9 Working documents

Working documents available to WGBFAS 2008:

Working Document 1


Summary: \( F_{\text{max}} \) for sole in area IIIa is considerably higher than \( F_{\text{opt}} \), but poorly defined as the yield-per-recruit curve has no distinct peak. There is no clear relation between SSB and recruitment and ICES estimated in 1999 the biomass reference point on the basis of MFA. Presented scenarios indicate that \( B_{\text{lim}} \) and \( B_{\text{pa}} \) are not consistent with the analogous F reference points, e.g. fishing at \( F_{\text{pa}} \) will lead to SSB of around twice the size of \( B_{\text{pa}} \). Scenario results show that under realistic assumptions of assessment uncertainties, \( F_{\text{MST}} \) is estimated to a value of around 0.35. The risk of SSB falling below the present precautionary biomass reference point is close to zero for a long term F at 0.35. Even with biomass reference points twice as big as the present ones, the risk of a SSB below those is less than 5%. A TAC for 2008 based on an F value of 0.35 is consistent with high long-term yield and a low risk of depleting the reproductive potential of the stock.

Working Document 2.


Abstract: A survey series targeting sole in Kattegat and Skagerrak was initiated in 2004 in order to establish a time series of catch and effort data independent of the commercial fishery. The time series is split in two independent series, one series based on fixed stations selected by the fishermen, and one series based on random selected fixed stations distributed by DTU Aqua. In 2005 the survey design was adjusted, in order to facilitate estimation of swept area biomass and abundance based on random selected fixed stations distributed over the entire survey area. CPUE for sole has decreased slightly on the fishermen’s stations during the four years, while CPUE at all stations combined has been stable. The biomass and abundance of sole has increased slightly during 2005 - 2007. CPUE, biomass and abundance for cod, plaice and Norway lobster showed a decrease from 2006 to 2007. The decrease in cod biomass and CPUE was statistically significant.

Working Document 3.

Henrik Svedäng & Massimiliano Cardinale: Modelling of IBTS and Ancylus survey age indices for improvement of the assessment of Kattegat cod (Gadus morhua).

According to the recommendations given by WGBFAS in 2007, an evaluation of tuning data available for the Kattegat cod assessment should be performed in order to explore the possibility of combining indices that could potentially result in fewer, but more consistent time series. It was also proposed that possible spatial distribution differences between spawning (i.e. first quarter of the year) and non-spawning periods should be taken into account.
In this study, IBTS in the first and third quarter of the year and the Ancylus surveys in the second and fourth quarter were included in the analysis. Combining IBTS Q1 and IBTS Q3 into one, respectively combining Ancylus Q2 and Ancylus Q4. The precision was increased as the both the temporal and spatial information was included to the generalized additive modelling. Importantly, the generalized form of modelling allowed for inclusion of more appropriate error distributions by the use of a link function. In other words, “noisy” character of data such as survey time series is much better handled using the information adequately instead of forcing the time series into models based normal error distributions. Conclusively, divergent observations are given less disproportionate influence on the evolution of the time series. However, these observations are not discarded but fitted to a more realistic error distribution. Substantial improvements of the accuracy as well as the precision are thereby gained.

**Working Document 4.**

Marie Storr-Paulsen and Margit Eero: Recent changes in the Danish fisheries and their potential influence on the assessment input data for the Western (and eastern?) Baltic cod.

**Abstract:** A new fisheries regulation system was enforced in Denmark in January 2007. Consequently, the CPUE for the Danish fleets are likely going to be affected by changes in the management. However, a number of stocks assessed in Kattegat and the Baltic use Danish logbooks as the only commercial fishing fleets in the assessment. In this working document we analyse the potential influence on the change in regulation system on fleet structure, effort and fishing patterns in 2007, with focus on Western Baltic cod.

**Working Document 5.**

Marie Storr-Paulsen and Jonna Tomkiewicz: Updated maturity data considering skip of spawning, sex ratios and weight at age for Baltic and Kattegat cod stocks.

