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Report of the Working Group on North Sea Cod and Plaice Egg Surveys in the North Sea (WGEGGS)

9–11 November 2010

ICES Headquarters, Copenhagen

ICES International Council for the Exploration of the Sea

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Executive summary

Working Group on North Sea Cod and Plaice Egg Surveys in the North Sea (WGEGGS) met in Copenhagen from 9–11 November 2010 to analyse and review the results of the 2009 North Sea cod and plaice egg surveys and compare egg and larvae distributions between 2004 and 2009.

For the assessment of cod spawning areas cod eggs were only genetically identified in the northern part of the North Sea. In the southern North Sea cod eggs were visually identified. The distribution of cod eggs was similar in 2004 and 2009 suggesting only minor changes in the distribution of cod spawning between the two years.

The highest densities of plaice eggs were found in the southern areas, off the Dutch coast, while eggs were less abundant off the Scottish East coast and in East-central North Sea. The main concentrations of plaice eggs were distributed similar to 2004, implying only small changes in plaice spawning.

Two of the participants in the survey programme, Norway and Denmark, carried out sampling for the cod and plaice egg survey in conjunction with the 1st quarter IBTS survey. The experience by these participants shows that it is possible to carry out the egg sampling without constraining the time available for ordinary procedures (daytime trawling and MIK hauls). It is however necessary to have additional, skilled people on board for working up the PLACES samples. WGEGGS recommends carrying out an internationally coordinated ichthyoplankton survey every 3 years in conjunction with IBTS and HELA surveys for monitoring spawning areas of main fish species. This has been recommended as a high priority for Ecosystem Based Approach to Management by the Bergen Declaration Meeting of Scientific Experts.

During the meeting WGEGGS met with the ICES Data Centre to discuss the possibilities of uploading ichthyoplankton survey data into the ICES DATRAS database. We reviewed the archiving of the 2004 and 2009 North Sea ichthyoplankton survey data within the ICES DATRAS database, and WGEGGS supplied the Data Centre with the values and legal ranges that are specific for the WGEGGS survey. The Data Centre will create a database structure for the importing of ichthyoplankton survey data.

WGEGGS will meet again in October 2011.

1 Opening of the meeting and adoption of the agenda

The Working Group on North Sea Cod and Plaice Egg Surveys in the North Sea (WGEGGS) met in Copenhagen from 9 to 11 November 2010 to:

a) Analyse and review the results of the 2009 North Sea cod and plaice egg surveys;

b) Compare the results from the 2004 and 2009 surveys to assess whether there has been a change in spawning distribution of the target species;

c) Review archiving of the 2004 and 2009 North Sea ichthyoplankton survey data within the ICES DATRAS database.

Four Institutes participated in the WGEGGS meeting (Annex 1). The agenda for the meeting can be found in Annex 2.

2 Data of the 2009 survey (ToR a)

2.1 Target species

In 2009 six countries participated in the North Sea wide ichthyoplankton survey for cod and plaice eggs. The reports from all surveys have been included in the 2009 WGEGGS report (ICES, 2009b).

Northern North Sea (North east section).

Norwegian survey

Samples

In all 4,284 pelagic fish eggs and 94 larvae were caught. The greatest concentration of eggs was in the northeastern part of the survey. The egg densities in these areas were between 234 and 366 individuals m^{-2}. Eggs occurred over nearly all the area but at much lower densities.

In all 732 eggs were measured and put in 100 % ethanol in individual vials, i.e. one egg per vial. Of these, 606 were classed as potential gadoid eggs and 126 as either Pleuronectid or potentially large gadoid eggs. In general where cod stage 1 eggs occurred, spawning occurred less 4.5 days prior to sampling and less than 4 days prior to sampling in plaice.

In addition to the fish eggs the larvae were sorted from the samples. The larvae consisted of herring (*Clupea harengus*), crystal gobies (*Crystallogobius linearis*) and a number of small larvae that were identified after the cruise. The fish larvae were patchily distributed with larvae being absent at many locations. The herring in particular appeared to occur from Northwest (just south of the Shetlands to the southeast, toward the Skagerrak.

