.180	3400.	566.	440.	553.	705.	24.6	0.153	0.118	0.151	0.190	3574.	3506.	11.0	7.6	3.4	87.8	-184.9	2.1	44.3	0.000	0.87	0.49
TargF	15.0	1	0.180	3500.	565.	442.	554.	703.	25.6	0.153	0.120	0.151	0.188	3554.	3545.	11.0	7.5	3.5	91.0	-185.7	2.0	50.7	0.000	0.87	0.48
TargF	15.0	1	0.200	2000.	605.	460.	601.	757.	15.6	0.190	0.140	0.190	0.238	3210.	3180.	11.0	7.3	3.7	68.3	-126.3	7.6	2.4	0.000	0.85	0.44
TargF	15.0	1	0.200	2100.	611.	466.	599.	767.	15.9	0.189	0.142	0.190	0.239	3247.	3193.	11.0	7.4	3.6	69.9	-134.8	7.1	3.0	0.000	0.85	0.44
TargF	15.0	1	0.200	2200.	608.	464.	601.	758.	16.2	0.186	0.139	0.187	0.231	3262.	3213.	11.0	7.5	3.5	69.7	-137.5	5.7	3.8	0.000	0.85	0.44
TargF	15.0	1	0.200	2300.	607.	469.	601.	759.	16.6	0.185	0.138	0.185	0.231	3289.	3252.	11.0	7.6	3.4	70.8	-141.6	6.1	6.1	0.000	0.85	0.44
TargF	15.0	1	0.200	2400.	607.	468.	604.	762.	17.0	0.183	0.135	0.183	0.229	3302.	3216.	11.0	7.6	3.4	71.5	-150.4	5.5	7.7	0.000	0.85	0.45
TargF	15.0	1	0.200	2500.	598.	454.	591.	749.	17.9	0.178	0.135	0.178	0.223	3325.	3287.	11.0	7.7	3.3	72.1	-158.8	5.0	10.5	0.000	0.86	0.45
TargF	15.0	1	0.200	2600.	596.	452.	592.	750.	18.7	0.180	0.135	0.178	0.228	3298.	3276.	11.0	7.7	3.3	74.5	-163.8	5.9	15.4	0.000	0.85	0.45
TargF	15.0	1	0.200	2700.	594.	450.	589.	742.	19.2	0.175	0.132	0.175	0.222	3348.	3335.	11.0	7.8	3.2	75.3	-171.1	4.5	17.1	0.000	0.86	0.45
TargF	15.0	1	0.200	2800.	591.	460.	579.	737.	20.2	0.175	0.133	0.174	0.219	3331.	3333.	11.0	7.8	3.2	77.3	-180.6	4.6	22.0	0.000	0.86	0.46
TargF	15.0	1	0.200	2900.	589.	450.	580.	736.	20.9	0.172	0.129	0.171	0.218	3374.	3385.	11.0	7.8	3.2	79.1	-185.0	4.1	26.0	0.000	0.86	0.46
TargF	15.0	1	0.200	3000.	590.	453.	586.	730.	22.1	0.172	0.133	0.170	0.213	3373.	3347.	11.0	7.8	3.2	82.5	-187.7	3.3	31.4	0.000	0.86	0.46
TargF	15.0	1	0.200	3100.	589.	461.	575.	735.	22.9	0.170	0.131	0.169	0.209	3400.	3404.	11.0	7.7	3.3	85.1	-189.6	3.8	35.9	0.000	0.86	0.46
TargF	15.0	1	0.200	3200.	588.	452.	579.	739.	24.0	0.170	0.128	0.169	0.209	3395.	3371.	11.0	7.7	3.3	88.0	-195.7	3.3	42.9	0.000	0.86	0.46
TargF	15.0	1	0.200	3300.	590.	452.	586.	729.	25.2	0.169	0.130	0.168	0.210	3422.	3432.	11.0	7.6	3.4	92.7	-200.5	3.1	46.1	0.000	0.86	0.46
TargF	15.0	1	0.200	3400.	582.	452.	573.	725.	26.5	0.167	0.128	0.166	0.207	3414.	3426.	11.0	7.5	3.5	95.9	-200.7	3.2	53.7	0.000	0.86	0.46
TargF	15.0	1	0.200	3500.	584.	464.	574.	724.	27.9	0.167	0.131	0.165	0.207	3417.	3407.	11.0	7.5	3.5	100.4	-204.4	3.3	59.1	0.000	0.86	0.46
TargF	15.0	1	0.220	2000.	624.	473.	624.	774.	16.1	0.207	0.154	0.207	0.263	3078.	3030.	11.0	7.4	3.6	71.1	-138.9	11.5	3.7	0.000	0.84	0.42
TargF	15.0	1	0.220	2100.	624.	480.	615.	774.	16.8	0.204	0.148	0.203	0.258	3128.	3085.	11.0	7.5	3.5	72.6	-150.6	10.5	4.9	0.000	0.84	0.42
TargF	15.0	1	0.220	2200.	617.	473.	613.	774.	17.1	0.202	0.146	0.203	0.260	3115.	3111.	11.0	7.6	3.4	72.2	-155.7	10.6	7.3	0.000	0.84	0.42

Method Perc Dur Targ Trig Cmean C10 C50 C90 IAV Fmean F10 F50 F90 Smean S20 Nchange
Nup Ndown Cup Cdown Risk Risk Depl 4+ 7+ lim trig

TargF	15.0	1	0.220	2300.	618.	477.	614.	762.	17.7	0.199	0.145	0.200	0.252	3151.	3112.	11.0	7.7	3.3	74.1	-164.3	9.7	9.7	0.000	0.85	0.43
TargF	15.0	1	0.220	2400.	610.	472.	605.	756.	18.5	0.195	0.145	0.195	0.245	3163.	3136.	11.0	7.7	3.3	75.2	-169.6	8.7	11.8	0.000	0.85	0.43
TargF	15.0	1	0.220	2500.	607.	470.	600.	749.	19.0	0.194	0.144	0.194	0.245	3165.	3159.	11.0	7.8	3.2	76.0	-172.3	8.7	16.3	0.000	0.85	0.43
TargF	15.0	1	0.220	2600.	614.	471.	610.	763.	19.9	0.192	0.142	0.191	0.243	3225.	3194.	11.0	7.9	3.1	78.8	-185.8	7.9	18.8	0.000	0.85	0.44
TargF	15.0	1	0.220	2700.	605.	469.	601.	754.	20.6	0.189	0.139	0.189	0.239	3231.	3199.	11.0	7.9	3.1	80.1	-190.6	7.6	23.8	0.000	0.85	0.44
TargF	15.0	1	0.220	2800.	604.	462.	597.	753.	21.7	0.188	0.139	0.185	0.238	3223.	3227.	11.0	7.8	3.2	82.9	-192.7	6.9	27.7	0.000	0.85	0.44
TargF	15.0	1	0.220	2900.	600.	466.	594.	748.	23.1	0.186	0.141	0.185	0.235	3232.	3201.	11.0	7.8	3.2	86.1	-200.8	7.1	34.5	0.000	0.85	0.44
TargF	15.0	1	0.220	3000.	610.	472.	603.	761.	23.4	0.188	0.142	0.186	0.234	3255.	3255.	11.0	7.7	3.3	89.6	-199.8	6.5	38.5	0.000	0.85	0.44
TargF	15.0	1	0.220	3100.	596.	464.	593.	740.	24.8	0.182	0.133	0.181	0.226	3282.	3289.	11.0	7.7	3.3	92.8	-206.5	6.5	43.9	0.000	0.85	0.45
TargF	15.0	1	0.220	3200.	601.	461.	595.	746.	25.5	0.183	0.136	0.183	0.232	3284.	3263.	11.0	7.6	3.4	95.5	-207.3	5.9	50.0	0.000	0.85	0.44
TargF	15.0	1	0.220	3300.	600.	473.	592.	741.	27.8	0.183	0.141	0.182	0.228	3268.	3272.	11.0	7.5	3.5	102.4	-214.6	5.3	56.7	0.000	0.85	0.45
TargF	15.0	1	0.220	3400.	599.	468.	591.	736.	28.8	0.181	0.137	0.179	0.224	3300.	3302.	11.0	7.4	3.5	106.7	-215.4	5.1	60.2	0.000	0.85	0.45
TargF	15.0	1	0.220	3500.	598.	470.	588.	736.	30.8	0.181	0.142	0.178	0.225	3274.	3267.	11.0	7.4	3.6	113.0	-226.0	5.1	67.1	0.000	0.85	0.45
TargF	15.0	1	0.240	2000.	632.	484.	631.	789.	16.8	0.221	0.159	0.222	0.282	2964.	2973.	11.0	7.6	3.4	73.2	-157.0	15.4	5.7	0.000	0.83	0.40
TargF	15.0	1	0.240	2100.	632.	477.	632.	783.	17.1	0.220	0.157	0.222	0.281	2981.	2957.	11.0	7.5	3.5	74.0	-156.8	15.4	8.1	0.000	0.84	0.40
TargF	15.0	1	0.240	2200.	630.	478.	621.	783.	17.8	0.216	0.151	0.215	0.276	3030.	3022.	11.0	7.8	3.2	75.7	-169.5	13.8	10.5	0.000	0.84	0.41
TargF	15.0	1	0.240	2300.	631.	493.	626.	788.	18.4	0.214	0.155	0.211	0.273	3046.	3016.	11.0	7.9	3.1	76.8	-178.6	11.8	11.8	0.000	0.84	0.41
TargF	15.0	1	0.240	2400.	626.	480.	624.	777.	19.0	0.209	0.153	0.209	0.266	3084.	3072.	11.0	7.8	3.2	78.6	-182.7	11.2	15.3	0.000	0.84	0.41
TargF	15.0	1	0.240	2500.	617.	479.	609.	768.	20.2	0.205	0.152	0.205	0.262	3079.	3065.	11.0	7.8	3.2	80.3	-190.7	11.6	20.7	0.001	0.84	0.42
TargF	15.0	1	0.240	2600.	618.	477.	612.	770.	20.4	0.204	0.148	0.203	0.261	3120.	3090.	11.0	7.9	3.1	81.1	-195.3	10.7	24.1	0.000	0.84	0.42
TargF	15.0	1	0.240	2700.	611.	471.	609.	756.	22.1	0.201	0.147	0.200	0.257	3110.	3106.	11.0	7.8	3.2	84.7	-205.5	10.8	29.6	0.000	0.84	0.42
TargF	15.0	1	0.240	2800.	616.	482.	611.	756.	23.2	0.203	0.151	0.200	0.259	3086.	3118.	11.0	7.8	3.2	89.6	-209.0	10.8	36.2	0.000	0.84	0.42
TargF	15.0	1	0.240	2900.	618.	480.	614.	764.	24.5	0.200	0.149	0.201	0.253	3135.	3120.	11.0	7.8	3.2	93.6	-213.2	9.2	40.4	0.000	0.84	0.42
TargF	15.0	1	0.240	3000.	612.	483.	603.	759.	25.4	0.200	0.150	0.201	0.248	3107.	3114.	11.0	7.6	3.4	96.6	-208.5	10.3	48.1	0.000	0.84	0.42
TargF	15.0	1	0.240	3100.	616.	479.	604.	764.	27.1	0.199	0.149	0.199	0.247	3128.	3112.	11.0	7.6	3.4	102.3	-218.6	9.5	53.0	0.000	0.84	0.42
TargF	15.0	1	0.240	3200.	616.	487.	607.	764.	28.6	0.199	0.149	0.198	0.251	3126.	3097.	11.0	7.5	3.5	107.7	-226.2	9.0	58.5	0.000	0.85	0.42
TargF	15.0	1	0.240	3300.	615.	487.	606.	751.	29.1	0.196	0.150	0.195	0.244	3172.	3181.	11.0	7.5	3.5	110.4	-228.3	7.3	62.8	0.000	0.85	0.43
TargF	15.0	1	0.240	3400.	614.	489.	605.	750.	30.9	0.197	0.150	0.197	0.247	3146.	3147.	11.0	7.4	3.6	116.8	-235.9	8.2	69.0	0.000	0.85	0.43
TargF	15.0	1	0.240	3500.	614.	487.	605.	745.	32.4	0.195	0.148	0.193	0.244	3171.	3179.	11.0	7.3	3.7	121.7	-232.0	7.7	73.2	0.000	0.85	0.43
TargF	15.0	1	0.260	2000.	640.	473.	634.	809.	17.5	0.235	0.165	0.235	0.306	2883.	2880.	11.0	7.7	3.3	76.0	-169.6	20.4	8.1	0.000	0.83	0.38
TargF	15.0	1	0.260	2100.	640.	488.	634.	794.	17.8	0.229	0.166	0.229	0.292	2925.	2930.	11.0	7.8	3.2	77.1	-174.2	17.2	9.1	0.000	0.83	0.39
TargF	15.0	1	0.260	2200.	632.	482.	626.	783.	19.2	0.225	0.163	0.225	0.285	2935.	2934.	11.0	7.9	3.1	78.8	-187.8	17.9	13.5	0.000	0.83	0.39
TargF	15.0	1	0.260	2300.	639.	489.	638.	790.	19.1	0.226	0.165	0.225	0.290	2962.	2915.	11.0	7.8	3.2	80.3	-192.3	17.4	17.4	0.000	0.83	0.40
TargF	15.0	1	0.260	2400.	635.	485.	628.	784.	20.3	0.224	0.160	0.222	0.291	2958.	2939.	11.0	7.8	3.2	82.6	-197.3	16.9	22.0	0.000	0.83	0.39
TargF	15.0	1	0.260	2500.	627.	483.	624.	770.	21.7	0.220	0.162	0.220	0.280	2956.	2982.	11.0	7.8	3.2	84.9	-203.6	16.3	26.0	0.000	0.83	0.40
TargF	15.0	1	0.260	2600.	625.	485.	620.	775.	22.3	0.217	0.162	0.217	0.275	2978.	2986.	11.0	7.9	3.1	87.3	-212.7	15.8	31.9	0.000	0.84	0.40
TargF	15.0	1	0.260	2700.	634.	495.	625.	786.	23.3	0.218	0.160	0.217	0.276	3000.	2970.	11.0	7.8	3.2	91.9	-213.5	13.8	35.8	0.000	0.84	0.40
TargF	15.0	1	0.260	2800.	624.	491.	617.	765.	25.2	0.214	0.161	0.210	0.272	2999.	2989.	11.0	7.8	3.2	96.1	-226.7	13.2	41.4	0.000	0.84	0.41
TargF	15.0	1	0.260	2900.	629.	490.	625.	773.	25.7	0.214	0.161	0.213	0.269	3030.	3022.	11.0	7.7	3.3	98.9	-224.8	12.9	46.3	0.000	0.84	0.41
TargF	15.0	1	0.260	3000.	624.	491.	623.	763.	27.9	0.212	0.160	0.211	0.269	3033.	3035.	11.0	7.6	3.4	106.0	-229.7	13.6	53.6	0.000	0.84	0.41
TargF	15.0	1	0.260	3100.	628.	493.	618.	780.	29.6	0.215	0.160	0.213	0.271	3002.	2999.	11.0	7.5	3.5	111.8	-237.6	13.3	60.6	0.000	0.84	0.41
TargF	15.0	1	0.260	3200.	624.	492.	616.	762.	31.2	0.211	0.160	0.210	0.262	3026.	3033.	11.0	7.4	3.6	118.1	-236.0	12.7	65.3	0.000	0.84	0.41
TargF	15.0	1	0.260	3300.	627.	492.	623.	766.	31.7	0.211	0.160	0.210	0.263	3038.	3039.	11.0	7.3	3.7	121.6	-238.4	11.2	69.3	0.000	0.84	0.41
TargF	15.0	1	0.260	3400.	629.	499.	623.	760.	33.8	0.212	0.165	0.210	0.266	3022.	3036.	11.0	7.1	3.9	130.6	-239.6	10.7	75.9	0.000	0.84	0.41
TargF	15.0	1	0.260	3500.	632.	507.	625.	770.	34.9	0.212	0.164	0.210	0.262	3041.	3045.	11.0	7.2	3.8	135.4	-246.1	10.7	78.9	0.000	0.84	0.41
TargF	15.0	1	0.280	2000.	648.	485.	646.	806.	18.1	0.247	0.169	0.249	0.323	2813.	2804.	11.0	7.8	3.2	78.1	-181.9	24.0	10.3	0.000	0.82	0.37
TargF	15.0	1	0.280	2100.	650.	498.	647.	804.	19.0	0.245	0.174	0.244	0.320	2817.	2806.	11.0	7.9	3.1	80.7	-195.9	23.1	13.4	0.000	0.82	0.37
TargF	15.0	1	0.280	2200.	636.	481.	639.	795.	20.0	0.238	0.170	0.236	0.308	2842.	2860.	11.0	7.9	3.1	80.7	-203.3	22.1	17.5	0.000	0.82	0.38
TargF	15.0	1	0.280	2300.	641.	486.	636.	802.	20.6	0.239	0.170	0.239	0.306	2852.	2869.	11.0	7.9	3.1	83.9	-213.1	22.6	22.6	0.000	0.82	0.38
TargF	15.0	1	0.280	2400.	636.	493.	629.	792.	21.7	0.233	0.168	0.233	0.300	2877.	2878.	11.0	8.0	3.0	86.5	-215.8	20.1	25.3	0.000	0.83	0.38
TargF	15.0	1	0.280	2500.	643.	490.	640.	797.	22.8	0.235	0.171	0.231	0.307	2884.	2840.	11.0	7.9	3.1	90.5	-215.6	19.7	30.8	0.000	0.83	0.38
TargF	15.0	1	0.280	2600.	639.	489.	635.	784.	24.0	0.233	0.166	0.232	0.296	2890.	2868.	11.0	7.9	3.1	93.6	-227.7	19.5	36.8	0.000	0.83	0.39
TargF	15.0	1	0.280	2700.	638.	498.	632.	786.	25.2	0.231	0.169	0.229	0.296	2903.	2912.	11.0	7.8	3.2	98.0	-231.7	18.3	41.9	0.000	0.83	0.39
TargF	15.0	1	0.280	2800.	634.	497.	625.	783.	26.5	0.227	0.171	0.224	0.286	2907.	2922.	11.0	7.8	3.2	101.8	-235.8	17.6	47.0	0.000	0.83	0.39
TargF	15.0	1	0.280	2900.	641.	507.	631.	793.	27.3	0.228	0.169	0.226	0.291	2938.	2954.	11.0	7.7	3.3	106.5	-240.9	15.2	52.7	0.000	0.83	0.38
TargF	15.0	1	0.280	3000.	631.	501.	628.	766.	29.5	0.227	0.173	0.226	0.282	2896.	2956.	11.0	7.5	3.5	112.2	-240.2	17.9	61.7	0.000	0.83	0.39
TargF	15.0	1	0.280	3100.	638.	503.	629.	782.	31.5	0.226	0.171	0.225	0.285	2933.	2945.	11.0	7.4	3.6	121.5	-247.4	16.4	63.9	0.000	0.83	0.39
TargF	15.0	1	0.280	3200.	643.	509.	637.	793.	32.3	0.228	0.171	0.228	0.287	2924.	2925.	11.0	7.3	3.7	126.1	-248.7	15.8	70.7	0.000	0.83	0.39

Method Perc Dur Targ Trig Cmean C10 C50 C90 IAV Fmean F10 F50 F90 Smean S20 Nchange
Nup Ndown Cup Cdown Risk Risk Depl 4+ 7+ lim trig

TargF	15.0	1	0.280	3300.	639.	507.	633.	781.	34.3	0.227	0.176	0.222	0.286	2926.	2898.	11.0	7.2	3.8	133.7	-252.4	16.4	74.8	0.000	0.83	0.39
TargF	15.0	1	0.280	3400.	637.	509.	628.	775.	37.2	0.225	0.171	0.224	0.282	2931.	2936.	11.0	7.2	3.8	141.6	-262.0	15.4	79.3	0.000	0.83	0.39
TargF	15.0	1	0.280	3500.	638.	512.	631.	780.	38.1	0.225	0.175	0.223	0.280	2929.	2930.	11.0	7.1	3.9	150.0	-263.3	15.1	82.9	0.000	0.83	0.39
TargF	15.0	1	0.300	2000.	652.	489.	651.	815.	19.3	0.260	0.178	0.259	0.341	2724.	2709.	11.0	7.9	3.1	81.2	-197.8	29.4	14.0	0.000	0.81	0.36
TargF	15.0	1	0.300	2100.	651.	493.	653.	801.	19.9	0.257	0.180	0.258	0.335	2736.	2748.	11.0	8.0	3.0	82.8	-209.4	27.8	17.4	0.000	0.81	0.36
TargF	15.0	1	0.300	2200.	650.	490.	646.	813.	20.9	0.255	0.180	0.253	0.332	2745.	2719.	11.0	8.0	3.0	85.1	-209.5	27.3	21.8	0.000	0.82	0.36
TargF	15.0	1	0.300	2300.	649.	493.	638.	811.	21.8	0.251	0.183	0.248	0.327	2781.	2788.	11.0	8.0	3.0	87.9	-225.7	26.5	26.5	0.000	0.82	0.37
TargF	15.0	1	0.300	2400.	647.	491.	643.	804.	23.4	0.250	0.175	0.246	0.324	2774.	2792.	11.0	7.9	3.1	92.1	-229.1	26.0	31.5	0.000	0.82	0.37
TargF	15.0	1	0.300	2500.	640.	495.	638.	794.	24.3	0.244	0.173	0.245	0.315	2807.	2790.	11.0	7.9	3.1	94.1	-231.0	24.7	36.1	0.000	0.82	0.37
TargF	15.0	1	0.300	2600.	651.	507.	650.	799.	25.2	0.247	0.181	0.245	0.318	2814.	2820.	11.0	7.9	3.1	98.6	-242.4	23.3	41.6	0.000	0.82	0.37
TargF	15.0	1	0.300	2700.	647.	502.	643.	801.	26.1	0.243	0.174	0.242	0.308	2829.	2840.	11.0	7.9	3.1	102.1	-246.0	22.4	47.3	0.000	0.82	0.37
TargF	15.0	1	0.300	2800.	646.	504.	645.	785.	28.2	0.244	0.181	0.242	0.308	2810.	2808.	11.0	7.7	3.3	109.1	-247.7	22.8	53.7	0.000	0.82	0.37
TargF	15.0	1	0.300	2900.	642.	496.	639.	791.	30.1	0.243	0.175	0.243	0.312	2818.	2842.	11.0	7.6	3.4	116.3	-248.2	23.0	58.8	0.000	0.82	0.37
TargF	15.0	1	0.300	3000.	646.	505.	639.	796.	31.5	0.242	0.180	0.240	0.310	2822.	2844.	11.0	7.5	3.5	122.4	-253.6	22.1	64.6	0.000	0.82	0.37
TargF	15.0	1	0.300	3100.	645.	513.	640.	790.	34.6	0.243	0.185	0.242	0.306	2789.	2814.	11.0	7.3	3.7	132.0	-259.8	22.4	72.7	0.000	0.82	0.37
TargF	15.0	1	0.300	3200.	645.	507.	639.	785.	35.5	0.242	0.185	0.238	0.307	2813.	2828.	11.0	7.3	3.7	137.0	-263.2	21.8	75.3	0.000	0.82	0.37
TargF	15.0	1	0.300	3300.	650.	515.	647.	792.	36.7	0.241	0.185	0.238	0.299	2824.	2827.	11.0	7.2	3.8	145.0	-268.0	20.0	79.9	0.000	0.82	0.38
TargF	15.0	1	0.300	3400.	647.	515.	643.	782.	38.7	0.239	0.181	0.239	0.298	2828.	2824.	11.0	7.0	4.0	154.4	-267.5	19.4	83.4	0.000	0.82	0.38
TargF	15.0	1	0.300	3500.	648.	510.	642.	785.	40.4	0.237	0.180	0.236	0.297	2857.	2880.	11.0	7.0	4.0	160.2	-272.7	19.1	85.3	0.000	0.82	0.38
TargF	20.0	1	0.120	2000.	529.	413.	527.	647.	16.2	0.128	0.105	0.128	0.152	3841.	3830.	11.0	6.4	4.6	71.5	-89.2	0.7	0.1	0.000	0.88	0.53
TargF	20.0	1	0.120	2100.	528.	420.	523.	641.	16.2	0.127	0.107	0.126	0.149	3859.	3829.	11.0	6.4	4.6	71.5	-89.5	0.8	0.2	0.000	0.88	0.53
TargF	20.0	1	0.120	2200.	530.	416.	523.	653.	16.6	0.126	0.104	0.125	0.148	3899.	3872.	11.0	6.4	4.6	72.7	-93.5	0.5	0.3	0.000	0.88	0.53
TargF	20.0	1	0.120	2300.	530.	404.	528.	654.	16.7	0.126	0.103	0.126	0.148	3907.	3871.	11.0	6.5	4.5	71.9	-96.0	0.8	0.8	0.000	0.88	0.53
TargF	20.0	1	0.120	2400.	524.	405.	520.	652.	17.2	0.125	0.101	0.126	0.147	3887.	3866.	11.0	6.6	4.4	71.9	-100.3	0.3	0.7	0.000	0.88	0.53
TargF	20.0	1	0.120	2500.	516.	394.	514.	638.	17.4	0.123	0.099	0.123	0.145	3891.	3869.	11.0	6.7	4.3	70.5	-102.3	0.5	1.3	0.000	0.89	0.53
TargF	20.0	1	0.120	2600.	516.	396.	513.	641.	18.0	0.122	0.098	0.121	0.145	3924.	3919.	11.0	6.8	4.2	72.1	-107.8	0.5	2.1	0.000	0.89	0.53
TargF	20.0	1	0.120	2700.	515.	393.	513.	645.	18.2	0.121	0.098	0.121	0.144	3938.	3901.	11.0	6.8	4.2	71.8	-108.6	0.3	2.8	0.000	0.89	0.53
TargF	20.0	1	0.120	2800.	512.	390.	503.	644.	18.7	0.119	0.095	0.119	0.142	3967.	3949.	11.0	6.9	4.1	71.9	-113.9	0.2	3.4	0.000	0.89	0.54
TargF	20.0	1	0.120	2900.	509.	377.	506.	639.	19.3	0.118	0.095	0.118	0.142	3958.	3931.	11.0	7.0	4.0	72.1	-117.1	0.3	6.0	0.000	0.89	0.54
TargF	20.0	1	0.120	3000.	507.	380.	504.	637.	19.7	0.117	0.093	0.117	0.141	3973.	3968.	11.0	7.0	4.0	72.6	-122.6	0.4	7.4	0.000	0.89	0.54
TargF	20.0	1	0.120	3100.	506.	383.	497.	639.	20.2	0.115	0.093	0.115	0.139	4020.	4006.	11.0	7.0	4.0	73.9	-123.4	0.3	9.6	0.000	0.89	0.54
TargF	20.0	1	0.120	3200.	504.	376.	498.	637.	20.9	0.115	0.092	0.115	0.139	4008.	4016.	11.0	7.1	3.9	74.5	-129.3	0.3	13.8	0.000	0.89	0.54
TargF	20.0	1	0.120	3300.	497.	371.	491.	635.	21.2	0.113	0.089	0.113	0.135	4018.	4028.	11.0	7.2	3.8	74.4	-129.9	0.3	16.3	0.000	0.89	0.55
TargF	20.0	1	0.120	3400.	501.	374.	494.	638.	21.9	0.114	0.091	0.113	0.136	4040.	4030.	11.0	7.1	3.9	76.7	-133.5	0.4	19.4	0.000	0.89	0.54
TargF	20.0	1	0.120	3500.	497.	376.	490.	633.	23.0	0.112	0.089	0.111	0.137	4053.	4068.	11.0	7.1	3.9	78.5	-138.8	0.1	23.3	0.000	0.89	0.55
TargF	20.0	1	0.140	2000.	567.	439.	564.	693.	16.7	0.148	0.123	0.147	0.175	3628.	3581.	11.0	6.5	4.5	76.7	-102.6	1.5	0.3	0.000	0.87	0.50
TargF	20.0	1	0.140	2100.	559.	427.	554.	689.	17.0	0.146	0.119	0.146	0.173	3623.	3627.	11.0	6.5	4.5	76.9	-104.1	1.6	0.5	0.000	0.87	0.50
TargF	20.0	1	0.140	2200.	555.	432.	550.	685.	17.2	0.144	0.116	0.144	0.172	3643.	3641.	11.0	6.6	4.4	75.8	-106.4	1.0	0.6	0.000	0.87	0.50
TargF	20.0	1	0.140	2300.	557.	434.	551.	689.	17.6	0.144	0.117	0.144	0.172	3647.	3618.	11.0	6.6	4.4	76.9	-110.4	0.8	0.8	0.000	0.87	0.50
TargF	20.0	1	0.140	2400.	553.	427.	548.	681.	17.9	0.142	0.113	0.142	0.168	3686.	3661.	11.0	6.8	4.2	77.0	-115.0	1.0	1.7	0.000	0.87	0.50
TargF	20.0	1	0.140	2500.	546.	430.	541.	682.	18.3	0.140	0.112	0.140	0.167	3667.	3661.	11.0	6.8	4.2	76.2	-117.6	1.1	2.6	0.000	0.88	0.51
TargF	20.0	1	0.140	2600.	553.	428.	547.	688.	18.6	0.141	0.112	0.140	0.169	3701.	3657.	11.0	6.9	4.1	77.4	-123.5	0.9	3.7	0.000	0.88	0.51
TargF	20.0	1	0.140	2700.	548.	421.	540.	686.	19.1	0.139	0.110	0.138	0.167	3724.	3720.	11.0	7.0	4.0	77.9	-126.1	0.8	5.5	0.000	0.88	0.51
TargF	20.0	1	0.140	2800.	544.	415.	535.	684.	19.7	0.137	0.107	0.136	0.167	3748.	3755.	11.0	7.0	4.0	77.9	-132.3	0.7	7.9	0.000	0.88	0.51
TargF	20.0	1	0.140	2900.	544.	420.	539.	679.	20.2	0.136	0.109	0.135	0.164	3769.	3773.	11.0	7.1	3.9	79.4	-137.8	0.5	9.4	0.000	0.88	0.51
TargF	20.0	1	0.140	3000.	538.	404.	528.	678.	21.0	0.133	0.106	0.133	0.160	3778.	3786.	11.0	7.2	3.8	80.1	-140.7	0.7	12.5	0.000	0.88	0.51
TargF	20.0	1	0.140	3100.	532.	411.	527.	669.	21.4	0.132	0.105	0.131	0.160	3772.	3790.	11.0	7.2	3.8	80.1	-145.7	0.6	15.6	0.000	0.88	0.52
TargF	20.0	1	0.140	3200.	533.	407.	528.	667.	22.4	0.131	0.105	0.131	0.159	3799.	3805.	11.0	7.2	3.8	83.3	-150.0	0.7	19.8	0.000	0.88	0.51
TargF	20.0	1	0.140	3300.	536.	407.	522.	683.	22.6	0.131	0.103	0.130	0.159	3840.	3847.	11.0	7.2	3.8	84.4	-152.1	0.6	23.7	0.000	0.88	0.52
TargF	20.0	1	0.140	3400.	527.	399.	516.	677.	23.7	0.128	0.100	0.127	0.156	3829.	3824.	11.0	7.3	3.7	85.7	-156.8	0.5	28.8	0.000	0.88	0.52
TargF	20.0	1	0.140	3500.	528.	399.	522.	663.	24.2	0.128	0.102	0.127	0.156	3845.	3835.	11.0	7.2	3.8	87.0	-158.3	0.5	33.6	0.000	0.88	0.52
TargF	20.0	1	0.160	2000.	587.	454.	589.	721.	17.2	0.167	0.134	0.167	0.202	3408.	3412.	11.0	6.5	4.5	80.8	-112.2	2.9	0.5	0.000	0.86	0.47
TargF	20.0	1	0.160	2100.	586.	457.	579.	714.	17.5	0.165	0.131	0.165	0.197	3434.	3384.	11.0	6.6	4.4	81.2	-116.7	2.5	0.9	0.000	0.86	0.47
TargF	20.0	1	0.160	2200.	583.	456.	579.	720.	17.9	0.164	0.131	0.162	0.197	3439.	3433.	11.0	6.7	4.3	81.3	-120.5	2.7	1.7	0.000	0.86	0.47
TargF	20.0	1	0.160	2300.	585.	447.	575.	726.	18.4	0.162	0.128	0.162	0.196	3479.	3452.	11.0	6.8	4.2	81.9	-127.8	2.2	2.2	0.000	0.87	0.48
TargF	20.0	1	0.160	2400.	580.	453.	574.	716.	18.9	0.160	0.127	0.159	0.195	3480.	3445.	11.0	6.9	4.1	81.9	-134.4	2.1	3.5	0.000	0.87	0.48
TargF	20.0	1	0.160	2500.	576.	446.	567.	720.	19.1	0.158	0.122	0.159	0.193	3515.	3474.	11.0	7.0	4.0	81.2	-136.9	2.2	5.1	0.000	0.87	0.48
TargF	20.0	1	0.160	2600.	572.	444.	568.	704.	19.7	0.156	0.124	0.155	0.190	3522.	3504.	11.0	7.1	3.9	82.4	-138.1	1.8	6.8	0.000	0.87	0.48

Method	Perc	Dur	Targ	Trig	Cmean	C10	C50	C90	IAV	Fmean	F10	F50	F90	Smean	S20	Nchange	Nup	Ndown	Cup	Cdown	Risk lim	Risk trig	Depl	4+	7+
TargF	20.0	1	0.160	2700.	572.	439.	566.	717.	20.5	0.155	0.123	0.154	0.187	3534.	3511.	11.0	7.1	3.9	83.9	-146.6	1.9	9.1	0.000	0.87	0.48
TargF	20.0	1	0.160	2800.	566.	431.	564.	706.	20.9	0.152	0.117	0.151	0.188	3565.	3560.	11.0	7.2	3.8	84.4	-150.8	1.6	11.8	0.000	0.87	0.49
TargF	20.0	1	0.160	2900.	567.	442.	554.	710.	21.4	0.152	0.120	0.150	0.187	3564.	3540.	11.0	7.2	3.8	85.6	-153.9	1.3	15.0	0.000	0.87	0.49
TargF	20.0	1	0.160	3000.	570.	437.	558.	717.	21.9	0.150	0.121	0.148	0.183	3618.	3613.	11.0	7.3	3.7	86.9	-162.9	1.3	18.4	0.000	0.87	0.49
TargF	20.0	1	0.160	3100.	559.	422.	553.	702.	23.3	0.147	0.114	0.146	0.182	3615.	3598.	11.0	7.3	3.7	88.9	-166.9	1.5	23.4	0.000	0.87	0.49
TargF	20.0	1	0.160	3200.	559.	432.	554.	699.	23.6	0.148	0.116	0.148	0.181	3599.	3595.	11.0	7.2	3.8	89.8	-167.3	1.6	28.8	0.000	0.87	0.49
TargF	20.0	1	0.160	3300.	554.	425.	546.	692.	24.7	0.146	0.113	0.146	0.176	3620.	3628.	11.0	7.3	3.7	92.7	-173.5	1.2	34.3	0.000	0.87	0.50
TargF	20.0	1	0.160	3400.	557.	431.	546.	696.	25.1	0.144	0.117	0.142	0.176	3654.	3631.	11.0	7.3	3.7	94.0	-175.2	1.2	37.8	0.000	0.87	0.50
TargF	20.0	1	0.160	3500.	545.	430.	535.	683.	26.5	0.141	0.111	0.140	0.173	3661.	3683.	11.0	7.3	3.7	96.3	-181.9	0.9	43.5	0.000	0.87	0.50
TargF	20.0	1	0.180	2000.	610.	480.	604.	750.	17.7	0.185	0.146	0.186	0.222	3258.	3238.	11.0	6.7	4.3	84.3	-125.4	4.9	1.2	0.000	0.85	0.44
TargF	20.0	1	0.180	2100.	609.	476.	607.	742.	18.1	0.182	0.143	0.182	0.223	3292.	3262.	11.0	6.8	4.2	84.4	-131.0	4.8	2.2	0.000	0.85	0.45
TargF	20.0	1	0.180	2200.	600.	469.	593.	741.	18.8	0.180	0.143	0.179	0.216	3279.	3258.	11.0	6.9	4.1	84.7	-137.5	4.8	3.1	0.000	0.86	0.45
TargF	20.0	1	0.180	2300.	606.	468.	598.	755.	19.2	0.178	0.137	0.177	0.218	3338.	3317.	11.0	7.0	4.0	86.4	-144.1	4.1	4.1	0.000	0.86	0.45
TargF	20.0	1	0.180	2400.	594.	459.	588.	742.	19.8	0.174	0.136	0.173	0.216	3335.	3334.	11.0	7.1	3.9	85.2	-151.5	4.0	5.9	0.000	0.86	0.46
TargF	20.0	1	0.180	2500.	592.	456.	587.	736.	20.4	0.173	0.133	0.172	0.214	3346.	3333.	11.0	7.2	3.8	86.4	-156.4	4.0	8.9	0.000	0.86	0.46
TargF	20.0	1	0.180	2600.	589.	456.	584.	729.	21.1	0.171	0.134	0.171	0.209	3360.	3370.	11.0	7.2	3.8	87.5	-159.5	4.0	11.8	0.000	0.86	0.46
TargF	20.0	1	0.180	2700.	589.	458.	580.	730.	21.2	0.169	0.133	0.167	0.209	3394.	3403.	11.0	7.2	3.8	88.8	-161.7	3.1	13.8	0.000	0.86	0.46
TargF	20.0	1	0.180	2800.	585.	453.	576.	727.	22.2	0.168	0.128	0.167	0.206	3400.	3386.	11.0	7.3	3.7	89.7	-172.5	3.3	18.5	0.000	0.86	0.47
TargF	20.0	1	0.180	2900.	584.	451.	579.	729.	22.7	0.166	0.128	0.166	0.206	3425.	3421.	11.0	7.3	3.7	91.4	-173.3	3.2	22.9	0.000	0.86	0.47
TargF	20.0	1	0.180	3000.	578.	445.	568.	723.	23.6	0.164	0.128	0.163	0.201	3428.	3424.	11.0	7.3	3.7	92.7	-177.5	2.9	28.1	0.000	0.86	0.47
TargF	20.0	1	0.180	3100.	579.	452.	569.	715.	24.8	0.164	0.127	0.162	0.202	3423.	3422.	11.0	7.3	3.7	95.6	-187.2	2.9	32.9	0.000	0.86	0.47
TargF	20.0	1	0.180	3200.	576.	455.	565.	713.	25.1	0.161	0.126	0.160	0.199	3464.	3475.	11.0	7.3	3.7	97.4	-184.8	2.4	37.6	0.000	0.86	0.47
TargF	20.0	1	0.180	3300.	576.	446.	567.	718.	27.0	0.160	0.124	0.159	0.197	3470.	3468.	11.0	7.3	3.7	101.4	-195.7	2.3	42.8	0.000	0.86	0.47
TargF	20.0	1	0.180	3400.	576.	447.	566.	714.	27.3	0.160	0.125	0.159	0.195	3475.	3487.	11.0	7.2	3.8	102.2	-195.9	2.1	49.6	0.000	0.86	0.47
TargF	20.0	1	0.180	3500.	573.	451.	566.	706.	29.1	0.158	0.124	0.156	0.195	3498.	3513.	11.0	7.3	3.7	108.0	-200.2	1.8	53.8	0.000	0.86	0.48
TargF	20.0	1	0.200	2000.	620.	485.	615.	758.	18.7	0.202	0.155	0.201	0.246	3095.	3076.	11.0	6.9	4.1	87.3	-139.9	9.8	2.9	0.000	0.84	0.42
TargF	20.0	1	0.200	2100.	614.	471.	614.	746.	19.2	0.198	0.154	0.198	0.242	3099.	3088.	11.0	6.9	4.1	87.4	-145.5	9.2	4.4	0.000	0.85	0.42
TargF	20.0	1	0.200	2200.	624.	487.	614.	775.	19.7	0.197	0.151	0.196	0.242	3171.	3154.	11.0	7.1	3.9	89.9	-154.6	7.3	4.9	0.000	0.85	0.43
TargF	20.0	1	0.200	2300.	615.	488.	612.	750.	20.0	0.194	0.150	0.193	0.239	3166.	3177.	11.0	7.2	3.8	88.8	-159.5	6.4	6.4	0.000	0.85	0.43
TargF	20.0	1	0.200	2400.	607.	473.	601.	747.	20.6	0.191	0.147	0.189	0.236	3169.	3156.	11.0	7.3	3.7	89.2	-165.4	7.2	10.3	0.000	0.85	0.44
TargF	20.0	1	0.200	2500.	609.	484.	599.	745.	21.4	0.189	0.148	0.189	0.233	3204.	3183.	11.0	7.3	3.7	91.5	-175.5	6.5	13.1	0.000	0.85	0.44
TargF	20.0	1	0.200	2600.	609.	469.	602.	754.	21.9	0.186	0.142	0.186	0.233	3245.	3218.	11.0	7.4	3.6	92.6	-176.8	6.3	15.9	0.000	0.85	0.44
TargF	20.0	1	0.200	2700.	606.	469.	599.	743.	22.6	0.186	0.141	0.185	0.230	3241.	3231.	11.0	7.4	3.6	94.1	-183.0	5.7	20.7	0.000	0.85	0.44
TargF	20.0	1	0.200	2800.	608.	478.	599.	747.	23.3	0.185	0.144	0.184	0.228	3259.	3227.	11.0	7.4	3.6	96.8	-186.5	5.5	24.7	0.000	0.85	0.44
TargF	20.0	1	0.200	2900.	600.	466.	586.	749.	24.9	0.180	0.138	0.179	0.222	3286.	3263.	11.0	7.4	3.6	99.2	-196.0	5.0	29.5	0.000	0.85	0.45
TargF	20.0	1	0.200	3000.	605.	476.	601.	748.	25.2	0.181	0.142	0.180	0.224	3301.	3290.	11.0	7.3	3.7	101.7	-195.4	4.5	35.2	0.000	0.85	0.45
TargF	20.0	1	0.200	3100.	596.	467.	590.	738.	27.1	0.177	0.137	0.175	0.218	3305.	3307.	11.0	7.4	3.6	105.0	-204.3	3.8	40.1	0.000	0.86	0.45
TargF	20.0	1	0.200	3200.	596.	465.	587.	736.	27.5	0.177	0.135	0.176	0.221	3321.	3328.	11.0	7.3	3.7	107.4	-206.1	4.4	45.4	0.000	0.86	0.45
TargF	20.0	1	0.200	3300.	593.	467.	583.	728.	28.7	0.175	0.136	0.174	0.218	3320.	3329.	11.0	7.2	3.8	110.8	-204.7	4.5	52.5	0.000	0.86	0.46
TargF	20.0	1	0.200	3400.	591.	469.	584.	720.	29.6	0.175	0.137	0.173	0.215	3319.	3353.	11.0	7.2	3.8	113.8	-213.4	4.1	58.4	0.000	0.86	0.45
TargF	20.0	1	0.200	3500.	590.	458.	583.	721.	31.3	0.172	0.133	0.170	0.215	3360.	3357.	11.0	7.2	3.8	118.7	-220.3	3.4	61.9	0.000	0.86	0.46
TargF	20.0	1	0.220	2000.	631.	492.	627.	772.	19.4	0.216	0.164	0.215	0.267	2989.	3016.	11.0	7.0	4.0	89.7	-154.6	12.7	4.0	0.000	0.84	0.40
TargF	20.0	1	0.220	2100.	633.	497.	627.	784.	19.7	0.215	0.161	0.215	0.266	3017.	3012.	11.0	7.2	3.8	90.3	-163.1	12.0	5.8	0.000	0.84	0.40
TargF	20.0	1	0.220	2200.	636.	487.	630.	792.	20.4	0.215	0.161	0.214	0.267	3021.	3005.	11.0	7.2	3.8	92.7	-168.5	11.8	8.2	0.000	0.84	0.40
TargF	20.0	1	0.220	2300.	631.	496.	627.	778.	20.9	0.211	0.162	0.209	0.263	3044.	3046.	11.0	7.3	3.7	93.4	-176.2	11.3	11.3	0.000	0.84	0.41
TargF	20.0	1	0.220	2400.	625.	490.	619.	775.	21.7	0.206	0.159	0.205	0.256	3079.	3076.	11.0	7.4	3.6	93.7	-186.9	9.6	13.8	0.000	0.84	0.42
TargF	20.0	1	0.220	2500.	625.	473.	625.	769.	22.7	0.204	0.153	0.204	0.252	3093.	3077.	11.0	7.4	3.6	96.2	-191.0	9.4	17.9	0.000	0.84	0.42
TargF	20.0	1	0.220	2600.	618.	480.	609.	759.	23.2	0.200	0.156	0.199	0.249	3109.	3115.	11.0	7.4	3.6	97.7	-193.8	8.8	21.6	0.000	0.84	0.42
TargF	20.0	1	0.220	2700.	618.	481.	608.	766.	24.2	0.199	0.152	0.199	0.249	3116.	3109.	11.0	7.4	3.6	99.7	-200.3	9.2	27.2	0.000	0.85	0.42
TargF	20.0	1	0.220	2800.	617.	476.	611.	760.	25.2	0.199	0.151	0.198	0.247	3120.	3094.	11.0	7.5	3.5	102.5	-208.0	8.9	32.9	0.000	0.85	0.43
TargF	20.0	1	0.220	2900.	612.	482.	601.	753.	26.2	0.195	0.151	0.192	0.239	3147.	3151.	11.0	7.4	3.6	105.3	-210.9	7.5	37.7	0.000	0.85	0.43
TargF	20.0	1	0.220	3000.	615.	484.	603.	772.	26.8	0.193	0.147	0.191	0.242	3195.	3184.	11.0	7.4	3.6	107.6	-212.8	7.0	41.6	0.000	0.85	0.43
TargF	20.0	1	0.220	3100.	608.	473.	604.	748.	28.1	0.193	0.148	0.191	0.240	3163.	3192.	11.0	7.4	3.6	111.6	-217.6	7.4	49.2	0.000	0.85	0.43
TargF	20.0	1	0.220	3200.	610.	485.	603.	747.	29.1	0.191	0.150	0.189	0.238	3187.	3167.	11.0	7.3	3.7	114.8	-216.8	5.9	54.7	0.000	0.85	0.43
TargF	20.0	1	0.220	3300.	609.	475.	607.	750.	30.9	0.192	0.148	0.190	0.238	3168.	3169.	11.0	7.2	3.8	120.0	-227.6	7.2	62.3	0.000	0.85	0.43
TargF	20.0	1	0.220	3400.	608.	476.	599.	754.	32.0	0.189	0.147	0.187	0.234	3215.	3206.	11.0	7.2	3.8	124.5	-231.7	5.7	65.1	0.000	0.85	0.44
TargF	20.0	1	0.220	3500.	601.	473.	591.	745.	32.8	0.186	0.146	0.183	0.232	3203.	3220.	11.0	7.1	3.9	127.4	-229.2	5.4	71.1	0.000	0.85	0.44
TargF	20.0	1	0.240	2000.	645.	493.	638.	797.	20.2	0.232	0.178	0.232	0.289	2887.	2884.	11.0	7.3	3.7	93.9	-170.6	17.4	6.0	0.000	0.83	0.39

