**Executive summary**

The Benchmark Workshop on *Nephrops* assessment, held in Aberdeen, Scotland from the 2–6 March 2009, addressed the problems encountered while generating TAC advice for *Nephrops* in 2008. These problems arose from different approaches in handling uncertainty and potential bias when using underwater TV surveys to estimate the abundance of *Nephrops* populations in Functional Units (FUs = the subdivisional geographical scale on which *Nephrops* are assessed).

The Workshop focused FUs: 6 (Farn Deeps, Division IV), 7 (Fladen Ground, Division IV), 8 (Firth of Forth, Division IV), 9 (Moray Firth, Division IV), 11 (North Minch, Division VI), 12 (South Minch, Division VI), 13 (Clyde, Division VI), 15 (Irish Sea West, Division VIIa) and 17 (Aran Grounds, Division VIIb).

Experts on *Nephrops* stock assessment and life history, industry representatives, and a panel of three independent, external experts were present. The meeting was chaired by Kevin Stokesbury. The meeting opened with presentations covering the evolution of the *Nephrops* TV surveys, their use and recent developments in analysis and assessment, *Nephrops* life history and information on the fishery.

The first decision for the group was whether the TV survey indices should be used as relative or absolute indices of abundance. Initially the group considered using the surveys as a relative index thereby avoiding the estimation of bias correction factors. The bias for each FU is listed in a Table of Uncertainty. However this still requires some coupling of the survey to absolute TAC advice and no obvious route to making this link could be found. The uncertainty in historical landings information was critically limiting. The group therefore reverted to using the TV index as an absolute index and made initial estimates of the various potential sources of bias. For each survey, each potential source of bias was tabulated and quantified.

Previously the TV surveys were assumed to have the same selectivity as the fishery. A comparison of fishery dependent and independent data in the Irish Sea demonstrated that there was a portion of the population which was physically on the ground and available to fishing gear but does not appear in the sampled catches. These smaller *Nephrops* are capable of constructing their own independent burrows and this suggests that the TV survey likely observed burrows of individuals are considerably smaller than the fishery selects. Using a combination of expert knowledge and on-screen measurements, the group suggested a knife-edge detection selectivity of 17 mm for all areas. This revision of TV survey selectivity required a revision of the sustainable harvest rate. New harvest rates corresponding to fishing at $F_{0.1}$ and $F_{\text{max}}$ were calculated for each Functional Unit.

Standard protocols for the handling of TV survey data and the generation of ICES catch option tables were produced and incorporated into the Stock Annexes for each Functional Unit. Research recommendations were provide that should improve the estimates of uncertainty in the next few years.