**Abstract:** Maturity and growth data originating from the Baltic International Trawl Surveys (BITS) were revised during 2006 and 2007 by WGBIFS as planned during the Workshop on BIFS Data Quality Assurance held in 2006. This working paper present a preliminary analysis of data for the Kattegat and Baltic cod stocks during the time period 1991-2007 based on DATRAS data. The results show sexually dimorphic maturation and longevity. The size of males at first maturity was smaller than females and the length at 50% maturity deviated by approximately 10 cm. The males had on average a shorter life span than females resulting in highly skewed sex ratios which were evident for all areas and years. These differences argue for using the female SSB in the stock assessment as an indicator of the stock reproduction capacity. Furthermore, within years on average 18% of females and 13% for males omitted spawning. The female SSB was calculated for the western Baltic cod stock based on the new maturity and weight data and compared to the recent assessment where these data have been constant for more than 10 years. This example showed a significantly improved stock recruitment relationship using the female SSB and the new data series.

**Working Document 6.**

Alex Elmerdahl Olsen (A. Espersen a/s) presented a Method to evaluate the catches of Cod in the Baltic Sea to the working group. The method is based on Supply
Balance techniques using EURO stat data for export and import for cod and cod products and conversion factors (from products to whole fish) based on yields as realised by Espersen. The results indicated that Supply Balance can be used to estimate the total level over fishing in the Baltic Sea and AEO recommend, that a working group with representatives from ICES and the Baltic Sea RAC should be established to evaluate further how estimates based on Supply Balance could be included in general models for estimating un-reported landings.

**Working Document 7.**

Anders Nielsen: State-space assessment model for cod in the Kattegat.

Abstract: A state-space statistical assessment model was developed and applied on cod in the Kattegat. Specific features of the model include consistent treatment of all Na,y values in the model, stochastic survival and random walk fishing mortality. Model parameters are estimated by maximum likelihood. Estimation of uncertainties is an integrated part of the model. For the cod stock in Kattegat the model was extended to allow estimation of possible bias (positive or negative) in the reported total landings. The model assumes that the reported landings in selected years could be scaled by a year and possibly also by an age specific factor.

**Working Document 8.**


The present WD is giving an overview on the German fisheries on herring and sprat in the Baltic Sea including information on spatial distribution of landings, fleets operating, species composition in the landings and the final stock assessment input.

In 2007 the total German herring landings in the Baltic Sea (SD 22-29) reached 26,255 t (2006: 26,103 t; 2005: 24,357 t; 2004: 22,332 t). The herring landings in SD 22 and 24 amounted to about 24,583 t, which is about 12 % higher than in 2006 (22,870 t). Almost all landings originated from SD 25-29 were landed in foreign ports (1,666 t of 1,672 t). The main part in SD 25-29 was caught in quarter 4 (955 t).

The main fishing season was during spring time as in former years. About 60 % of all herring was caught between March and May (2006: 77 %). The dominant part of the German herring landings was taken in SD 24 (2007: 86 % and 2006: 75 %). About 33 % of the total landings are originating from waters around the Island of Rügen in SD 24 (2006: 39 %). The German fishing fleet in the Baltic Sea consists of two parts where all catches for herring are taken in a directed fishery:

1. coastal fleet with open boats (rowing/motor boats <=10 m and engine power <=100 HP)
2. cutter fleet of total length between 12 m and 30 m.

No assessment input data could submitted for SD 25-29 to WGBFAS 2008. Herring could not be sampled in SD 25-29 since almost all herring (99.6 %) was landed in foreign ports.

was landed in foreign ports (2007: 28,022 t = 95 %; 2006: 29,590 t = 98 %; 2005: 27,336.5 t = 99 %).

The German fishing fleet in the Baltic Sea consists of only of one part where all catches for sprat are taken in a directed trawl fishery (cutter fleet of total length between 12 m and 30 m).

Even so most of the sprat was landed in foreign ports in 2007 (93 %), it was possible to get samples/to produce assessment input data from:

SD 22: quarter 1, 2 and 4,
SD 24: quarter 2,
SD 25: quarter 2.

The samples from Sub-division 25 could be sampled at sea within the scope of the EU sampling programme. The officially reported trawl landings (t) and the referring assessment input data were not corrected for the overall small differences in species composition in the samples.