Method Perc Dur Targ Trig Cmean C10 C50 C90 IAV Fmean F10 F50 F90 Smean S20 Nchange
Nup Ndown Cup Cdown Risk Risk Depl 4+ 7+ lim trig

TargF	20.0	1	0.240	2100.	638.	501.	633.	784.	21.0	0.230	0.174	0.229	0.287	2867.	2871.	11.0	7.2	3.8	94.1	-179.1	16.6	8.2	0.000	0.83	0.39
TargF	20.0	1	0.240	2200.	640.	498.	633.	790.	21.4	0.226	0.169	0.224	0.282	2934.	2939.	11.0	7.3	3.7	95.6	-183.2	15.8	12.0	0.000	0.83	0.39
TargF	20.0	1	0.240	2300.	635.	496.	630.	776.	22.1	0.223	0.168	0.222	0.280	2939.	2916.	11.0	7.4	3.6	96.2	-191.8	15.6	15.6	0.000	0.83	0.40
TargF	20.0	1	0.240	2400.	639.	495.	634.	787.	22.7	0.222	0.167	0.221	0.280	2969.	2944.	11.0	7.4	3.6	98.9	-199.6	14.3	18.9	0.000	0.83	0.40
TargF	20.0	1	0.240	2500.	638.	498.	635.	779.	23.5	0.222	0.168	0.222	0.275	2949.	2939.	11.0	7.4	3.6	100.7	-203.4	13.7	24.1	0.000	0.83	0.40
TargF	20.0	1	0.240	2600.	630.	501.	629.	767.	24.4	0.218	0.166	0.216	0.271	2970.	2985.	11.0	7.4	3.6	102.1	-207.8	13.6	29.4	0.000	0.83	0.40
TargF	20.0	1	0.240	2700.	633.	489.	629.	780.	25.1	0.215	0.163	0.213	0.271	3019.	3006.	11.0	7.4	3.6	105.5	-211.0	13.4	33.4	0.000	0.84	0.41
TargF	20.0	1	0.240	2800.	633.	494.	627.	779.	26.6	0.212	0.164	0.210	0.264	3050.	3024.	11.0	7.5	3.5	109.7	-221.1	11.3	37.6	0.000	0.84	0.41
TargF	20.0	1	0.240	2900.	627.	490.	622.	769.	28.0	0.210	0.159	0.208	0.265	3041.	3053.	11.0	7.4	3.6	113.0	-226.9	11.2	43.5	0.000	0.84	0.41
TargF	20.0	1	0.240	3000.	626.	492.	619.	768.	28.5	0.208	0.159	0.206	0.260	3063.	3082.	11.0	7.3	3.7	115.9	-227.9	10.8	49.7	0.000	0.84	0.41
TargF	20.0	1	0.240	3100.	623.	489.	615.	777.	30.6	0.207	0.161	0.206	0.258	3055.	3056.	11.0	7.4	3.6	120.8	-234.2	10.0	56.8	0.000	0.84	0.41
TargF	20.0	1	0.240	3200.	623.	491.	617.	757.	32.1	0.204	0.158	0.202	0.251	3082.	3075.	11.0	7.3	3.7	125.8	-242.4	8.5	62.0	0.000	0.84	0.42
TargF	20.0	1	0.240	3300.	624.	499.	621.	756.	32.4	0.205	0.158	0.203	0.254	3077.	3064.	11.0	7.2	3.8	128.7	-237.5	9.1	67.1	0.000	0.84	0.42
TargF	20.0	1	0.240	3400.	621.	496.	616.	759.	33.7	0.203	0.157	0.201	0.249	3085.	3082.	11.0	7.2	3.8	134.6	-244.0	9.0	72.1	0.000	0.84	0.42
TargF	20.0	1	0.240	3500.	617.	492.	609.	755.	35.5	0.201	0.157	0.200	0.246	3092.	3109.	11.0	7.0	4.0	140.3	-245.5	8.5	76.4	0.000	0.84	0.42
TargF	20.0	1	0.260	2000.	651.	507.	648.	797.	20.8	0.248	0.188	0.247	0.311	2766.	2780.	11.0	7.3	3.7	95.7	-182.8	23.1	9.6	0.000	0.82	0.37
TargF	20.0	1	0.260	2100.	653.	509.	652.	797.	21.7	0.246	0.184	0.246	0.309	2799.	2767.	11.0	7.4	3.6	97.5	-195.5	22.5	13.4	0.000	0.82	0.37
TargF	20.0	1	0.260	2200.	653.	508.	649.	798.	22.3	0.242	0.182	0.239	0.305	2822.	2807.	11.0	7.4	3.6	99.5	-198.9	20.5	15.6	0.000	0.82	0.37
TargF	20.0	1	0.260	2300.	651.	501.	643.	807.	22.9	0.240	0.181	0.237	0.305	2839.	2844.	11.0	7.5	3.5	100.6	-205.9	19.7	19.7	0.000	0.82	0.38
TargF	20.0	1	0.260	2400.	646.	504.	644.	782.	24.0	0.235	0.177	0.234	0.295	2873.	2848.	11.0	7.6	3.4	103.0	-215.5	18.6	23.9	0.000	0.83	0.38
TargF	20.0	1	0.260	2500.	639.	502.	632.	780.	24.9	0.231	0.172	0.230	0.291	2880.	2901.	11.0	7.5	3.5	104.6	-221.7	17.3	28.8	0.000	0.83	0.38
TargF	20.0	1	0.260	2600.	638.	496.	634.	796.	26.6	0.229	0.172	0.229	0.286	2885.	2898.	11.0	7.5	3.5	108.9	-225.5	17.9	35.3	0.000	0.83	0.39
TargF	20.0	1	0.260	2700.	650.	513.	642.	791.	26.9	0.232	0.179	0.231	0.284	2906.	2868.	11.0	7.4	3.6	113.0	-228.3	16.5	39.7	0.000	0.83	0.39
TargF	20.0	1	0.260	2800.	640.	501.	632.	789.	27.9	0.227	0.169	0.224	0.284	2932.	2928.	11.0	7.5	3.5	115.0	-237.9	15.8	46.0	0.000	0.83	0.39
TargF	20.0	1	0.260	2900.	636.	504.	629.	782.	29.6	0.224	0.172	0.223	0.280	2927.	2953.	11.0	7.4	3.6	119.8	-239.1	15.5	52.9	0.000	0.83	0.39
TargF	20.0	1	0.260	3000.	638.	511.	630.	778.	30.9	0.224	0.174	0.222	0.278	2936.	2908.	11.0	7.4	3.6	124.3	-249.6	14.7	57.4	0.000	0.83	0.40
TargF	20.0	1	0.260	3100.	638.	503.	629.	779.	31.9	0.222	0.172	0.221	0.277	2950.	2964.	11.0	7.3	3.7	130.4	-245.7	14.6	63.7	0.000	0.83	0.40
TargF	20.0	1	0.260	3200.	637.	509.	634.	769.	33.3	0.221	0.170	0.218	0.272	2961.	2959.	11.0	7.2	3.8	134.4	-252.2	13.1	68.2	0.000	0.83	0.40
TargF	20.0	1	0.260	3300.	637.	506.	634.	769.	34.9	0.219	0.171	0.216	0.271	2981.	2969.	11.0	7.2	3.8	139.9	-256.1	12.3	73.0	0.000	0.83	0.40
TargF	20.0	1	0.260	3400.	636.	503.	632.	777.	36.1	0.216	0.169	0.214	0.267	3001.	3007.	11.0	7.1	3.9	146.1	-258.0	11.6	76.7	0.000	0.84	0.40
TargF	20.0	1	0.260	3500.	631.	508.	626.	765.	37.7	0.218	0.172	0.216	0.264	2949.	2971.	11.0	6.9	4.1	153.0	-253.5	12.9	83.0	0.000	0.83	0.40
TargF	20.0	1	0.280	2000.	658.	505.	660.	818.	21.6	0.265	0.189	0.263	0.340	2674.	2687.	11.0	7.4	3.6	97.7	-195.9	29.5	13.2	0.000	0.81	0.35
TargF	20.0	1	0.280	2100.	655.	503.	657.	806.	22.7	0.260	0.194	0.256	0.331	2707.	2740.	11.0	7.5	3.5	99.7	-207.3	27.0	16.5	0.000	0.81	0.35
TargF	20.0	1	0.280	2200.	655.	510.	651.	816.	23.1	0.256	0.191	0.253	0.324	2728.	2742.	11.0	7.5	3.5	102.5	-210.8	26.7	21.1	0.000	0.82	0.36
TargF	20.0	1	0.280	2300.	653.	501.	650.	799.	24.5	0.252	0.185	0.250	0.316	2751.	2754.	11.0	7.6	3.4	104.2	-221.9	25.7	25.7	0.000	0.82	0.36
TargF	20.0	1	0.280	2400.	649.	508.	646.	793.	25.2	0.249	0.187	0.247	0.313	2762.	2773.	11.0	7.6	3.4	107.2	-227.5	24.6	31.1	0.000	0.82	0.37
TargF	20.0	1	0.280	2500.	651.	505.	641.	802.	26.7	0.248	0.192	0.245	0.308	2761.	2792.	11.0	7.5	3.5	111.0	-236.7	23.7	35.7	0.000	0.82	0.37
TargF	20.0	1	0.280	2600.	641.	502.	640.	782.	27.2	0.242	0.183	0.240	0.301	2796.	2822.	11.0	7.5	3.5	113.1	-236.1	21.2	41.3	0.000	0.82	0.37
TargF	20.0	1	0.280	2700.	651.	511.	646.	805.	28.9	0.245	0.181	0.240	0.315	2804.	2791.	11.0	7.5	3.5	119.2	-246.1	22.1	46.4	0.000	0.82	0.37
TargF	20.0	1	0.280	2800.	645.	501.	638.	796.	30.1	0.240	0.182	0.238	0.300	2816.	2818.	11.0	7.4	3.6	122.8	-245.8	20.9	53.4	0.000	0.82	0.38
TargF	20.0	1	0.280	2900.	650.	514.	643.	792.	30.2	0.239	0.182	0.237	0.304	2844.	2831.	11.0	7.3	3.7	126.1	-247.9	19.6	57.9	0.000	0.82	0.38
TargF	20.0	1	0.280	3000.	649.	516.	639.	799.	32.6	0.239	0.183	0.239	0.298	2842.	2835.	11.0	7.2	3.8	132.7	-252.4	19.1	64.1	0.000	0.82	0.38
TargF	20.0	1	0.280	3100.	648.	515.	643.	782.	34.7	0.238	0.184	0.236	0.293	2843.	2854.	11.0	7.1	3.9	140.5	-256.3	19.4	69.3	0.000	0.82	0.38
TargF	20.0	1	0.280	3200.	650.	520.	641.	790.	35.8	0.237	0.185	0.233	0.296	2854.	2890.	11.0	7.1	3.9	146.5	-265.1	18.2	73.8	0.000	0.82	0.38
TargF	20.0	1	0.280	3300.	640.	513.	633.	774.	37.0	0.232	0.180	0.232	0.286	2861.	2891.	11.0	7.0	4.0	150.3	-261.0	18.2	78.0	0.000	0.83	0.38
TargF	20.0	1	0.280	3400.	651.	521.	640.	798.	39.4	0.235	0.185	0.233	0.293	2864.	2847.	11.0	6.9	4.1	160.6	-268.1	17.3	82.2	0.000	0.83	0.38
TargF	20.0	1	0.280	3500.	643.	507.	635.	778.	40.1	0.231	0.181	0.228	0.286	2869.	2864.	11.0	6.9	4.1	163.9	-273.0	15.6	86.9	0.000	0.83	0.38
TargF	20.0	1	0.300	2000.	665.	514.	663.	814.	22.7	0.276	0.204	0.275	0.355	2615.	2604.	11.0	7.6	3.4	101.3	-213.6	33.4	16.9	0.000	0.81	0.34
TargF	20.0	1	0.300	2100.	661.	508.	654.	824.	23.7	0.271	0.194	0.269	0.347	2644.	2642.	11.0	7.6	3.4	104.0	-221.6	31.4	20.0	0.000	0.81	0.34
TargF	20.0	1	0.300	2200.	660.	496.	662.	823.	24.5	0.269	0.200	0.267	0.343	2650.	2636.	11.0	7.5	3.5	105.9	-226.1	31.5	25.4	0.000	0.81	0.34
TargF	20.0	1	0.300	2300.	660.	516.	653.	807.	25.6	0.267	0.193	0.264	0.345	2669.	2680.	11.0	7.5	3.5	108.8	-233.7	30.0	30.0	0.000	0.81	0.35
TargF	20.0	1	0.300	2400.	664.	516.	663.	811.	26.8	0.267	0.197	0.261	0.345	2680.	2686.	11.0	7.6	3.4	113.4	-239.7	29.9	36.2	0.000	0.81	0.35
TargF	20.0	1	0.300	2500.	657.	507.	654.	806.	27.9	0.261	0.193	0.258	0.334	2701.	2719.	11.0	7.5	3.5	116.2	-243.5	27.9	40.5	0.000	0.81	0.35
TargF	20.0	1	0.300	2600.	655.	515.	644.	812.	29.1	0.257	0.191	0.254	0.325	2722.	2732.	11.0	7.5	3.5	120.6	-252.6	27.1	46.1	0.000	0.82	0.36
TargF	20.0	1	0.300	2700.	661.	517.	657.	805.	29.9	0.257	0.192	0.255	0.326	2737.	2743.	11.0	7.5	3.5	124.6	-256.4	26.0	51.6	0.000	0.82	0.36
TargF	20.0	1	0.300	2800.	656.	522.	647.	802.	32.3	0.255	0.196	0.251	0.323	2718.	2737.	11.0	7.4	3.6	131.9	-261.9	25.6	58.5	0.000	0.82	0.36
TargF	20.0	1	0.300	2900.	653.	519.	645.	800.	33.7	0.253	0.193	0.252	0.315	2730.	2717.	11.0	7.3	3.7	136.9	-263.3	25.7	64.7	0.000	0.82	0.36
TargF	20.0	1	0.300	3000.	657.	524.	647.	798.	34.8	0.252	0.192	0.249	0.314	2755.	2764.	11.0	7.2	3.8	141.8	-267.2	24.0	68.6	0.000	0.82	0.36

Method Perc Dur Targ Trig Cmean C10 C50 C90 IAV Fmean F10 F50 F90 Smean S20 Nchange
Nup Ndown Cup Cdown Risk Risk Depl 4+ 7+ lim trig

TargF	20.0	1	0.300	3100.	656.	522.	650.	796.	36.0	0.252	0.194	0.248	0.316	2753.	2743.	11.0	7.2	3.8	148.8	-270.8	24.1	74.0	0.000	0.82	0.36
TargF	20.0	1	0.300	3200.	653.	516.	650.	790.	37.8	0.250	0.193	0.247	0.310	2752.	2769.	11.0	7.0	4.0	155.1	-271.9	23.1	79.3	0.000	0.82	0.36
TargF	20.0	1	0.300	3300.	653.	518.	644.	797.	40.2	0.248	0.195	0.243	0.310	2766.	2775.	11.0	6.9	4.1	163.7	-277.4	22.9	82.6	0.000	0.82	0.37
TargF	20.0	1	0.300	3400.	654.	522.	648.	793.	41.1	0.247	0.192	0.244	0.307	2775.	2772.	11.0	6.9	4.1	169.1	-280.8	21.0	86.0	0.000	0.82	0.37
TargF	20.0	1	0.300	3500.	648.	514.	642.	787.	44.3	0.245	0.187	0.243	0.305	2770.	2800.	11.0	6.8	4.2	180.7	-285.7	21.3	89.0	0.000	0.82	0.37

TAC rule, Constraint on TAC variation only at SSB above trigger

Method Perc Dur Targ Trig Cmean C10 C50 C90 IAV Fmean F10 F50 F90 Smean S20 Nchange
Nup Ndown Cup Cdown Risk Risk Depl 4+ 7+ lim trig

TargC	5.0	1	400.000	2300.	418.	395.	419.	439.	1.1	0.092	0.065	0.091	0.120	4355.	4548.	1.8	1.5	0.3	17.4	-47.8	0.9	0.9	0.000	0.89	0.56
TargC	5.0	1	400.000	2600.	415.	390.	418.	438.	1.7	0.090	0.066	0.090	0.114	4344.	4508.	2.8	2.2	0.5	17.7	-46.3	0.3	1.6	0.000	0.90	0.57
TargC	5.0	1	400.000	2900.	410.	376.	415.	437.	2.6	0.086	0.064	0.086	0.110	4457.	4579.	3.8	2.9	0.8	19.4	-49.1	0.3	5.0	0.000	0.90	0.58
TargC	5.0	1	400.000	3200.	406.	368.	411.	434.	3.5	0.084	0.063	0.084	0.104	4500.	4616.	4.8	3.6	1.2	20.4	-50.2	0.3	8.1	0.000	0.90	0.58
TargC	5.0	1	400.000	3500.	398.	355.	405.	432.	4.8	0.081	0.062	0.080	0.099	4547.	4676.	6.0	4.4	1.6	22.1	-49.4	0.2	15.6	0.000	0.90	0.59
TargC	5.0	1	450.000	2300.	466.	437.	469.	492.	1.6	0.112	0.080	0.110	0.148	4056.	4216.	2.6	2.1	0.5	19.9	-53.1	1.9	1.9	0.000	0.88	0.53
TargC	5.0	1	450.000	2600.	461.	426.	465.	490.	2.3	0.108	0.079	0.107	0.137	4117.	4248.	3.6	2.8	0.7	20.8	-53.3	1.0	3.4	0.000	0.89	0.54
TargC	5.0	1	450.000	2900.	456.	416.	462.	490.	3.4	0.103	0.077	0.103	0.130	4204.	4315.	4.6	3.5	1.1	22.9	-57.0	0.6	7.1	0.000	0.89	0.55
TargC	5.0	1	450.000	3200.	447.	398.	455.	484.	4.7	0.099	0.076	0.099	0.122	4235.	4337.	5.9	4.4	1.5	24.2	-58.0	0.5	12.6	0.000	0.89	0.56
TargC	5.0	1	450.000	3500.	438.	389.	445.	480.	6.4	0.095	0.074	0.095	0.116	4305.	4402.	7.0	5.0	1.9	27.6	-61.5	0.5	21.7	0.000	0.90	0.57
TargC	5.0	1	500.000	2300.	513.	473.	520.	547.	2.4	0.137	0.097	0.134	0.180	3734.	3859.	3.4	2.6	0.8	24.1	-62.0	4.5	4.5	0.000	0.87	0.50
TargC	5.0	1	500.000	2600.	504.	456.	511.	543.	3.6	0.130	0.095	0.129	0.167	3816.	3953.	4.7	3.6	1.1	25.8	-64.9	3.3	7.9	0.000	0.88	0.51
TargC	5.0	1	500.000	2900.	498.	447.	504.	541.	4.6	0.125	0.093	0.125	0.155	3872.	3973.	5.8	4.3	1.4	27.3	-66.1	1.6	13.2	0.000	0.88	0.52
TargC	5.0	1	500.000	3200.	487.	432.	493.	534.	6.0	0.117	0.090	0.117	0.144	3991.	4080.	6.8	5.0	1.8	29.1	-67.6	1.0	20.7	0.000	0.88	0.53
TargC	5.0	1	500.000	3500.	479.	421.	486.	531.	7.2	0.111	0.088	0.111	0.135	4095.	4186.	7.6	5.4	2.2	31.5	-68.0	0.8	27.9	0.000	0.89	0.54
TargC	5.0	1	550.000	2300.	554.	498.	562.	596.	3.7	0.166	0.121	0.165	0.212	3394.	3521.	4.6	3.5	1.1	29.3	-72.9	8.3	8.3	0.000	0.86	0.46
TargC	5.0	1	550.000	2600.	546.	487.	556.	593.	4.7	0.155	0.114	0.155	0.196	3520.	3616.	5.7	4.2	1.5	30.5	-70.7	5.4	12.6	0.000	0.86	0.47
TargC	5.0	1	550.000	2900.	535.	468.	543.	589.	6.0	0.144	0.108	0.143	0.179	3671.	3750.	6.7	4.9	1.8	32.3	-76.6	3.6	18.8	0.000	0.87	0.49
TargC	5.0	1	550.000	3200.	525.	459.	532.	581.	7.4	0.136	0.104	0.137	0.167	3738.	3842.	7.6	5.4	2.2	34.2	-77.1	2.4	28.5	0.000	0.87	0.50
TargC	5.0	1	550.000	3500.	512.	447.	515.	578.	9.1	0.128	0.101	0.128	0.155	3831.	3912.	8.5	5.9	2.6	38.3	-77.4	1.5	38.0	0.000	0.88	0.51
TargC	5.0	1	600.000	2300.	594.	523.	607.	647.	4.9	0.197	0.139	0.196	0.256	3158.	3214.	5.6	4.1	1.5	34.1	-82.0	14.9	14.9	0.000	0.84	0.42
TargC	5.0	1	600.000	2600.	580.	506.	592.	638.	6.5	0.182	0.133	0.181	0.230	3272.	3348.	6.8	4.9	1.9	37.0	-83.5	11.2	21.8	0.000	0.85	0.44
TargC	5.0	1	600.000	2900.	571.	500.	577.	638.	7.8	0.169	0.128	0.168	0.210	3403.	3475.	7.6	5.4	2.2	40.2	-86.2	6.7	29.8	0.000	0.86	0.46
TargC	5.0	1	600.000	3200.	559.	485.	562.	628.	9.3	0.158	0.121	0.160	0.191	3508.	3584.	8.5	5.9	2.6	42.3	-87.8	4.8	39.0	0.000	0.86	0.47
TargC	5.0	1	600.000	3500.	547.	477.	548.	619.	10.5	0.148	0.117	0.148	0.178	3615.	3639.	9.1	6.2	2.9	45.1	-87.3	2.8	49.5	0.000	0.87	0.49
TargC	5.0	1	650.000	2300.	620.	529.	635.	689.	7.4	0.234	0.164	0.231	0.306	2884.	2942.	6.9	4.9	2.0	43.2	-96.4	24.6	24.6	0.000	0.83	0.38
TargC	5.0	1	650.000	2600.	615.	528.	625.	689.	8.3	0.214	0.162	0.212	0.264	3001.	3040.	7.5	5.2	2.3	44.6	-94.9	16.6	30.7	0.000	0.84	0.41
TargC	5.0	1	650.000	2900.	602.	527.	603.	681.	9.5	0.196	0.153	0.196	0.240	3137.	3177.	8.6	5.9	2.7	46.0	-94.5	11.5	40.5	0.000	0.84	0.42
TargC	5.0	1	650.000	3200.	588.	505.	592.	670.	11.0	0.181	0.144	0.180	0.218	3268.	3318.	9.3	6.3	2.9	48.9	-97.6	8.1	49.6	0.000	0.85	0.44
TargC	5.0	1	650.000	3500.	576.	497.	575.	658.	12.2	0.167	0.134	0.166	0.200	3412.	3452.	9.5	6.3	3.2	53.3	-98.4	4.8	59.6	0.000	0.86	0.46
TargC	5.0	1	700.000	2300.	645.	535.	659.	737.	9.4	0.272	0.191	0.272	0.353	2631.	2664.	7.8	5.4	2.4	50.2	-108.3	35.4	35.4	0.000	0.81	0.35
TargC	5.0	1	700.000	2600.	637.	533.	645.	727.	10.4	0.243	0.185	0.243	0.302	2801.	2811.	8.5	5.8	2.7	52.4	-107.7	26.3	42.8	0.000	0.82	0.38
TargC	5.0	1	700.000	2900.	625.	528.	630.	716.	11.8	0.222	0.173	0.221	0.273	2936.	2987.	9.2	6.2	3.0	55.6	-108.0	18.9	51.8	0.000	0.83	0.40
TargC	5.0	1	700.000	3200.	613.	531.	614.	705.	13.0	0.203	0.159	0.204	0.246	3090.	3131.	9.7	6.4	3.3	59.0	-109.2	12.7	60.3	0.000	0.84	0.42
TargC	5.0	1	700.000	3500.	601.	511.	601.	692.	14.5	0.188	0.155	0.188	0.221	3192.	3226.	10.0	6.4	3.6	64.2	-109.2	8.3	70.5	0.000	0.85	0.43
TargC	5.0	3	400.000	2300.	391.	309.	411.	437.	1.2	0.084	0.054	0.083	0.115	4476.	4697.	2.6	1.9	0.7	16.0	-20.0	1.0	1.0	0.000	0.90	0.57
TargC	5.0	3	400.000	2600.	382.	292.	403.	434.	1.5	0.080	0.050	0.078	0.113	4546.	4712.	2.9	2.3	0.6	16.4	-24.8	0.7	2.0	0.000	0.90	0.58
TargC	5.0	3	400.000	2900.	370.	274.	387.	430.	1.8	0.075	0.046	0.075	0.104	4631.	4794.	3.2	2.7	0.5	17.4	-35.5	0.3	3.5	0.000	0.90	0.59
TargC	5.0	3	400.000	3200.	366.	276.	384.	427.	2.2	0.074	0.044	0.073	0.102	4696.	4835.	3.4	2.9	0.5	18.9	-41.3	0.3	8.4	0.000	0.90	0.59
TargC	5.0	3	400.000	3500.	362.	277.	373.	427.	2.7	0.071	0.043	0.071	0.097	4749.	4856.	3.4	2.9	0.6	21.4	-50.6	0.3	13.3	0.000	0.91	0.60
TargC	5.0	3	450.000	2300.	435.	345.	459.	491.	1.3	0.103	0.064	0.101	0.144	4173.	4331.	2.2	2.0	0.2	19.0	-62.4	2.6	2.6	0.000	0.89	0.54
TargC	5.0	3	450.000	2600.	428.	326.	452.	487.	1.5	0.097	0.059	0.097	0.136	4300.	4421.	2.5	2.3	0.2	19.1	-56.8	1.1	3.3	0.000	0.89	0.56
TargC	5.0	3	450.000	2900.	422.	323.	443.	485.	2.0	0.093	0.060	0.093	0.126	4348.	4484.	2.9	2.6	0.3	21.2	-59.1	1.1	6.2	0.000	0.89	0.56
TargC	5.0	3	450.000	3200.	410.	315.	426.	478.	2.5	0.089	0.056	0.089	0.123	4432.	4586.	3.2	2.8	0.4	23.8	-63.8	0.8	13.1	0.000	0.90	0.57
TargC	5.0	3	450.000	3500.	403.	303.	413.	478.	2.9	0.085	0.051	0.087	0.115	4484.	4585.	3.4	2.8	0.5	25.2	-67.7	0.6	19.9	0.000	0.90	0.58
TargC	5.0	3	500.000	2300.	482.	382.	508.	543.	1.5	0.124	0.075	0.122	0.174	3910.	4055.	2.2	2.0	0.3	22.3	-73.9	4.1	4.1	0.000	0.88	0.51
TargC	5.0	3	500.000	2600.	472.	369.	495.	538.	1.9	0.118	0.074	0.117	0.163	3973.	4112.	2.7	2.3	0.4	23.4	-74.0	3.1	7.0	0.000	0.88	0.52
TargC	5.0	3	500.000	2900.	459.	355.	477.	533.	2.4	0.111	0.065	0.110	0.152	4070.	4199.	3.1	2.7	0.4	25.3	-73.8	2.0	11.5	0.000	0.88	0.53
TargC	5.0	3	500.000	3200.	447.	342.	459.	529.	2.9	0.104	0.062	0.105	0.143	4196.	4280.	3.4	2.8	0.5	27.4	-72.3	1.2	17.3	0.000	0.89	0.55
TargC	5.0	3	500.000	3500.	441.	347.	452.	522.	3.5	0.100	0.062	0.100	0.136	4272.	4391.	3.5	2.9	0.7	31.4	-80.1	1.0	25.4	0.000	0.89	0.56
TargC	5.0	3	550.000	2300.	524.	408.	551.	595.	1.7	0.150	0.090	0.148	0.213	3625.	3741.	2.4	2.1	0.4	25.0	-74.9	7.6	7.6	0.000	0.86	0.48
TargC	5.0	3	550.000	2600.	508.	386.	529.	588.	2.3	0.138	0.081	0.138	0.194	3760.	3878.	3.0	2.5	0.4	27.0	-83.9	5.7	11.0	0.000	0.87	0.49
TargC	5.0	3	550.000	2900.	494.	378.	511.	583.	2.7	0.129	0.075	0.130	0.179	3869.	3966.	3.3	2.7	0.5	29.4	-85.9	3.5	16.8	0.000	0.88	0.51
TargC	5.0	3	550.000	3200.	484.	378.	496.	577.	3.3	0.122	0.074	0.124	0.166	3934.	4031.	3.5	2.8	0.6	32.2	-90.2	2.9	23.9	0.000	0.88	0.52
TargC	5.0	3	550.000	3500.	476.	371.	487.	565.	4.0	0.117	0.068	0.119	0.157	4028.	4130.	3.7	2.9	0.8	37.2	-87.6	1.9	34.6	0.000	0.88	0.53

Method Perc Dur Targ Trig Cmean C10 C50 C90 IAV Fmean F10 F50 F90 Smean S20 Nchange
Nup Ndown Cup Cdown Risk Risk Depl 4+ 7+ lim trig

