Executive summary

This is the sixth report of the pan-regional Working Group on Multispecies Assessment Methods (WGSAM). The group met at the Ca’ Foscari University of Venice in Venice, Italy, and reviewed ongoing multispecies and ecosystem modelling activities in each ICES ecoregion.

The participants provided an updated inventory, to supplement the information collated in 2007-2011 (ToR ‘a’ and ‘b’). New information was presented for Barents Sea, North Sea, Kattegat/Skagerrak, Venice lagoon, Adriatic Sea, Baltic Sea and Northeast US. The group reviewed a new key run for the Baltic Sea SMS. A summary dataset of natural mortalities, stock numbers and biomasses of the modelled species was compiled and is available for download with the report.

WGSAM has continually worked towards significant development of new methods and improvements in model functionality. This year, WGSAM worked for the first time on evaluating and exploring the use of size spectra models (ToR ‘f’), with a particular emphasis on investigating the effect of parameter selection on model predictions. Work on the development of cross-model validation techniques and suggestions of how to test various multispecies models using a common, virtual dataset were continued from last year and discussed along with the necessary characteristics of such datasets (ToR ‘d’). The group further continued their work towards obtaining new stomach data from the ICES region (ToR ‘c’).

WGSAM, WGFE and WGECO all examined the development of foodweb and ecosystem indicators relevant to the marine strategy framework directive (MSFD descriptor 4) this year. To ensure knowledge transfer and coordination between the groups, WGFE and WGSAM met consecutively/concurrently and worked in a few joint session on this topic (ToR ‘e’). Two joint members of WGECO and WGSAM attended the WGSAM/WGFE meeting. A range of indicators of foodweb and ecosystem Good Environmental Status were suggested, four of which (natural mortality by age, the proportion of total mortality which is caused by natural sources, the large fish indicator LFI, and the biomass in functional groups) were selected to present examples of multispecies advice.

The concept of Maximum Sustainable Yield and other biological reference points was explored in WGSAM using simulations based on stochastic age based models (Gadget, STOCOBAR and SMS) and fleet based biomass models (Ecopath with Ecosim), as well as with analytical considerations (ToR ‘h’). The models showed that increasing predator stocks will result in decreasing yield of their prey. Balanced fishing was examined to determine if this harvest strategy could improve yield but this was not the case. For the North Sea, the rebuilding of the top predators cod and saithe resulted in increasing predation mortality of haddock and whiting, and these stocks could only be maintained within safe biological limits if fishing mortality was substantially higher than current single species estimates; again this should be received as a simulation result, not a recommendation. Even in this case, whiting was frequently at low biomass due to high predation mortalities induced by grey gurnard.

This year, WGSAM suggests a format for multispecies advice for inclusion in reports of other working groups and in ICES advice (ToR ‘i’). The advice includes a general description of the most important species interactions, advice on community and foodweb indicators and advice on the combination of target Fishing mortalities pro-
ducing precautionary results or close-to-MSY in a multispecies environment. Examples are presented for the North Sea and Baltic Sea.