Sample processing

All eggs that were picked out and stored in ethanol were sent to FRS Aberdeen (now Marine Scotland Science, Aberdeen). All eggs between 1.2 and 1.7 mm diameter were screened with genetic probes (see 'Methods for DNA analysis') for the following species: Cod (*Gadus morhua*), whiting (*Merlangius merlangus*), haddock (*Melanogrammus aegefinus*) and Norway pout (*Trispoterus esmakii*). Eggs that were not identified remained as Gadoid sp. Of the 732 eggs sent to Marine Scotland 604 eggs were analysed with 11 DNA extract failures (see Table xx). Of the analysed eggs there was a fairly even distribution between cod, haddock and Norway pout. No whiting were identified in the northeastern samples.

The remaining formalin preserved samples with eggs and larvae were identified (using Russell, 1976) as far as possible. Due to the delay in processing generally it was only possible to identify the eggs to gadoid-like, plaice, long-rough dab or with large perivitelline space. Very occasionally later stage eggs could be identified to species. For large samples, the eggs were subsampled and all eggs that were subject to identification and staging were measured using an ocular micrometre on a binocular microscope. Most larvae were measured and identified to species.

Northern North Sea (North west section)

Scottish survey

Fish eggs and larvae were separated from zooplankton and then plaice and cod-like eggs were staged. A subsample of up to 50 stage 1 cod-like eggs within the range 1.1–1.7 mm were measured using a calibrated eye piece graticule and then fixed in 100% ethanol in individual vials for later molecular identification. Samples from both Bongo nets were sorted only where there were less than the required number of stage I cod like eggs and fewer than 100 other eggs. After sorting, remaining eggs and fish larvae were fixed in observation fluid (ICES, 2009a).

Eggs and larvae were sorted from both nets in 43 stations. In all 11007 eggs were caught from which 4488 were staged and 1215 cod-like eggs were extracted for later genetic identification of cod, haddock, whiting and Norway pout eggs. High numbers of spawning Norway pout adults were caught in bottom-trawls carried out at several stations during the cruise. Gill tissue from Norway pout were taken in order to develop a genetic probe for this species.

The frequency composition of stage I cod-like eggs suggested the presence of two major modes, at 1.1 and at 1.4 mm. The lower mode was consistent with the upper diameter range of Norway pout, which were found to be spawning in the northern part of the study area. The highest densities of stage I eggs in the main size range for cod and haddock (i.e. 1.3–1.6 mm) were at stations off the Moray Firth, west of Orkney and northeast of Shetland. Samples from these locations also contained stage V cod eggs. Only 15 spawning cod were caught in total and all but 1 came from the Moray Firth. Spawning haddock were caught on the Bressay grounds. Spawning Norway pout were also recorded in this area.

Mean water column temperatures ranged from 5.7 to 9.7ºC. The warmest water temperatures were recorded in the northwest of the survey area and the coldest in the coastal waters of the Scottish east coast. The high salinity areas in the north and west of the surveyed area were consistent with Atlantic water (salinity > 35.3)

Methods for DNA analysis

Individual eggs stored in ethanol from Norwegian and Scottish samples were used for molecular analysis to identify species.

The Chelex™ method in Estoup *et al*. (1996) was used to extract DNA from individually stored egg samples. The methods of Taylor *et al.* (2002), Fox *et al*. (2005) and O'Sullivan *et al*. (pers. comm) were used to analyse DNA extracted from eggs in order to identify species. Genomic DNA was extracted from adult gill tissues to create PCR control templates; a specific TaqMan-MGB probe for identification of Norway pout and universal TaqMan primer (GAD-RII) was created for the analysis of egg samples from PGEGGS surveys. A summary of DNA analysis of both Scottish and Norwegian egg samples is shown in Table 2.1.