TargC	5.0	3	600.000	2300.	556.	418.	585.	646.	2.5	0.177	0.104	0.176	0.250	3366.	3471.	3.0	2.5	0.5	31.2	-99.5	12.6	12.6	0.000	0.85	0.44
TargC	5.0	3	600.000	2600.	540.	412.	555.	637.	2.9	0.161	0.090	0.160	0.229	3522.	3601.	3.3	2.7	0.5	32.0	-103.7	9.4	17.3	0.000	0.86	0.47
TargC	5.0	3	600.000	2900.	533.	413.	546.	630.	3.3	0.151	0.090	0.152	0.210	3618.	3689.	3.5	2.8	0.6	34.8	-99.8	6.9	25.0	0.000	0.86	0.48
TargC	5.0	3	600.000	3200.	519.	401.	531.	618.	4.0	0.141	0.084	0.142	0.192	3728.	3815.	3.7	2.9	0.8	39.1	-105.8	4.4	31.3	0.000	0.87	0.49
TargC	5.0	3	600.000	3500.	510.	400.	518.	614.	4.6	0.133	0.083	0.136	0.177	3821.	3908.	3.8	2.9	0.9	43.9	-101.5	3.4	41.5	0.000	0.87	0.51
TargC	5.0	3	650.000	2300.	588.	451.	614.	683.	3.3	0.207	0.122	0.203	0.299	3129.	3174.	3.5	2.9	0.6	35.7	-111.6	19.6	19.6	0.000	0.84	0.42
TargC	5.0	3	650.000	2600.	574.	445.	588.	681.	3.5	0.188	0.108	0.186	0.266	3292.	3356.	3.7	3.0	0.7	37.1	-110.6	15.4	25.8	0.000	0.85	0.44
TargC	5.0	3	650.000	2900.	561.	439.	572.	669.	4.1	0.173	0.099	0.175	0.242	3416.	3469.	3.7	3.0	0.8	42.4	-113.6	10.8	33.8	0.000	0.85	0.45
TargC	5.0	3	650.000	3200.	554.	441.	562.	659.	4.8	0.165	0.101	0.167	0.222	3470.	3504.	3.8	2.9	0.9	49.0	-114.4	8.2	43.2	0.000	0.86	0.47
TargC	5.0	3	650.000	3500.	543.	430.	548.	651.	5.5	0.154	0.094	0.157	0.204	3584.	3642.	3.9	2.8	1.0	55.0	-117.8	5.5	52.5	0.000	0.86	0.48
TargC	5.0	3	700.000	2300.	610.	442.	644.	720.	3.9	0.240	0.131	0.235	0.350	2932.	2912.	3.8	3.1	0.7	40.4	-124.5	28.0	28.0	0.001	0.82	0.39
TargC	5.0	3	700.000	2600.	591.	450.	603.	705.	4.4	0.210	0.118	0.208	0.300	3106.	3135.	3.8	3.0	0.8	45.3	-128.5	20.4	33.0	0.001	0.84	0.41
TargC	5.0	3	700.000	2900.	588.	455.	600.	703.	4.9	0.197	0.108	0.196	0.276	3237.	3228.	3.9	3.0	0.9	50.2	-125.5	16.9	40.5	0.000	0.84	0.43
TargC	5.0	3	700.000	3200.	578.	448.	589.	694.	5.4	0.185	0.111	0.187	0.250	3306.	3327.	3.9	2.9	1.0	56.5	-123.5	12.8	50.7	0.000	0.85	0.44
TargC	5.0	3	700.000	3500.	566.	442.	573.	685.	6.0	0.172	0.108	0.173	0.230	3416.	3446.	3.9	2.8	1.2	63.0	-124.2	9.1	59.6	0.000	0.86	0.46
TargC	15.0	1	400.000	2300.	421.	401.	421.	440.	1.0	0.094	0.066	0.092	0.123	4292.	4464.	1.0	0.6	0.4	33.4	-44.9	1.0	1.0	0.000	0.89	0.56
TargC	15.0	1	400.000	2600.	419.	398.	421.	438.	1.7	0.091	0.067	0.090	0.116	4353.	4540.	1.7	1.1	0.6	34.2	-47.7	0.7	2.2	0.000	0.90	0.56
TargC	15.0	1	400.000	2900.	415.	390.	418.	438.	2.7	0.089	0.066	0.088	0.111	4402.	4572.	2.4	1.5	0.9	36.3	-50.7	0.5	5.4	0.000	0.90	0.57
TargC	15.0	1	400.000	3200.	410.	378.	413.	435.	4.3	0.087	0.066	0.087	0.107	4409.	4575.	3.8	2.3	1.5	36.9	-50.7	0.3	10.6	0.000	0.90	0.58
TargC	15.0	1	400.000	3500.	404.	365.	409.	434.	5.9	0.084	0.066	0.083	0.103	4436.	4599.	4.8	2.9	1.9	39.3	-54.6	0.3	18.0	0.000	0.90	0.58
TargC	15.0	1	450.000	2300.	471.	448.	472.	494.	1.7	0.117	0.082	0.114	0.153	3972.	4142.	1.5	1.0	0.6	39.9	-54.7	2.6	2.6	0.000	0.88	0.53
TargC	15.0	1	450.000	2600.	468.	440.	470.	493.	2.7	0.112	0.080	0.112	0.145	4046.	4194.	2.4	1.5	0.9	40.6	-56.6	1.9	4.9	0.000	0.88	0.53
TargC	15.0	1	450.000	2900.	463.	431.	466.	492.	3.9	0.108	0.080	0.109	0.134	4090.	4246.	3.5	2.1	1.3	41.3	-57.7	1.0	8.4	0.000	0.89	0.54
TargC	15.0	1	450.000	3200.	456.	417.	461.	488.	5.3	0.104	0.079	0.104	0.127	4160.	4278.	4.5	2.8	1.8	42.5	-59.1	0.7	14.9	0.000	0.89	0.55
TargC	15.0	1	450.000	3500.	448.	406.	453.	483.	6.9	0.099	0.079	0.100	0.119	4226.	4364.	5.6	3.4	2.2	44.0	-61.7	0.3	23.2	0.000	0.89	0.56
TargC	15.0	1	500.000	2300.	520.	488.	524.	548.	2.5	0.142	0.101	0.139	0.186	3676.	3791.	2.2	1.4	0.8	46.4	-64.2	4.8	4.8	0.000	0.87	0.49
TargC	15.0	1	500.000	2600.	514.	476.	518.	545.	3.7	0.136	0.099	0.135	0.171	3735.	3879.	3.3	2.0	1.3	46.3	-63.4	3.1	8.1	0.000	0.87	0.50
TargC	15.0	1	500.000	2900.	508.	468.	513.	543.	5.1	0.129	0.095	0.129	0.162	3828.	3929.	4.3	2.6	1.7	46.8	-65.8	2.3	14.1	0.000	0.88	0.51
TargC	15.0	1	500.000	3200.	497.	447.	504.	539.	7.1	0.123	0.095	0.124	0.150	3889.	4028.	5.6	3.4	2.2	49.3	-70.5	1.4	24.0	0.000	0.88	0.52
TargC	15.0	1	500.000	3500.	486.	431.	491.	530.	8.7	0.116	0.094	0.116	0.138	3945.	4048.	6.7	4.0	2.7	51.0	-70.4	0.7	32.6	0.000	0.88	0.53
TargC	15.0	1	550.000	2300.	563.	514.	571.	601.	4.0	0.173	0.126	0.172	0.226	3345.	3455.	3.3	2.1	1.2	52.4	-76.0	10.2	10.2	0.000	0.85	0.45
TargC	15.0	1	550.000	2600.	556.	507.	563.	597.	5.6	0.164	0.121	0.163	0.206	3425.	3526.	4.5	2.7	1.7	53.8	-75.6	6.5	15.3	0.000	0.86	0.46
TargC	15.0	1	550.000	2900.	547.	488.	553.	593.	7.0	0.153	0.116	0.154	0.189	3557.	3664.	5.4	3.3	2.1	55.9	-76.9	4.8	23.0	0.000	0.86	0.48
TargC	15.0	1	550.000	3200.	536.	473.	541.	587.	8.9	0.144	0.114	0.145	0.173	3620.	3704.	6.5	4.0	2.6	57.6	-81.2	3.0	32.7	0.000	0.87	0.49
TargC	15.0	1	550.000	3500.	523.	459.	529.	580.	10.8	0.135	0.107	0.135	0.160	3737.	3819.	7.5	4.5	3.0	60.0	-83.5	1.8	42.8	0.000	0.88	0.50
TargC	15.0	1	600.000	2300.	600.	538.	612.	649.	6.2	0.208	0.148	0.208	0.269	3054.	3123.	4.5	2.7	1.7	61.5	-88.9	18.1	18.1	0.000	0.84	0.41
TargC	15.0	1	600.000	2600.	593.	531.	602.	644.	7.4	0.191	0.142	0.192	0.240	3200.	3257.	5.5	3.4	2.2	61.4	-87.1	12.1	23.9	0.000	0.85	0.43
TargC	15.0	1	600.000	2900.	583.	519.	590.	643.	8.9	0.178	0.138	0.178	0.217	3315.	3385.	6.4	3.8	2.6	63.5	-88.7	7.7	32.0	0.000	0.85	0.45
TargC	15.0	1	600.000	3200.	573.	507.	577.	634.	10.7	0.166	0.133	0.166	0.199	3423.	3449.	7.3	4.4	3.0	65.8	-92.2	4.6	42.6	0.000	0.86	0.46
TargC	15.0	1	600.000	3500.	559.	484.	564.	627.	12.1	0.154	0.126	0.154	0.182	3546.	3633.	8.1	4.8	3.3	66.7	-91.8	3.3	51.4	0.000	0.87	0.48
TargC	15.0	1	650.000	2300.	632.	546.	647.	697.	8.6	0.247	0.182	0.247	0.311	2763.	2815.	5.8	3.5	2.3	70.4	-100.1	28.1	28.1	0.000	0.82	0.37
TargC	15.0	1	650.000	2600.	624.	546.	634.	691.	9.6	0.222	0.170	0.221	0.278	2953.	2988.	6.6	4.0	2.6	70.5	-97.2	19.0	34.3	0.000	0.83	0.39
TargC	15.0	1	650.000	2900.	613.	533.	622.	683.	11.1	0.204	0.160	0.204	0.244	3095.	3144.	7.4	4.4	3.0	71.6	-100.2	12.7	43.4	0.000	0.84	0.41
TargC	15.0	1	650.000	3200.	600.	519.	605.	672.	13.1	0.190	0.155	0.189	0.227	3175.	3198.	8.3	4.9	3.4	75.4	-101.8	9.4	55.4	0.000	0.85	0.43
TargC	15.0	1	650.000	3500.	586.	507.	588.	665.	14.3	0.175	0.146	0.175	0.205	3314.	3351.	9.0	5.2	3.8	75.8	-101.0	5.5	63.5	0.000	0.86	0.45
TargC	15.0	1	700.000	2300.	657.	551.	673.	743.	10.9	0.289	0.217	0.284	0.369	2536.	2548.	6.9	4.1	2.8	77.9	-111.4	39.0	39.0	0.000	0.80	0.33
TargC	15.0	1	700.000	2600.	652.	564.	658.	731.	11.8	0.257	0.200	0.255	0.317	2723.	2737.	7.5	4.4	3.1	79.0	-111.3	28.6	45.6	0.000	0.82	0.36
TargC	15.0	1	700.000	2900.	637.	537.	643.	727.	13.7	0.232	0.185	0.232	0.281	2871.	2900.	8.3	4.9	3.4	82.5	-112.4	22.0	56.6	0.000	0.83	0.38
TargC	15.0	1	700.000	3200.	628.	537.	631.	715.	14.4	0.213	0.175	0.212	0.251	3018.	3026.	8.8	5.1	3.7	83.4	-109.9	13.7	64.3	0.000	0.84	0.41
TargC	15.0	1	700.000	3500.	609.	517.	613.	696.	16.1	0.197	0.166	0.197	0.230	3106.	3153.	9.5	5.5	4.0	84.4	-114.0	10.1	74.9	0.000	0.84	0.42
TargC	15.0	3	400.000	2300.	414.	386.	418.	438.	1.1	0.090	0.065	0.087	0.119	4372.	4514.	1.0	0.9	0.1	35.8	-48.8	0.9	0.9	0.000	0.90	0.57
TargC	15.0	3	400.000	2600.	408.	374.	415.	436.	1.6	0.087	0.060	0.085	0.114	4434.	4552.	1.5	1.3	0.2	36.0	-46.6	0.4	1.8	0.000	0.90	0.58
TargC	15.0	3	400.000	2900.	403.	358.	412.	434.	2.2	0.084	0.060	0.083	0.110	4488.	4605.	1.9	1.6	0.3	37.5	-51.2	0.4	4.5	0.000	0.90	0.58
TargC	15.0	3	400.000	3200.	397.	341.	411.	435.	2.5	0.081	0.058	0.080	0.106	4601.	4719.	2.1	1.7	0.4	37.8	-56.2	0.3	9.1	0.000	0.90	0.59
TargC	15.0	3	400.000	3500.	391.	339.	401.	432.	3.2	0.079	0.058	0.078	0.100	4601.	4690.	2.6	2.0	0.6	39.1	-56.4	0.3	15.1	0.000	0.90	0.59
TargC	15.0	3	450.000	2300.	463.	428.	470.	493.	1.3	0.110	0.077	0.108	0.146	4086.	4190.	1.2	1.0	0.2	40.1	-53.9	2.0	2.0	0.000	0.89	0.54
TargC	15.0	3	450.000	2600.	456.	405.	467.	491.	1.9	0.106	0.072	0.105	0.141	4171.	4267.	1.7	1.4	0.3	41.4	-63.6	1.4	4.3	0.000	0.89	0.55
TargC	15.0	3	450.000	2900.	448.	389.	460.	489.	2.6	0.101	0.072	0.100	0.133	4236.	4327.	2.1	1.7	0.4	43.2	-70.9	1.3	7.8	0.000	0.89	0.55

Method Perc Dur Targ Trig Cmean C10 C50 C90 IAV Fmean F10 F50 F90 Smean S20 Nchange
Nup Ndown Cup Cdown Risk Risk Depl 4+ 7+ lim trig

TargC	15.0	3	450.000	3200.	441.	380.	452.	486.	3.1	0.097	0.070	0.097	0.125	4307.	4389.	2.5	2.0	0.6	44.1	-65.1	1.0	13.4	0.000	0.89	0.56
TargC	15.0	3	450.000	3500.	435.	372.	448.	483.	3.6	0.093	0.068	0.092	0.118	4400.	4456.	2.8	2.1	0.7	45.0	-69.3	0.6	19.2	0.000	0.90	0.57
TargC	15.0	3	500.000	2300.	509.	459.	521.	547.	1.8	0.135	0.091	0.134	0.181	3769.	3859.	1.5	1.2	0.3	46.5	-63.8	4.2	4.2	0.000	0.87	0.50
TargC	15.0	3	500.000	2600.	499.	432.	512.	543.	2.5	0.126	0.086	0.125	0.166	3924.	3991.	2.0	1.6	0.4	48.4	-80.5	3.6	7.4	0.000	0.88	0.52
TargC	15.0	3	500.000	2900.	495.	434.	507.	541.	3.0	0.123	0.088	0.123	0.162	3924.	3998.	2.3	1.8	0.5	49.8	-75.6	2.3	14.2	0.000	0.88	0.52
TargC	15.0	3	500.000	3200.	479.	406.	491.	537.	3.8	0.114	0.081	0.115	0.145	4035.	4090.	2.8	2.1	0.7	51.5	-76.7	1.4	18.8	0.000	0.89	0.54
TargC	15.0	3	500.000	3500.	473.	397.	481.	534.	4.4	0.110	0.081	0.108	0.140	4101.	4173.	3.0	2.2	0.8	53.5	-80.9	1.1	28.5	0.000	0.89	0.55
TargC	15.0	3	550.000	2300.	551.	480.	566.	598.	2.3	0.166	0.109	0.162	0.224	3446.	3537.	1.8	1.4	0.4	53.5	-86.3	9.9	9.9	0.001	0.86	0.46
TargC	15.0	3	550.000	2600.	538.	452.	556.	593.	3.1	0.152	0.103	0.150	0.203	3586.	3672.	2.3	1.8	0.6	55.4	-86.8	6.5	13.9	0.000	0.86	0.48
TargC	15.0	3	550.000	2900.	529.	448.	544.	592.	3.6	0.141	0.098	0.140	0.181	3743.	3778.	2.7	2.0	0.7	56.2	-86.0	4.3	18.7	0.000	0.87	0.50
TargC	15.0	3	550.000	3200.	521.	430.	536.	587.	4.1	0.135	0.096	0.134	0.175	3793.	3820.	2.9	2.1	0.8	57.2	-88.9	3.4	28.5	0.000	0.88	0.51
TargC	15.0	3	550.000	3500.	507.	421.	515.	583.	5.0	0.127	0.094	0.127	0.161	3889.	3933.	3.2	2.2	1.0	61.9	-95.0	2.5	37.4	0.000	0.88	0.52
TargC	15.0	3	600.000	2300.	583.	484.	608.	649.	3.1	0.195	0.125	0.192	0.266	3201.	3240.	2.2	1.6	0.6	60.0	-100.2	15.6	15.6	0.000	0.84	0.43
TargC	15.0	3	600.000	2600.	572.	470.	592.	642.	3.9	0.178	0.119	0.177	0.236	3339.	3399.	2.6	1.9	0.7	63.7	-103.1	11.9	22.0	0.000	0.85	0.45
TargC	15.0	3	600.000	2900.	560.	456.	577.	640.	4.5	0.166	0.115	0.165	0.217	3447.	3473.	3.0	2.1	0.9	64.2	-105.8	8.8	28.8	0.000	0.86	0.47
TargC	15.0	3	600.000	3200.	552.	458.	561.	632.	5.2	0.154	0.110	0.154	0.197	3588.	3604.	3.2	2.3	0.9	68.2	-107.2	4.9	36.6	0.000	0.87	0.48
TargC	15.0	3	600.000	3500.	540.	451.	546.	626.	5.7	0.145	0.106	0.143	0.186	3672.	3677.	3.4	2.4	1.1	70.0	-105.3	3.4	46.5	0.000	0.87	0.50
TargC	15.0	3	650.000	2300.	611.	478.	638.	697.	4.2	0.232	0.145	0.225	0.321	2921.	2936.	2.6	1.8	0.8	69.7	-121.2	25.1	25.1	0.002	0.83	0.39
TargC	15.0	3	650.000	2600.	603.	490.	621.	690.	4.8	0.205	0.142	0.202	0.276	3132.	3146.	2.9	2.1	0.9	71.6	-122.0	17.9	29.9	0.000	0.84	0.42
TargC	15.0	3	650.000	2900.	592.	480.	608.	684.	5.2	0.190	0.128	0.188	0.251	3265.	3295.	3.2	2.2	1.0	72.0	-117.4	12.1	37.0	0.000	0.85	0.44
TargC	15.0	3	650.000	3200.	583.	480.	591.	679.	5.8	0.176	0.125	0.177	0.226	3383.	3412.	3.4	2.3	1.1	76.1	-117.5	9.0	46.0	0.001	0.85	0.45
TargC	15.0	3	650.000	3500.	564.	462.	571.	663.	6.6	0.163	0.118	0.165	0.207	3465.	3522.	3.6	2.3	1.3	80.7	-123.1	5.9	56.8	0.000	0.86	0.47
TargC	15.0	3	700.000	2300.	641.	502.	668.	746.	5.2	0.275	0.178	0.266	0.384	2666.	2665.	2.8	1.8	1.0	81.0	-139.4	35.1	35.1	0.001	0.81	0.35
TargC	15.0	3	700.000	2600.	628.	491.	648.	735.	5.7	0.241	0.159	0.239	0.323	2860.	2887.	3.2	2.1	1.1	81.8	-137.6	26.5	40.8	0.001	0.82	0.38
TargC	15.0	3	700.000	2900.	617.	487.	630.	725.	6.1	0.219	0.145	0.218	0.291	3029.	3001.	3.4	2.2	1.1	83.2	-135.0	20.3	48.3	0.000	0.83	0.41
TargC	15.0	3	700.000	3200.	609.	492.	617.	716.	6.7	0.199	0.144	0.197	0.257	3199.	3204.	3.5	2.4	1.2	87.7	-136.3	12.9	54.5	0.000	0.84	0.43
TargC	15.0	3	700.000	3500.	591.	480.	595.	700.	7.3	0.186	0.133	0.185	0.237	3268.	3270.	3.7	2.4	1.3	91.3	-138.0	11.0	65.1	0.000	0.85	0.44
TargC	25.0	1	400.000	2300.	421.	403.	422.	440.	1.0	0.094	0.067	0.093	0.124	4312.	4491.	0.9	0.5	0.4	41.0	-47.3	0.8	0.8	0.000	0.89	0.56
TargC	25.0	1	400.000	2600.	419.	397.	421.	439.	1.9	0.092	0.068	0.092	0.119	4307.	4488.	1.5	0.9	0.7	42.6	-49.7	0.9	2.3	0.000	0.89	0.56
TargC	25.0	1	400.000	2900.	416.	393.	419.	438.	2.8	0.090	0.067	0.089	0.115	4375.	4562.	2.3	1.3	1.0	42.5	-47.4	0.3	5.4	0.000	0.90	0.57
TargC	25.0	1	400.000	3200.	413.	384.	415.	436.	4.2	0.087	0.065	0.086	0.109	4443.	4602.	3.3	1.9	1.4	44.6	-51.6	0.2	9.6	0.000	0.90	0.57
TargC	25.0	1	400.000	3500.	406.	373.	410.	434.	5.9	0.084	0.064	0.084	0.104	4470.	4617.	4.4	2.5	1.9	45.6	-53.7	0.3	17.4	0.000	0.90	0.58
TargC	25.0	1	450.000	2300.	472.	450.	474.	494.	1.8	0.117	0.083	0.115	0.152	3943.	4097.	1.5	0.9	0.6	46.8	-55.4	2.6	2.6	0.000	0.88	0.52
TargC	25.0	1	450.000	2600.	468.	443.	470.	492.	2.8	0.113	0.081	0.113	0.145	4014.	4176.	2.2	1.3	0.9	49.2	-55.8	2.1	4.9	0.000	0.88	0.53
TargC	25.0	1	450.000	2900.	464.	434.	466.	489.	4.0	0.109	0.081	0.109	0.137	4085.	4235.	3.2	1.8	1.4	49.7	-56.8	0.8	8.6	0.000	0.89	0.54
TargC	25.0	1	450.000	3200.	457.	422.	462.	488.	5.8	0.105	0.078	0.105	0.130	4162.	4305.	4.2	2.4	1.9	52.8	-60.7	0.9	16.0	0.000	0.89	0.55
TargC	25.0	1	450.000	3500.	449.	405.	455.	484.	7.3	0.099	0.078	0.100	0.120	4234.	4364.	5.1	2.9	2.2	53.2	-64.4	0.4	23.6	0.000	0.89	0.56
TargC	25.0	1	500.000	2300.	521.	495.	525.	548.	2.7	0.144	0.101	0.142	0.187	3636.	3747.	2.1	1.2	0.9	54.8	-62.6	5.4	5.4	0.000	0.87	0.49
TargC	25.0	1	500.000	2600.	515.	482.	519.	544.	4.0	0.137	0.100	0.137	0.173	3717.	3851.	3.1	1.7	1.3	55.2	-65.1	3.5	8.6	0.000	0.87	0.50
TargC	25.0	1	500.000	2900.	508.	466.	514.	540.	5.7	0.131	0.097	0.131	0.164	3791.	3919.	4.1	2.3	1.8	58.3	-68.9	2.4	16.2	0.000	0.88	0.51
TargC	25.0	1	500.000	3200.	500.	451.	506.	538.	7.2	0.124	0.095	0.124	0.149	3889.	3975.	5.1	2.9	2.2	59.4	-71.3	1.2	22.1	0.000	0.88	0.52
TargC	25.0	1	500.000	3500.	490.	435.	496.	534.	9.2	0.117	0.092	0.118	0.140	3984.	4098.	6.2	3.5	2.7	60.9	-73.1	1.1	32.1	0.000	0.88	0.53
TargC	25.0	1	550.000	2300.	565.	524.	571.	599.	4.3	0.174	0.121	0.172	0.228	3347.	3450.	3.2	1.8	1.4	63.5	-72.1	9.9	9.9	0.000	0.85	0.45
TargC	25.0	1	550.000	2600.	558.	509.	565.	596.	5.9	0.165	0.118	0.164	0.211	3439.	3552.	4.1	2.3	1.8	64.9	-78.9	7.3	15.8	0.000	0.86	0.46
TargC	25.0	1	550.000	2900.	549.	497.	555.	593.	7.4	0.155	0.120	0.156	0.189	3509.	3604.	5.1	2.9	2.3	65.5	-77.5	4.4	23.6	0.000	0.86	0.47
TargC	25.0	1	550.000	3200.	541.	485.	547.	587.	9.0	0.144	0.112	0.146	0.175	3660.	3743.	6.0	3.4	2.6	67.7	-79.3	2.5	31.3	0.000	0.87	0.49
TargC	25.0	1	550.000	3500.	529.	464.	535.	582.	10.8	0.137	0.110	0.137	0.162	3734.	3808.	6.9	3.9	3.0	69.5	-82.5	1.8	43.5	0.000	0.87	0.50
TargC	25.0	1	600.000	2300.	603.	545.	613.	648.	6.5	0.210	0.150	0.208	0.267	3032.	3119.	4.3	2.5	1.9	72.8	-87.9	17.5	17.5	0.000	0.83	0.40
TargC	25.0	1	600.000	2600.	594.	529.	603.	645.	7.9	0.193	0.142	0.195	0.245	3183.	3256.	5.2	2.9	2.2	73.6	-89.4	13.1	25.6	0.000	0.84	0.42
TargC	25.0	1	600.000	2900.	585.	517.	594.	642.	9.7	0.179	0.141	0.180	0.218	3287.	3330.	6.1	3.4	2.7	76.7	-91.0	8.0	32.8	0.000	0.85	0.44
TargC	25.0	1	600.000	3200.	574.	497.	581.	634.	11.5	0.169	0.135	0.169	0.201	3384.	3433.	7.2	4.0	3.2	77.1	-93.0	5.7	45.2	0.000	0.86	0.46
TargC	25.0	1	600.000	3500.	562.	494.	565.	626.	12.9	0.157	0.129	0.157	0.185	3501.	3538.	7.9	4.4	3.6	78.6	-91.2	2.8	54.2	0.000	0.87	0.47
TargC	25.0	1	650.000	2300.	635.	554.	650.	697.	8.8	0.250	0.183	0.248	0.322	2758.	2818.	5.4	3.1	2.4	81.5	-99.5	28.6	28.6	0.000	0.82	0.36
TargC	25.0	1	650.000	2600.	625.	541.	638.	694.	10.4	0.228	0.174	0.228	0.283	2896.	2911.	6.4	3.6	2.8	82.7	-101.1	21.4	37.0	0.000	0.83	0.39
TargC	25.0	1	650.000	2900.	616.	542.	624.	684.	12.0	0.208	0.171	0.208	0.249	3031.	3084.	7.3	4.1	3.2	84.3	-101.1	13.8	45.7	0.000	0.84	0.41
TargC	25.0	1	650.000	3200.	602.	523.	606.	676.	13.6	0.192	0.156	0.193	0.228	3163.	3215.	8.0	4.5	3.5	85.8	-103.8	9.8	55.6	0.000	0.85	0.43
TargC	25.0	1	650.000	3500.	591.	512.	592.	668.	14.7	0.177	0.148	0.177	0.205	3316.	3348.	8.6	4.8	3.8	85.9	-103.4	5.2	64.4	0.000	0.86	0.45
TargC	25.0	1	700.000	2300.	657.	554.	675.	743.	11.9	0.294	0.220	0.294	0.368	2496.	2537.	6.6	3.7	2.9	93.1	-114.1	41.7	41.7	0.000	0.80	0.32

Method Perc Dur Targ Trig Cmean C10 C50 C90 IAV Fmean F10 F50 F90 Smean S20 Nchange
Nup Ndown Cup Cdown Risk Risk Depl 4+ 7+ lim trig

TargC	25.0	1	700.000	2600.	650.	550.	662.	736.	13.1	0.263	0.205	0.263	0.319	2664.	2673.	7.5	4.2	3.3	92.9	-113.8	32.2	49.7	0.000	0.81	0.35
TargC	25.0	1	700.000	2900.	641.	542.	654.	727.	14.3	0.238	0.194	0.237	0.282	2823.	2854.	8.1	4.5	3.6	94.2	-113.6	22.4	58.5	0.000	0.83	0.38
TargC	25.0	1	700.000	3200.	628.	540.	633.	711.	16.0	0.216	0.179	0.216	0.256	2982.	3040.	8.8	4.9	3.9	96.9	-115.9	13.9	67.5	0.000	0.83	0.40
TargC	25.0	1	700.000	3500.	611.	521.	616.	705.	17.4	0.199	0.167	0.197	0.232	3100.	3165.	9.2	5.1	4.1	98.0	-117.1	10.2	75.1	0.000	0.84	0.42
TargC	25.0	3	400.000	2300.	420.	400.	422.	440.	0.9	0.092	0.066	0.090	0.119	4360.	4518.	0.7	0.5	0.1	46.1	-51.0	1.2	1.2	0.000	0.90	0.57
TargC	25.0	3	400.000	2600.	417.	393.	420.	440.	1.3	0.090	0.065	0.088	0.117	4396.	4541.	1.0	0.7	0.2	46.5	-53.5	0.9	2.7	0.000	0.90	0.57
TargC	25.0	3	400.000	2900.	413.	382.	418.	438.	1.9	0.087	0.064	0.086	0.111	4464.	4593.	1.3	1.0	0.3	47.5	-58.9	0.6	4.5	0.000	0.90	0.58
TargC	25.0	3	400.000	3200.	409.	371.	414.	437.	2.4	0.084	0.063	0.084	0.108	4511.	4625.	1.7	1.2	0.5	48.3	-56.0	0.4	9.2	0.000	0.90	0.58
TargC	25.0	3	400.000	3500.	400.	355.	408.	433.	3.4	0.082	0.061	0.082	0.104	4518.	4625.	2.2	1.5	0.7	50.3	-59.0	0.2	17.6	0.000	0.90	0.59
TargC	25.0	3	450.000	2300.	468.	443.	471.	494.	1.2	0.114	0.080	0.111	0.152	4022.	4179.	0.9	0.7	0.2	52.2	-59.0	2.6	2.6	0.000	0.88	0.53
TargC	25.0	3	450.000	2600.	464.	427.	469.	493.	1.8	0.109	0.079	0.106	0.145	4102.	4192.	1.3	0.9	0.4	54.9	-60.2	1.8	4.7	0.000	0.89	0.54
TargC	25.0	3	450.000	2900.	459.	416.	466.	490.	2.4	0.105	0.077	0.104	0.134	4193.	4292.	1.7	1.2	0.5	55.3	-63.0	1.1	8.0	0.000	0.89	0.55
TargC	25.0	3	450.000	3200.	451.	402.	460.	488.	3.2	0.100	0.074	0.100	0.127	4275.	4356.	2.0	1.4	0.6	57.3	-72.7	0.8	14.1	0.000	0.89	0.56
TargC	25.0	3	450.000	3500.	446.	390.	454.	486.	3.8	0.097	0.073	0.096	0.123	4322.	4396.	2.4	1.6	0.8	58.3	-70.2	0.5	22.4	0.000	0.90	0.57
TargC	25.0	3	500.000	2300.	513.	477.	521.	547.	1.9	0.139	0.096	0.137	0.186	3718.	3865.	1.3	0.9	0.3	60.7	-71.6	5.1	5.1	0.000	0.87	0.49
TargC	25.0	3	500.000	2600.	509.	462.	518.	544.	2.3	0.131	0.092	0.129	0.172	3835.	3909.	1.5	1.1	0.5	61.4	-75.1	3.6	7.9	0.000	0.88	0.51
TargC	25.0	3	500.000	2900.	501.	446.	511.	543.	3.2	0.126	0.091	0.125	0.161	3891.	3998.	2.0	1.4	0.6	62.9	-76.6	2.4	14.5	0.000	0.88	0.52
TargC	25.0	3	500.000	3200.	495.	431.	505.	541.	3.8	0.119	0.088	0.118	0.152	4011.	4067.	2.4	1.7	0.7	64.4	-79.3	1.7	20.4	0.000	0.88	0.53
TargC	25.0	3	500.000	3500.	483.	412.	493.	534.	4.5	0.112	0.085	0.112	0.140	4090.	4147.	2.7	1.8	0.9	65.6	-81.4	1.4	29.1	0.000	0.89	0.54
TargC	25.0	3	550.000	2300.	556.	504.	569.	599.	2.6	0.169	0.113	0.165	0.224	3417.	3505.	1.5	1.0	0.5	72.7	-85.9	9.9	9.9	0.000	0.86	0.46
TargC	25.0	3	550.000	2600.	547.	476.	561.	598.	3.3	0.159	0.113	0.155	0.210	3492.	3568.	2.0	1.4	0.6	72.2	-88.6	8.0	15.8	0.000	0.86	0.47
TargC	25.0	3	550.000	2900.	543.	478.	555.	594.	3.7	0.148	0.109	0.146	0.190	3658.	3709.	2.3	1.5	0.7	72.3	-87.1	4.8	20.4	0.000	0.87	0.49
TargC	25.0	3	550.000	3200.	532.	456.	543.	590.	4.7	0.140	0.104	0.139	0.179	3736.	3752.	2.7	1.8	0.9	74.3	-94.3	3.4	30.6	0.000	0.87	0.50
TargC	25.0	3	550.000	3500.	520.	437.	531.	586.	5.1	0.131	0.098	0.131	0.163	3835.	3848.	2.9	1.9	1.0	74.2	-94.2	2.0	39.6	0.000	0.88	0.52
TargC	25.0	3	600.000	2300.	594.	515.	611.	653.	3.6	0.204	0.137	0.199	0.274	3106.	3186.	2.0	1.3	0.7	82.3	-104.0	18.4	18.4	0.001	0.84	0.42
TargC	25.0	3	600.000	2600.	585.	498.	602.	647.	4.1	0.188	0.135	0.184	0.243	3236.	3295.	2.4	1.6	0.8	79.6	-103.4	12.3	22.6	0.001	0.85	0.44
TargC	25.0	3	600.000	2900.	572.	478.	586.	642.	4.9	0.173	0.127	0.171	0.221	3368.	3408.	2.7	1.8	1.0	82.6	-106.8	8.5	31.6	0.000	0.86	0.46
TargC	25.0	3	600.000	3200.	569.	479.	580.	640.	5.4	0.161	0.120	0.159	0.204	3534.	3555.	3.0	1.9	1.1	83.1	-107.8	5.1	38.6	0.000	0.86	0.48
TargC	25.0	3	600.000	3500.	552.	460.	560.	628.	6.1	0.151	0.114	0.149	0.188	3595.	3607.	3.2	2.0	1.2	85.6	-108.2	3.5	49.5	0.000	0.87	0.49
TargC	25.0	3	650.000	2300.	621.	504.	648.	699.	4.7	0.240	0.162	0.234	0.318	2849.	2870.	2.4	1.5	0.9	91.2	-120.2	26.2	26.2	0.000	0.82	0.38
TargC	25.0	3	650.000	2600.	616.	521.	629.	693.	5.2	0.217	0.155	0.214	0.284	3013.	3038.	2.8	1.8	1.0	90.4	-119.2	19.3	33.4	0.000	0.83	0.41
TargC	25.0	3	650.000	2900.	600.	495.	611.	687.	5.9	0.200	0.145	0.199	0.255	3117.	3164.	3.1	1.9	1.1	92.0	-121.1	14.9	42.7	0.001	0.84	0.42
TargC	25.0	3	650.000	3200.	593.	490.	606.	681.	6.5	0.186	0.139	0.185	0.237	3249.	3275.	3.3	2.0	1.2	94.9	-121.0	9.8	51.4	0.000	0.85	0.44
TargC	25.0	3	650.000	3500.	583.	486.	590.	673.	6.9	0.171	0.131	0.170	0.211	3411.	3420.	3.5	2.1	1.4	95.6	-121.4	6.0	58.2	0.000	0.86	0.46
TargC	25.0	3	700.000	2300.	644.	505.	672.	744.	5.9	0.284	0.190	0.278	0.384	2597.	2598.	2.7	1.6	1.1	103.1	-144.2	37.5	37.5	0.001	0.81	0.34
TargC	25.0	3	700.000	2600.	643.	517.	664.	741.	6.1	0.254	0.177	0.251	0.329	2773.	2792.	3.0	1.8	1.2	101.2	-134.9	29.1	44.8	0.001	0.82	0.37
TargC	25.0	3	700.000	2900.	625.	511.	635.	726.	6.9	0.227	0.164	0.222	0.294	2940.	2944.	3.3	2.0	1.3	104.4	-141.8	22.4	51.7	0.001	0.83	0.40
TargC	25.0	3	700.000	3200.	622.	513.	627.	728.	7.1	0.208	0.155	0.206	0.264	3107.	3066.	3.4	2.0	1.3	106.7	-136.2	15.2	58.9	0.000	0.84	0.42
TargC	25.0	3	700.000	3500.	601.	486.	604.	710.	7.8	0.190	0.144	0.188	0.240	3206.	3213.	3.6	2.1	1.4	108.7	-139.0	10.4	68.0	0.000	0.85	0.44

TAC rule, Constraint on TAC variation at all levels of SSB

Method Perc Dur Targ Trig Cmean C10 C50 C90 IAV Fmean F10 F50 F90 Smean S20 Nchange
Nup Ndown Cup Cdown Risk Risk Depl 4+ 7+ lim trig

TargC	5.0	1	400.000	2300.	413.	397.	421.	440.	1.0	0.134	0.066	0.098	0.136	4125.	4372.	1.9	1.1	0.8	13.1	-16.3	4.9	4.9	0.016	0.89	0.54
TargC	5.0	1	400.000	2600.	411.	393.	420.	438.	1.4	0.132	0.069	0.096	0.129	4086.	4325.	2.9	1.7	1.1	13.5	-16.4	4.6	7.0	0.016	0.89	0.54
TargC	5.0	1	400.000	2900.	406.	381.	417.	438.	1.9	0.134	0.067	0.093	0.124	4154.	4358.	4.0	2.4	1.6	13.8	-15.7	4.9	11.3	0.016	0.89	0.55
TargC	5.0	1	400.000	3200.	404.	372.	414.	436.	2.1	0.120	0.067	0.092	0.117	4193.	4422.	5.2	3.1	2.0	13.9	-16.2	3.9	15.7	0.014	0.89	0.55
TargC	5.0	1	400.000	3500.	396.	355.	410.	433.	2.8	0.133	0.067	0.089	0.115	4190.	4428.	6.3	3.7	2.6	14.1	-16.1	4.6	23.9	0.021	0.89	0.56
TargC	5.0	1	450.000	2300.	460.	440.	472.	493.	1.4	0.161	0.082	0.116	0.163	3853.	4065.	2.6	1.7	0.9	14.8	-17.4	6.1	6.1	0.019	0.88	0.51
TargC	5.0	1	450.000	2600.	459.	435.	469.	491.	1.5	0.141	0.082	0.114	0.154	3899.	4089.	3.6	2.3	1.3	14.9	-17.5	5.1	8.4	0.011	0.88	0.52
TargC	5.0	1	450.000	2900.	452.	411.	465.	492.	2.2	0.151	0.080	0.111	0.146	3940.	4121.	4.9	3.1	1.8	15.5	-17.7	5.0	13.5	0.019	0.88	0.52
TargC	5.0	1	450.000	3200.	446.	395.	460.	486.	2.7	0.140	0.080	0.108	0.137	3968.	4146.	6.3	3.9	2.3	15.8	-17.9	4.4	20.6	0.012	0.88	0.53
TargC	5.0	1	450.000	3500.	438.	381.	453.	482.	3.2	0.132	0.080	0.103	0.129	4048.	4218.	7.4	4.5	2.8	16.0	-18.0	3.7	29.6	0.012	0.89	0.54
TargC	5.0	1	500.000	2300.	512.	486.	525.	548.	1.5	0.178	0.102	0.142	0.201	3553.	3702.	3.4	2.1	1.3	16.6	-19.3	8.7	8.7	0.014	0.86	0.48
TargC	5.0	1	500.000	2600.	501.	453.	517.	545.	2.0	0.163	0.099	0.138	0.185	3611.	3792.	4.8	3.1	1.7	17.0	-19.7	7.9	13.7	0.016	0.87	0.49
TargC	5.0	1	500.000	2900.	495.	436.	513.	543.	2.5	0.156	0.100	0.134	0.172	3657.	3807.	6.0	3.9	2.1	17.4	-19.8	6.4	20.6	0.009	0.87	0.50
TargC	5.0	1	500.000	3200.	483.	418.	504.	538.	3.1	0.162	0.095	0.125	0.163	3745.	3882.	7.2	4.6	2.6	17.8	-19.4	5.8	28.5	0.021	0.88	0.51
TargC	5.0	1	500.000	3500.	476.	403.	495.	535.	3.4	0.143	0.093	0.119	0.149	3858.	4016.	8.0	5.1	3.0	17.9	-19.6	5.0	35.8	0.010	0.88	0.52
TargC	5.0	1	550.000	2300.	552.	510.	570.	600.	2.0	0.208	0.128	0.176	0.243	3212.	3359.	4.6	2.9	1.7	18.8	-21.5	14.2	14.2	0.013	0.85	0.44
TargC	5.0	1	550.000	2600.	542.	473.	564.	597.	2.5	0.196	0.121	0.166	0.218	3313.	3431.	6.0	3.8	2.2	19.0	-21.0	11.2	19.7	0.015	0.85	0.45
TargC	5.0	1	550.000	2900.	530.	452.	556.	595.	3.1	0.197	0.113	0.154	0.203	3440.	3541.	6.9	4.3	2.6	19.4	-21.5	10.0	27.1	0.020	0.86	0.47
TargC	5.0	1	550.000	3200.	524.	445.	547.	587.	3.6	0.183	0.111	0.146	0.189	3545.	3655.	8.0	5.0	2.9	19.7	-21.8	7.1	34.9	0.016	0.87	0.48
TargC	5.0	1	550.000	3500.	502.	410.	527.	582.	4.1	0.188	0.103	0.134	0.178	3604.	3704.	9.0	5.6	3.4	19.8	-21.0	7.5	44.5	0.023	0.87	0.50
TargC	5.0	1	600.000	2300.	597.	523.	618.	652.	2.4	0.242	0.147	0.212	0.298	2989.	3037.	5.6	3.4	2.3	20.9	-24.1	21.9	21.9	0.013	0.83	0.41
TargC	5.0	1	600.000	2600.	576.	493.	605.	645.	3.2	0.248	0.140	0.194	0.273	3070.	3123.	6.9	4.2	2.8	21.2	-23.0	17.9	28.8	0.027	0.84	0.42
TargC	5.0	1	600.000	2900.	569.	479.	594.	643.	3.3	0.203	0.134	0.178	0.234	3242.	3317.	7.8	4.9	3.0	21.5	-23.5	12.7	36.1	0.014	0.85	0.45
TargC	5.0	1	600.000	3200.	555.	453.	577.	638.	3.8	0.195	0.127	0.166	0.218	3337.	3410.	8.8	5.4	3.3	21.6	-23.0	11.2	44.0	0.012	0.86	0.46
TargC	5.0	1	600.000	3500.	543.	443.	560.	628.	4.0	0.172	0.116	0.153	0.198	3484.	3517.	9.5	6.0	3.5	21.6	-23.2	7.8	52.7	0.008	0.86	0.48
TargC	5.0	1	650.000	2300.	621.	504.	659.	700.	3.1	0.310	0.169	0.250	0.381	2709.	2717.	6.8	3.9	2.9	22.5	-25.6	31.9	31.9	0.030	0.81	0.37
TargC	5.0	1	650.000	2600.	612.	497.	645.	697.	3.5	0.276	0.162	0.228	0.308	2861.	2854.	7.8	4.7	3.1	23.2	-25.2	23.3	36.6	0.023	0.83	0.40
TargC	5.0	1	650.000	2900.	600.	493.	626.	688.	3.9	0.245	0.152	0.208	0.269	3007.	3010.	8.8	5.4	3.5	23.3	-25.3	17.9	45.0	0.017	0.84	0.42
TargC	5.0	1	650.000	3200.	585.	469.	610.	680.	4.2	0.231	0.145	0.190	0.251	3131.	3139.	9.5	5.8	3.7	23.4	-24.8	14.7	53.1	0.020	0.85	0.43
TargC	5.0	1	650.000	3500.	568.	453.	588.	672.	4.5	0.214	0.132	0.171	0.227	3286.	3296.	9.8	6.0	3.8	23.1	-24.4	10.8	61.3	0.019	0.86	0.46
TargC	5.0	1	700.000	2300.	656.	533.	692.	749.	3.6	0.369	0.203	0.297	0.454	2460.	2406.	7.8	4.2	3.6	24.5	-28.3	42.8	42.8	0.036	0.79	0.33
TargC	5.0	1	700.000	2600.	642.	502.	676.	741.	3.9	0.311	0.183	0.264	0.378	2649.	2581.	8.7	4.9	3.7	25.1	-27.4	33.5	48.3	0.021	0.81	0.36
TargC	5.0	1	700.000	2900.	623.	494.	657.	731.	4.5	0.301	0.174	0.235	0.334	2789.	2746.	9.3	5.4	3.9	25.1	-26.6	25.3	55.0	0.031	0.82	0.39
TargC	5.0	1	700.000	3200.	615.	502.	638.	726.	4.6	0.266	0.163	0.211	0.293	2971.	2936.	9.8	5.8	4.0	25.1	-26.7	18.8	61.3	0.024	0.84	0.41
TargC	5.0	1	700.000	3500.	588.	453.	609.	712.	4.7	0.233	0.142	0.190	0.257	3114.	3107.	10.3	6.2	4.0	24.5	-25.7	14.6	68.0	0.018	0.85	0.43
TargC	5.0	3	400.000	2300.	412.	402.	423.	442.	1.7	0.215	0.070	0.101	0.162	3899.	4209.	2.5	0.1	2.4	14.3	-16.7	9.1	9.1	0.043	0.87	0.51
TargC	5.0	3	400.000	2600.	414.	401.	423.	442.	1.5	0.199	0.070	0.102	0.165	3858.	4141.	2.6	0.2	2.4	14.9	-17.4	9.4	12.5	0.045	0.87	0.51
TargC	5.0	3	400.000	2900.	411.	400.	422.	441.	1.7	0.207	0.071	0.103	0.167	3852.	4151.	2.9	0.3	2.6	14.4	-17.1	9.6	18.0	0.042	0.87	0.51
TargC	5.0	3	400.000	3200.	412.	399.	421.	439.	1.7	0.202	0.070	0.102	0.161	3863.	4167.	3.0	0.4	2.7	14.1	-18.4	9.2	25.5	0.041	0.87	0.51
TargC	5.0	3	400.000	3500.	412.	399.	420.	440.	1.7	0.187	0.071	0.102	0.153	3892.	4175.	3.2	0.4	2.8	14.1	-18.3	8.6	34.9	0.040	0.87	0.51
TargC	5.0	3	450.000	2300.	459.	439.	473.	494.	1.1	0.216	0.085	0.121	0.192	3669.	3871.	1.4	0.7	0.7	13.9	-25.4	10.3	10.3	0.045	0.86	0.49
TargC	5.0	3	450.000	2600.	458.	434.	471.	494.	1.2	0.211	0.083	0.118	0.175	3733.	3907.	1.8	0.9	0.9	13.9	-24.8	8.7	12.8	0.041	0.87	0.50
TargC	5.0	3	450.000	2900.	453.	420.	468.	491.	1.6	0.222	0.084	0.119	0.178	3688.	3905.	2.4	1.2	1.2	14.3	-22.4	9.9	19.9	0.046	0.87	0.50
TargC	5.0	3	450.000	3200.	449.	414.	463.	489.	1.6	0.211	0.082	0.116	0.172	3755.	4002.	2.7	1.3	1.4	14.8	-21.6	9.3	28.3	0.042	0.87	0.50
TargC	5.0	3	450.000	3500.	444.	409.	459.	487.	2.0	0.216	0.082	0.114	0.166	3749.	3956.	3.1	1.3	1.7	15.4	-21.9	9.1	38.8	0.041	0.87	0.51
TargC	5.0	3	500.000	2300.	506.	465.	522.	548.	1.1	0.224	0.101	0.145	0.224	3467.	3617.	1.8	1.0	0.8	16.3	-24.1	12.4	12.4	0.036	0.86	0.47
TargC	5.0	3	500.000	2600.	501.	450.	517.	545.	1.4	0.230	0.101	0.143	0.216	3461.	3624.	2.4	1.4	1.0	16.6	-25.6	11.9	17.5	0.042	0.86	0.47
TargC	5.0	3	500.000	2900.	488.	426.	512.	541.	1.9	0.252	0.099	0.139	0.212	3450.	3615.	3.0	1.6	1.3	17.5	-24.4	12.5	26.6	0.050	0.86	0.47
TargC	5.0	3	500.000	3200.	478.	415.	502.	540.	2.3	0.267	0.098	0.133	0.208	3488.	3630.	3.3	1.7	1.6	17.7	-22.8	12.9	35.5	0.057	0.86	0.48
TargC	5.0	3	500.000	3500.	477.	419.	495.	536.	2.1	0.229	0.096	0.128	0.186	3580.	3770.	3.5	1.8	1.7	18.4	-22.9	10.0	44.4	0.046	0.86	0.49
TargC	5.0	3	550.000	2300.	544.	483.	567.	600.	1.7	0.274	0.117	0.171	0.266	3232.	3315.	2.6	1.6	0.9	18.9	-27.4	15.8	15.8	0.047	0.84	0.44
TargC	5.0	3	550.000	2600.	535.	460.	560.	595.	1.9	0.260	0.117	0.164	0.268	3275.	3376.	3.1	2.0	1.1	19.4	-26.0	15.1	22.6	0.044	0.85	0.45
TargC	5.0	3	550.000	2900.	527.	452.	550.	589.	1.9	0.236	0.113	0.157	0.226	3345.	3465.	3.4	2.2	1.2	20.2	-26.2	12.6	30.6	0.033	0.85	0.46
TargC	5.0	3	550.000	3200.	514.	442.	534.	584.	2.2	0.245	0.109	0.149	0.227	3372.	3494.	3.7	2.2	1.5	20.6	-23.5	12.8	40.1	0.039	0.86	0.47
TargC	5.0	3	550.000	3500.	499.	429.	513.	573.	2.3	0.233	0.105	0.140	0.203	3467.	3629.	3.9	2.3	1.7	20.8	-23.7	10.7	50.1	0.041	0.86	0.48
TargC	5.0	3	600.000	2300.	571.	464.	605.	647.	2.2	0.317	0.132	0.194	0.335	3026.	3064.	3.2	2.1	1.1	23.6	-26.4	21.0	21.0	0.054	0.83	0.42

Method Perc Dur Targ Trig Cmean C10 C50 C90 IAV Fmean F10 F50 F90 Smean S20 Nchange
Nup Ndown Cup Cdown Risk Risk Depl 4+ 7+ lim trig

TargC	5.0	3	600.000	2600.	564.	479.	589.	640.	2.1	0.275	0.129	0.179	0.284	3141.	3169.	3.5	2.4	1.1	23.8	-26.7	17.9	27.6	0.041	0.84	0.43
TargC	5.0	3	600.000	2900.	553.	466.	573.	633.	2.1	0.250	0.122	0.168	0.264	3240.	3284.	3.7	2.5	1.2	23.7	-24.6	15.5	34.8	0.032	0.85	0.45
TargC	5.0	3	600.000	3200.	532.	441.	553.	622.	2.5	0.274	0.118	0.161	0.251	3258.	3335.	3.9	2.5	1.5	23.4	-25.3	14.5	44.8	0.048	0.85	0.45
TargC	5.0	3	600.000	3500.	523.	444.	535.	616.	2.4	0.247	0.113	0.150	0.230	3381.	3489.	4.0	2.5	1.6	23.2	-25.1	12.4	52.9	0.040	0.85	0.47
TargC	5.0	3	650.000	2300.	595.	488.	627.	681.	2.6	0.341	0.146	0.213	0.379	2893.	2849.	4.0	2.9	1.0	25.5	-30.2	24.6	24.6	0.056	0.83	0.40
TargC	5.0	3	650.000	2600.	580.	493.	607.	677.	2.6	0.323	0.136	0.199	0.349	3004.	2981.	4.1	2.9	1.2	25.4	-28.1	22.1	32.0	0.055	0.83	0.42
TargC	5.0	3	650.000	2900.	566.	474.	586.	663.	2.6	0.293	0.129	0.184	0.294	3124.	3135.	4.1	2.9	1.2	25.2	-27.2	18.1	38.9	0.045	0.84	0.43
TargC	5.0	3	650.000	3200.	551.	451.	572.	649.	2.7	0.293	0.124	0.175	0.272	3166.	3173.	4.2	2.8	1.4	25.1	-25.7	16.5	49.5	0.049	0.85	0.45
TargC	5.0	3	650.000	3500.	532.	443.	546.	636.	2.6	0.274	0.120	0.161	0.253	3261.	3337.	4.2	2.7	1.5	24.2	-24.7	14.7	58.3	0.046	0.85	0.45
TargC	5.0	3	700.000	2300.	610.	495.	643.	701.	2.8	0.362	0.151	0.229	0.412	2834.	2709.	4.2	3.3	1.0	28.4	-30.7	28.1	28.1	0.064	0.82	0.39
TargC	5.0	3	700.000	2600.	595.	505.	619.	689.	2.7	0.327	0.144	0.206	0.343	2959.	2876.	4.2	3.2	1.1	27.6	-29.9	21.8	32.9	0.053	0.83	0.41
TargC	5.0	3	700.000	2900.	582.	481.	604.	687.	2.6	0.318	0.137	0.196	0.322	3047.	2976.	4.2	3.1	1.2	26.9	-28.5	20.4	42.2	0.051	0.84	0.43
TargC	5.0	3	700.000	3200.	563.	454.	581.	671.	2.7	0.303	0.130	0.182	0.290	3100.	3074.	4.2	2.9	1.3	26.1	-26.6	18.4	51.5	0.052	0.84	0.43
TargC	5.0	3	700.000	3500.	554.	463.	567.	652.	2.4	0.251	0.124	0.171	0.256	3245.	3268.	4.2	2.8	1.3	25.4	-24.2	14.5	60.7	0.031	0.85	0.45
TargC	15.0	1	400.000	2300.	419.	400.	421.	440.	1.0	0.099	0.067	0.094	0.126	4235.	4427.	1.2	0.8	0.4	29.8	-32.3	1.7	1.7	0.002	0.89	0.55
TargC	15.0	1	400.000	2600.	417.	398.	421.	438.	1.6	0.095	0.067	0.091	0.118	4293.	4503.	1.9	1.2	0.7	30.6	-35.3	1.4	3.3	0.001	0.89	0.56
TargC	15.0	1	400.000	2900.	413.	389.	417.	437.	2.4	0.090	0.066	0.089	0.114	4345.	4537.	2.7	1.7	1.0	30.8	-36.3	1.2	6.7	0.001	0.90	0.56
TargC	15.0	1	400.000	3200.	407.	377.	413.	435.	3.8	0.090	0.066	0.088	0.109	4339.	4527.	4.2	2.6	1.6	31.9	-36.4	1.1	12.0	0.001	0.90	0.57
TargC	15.0	1	400.000	3500.	400.	359.	409.	434.	4.8	0.091	0.067	0.085	0.104	4354.	4541.	5.1	3.2	1.9	31.6	-38.0	1.3	20.3	0.003	0.90	0.58
TargC	15.0	1	450.000	2300.	470.	448.	472.	494.	1.4	0.118	0.083	0.115	0.156	3932.	4115.	1.7	1.1	0.6	33.6	-39.5	3.7	3.7	0.001	0.88	0.52
TargC	15.0	1	450.000	2600.	466.	442.	470.	493.	2.3	0.114	0.081	0.113	0.146	4003.	4164.	2.6	1.6	1.0	35.2	-41.3	2.7	5.8	0.001	0.88	0.53
TargC	15.0	1	450.000	2900.	462.	431.	467.	492.	3.3	0.110	0.081	0.110	0.137	4041.	4209.	3.7	2.2	1.4	35.2	-41.1	1.8	9.9	0.002	0.89	0.54
TargC	15.0	1	450.000	3200.	455.	419.	462.	489.	4.3	0.111	0.079	0.106	0.129	4103.	4232.	4.8	2.9	1.9	35.4	-41.4	1.5	16.4	0.002	0.89	0.55
TargC	15.0	1	450.000	3500.	447.	400.	456.	483.	5.5	0.101	0.079	0.101	0.122	4170.	4321.	5.9	3.6	2.3	36.3	-42.6	1.1	25.1	0.002	0.89	0.55
TargC	15.0	1	500.000	2300.	518.	489.	524.	548.	2.1	0.146	0.101	0.140	0.190	3641.	3762.	2.3	1.4	0.9	38.6	-44.6	5.9	5.9	0.001	0.87	0.49
TargC	15.0	1	500.000	2600.	513.	480.	519.	545.	3.1	0.140	0.100	0.137	0.175	3696.	3846.	3.4	2.1	1.3	38.9	-46.2	4.1	9.4	0.001	0.87	0.50
TargC	15.0	1	500.000	2900.	509.	472.	515.	544.	4.0	0.134	0.097	0.131	0.164	3794.	3898.	4.4	2.7	1.8	39.1	-46.2	3.2	15.2	0.002	0.88	0.51
TargC	15.0	1	500.000	3200.	496.	447.	505.	539.	5.4	0.127	0.095	0.126	0.152	3848.	3991.	5.7	3.4	2.3	40.2	-47.7	2.5	25.1	0.001	0.88	0.52
TargC	15.0	1	500.000	3500.	486.	429.	495.	531.	6.6	0.118	0.095	0.117	0.141	3915.	4014.	6.8	4.0	2.8	41.9	-48.0	1.2	34.0	0.000	0.88	0.53
TargC	15.0	1	550.000	2300.	563.	518.	573.	601.	3.1	0.178	0.126	0.175	0.232	3308.	3421.	3.4	2.1	1.3	42.6	-51.6	11.7	11.7	0.001	0.85	0.44
TargC	15.0	1	550.000	2600.	556.	510.	565.	597.	4.3	0.168	0.122	0.166	0.210	3387.	3491.	4.6	2.8	1.9	44.4	-52.7	8.1	17.2	0.001	0.86	0.46
TargC	15.0	1	550.000	2900.	548.	491.	557.	594.	5.2	0.155	0.116	0.156	0.194	3527.	3633.	5.5	3.3	2.2	44.1	-53.1	5.8	24.4	0.000	0.86	0.47
TargC	15.0	1	550.000	3200.	536.	473.	548.	588.	6.4	0.146	0.115	0.147	0.175	3581.	3665.	6.7	3.9	2.7	45.0	-54.2	4.1	34.0	0.000	0.87	0.49
TargC	15.0	1	550.000	3500.	524.	463.	533.	583.	7.5	0.139	0.108	0.137	0.163	3702.	3772.	7.6	4.5	3.1	45.8	-53.5	2.8	44.0	0.001	0.87	0.50
TargC	15.0	1	600.000	2300.	601.	542.	614.	649.	4.4	0.213	0.150	0.212	0.275	3018.	3083.	4.6	2.7	1.9	48.1	-58.2	19.7	19.7	0.002	0.84	0.40
TargC	15.0	1	600.000	2600.	594.	535.	607.	646.	5.4	0.195	0.143	0.194	0.246	3161.	3217.	5.6	3.3	2.3	48.7	-58.2	13.7	25.9	0.000	0.84	0.43
TargC	15.0	1	600.000	2900.	586.	519.	596.	644.	6.3	0.184	0.139	0.180	0.224	3282.	3338.	6.5	3.7	2.8	49.5	-57.4	9.2	33.6	0.002	0.85	0.44
TargC	15.0	1	600.000	3200.	576.	505.	586.	636.	7.4	0.168	0.134	0.168	0.203	3401.	3408.	7.4	4.4	3.1	50.2	-59.7	5.9	43.3	0.000	0.86	0.46
TargC	15.0	1	600.000	3500.	560.	482.	572.	631.	8.2	0.164	0.126	0.156	0.188	3512.	3583.	8.1	4.7	3.4	49.8	-58.0	4.7	52.2	0.003	0.87	0.48
TargC	15.0	1	650.000	2300.	633.	540.	653.	698.	5.8	0.256	0.183	0.252	0.325	2720.	2765.	5.9	3.4	2.6	52.6	-63.8	30.7	30.7	0.002	0.82	0.36
TargC	15.0	1	650.000	2600.	626.	543.	640.	694.	6.6	0.227	0.172	0.225	0.284	2916.	2945.	6.7	3.9	2.9	53.3	-63.5	21.0	36.5	0.000	0.83	0.39
TargC	15.0	1	650.000	2900.	616.	536.	631.	686.	7.5	0.211	0.162	0.208	0.251	3063.	3102.	7.5	4.3	3.2	53.8	-63.7	14.2	44.8	0.001	0.84	0.41
TargC	15.0	1	650.000	3200.	603.	518.	614.	677.	8.5	0.193	0.155	0.192	0.231	3155.	3159.	8.4	4.7	3.6	54.6	-63.8	10.7	55.7	0.000	0.85	0.43
TargC	15.0	1	650.000	3500.	588.	498.	595.	669.	9.2	0.182	0.146	0.176	0.210	3293.	3306.	9.0	5.1	3.9	54.6	-63.1	6.9	63.6	0.002	0.86	0.45
TargC	15.0	1	700.000	2300.	659.	544.	684.	745.	7.1	0.303	0.219	0.292	0.385	2482.	2481.	7.0	3.8	3.1	57.4	-68.3	42.1	42.1	0.004	0.80	0.33
TargC	15.0	1	700.000	2600.	655.	559.	672.	733.	7.7	0.266	0.200	0.262	0.329	2686.	2683.	7.6	4.2	3.4	58.1	-68.5	30.8	47.5	0.001	0.81	0.36
TargC	15.0	1	700.000	2900.	639.	531.	652.	731.	8.6	0.239	0.186	0.235	0.292	2840.	2854.	8.4	4.8	3.6	58.2	-68.2	23.8	57.1	0.002	0.83	0.38
TargC	15.0	1	700.000	3200.	632.	530.	643.	720.	9.2	0.217	0.174	0.216	0.261	3000.	2993.	8.9	4.9	4.0	59.2	-68.0	15.8	64.5	0.000	0.84	0.41
TargC	15.0	1	700.000	3500.	613.	510.	624.	708.	10.0	0.200	0.164	0.200	0.235	3092.	3107.	9.6	5.4	4.2	58.6	-67.8	11.6	74.5	0.001	0.84	0.42
TargC	15.0	3	400.000	2300.	412.	391.	420.	438.	0.9	0.120	0.068	0.093	0.129	4147.	4369.	0.8	0.5	0.3	33.6	-34.5	4.3	4.3	0.011	0.89	0.55
TargC	15.0	3	400.000	2600.	410.	385.	418.	437.	1.2	0.113	0.068	0.092	0.123	4175.	4395.	1.2	0.7	0.4	34.3	-34.6	3.5	5.4	0.008	0.89	0.55
TargC	15.0	3	400.000	2900.	405.	371.	415.	436.	1.7	0.116	0.067	0.091	0.122	4178.	4413.	1.6	1.1	0.6	34.3	-35.0	3.7	9.4	0.009	0.89	0.55
TargC	15.0	3	400.000	3200.	403.	360.	412.	437.	2.0	0.106	0.066	0.088	0.113	4306.	4533.	1.9	1.2	0.7	35.1	-36.6	2.5	14.0	0.008	0.89	0.56
TargC	15.0	3	400.000	3500.	393.	338.	405.	433.	2.6	0.112	0.066	0.086	0.110	4264.	4491.	2.4	1.5	0.9	35.3	-37.1	3.4	22.5	0.010	0.89	0.56
TargC	15.0	3	450.000	2300.	463.	437.	471.	494.	1.0	0.131	0.081	0.114	0.157	3915.	4077.	1.0	0.7	0.3	35.8	-37.8	4.7	4.7	0.005	0.88	0.52
TargC	15.0	3	450.000	2600.	458.	426.	469.	493.	1.5	0.136	0.080	0.112	0.152	3946.	4128.	1.5	1.0	0.5	36.0	-40.8	4.6	8.4	0.010	0.88	0.52
TargC	15.0	3	450.000	2900.	450.	404.	462.	490.	2.0	0.122	0.080	0.108	0.141	3988.	4177.	2.0	1.4	0.6	37.6	-43.2	4.0	12.7	0.007	0.88	0.53
TargC	15.0	3	450.000	3200.	442.	385.	456.	486.	2.4	0.120	0.079	0.103	0.134	4028.	4217.	2.4	1.6	0.8	38.7	-43.3	3.8	18.6	0.010	0.89	0.54

Method Perc Dur Targ Trig Cmean C10 C50 C90 IAV Fmean F10 F50 F90 Smean S20 Nchange
Nup Ndown Cup Cdown Risk Risk Depl 4+ 7+ lim trig

TargC	15.0	3	450.000	3500.	436.	370.	450.	484.	2.8	0.114	0.076	0.099	0.128	4126.	4291.	2.7	1.8	0.9	39.9	-43.1	3.3	26.3	0.006	0.89	0.55
TargC	15.0	3	500.000	2300.	508.	465.	522.	547.	1.6	0.163	0.099	0.140	0.190	3601.	3739.	1.5	1.0	0.5	40.8	-41.6	7.9	7.9	0.008	0.87	0.48
TargC	15.0	3	500.000	2600.	500.	449.	516.	545.	2.0	0.158	0.095	0.134	0.176	3713.	3844.	1.9	1.3	0.6	42.3	-47.0	7.0	11.3	0.011	0.87	0.50
TargC	15.0	3	500.000	2900.	494.	435.	511.	541.	2.4	0.144	0.096	0.128	0.169	3732.	3874.	2.3	1.6	0.7	42.9	-46.4	5.2	18.6	0.005	0.87	0.51
TargC	15.0	3	500.000	3200.	479.	406.	497.	538.	3.0	0.146	0.092	0.121	0.156	3782.	3925.	2.8	1.8	1.0	43.4	-46.3	5.0	25.7	0.012	0.88	0.51
TargC	15.0	3	500.000	3500.	470.	393.	486.	532.	3.3	0.138	0.088	0.115	0.151	3861.	4011.	3.1	2.1	1.1	44.3	-48.0	4.4	35.2	0.012	0.88	0.52
TargC	15.0	3	550.000	2300.	552.	495.	569.	598.	1.8	0.193	0.122	0.171	0.241	3296.	3416.	1.7	1.1	0.6	45.8	-49.8	13.5	13.5	0.008	0.85	0.45
TargC	15.0	3	550.000	2600.	537.	465.	559.	593.	2.5	0.194	0.114	0.160	0.221	3384.	3504.	2.3	1.5	0.8	47.2	-50.9	11.2	19.1	0.014	0.86	0.46
TargC	15.0	3	550.000	2900.	529.	454.	551.	591.	2.9	0.174	0.109	0.147	0.198	3536.	3619.	2.7	1.8	0.9	48.5	-51.4	8.3	23.7	0.010	0.86	0.48
TargC	15.0	3	550.000	3200.	519.	436.	543.	587.	3.3	0.173	0.105	0.140	0.185	3610.	3676.	3.0	2.0	1.0	48.2	-50.0	6.6	33.8	0.012	0.87	0.49
TargC	15.0	3	550.000	3500.	505.	414.	525.	581.	3.7	0.162	0.100	0.133	0.174	3675.	3767.	3.3	2.1	1.2	49.2	-51.7	6.3	43.2	0.010	0.87	0.51
TargC	15.0	3	600.000	2300.	586.	502.	612.	653.	2.5	0.251	0.139	0.205	0.291	3019.	3060.	2.3	1.4	0.9	50.5	-53.8	20.2	20.2	0.024	0.84	0.41
TargC	15.0	3	600.000	2600.	574.	470.	600.	643.	2.8	0.212	0.132	0.187	0.264	3156.	3225.	2.7	1.7	1.0	52.5	-58.8	17.1	27.3	0.009	0.84	0.43
TargC	15.0	3	600.000	2900.	562.	461.	586.	641.	3.5	0.211	0.125	0.174	0.237	3268.	3312.	3.1	1.9	1.1	53.7	-55.8	12.9	34.3	0.014	0.85	0.45
TargC	15.0	3	600.000	3200.	545.	437.	568.	630.	3.7	0.184	0.117	0.159	0.210	3406.	3470.	3.3	2.2	1.1	54.1	-58.5	9.3	41.1	0.012	0.86	0.47
TargC	15.0	3	600.000	3500.	533.	437.	549.	626.	4.0	0.168	0.112	0.148	0.192	3524.	3558.	3.5	2.3	1.2	54.4	-57.5	7.0	50.6	0.008	0.87	0.48
TargC	15.0	3	650.000	2300.	616.	486.	652.	701.	3.1	0.311	0.161	0.243	0.385	2734.	2718.	2.7	1.6	1.1	55.2	-63.3	30.9	30.9	0.030	0.82	0.37
TargC	15.0	3	650.000	2600.	608.	494.	636.	692.	3.5	0.272	0.152	0.214	0.318	2946.	2948.	3.1	1.9	1.2	57.6	-61.4	22.8	35.0	0.023	0.83	0.40
TargC	15.0	3	650.000	2900.	599.	483.	618.	686.	3.7	0.228	0.142	0.200	0.272	3097.	3123.	3.3	2.1	1.2	57.5	-64.3	16.7	41.7	0.011	0.84	0.42
TargC	15.0	3	650.000	3200.	576.	456.	601.	681.	4.1	0.224	0.132	0.179	0.246	3236.	3262.	3.6	2.3	1.3	57.7	-60.0	13.5	48.9	0.018	0.85	0.44
TargC	15.0	3	650.000	3500.	559.	442.	578.	668.	4.4	0.201	0.123	0.167	0.224	3319.	3368.	3.8	2.4	1.4	58.0	-60.4	10.1	59.9	0.012	0.86	0.46
TargC	15.0	3	700.000	2300.	651.	511.	689.	747.	3.6	0.372	0.193	0.286	0.469	2509.	2442.	2.9	1.6	1.4	63.2	-70.5	40.3	40.3	0.041	0.80	0.34
TargC	15.0	3	700.000	2600.	634.	497.	667.	738.	4.0	0.318	0.168	0.251	0.376	2724.	2691.	3.3	1.9	1.4	64.0	-68.6	30.5	44.9	0.032	0.81	0.37
TargC	15.0	3	700.000	2900.	620.	489.	649.	730.	4.0	0.276	0.160	0.224	0.332	2886.	2818.	3.5	2.1	1.4	63.2	-68.1	24.3	51.3	0.025	0.83	0.40
TargC	15.0	3	700.000	3200.	610.	482.	625.	719.	4.2	0.229	0.145	0.201	0.285	3100.	3085.	3.6	2.3	1.3	63.7	-69.6	16.5	55.8	0.010	0.84	0.42
TargC	15.0	3	700.000	3500.	587.	466.	600.	704.	4.4	0.202	0.135	0.183	0.262	3194.	3166.	3.8	2.4	1.4	63.3	-67.9	14.5	64.8	0.004	0.85	0.44
TargC	25.0	1	400.000	2300.	421.	403.	422.	440.	1.0	0.094	0.067	0.093	0.126	4297.	4482.	0.9	0.5	0.4	39.5	-43.9	1.1	1.1	0.000	0.89	0.56
TargC	25.0	1	400.000	2600.	419.	398.	421.	439.	1.8	0.093	0.068	0.092	0.120	4288.	4476.	1.6	0.9	0.7	40.3	-44.9	1.1	2.6	0.002	0.89	0.56
TargC	25.0	1	400.000	2900.	416.	394.	418.	438.	2.7	0.090	0.067	0.089	0.115	4355.	4547.	2.4	1.4	1.0	40.4	-44.2	0.6	6.0	0.001	0.90	0.57
TargC	25.0	1	400.000	3200.	412.	383.	414.	436.	4.0	0.087	0.065	0.087	0.109	4422.	4588.	3.5	2.0	1.5	41.9	-47.2	0.3	10.0	0.000	0.90	0.57
TargC	25.0	1	400.000	3500.	405.	373.	410.	433.	5.4	0.085	0.065	0.085	0.104	4447.	4601.	4.5	2.6	1.9	42.3	-48.7	0.5	18.1	0.000	0.90	0.58
TargC	25.0	1	450.000	2300.	472.	450.	474.	494.	1.8	0.118	0.083	0.115	0.153	3931.	4089.	1.6	0.9	0.7	44.5	-51.0	2.9	2.9	0.000	0.88	0.52
TargC	25.0	1	450.000	2600.	467.	443.	470.	492.	2.6	0.116	0.081	0.113	0.147	3994.	4158.	2.3	1.3	1.0	45.1	-50.3	2.5	5.5	0.002	0.88	0.53
TargC	25.0	1	450.000	2900.	463.	435.	466.	489.	3.8	0.109	0.081	0.109	0.137	4071.	4225.	3.3	1.9	1.4	46.9	-51.9	1.0	9.0	0.000	0.89	0.54
TargC	25.0	1	450.000	3200.	457.	422.	462.	488.	5.2	0.105	0.078	0.105	0.130	4150.	4294.	4.3	2.4	1.9	48.3	-54.3	1.0	16.6	0.000	0.89	0.55
TargC	25.0	1	450.000	3500.	449.	406.	455.	484.	6.5	0.100	0.078	0.100	0.120	4221.	4353.	5.2	2.9	2.2	48.6	-56.9	0.6	24.0	0.000	0.89	0.56
TargC	25.0	1	500.000	2300.	521.	496.	525.	548.	2.5	0.145	0.101	0.142	0.187	3631.	3743.	2.1	1.2	0.9	51.2	-56.8	5.6	5.6	0.000	0.87	0.49
TargC	25.0	1	500.000	2600.	515.	483.	519.	544.	3.6	0.137	0.100	0.138	0.173	3709.	3844.	3.1	1.8	1.3	51.6	-58.7	3.8	9.0	0.000	0.87	0.50
TargC	25.0	1	500.000	2900.	508.	463.	514.	540.	5.1	0.131	0.097	0.131	0.164	3782.	3909.	4.1	2.4	1.8	54.1	-61.8	3.1	16.4	0.000	0.88	0.51
TargC	25.0	1	500.000	3200.	500.	451.	507.	538.	6.4	0.124	0.095	0.124	0.150	3882.	3967.	5.1	2.9	2.2	54.3	-63.6	1.4	22.4	0.000	0.88	0.52
TargC	25.0	1	500.000	3500.	490.	434.	498.	534.	8.1	0.117	0.092	0.118	0.141	3977.	4091.	6.2	3.6	2.7	54.9	-64.3	1.4	32.1	0.000	0.88	0.53
TargC	25.0	1	550.000	2300.	564.	525.	571.	599.	3.8	0.174	0.121	0.171	0.228	3341.	3445.	3.2	1.8	1.4	57.9	-63.9	10.2	10.2	0.001	0.85	0.45
TargC	25.0	1	550.000	2600.	558.	512.	566.	597.	5.1	0.165	0.118	0.164	0.211	3434.	3545.	4.1	2.3	1.8	59.3	-69.0	7.5	16.1	0.000	0.86	0.46
TargC	25.0	1	550.000	2900.	549.	498.	556.	593.	6.5	0.155	0.119	0.156	0.189	3504.	3597.	5.2	2.9	2.3	60.1	-67.6	4.7	24.0	0.000	0.86	0.47
TargC	25.0	1	550.000	3200.	541.	485.	549.	587.	7.8	0.145	0.112	0.146	0.175	3658.	3739.	6.0	3.4	2.7	61.2	-69.0	2.8	31.2	0.000	0.87	0.49
TargC	25.0	1	550.000	3500.	529.	466.	537.	582.	9.3	0.137	0.110	0.137	0.163	3729.	3803.	7.0	3.9	3.0	61.6	-71.3	2.0	43.8	0.000	0.87	0.50
TargC	25.0	1	600.000	2300.	603.	545.	614.	648.	5.6	0.211	0.149	0.210	0.267	3025.	3109.	4.3	2.5	1.9	64.9	-76.0	17.6	17.6	0.000	0.83	0.40
TargC	25.0	1	600.000	2600.	594.	528.	604.	645.	6.7	0.194	0.143	0.195	0.245	3178.	3248.	5.2	2.9	2.3	65.2	-76.6	13.5	25.6	0.000	0.84	0.43
TargC	25.0	1	600.000	2900.	586.	514.	598.	641.	8.1	0.180	0.141	0.180	0.219	3280.	3319.	6.1	3.4	2.7	67.3	-76.9	8.3	33.2	0.001	0.85	0.44
TargC	25.0	1	600.000	3200.	575.	498.	584.	635.	9.6	0.169	0.136	0.170	0.203	3382.	3426.	7.2	4.0	3.2	66.8	-78.9	6.1	45.1	0.000	0.86	0.46
TargC	25.0	1	600.000	3500.	562.	490.	567.	627.	10.9	0.156	0.128	0.157	0.185	3503.	3534.	7.9	4.4	3.6	69.2	-78.4	3.1	53.5	0.000	0.87	0.48
TargC	25.0	1	650.000	2300.	636.	558.	651.	697.	7.3	0.251	0.185	0.250	0.322	2754.	2811.	5.4	3.0	2.4	71.4	-84.5	29.0	29.0	0.000	0.82	0.36
TargC	25.0	1	650.000	2600.	626.	537.	641.	694.	8.6	0.229	0.174	0.229	0.283	2892.	2903.	6.3	3.5	2.8	72.6	-84.9	21.7	37.1	0.000	0.83	0.39
TargC	25.0	1	650.000	2900.	617.	540.	626.	685.	9.9	0.209	0.170	0.209	0.249	3029.	3077.	7.3	4.0	3.3	73.5	-85.5	13.8	45.8	0.000	0.84	0.41
TargC	25.0	1	650.000	3200.	603.	519.	610.	677.	11.1	0.192	0.157	0.192	0.227	3164.	3212.	8.0	4.4	3.5	73.3	-87.0	10.0	55.4	0.000	0.85	0.43
TargC	25.0	1	650.000	3500.	592.	509.	594.	669.	12.0	0.177	0.148	0.177	0.206	3319.	3342.	8.6	4.8	3.8	73.8	-85.3	5.7	64.0	0.000	0.86	0.45
TargC	25.0	1	700.000	2300.	657.	548.	678.	743.	9.4	0.296	0.220	0.295	0.370	2488.	2524.	6.7	3.7	3.0	78.6	-92.8	42.3	42.3	0.000	0.80	0.32
TargC	25.0	1	700.000	2600.	651.	546.	666.	736.	10.5	0.263	0.207	0.263	0.318	2663.	2668.	7.5	4.1	3.4	79.1	-92.7	32.1	50.0	0.001	0.81	0.35

Method Perc Dur Targ Trig Cmean C10 C50 C90 IAV Fmean F10 F50 F90 Smean S20 Nchange
Nup Ndown Cup Cdown Risk Risk Depl 4+ 7+ lim trig

TargC	25.0	1	700.000	2900.	642.	539.	657.	728.	11.4	0.239	0.193	0.238	0.283	2820.	2848.	8.1	4.4	3.7	79.0	-93.7	22.6	58.2	0.000	0.83	0.38
TargC	25.0	1	700.000	3200.	630.	538.	635.	714.	12.7	0.216	0.179	0.216	0.258	2987.	3034.	8.8	4.9	4.0	80.8	-93.7	13.7	66.9	0.000	0.84	0.40
TargC	25.0	1	700.000	3500.	612.	515.	617.	706.	13.6	0.198	0.166	0.197	0.233	3107.	3164.	9.3	5.1	4.2	81.0	-94.2	10.2	74.6	0.000	0.84	0.42
TargC	25.0	3	400.000	2300.	418.	398.	422.	440.	0.9	0.099	0.067	0.092	0.124	4278.	4472.	0.7	0.5	0.2	43.6	-41.4	2.3	2.3	0.004	0.89	0.56
TargC	25.0	3	400.000	2600.	413.	383.	420.	440.	1.4	0.098	0.067	0.091	0.120	4290.	4486.	1.0	0.7	0.3	45.1	-45.2	2.2	4.4	0.002	0.89	0.56
TargC	25.0	3	400.000	2900.	410.	377.	418.	438.	1.8	0.092	0.066	0.088	0.113	4357.	4539.	1.4	1.0	0.4	45.7	-49.7	1.3	6.2	0.002	0.90	0.57
TargC	25.0	3	400.000	3200.	406.	365.	414.	437.	2.4	0.089	0.065	0.086	0.109	4393.	4569.	1.8	1.2	0.6	47.1	-47.5	1.0	10.9	0.001	0.90	0.57
TargC	25.0	3	400.000	3500.	394.	349.	406.	432.	3.1	0.086	0.063	0.083	0.106	4384.	4567.	2.3	1.6	0.7	46.2	-49.1	1.4	20.3	0.001	0.90	0.58
TargC	25.0	3	450.000	2300.	466.	443.	471.	493.	1.2	0.119	0.083	0.113	0.154	3949.	4141.	0.9	0.7	0.3	49.1	-48.2	3.9	3.9	0.001	0.88	0.52
TargC	25.0	3	450.000	2600.	462.	431.	470.	493.	1.7	0.120	0.082	0.109	0.146	4007.	4135.	1.3	0.9	0.4	49.6	-50.4	2.8	5.8	0.003	0.89	0.54
TargC	25.0	3	450.000	2900.	457.	415.	466.	491.	2.2	0.110	0.080	0.105	0.136	4105.	4251.	1.7	1.2	0.5	52.3	-52.0	1.9	9.6	0.001	0.89	0.54
TargC	25.0	3	450.000	3200.	448.	397.	460.	488.	3.0	0.108	0.076	0.102	0.130	4179.	4304.	2.2	1.5	0.7	52.8	-59.1	1.6	15.4	0.002	0.89	0.55
TargC	25.0	3	450.000	3500.	442.	380.	454.	485.	3.5	0.102	0.075	0.097	0.124	4222.	4347.	2.5	1.7	0.8	53.6	-57.2	1.3	24.5	0.004	0.89	0.56
TargC	25.0	3	500.000	2300.	512.	479.	521.	547.	1.6	0.143	0.097	0.138	0.190	3652.	3830.	1.3	0.9	0.4	55.9	-59.1	6.1	6.1	0.001	0.87	0.49
TargC	25.0	3	500.000	2600.	507.	461.	518.	545.	2.1	0.134	0.095	0.132	0.174	3773.	3879.	1.6	1.1	0.5	58.5	-63.8	4.5	9.2	0.000	0.87	0.50
TargC	25.0	3	500.000	2900.	498.	446.	511.	543.	2.9	0.131	0.095	0.128	0.162	3807.	3952.	2.0	1.4	0.7	59.7	-64.4	3.7	16.5	0.002	0.88	0.51
TargC	25.0	3	500.000	3200.	492.	429.	505.	541.	3.4	0.122	0.090	0.121	0.153	3917.	4017.	2.4	1.6	0.8	60.1	-65.7	3.0	22.7	0.001	0.88	0.52
TargC	25.0	3	500.000	3500.	478.	405.	491.	534.	4.1	0.113	0.085	0.112	0.142	4028.	4113.	2.8	1.9	0.9	61.9	-66.6	2.2	30.5	0.000	0.89	0.54
TargC	25.0	3	550.000	2300.	551.	503.	569.	599.	2.2	0.175	0.120	0.167	0.228	3339.	3449.	1.5	1.0	0.5	63.2	-72.4	11.7	11.7	0.001	0.85	0.45
TargC	25.0	3	550.000	2600.	542.	470.	562.	598.	2.9	0.175	0.117	0.157	0.215	3408.	3513.	2.0	1.3	0.7	65.6	-68.7	9.9	18.0	0.007	0.86	0.47
TargC	25.0	3	550.000	2900.	539.	476.	554.	594.	3.3	0.155	0.111	0.148	0.194	3588.	3663.	2.3	1.5	0.8	66.2	-71.5	6.3	21.9	0.003	0.87	0.48
TargC	25.0	3	550.000	3200.	525.	443.	540.	589.	4.2	0.141	0.106	0.139	0.180	3674.	3721.	2.8	1.9	0.9	67.8	-76.7	4.8	32.0	0.002	0.87	0.50
TargC	25.0	3	550.000	3500.	516.	427.	531.	585.	4.6	0.136	0.099	0.131	0.166	3771.	3812.	3.0	1.9	1.1	69.1	-75.6	3.3	40.6	0.003	0.88	0.51
TargC	25.0	3	600.000	2300.	589.	513.	612.	653.	3.0	0.218	0.140	0.203	0.280	3034.	3135.	2.0	1.3	0.7	70.0	-80.4	20.3	20.3	0.005	0.84	0.41
TargC	25.0	3	600.000	2600.	580.	495.	603.	647.	3.6	0.205	0.138	0.186	0.249	3156.	3227.	2.4	1.5	0.9	70.5	-78.2	14.2	24.9	0.007	0.85	0.43
TargC	25.0	3	600.000	2900.	569.	473.	587.	641.	4.2	0.184	0.130	0.172	0.224	3304.	3362.	2.8	1.7	1.0	73.1	-82.2	10.1	33.2	0.005	0.85	0.45
TargC	25.0	3	600.000	3200.	566.	477.	578.	636.	4.5	0.162	0.120	0.160	0.206	3491.	3522.	3.0	1.9	1.1	73.3	-83.8	6.0	39.7	0.000	0.86	0.47
TargC	25.0	3	600.000	3500.	546.	454.	558.	624.	5.2	0.153	0.112	0.149	0.189	3567.	3577.	3.3	2.2	1.2	74.6	-85.0	4.4	49.1	0.001	0.87	0.49
TargC	25.0	3	650.000	2300.	616.	494.	650.	700.	3.8	0.274	0.168	0.239	0.337	2762.	2788.	2.4	1.4	1.0	77.6	-86.6	28.8	28.8	0.016	0.82	0.38
TargC	25.0	3	650.000	2600.	612.	516.	632.	695.	4.4	0.241	0.157	0.218	0.294	2940.	2975.	2.8	1.7	1.1	79.5	-87.6	21.5	35.2	0.007	0.83	0.40
TargC	25.0	3	650.000	2900.	596.	492.	618.	687.	5.0	0.228	0.148	0.201	0.266	3053.	3097.	3.1	1.9	1.2	80.5	-89.5	16.8	44.4	0.009	0.84	0.42
TargC	25.0	3	650.000	3200.	589.	481.	606.	680.	5.2	0.194	0.141	0.184	0.243	3204.	3218.	3.3	2.1	1.2	80.9	-91.7	11.2	51.5	0.004	0.85	0.44
TargC	25.0	3	650.000	3500.	577.	477.	591.	670.	5.6	0.171	0.125	0.168	0.214	3404.	3402.	3.5	2.2	1.3	81.9	-92.1	7.0	57.4	0.002	0.86	0.46
TargC	25.0	3	700.000	2300.	643.	496.	682.	746.	4.6	0.355	0.200	0.287	0.425	2492.	2471.	2.8	1.5	1.3	85.9	-94.7	40.7	40.7	0.034	0.80	0.34
TargC	25.0	3	700.000	2600.	641.	516.	671.	744.	4.8	0.282	0.184	0.256	0.345	2702.	2705.	3.0	1.7	1.3	86.4	-96.1	31.5	46.5	0.012	0.81	0.36
TargC	25.0	3	700.000	2900.	626.	518.	644.	728.	5.4	0.246	0.169	0.228	0.313	2873.	2859.	3.3	1.9	1.3	89.8	-102.8	24.3	53.1	0.007	0.83	0.39
TargC	25.0	3	700.000	3200.	619.	502.	634.	727.	5.5	0.213	0.154	0.204	0.269	3090.	3031.	3.4	2.1	1.3	89.4	-99.4	16.4	58.1	0.003	0.84	0.42
TargC	25.0	3	700.000	3500.	598.	471.	611.	710.	5.9	0.199	0.139	0.188	0.249	3184.	3172.	3.6	2.2	1.4	88.4	-99.6	12.1	67.8	0.004	0.85	0.44