Table 2.1. Eggs from surveys in Northern North Sea in 2009 analysed by genetic probe.

	Norwegian Samples	Scottish Samples
Not analysed	106	67
Failed extract	11	44
Unidentified gadoid	218	232
Cod	120	97
Cod not stage 1	1	17

Haddock	119	571
Norway pout	135	202

Central North Sea (Eastern section - Denmark)

Danish Survey

In total 68 stations were sampled during the Danish investigation, using a 60 cm diameter Bongo net. The 330 μm samples were fixed in 4 % Borax buffered Formalin/Seawater Solution and this sample was processed for abundance estimations. All eggs and larvae were sorted from each station, identified (using Munk and Nielsen 2005) and length measured. No molecular species identification of eggs were carried out, and eggs within the size range 1.1–1.75 mm and with no oil globules were interpreted as belonging to the family gadidae. These data have been entered into the database. An additional procedure was to identify and measure lengths of larvae from the Scottish samples and enter these into the database. Subsequent allocation of sampled gadoid eggs to species by the Danish sampling will be based on the estimation of distribution among species by Scottish and French partners from overlapping areas of sampling.

Southern North Sea (December-January sampling)

Dutch survey

In total 78 stations were sampled during the December survey and 83 stations during the January survey. Both surveys were carried out with a Gulf VII planktontorpedo with 280 μm meshsize net. Samples were fixed in 4% buffered Formaldehyde solution. All eggs and larvae were sorted from each station, identified (if possible) and length measured. No molecular species identification of egg were carried out, and eggs within the size range 1.1–1.75 mm and with no oil globules were interpreted as belonging to the family gadidae. These data have been entered into the database.

2.2 Non-target species

Eggs and larvae from non-target species, e.g. sandeel larvae, have for the most been worked up from the samples but have not in all cases been reported to the WGEGGS datasheet. Participants are requested to deliver the available data on non-target species that have not been delivered so far.

3 Results of 2009 survey and comparison with 2004 (ToR a, b)

From the surveys in 2009, 24 species were identified in egg and larval samples, using either genetic (Norwegian and Scottish gadoids eggs only) or visual (eggs and larvae) methods. A further 6 groups of eggs and larvae were identified to genus or family i.e. *Ammodytes* spp, *Callionymus* spp, Clupeidae, Gadidae, Gobiidae and Pleuronectidae. The distributions and densities of all stages of eggs and larvae of 9 of the species recorded are mapped in figures 3.1 to 3.10. It must be noted, however, that not all 'gadoid' eggs were identified to species; therefore the maps of cod, whiting, haddock and Norway pout do not give a complete representation of the abundance and distribution of these species. These data will be finalized and presented in peer reviewed manuscripts (see section 4). Therefore a direct comparison between densities of 2004 surveys and 2009 surveys is not yet possible for gadoid eggs. It must also be noted that there is a gap (the region between 54N, 2E and 54N, 4E) in the sampling coverage of the 2009 surveys.

Gadoid eggs (unidentified cod-like) (Figure 3.1)

Most of the regions were high abundances of gadoid eggs were observed in the 2009 surveys, also showed significant densities in the 2004 surveys. A notable difference between the two years is the region south of Dogger Bank; abundances here were in 2009 much less than observed in 2004. It must be noted however, that this area is poorly covered by the 2009 surveys.