HR rule, Constraint on TAC variation only at SSB above trigger

Method Perc Dur Targ Trig Cmean C10 C50 C90 IAV Fmean F10 F50 F90 Smean S20 Nchange
Nup Ndown Cup Cdown Risk Risk Depl 4+ 7+ lim trig

TargHR	5.0	1	0.100	2300.	351.	229.	343.	493.	5.3	0.066	0.036	0.064	0.098	4907.	4940.	11.0	9.0	2.0	14.7	-28.4	0.1	0.1	0.000	0.91	0.61
TargHR	5.0	1	0.100	2600.	346.	233.	344.	458.	5.7	0.064	0.036	0.064	0.090	4922.	4928.	11.0	9.4	1.6	15.1	-35.4	0.1	0.3	0.000	0.91	0.62
TargHR	5.0	1	0.100	2900.	351.	237.	342.	475.	6.3	0.064	0.038	0.064	0.088	4961.	4932.	11.0	9.4	1.6	15.8	-43.5	0.0	1.5	0.000	0.91	0.62
TargHR	5.0	1	0.100	3200.	356.	251.	355.	468.	7.5	0.065	0.040	0.066	0.086	4937.	4910.	11.0	9.4	1.6	17.4	-57.2	0.1	3.9	0.000	0.91	0.62
TargHR	5.0	1	0.100	3500.	359.	261.	356.	468.	9.2	0.066	0.045	0.066	0.085	4907.	4914.	11.0	9.3	1.7	19.9	-66.7	0.1	9.6	0.000	0.91	0.62
TargHR	5.0	1	0.120	2300.	389.	256.	385.	524.	5.5	0.077	0.041	0.075	0.115	4716.	4708.	11.0	9.3	1.7	16.7	-35.7	0.2	0.2	0.000	0.90	0.60
TargHR	5.0	1	0.120	2600.	398.	265.	394.	532.	6.0	0.079	0.046	0.079	0.110	4663.	4622.	11.0	9.4	1.6	17.5	-46.9	0.1	0.6	0.000	0.91	0.60
TargHR	5.0	1	0.120	2900.	403.	283.	392.	537.	7.0	0.079	0.048	0.080	0.105	4686.	4646.	11.0	9.4	1.6	19.0	-58.3	0.1	2.3	0.000	0.91	0.60
TargHR	5.0	1	0.120	3200.	398.	285.	391.	526.	8.5	0.078	0.050	0.080	0.103	4658.	4644.	11.0	9.3	1.7	20.8	-74.5	0.1	6.1	0.000	0.91	0.60
TargHR	5.0	1	0.120	3500.	403.	300.	390.	529.	10.8	0.079	0.053	0.080	0.103	4624.	4634.	11.0	9.1	1.9	24.7	-88.8	0.2	12.9	0.000	0.91	0.60
TargHR	5.0	1	0.140	2300.	436.	284.	436.	588.	5.9	0.094	0.050	0.093	0.138	4433.	4389.	11.0	9.2	1.8	18.8	-48.7	0.6	0.6	0.000	0.90	0.57
TargHR	5.0	1	0.140	2600.	437.	302.	430.	579.	6.7	0.093	0.053	0.093	0.130	4425.	4409.	11.0	9.3	1.7	20.1	-59.1	0.6	1.7	0.000	0.90	0.57
TargHR	5.0	1	0.140	2900.	439.	313.	431.	571.	7.9	0.094	0.058	0.095	0.126	4390.	4373.	11.0	9.3	1.7	21.8	-78.2	0.4	5.0	0.000	0.90	0.58
TargHR	5.0	1	0.140	3200.	442.	325.	433.	577.	9.4	0.093	0.062	0.093	0.123	4409.	4383.	11.0	9.2	1.8	24.9	-89.4	0.2	10.0	0.000	0.90	0.58
TargHR	5.0	1	0.140	3500.	450.	337.	439.	573.	12.3	0.096	0.068	0.097	0.121	4366.	4379.	11.0	8.9	2.1	31.1	-107.4	0.3	19.1	0.000	0.90	0.57
TargHR	5.0	1	0.160	2300.	468.	322.	468.	610.	6.3	0.109	0.061	0.108	0.160	4166.	4150.	11.0	9.1	1.9	20.8	-58.0	1.1	1.1	0.000	0.89	0.55
TargHR	5.0	1	0.160	2600.	470.	327.	467.	616.	7.3	0.108	0.061	0.110	0.150	4185.	4176.	11.0	9.2	1.8	22.3	-76.0	0.8	2.6	0.000	0.89	0.55
TargHR	5.0	1	0.160	2900.	475.	341.	468.	619.	8.9	0.108	0.067	0.109	0.145	4200.	4182.	11.0	9.2	1.8	25.2	-96.3	0.6	6.7	0.000	0.89	0.55
TargHR	5.0	1	0.160	3200.	477.	349.	473.	607.	11.5	0.109	0.070	0.111	0.142	4150.	4175.	11.0	9.0	2.0	30.5	-114.6	0.8	15.1	0.000	0.89	0.55
TargHR	5.0	1	0.160	3500.	481.	362.	472.	614.	14.8	0.110	0.073	0.111	0.142	4127.	4144.	11.0	8.7	2.3	38.6	-125.6	0.5	26.3	0.000	0.89	0.55
TargHR	5.0	1	0.180	2300.	501.	351.	495.	664.	6.7	0.124	0.065	0.124	0.179	3995.	3937.	11.0	9.2	1.8	22.5	-75.4	2.0	2.0	0.000	0.88	0.53
TargHR	5.0	1	0.180	2600.	501.	359.	495.	652.	8.0	0.122	0.070	0.122	0.171	4001.	3968.	11.0	9.3	1.7	24.8	-92.9	1.4	4.6	0.000	0.88	0.53
TargHR	5.0	1	0.180	2900.	508.	382.	495.	660.	10.4	0.124	0.081	0.125	0.163	3947.	3948.	11.0	9.0	2.0	30.0	-113.9	1.3	11.0	0.000	0.88	0.53
TargHR	5.0	1	0.180	3200.	507.	376.	501.	648.	13.5	0.124	0.080	0.128	0.161	3932.	3974.	11.0	8.8	2.2	36.9	-135.7	1.0	22.7	0.000	0.88	0.52
TargHR	5.0	1	0.180	3500.	517.	398.	509.	647.	17.3	0.127	0.088	0.130	0.161	3895.	3886.	11.0	8.4	2.6	48.4	-147.3	1.1	37.3	0.000	0.88	0.52
TargHR	5.0	1	0.200	2300.	523.	367.	515.	692.	7.2	0.137	0.075	0.138	0.196	3822.	3799.	11.0	9.2	1.8	24.3	-90.8	2.9	2.9	0.000	0.87	0.50
TargHR	5.0	1	0.200	2600.	532.	390.	523.	692.	9.2	0.140	0.082	0.142	0.191	3772.	3744.	11.0	9.1	1.9	28.3	-112.8	2.1	6.9	0.000	0.87	0.50
TargHR	5.0	1	0.200	2900.	533.	398.	528.	675.	11.5	0.140	0.090	0.143	0.186	3732.	3732.	11.0	9.0	2.0	33.6	-132.8	2.2	15.8	0.000	0.87	0.50
TargHR	5.0	1	0.200	3200.	539.	408.	533.	673.	15.5	0.142	0.097	0.144	0.182	3725.	3720.	11.0	8.7	2.3	44.8	-153.3	2.2	29.3	0.000	0.87	0.50
TargHR	5.0	1	0.200	3500.	543.	417.	538.	672.	20.4	0.143	0.101	0.146	0.181	3699.	3713.	11.0	8.2	2.8	59.8	-169.1	1.7	46.5	0.000	0.87	0.50
TargHR	5.0	1	0.220	2300.	548.	384.	542.	718.	8.4	0.155	0.084	0.158	0.217	3613.	3617.	11.0	9.2	1.8	27.3	-109.7	5.0	5.0	0.000	0.86	0.48
TargHR	5.0	1	0.220	2600.	547.	397.	542.	703.	10.6	0.152	0.090	0.155	0.205	3624.	3609.	11.0	9.1	1.9	32.1	-130.8	4.4	11.5	0.000	0.87	0.49
TargHR	5.0	1	0.220	2900.	558.	422.	552.	709.	13.9	0.157	0.100	0.160	0.206	3558.	3586.	11.0	8.8	2.2	41.1	-151.7	4.2	22.6	0.000	0.86	0.48
TargHR	5.0	1	0.220	3200.	561.	434.	557.	697.	18.1	0.157	0.107	0.160	0.201	3559.	3574.	11.0	8.5	2.5	53.8	-171.9	3.5	36.5	0.000	0.86	0.48
TargHR	5.0	1	0.220	3500.	569.	444.	565.	695.	24.2	0.161	0.117	0.163	0.202	3483.	3504.	11.0	8.0	3.0	74.9	-191.4	3.3	56.5	0.000	0.86	0.47
TargHR	5.0	1	0.240	2300.	578.	414.	567.	751.	9.0	0.172	0.098	0.174	0.241	3485.	3458.	11.0	9.1	1.9	30.2	-117.6	7.0	7.0	0.000	0.86	0.46
TargHR	5.0	1	0.240	2600.	576.	423.	574.	727.	12.0	0.172	0.103	0.176	0.230	3435.	3425.	11.0	9.0	2.0	37.0	-152.8	7.2	17.1	0.000	0.86	0.46
TargHR	5.0	1	0.240	2900.	576.	434.	572.	723.	16.5	0.172	0.110	0.174	0.225	3409.	3456.	11.0	8.6	2.4	49.6	-173.1	6.7	30.5	0.000	0.86	0.46
TargHR	5.0	1	0.240	3200.	585.	456.	579.	724.	21.0	0.176	0.123	0.179	0.223	3364.	3376.	11.0	8.1	2.9	66.0	-185.6	6.8	48.0	0.000	0.86	0.45
TargHR	5.0	1	0.240	3500.	596.	464.	592.	727.	27.5	0.181	0.133	0.183	0.225	3306.	3302.	11.0	7.6	3.4	91.0	-203.7	5.8	66.3	0.000	0.85	0.45
TargHR	5.0	1	0.260	2300.	582.	415.	581.	745.	10.6	0.185	0.099	0.190	0.259	3331.	3334.	11.0	9.1	1.9	33.7	-142.8	11.5	11.5	0.000	0.85	0.44
TargHR	5.0	1	0.260	2600.	591.	437.	591.	746.	13.5	0.186	0.110	0.190	0.254	3316.	3316.	11.0	8.9	2.1	42.2	-169.8	10.0	21.7	0.000	0.85	0.44
TargHR	5.0	1	0.260	2900.	595.	458.	597.	733.	18.3	0.188	0.123	0.191	0.246	3265.	3296.	11.0	8.5	2.5	57.4	-186.7	9.6	36.6	0.000	0.85	0.43
TargHR	5.0	1	0.260	3200.	604.	470.	599.	740.	24.9	0.194	0.136	0.197	0.247	3204.	3246.	11.0	7.9	3.1	80.8	-207.6	10.3	56.5	0.000	0.85	0.43
TargHR	5.0	1	0.260	3500.	612.	472.	609.	751.	30.9	0.198	0.150	0.199	0.253	3144.	3143.	11.0	7.4	3.6	107.9	-217.9	10.0	72.9	0.000	0.85	0.42
TargHR	5.0	1	0.280	2300.	601.	432.	594.	768.	11.8	0.200	0.106	0.204	0.277	3212.	3233.	11.0	9.0	2.0	37.1	-156.1	14.8	14.8	0.000	0.84	0.42
TargHR	5.0	1	0.280	2600.	599.	447.	599.	751.	15.7	0.200	0.118	0.205	0.267	3153.	3216.	11.0	8.7	2.3	48.3	-184.9	14.1	27.7	0.000	0.84	0.42
TargHR	5.0	1	0.280	2900.	610.	464.	612.	757.	21.6	0.207	0.134	0.210	0.272	3097.	3120.	11.0	8.3	2.7	69.1	-205.2	14.4	45.5	0.000	0.84	0.41
TargHR	5.0	1	0.280	3200.	624.	489.	623.	766.	28.9	0.214	0.153	0.217	0.267	3028.	3023.	11.0	7.7	3.3	97.4	-228.2	14.5	65.6	0.000	0.84	0.41
TargHR	5.0	1	0.280	3500.	631.	499.	628.	766.	34.7	0.217	0.163	0.218	0.272	2999.	3015.	11.0	7.2	3.8	126.4	-241.1	14.5	79.1	0.000	0.84	0.40
TargHR	5.0	1	0.300	2300.	622.	458.	615.	797.	13.8	0.223	0.130	0.226	0.306	3040.	3060.	11.0	8.9	2.1	43.4	-177.0	20.4	20.4	0.000	0.83	0.40
TargHR	5.0	1	0.300	2600.	623.	470.	622.	775.	18.1	0.222	0.137	0.227	0.294	3025.	3044.	11.0	8.6	2.5	57.4	-201.4	19.2	35.1	0.000	0.83	0.40
TargHR	5.0	1	0.300	2900.	631.	491.	628.	775.	25.1	0.229	0.152	0.234	0.295	2944.	2977.	11.0	8.0	3.0	82.8	-223.3	20.4	55.5	0.000	0.83	0.39
TargHR	5.0	1	0.300	3200.	633.	490.	628.	775.	32.5	0.229	0.163	0.231	0.291	2913.	2951.	11.0	7.5	3.5	113.7	-238.8	19.9	71.7	0.000	0.83	0.39
TargHR	5.0	1	0.300	3500.	642.	503.	638.	780.	39.5	0.234	0.178	0.234	0.296	2874.	2900.	11.0	7.0	4.0	150.6	-261.6	19.2	84.6	0.000	0.83	0.38

Method Perc Dur Targ Trig Cmean C10 C50 C90 IAV Fmean F10 F50 F90 Smean S20 Nchange
Nup Ndown Cup Cdown Risk Risk Depl 4+ 7+ lim trig

TargHR	5.0	3	0.100	2300.	276.	115.	237.	493.	2.1	0.053	0.016	0.039	0.106	5146.	5374.	4.0	3.3	0.7	10.7	-38.8	0.2	0.2	0.000	0.91	0.60
TargHR	5.0	3	0.100	2600.	256.	107.	235.	472.	2.2	0.047	0.015	0.038	0.098	5264.	5463.	4.0	3.5	0.5	10.5	-55.2	0.3	0.7	0.000	0.91	0.62
TargHR	5.0	3	0.100	2900.	250.	107.	243.	380.	2.5	0.045	0.015	0.040	0.083	5338.	5515.	4.0	3.7	0.3	11.7	-65.8	0.2	1.3	0.000	0.92	0.64
TargHR	5.0	3	0.100	3200.	260.	119.	258.	376.	2.9	0.046	0.017	0.043	0.077	5298.	5468.	4.0	3.6	0.4	13.7	-77.1	0.2	2.9	0.000	0.92	0.64
TargHR	5.0	3	0.100	3500.	268.	129.	271.	390.	3.8	0.047	0.018	0.046	0.078	5288.	5431.	4.0	3.6	0.4	16.9	-81.3	0.0	6.9	0.000	0.92	0.64
TargHR	5.0	3	0.120	2300.	308.	131.	284.	518.	2.1	0.062	0.018	0.051	0.121	4939.	5138.	4.0	3.4	0.6	12.6	-42.5	0.4	0.4	0.000	0.90	0.59
TargHR	5.0	3	0.120	2600.	300.	141.	284.	520.	2.3	0.058	0.019	0.050	0.112	5052.	5244.	4.0	3.5	0.5	13.1	-64.3	0.4	1.2	0.000	0.91	0.61
TargHR	5.0	3	0.120	2900.	294.	141.	295.	439.	2.6	0.056	0.020	0.051	0.099	5101.	5255.	4.0	3.6	0.4	14.4	-80.0	0.1	1.7	0.000	0.91	0.61
TargHR	5.0	3	0.120	3200.	299.	154.	298.	435.	3.1	0.056	0.020	0.055	0.094	5090.	5200.	4.0	3.7	0.3	17.0	-89.2	0.1	5.1	0.000	0.91	0.62
TargHR	5.0	3	0.120	3500.	309.	143.	314.	444.	4.3	0.059	0.020	0.058	0.097	5048.	5182.	4.0	3.6	0.4	21.3	-110.8	0.2	10.3	0.000	0.91	0.62
TargHR	5.0	3	0.140	2300.	335.	156.	319.	552.	2.2	0.070	0.021	0.061	0.134	4823.	4974.	4.0	3.5	0.5	14.3	-59.6	0.5	0.5	0.000	0.90	0.58
TargHR	5.0	3	0.140	2600.	319.	148.	308.	522.	2.5	0.065	0.021	0.056	0.120	4897.	5051.	4.0	3.6	0.4	14.8	-86.1	0.3	1.3	0.000	0.90	0.59
TargHR	5.0	3	0.140	2900.	339.	159.	344.	505.	2.9	0.068	0.023	0.065	0.119	4869.	4972.	4.0	3.7	0.3	17.6	-99.4	0.6	3.7	0.000	0.90	0.60
TargHR	5.0	3	0.140	3200.	339.	162.	343.	494.	3.6	0.068	0.024	0.067	0.114	4845.	4948.	4.0	3.6	0.4	20.8	-102.1	0.2	7.0	0.000	0.90	0.60
TargHR	5.0	3	0.140	3500.	353.	180.	360.	508.	4.8	0.072	0.027	0.072	0.116	4792.	4889.	4.0	3.5	0.5	26.1	-129.5	0.3	15.0	0.000	0.90	0.59
TargHR	5.0	3	0.160	2300.	372.	162.	363.	590.	2.4	0.084	0.024	0.074	0.155	4609.	4752.	4.0	3.5	0.5	16.3	-72.3	1.2	1.2	0.000	0.89	0.56
TargHR	5.0	3	0.160	2600.	366.	169.	368.	575.	2.7	0.080	0.025	0.075	0.143	4677.	4845.	4.0	3.6	0.4	17.6	-102.0	0.8	2.3	0.000	0.89	0.57
TargHR	5.0	3	0.160	2900.	362.	181.	363.	531.	3.3	0.077	0.028	0.073	0.131	4724.	4870.	4.0	3.6	0.4	20.2	-120.6	0.7	5.4	0.000	0.90	0.58
TargHR	5.0	3	0.160	3200.	368.	188.	369.	543.	4.2	0.079	0.027	0.078	0.131	4672.	4812.	4.0	3.6	0.4	25.3	-131.7	0.6	10.8	0.000	0.90	0.58
TargHR	5.0	3	0.160	3500.	386.	202.	398.	560.	6.1	0.084	0.029	0.085	0.135	4563.	4681.	4.0	3.4	0.6	35.2	-151.9	0.8	19.8	0.000	0.90	0.57
TargHR	5.0	3	0.180	2300.	403.	184.	405.	623.	2.4	0.096	0.028	0.088	0.175	4416.	4554.	4.0	3.6	0.4	18.3	-91.1	2.2	2.2	0.000	0.89	0.55
TargHR	5.0	3	0.180	2600.	394.	188.	394.	607.	2.9	0.090	0.027	0.085	0.158	4485.	4620.	4.0	3.6	0.4	19.7	-115.1	1.8	4.2	0.000	0.89	0.55
TargHR	5.0	3	0.180	2900.	398.	199.	404.	590.	3.5	0.091	0.029	0.089	0.154	4494.	4626.	4.0	3.6	0.4	23.7	-129.3	1.0	7.4	0.000	0.89	0.56
TargHR	5.0	3	0.180	3200.	414.	213.	424.	601.	2.6	0.095	0.034	0.095	0.155	4420.	4499.	4.0	3.5	0.5	30.0	-158.8	1.4	15.2	0.000	0.89	0.55
TargHR	5.0	3	0.180	3500.	420.	229.	424.	598.	2.8	0.097	0.034	0.099	0.154	4407.	4521.	4.0	3.4	0.6	41.5	-175.9	1.4	25.3	0.000	0.89	0.55
TargHR	5.0	3	0.200	2300.	425.	204.	421.	644.	2.4	0.103	0.033	0.096	0.180	4302.	4410.	4.0	3.6	0.4	19.8	-106.2	2.3	2.3	0.000	0.88	0.53
TargHR	5.0	3	0.200	2600.	419.	200.	425.	632.	2.5	0.101	0.030	0.098	0.175	4317.	4468.	4.0	3.6	0.4	22.4	-131.4	2.2	5.4	0.000	0.88	0.54
TargHR	5.0	3	0.200	2900.	434.	217.	443.	639.	2.3	0.105	0.035	0.104	0.176	4287.	4381.	4.0	3.6	0.4	27.2	-152.4	2.0	10.8	0.000	0.88	0.54
TargHR	5.0	3	0.200	3200.	438.	217.	451.	631.	2.7	0.108	0.033	0.110	0.173	4241.	4373.	4.0	3.4	0.6	38.0	-174.4	2.7	20.8	0.000	0.88	0.53
TargHR	5.0	3	0.200	3500.	459.	258.	468.	644.	2.6	0.115	0.042	0.118	0.178	4127.	4199.	4.0	3.2	0.8	55.6	-196.0	2.5	33.6	0.000	0.88	0.53
TargHR	5.0	3	0.220	2300.	449.	232.	452.	667.	2.6	0.117	0.041	0.112	0.198	4115.	4243.	4.0	3.6	0.4	21.5	-134.4	4.1	4.1	0.000	0.88	0.51
TargHR	5.0	3	0.220	2600.	446.	227.	459.	658.	2.9	0.116	0.036	0.115	0.195	4119.	4236.	4.0	3.6	0.4	25.1	-158.1	3.5	7.8	0.000	0.88	0.52
TargHR	5.0	3	0.220	2900.	451.	231.	461.	665.	2.7	0.117	0.036	0.118	0.194	4143.	4287.	4.0	3.5	0.5	31.7	-176.9	4.4	16.4	0.000	0.88	0.51
TargHR	5.0	3	0.220	3200.	464.	251.	477.	660.	2.7	0.123	0.041	0.127	0.197	4045.	4176.	4.0	3.3	0.7	45.7	-207.8	4.0	27.5	0.000	0.87	0.51
TargHR	5.0	3	0.220	3500.	478.	257.	498.	659.	2.6	0.128	0.044	0.132	0.203	4000.	4097.	4.0	3.2	0.8	65.2	-226.6	4.6	41.0	0.000	0.87	0.50
TargHR	5.0	3	0.240	2300.	468.	216.	486.	680.	2.6	0.127	0.039	0.126	0.214	3993.	4086.	4.0	3.6	0.4	23.2	-143.2	4.9	4.9	0.000	0.87	0.50
TargHR	5.0	3	0.240	2600.	478.	240.	490.	683.	2.5	0.129	0.041	0.130	0.212	3976.	4054.	4.0	3.6	0.4	28.3	-171.2	5.4	10.7	0.000	0.87	0.50
TargHR	5.0	3	0.240	2900.	468.	236.	491.	670.	2.5	0.127	0.038	0.129	0.216	4039.	4152.	4.0	3.4	0.6	38.2	-194.2	5.4	19.3	0.000	0.87	0.50
TargHR	5.0	3	0.240	3200.	496.	270.	513.	696.	2.4	0.140	0.044	0.144	0.224	3893.	3956.	4.0	3.3	0.7	55.6	-227.7	6.0	32.7	0.000	0.87	0.49
TargHR	5.0	3	0.240	3500.	505.	292.	523.	685.	2.8	0.143	0.047	0.147	0.225	3850.	3972.	4.0	3.1	0.9	78.3	-250.8	7.4	46.0	0.000	0.87	0.48
TargHR	5.0	3	0.260	2300.	491.	260.	514.	685.	2.6	0.139	0.049	0.142	0.227	3828.	3919.	4.0	3.6	0.4	25.8	-166.2	6.6	6.6	0.000	0.87	0.49
TargHR	5.0	3	0.260	2600.	492.	256.	512.	689.	2.6	0.140	0.043	0.144	0.229	3876.	3966.	4.0	3.5	0.5	33.8	-192.7	6.6	13.2	0.000	0.86	0.48
TargHR	5.0	3	0.260	2900.	506.	270.	520.	696.	2.9	0.148	0.050	0.144	0.244	3784.	3888.	4.0	3.4	0.6	46.6	-219.1	8.1	24.9	0.001	0.86	0.47
TargHR	5.0	3	0.260	3200.	505.	271.	518.	702.	2.4	0.153	0.045	0.153	0.251	3745.	3838.	4.0	3.2	0.8	69.9	-262.2	10.1	38.7	0.000	0.86	0.47
TargHR	5.0	3	0.260	3500.	520.	277.	543.	710.	2.6	0.159	0.050	0.165	0.251	3671.	3752.	4.0	3.0	1.0	94.7	-283.5	9.9	52.1	0.000	0.86	0.46
TargHR	5.0	3	0.280	2300.	524.	291.	549.	697.	2.5	0.159	0.055	0.159	0.261	3686.	3749.	4.0	3.6	0.4	29.9	-168.6	9.8	9.8	0.000	0.86	0.46
TargHR	5.0	3	0.280	2600.	515.	272.	539.	699.	2.3	0.155	0.052	0.153	0.258	3715.	3765.	4.0	3.5	0.5	36.0	-216.0	9.5	17.2	0.000	0.86	0.47
TargHR	5.0	3	0.280	2900.	518.	278.	533.	709.	2.8	0.160	0.051	0.161	0.262	3662.	3758.	4.0	3.3	0.7	57.1	-241.2	11.0	30.0	0.000	0.85	0.46
TargHR	5.0	3	0.280	3200.	529.	301.	541.	720.	2.3	0.169	0.053	0.168	0.273	3617.	3716.	4.0	3.1	0.9	80.9	-290.3	12.8	43.9	0.000	0.85	0.45
TargHR	5.0	3	0.280	3500.	546.	314.	555.	742.	2.5	0.181	0.064	0.185	0.290	3438.	3547.	4.0	2.9	1.1	118.0	-319.4	15.2	60.0	0.001	0.85	0.44
TargHR	5.0	3	0.300	2300.	530.	281.	568.	701.	2.8	0.166	0.055	0.170	0.265	3570.	3631.	4.0	3.6	0.4	31.5	-203.0	11.4	11.4	0.000	0.85	0.45
TargHR	5.0	3	0.300	2600.	519.	283.	538.	714.	2.9	0.166	0.050	0.163	0.280	3609.	3685.	4.0	3.4	0.6	44.3	-227.9	13.1	21.8	0.001	0.85	0.45
TargHR	5.0	3	0.300	2900.	524.	270.	542.	717.	2.8	0.174	0.051	0.173	0.289	3551.	3675.	4.0	3.3	0.7	67.7	-280.8	14.3	34.6	0.000	0.85	0.44
TargHR	5.0	3	0.300	3200.	556.	311.	581.	753.	2.4	0.190	0.059	0.195	0.306	3443.	3518.	4.0	3.0	1.0	98.1	-305.0	16.6	50.4	0.000	0.84	0.43
TargHR	5.0	3	0.300	3500.	557.	334.	578.	755.	2.6	0.197	0.065	0.196	0.311	3330.	3427.	4.0	2.9	1.1	138.6	-360.5	18.9	63.9	0.000	0.84	0.42
TargHR	15.0	1	0.100	2300.	450.	344.	446.	557.	12.1	0.091	0.075	0.090	0.108	4443.	4349.	11.0	6.6	4.4	48.5	-58.8	0.1	0.1	0.000	0.90	0.59
TargHR	15.0	1	0.100	2600.	444.	326.	443.	564.	12.2	0.089	0.071	0.089	0.106	4470.	4394.	11.0	6.9	4.1	48.5	-64.3	0.1	0.6	0.000	0.90	0.59
TargHR	15.0	1	0.100	2900.	439.	323.	435.	563.	12.3	0.087	0.071	0.087	0.104	4508.	4426.	11.0	7.1	3.9	48.8	-69.2	0.2	2.7	0.000	0.90	0.59

Method Perc Dur Targ Trig Cmean C10 C50 C90 IAV Fmean F10 F50 F90 Smean S20 Nchange
Nup Ndown Cup Cdown Risk Risk Depl 4+ 7+ lim trig

TargHR	15.0	1	0.100	3200.	434.	313.	430.	551.	12.4	0.085	0.068	0.085	0.102	4522.	4468.	11.0	7.2	3.8	49.8	-77.6	0.0	6.3	0.000	0.91	0.60
TargHR	15.0	1	0.100	3500.	427.	301.	422.	555.	12.7	0.083	0.065	0.083	0.100	4563.	4525.	11.0	7.3	3.7	51.3	-87.3	0.1	11.4	0.000	0.91	0.60
TargHR	15.0	1	0.120	2300.	501.	382.	497.	620.	12.2	0.111	0.089	0.111	0.132	4135.	4008.	11.0	6.7	4.3	54.5	-68.3	0.4	0.4	0.000	0.89	0.56
TargHR	15.0	1	0.120	2600.	493.	371.	492.	624.	12.4	0.107	0.086	0.108	0.128	4199.	4109.	11.0	7.0	4.0	54.1	-80.4	0.4	1.7	0.000	0.89	0.56
TargHR	15.0	1	0.120	2900.	483.	356.	477.	618.	12.3	0.105	0.083	0.106	0.126	4180.	4128.	11.0	7.1	3.9	54.3	-86.8	0.3	3.9	0.000	0.90	0.56
TargHR	15.0	1	0.120	3200.	473.	350.	464.	609.	12.6	0.102	0.081	0.101	0.123	4218.	4183.	11.0	7.2	3.8	56.3	-97.6	0.1	9.7	0.000	0.90	0.57
TargHR	15.0	1	0.120	3500.	464.	341.	456.	597.	12.9	0.099	0.078	0.099	0.120	4254.	4249.	11.0	7.4	3.6	58.6	-109.0	0.2	17.8	0.000	0.90	0.57
TargHR	15.0	1	0.140	2300.	538.	414.	537.	665.	12.2	0.131	0.105	0.131	0.157	3852.	3777.	11.0	6.7	4.3	58.9	-80.3	1.1	1.1	0.000	0.88	0.53
TargHR	15.0	1	0.140	2600.	530.	399.	526.	662.	12.4	0.127	0.100	0.126	0.153	3896.	3835.	11.0	7.0	4.0	59.5	-92.1	0.9	3.2	0.000	0.88	0.53
TargHR	15.0	1	0.140	2900.	523.	390.	515.	668.	12.5	0.122	0.095	0.122	0.150	3966.	3896.	11.0	7.3	3.7	60.6	-108.4	0.5	6.5	0.000	0.89	0.54
TargHR	15.0	1	0.140	3200.	514.	380.	500.	656.	12.7	0.120	0.092	0.119	0.147	3971.	3930.	11.0	7.4	3.6	63.8	-120.2	0.3	15.7	0.000	0.89	0.54
TargHR	15.0	1	0.140	3500.	499.	371.	490.	640.	13.0	0.115	0.090	0.113	0.141	4015.	4021.	11.0	7.3	3.7	68.8	-132.6	0.5	26.4	0.000	0.89	0.55
TargHR	15.0	1	0.160	2300.	571.	436.	562.	713.	12.3	0.150	0.117	0.151	0.185	3639.	3529.	11.0	6.8	4.2	63.4	-95.1	1.9	1.9	0.000	0.87	0.50
TargHR	15.0	1	0.160	2600.	572.	449.	569.	711.	12.6	0.158	0.125	0.158	0.190	3515.	3473.	11.0	6.3	4.7	62.8	-71.4	3.8	10.1	0.001	0.87	0.48
TargHR	15.0	1	0.160	2900.	567.	435.	568.	699.	12.8	0.154	0.117	0.155	0.188	3554.	3463.	11.0	6.4	4.6	62.9	-71.5	3.7	18.7	0.000	0.87	0.49
TargHR	15.0	1	0.160	3200.	560.	422.	566.	699.	13.1	0.153	0.109	0.149	0.185	3642.	3539.	11.0	6.6	4.4	62.9	-72.1	3.3	28.5	0.003	0.87	0.50
TargHR	15.0	1	0.160	3500.	557.	411.	557.	703.	13.1	0.145	0.108	0.145	0.183	3665.	3547.	11.0	6.5	4.5	62.8	-73.3	3.0	43.3	0.000	0.88	0.51
TargHR	15.0	1	0.180	2300.	603.	477.	597.	745.	12.5	0.186	0.147	0.182	0.223	3249.	3207.	11.0	6.1	4.9	66.4	-73.7	7.3	7.3	0.002	0.85	0.45
TargHR	15.0	1	0.180	2600.	606.	471.	604.	745.	12.7	0.182	0.140	0.181	0.221	3305.	3246.	11.0	6.2	4.8	67.1	-76.1	6.8	15.4	0.001	0.86	0.45
TargHR	15.0	1	0.180	2900.	602.	467.	601.	747.	12.9	0.178	0.134	0.178	0.223	3354.	3286.	11.0	6.3	4.7	67.2	-77.9	6.6	27.3	0.002	0.86	0.46
TargHR	15.0	1	0.180	3200.	595.	444.	593.	759.	13.1	0.173	0.123	0.170	0.217	3430.	3344.	11.0	6.4	4.6	67.3	-77.4	5.7	39.0	0.002	0.86	0.47
TargHR	15.0	1	0.180	3500.	577.	425.	575.	737.	13.3	0.162	0.115	0.161	0.212	3491.	3415.	11.0	6.5	4.5	66.1	-77.0	4.7	52.8	0.000	0.87	0.48
TargHR	15.0	1	0.200	2300.	632.	509.	629.	770.	12.5	0.211	0.163	0.209	0.261	3049.	3003.	11.0	6.1	4.9	69.2	-78.7	12.1	12.1	0.000	0.84	0.42
TargHR	15.0	1	0.200	2600.	628.	481.	629.	772.	12.8	0.206	0.155	0.202	0.254	3127.	3061.	11.0	6.2	4.8	69.6	-79.9	10.9	22.9	0.003	0.85	0.43
TargHR	15.0	1	0.200	2900.	624.	471.	627.	773.	13.1	0.203	0.149	0.200	0.250	3160.	3052.	11.0	6.2	4.8	70.6	-81.3	12.0	37.9	0.003	0.85	0.44
TargHR	15.0	1	0.200	3200.	625.	474.	623.	783.	13.3	0.196	0.140	0.191	0.249	3273.	3157.	11.0	6.4	4.6	71.4	-83.1	8.8	47.6	0.001	0.85	0.45
TargHR	15.0	1	0.200	3500.	606.	444.	607.	764.	13.4	0.184	0.130	0.181	0.235	3322.	3209.	11.0	6.3	4.7	70.3	-81.3	7.7	61.8	0.001	0.86	0.46
TargHR	15.0	1	0.220	2300.	655.	514.	656.	790.	12.7	0.238	0.181	0.236	0.296	2874.	2818.	11.0	6.1	4.9	72.3	-83.5	19.0	19.0	0.000	0.83	0.39
TargHR	15.0	1	0.220	2600.	647.	512.	648.	789.	13.0	0.230	0.173	0.226	0.285	2939.	2843.	11.0	6.2	4.8	73.4	-83.6	17.0	31.6	0.002	0.83	0.40
TargHR	15.0	1	0.220	2900.	642.	484.	644.	797.	13.3	0.229	0.155	0.222	0.284	2993.	2943.	11.0	6.2	4.8	73.6	-85.2	16.1	47.0	0.004	0.84	0.41
TargHR	15.0	1	0.220	3200.	633.	477.	631.	785.	13.5	0.212	0.145	0.204	0.274	3135.	3028.	11.0	6.3	4.7	73.3	-85.5	12.2	56.5	0.002	0.84	0.43
TargHR	15.0	1	0.220	3500.	627.	460.	622.	807.	13.5	0.203	0.141	0.198	0.264	3183.	3055.	11.0	6.3	4.7	73.2	-86.0	11.1	68.0	0.001	0.85	0.44
TargHR	15.0	1	0.240	2300.	656.	506.	661.	806.	13.0	0.269	0.188	0.258	0.335	2693.	2656.	11.0	5.9	5.1	74.6	-85.1	28.3	28.3	0.003	0.82	0.36
TargHR	15.0	1	0.240	2600.	657.	495.	667.	816.	13.3	0.272	0.182	0.252	0.333	2754.	2687.	11.0	6.0	5.0	75.1	-86.4	25.4	42.1	0.008	0.82	0.37
TargHR	15.0	1	0.240	2900.	655.	504.	654.	818.	13.4	0.246	0.170	0.237	0.319	2875.	2793.	11.0	6.2	4.8	75.4	-88.5	20.8	54.1	0.002	0.83	0.39
TargHR	15.0	1	0.240	3200.	649.	479.	642.	822.	13.6	0.238	0.160	0.227	0.316	2946.	2883.	11.0	6.1	4.9	75.7	-89.2	19.5	65.2	0.002	0.83	0.40
TargHR	15.0	1	0.240	3500.	641.	477.	639.	818.	13.7	0.223	0.150	0.213	0.294	3064.	2952.	11.0	6.2	4.8	76.3	-88.8	15.9	72.4	0.002	0.84	0.42
TargHR	15.0	1	0.260	2300.	676.	510.	682.	834.	13.1	0.302	0.213	0.285	0.382	2551.	2479.	11.0	5.9	5.1	76.8	-88.7	36.1	36.1	0.004	0.80	0.34
TargHR	15.0	1	0.260	2600.	667.	494.	674.	829.	13.4	0.289	0.198	0.275	0.363	2625.	2577.	11.0	5.9	5.1	77.6	-89.9	32.4	49.3	0.007	0.81	0.35
TargHR	15.0	1	0.260	2900.	660.	477.	665.	842.	13.6	0.274	0.178	0.259	0.358	2728.	2669.	11.0	6.0	5.0	77.2	-90.4	28.5	60.5	0.005	0.82	0.37
TargHR	15.0	1	0.260	3200.	662.	484.	661.	846.	13.7	0.271	0.168	0.249	0.344	2818.	2696.	11.0	6.0	5.0	78.7	-92.1	25.0	70.0	0.006	0.82	0.38
TargHR	15.0	1	0.260	3500.	652.	479.	647.	842.	13.8	0.257	0.160	0.228	0.329	2936.	2821.	11.0	6.2	4.8	77.6	-90.2	18.9	78.1	0.008	0.83	0.40
TargHR	15.0	1	0.280	2300.	675.	489.	677.	853.	13.5	0.338	0.215	0.306	0.430	2422.	2384.	11.0	5.8	5.2	79.0	-90.2	43.8	43.8	0.012	0.79	0.32
TargHR	15.0	1	0.280	2600.	674.	481.	681.	857.	13.6	0.328	0.205	0.295	0.424	2490.	2435.	11.0	5.8	5.2	79.5	-92.1	40.1	56.5	0.013	0.80	0.33
TargHR	15.0	1	0.280	2900.	669.	477.	667.	853.	13.7	0.306	0.196	0.279	0.393	2591.	2514.	11.0	5.9	5.1	79.6	-92.6	34.2	66.8	0.011	0.80	0.35
TargHR	15.0	1	0.280	3200.	669.	491.	664.	855.	13.8	0.293	0.182	0.259	0.401	2709.	2618.	11.0	5.9	5.1	80.2	-93.2	30.0	73.5	0.009	0.81	0.36
TargHR	15.0	1	0.280	3500.	661.	474.	661.	854.	13.9	0.280	0.171	0.243	0.365	2804.	2701.	11.0	6.0	5.0	80.0	-93.1	25.4	81.6	0.010	0.82	0.38
TargHR	15.0	1	0.300	2300.	679.	489.	690.	861.	13.6	0.375	0.231	0.329	0.465	2298.	2267.	11.0	5.7	5.3	80.2	-91.6	50.7	50.7	0.018	0.78	0.30
TargHR	15.0	1	0.300	2600.	672.	474.	682.	859.	13.8	0.365	0.218	0.315	0.471	2361.	2335.	11.0	5.6	5.4	80.6	-92.9	46.9	63.0	0.024	0.78	0.31
TargHR	15.0	1	0.300	2900.	678.	477.	689.	876.	13.8	0.350	0.202	0.303	0.454	2481.	2370.	11.0	5.8	5.2	81.5	-94.5	40.8	71.0	0.020	0.79	0.33
TargHR	15.0	1	0.300	3200.	679.	481.	678.	882.	14.1	0.331	0.195	0.280	0.424	2582.	2443.	11.0	5.9	5.1	82.1	-96.5	35.3	78.9	0.017	0.80	0.35
TargHR	15.0	1	0.300	3500.	668.	490.	659.	856.	13.9	0.298	0.179	0.259	0.406	2715.	2590.	11.0	5.9	5.1	80.7	-94.2	28.7	84.4	0.013	0.81	0.37
TargHR	15.0	3	0.100	2300.	412.	319.	411.	514.	4.7	0.107	0.070	0.088	0.116	4235.	4416.	4.0	2.4	1.6	47.5	-47.1	2.8	2.8	0.007	0.89	0.56
TargHR	15.0	3	0.100	2600.	408.	317.	407.	511.	4.8	0.116	0.071	0.087	0.116	4197.	4330.	4.0	2.4	1.6	47.4	-45.9	4.1	5.7	0.013	0.89	0.56
TargHR	15.0	3	0.100	2900.	412.	318.	414.	507.	4.6	0.098	0.070	0.089	0.114	4220.	4399.	4.0	2.4	1.6	47.3	-48.8	3.1	7.6	0.004	0.89	0.56
TargHR	15.0	3	0.100	3200.	408.	315.	407.	514.	5.0	0.123	0.069	0.088	0.115	4204.	4389.	4.1	2.4	1.7	47.9	-47.7	3.4	14.2	0.013	0.89	0.56
TargHR	15.0	3	0.100	3500.	408.	300.	411.	524.	4.8	0.106	0.068	0.086	0.117	4252.	4421.	4.0	2.4	1.6	48.2	-48.9	3.5	21.5	0.009	0.89	0.56
TargHR	15.0	3	0.120	2300.	458.	348.	455.	576.	4.8	0.132	0.082	0.106	0.142	3969.	4098.	4.0	2.5	1.5	53.1	-51.4	3.7	3.7	0.011	0.88	0.54

Method Perc Dur Targ Trig Cmean C10 C50 C90 IAV Fmean F10 F50 F90 Smean S20 Nchange
Nup Ndown Cup Cdown Risk Risk Depl 4+ 7+ lim trig

TargHR	15.0	3	0.120	2600.	455.	344.	454.	579.	4.9	0.133	0.081	0.105	0.142	3976.	4059.	4.1	2.5	1.5	52.6	-52.0	4.3	6.5	0.010	0.89	0.54
TargHR	15.0	3	0.120	2900.	460.	350.	456.	573.	4.8	0.128	0.082	0.105	0.141	4006.	4098.	4.0	2.5	1.5	53.4	-52.6	3.5	10.3	0.009	0.89	0.54
TargHR	15.0	3	0.120	3200.	452.	332.	450.	577.	4.9	0.116	0.078	0.104	0.140	4038.	4190.	4.0	2.5	1.5	53.6	-54.5	3.0	17.8	0.004	0.89	0.54
TargHR	15.0	3	0.120	3500.	447.	326.	448.	577.	5.0	0.134	0.074	0.103	0.143	4018.	4159.	4.1	2.5	1.6	53.0	-54.0	4.3	28.4	0.013	0.89	0.54
TargHR	15.0	3	0.140	2300.	504.	392.	500.	634.	4.8	0.153	0.095	0.126	0.168	3777.	3810.	4.0	2.6	1.5	58.3	-56.5	5.1	5.1	0.011	0.88	0.52
TargHR	15.0	3	0.140	2600.	498.	366.	498.	624.	4.9	0.156	0.093	0.126	0.172	3755.	3821.	4.1	2.5	1.5	58.5	-57.9	5.6	9.5	0.013	0.88	0.51
TargHR	15.0	3	0.140	2900.	498.	368.	499.	612.	4.9	0.146	0.090	0.123	0.173	3815.	3871.	4.0	2.6	1.4	58.0	-58.8	5.2	15.5	0.008	0.88	0.52
TargHR	15.0	3	0.140	3200.	490.	349.	484.	620.	4.9	0.133	0.085	0.119	0.168	3839.	3927.	4.0	2.6	1.4	57.6	-61.2	4.2	23.1	0.004	0.88	0.52
TargHR	15.0	3	0.140	3500.	470.	332.	466.	617.	5.0	0.141	0.080	0.114	0.167	3831.	3945.	4.0	2.5	1.5	57.2	-56.9	5.9	35.4	0.010	0.88	0.52
TargHR	15.0	3	0.160	2300.	534.	402.	538.	668.	4.9	0.169	0.104	0.144	0.203	3559.	3599.	4.0	2.6	1.4	62.2	-63.8	7.4	7.4	0.010	0.87	0.49
TargHR	15.0	3	0.160	2600.	535.	393.	543.	673.	5.0	0.171	0.103	0.144	0.207	3562.	3554.	4.0	2.6	1.5	62.3	-63.8	7.2	12.9	0.011	0.87	0.49
TargHR	15.0	3	0.160	2900.	530.	380.	534.	663.	5.0	0.159	0.097	0.141	0.202	3634.	3662.	4.0	2.6	1.4	62.6	-66.6	6.2	20.1	0.006	0.87	0.49
TargHR	15.0	3	0.160	3200.	523.	369.	523.	673.	5.1	0.153	0.091	0.134	0.196	3714.	3721.	4.0	2.7	1.4	62.4	-66.3	5.3	29.4	0.006	0.87	0.50
TargHR	15.0	3	0.160	3500.	512.	359.	505.	665.	5.1	0.152	0.087	0.129	0.190	3741.	3774.	4.0	2.6	1.4	62.1	-64.5	5.4	40.3	0.008	0.87	0.50
TargHR	15.0	3	0.180	2300.	562.	417.	572.	701.	4.8	0.188	0.112	0.166	0.234	3380.	3415.	4.0	2.6	1.5	65.0	-66.4	10.0	10.0	0.010	0.86	0.46
TargHR	15.0	3	0.180	2600.	566.	412.	573.	723.	4.9	0.180	0.109	0.165	0.239	3409.	3393.	4.0	2.6	1.4	66.3	-70.5	10.1	17.4	0.004	0.86	0.46
TargHR	15.0	3	0.180	2900.	552.	399.	562.	714.	5.2	0.197	0.106	0.157	0.228	3446.	3454.	4.1	2.6	1.4	66.0	-67.7	9.1	27.0	0.018	0.86	0.47
TargHR	15.0	3	0.180	3200.	545.	385.	547.	714.	5.2	0.183	0.097	0.149	0.227	3539.	3529.	4.1	2.7	1.4	65.4	-68.3	8.6	35.6	0.013	0.86	0.48
TargHR	15.0	3	0.180	3500.	532.	368.	528.	710.	5.1	0.163	0.093	0.140	0.218	3630.	3630.	4.0	2.7	1.4	64.3	-68.9	6.6	45.1	0.008	0.87	0.49
TargHR	15.0	3	0.200	2300.	594.	438.	601.	754.	5.1	0.230	0.131	0.189	0.281	3159.	3108.	4.1	2.6	1.5	69.7	-72.0	15.7	15.7	0.013	0.84	0.43
TargHR	15.0	3	0.200	2600.	576.	412.	595.	742.	5.2	0.234	0.120	0.182	0.277	3181.	3167.	4.1	2.5	1.6	69.0	-69.6	15.9	24.8	0.022	0.85	0.44
TargHR	15.0	3	0.200	2900.	576.	423.	588.	738.	5.2	0.205	0.110	0.172	0.262	3346.	3292.	4.1	2.7	1.4	69.2	-73.1	11.9	31.1	0.013	0.85	0.46
TargHR	15.0	3	0.200	3200.	557.	379.	564.	726.	5.2	0.194	0.102	0.161	0.264	3402.	3368.	4.0	2.6	1.4	67.5	-71.0	11.8	41.9	0.013	0.86	0.47
TargHR	15.0	3	0.200	3500.	557.	388.	563.	731.	5.1	0.179	0.101	0.153	0.244	3486.	3430.	4.0	2.7	1.3	68.1	-71.4	9.3	51.7	0.010	0.86	0.47
TargHR	15.0	3	0.220	2300.	611.	441.	618.	778.	5.2	0.254	0.132	0.211	0.320	3008.	2963.	4.1	2.6	1.5	71.8	-74.2	20.6	20.6	0.015	0.83	0.41
TargHR	15.0	3	0.220	2600.	599.	437.	608.	772.	5.3	0.253	0.126	0.199	0.313	3077.	3007.	4.1	2.6	1.5	71.5	-72.6	18.0	28.5	0.020	0.84	0.42
TargHR	15.0	3	0.220	2900.	591.	418.	596.	776.	5.2	0.228	0.116	0.185	0.309	3173.	3116.	4.0	2.6	1.5	72.1	-75.7	16.9	38.7	0.013	0.84	0.43
TargHR	15.0	3	0.220	3200.	591.	423.	596.	775.	5.2	0.210	0.106	0.176	0.294	3319.	3233.	4.0	2.7	1.4	71.3	-79.4	12.9	46.6	0.011	0.85	0.45
TargHR	15.0	3	0.220	3500.	566.	404.	570.	749.	5.2	0.193	0.103	0.164	0.278	3371.	3313.	4.0	2.7	1.4	69.9	-74.6	12.3	55.5	0.006	0.85	0.46
TargHR	15.0	3	0.240	2300.	625.	435.	637.	803.	5.4	0.297	0.137	0.233	0.374	2878.	2762.	4.1	2.5	1.6	75.2	-76.5	25.5	25.5	0.028	0.82	0.40
TargHR	15.0	3	0.240	2600.	621.	447.	623.	803.	5.3	0.270	0.129	0.219	0.356	2976.	2882.	4.1	2.6	1.5	74.4	-79.6	21.6	33.4	0.020	0.83	0.41
TargHR	15.0	3	0.240	2900.	603.	438.	613.	787.	5.5	0.267	0.122	0.205	0.345	3045.	2985.	4.1	2.6	1.5	73.3	-76.0	20.5	44.1	0.021	0.83	0.42
TargHR	15.0	3	0.240	3200.	598.	433.	602.	792.	5.4	0.243	0.117	0.190	0.327	3148.	3054.	4.1	2.7	1.4	73.8	-79.3	16.8	52.5	0.021	0.84	0.43
TargHR	15.0	3	0.240	3500.	584.	416.	589.	773.	5.3	0.206	0.111	0.169	0.281	3320.	3258.	4.0	2.7	1.3	71.6	-76.7	12.3	58.6	0.009	0.85	0.45
TargHR	15.0	3	0.260	2300.	652.	456.	661.	828.	5.4	0.336	0.147	0.259	0.458	2754.	2603.	4.1	2.5	1.7	78.5	-82.7	31.8	31.8	0.036	0.81	0.37
TargHR	15.0	3	0.260	2600.	647.	455.	649.	819.	5.3	0.290	0.142	0.239	0.400	2889.	2726.	4.1	2.6	1.5	78.9	-82.8	25.7	38.1	0.026	0.82	0.39
TargHR	15.0	3	0.260	2900.	630.	449.	626.	817.	5.3	0.280	0.131	0.222	0.379	2952.	2800.	4.1	2.6	1.5	77.8	-82.0	23.5	48.8	0.025	0.83	0.40
TargHR	15.0	3	0.260	3200.	617.	440.	617.	811.	5.3	0.255	0.120	0.199	0.346	3115.	2944.	4.1	2.7	1.4	77.1	-81.0	19.7	53.8	0.020	0.84	0.42
TargHR	15.0	3	0.260	3500.	600.	416.	601.	801.	5.3	0.235	0.116	0.188	0.333	3168.	3046.	4.1	2.6	1.4	75.2	-77.3	17.4	64.1	0.013	0.84	0.43
TargHR	15.0	3	0.280	2300.	659.	432.	680.	849.	5.5	0.372	0.160	0.274	0.510	2635.	2440.	4.1	2.5	1.7	80.5	-84.3	35.8	35.8	0.049	0.80	0.36
TargHR	15.0	3	0.280	2600.	656.	453.	665.	847.	5.5	0.328	0.144	0.255	0.455	2778.	2597.	4.1	2.6	1.5	80.3	-84.9	30.3	43.1	0.033	0.81	0.37
TargHR	15.0	3	0.280	2900.	632.	443.	629.	821.	5.5	0.297	0.135	0.220	0.438	2931.	2769.	4.1	2.7	1.4	79.2	-83.0	25.2	48.4	0.030	0.82	0.40
TargHR	15.0	3	0.280	3200.	625.	442.	623.	827.	5.5	0.280	0.127	0.218	0.397	2987.	2853.	4.1	2.6	1.5	78.1	-81.5	23.3	58.4	0.026	0.83	0.41
TargHR	15.0	3	0.280	3500.	613.	437.	609.	814.	5.5	0.261	0.121	0.197	0.350	3113.	2996.	4.1	2.6	1.4	76.0	-79.9	18.8	66.7	0.022	0.84	0.42
TargHR	15.0	3	0.300	2300.	686.	465.	705.	869.	5.5	0.393	0.169	0.302	0.578	2551.	2297.	4.1	2.5	1.6	83.2	-90.1	40.2	40.2	0.042	0.79	0.34
TargHR	15.0	3	0.300	2600.	666.	451.	669.	866.	5.5	0.354	0.154	0.269	0.520	2679.	2474.	4.1	2.5	1.6	82.2	-88.4	33.6	47.1	0.042	0.80	0.36
TargHR	15.0	3	0.300	2900.	652.	454.	648.	848.	5.6	0.333	0.142	0.249	0.477	2820.	2597.	4.1	2.6	1.5	81.3	-84.9	29.5	54.0	0.035	0.82	0.38
TargHR	15.0	3	0.300	3200.	635.	440.	635.	835.	5.6	0.302	0.137	0.226	0.422	2918.	2727.	4.1	2.6	1.5	79.8	-82.4	25.7	61.6	0.029	0.82	0.40
TargHR	15.0	3	0.300	3500.	621.	441.	616.	819.	5.4	0.264	0.129	0.213	0.380	3002.	2865.	4.1	2.6	1.4	77.8	-82.4	22.5	70.8	0.018	0.83	0.41
TargHR	25.0	1	0.100	2300.	456.	356.	449.	572.	17.6	0.096	0.082	0.095	0.111	4271.	4295.	11.0	6.1	4.9	70.3	-79.8	0.3	0.3	0.000	0.90	0.57
TargHR	25.0	1	0.100	2600.	455.	355.	451.	565.	17.6	0.095	0.081	0.095	0.110	4304.	4337.	11.0	6.2	4.8	69.8	-79.2	0.4	1.0	0.000	0.90	0.57
TargHR	25.0	1	0.100	2900.	453.	353.	451.	559.	17.7	0.094	0.081	0.094	0.110	4307.	4306.	11.0	6.1	4.9	69.9	-78.7	0.4	3.4	0.000	0.90	0.58
TargHR	25.0	1	0.100	3200.	452.	348.	448.	563.	17.9	0.093	0.079	0.093	0.108	4335.	4336.	11.0	6.3	4.7	69.3	-79.9	0.2	7.8	0.000	0.90	0.58
TargHR	25.0	1	0.100	3500.	452.	342.	449.	566.	18.3	0.092	0.076	0.092	0.107	4384.	4341.	11.0	6.2	4.8	70.9	-80.3	0.3	14.3	0.000	0.90	0.58
TargHR	25.0	1	0.120	2300.	508.	404.	500.	622.	17.4	0.117	0.100	0.117	0.135	3979.	3955.	11.0	6.1	4.9	77.4	-88.3	0.5	0.5	0.000	0.89	0.54
TargHR	25.0	1	0.120	2600.	507.	407.	504.	619.	17.6	0.117	0.100	0.117	0.135	3980.	3951.	11.0	6.1	4.9	78.3	-89.2	0.6	2.0	0.000	0.89	0.54
TargHR	25.0	1	0.120	2900.	506.	405.	500.	622.	17.9	0.116	0.097	0.115	0.135	4010.	4006.	11.0	6.1	4.9	79.1	-89.3	0.5	5.8	0.000	0.89	0.54
TargHR	25.0	1	0.120	3200.	501.	384.	497.	623.	18.3	0.113	0.095	0.113	0.134	4026.	3974.	11.0	6.1	4.9	78.8	-91.6	0.5	13.4	0.001	0.89	0.55

Method Perc Dur Targ Trig Cmean C10 C50 C90 IAV Fmean F10 F50 F90 Smean S20 Nchange
Nup Ndown Cup Cdown Risk Risk Depl 4+ 7+ lim trig

TargHR	25.0	1	0.120	3500.	498.	381.	495.	621.	18.8	0.112	0.090	0.111	0.133	4073.	4016.	11.0	6.3	4.7	78.9	-93.2	0.5	23.4	0.000	0.89	0.55
TargHR	25.0	1	0.140	2300.	555.	448.	550.	675.	17.6	0.141	0.120	0.140	0.164	3704.	3670.	11.0	6.0	5.0	85.9	-97.5	1.3	1.3	0.000	0.88	0.50
TargHR	25.0	1	0.140	2600.	544.	429.	541.	659.	17.9	0.139	0.116	0.137	0.164	3687.	3672.	11.0	6.1	4.9	84.3	-96.3	1.3	4.8	0.001	0.88	0.51
TargHR	25.0	1	0.140	2900.	550.	432.	547.	676.	18.3	0.137	0.113	0.137	0.163	3755.	3704.	11.0	6.2	4.8	86.3	-100.1	1.3	10.1	0.000	0.88	0.51
TargHR	25.0	1	0.140	3200.	546.	425.	545.	667.	18.7	0.137	0.110	0.133	0.160	3801.	3723.	11.0	6.2	4.8	86.6	-101.1	0.9	20.2	0.001	0.88	0.52
TargHR	25.0	1	0.140	3500.	534.	400.	533.	673.	19.4	0.130	0.103	0.129	0.158	3834.	3759.	11.0	6.2	4.8	87.1	-103.6	1.0	33.7	0.000	0.88	0.53
TargHR	25.0	1	0.160	2300.	589.	483.	581.	713.	17.9	0.164	0.141	0.163	0.193	3454.	3416.	11.0	6.1	4.9	91.4	-104.8	3.0	3.0	0.000	0.86	0.47
TargHR	25.0	1	0.160	2600.	591.	475.	588.	718.	18.1	0.163	0.136	0.162	0.190	3484.	3437.	11.0	6.0	5.0	93.6	-105.7	2.3	7.7	0.000	0.87	0.48
TargHR	25.0	1	0.160	2900.	579.	459.	576.	705.	18.6	0.158	0.129	0.158	0.187	3508.	3461.	11.0	6.1	4.9	91.8	-107.4	2.5	18.3	0.001	0.87	0.48
TargHR	25.0	1	0.160	3200.	580.	450.	578.	717.	19.2	0.156	0.127	0.156	0.185	3549.	3489.	11.0	6.2	4.8	93.4	-112.7	2.3	31.6	0.000	0.87	0.49
TargHR	25.0	1	0.160	3500.	569.	432.	562.	714.	19.7	0.149	0.117	0.148	0.183	3625.	3560.	11.0	6.2	4.8	94.4	-112.6	2.1	45.4	0.000	0.87	0.50
TargHR	25.0	1	0.180	2300.	611.	493.	607.	736.	18.1	0.188	0.156	0.187	0.224	3202.	3185.	11.0	5.9	5.1	96.8	-109.8	6.5	6.5	0.000	0.85	0.44
TargHR	25.0	1	0.180	2600.	613.	489.	607.	744.	18.4	0.186	0.151	0.183	0.218	3254.	3229.	11.0	6.1	4.9	96.7	-113.1	5.1	14.9	0.001	0.85	0.45
TargHR	25.0	1	0.180	2900.	609.	477.	607.	748.	19.2	0.181	0.145	0.180	0.220	3291.	3260.	11.0	6.1	4.9	99.5	-117.8	5.2	27.9	0.000	0.86	0.45
TargHR	25.0	1	0.180	3200.	602.	460.	600.	746.	19.7	0.175	0.138	0.174	0.213	3357.	3286.	11.0	6.2	4.8	99.5	-121.2	5.0	42.0	0.001	0.86	0.47
TargHR	25.0	1	0.180	3500.	598.	448.	594.	752.	20.0	0.169	0.130	0.167	0.207	3433.	3372.	11.0	6.1	4.9	100.8	-121.1	3.4	56.2	0.000	0.86	0.47
TargHR	25.0	1	0.200	2300.	629.	499.	628.	762.	18.6	0.214	0.171	0.209	0.256	2994.	2971.	11.0	6.0	5.0	100.6	-116.4	11.9	11.9	0.003	0.84	0.41
TargHR	25.0	1	0.200	2600.	629.	503.	628.	760.	19.2	0.206	0.164	0.205	0.249	3064.	3032.	11.0	6.0	5.0	102.6	-121.9	10.4	23.7	0.001	0.84	0.42
TargHR	25.0	1	0.200	2900.	629.	490.	624.	775.	19.6	0.200	0.159	0.198	0.243	3131.	3085.	11.0	6.0	5.0	104.5	-125.0	7.8	37.7	0.000	0.85	0.43
TargHR	25.0	1	0.200	3200.	616.	470.	612.	769.	20.2	0.191	0.147	0.191	0.238	3200.	3189.	11.0	6.1	4.9	104.3	-125.7	7.6	51.5	0.000	0.85	0.44
TargHR	25.0	1	0.200	3500.	611.	460.	610.	769.	20.4	0.188	0.139	0.184	0.233	3261.	3206.	11.0	6.1	4.9	104.6	-127.9	7.0	65.8	0.001	0.86	0.45
TargHR	25.0	1	0.220	2300.	653.	522.	651.	781.	18.9	0.240	0.190	0.235	0.287	2838.	2806.	11.0	6.0	5.0	105.8	-123.5	17.3	17.3	0.001	0.83	0.38
TargHR	25.0	1	0.220	2600.	643.	509.	642.	785.	19.6	0.230	0.181	0.226	0.283	2885.	2869.	11.0	6.1	4.9	105.8	-128.4	17.2	33.3	0.000	0.83	0.40
TargHR	25.0	1	0.220	2900.	645.	497.	642.	804.	20.0	0.221	0.170	0.220	0.274	2975.	2940.	11.0	6.1	4.9	107.7	-133.0	14.0	47.9	0.000	0.84	0.41
TargHR	25.0	1	0.220	3200.	634.	487.	626.	790.	20.4	0.210	0.162	0.206	0.261	3062.	3038.	11.0	6.1	4.9	108.6	-130.9	11.7	60.3	0.000	0.84	0.42
TargHR	25.0	1	0.220	3500.	633.	478.	630.	786.	20.7	0.204	0.152	0.199	0.260	3144.	3086.	11.0	6.1	4.9	110.7	-135.0	10.4	71.3	0.000	0.85	0.43
TargHR	25.0	1	0.240	2300.	671.	531.	668.	816.	19.3	0.264	0.208	0.263	0.320	2688.	2651.	11.0	6.0	5.0	110.3	-130.3	26.0	26.0	0.000	0.82	0.36
TargHR	25.0	1	0.240	2600.	665.	516.	663.	808.	19.9	0.251	0.192	0.245	0.310	2789.	2742.	11.0	6.1	4.9	111.3	-134.8	21.8	39.4	0.000	0.82	0.37
TargHR	25.0	1	0.240	2900.	660.	512.	656.	810.	20.3	0.241	0.184	0.237	0.299	2853.	2813.	11.0	6.0	5.0	113.6	-135.2	19.3	56.0	0.001	0.83	0.39
TargHR	25.0	1	0.240	3200.	647.	486.	642.	814.	20.6	0.233	0.171	0.228	0.297	2894.	2880.	11.0	6.0	5.0	112.7	-137.5	18.6	68.6	0.001	0.83	0.40
TargHR	25.0	1	0.240	3500.	644.	479.	634.	822.	21.1	0.221	0.161	0.215	0.281	3013.	2936.	11.0	6.1	4.9	114.7	-139.7	14.0	77.0	0.001	0.84	0.42
TargHR	25.0	1	0.260	2300.	676.	526.	677.	827.	19.6	0.285	0.222	0.280	0.353	2560.	2573.	11.0	6.0	5.0	112.8	-132.7	34.1	34.1	0.000	0.80	0.34
TargHR	25.0	1	0.260	2600.	671.	507.	671.	829.	20.2	0.277	0.207	0.268	0.352	2626.	2628.	11.0	6.0	5.0	113.9	-138.8	30.0	48.9	0.004	0.81	0.35
TargHR	25.0	1	0.260	2900.	672.	513.	669.	832.	20.8	0.264	0.198	0.261	0.328	2730.	2708.	11.0	6.1	4.9	117.8	-144.0	26.3	62.0	0.002	0.82	0.36
TargHR	25.0	1	0.260	3200.	661.	506.	652.	822.	21.1	0.252	0.186	0.241	0.319	2806.	2726.	11.0	6.0	5.0	118.7	-141.7	21.1	74.4	0.001	0.83	0.38
TargHR	25.0	1	0.260	3500.	651.	496.	647.	811.	21.1	0.238	0.175	0.229	0.309	2886.	2862.	11.0	6.1	4.9	116.3	-142.9	19.3	81.8	0.000	0.83	0.39
TargHR	25.0	1	0.280	2300.	684.	518.	688.	840.	20.0	0.309	0.229	0.299	0.382	2463.	2456.	11.0	6.0	5.0	115.3	-137.7	40.0	40.0	0.002	0.79	0.31
TargHR	25.0	1	0.280	2600.	677.	512.	676.	846.	20.5	0.297	0.219	0.287	0.370	2528.	2505.	11.0	6.1	4.9	117.3	-140.6	36.9	56.4	0.001	0.80	0.33
TargHR	25.0	1	0.280	2900.	668.	498.	671.	839.	20.9	0.284	0.205	0.274	0.358	2596.	2593.	11.0	6.0	5.0	117.7	-143.3	32.0	69.0	0.004	0.81	0.34
TargHR	25.0	1	0.280	3200.	661.	495.	662.	836.	21.3	0.270	0.191	0.259	0.342	2695.	2705.	11.0	6.0	5.0	119.6	-144.8	27.6	78.0	0.003	0.81	0.36
TargHR	25.0	1	0.280	3500.	658.	500.	657.	831.	21.4	0.258	0.183	0.246	0.332	2778.	2754.	11.0	6.0	5.0	119.8	-144.8	23.6	86.3	0.003	0.82	0.38
TargHR	25.0	1	0.300	2300.	676.	494.	685.	847.	20.5	0.341	0.242	0.321	0.422	2317.	2358.	11.0	5.9	5.1	116.7	-141.2	50.0	50.0	0.005	0.78	0.30
TargHR	25.0	1	0.300	2600.	674.	489.	676.	850.	21.1	0.321	0.225	0.305	0.404	2421.	2427.	11.0	6.1	4.9	119.7	-144.6	42.9	62.2	0.005	0.79	0.31
TargHR	25.0	1	0.300	2900.	678.	510.	680.	844.	21.2	0.311	0.218	0.293	0.398	2496.	2472.	11.0	6.0	5.0	121.2	-146.8	38.2	73.5	0.004	0.80	0.33
TargHR	25.0	1	0.300	3200.	661.	492.	661.	838.	21.5	0.292	0.202	0.271	0.371	2579.	2591.	11.0	5.9	5.1	121.2	-147.8	34.1	82.4	0.004	0.81	0.35
TargHR	25.0	1	0.300	3500.	658.	477.	656.	836.	21.6	0.275	0.190	0.256	0.358	2695.	2686.	11.0	6.0	5.0	120.9	-148.5	28.7	87.0	0.006	0.81	0.36
TargHR	25.0	3	0.100	2300.	425.	326.	417.	539.	6.9	0.092	0.068	0.088	0.112	4360.	4420.	4.0	2.6	1.4	70.4	-71.7	1.1	1.1	0.001	0.90	0.58
TargHR	25.0	3	0.100	2600.	420.	324.	417.	530.	7.0	0.091	0.065	0.087	0.110	4365.	4431.	4.0	2.6	1.4	70.2	-74.0	1.4	2.4	0.001	0.90	0.58
TargHR	25.0	3	0.100	2900.	420.	317.	412.	544.	7.0	0.092	0.064	0.088	0.111	4368.	4449.	4.0	2.7	1.4	69.9	-72.9	1.9	5.5	0.003	0.90	0.58
TargHR	25.0	3	0.100	3200.	420.	316.	411.	542.	7.3	0.091	0.063	0.086	0.112	4419.	4479.	4.0	2.6	1.4	71.9	-76.2	1.3	9.4	0.003	0.90	0.58
TargHR	25.0	3	0.100	3500.	409.	283.	406.	536.	7.3	0.091	0.060	0.085	0.111	4403.	4472.	4.0	2.7	1.4	69.0	-73.9	1.5	16.1	0.003	0.90	0.58
TargHR	25.0	3	0.120	2300.	472.	364.	467.	600.	7.1	0.111	0.077	0.108	0.139	4079.	4120.	4.0	2.6	1.4	78.9	-84.3	2.5	2.5	0.001	0.89	0.55
TargHR	25.0	3	0.120	2600.	475.	359.	475.	603.	7.0	0.112	0.079	0.108	0.138	4061.	4096.	4.0	2.6	1.5	78.5	-84.2	2.1	4.2	0.001	0.89	0.55
TargHR	25.0	3	0.120	2900.	474.	358.	477.	601.	7.2	0.109	0.075	0.108	0.141	4097.	4080.	4.0	2.6	1.4	79.4	-87.9	2.0	8.5	0.001	0.89	0.55
TargHR	25.0	3	0.120	3200.	461.	340.	460.	595.	7.3	0.104	0.071	0.103	0.137	4154.	4182.	4.0	2.6	1.4	78.5	-84.2	1.6	14.3	0.000	0.89	0.56
TargHR	25.0	3	0.120	3500.	453.	317.	455.	587.	7.5	0.104	0.067	0.101	0.135	4178.	4213.	4.0	2.7	1.3	78.4	-88.6	1.6	22.6	0.001	0.89	0.56
TargHR	25.0	3	0.140	2300.	515.	389.	513.	639.	7.1	0.132	0.092	0.129	0.169	3811.	3776.	4.0	2.6	1.5	85.7	-92.4	2.8	2.8	0.001	0.88	0.52
TargHR	25.0	3	0.140	2600.	516.	389.	520.	641.	7.2	0.131	0.089	0.126	0.167	3866.	3820.	4.0	2.6	1.4	86.9	-94.8	2.7	6.2	0.001	0.88	0.52

Method Perc Dur Targ Trig Cmean C10 C50 C90 IAV Fmean F10 F50 F90 Smean S20 Nchange
Nup Ndown Cup Cdown Risk Risk Depl 4+ 7+ lim trig

TargHR	25.0	3	0.140	2900.	511.	379.	514.	641.	7.4	0.127	0.080	0.124	0.170	3905.	3891.	4.0	2.7	1.3	87.0	-97.1	3.1	12.3	0.001	0.88	0.52
TargHR	25.0	3	0.140	3200.	500.	360.	503.	641.	7.5	0.126	0.077	0.120	0.164	3953.	3914.	4.0	2.7	1.4	86.6	-94.6	2.4	20.0	0.003	0.88	0.53
TargHR	25.0	3	0.140	3500.	493.	349.	495.	634.	7.7	0.127	0.074	0.118	0.165	3967.	3929.	4.0	2.7	1.3	86.1	-100.6	3.3	30.9	0.003	0.88	0.54
TargHR	25.0	3	0.160	2300.	555.	409.	554.	692.	7.1	0.155	0.106	0.150	0.200	3603.	3568.	4.0	2.5	1.5	92.3	-104.1	5.4	5.4	0.001	0.87	0.49
TargHR	25.0	3	0.160	2600.	553.	408.	557.	686.	7.3	0.152	0.099	0.146	0.199	3670.	3568.	4.0	2.6	1.4	93.8	-105.6	5.0	10.1	0.002	0.87	0.50
TargHR	25.0	3	0.160	2900.	544.	390.	548.	692.	7.4	0.146	0.094	0.146	0.194	3681.	3634.	4.0	2.6	1.4	92.5	-109.1	4.3	18.3	0.000	0.87	0.50
TargHR	25.0	3	0.160	3200.	531.	380.	531.	686.	7.6	0.143	0.087	0.137	0.191	3760.	3702.	4.0	2.7	1.4	92.6	-106.8	4.6	27.2	0.001	0.87	0.51
TargHR	25.0	3	0.160	3500.	522.	363.	524.	683.	7.8	0.137	0.080	0.131	0.190	3813.	3733.	4.0	2.7	1.3	92.1	-109.9	4.2	38.2	0.001	0.88	0.52
TargHR	25.0	3	0.180	2300.	586.	445.	592.	727.	7.2	0.181	0.119	0.172	0.239	3366.	3292.	4.0	2.5	1.5	97.8	-114.0	9.0	9.0	0.002	0.86	0.46
TargHR	25.0	3	0.180	2600.	579.	405.	582.	740.	7.4	0.173	0.107	0.168	0.233	3456.	3384.	4.0	2.6	1.4	98.6	-114.5	8.2	16.1	0.001	0.86	0.47
TargHR	25.0	3	0.180	2900.	575.	404.	580.	732.	7.5	0.167	0.099	0.163	0.224	3525.	3414.	4.0	2.6	1.4	99.2	-114.6	6.6	24.7	0.001	0.86	0.48
TargHR	25.0	3	0.180	3200.	563.	397.	571.	719.	7.7	0.166	0.096	0.156	0.227	3542.	3475.	4.0	2.6	1.4	98.5	-118.3	7.0	37.4	0.002	0.86	0.48
TargHR	25.0	3	0.180	3500.	542.	384.	548.	714.	8.0	0.158	0.088	0.144	0.215	3642.	3554.	4.0	2.7	1.3	98.1	-118.4	7.1	44.7	0.006	0.87	0.50
TargHR	25.0	3	0.200	2300.	607.	443.	612.	769.	7.4	0.214	0.128	0.195	0.282	3158.	3068.	4.0	2.5	1.5	104.0	-117.9	14.7	14.7	0.009	0.84	0.43
TargHR	25.0	3	0.200	2600.	606.	426.	610.	771.	7.5	0.206	0.117	0.191	0.276	3238.	3137.	4.0	2.5	1.5	104.3	-124.1	14.1	23.9	0.008	0.85	0.44
TargHR	25.0	3	0.200	2900.	603.	428.	604.	776.	7.7	0.195	0.115	0.178	0.270	3340.	3221.	4.0	2.6	1.4	106.6	-124.7	11.4	32.6	0.005	0.85	0.45
TargHR	25.0	3	0.200	3200.	584.	402.	589.	755.	7.9	0.186	0.103	0.172	0.259	3384.	3290.	4.0	2.6	1.4	105.0	-126.4	10.4	43.1	0.003	0.85	0.46
TargHR	25.0	3	0.200	3500.	570.	391.	578.	750.	8.0	0.174	0.094	0.163	0.247	3502.	3401.	4.0	2.6	1.4	104.3	-124.4	9.3	51.3	0.003	0.86	0.48
TargHR	25.0	3	0.220	2300.	624.	434.	636.	784.	7.6	0.248	0.134	0.220	0.330	2977.	2906.	4.0	2.4	1.6	107.9	-128.3	21.6	21.6	0.012	0.83	0.41
TargHR	25.0	3	0.220	2600.	627.	435.	631.	806.	7.7	0.237	0.127	0.209	0.321	3086.	2977.	4.0	2.4	1.6	110.0	-131.2	18.7	30.1	0.011	0.83	0.42
TargHR	25.0	3	0.220	2900.	619.	431.	628.	790.	7.9	0.224	0.119	0.198	0.313	3171.	3069.	4.0	2.5	1.5	109.9	-132.0	16.5	39.0	0.008	0.84	0.43
TargHR	25.0	3	0.220	3200.	605.	419.	612.	791.	8.1	0.230	0.110	0.185	0.312	3248.	3095.	4.1	2.6	1.5	109.2	-131.6	15.3	49.5	0.016	0.84	0.44
TargHR	25.0	3	0.220	3500.	589.	398.	591.	784.	8.0	0.193	0.103	0.173	0.274	3360.	3270.	4.0	2.6	1.4	107.8	-131.7	11.8	57.9	0.006	0.85	0.45
TargHR	25.0	3	0.240	2300.	644.	453.	646.	827.	7.8	0.283	0.144	0.242	0.388	2837.	2742.	4.0	2.4	1.6	113.8	-134.5	27.4	27.4	0.018	0.82	0.38
TargHR	25.0	3	0.240	2600.	641.	451.	645.	819.	7.8	0.271	0.140	0.235	0.368	2894.	2782.	4.0	2.4	1.6	112.6	-137.1	24.4	37.5	0.014	0.82	0.39
TargHR	25.0	3	0.240	2900.	627.	435.	632.	817.	8.2	0.255	0.124	0.217	0.356	3026.	2900.	4.0	2.5	1.5	115.0	-137.2	21.9	45.9	0.013	0.83	0.41
TargHR	25.0	3	0.240	3200.	621.	428.	628.	818.	8.1	0.242	0.121	0.198	0.357	3120.	2951.	4.0	2.6	1.5	113.1	-139.1	18.9	54.5	0.012	0.84	0.42
TargHR	25.0	3	0.240	3500.	605.	403.	604.	813.	8.2	0.217	0.107	0.186	0.307	3285.	3114.	4.0	2.7	1.4	111.7	-135.5	14.2	61.3	0.011	0.85	0.44
TargHR	25.0	3	0.260	2300.	655.	453.	661.	850.	8.1	0.336	0.162	0.270	0.465	2649.	2540.	4.1	2.3	1.8	118.4	-136.5	35.1	35.1	0.030	0.80	0.36
TargHR	25.0	3	0.260	2600.	652.	446.	653.	852.	8.2	0.317	0.151	0.251	0.435	2782.	2641.	4.1	2.4	1.7	119.0	-138.5	30.3	43.0	0.024	0.81	0.37
TargHR	25.0	3	0.260	2900.	644.	451.	646.	838.	8.2	0.292	0.131	0.233	0.424	2907.	2755.	4.1	2.5	1.6	117.5	-145.1	27.0	51.0	0.021	0.82	0.39
TargHR	25.0	3	0.260	3200.	632.	420.	627.	838.	8.4	0.285	0.130	0.218	0.392	2980.	2825.	4.1	2.5	1.6	117.1	-138.9	22.2	59.7	0.026	0.83	0.40
TargHR	25.0	3	0.260	3500.	619.	415.	615.	819.	8.3	0.246	0.118	0.197	0.363	3137.	3022.	4.0	2.5	1.5	115.1	-142.7	19.1	65.2	0.013	0.83	0.42
TargHR	25.0	3	0.280	2300.	673.	467.	683.	858.	8.2	0.386	0.171	0.294	0.543	2530.	2362.	4.1	2.3	1.8	121.8	-141.8	39.5	39.5	0.047	0.79	0.34
TargHR	25.0	3	0.280	2600.	673.	454.	670.	880.	8.3	0.356	0.158	0.281	0.555	2645.	2439.	4.1	2.4	1.7	124.1	-147.4	35.1	48.3	0.035	0.80	0.35
TargHR	25.0	3	0.280	2900.	648.	434.	645.	852.	8.4	0.318	0.148	0.245	0.463	2768.	2629.	4.1	2.5	1.6	120.5	-148.4	30.6	56.6	0.027	0.81	0.37
TargHR	25.0	3	0.280	3200.	633.	429.	634.	840.	8.5	0.307	0.125	0.226	0.444	2912.	2756.	4.1	2.4	1.7	120.2	-144.9	27.6	61.8	0.031	0.82	0.39
TargHR	25.0	3	0.280	3500.	631.	446.	623.	825.	8.4	0.274	0.125	0.211	0.400	3021.	2880.	4.1	2.5	1.6	118.5	-143.2	22.4	69.6	0.022	0.83	0.41
TargHR	25.0	3	0.300	2300.	678.	462.	688.	884.	8.5	0.435	0.175	0.319	0.659	2400.	2213.	4.2	2.3	1.9	123.9	-147.1	45.9	45.9	0.060	0.78	0.32
TargHR	25.0	3	0.300	2600.	678.	472.	677.	887.	8.5	0.411	0.161	0.297	0.736	2528.	2315.	4.1	2.3	1.8	125.2	-154.4	40.6	52.6	0.058	0.79	0.33
TargHR	25.0	3	0.300	2900.	663.	449.	660.	884.	8.6	0.382	0.150	0.275	0.635	2628.	2449.	4.1	2.4	1.8	125.2	-150.9	37.0	60.4	0.044	0.79	0.35
TargHR	25.0	3	0.300	3200.	646.	415.	646.	878.	8.7	0.347	0.138	0.251	0.496	2760.	2588.	4.1	2.4	1.7	123.4	-146.9	31.7	67.4	0.047	0.81	0.37
TargHR	25.0	3	0.300	3500.	650.	442.	646.	870.	8.5	0.317	0.131	0.229	0.460	2899.	2700.	4.1	2.4	1.7	123.7	-150.0	25.5	73.4	0.038	0.81	0.39