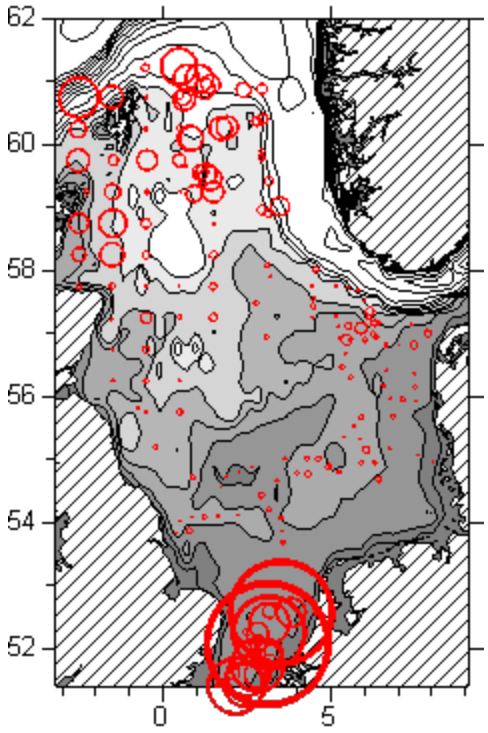

Figure 3.1. Distribution of gadoid eggs during the 2009 survey.

Gadus morhua – Cod (Figure 3.2)

Cod egg identification was only carried out on a subset of samples from the surveys at the time of the present meeting. The highest cod egg densities in 2009 were found Southeast of Shetland along the slope of the Norwegian Trench and in the Southern Bight.

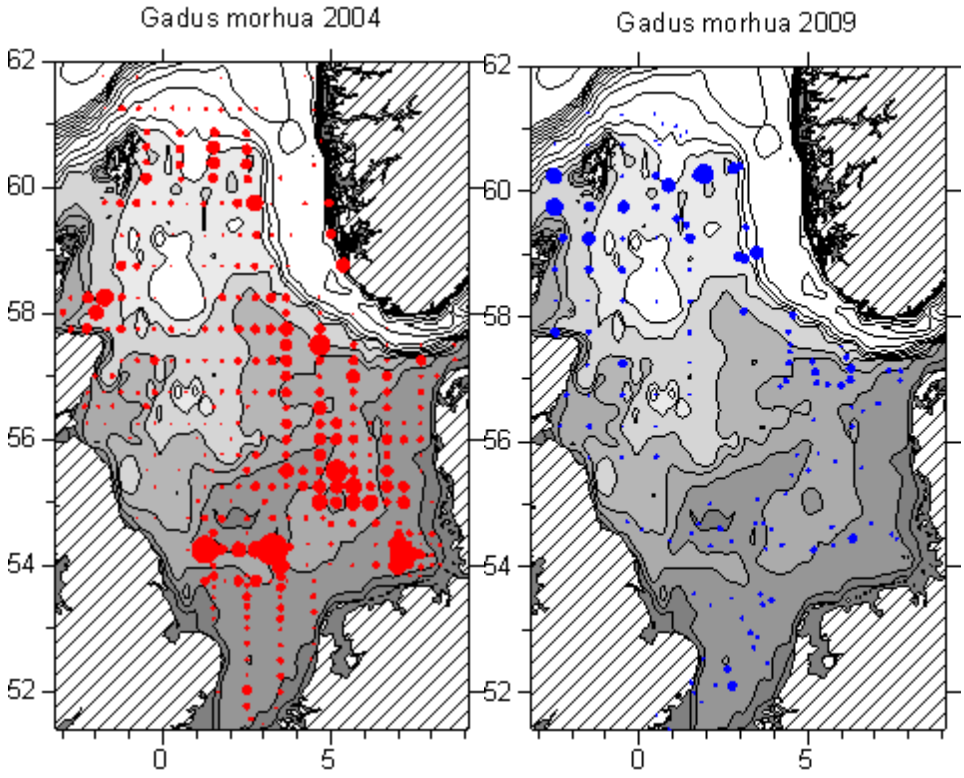

Figure 3.2. Comparison between findings of cod eggs 2004 (relative size of circles: eggs m^{-2}) and 2009 (circles show cod eggs >0.5 m^{-2}).

Merlangius merlangus – whiting (Figure 3.3)

Whiting eggs were found only in the southern and northwestern surveys. No whiting eggs were found in Norwegian samples. As whiting were included in the genetic screening in the Northern sections (above 56N), greater confidence can be placed in the absence of whiting eggs in the North-east.