HR rule, Constraint on TAC variation at all levels of SSB

Method Perc Dur Targ Trig Cmean C10 C50 C90 IAV Fmean F10 F50 F90 Smean S20 Nchange
Nup Ndown Cup Cdown Risk Risk Depl 4+ 7+ lim trig

TargHR	5.0	1	0.100	2300.	416.	325.	413.	514.	5.0	0.130	0.077	0.091	0.115	4129.	4337.	11.0	6.2	4.8	18.4	-18.4	4.3	4.3	0.016	0.89	0.55
TargHR	5.0	1	0.100	2600.	413.	328.	410.	510.	5.0	0.128	0.076	0.092	0.113	4098.	4289.	11.0	6.4	4.6	18.4	-18.2	4.1	5.8	0.016	0.89	0.55
TargHR	5.0	1	0.100	2900.	413.	326.	412.	520.	5.1	0.134	0.076	0.091	0.114	4134.	4289.	11.0	6.3	4.7	18.4	-17.9	4.7	9.8	0.016	0.89	0.55
TargHR	5.0	1	0.100	3200.	415.	328.	413.	513.	4.9	0.121	0.076	0.091	0.113	4149.	4332.	11.0	6.3	4.7	18.4	-18.2	3.9	14.4	0.014	0.89	0.55
TargHR	5.0	1	0.100	3500.	411.	317.	413.	513.	5.1	0.136	0.076	0.090	0.115	4123.	4317.	11.0	6.3	4.7	18.5	-18.2	4.7	23.5	0.021	0.89	0.56
TargHR	5.0	1	0.120	2300.	458.	367.	459.	568.	5.1	0.153	0.088	0.107	0.138	3939.	4071.	11.0	6.8	4.2	20.3	-20.3	4.7	4.7	0.019	0.88	0.53
TargHR	5.0	1	0.120	2600.	465.	366.	462.	570.	4.9	0.137	0.090	0.110	0.141	3920.	4034.	11.0	6.7	4.3	20.4	-20.5	4.2	6.5	0.011	0.88	0.53
TargHR	5.0	1	0.120	2900.	461.	356.	464.	576.	5.0	0.150	0.088	0.108	0.140	3931.	4038.	11.0	6.7	4.3	20.4	-20.3	4.5	11.5	0.019	0.88	0.53
TargHR	5.0	1	0.120	3200.	457.	350.	458.	568.	5.1	0.142	0.087	0.106	0.137	3940.	4057.	11.0	6.7	4.3	20.3	-20.3	4.3	19.1	0.012	0.88	0.54
TargHR	5.0	1	0.120	3500.	454.	339.	453.	580.	5.1	0.136	0.084	0.105	0.135	3982.	4100.	11.0	6.5	4.5	20.2	-20.4	3.7	28.5	0.012	0.89	0.54
TargHR	5.0	1	0.140	2300.	508.	405.	507.	624.	5.0	0.164	0.104	0.129	0.168	3697.	3747.	11.0	6.8	4.2	22.3	-22.5	5.5	5.5	0.014	0.88	0.51
TargHR	5.0	1	0.140	2600.	499.	382.	499.	616.	4.9	0.153	0.100	0.127	0.166	3712.	3819.	11.0	6.8	4.2	22.1	-22.1	5.7	9.6	0.016	0.87	0.51
TargHR	5.0	1	0.140	2900.	500.	371.	505.	621.	4.9	0.152	0.099	0.128	0.169	3687.	3774.	11.0	6.7	4.3	21.9	-22.3	5.4	17.2	0.009	0.87	0.51
TargHR	5.0	1	0.140	3200.	491.	360.	497.	616.	5.0	0.161	0.094	0.124	0.165	3745.	3815.	11.0	6.8	4.2	22.0	-21.7	5.6	25.9	0.021	0.88	0.51
TargHR	5.0	1	0.140	3500.	488.	359.	489.	626.	5.0	0.146	0.092	0.119	0.163	3818.	3920.	11.0	6.8	4.2	21.8	-21.9	4.8	35.8	0.010	0.88	0.52
TargHR	5.0	1	0.160	2300.	535.	422.	542.	647.	4.9	0.177	0.115	0.148	0.195	3481.	3549.	11.0	6.8	4.2	23.6	-24.0	6.8	6.8	0.012	0.86	0.48
TargHR	5.0	1	0.160	2600.	533.	400.	541.	667.	5.0	0.180	0.114	0.148	0.202	3467.	3521.	11.0	6.7	4.3	23.6	-23.5	8.0	12.7	0.015	0.86	0.48
TargHR	5.0	1	0.160	2900.	530.	381.	538.	671.	5.1	0.190	0.109	0.145	0.201	3512.	3547.	11.0	6.7	4.3	23.6	-23.7	8.3	22.4	0.019	0.87	0.49
TargHR	5.0	1	0.160	3200.	526.	390.	532.	659.	5.2	0.181	0.102	0.141	0.193	3586.	3635.	11.0	6.9	4.1	23.5	-23.9	6.8	31.7	0.016	0.87	0.49
TargHR	5.0	1	0.160	3500.	505.	361.	509.	652.	5.3	0.189	0.096	0.132	0.191	3620.	3670.	11.0	6.9	4.1	22.9	-22.8	7.8	42.7	0.023	0.87	0.50
TargHR	5.0	1	0.180	2300.	579.	453.	581.	718.	4.9	0.194	0.130	0.171	0.233	3298.	3279.	11.0	6.8	4.2	25.4	-26.1	10.0	10.0	0.007	0.86	0.46
TargHR	5.0	1	0.180	2600.	563.	416.	574.	709.	5.2	0.219	0.122	0.170	0.234	3288.	3284.	11.0	6.7	4.3	25.2	-25.0	11.7	19.1	0.022	0.86	0.46
TargHR	5.0	1	0.180	2900.	561.	399.	570.	715.	5.0	0.188	0.116	0.164	0.229	3375.	3402.	11.0	6.7	4.3	24.8	-25.4	9.8	28.3	0.013	0.86	0.47
TargHR	5.0	1	0.180	3200.	548.	390.	551.	704.	5.1	0.187	0.110	0.153	0.226	3437.	3455.	11.0	6.9	4.1	24.5	-24.7	9.3	38.2	0.012	0.86	0.47
TargHR	5.0	1	0.180	3500.	541.	391.	538.	698.	5.0	0.169	0.104	0.145	0.208	3547.	3528.	11.0	7.0	4.0	24.2	-24.8	7.2	48.8	0.008	0.87	0.49
TargHR	5.0	1	0.200	2300.	595.	434.	607.	745.	5.0	0.230	0.137	0.191	0.272	3115.	3103.	11.0	6.8	4.2	26.2	-26.8	15.3	15.3	0.020	0.84	0.43
TargHR	5.0	1	0.200	2600.	587.	420.	604.	742.	5.1	0.231	0.129	0.188	0.258	3152.	3109.	11.0	6.8	4.2	25.9	-26.4	13.1	23.3	0.019	0.85	0.44
TargHR	5.0	1	0.200	2900.	580.	421.	589.	741.	5.1	0.216	0.124	0.178	0.255	3236.	3198.	11.0	6.9	4.1	25.7	-26.8	12.0	33.7	0.016	0.85	0.45
TargHR	5.0	1	0.200	3200.	568.	409.	576.	724.	5.2	0.213	0.115	0.169	0.251	3315.	3273.	11.0	7.0	4.0	25.5	-25.7	11.1	44.2	0.019	0.86	0.46
TargHR	5.0	1	0.200	3500.	561.	396.	555.	739.	5.3	0.208	0.113	0.159	0.238	3388.	3344.	11.0	7.0	4.0	25.4	-25.8	10.1	55.1	0.020	0.86	0.47
TargHR	5.0	1	0.220	2300.	624.	476.	632.	776.	5.0	0.259	0.153	0.220	0.323	2930.	2874.	11.0	6.6	4.4	27.6	-28.4	20.5	20.5	0.020	0.83	0.41
TargHR	5.0	1	0.220	2600.	612.	442.	626.	770.	5.1	0.250	0.138	0.208	0.305	3019.	2928.	11.0	6.8	4.2	27.2	-28.2	19.2	30.9	0.016	0.84	0.42
TargHR	5.0	1	0.220	2900.	599.	419.	613.	775.	5.4	0.262	0.135	0.198	0.303	3067.	2982.	11.0	6.8	4.2	27.0	-27.3	16.8	40.8	0.027	0.84	0.43
TargHR	5.0	1	0.220	3200.	596.	441.	603.	771.	5.3	0.242	0.127	0.185	0.284	3192.	3097.	11.0	6.9	4.1	27.0	-27.3	13.2	49.5	0.024	0.85	0.44
TargHR	5.0	1	0.220	3500.	570.	393.	574.	750.	5.2	0.219	0.115	0.170	0.265	3281.	3240.	11.0	7.0	4.0	25.9	-26.3	12.5	59.6	0.019	0.85	0.46
TargHR	5.0	1	0.240	2300.	646.	478.	657.	814.	5.3	0.295	0.158	0.240	0.344	2850.	2739.	11.0	6.7	4.3	28.7	-29.3	24.2	24.2	0.021	0.82	0.39
TargHR	5.0	1	0.240	2600.	638.	449.	649.	804.	5.1	0.272	0.149	0.230	0.347	2906.	2771.	11.0	6.8	4.2	28.5	-29.5	23.4	35.6	0.018	0.83	0.40
TargHR	5.0	1	0.240	2900.	617.	436.	626.	804.	5.2	0.267	0.139	0.212	0.322	2996.	2901.	11.0	6.9	4.1	27.7	-28.5	19.5	45.6	0.023	0.84	0.42
TargHR	5.0	1	0.240	3200.	602.	415.	605.	777.	5.1	0.231	0.127	0.191	0.296	3151.	3044.	11.0	7.2	3.8	27.2	-27.8	15.9	51.8	0.014	0.84	0.43
TargHR	5.0	1	0.240	3500.	591.	421.	590.	778.	5.1	0.215	0.122	0.182	0.279	3223.	3115.	11.0	7.1	3.9	26.6	-27.3	13.3	62.9	0.015	0.85	0.45
TargHR	5.0	1	0.260	2300.	659.	476.	678.	825.	5.0	0.314	0.165	0.263	0.418	2709.	2530.	11.0	6.7	4.3	29.5	-29.8	31.6	31.6	0.025	0.81	0.37
TargHR	5.0	1	0.260	2600.	658.	484.	671.	832.	5.0	0.286	0.159	0.242	0.387	2823.	2642.	11.0	6.8	4.2	29.3	-30.6	26.4	40.1	0.020	0.82	0.39
TargHR	5.0	1	0.260	2900.	632.	440.	637.	827.	5.2	0.278	0.142	0.225	0.369	2918.	2789.	11.0	7.0	4.0	28.5	-29.3	22.7	49.0	0.020	0.83	0.40
TargHR	5.0	1	0.260	3200.	624.	448.	628.	812.	5.2	0.258	0.138	0.211	0.340	3017.	2921.	11.0	6.9	4.1	28.3	-28.6	19.3	58.6	0.018	0.83	0.42
TargHR	5.0	1	0.260	3500.	610.	422.	612.	795.	5.2	0.241	0.131	0.196	0.311	3100.	2971.	11.0	7.1	3.9	27.7	-28.0	16.9	68.1	0.015	0.84	0.43
TargHR	5.0	1	0.280	2300.	685.	495.	699.	865.	5.1	0.351	0.182	0.289	0.472	2601.	2376.	11.0	6.5	4.5	30.6	-31.7	36.3	36.3	0.032	0.80	0.35
TargHR	5.0	1	0.280	2600.	667.	474.	683.	846.	5.1	0.319	0.164	0.265	0.448	2706.	2530.	11.0	6.7	4.3	29.9	-31.4	31.3	45.4	0.021	0.81	0.37
TargHR	5.0	1	0.280	2900.	646.	449.	657.	841.	5.2	0.300	0.155	0.243	0.403	2789.	2624.	11.0	6.9	4.1	29.3	-30.4	27.0	55.0	0.024	0.82	0.38
TargHR	5.0	1	0.280	3200.	631.	418.	645.	827.	5.5	0.296	0.145	0.226	0.382	2882.	2717.	11.0	6.9	4.1	28.9	-29.4	24.7	63.6	0.028	0.83	0.40
TargHR	5.0	1	0.280	3500.	621.	438.	626.	813.	5.2	0.259	0.135	0.211	0.331	3012.	2916.	11.0	6.9	4.1	28.1	-28.8	19.9	71.5	0.022	0.83	0.42
TargHR	5.0	1	0.300	2300.	699.	496.	716.	882.	5.3	0.380	0.197	0.311	0.514	2519.	2249.	11.0	6.6	4.4	31.6	-33.3	40.9	40.9	0.037	0.79	0.34
TargHR	5.0	1	0.300	2600.	685.	488.	694.	881.	5.1	0.335	0.174	0.285	0.467	2636.	2399.	11.0	6.8	4.2	31.0	-31.4	34.9	48.6	0.022	0.80	0.36
TargHR	5.0	1	0.300	2900.	667.	475.	670.	850.	5.0	0.293	0.159	0.253	0.411	2774.	2588.	11.0	7.0	4.0	30.0	-31.7	29.4	56.9	0.013	0.82	0.38
TargHR	5.0	1	0.300	3200.	648.	466.	658.	837.	5.2	0.297	0.153	0.241	0.392	2828.	2674.	11.0	6.9	4.1	29.3	-30.7	27.1	67.1	0.023	0.82	0.39
TargHR	5.0	1	0.300	3500.	627.	458.	627.	810.	5.2	0.265	0.140	0.216	0.345	2975.	2841.	11.0	7.1	3.9	28.5	-29.2	21.5	73.0	0.017	0.83	0.41
TargHR	5.0	3	0.100	2300.	436.	396.	436.	512.	2.5	0.212	0.084	0.108	0.171	3772.	4048.	4.2	1.4	2.8	20.0	-21.2	9.4	9.4	0.045	0.87	

0.51Method

Method Perc Dur Targ Trig Cmean C10 C50 C90 IAV Fmean F10 F50 F90 Smean S20 Nchange
Nup Ndown Cup Cdown Risk Risk Depl 4+ 7+ lim trig

TargHR	5.0	3	0.100	2600.	440.	397.	440.	505.	2.2	0.182	0.084	0.108	0.162	3797.	4055.	4.1	1.4	2.7	19.8	-21.2	8.2	11.4	0.030	0.87	0.51
TargHR	5.0	3	0.100	2900.	440.	398.	439.	508.	2.3	0.187	0.083	0.107	0.160	3795.	4041.	4.1	1.5	2.7	19.8	-21.1	8.4	17.4	0.031	0.87	0.51
TargHR	5.0	3	0.100	3200.	437.	396.	438.	505.	2.6	0.223	0.086	0.110	0.183	3707.	3970.	4.2	1.4	2.8	19.7	-21.9	10.5	27.0	0.046	0.87	0.50
TargHR	5.0	3	0.100	3500.	438.	398.	439.	503.	2.5	0.204	0.084	0.108	0.162	3776.	4050.	4.2	1.4	2.7	19.8	-21.9	9.0	36.1	0.039	0.87	0.51
TargHR	5.0	3	0.120	2300.	460.	406.	463.	536.	2.4	0.210	0.092	0.119	0.178	3653.	3874.	4.2	1.9	2.3	20.9	-22.1	9.6	9.6	0.037	0.87	0.50
TargHR	5.0	3	0.120	2600.	462.	406.	464.	550.	2.5	0.221	0.093	0.120	0.176	3648.	3854.	4.2	1.9	2.3	21.3	-22.2	9.5	13.4	0.043	0.87	0.50
TargHR	5.0	3	0.120	2900.	462.	410.	469.	537.	2.6	0.218	0.092	0.120	0.168	3672.	3885.	4.2	1.9	2.3	21.2	-22.7	8.6	19.2	0.040	0.87	0.50
TargHR	5.0	3	0.120	3200.	462.	406.	467.	544.	2.7	0.236	0.093	0.120	0.181	3614.	3784.	4.2	1.9	2.3	21.1	-22.4	9.9	30.5	0.046	0.87	0.50
TargHR	5.0	3	0.120	3500.	459.	404.	463.	542.	2.6	0.233	0.092	0.119	0.186	3620.	3832.	4.2	1.9	2.3	21.1	-22.3	10.3	41.9	0.045	0.87	0.50
TargHR	5.0	3	0.140	2300.	488.	417.	495.	574.	2.4	0.220	0.099	0.132	0.196	3548.	3688.	4.2	2.3	1.9	22.3	-22.9	10.4	10.4	0.038	0.86	0.49
TargHR	5.0	3	0.140	2600.	487.	422.	492.	568.	2.4	0.215	0.099	0.130	0.187	3584.	3720.	4.2	2.3	1.9	22.2	-23.8	8.7	13.3	0.035	0.87	0.49
TargHR	5.0	3	0.140	2900.	491.	419.	494.	585.	2.5	0.234	0.101	0.132	0.191	3554.	3663.	4.2	2.3	1.9	22.5	-23.5	10.5	22.6	0.039	0.86	0.49
TargHR	5.0	3	0.140	3200.	485.	412.	495.	579.	2.7	0.246	0.101	0.132	0.212	3504.	3633.	4.2	2.2	2.0	22.6	-23.3	11.8	33.5	0.048	0.86	0.48
TargHR	5.0	3	0.140	3500.	485.	413.	490.	572.	2.4	0.207	0.099	0.129	0.190	3594.	3748.	4.1	2.2	2.0	22.6	-22.3	9.1	45.5	0.029	0.87	0.49
TargHR	5.0	3	0.160	2300.	508.	431.	516.	606.	2.6	0.247	0.108	0.143	0.211	3437.	3530.	4.2	2.5	1.7	23.3	-24.6	11.6	11.6	0.044	0.86	0.48
TargHR	5.0	3	0.160	2600.	515.	437.	521.	608.	2.3	0.218	0.107	0.144	0.211	3471.	3595.	4.1	2.5	1.6	23.4	-23.3	10.4	16.4	0.032	0.86	0.47
TargHR	5.0	3	0.160	2900.	509.	422.	519.	606.	2.5	0.242	0.107	0.142	0.225	3447.	3563.	4.2	2.5	1.7	23.5	-24.2	12.6	25.7	0.041	0.86	0.47
TargHR	5.0	3	0.160	3200.	499.	418.	509.	598.	2.7	0.256	0.107	0.140	0.217	3414.	3552.	4.2	2.4	1.9	23.5	-24.0	12.1	38.1	0.050	0.86	0.47
TargHR	5.0	3	0.160	3500.	491.	408.	502.	593.	2.8	0.260	0.104	0.137	0.218	3425.	3578.	4.2	2.3	1.9	23.3	-23.7	12.6	48.9	0.052	0.86	0.48
TargHR	5.0	3	0.180	2300.	534.	443.	546.	637.	2.4	0.245	0.116	0.158	0.246	3329.	3408.	4.1	2.7	1.5	24.6	-24.9	13.4	13.4	0.040	0.85	0.46
TargHR	5.0	3	0.180	2600.	530.	438.	545.	634.	2.7	0.273	0.116	0.158	0.241	3301.	3364.	4.2	2.6	1.6	24.5	-25.8	13.9	21.7	0.047	0.85	0.46
TargHR	5.0	3	0.180	2900.	526.	430.	538.	635.	2.6	0.261	0.115	0.154	0.240	3339.	3428.	4.2	2.6	1.6	24.5	-25.4	12.6	29.1	0.047	0.85	0.46
TargHR	5.0	3	0.180	3200.	520.	429.	531.	624.	2.6	0.242	0.109	0.148	0.227	3408.	3485.	4.2	2.6	1.6	24.5	-24.0	12.2	39.1	0.037	0.86	0.47
TargHR	5.0	3	0.180	3500.	503.	416.	514.	612.	2.8	0.265	0.106	0.142	0.219	3416.	3552.	4.2	2.5	1.8	23.8	-24.3	12.3	50.9	0.052	0.86	0.47
TargHR	5.0	3	0.200	2300.	552.	444.	567.	656.	2.4	0.265	0.124	0.168	0.259	3234.	3256.	4.2	2.9	1.3	25.5	-25.8	14.9	14.9	0.039	0.85	0.45
TargHR	5.0	3	0.200	2600.	546.	444.	563.	650.	2.5	0.269	0.121	0.168	0.255	3237.	3302.	4.2	2.8	1.4	25.3	-26.0	14.4	22.0	0.042	0.85	0.45
TargHR	5.0	3	0.200	2900.	544.	445.	555.	648.	2.3	0.232	0.115	0.158	0.244	3351.	3410.	4.1	2.8	1.3	25.2	-25.8	12.7	30.9	0.031	0.85	0.46
TargHR	5.0	3	0.200	3200.	524.	428.	539.	630.	2.7	0.277	0.115	0.153	0.252	3327.	3438.	4.2	2.7	1.6	24.8	-26.4	14.0	42.3	0.051	0.85	0.46
TargHR	5.0	3	0.200	3500.	516.	418.	525.	624.	2.6	0.249	0.111	0.147	0.236	3353.	3443.	4.2	2.6	1.6	24.5	-25.7	12.6	54.0	0.043	0.86	0.47
TargHR	5.0	3	0.220	2300.	562.	458.	576.	672.	2.6	0.281	0.129	0.181	0.286	3141.	3156.	4.2	2.9	1.3	26.1	-26.8	17.3	17.3	0.045	0.84	0.44
TargHR	5.0	3	0.220	2600.	552.	451.	569.	665.	2.9	0.307	0.124	0.176	0.289	3137.	3149.	4.3	2.9	1.4	25.9	-26.1	16.6	25.1	0.052	0.84	0.44
TargHR	5.0	3	0.220	2900.	545.	441.	559.	664.	2.7	0.286	0.119	0.167	0.272	3230.	3275.	4.2	2.8	1.4	25.7	-27.2	16.1	34.0	0.052	0.85	0.45
TargHR	5.0	3	0.220	3200.	533.	438.	549.	640.	2.7	0.284	0.117	0.161	0.269	3250.	3301.	4.2	2.8	1.5	25.2	-26.0	14.6	44.8	0.054	0.85	0.46
TargHR	5.0	3	0.220	3500.	527.	424.	538.	642.	2.6	0.259	0.113	0.155	0.248	3316.	3386.	4.2	2.7	1.5	25.0	-25.1	13.5	57.2	0.046	0.85	0.46
TargHR	5.0	3	0.240	2300.	574.	460.	597.	680.	2.6	0.295	0.131	0.191	0.306	3078.	3059.	4.2	3.0	1.2	26.8	-27.0	19.9	19.9	0.045	0.84	0.43
TargHR	5.0	3	0.240	2600.	570.	460.	590.	680.	2.5	0.281	0.128	0.181	0.293	3172.	3136.	4.2	3.0	1.2	26.7	-27.9	16.8	25.2	0.047	0.84	0.44
TargHR	5.0	3	0.240	2900.	554.	453.	568.	665.	2.5	0.258	0.122	0.168	0.271	3257.	3294.	4.2	2.9	1.2	26.0	-26.4	15.1	33.9	0.038	0.85	0.45
TargHR	5.0	3	0.240	3200.	549.	447.	562.	666.	2.4	0.260	0.121	0.167	0.263	3254.	3253.	4.2	2.9	1.3	25.8	-26.6	15.0	45.7	0.042	0.85	0.45
TargHR	5.0	3	0.240	3500.	539.	441.	555.	651.	2.8	0.284	0.115	0.159	0.260	3318.	3378.	4.2	2.8	1.4	25.5	-25.3	13.9	54.9	0.053	0.85	0.46
TargHR	5.0	3	0.260	2300.	582.	477.	604.	689.	2.6	0.301	0.136	0.196	0.323	3029.	2989.	4.2	3.1	1.1	27.1	-28.4	20.3	20.3	0.043	0.84	0.42
TargHR	5.0	3	0.260	2600.	572.	460.	593.	681.	2.6	0.299	0.129	0.185	0.303	3126.	3094.	4.2	3.1	1.2	27.0	-28.7	17.9	27.4	0.052	0.84	0.43
TargHR	5.0	3	0.260	2900.	561.	453.	582.	676.	2.9	0.305	0.127	0.176	0.293	3179.	3184.	4.3	3.0	1.3	26.6	-28.0	16.7	36.5	0.055	0.84	0.44
TargHR	5.0	3	0.260	3200.	558.	458.	570.	666.	2.4	0.266	0.123	0.173	0.269	3211.	3201.	4.2	2.9	1.3	26.0	-26.7	15.2	47.9	0.038	0.85	0.45
TargHR	5.0	3	0.260	3500.	544.	442.	558.	655.	2.6	0.271	0.119	0.165	0.259	3261.	3288.	4.2	2.9	1.4	25.7	-26.3	13.8	57.6	0.046	0.85	0.45
TargHR	5.0	3	0.280	2300.	592.	480.	617.	694.	2.5	0.309	0.138	0.205	0.318	3017.	2963.	4.2	3.2	1.0	27.6	-28.5	21.0	21.0	0.045	0.83	0.42
TargHR	5.0	3	0.280	2600.	585.	480.	603.	686.	2.3	0.264	0.132	0.186	0.299	3156.	3105.	4.1	3.2	0.9	27.2	-27.7	16.6	26.2	0.035	0.84	0.43
TargHR	5.0	3	0.280	2900.	565.	458.	585.	681.	2.8	0.300	0.124	0.183	0.297	3134.	3115.	4.2	3.0	1.2	26.8	-25.9	18.6	39.4	0.049	0.84	0.44
TargHR	5.0	3	0.280	3200.	569.	459.	582.	674.	2.3	0.257	0.123	0.180	0.276	3232.	3206.	4.1	3.0	1.1	26.5	-27.4	15.8	49.2	0.038	0.85	0.44
TargHR	5.0	3	0.280	3500.	552.	454.	565.	664.	2.5	0.266	0.124	0.171	0.275	3207.	3246.	4.2	2.9	1.3	25.9	-26.5	15.8	60.9	0.039	0.85	0.45
TargHR	5.0	3	0.300	2300.	589.	459.	621.	695.	2.8	0.339	0.141	0.205	0.376	2941.	2861.	4.2	3.2	1.1	28.1	-28.7	23.5	23.5	0.061	0.83	0.41
TargHR	5.0	3	0.300	2600.	577.	463.	602.	685.	2.9	0.314	0.134	0.195	0.313	3038.	2998.	4.2	3.1	1.1	27.4	-26.8	20.2	29.7	0.048	0.84	0.43
TargHR	5.0	3	0.300	2900.	566.	456.	589.	675.	2.8	0.313	0.132	0.186	0.311	3054.	3054.	4.2	3.1	1.2	26.8	-28.1	19.7	40.9	0.054	0.84	0.43
TargHR	5.0	3	0.300	3200.	573.	466.	587.	681.	2.4	0.268	0.128	0.181	0.285	3187.	3179.	4.1	3.1	1.1	26.7	-26.4	16.5	50.5	0.036	0.84	0.44
TargHR	5.0	3	0.300	3500.	554.	445.	569.	668.	2.6	0.282	0.126	0.174	0.280	3170.	3195.	4.2	2.9	1.3	26.0	-26.0	16.3	62.5	0.046	0.84	0.44
TargHR	15.0	1	0.100	2300.	445.	348.	440.	552.	12.1	0.093	0.078	0.092	0.109	4304.	4315.	11.0	6.4	4.6	47.8	-52.9	0.5	0.5	0.000	0.90	0.57
TargHR	15.0	1	0.100	2600.	444.	348.	440.	558.	12.2	0.093	0.077	0.093	0.110	4302.	4326.	11.0	6.4	4.6	47.9	-52.6	0.7	1.6	0.001	0.90	0.57
TargHR	15.0	1	0.100	2900.	441.	339.	438.	547.	12.3	0.092	0.075	0.091	0.108	4333.	4335.	11.0	6.6	4.4	47.5	-52.8	0.8	4.3	0.000	0.90	0.58
TargHR	15.0	1	0.100	3200.	437.	341.	437.	541.	12.4	0.090	0.073	0.090	0.108	4356.	4360.	11.0	6.6	4.4	47.6	-51.7	0.8	8.7	0.000	0.90	0.58

Method Perc Dur Targ Trig Cmean C10 C50 C90 IAV Fmean F10 F50 F90 Smean S20 Nchange
Nup Ndown Cup Cdown Risk Risk Depl 4+ 7+ lim trig

TargHR	15.0	1	0.100	3500.	437.	325.	436.	553.	12.7	0.089	0.071	0.091	0.107	4387.	4376.	11.0	6.6	4.4	48.4	-53.7	0.6	15.4	0.000	0.90	0.58
TargHR	15.0	1	0.120	2300.	498.	395.	493.	610.	12.2	0.115	0.097	0.114	0.135	3994.	3963.	11.0	6.4	4.6	53.6	-59.2	0.9	0.9	0.000	0.89	0.54
TargHR	15.0	1	0.120	2600.	496.	393.	493.	614.	12.4	0.114	0.092	0.113	0.134	4034.	4003.	11.0	6.4	4.6	54.0	-59.9	1.3	3.2	0.002	0.89	0.54
TargHR	15.0	1	0.120	2900.	492.	382.	489.	617.	12.3	0.113	0.091	0.113	0.135	4013.	3997.	11.0	6.4	4.6	53.1	-59.3	1.1	6.8	0.001	0.89	0.55
TargHR	15.0	1	0.120	3200.	484.	370.	482.	611.	12.6	0.112	0.085	0.111	0.133	4049.	4024.	11.0	6.5	4.5	53.1	-59.0	1.1	13.8	0.002	0.89	0.55
TargHR	15.0	1	0.120	3500.	478.	355.	479.	601.	12.9	0.107	0.082	0.107	0.131	4099.	4072.	11.0	6.7	4.3	53.0	-60.1	1.2	23.0	0.001	0.89	0.56
TargHR	15.0	1	0.140	2300.	541.	434.	536.	659.	12.2	0.138	0.115	0.137	0.163	3700.	3686.	11.0	6.2	4.8	58.7	-65.0	2.0	2.0	0.001	0.88	0.51
TargHR	15.0	1	0.140	2600.	536.	418.	536.	656.	12.4	0.135	0.109	0.136	0.163	3744.	3731.	11.0	6.4	4.6	58.1	-65.6	2.1	5.3	0.000	0.88	0.51
TargHR	15.0	1	0.140	2900.	537.	416.	534.	670.	12.5	0.136	0.107	0.133	0.162	3792.	3719.	11.0	6.5	4.5	58.2	-66.7	1.8	11.0	0.001	0.88	0.52
TargHR	15.0	1	0.140	3200.	533.	401.	532.	664.	12.7	0.134	0.100	0.132	0.159	3806.	3724.	11.0	6.4	4.6	59.1	-66.0	1.9	21.2	0.001	0.88	0.52
TargHR	15.0	1	0.140	3500.	520.	388.	523.	660.	13.0	0.127	0.093	0.126	0.158	3864.	3808.	11.0	6.5	4.5	58.5	-66.6	2.4	33.2	0.001	0.88	0.53
TargHR	15.0	1	0.160	2300.	579.	461.	573.	703.	12.3	0.162	0.132	0.161	0.196	3466.	3408.	11.0	6.2	4.8	63.1	-69.8	3.9	3.9	0.000	0.87	0.48
TargHR	15.0	1	0.160	2600.	572.	449.	569.	711.	12.6	0.158	0.125	0.158	0.190	3515.	3473.	11.0	6.3	4.7	62.8	-71.4	3.8	10.1	0.001	0.87	0.48
TargHR	15.0	1	0.160	2900.	567.	435.	568.	699.	12.8	0.154	0.117	0.155	0.188	3554.	3463.	11.0	6.4	4.6	62.9	-71.5	3.7	18.7	0.000	0.87	0.49
TargHR	15.0	1	0.160	3200.	560.	422.	566.	699.	13.1	0.153	0.109	0.149	0.185	3642.	3539.	11.0	6.6	4.4	62.9	-72.1	3.3	28.5	0.003	0.87	0.50
TargHR	15.0	1	0.160	3500.	557.	411.	557.	703.	13.1	0.145	0.108	0.145	0.183	3665.	3547.	11.0	6.5	4.5	62.8	-73.3	3.0	43.3	0.000	0.88	0.51
TargHR	15.0	1	0.180	2300.	603.	477.	597.	745.	12.5	0.186	0.147	0.182	0.223	3249.	3207.	11.0	6.1	4.9	66.4	-73.7	7.3	7.3	0.002	0.85	0.45
TargHR	15.0	1	0.180	2600.	606.	471.	604.	745.	12.7	0.182	0.140	0.181	0.221	3305.	3246.	11.0	6.2	4.8	67.1	-76.1	6.8	15.4	0.001	0.86	0.45
TargHR	15.0	1	0.180	2900.	602.	467.	601.	747.	12.9	0.178	0.134	0.178	0.223	3354.	3286.	11.0	6.3	4.7	67.2	-77.9	6.6	27.3	0.002	0.86	0.46
TargHR	15.0	1	0.180	3200.	595.	444.	593.	759.	13.1	0.173	0.123	0.170	0.217	3430.	3344.	11.0	6.4	4.6	67.3	-77.4	5.7	39.0	0.002	0.86	0.47
TargHR	15.0	1	0.180	3500.	577.	425.	575.	737.	13.3	0.162	0.115	0.161	0.212	3491.	3415.	11.0	6.5	4.5	66.1	-77.0	4.7	52.8	0.000	0.87	0.48
TargHR	15.0	1	0.200	2300.	632.	509.	629.	770.	12.5	0.211	0.163	0.209	0.261	3049.	3003.	11.0	6.1	4.9	69.2	-78.7	12.1	12.1	0.000	0.84	0.42
TargHR	15.0	1	0.200	2600.	628.	481.	629.	772.	12.8	0.206	0.155	0.202	0.254	3127.	3061.	11.0	6.2	4.8	69.6	-79.9	10.9	22.9	0.003	0.85	0.43
TargHR	15.0	1	0.200	2900.	624.	471.	627.	773.	13.1	0.203	0.149	0.200	0.250	3160.	3052.	11.0	6.2	4.8	70.6	-81.3	12.0	37.9	0.003	0.85	0.44
TargHR	15.0	1	0.200	3200.	625.	474.	623.	783.	13.3	0.196	0.140	0.191	0.249	3273.	3157.	11.0	6.4	4.6	71.4	-83.1	8.8	47.6	0.001	0.85	0.45
TargHR	15.0	1	0.200	3500.	606.	444.	607.	764.	13.4	0.184	0.130	0.181	0.235	3322.	3209.	11.0	6.3	4.7	70.3	-81.3	7.7	61.8	0.001	0.86	0.46
TargHR	15.0	1	0.220	2300.	655.	514.	656.	790.	12.7	0.238	0.181	0.236	0.296	2874.	2818.	11.0	6.1	4.9	72.3	-83.5	19.0	19.0	0.000	0.83	0.39
TargHR	15.0	1	0.220	2600.	647.	512.	648.	789.	13.0	0.230	0.173	0.226	0.285	2939.	2843.	11.0	6.2	4.8	73.4	-83.6	17.0	31.6	0.002	0.83	0.40
TargHR	15.0	1	0.220	2900.	642.	484.	644.	797.	13.3	0.229	0.155	0.222	0.284	2993.	2943.	11.0	6.2	4.8	73.6	-85.2	16.1	47.0	0.004	0.84	0.41
TargHR	15.0	1	0.220	3200.	633.	477.	631.	785.	13.5	0.212	0.145	0.204	0.274	3135.	3028.	11.0	6.3	4.7	73.3	-85.5	12.2	56.5	0.002	0.84	0.43
TargHR	15.0	1	0.220	3500.	627.	460.	622.	807.	13.5	0.203	0.141	0.198	0.264	3183.	3055.	11.0	6.3	4.7	73.2	-86.0	11.1	68.0	0.001	0.85	0.44
TargHR	15.0	1	0.240	2300.	656.	506.	661.	806.	13.0	0.269	0.188	0.258	0.335	2693.	2656.	11.0	5.9	5.1	74.6	-85.1	28.3	28.3	0.003	0.82	0.36
TargHR	15.0	1	0.240	2600.	657.	495.	667.	816.	13.3	0.272	0.182	0.252	0.333	2754.	2687.	11.0	6.0	5.0	75.1	-86.4	25.4	42.1	0.008	0.82	0.37
TargHR	15.0	1	0.240	2900.	655.	504.	654.	818.	13.4	0.246	0.170	0.237	0.319	2875.	2793.	11.0	6.2	4.8	75.4	-88.5	20.8	54.1	0.002	0.83	0.39
TargHR	15.0	1	0.240	3200.	649.	479.	642.	822.	13.6	0.238	0.160	0.227	0.316	2946.	2883.	11.0	6.1	4.9	75.7	-89.2	19.5	65.2	0.002	0.83	0.40
TargHR	15.0	1	0.240	3500.	641.	477.	639.	818.	13.7	0.223	0.150	0.213	0.294	3064.	2952.	11.0	6.2	4.8	76.3	-88.8	15.9	72.4	0.002	0.84	0.42
TargHR	15.0	1	0.260	2300.	676.	510.	682.	834.	13.1	0.302	0.213	0.285	0.382	2551.	2479.	11.0	5.9	5.1	76.8	-88.7	36.1	36.1	0.004	0.80	0.34
TargHR	15.0	1	0.260	2600.	667.	494.	674.	829.	13.4	0.289	0.198	0.275	0.363	2625.	2577.	11.0	5.9	5.1	77.6	-89.9	32.4	49.3	0.007	0.81	0.35
TargHR	15.0	1	0.260	2900.	660.	477.	665.	842.	13.6	0.274	0.178	0.259	0.358	2728.	2669.	11.0	6.0	5.0	77.2	-90.4	28.5	60.5	0.005	0.82	0.37
TargHR	15.0	1	0.260	3200.	662.	484.	661.	846.	13.7	0.271	0.168	0.249	0.344	2818.	2696.	11.0	6.0	5.0	78.7	-92.1	25.0	70.0	0.006	0.82	0.38
TargHR	15.0	1	0.260	3500.	652.	479.	647.	842.	13.8	0.257	0.160	0.228	0.329	2936.	2821.	11.0	6.2	4.8	77.6	-90.2	18.9	78.1	0.008	0.83	0.40
TargHR	15.0	1	0.280	2300.	675.	489.	677.	853.	13.5	0.338	0.215	0.306	0.430	2422.	2384.	11.0	5.8	5.2	79.0	-90.2	43.8	43.8	0.012	0.79	0.32
TargHR	15.0	1	0.280	2600.	674.	481.	681.	857.	13.6	0.328	0.205	0.295	0.424	2490.	2435.	11.0	5.8	5.2	79.5	-92.1	40.1	56.5	0.013	0.80	0.33
TargHR	15.0	1	0.280	2900.	669.	477.	667.	853.	13.7	0.306	0.196	0.279	0.393	2591.	2514.	11.0	5.9	5.1	79.6	-92.6	34.2	66.8	0.011	0.80	0.35
TargHR	15.0	1	0.280	3200.	669.	491.	664.	855.	13.8	0.293	0.182	0.259	0.401	2709.	2618.	11.0	5.9	5.1	80.2	-93.2	30.0	73.5	0.009	0.81	0.36
TargHR	15.0	1	0.280	3500.	661.	474.	661.	854.	13.9	0.280	0.171	0.243	0.365	2804.	2701.	11.0	6.0	5.0	80.0	-93.1	25.4	81.6	0.010	0.82	0.38
TargHR	15.0	1	0.300	2300.	679.	489.	690.	861.	13.6	0.375	0.231	0.329	0.465	2298.	2267.	11.0	5.7	5.3	80.2	-91.6	50.7	50.7	0.018	0.78	0.30
TargHR	15.0	1	0.300	2600.	672.	474.	682.	859.	13.8	0.365	0.218	0.315	0.471	2361.	2335.	11.0	5.6	5.4	80.6	-92.9	46.9	63.0	0.024	0.78	0.31
TargHR	15.0	1	0.300	2900.	678.	477.	689.	876.	13.8	0.350	0.202	0.303	0.454	2481.	2370.	11.0	5.8	5.2	81.5	-94.5	40.8	71.0	0.020	0.79	0.33
TargHR	15.0	1	0.300	3200.	679.	481.	678.	882.	14.1	0.331	0.195	0.280	0.424	2582.	2443.	11.0	5.9	5.1	82.1	-96.5	35.3	78.9	0.017	0.80	0.35
TargHR	15.0	1	0.300	3500.	668.	490.	659.	856.	13.9	0.298	0.179	0.259	0.406	2715.	2590.	11.0	5.9	5.1	80.7	-94.2	28.7	84.4	0.013	0.81	0.37
TargHR	15.0	3	0.100	2300.	412.	319.	411.	514.	4.7	0.107	0.070	0.088	0.116	4235.	4416.	4.0	2.4	1.6	47.5	-47.1	2.8	2.8	0.007	0.89	0.56
TargHR	15.0	3	0.100	2600.	408.	317.	407.	511.	4.8	0.116	0.071	0.087	0.116	4197.	4330.	4.0	2.4	1.6	47.4	-45.9	4.1	5.7	0.013	0.89	0.56
TargHR	15.0	3	0.100	2900.	412.	318.	414.	507.	4.6	0.098	0.070	0.089	0.114	4220.	4399.	4.0	2.4	1.6	47.3	-48.8	3.1	7.6	0.004	0.89	0.56
TargHR	15.0	3	0.100	3200.	408.	315.	407.	514.	5.0	0.123	0.069	0.088	0.115	4204.	4389.	4.1	2.4	1.7	47.9	-47.7	3.4	14.2	0.013	0.89	0.56
TargHR	15.0	3	0.100	3500.	408.	300.	411.	524.	4.8	0.106	0.068	0.086	0.117	4252.	4421.	4.0	2.4	1.6	48.2	-48.9	3.5	21.5	0.009	0.89	0.56
TargHR	15.0	3	0.120	2300.	458.	348.	455.	576.	4.8	0.132	0.082	0.106	0.142	3969.	4098.	4.0	2.5	1.5	53.1	-51.4	3.7	3.7	0.011	0.88	0.54
TargHR	15.0	3	0.120	2600.	455.	344.	454.	579.	4.9	0.133	0.081	0.105	0.142	3976.	4059.	4.1	2.5	1.5	52.6	-52.0	4.3	6.5	0.010	0.89	0.54