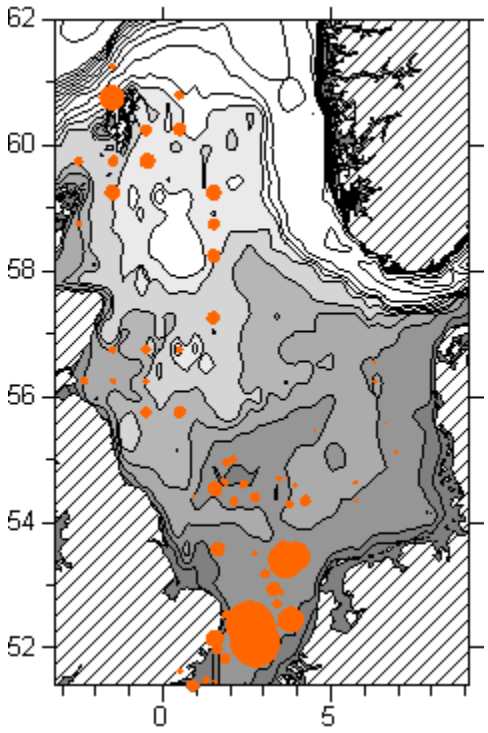

Figure 3.3. Distribution of whiting eggs during the 2009 survey.

Melanogrammus aeglefinus – Haddock (Figure 3.4)

Haddock were found mainly in the Northern North Sea and along the Scottish East Coast, as in 2004. Again, genetic screening of haddock in 2009 was only carried out for the Northern section (above 56◦N).

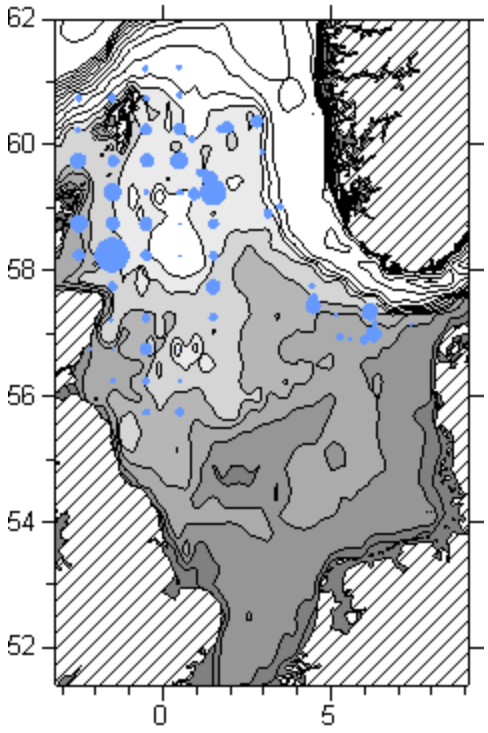

Figure 3.4. Distribution of haddock eggs during the 2009 survey.

Trisopterus esmarkii – Norway pout (Figure 3.5)

Genetic probes for Norway pout were available only for 2009 surveys and only eggs from the Scottish and Norwegian surveys were screened for Norway pout. Norway pout eggs were found in the central part of the northern North Sea, and to just west of Shetland. The highest densities were found between 59N and 61N.

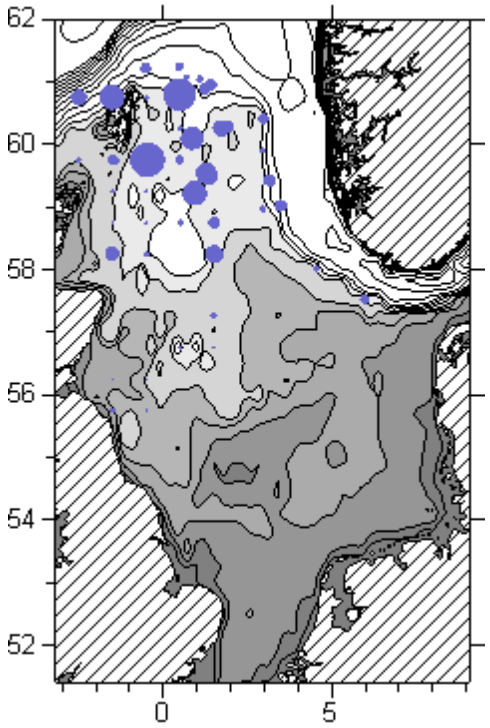

Figure 3.5. Distribution of Norway pout eggs during the 2009 survey.

Pleuronectes platessa – Plaice (Figure 3.6)

Plaice eggs were identified visually; the highest densities were found in the southern areas, off the Dutch coast, with relatively smaller numbers of eggs off the Scottish East coast and in central-eastern part of the North Sea. Hence, the distribution of plaice eggs does not extend as northerly as observed in 2004, a difference that might partly be due to the earlier sampling period of the 2009 surveys.

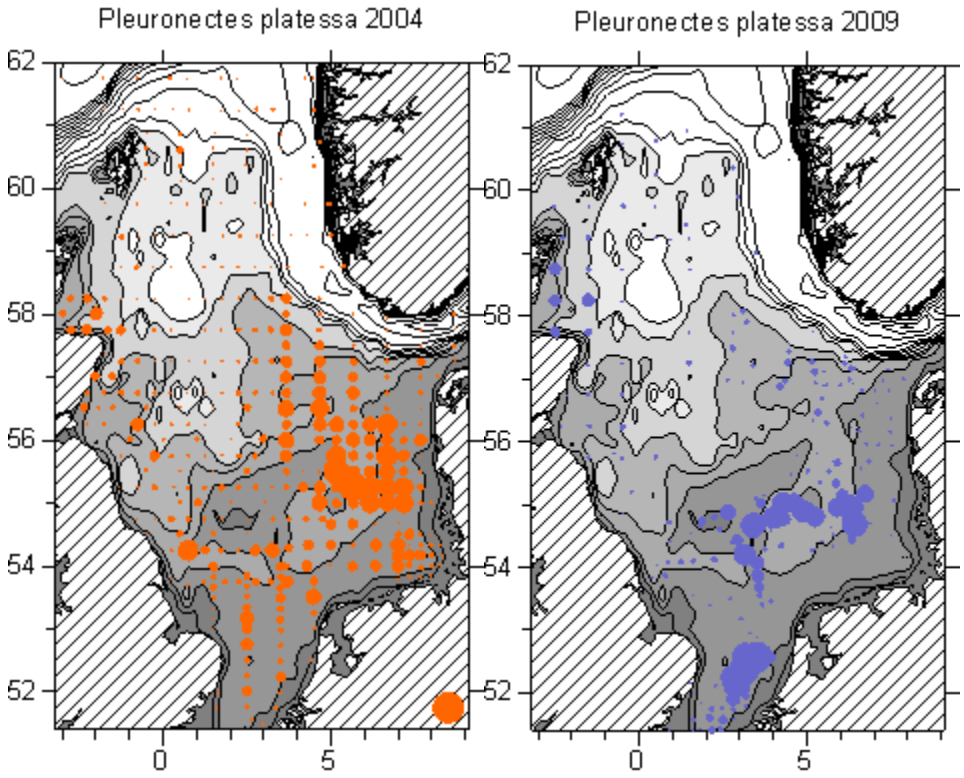

Figure 3.6. Comparison between findings of plaice eggs 2004 and 2009 (relative size of circles: eggs m^{-2}).

Hippoglossoides platessoides – Long rough dab (Figure 3.7)

Long rough dab eggs were identified visually. The highest densities were found in the southerly surveys, with smaller numbers in the Norwegian surveys of the north eastern sectors. The smaller densities in the North and the higher densities in the south is different from the 2004 surveys (Taylor *et al.*, 2007), where very few were identified in the southern North Sea.