Method Perc Dur Targ Trig Cmean C10 C50 C90 IAV Fmean F10 F50 F90 Smean S20 Nchange
Nup Ndown Cup Cdown Risk Risk Depl 4+ 7+ lim trig

TargHR	15.0	3	0.120	2900.	460.	350.	456.	573.	4.8	0.128	0.082	0.105	0.141	4006.	4098.	4.0	2.5	1.5	53.4	-52.6	3.5	10.3	0.009	0.89	0.54
TargHR	15.0	3	0.120	3200.	452.	332.	450.	577.	4.9	0.116	0.078	0.104	0.140	4038.	4190.	4.0	2.5	1.5	53.6	-54.5	3.0	17.8	0.004	0.89	0.54
TargHR	15.0	3	0.120	3500.	447.	326.	448.	577.	5.0	0.134	0.074	0.103	0.143	4018.	4159.	4.1	2.5	1.6	53.0	-54.0	4.3	28.4	0.013	0.89	0.54
TargHR	15.0	3	0.140	2300.	504.	392.	500.	634.	4.8	0.153	0.095	0.126	0.168	3777.	3810.	4.0	2.6	1.5	58.3	-56.5	5.1	5.1	0.011	0.88	0.52
TargHR	15.0	3	0.140	2600.	498.	366.	498.	624.	4.9	0.156	0.093	0.126	0.172	3755.	3821.	4.1	2.5	1.5	58.5	-57.9	5.6	9.5	0.013	0.88	0.51
TargHR	15.0	3	0.140	2900.	498.	368.	499.	612.	4.9	0.146	0.090	0.123	0.173	3815.	3871.	4.0	2.6	1.4	58.0	-58.8	5.2	15.5	0.008	0.88	0.52
TargHR	15.0	3	0.140	3200.	490.	349.	484.	620.	4.9	0.133	0.085	0.119	0.168	3839.	3927.	4.0	2.6	1.4	57.6	-61.2	4.2	23.1	0.004	0.88	0.52
TargHR	15.0	3	0.140	3500.	470.	332.	466.	617.	5.0	0.141	0.080	0.114	0.167	3831.	3945.	4.0	2.5	1.5	57.2	-56.9	5.9	35.4	0.010	0.88	0.52
TargHR	15.0	3	0.160	2300.	534.	402.	538.	668.	4.9	0.169	0.104	0.144	0.203	3559.	3599.	4.0	2.6	1.4	62.2	-63.8	7.4	7.4	0.010	0.87	0.49
TargHR	15.0	3	0.160	2600.	535.	393.	543.	673.	5.0	0.171	0.103	0.144	0.207	3562.	3554.	4.0	2.6	1.5	62.3	-63.8	7.2	12.9	0.011	0.87	0.49
TargHR	15.0	3	0.160	2900.	530.	380.	534.	663.	5.0	0.159	0.097	0.141	0.202	3634.	3662.	4.0	2.6	1.4	62.6	-66.6	6.2	20.1	0.006	0.87	0.49
TargHR	15.0	3	0.160	3200.	523.	369.	523.	673.	5.1	0.153	0.091	0.134	0.196	3714.	3721.	4.0	2.7	1.4	62.4	-66.3	5.3	29.4	0.006	0.87	0.50
TargHR	15.0	3	0.160	3500.	512.	359.	505.	665.	5.1	0.152	0.087	0.129	0.190	3741.	3774.	4.0	2.6	1.4	62.1	-64.5	5.4	40.3	0.008	0.87	0.50
TargHR	15.0	3	0.180	2300.	562.	417.	572.	701.	4.8	0.188	0.112	0.166	0.234	3380.	3415.	4.0	2.6	1.5	65.0	-66.4	10.0	10.0	0.010	0.86	0.46
TargHR	15.0	3	0.180	2600.	566.	412.	573.	723.	4.9	0.180	0.109	0.165	0.239	3409.	3393.	4.0	2.6	1.4	66.3	-70.5	10.1	17.4	0.004	0.86	0.46
TargHR	15.0	3	0.180	2900.	552.	399.	562.	714.	5.2	0.197	0.106	0.157	0.228	3446.	3454.	4.1	2.6	1.4	66.0	-67.7	9.1	27.0	0.018	0.86	0.47
TargHR	15.0	3	0.180	3200.	545.	385.	547.	714.	5.2	0.183	0.097	0.149	0.227	3539.	3529.	4.1	2.7	1.4	65.4	-68.3	8.6	35.6	0.013	0.86	0.48
TargHR	15.0	3	0.180	3500.	532.	368.	528.	710.	5.1	0.163	0.093	0.140	0.218	3630.	3630.	4.0	2.7	1.4	64.3	-68.9	6.6	45.1	0.008	0.87	0.49
TargHR	15.0	3	0.200	2300.	594.	438.	601.	754.	5.1	0.230	0.131	0.189	0.281	3159.	3108.	4.1	2.6	1.5	69.7	-72.0	15.7	15.7	0.013	0.84	0.43
TargHR	15.0	3	0.200	2600.	576.	412.	595.	742.	5.2	0.234	0.120	0.182	0.277	3181.	3167.	4.1	2.5	1.6	69.0	-69.6	15.9	24.8	0.022	0.85	0.44
TargHR	15.0	3	0.200	2900.	576.	423.	588.	738.	5.2	0.205	0.110	0.172	0.262	3346.	3292.	4.1	2.7	1.4	69.2	-73.1	11.9	31.1	0.013	0.85	0.46
TargHR	15.0	3	0.200	3200.	557.	379.	564.	726.	5.2	0.194	0.102	0.161	0.264	3402.	3368.	4.0	2.6	1.4	67.5	-71.0	11.8	41.9	0.013	0.86	0.47
TargHR	15.0	3	0.200	3500.	557.	388.	563.	731.	5.1	0.179	0.101	0.153	0.244	3486.	3430.	4.0	2.7	1.3	68.1	-71.4	9.3	51.7	0.010	0.86	0.47
TargHR	15.0	3	0.220	2300.	611.	441.	618.	778.	5.2	0.254	0.132	0.211	0.320	3008.	2963.	4.1	2.6	1.5	71.8	-74.2	20.6	20.6	0.015	0.83	0.41
TargHR	15.0	3	0.220	2600.	599.	437.	608.	772.	5.3	0.253	0.126	0.199	0.313	3077.	3007.	4.1	2.6	1.5	71.5	-72.6	18.0	28.5	0.020	0.84	0.42
TargHR	15.0	3	0.220	2900.	591.	418.	596.	776.	5.2	0.228	0.116	0.185	0.309	3173.	3116.	4.0	2.6	1.5	72.1	-75.7	16.9	38.7	0.013	0.84	0.43
TargHR	15.0	3	0.220	3200.	591.	423.	596.	775.	5.2	0.210	0.106	0.176	0.294	3319.	3233.	4.0	2.7	1.4	71.3	-79.4	12.9	46.6	0.011	0.85	0.45
TargHR	15.0	3	0.220	3500.	566.	404.	570.	749.	5.2	0.193	0.103	0.164	0.278	3371.	3313.	4.0	2.7	1.4	69.9	-74.6	12.3	55.5	0.006	0.85	0.46
TargHR	15.0	3	0.240	2300.	625.	435.	637.	803.	5.4	0.297	0.137	0.233	0.374	2878.	2762.	4.1	2.5	1.6	75.2	-76.5	25.5	25.5	0.028	0.82	0.40
TargHR	15.0	3	0.240	2600.	621.	447.	623.	803.	5.3	0.270	0.129	0.219	0.356	2976.	2882.	4.1	2.6	1.5	74.4	-79.6	21.6	33.4	0.020	0.83	0.41
TargHR	15.0	3	0.240	2900.	603.	438.	613.	787.	5.5	0.267	0.122	0.205	0.345	3045.	2985.	4.1	2.6	1.5	73.3	-76.0	20.5	44.1	0.021	0.83	0.42
TargHR	15.0	3	0.240	3200.	598.	433.	602.	792.	5.4	0.243	0.117	0.190	0.327	3148.	3054.	4.1	2.7	1.4	73.8	-79.3	16.8	52.5	0.021	0.84	0.43
TargHR	15.0	3	0.240	3500.	584.	416.	589.	773.	5.3	0.206	0.111	0.169	0.281	3320.	3258.	4.0	2.7	1.3	71.6	-76.7	12.3	58.6	0.009	0.85	0.45
TargHR	15.0	3	0.260	2300.	652.	456.	661.	828.	5.4	0.336	0.147	0.259	0.458	2754.	2603.	4.1	2.5	1.7	78.5	-82.7	31.8	31.8	0.036	0.81	0.37
TargHR	15.0	3	0.260	2600.	647.	455.	649.	819.	5.3	0.290	0.142	0.239	0.400	2889.	2726.	4.1	2.6	1.5	78.9	-82.8	25.7	38.1	0.026	0.82	0.39
TargHR	15.0	3	0.260	2900.	630.	449.	626.	817.	5.3	0.280	0.131	0.222	0.379	2952.	2800.	4.1	2.6	1.5	77.8	-82.0	23.5	48.8	0.025	0.83	0.40
TargHR	15.0	3	0.260	3200.	617.	440.	617.	811.	5.3	0.255	0.120	0.199	0.346	3115.	2944.	4.1	2.7	1.4	77.1	-81.0	19.7	53.8	0.020	0.84	0.42
TargHR	15.0	3	0.260	3500.	600.	416.	601.	801.	5.3	0.235	0.116	0.188	0.333	3168.	3046.	4.1	2.6	1.4	75.2	-77.3	17.4	64.1	0.013	0.84	0.43
TargHR	15.0	3	0.280	2300.	659.	432.	680.	849.	5.5	0.372	0.160	0.274	0.510	2635.	2440.	4.1	2.5	1.7	80.5	-84.3	35.8	35.8	0.049	0.80	0.36
TargHR	15.0	3	0.280	2600.	656.	453.	665.	847.	5.5	0.328	0.144	0.255	0.455	2778.	2597.	4.1	2.6	1.5	80.3	-84.9	30.3	43.1	0.033	0.81	0.37
TargHR	15.0	3	0.280	2900.	632.	443.	629.	821.	5.5	0.297	0.135	0.220	0.438	2931.	2769.	4.1	2.7	1.4	79.2	-83.0	25.2	48.4	0.030	0.82	0.40
TargHR	15.0	3	0.280	3200.	625.	442.	623.	827.	5.5	0.280	0.127	0.218	0.397	2987.	2853.	4.1	2.6	1.5	78.1	-81.5	23.3	58.4	0.026	0.83	0.41
TargHR	15.0	3	0.280	3500.	613.	437.	609.	814.	5.5	0.261	0.121	0.197	0.350	3113.	2996.	4.1	2.6	1.4	76.0	-79.9	18.8	66.7	0.022	0.84	0.42
TargHR	15.0	3	0.300	2300.	686.	465.	705.	869.	5.5	0.393	0.169	0.302	0.578	2551.	2297.	4.1	2.5	1.6	83.2	-90.1	40.2	40.2	0.042	0.79	0.34
TargHR	15.0	3	0.300	2600.	666.	451.	669.	866.	5.5	0.354	0.154	0.269	0.520	2679.	2474.	4.1	2.5	1.6	82.2	-88.4	33.6	47.1	0.042	0.80	0.36
TargHR	15.0	3	0.300	2900.	652.	454.	648.	848.	5.6	0.333	0.142	0.249	0.477	2820.	2597.	4.1	2.6	1.5	81.3	-84.9	29.5	54.0	0.035	0.82	0.38
TargHR	15.0	3	0.300	3200.	635.	440.	635.	835.	5.6	0.302	0.137	0.226	0.422	2918.	2727.	4.1	2.6	1.5	79.8	-82.4	25.7	61.6	0.029	0.82	0.40
TargHR	15.0	3	0.300	3500.	621.	441.	616.	819.	5.4	0.264	0.129	0.213	0.380	3002.	2865.	4.1	2.6	1.4	77.8	-82.4	22.5	70.8	0.018	0.83	0.41
TargHR	25.0	1	0.100	2300.	456.	356.	449.	572.	17.6	0.096	0.082	0.095	0.111	4271.	4295.	11.0	6.1	4.9	70.3	-79.8	0.3	0.3	0.000	0.90	0.57
TargHR	25.0	1	0.100	2600.	455.	355.	451.	565.	17.6	0.095	0.081	0.095	0.110	4304.	4337.	11.0	6.2	4.8	69.8	-79.2	0.4	1.0	0.000	0.90	0.57
TargHR	25.0	1	0.100	2900.	453.	353.	451.	559.	17.7	0.094	0.081	0.094	0.110	4307.	4306.	11.0	6.1	4.9	69.9	-78.7	0.4	3.4	0.000	0.90	0.58
TargHR	25.0	1	0.100	3200.	452.	348.	448.	563.	17.9	0.093	0.079	0.093	0.108	4335.	4336.	11.0	6.3	4.7	69.3	-79.9	0.2	7.8	0.000	0.90	0.58
TargHR	25.0	1	0.100	3500.	452.	342.	449.	566.	18.3	0.092	0.076	0.092	0.107	4384.	4341.	11.0	6.2	4.8	70.9	-80.3	0.3	14.3	0.000	0.90	0.58
TargHR	25.0	1	0.120	2300.	508.	404.	500.	622.	17.4	0.117	0.100	0.117	0.135	3979.	3955.	11.0	6.1	4.9	77.4	-88.3	0.5	0.5	0.000	0.89	0.54
TargHR	25.0	1	0.120	2600.	507.	407.	504.	619.	17.6	0.117	0.100	0.117	0.135	3980.	3951.	11.0	6.1	4.9	78.3	-89.2	0.6	2.0	0.000	0.89	0.54
TargHR	25.0	1	0.120	2900.	506.	405.	500.	622.	17.9	0.116	0.097	0.115	0.135	4010.	4006.	11.0	6.1	4.9	79.1	-89.3	0.5	5.8	0.000	0.89	0.54
TargHR	25.0	1	0.120	3200.	501.	384.	497.	623.	18.3	0.113	0.095	0.113	0.134	4026.	3974.	11.0	6.1	4.9	78.8	-91.6	0.5	13.4	0.001	0.89	0.55
TargHR	25.0	1	0.120	3500.	498.	381.	495.	621.	18.8	0.112	0.090	0.111	0.133	4073.	4016.	11.0	6.3	4.7	78.9	-93.2	0.5	23.4	0.000	0.89	0.55

Method Perc Dur Targ Trig Cmean C10 C50 C90 IAV Fmean F10 F50 F90 Smean S20 Nchange
Nup Ndown Cup Cdown Risk Risk Depl 4+ 7+ lim trig

TargHR	25.0	1	0.140	2300.	555.	448.	550.	675.	17.6	0.141	0.120	0.140	0.164	3704.	3670.	11.0	6.0	5.0	85.9	-97.5	1.3	1.3	0.000	0.88	0.50
TargHR	25.0	1	0.140	2600.	544.	429.	541.	659.	17.9	0.139	0.116	0.137	0.164	3687.	3672.	11.0	6.1	4.9	84.3	-96.3	1.3	4.8	0.001	0.88	0.51
TargHR	25.0	1	0.140	2900.	550.	432.	547.	676.	18.3	0.137	0.113	0.137	0.163	3755.	3704.	11.0	6.2	4.8	86.3	-100.1	1.3	10.1	0.000	0.88	0.51
TargHR	25.0	1	0.140	3200.	546.	425.	545.	667.	18.7	0.137	0.110	0.133	0.160	3801.	3723.	11.0	6.2	4.8	86.6	-101.1	0.9	20.2	0.001	0.88	0.52
TargHR	25.0	1	0.140	3500.	534.	400.	533.	673.	19.4	0.130	0.103	0.129	0.158	3834.	3759.	11.0	6.2	4.8	87.1	-103.6	1.0	33.7	0.000	0.88	0.53
TargHR	25.0	1	0.160	2300.	589.	483.	581.	713.	17.9	0.164	0.141	0.163	0.193	3454.	3416.	11.0	6.1	4.9	91.4	-104.8	3.0	3.0	0.000	0.86	0.47
TargHR	25.0	1	0.160	2600.	591.	475.	588.	718.	18.1	0.163	0.136	0.162	0.190	3484.	3437.	11.0	6.0	5.0	93.6	-105.7	2.3	7.7	0.000	0.87	0.48
TargHR	25.0	1	0.160	2900.	579.	459.	576.	705.	18.6	0.158	0.129	0.158	0.187	3508.	3461.	11.0	6.1	4.9	91.8	-107.4	2.5	18.3	0.001	0.87	0.48
TargHR	25.0	1	0.160	3200.	580.	450.	578.	717.	19.2	0.156	0.127	0.156	0.185	3549.	3489.	11.0	6.2	4.8	93.4	-112.7	2.3	31.6	0.000	0.87	0.49
TargHR	25.0	1	0.160	3500.	569.	432.	562.	714.	19.7	0.149	0.117	0.148	0.183	3625.	3560.	11.0	6.2	4.8	94.4	-112.6	2.1	45.4	0.000	0.87	0.50
TargHR	25.0	1	0.180	2300.	611.	493.	607.	736.	18.1	0.188	0.156	0.187	0.224	3202.	3185.	11.0	5.9	5.1	96.8	-109.8	6.5	6.5	0.000	0.85	0.44
TargHR	25.0	1	0.180	2600.	613.	489.	607.	744.	18.4	0.186	0.151	0.183	0.218	3254.	3229.	11.0	6.1	4.9	96.7	-113.1	5.1	14.9	0.001	0.85	0.45
TargHR	25.0	1	0.180	2900.	609.	477.	607.	748.	19.2	0.181	0.145	0.180	0.220	3291.	3260.	11.0	6.1	4.9	99.5	-117.8	5.2	27.9	0.000	0.86	0.45
TargHR	25.0	1	0.180	3200.	602.	460.	600.	746.	19.7	0.175	0.138	0.174	0.213	3357.	3286.	11.0	6.2	4.8	99.5	-121.2	5.0	42.0	0.001	0.86	0.47
TargHR	25.0	1	0.180	3500.	598.	448.	594.	752.	20.0	0.169	0.130	0.167	0.207	3433.	3372.	11.0	6.1	4.9	100.8	-121.1	3.4	56.2	0.000	0.86	0.47
TargHR	25.0	1	0.200	2300.	629.	499.	628.	762.	18.6	0.214	0.171	0.209	0.256	2994.	2971.	11.0	6.0	5.0	100.6	-116.4	11.9	11.9	0.003	0.84	0.41
TargHR	25.0	1	0.200	2600.	629.	503.	628.	760.	19.2	0.206	0.164	0.205	0.249	3064.	3032.	11.0	6.0	5.0	102.6	-121.9	10.4	23.7	0.001	0.84	0.42
TargHR	25.0	1	0.200	2900.	629.	490.	624.	775.	19.6	0.200	0.159	0.198	0.243	3131.	3085.	11.0	6.0	5.0	104.5	-125.0	7.8	37.7	0.000	0.85	0.43
TargHR	25.0	1	0.200	3200.	616.	470.	612.	769.	20.2	0.191	0.147	0.191	0.238	3200.	3189.	11.0	6.1	4.9	104.3	-125.7	7.6	51.5	0.000	0.85	0.44
TargHR	25.0	1	0.200	3500.	611.	460.	610.	769.	20.4	0.188	0.139	0.184	0.233	3261.	3206.	11.0	6.1	4.9	104.6	-127.9	7.0	65.8	0.001	0.86	0.45
TargHR	25.0	1	0.220	2300.	653.	522.	651.	781.	18.9	0.240	0.190	0.235	0.287	2838.	2806.	11.0	6.0	5.0	105.8	-123.5	17.3	17.3	0.001	0.83	0.38
TargHR	25.0	1	0.220	2600.	643.	509.	642.	785.	19.6	0.230	0.181	0.226	0.283	2885.	2869.	11.0	6.1	4.9	105.8	-128.4	17.2	33.3	0.000	0.83	0.40
TargHR	25.0	1	0.220	2900.	645.	497.	642.	804.	20.0	0.221	0.170	0.220	0.274	2975.	2940.	11.0	6.1	4.9	107.7	-133.0	14.0	47.9	0.000	0.84	0.41
TargHR	25.0	1	0.220	3200.	634.	487.	626.	790.	20.4	0.210	0.162	0.206	0.261	3062.	3038.	11.0	6.1	4.9	108.6	-130.9	11.7	60.3	0.000	0.84	0.42
TargHR	25.0	1	0.220	3500.	633.	478.	630.	786.	20.7	0.204	0.152	0.199	0.260	3144.	3086.	11.0	6.1	4.9	110.7	-135.0	10.4	71.3	0.000	0.85	0.43
TargHR	25.0	1	0.240	2300.	671.	531.	668.	816.	19.3	0.264	0.208	0.263	0.320	2688.	2651.	11.0	6.0	5.0	110.3	-130.3	26.0	26.0	0.000	0.82	0.36
TargHR	25.0	1	0.240	2600.	665.	516.	663.	808.	19.9	0.251	0.192	0.245	0.310	2789.	2742.	11.0	6.1	4.9	111.3	-134.8	21.8	39.4	0.000	0.82	0.37
TargHR	25.0	1	0.240	2900.	660.	512.	656.	810.	20.3	0.241	0.184	0.237	0.299	2853.	2813.	11.0	6.0	5.0	113.6	-135.2	19.3	56.0	0.001	0.83	0.39
TargHR	25.0	1	0.240	3200.	647.	486.	642.	814.	20.6	0.233	0.171	0.228	0.297	2894.	2880.	11.0	6.0	5.0	112.7	-137.5	18.6	68.6	0.001	0.83	0.40
TargHR	25.0	1	0.240	3500.	644.	479.	634.	822.	21.1	0.221	0.161	0.215	0.281	3013.	2936.	11.0	6.1	4.9	114.7	-139.7	14.0	77.0	0.001	0.84	0.42
TargHR	25.0	1	0.260	2300.	676.	526.	677.	827.	19.6	0.285	0.222	0.280	0.353	2560.	2573.	11.0	6.0	5.0	112.8	-132.7	34.1	34.1	0.000	0.80	0.34
TargHR	25.0	1	0.260	2600.	671.	507.	671.	829.	20.2	0.277	0.207	0.268	0.352	2626.	2628.	11.0	6.0	5.0	113.9	-138.8	30.0	48.9	0.004	0.81	0.35
TargHR	25.0	1	0.260	2900.	672.	513.	669.	832.	20.8	0.264	0.198	0.261	0.328	2730.	2708.	11.0	6.1	4.9	117.8	-144.0	26.3	62.0	0.002	0.82	0.36
TargHR	25.0	1	0.260	3200.	661.	506.	652.	822.	21.1	0.252	0.186	0.241	0.319	2806.	2726.	11.0	6.0	5.0	118.7	-141.7	21.1	74.4	0.001	0.83	0.38
TargHR	25.0	1	0.260	3500.	651.	496.	647.	811.	21.1	0.238	0.175	0.229	0.309	2886.	2862.	11.0	6.1	4.9	116.3	-142.9	19.3	81.8	0.000	0.83	0.39
TargHR	25.0	1	0.280	2300.	684.	518.	688.	840.	20.0	0.309	0.229	0.299	0.382	2463.	2456.	11.0	6.0	5.0	115.3	-137.7	40.0	40.0	0.002	0.79	0.31
TargHR	25.0	1	0.280	2600.	677.	512.	676.	846.	20.5	0.297	0.219	0.287	0.370	2528.	2505.	11.0	6.1	4.9	117.3	-140.6	36.9	56.4	0.001	0.80	0.33
TargHR	25.0	1	0.280	2900.	668.	498.	671.	839.	20.9	0.284	0.205	0.274	0.358	2596.	2593.	11.0	6.0	5.0	117.7	-143.3	32.0	69.0	0.004	0.81	0.34
TargHR	25.0	1	0.280	3200.	661.	495.	662.	836.	21.3	0.270	0.191	0.259	0.342	2695.	2705.	11.0	6.0	5.0	119.6	-144.8	27.6	78.0	0.003	0.81	0.36
TargHR	25.0	1	0.280	3500.	658.	500.	657.	831.	21.4	0.258	0.183	0.246	0.332	2778.	2754.	11.0	6.0	5.0	119.8	-144.8	23.6	86.3	0.003	0.82	0.38
TargHR	25.0	1	0.300	2300.	676.	494.	685.	847.	20.5	0.341	0.242	0.321	0.422	2317.	2358.	11.0	5.9	5.1	116.7	-141.2	50.0	50.0	0.005	0.78	0.30
TargHR	25.0	1	0.300	2600.	674.	489.	676.	850.	21.1	0.321	0.225	0.305	0.404	2421.	2427.	11.0	6.1	4.9	119.7	-144.6	42.9	62.2	0.005	0.79	0.31
TargHR	25.0	1	0.300	2900.	678.	510.	680.	844.	21.2	0.311	0.218	0.293	0.398	2496.	2472.	11.0	6.0	5.0	121.2	-146.8	38.2	73.5	0.004	0.80	0.33
TargHR	25.0	1	0.300	3200.	661.	492.	661.	838.	21.5	0.292	0.202	0.271	0.371	2579.	2591.	11.0	5.9	5.1	121.2	-147.8	34.1	82.4	0.004	0.81	0.35
TargHR	25.0	1	0.300	3500.	658.	477.	656.	836.	21.6	0.275	0.190	0.256	0.358	2695.	2686.	11.0	6.0	5.0	120.9	-148.5	28.7	87.0	0.006	0.81	0.36
TargHR	25.0	3	0.100	2300.	425.	326.	417.	539.	6.9	0.092	0.068	0.088	0.112	4360.	4420.	4.0	2.6	1.4	70.4	-71.7	1.1	1.1	0.001	0.90	0.58
TargHR	25.0	3	0.100	2600.	420.	324.	417.	530.	7.0	0.091	0.065	0.087	0.110	4365.	4431.	4.0	2.6	1.4	70.2	-74.0	1.4	2.4	0.001	0.90	0.58
TargHR	25.0	3	0.100	2900.	420.	317.	412.	544.	7.0	0.092	0.064	0.088	0.111	4368.	4449.	4.0	2.7	1.4	69.9	-72.9	1.9	5.5	0.003	0.90	0.58
TargHR	25.0	3	0.100	3200.	420.	316.	411.	542.	7.3	0.091	0.063	0.086	0.112	4419.	4479.	4.0	2.6	1.4	71.9	-76.2	1.3	9.4	0.003	0.90	0.58
TargHR	25.0	3	0.100	3500.	409.	283.	406.	536.	7.3	0.091	0.060	0.085	0.111	4403.	4472.	4.0	2.7	1.4	69.0	-73.9	1.5	16.1	0.003	0.90	0.58
TargHR	25.0	3	0.120	2300.	472.	364.	467.	600.	7.1	0.111	0.077	0.108	0.139	4079.	4120.	4.0	2.6	1.4	78.9	-84.3	2.5	2.5	0.001	0.89	0.55
TargHR	25.0	3	0.120	2600.	475.	359.	475.	603.	7.0	0.112	0.079	0.108	0.138	4061.	4096.	4.0	2.6	1.5	78.5	-84.2	2.1	4.2	0.001	0.89	0.55
TargHR	25.0	3	0.120	2900.	474.	358.	477.	601.	7.2	0.109	0.075	0.108	0.141	4097.	4080.	4.0	2.6	1.4	79.4	-87.9	2.0	8.5	0.001	0.89	0.55
TargHR	25.0	3	0.120	3200.	461.	340.	460.	595.	7.3	0.104	0.071	0.103	0.137	4154.	4182.	4.0	2.6	1.4	78.5	-84.2	1.6	14.3	0.000	0.89	0.56
TargHR	25.0	3	0.120	3500.	453.	317.	455.	587.	7.5	0.104	0.067	0.101	0.135	4178.	4213.	4.0	2.7	1.3	78.4	-88.6	1.6	22.6	0.001	0.89	0.56
TargHR	25.0	3	0.140	2300.	515.	389.	513.	639.	7.1	0.132	0.092	0.129	0.169	3811.	3776.	4.0	2.6	1.5	85.7	-92.4	2.8	2.8	0.001	0.88	0.52
TargHR	25.0	3	0.140	2600.	516.	389.	520.	641.	7.2	0.131	0.089	0.126	0.167	3866.	3820.	4.0	2.6	1.4	86.9	-94.8	2.7	6.2	0.001	0.88	0.52
TargHR	25.0	3	0.140	2900.	511.	379.	514.	641.	7.4	0.127	0.080	0.124	0.170	3905.	3891.	4.0	2.7	1.3	87.0	-97.1	3.1	12.3	0.001	0.88	0.52

Method Perc Dur Targ Trig Cmean C10 C50 C90 IAV Fmean F10 F50 F90 Smean S20 Nchange
Nup Ndown Cup Cdown Risk Risk Depl 4+ 7+ lim trig

TargHR	25.0	3	0.140	3200.	500.	360.	503.	641.	7.5	0.126	0.077	0.120	0.164	3953.	3914.	4.0	2.7	1.4	86.6	-94.6	2.4	20.0	0.003	0.88	0.53
TargHR	25.0	3	0.140	3500.	493.	349.	495.	634.	7.7	0.127	0.074	0.118	0.165	3967.	3929.	4.0	2.7	1.3	86.1	-100.6	3.3	30.9	0.003	0.88	0.54
TargHR	25.0	3	0.160	2300.	555.	409.	554.	692.	7.1	0.155	0.106	0.150	0.200	3603.	3568.	4.0	2.5	1.5	92.3	-104.1	5.4	5.4	0.001	0.87	0.49
TargHR	25.0	3	0.160	2600.	553.	408.	557.	686.	7.3	0.152	0.099	0.146	0.199	3670.	3568.	4.0	2.6	1.4	93.8	-105.6	5.0	10.1	0.002	0.87	0.50
TargHR	25.0	3	0.160	2900.	544.	390.	548.	692.	7.4	0.146	0.094	0.146	0.194	3681.	3634.	4.0	2.6	1.4	92.5	-109.1	4.3	18.3	0.000	0.87	0.50
TargHR	25.0	3	0.160	3200.	531.	380.	531.	686.	7.6	0.143	0.087	0.137	0.191	3760.	3702.	4.0	2.7	1.4	92.6	-106.8	4.6	27.2	0.001	0.87	0.51
TargHR	25.0	3	0.160	3500.	522.	363.	524.	683.	7.8	0.137	0.080	0.131	0.190	3813.	3733.	4.0	2.7	1.3	92.1	-109.9	4.2	38.2	0.001	0.88	0.52
TargHR	25.0	3	0.180	2300.	586.	445.	592.	727.	7.2	0.181	0.119	0.172	0.239	3366.	3292.	4.0	2.5	1.5	97.8	-114.0	9.0	9.0	0.002	0.86	0.46
TargHR	25.0	3	0.180	2600.	579.	405.	582.	740.	7.4	0.173	0.107	0.168	0.233	3456.	3384.	4.0	2.6	1.4	98.6	-114.5	8.2	16.1	0.001	0.86	0.47
TargHR	25.0	3	0.180	2900.	575.	404.	580.	732.	7.5	0.167	0.099	0.163	0.224	3525.	3414.	4.0	2.6	1.4	99.2	-114.6	6.6	24.7	0.001	0.86	0.48
TargHR	25.0	3	0.180	3200.	563.	397.	571.	719.	7.7	0.166	0.096	0.156	0.227	3542.	3475.	4.0	2.6	1.4	98.5	-118.3	7.0	37.4	0.002	0.86	0.48
TargHR	25.0	3	0.180	3500.	542.	384.	548.	714.	8.0	0.158	0.088	0.144	0.215	3642.	3554.	4.0	2.7	1.3	98.1	-118.4	7.1	44.7	0.006	0.87	0.50
TargHR	25.0	3	0.200	2300.	607.	443.	612.	769.	7.4	0.214	0.128	0.195	0.282	3158.	3068.	4.0	2.5	1.5	104.0	-117.9	14.7	14.7	0.009	0.84	0.43
TargHR	25.0	3	0.200	2600.	606.	426.	610.	771.	7.5	0.206	0.117	0.191	0.276	3238.	3137.	4.0	2.5	1.5	104.3	-124.1	14.1	23.9	0.008	0.85	0.44
TargHR	25.0	3	0.200	2900.	603.	428.	604.	776.	7.7	0.195	0.115	0.178	0.270	3340.	3221.	4.0	2.6	1.4	106.6	-124.7	11.4	32.6	0.005	0.85	0.45
TargHR	25.0	3	0.200	3200.	584.	402.	589.	755.	7.9	0.186	0.103	0.172	0.259	3384.	3290.	4.0	2.6	1.4	105.0	-126.4	10.4	43.1	0.003	0.85	0.46
TargHR	25.0	3	0.200	3500.	570.	391.	578.	750.	8.0	0.174	0.094	0.163	0.247	3502.	3401.	4.0	2.6	1.4	104.3	-124.4	9.3	51.3	0.003	0.86	0.48
TargHR	25.0	3	0.220	2300.	624.	434.	636.	784.	7.6	0.248	0.134	0.220	0.330	2977.	2906.	4.0	2.4	1.6	107.9	-128.3	21.6	21.6	0.012	0.83	0.41
TargHR	25.0	3	0.220	2600.	627.	435.	631.	806.	7.7	0.237	0.127	0.209	0.321	3086.	2977.	4.0	2.4	1.6	110.0	-131.2	18.7	30.1	0.011	0.83	0.42
TargHR	25.0	3	0.220	2900.	619.	431.	628.	790.	7.9	0.224	0.119	0.198	0.313	3171.	3069.	4.0	2.5	1.5	109.9	-132.0	16.5	39.0	0.008	0.84	0.43
TargHR	25.0	3	0.220	3200.	605.	419.	612.	791.	8.1	0.230	0.110	0.185	0.312	3248.	3095.	4.1	2.6	1.5	109.2	-131.6	15.3	49.5	0.016	0.84	0.44
TargHR	25.0	3	0.220	3500.	589.	398.	591.	784.	8.0	0.193	0.103	0.173	0.274	3360.	3270.	4.0	2.6	1.4	107.8	-131.7	11.8	57.9	0.006	0.85	0.45
TargHR	25.0	3	0.240	2300.	644.	453.	646.	827.	7.8	0.283	0.144	0.242	0.388	2837.	2742.	4.0	2.4	1.6	113.8	-134.5	27.4	27.4	0.018	0.82	0.38
TargHR	25.0	3	0.240	2600.	641.	451.	645.	819.	7.8	0.271	0.140	0.235	0.368	2894.	2782.	4.0	2.4	1.6	112.6	-137.1	24.4	37.5	0.014	0.82	0.39
TargHR	25.0	3	0.240	2900.	627.	435.	632.	817.	8.2	0.255	0.124	0.217	0.356	3026.	2900.	4.0	2.5	1.5	115.0	-137.2	21.9	45.9	0.013	0.83	0.41
TargHR	25.0	3	0.240	3200.	621.	428.	628.	818.	8.1	0.242	0.121	0.198	0.357	3120.	2951.	4.0	2.6	1.5	113.1	-139.1	18.9	54.5	0.012	0.84	0.42
TargHR	25.0	3	0.240	3500.	605.	403.	604.	813.	8.2	0.217	0.107	0.186	0.307	3285.	3114.	4.0	2.7	1.4	111.7	-135.5	14.2	61.3	0.011	0.85	0.44
TargHR	25.0	3	0.260	2300.	655.	453.	661.	850.	8.1	0.336	0.162	0.270	0.465	2649.	2540.	4.1	2.3	1.8	118.4	-136.5	35.1	35.1	0.030	0.80	0.36
TargHR	25.0	3	0.260	2600.	652.	446.	653.	852.	8.2	0.317	0.151	0.251	0.435	2782.	2641.	4.1	2.4	1.7	119.0	-138.5	30.3	43.0	0.024	0.81	0.37
TargHR	25.0	3	0.260	2900.	644.	451.	646.	838.	8.2	0.292	0.131	0.233	0.424	2907.	2755.	4.1	2.5	1.6	117.5	-145.1	27.0	51.0	0.021	0.82	0.39
TargHR	25.0	3	0.260	3200.	632.	420.	627.	838.	8.4	0.285	0.130	0.218	0.392	2980.	2825.	4.1	2.5	1.6	117.1	-138.9	22.2	59.7	0.026	0.83	0.40
TargHR	25.0	3	0.260	3500.	619.	415.	615.	819.	8.3	0.246	0.118	0.197	0.363	3137.	3022.	4.0	2.5	1.5	115.1	-142.7	19.1	65.2	0.013	0.83	0.42
TargHR	25.0	3	0.280	2300.	673.	467.	683.	858.	8.2	0.386	0.171	0.294	0.543	2530.	2362.	4.1	2.3	1.8	121.8	-141.8	39.5	39.5	0.047	0.79	0.34
TargHR	25.0	3	0.280	2600.	673.	454.	670.	880.	8.3	0.356	0.158	0.281	0.555	2645.	2439.	4.1	2.4	1.7	124.1	-147.4	35.1	48.3	0.035	0.80	0.35
TargHR	25.0	3	0.280	2900.	648.	434.	645.	852.	8.4	0.318	0.148	0.245	0.463	2768.	2629.	4.1	2.5	1.6	120.5	-148.4	30.6	56.6	0.027	0.81	0.37
TargHR	25.0	3	0.280	3200.	633.	429.	634.	840.	8.5	0.307	0.125	0.226	0.444	2912.	2756.	4.1	2.4	1.7	120.2	-144.9	27.6	61.8	0.031	0.82	0.39
TargHR	25.0	3	0.280	3500.	631.	446.	623.	825.	8.4	0.274	0.125	0.211	0.400	3021.	2880.	4.1	2.5	1.6	118.5	-143.2	22.4	69.6	0.022	0.83	0.41
TargHR	25.0	3	0.300	2300.	678.	462.	688.	884.	8.5	0.435	0.175	0.319	0.659	2400.	2213.	4.2	2.3	1.9	123.9	-147.1	45.9	45.9	0.060	0.78	0.32
TargHR	25.0	3	0.300	2600.	678.	472.	677.	887.	8.5	0.411	0.161	0.297	0.736	2528.	2315.	4.1	2.3	1.8	125.2	-154.4	40.6	52.6	0.058	0.79	0.33
TargHR	25.0	3	0.300	2900.	663.	449.	660.	884.	8.6	0.382	0.150	0.275	0.635	2628.	2449.	4.1	2.4	1.8	125.2	-150.9	37.0	60.4	0.044	0.79	0.35
TargHR	25.0	3	0.300	3200.	646.	415.	646.	878.	8.7	0.347	0.138	0.251	0.496	2760.	2588.	4.1	2.4	1.7	123.4	-146.9	31.7	67.4	0.047	0.81	0.37
TargHR	25.0	3	0.300	3500.	650.	442.	646.	870.	8.5	0.317	0.131	0.229	0.460	2899.	2700.	4.1	2.4	1.7	123.7	-150.0	25.5	73.4	0.038	0.81	0.39