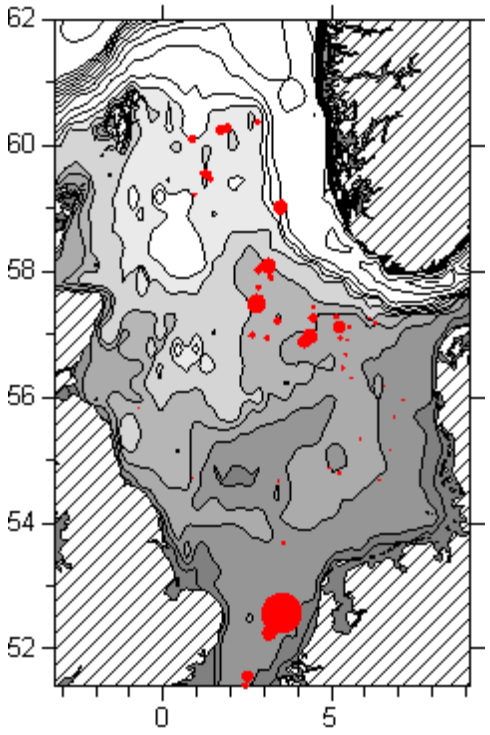

Figure 3.7. Distribution of long rough dab eggs during the 2009 survey.

Ammodytidae – Sandeels (Figure 3.8)

As sandeel eggs are benthic, no eggs will be found in plankton samples. However, with less confidence, the spawning sites can be traced by the distribution of newly hatched larvae. The sandeel larvae from the 2009 surveys were caught in highest densities between Orkney and Shetland isles, the Scottish East Coast and from the English East Coast across the central North Sea to German Bight. The distributions differ from the 2004 observations by a more prominent abundances south of Shetland and off Yorkshire, and less abundance off the coast of Jutland. Note that the larvae have not yet been processed for stations south of 54N.

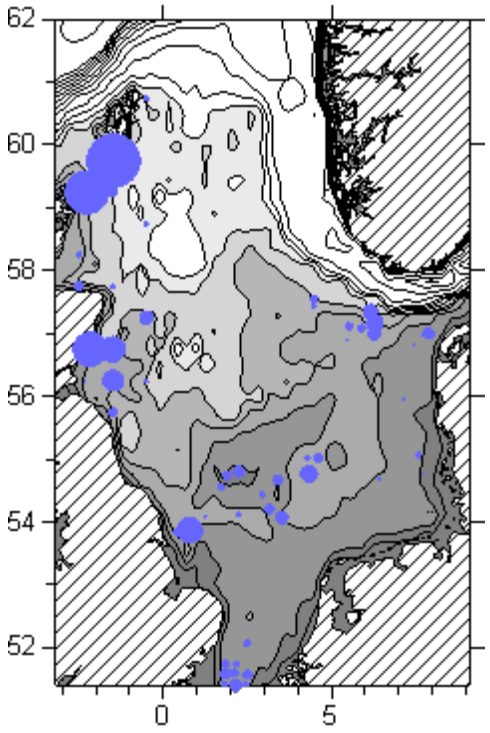

Figure 3.8. Distribution of ammodytidae larvae during the 2009 survey.

Clupea harengus – Herring (Figure 3.9)

Herring eggs are demersal and will to be found in pelagic plankton samples. Herring larvae were found mostly along the slope to the Norwegian Trench and south of Dogger Bank. These findings are consistent with the parallel observations made by the large 2 meter ring (MIK) sampling (ICES, 2009c).

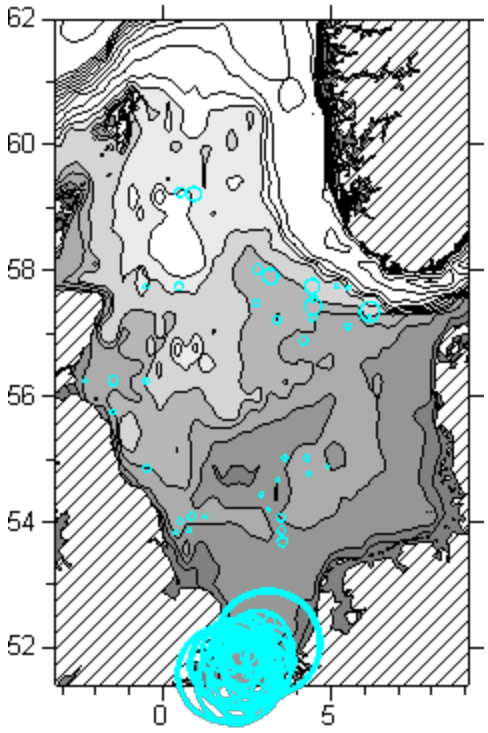

Figure 3.9. Distribution of herring larvae during the 2009 survey.

Crystallogobious linearis – Crystal goby (Figure 3.10)

Crystal goby is very abundant in the catches, with highest abundances off the English coast.

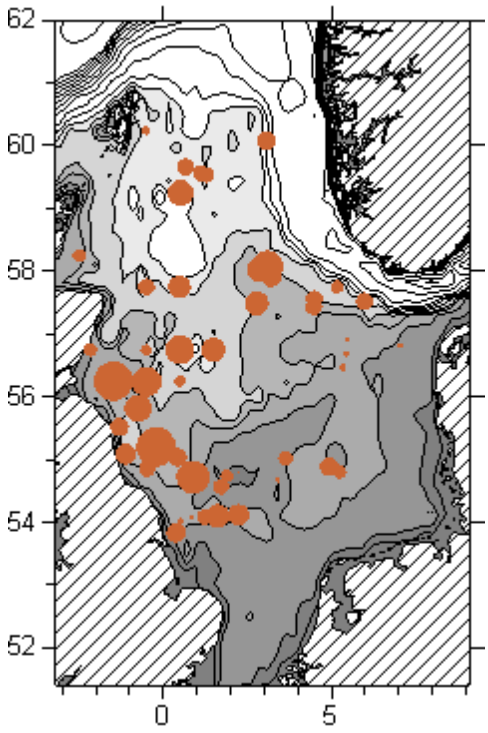

Figure 3.10. Distribution of crystal gobies during the 2009 survey.

4 Future analysis of the 2009 survey data

4.1 Norway pout

Norway pout are a short lived gadoid important to industrial fisheries. They largely occur in the northern North Sea. In the 2004 PGEGGS survey this species was distinguished from other gadoids on the basis of egg-size alone, as no molecular probe had been developed. However, the maximum egg diameter of this species overlaps with the minimum of that of cod and haddock. Consequently, Marine Scotland Science extended the probes developed by Taylor *et al*. (2002) to this species for the 2009 samples. In so doing we were able to provide a reliable indication of the distribution and major concentrations of eggs of this species in the Scottish and Norwegian samples. In collaboration with IMR, MSS will produce a short communication describing the new molecular probe and presenting the distribution from the 2009 survey.

4.2 Plaice

Plaice is a commercially important fish species. Next to the 2009 egg survey data fecundity data has also been collected by IMARES. The southern North Sea has been sampled 3 times from December 2008 to February 2009. This allows for an annual egg production estimate and fisheries independent SSB estimate to compare to the ICES VPA data. These data will be available at the WGEGGS 2011 meeting and published in the WGEGGS 2011 report.

Currently a model is being developed to describe movements of plaice as eggs from the spawning grounds to the larvae nursery grounds, suggesting the distribution of the plaice eggs reflects the location of the nursery grounds. The data from the 2009 egg survey will allow validation of this model. University of Hamburg, IMR and IMARES will produce a peer reviewed manuscript.

4.3 Spawning areas and hydrograpy

Several studies indicate that fish spawning are linked to hydrographical characteristics (e.g. Sabate´s and Olivar, 1996). Such linkage was also suggested by the findings from our 2004 studies (Munk *et al*., 2009). In 2004 we found concentrations of eggs from cod, haddock, plaice and other species in the vicinity of hydrographic frontal zones. Focus on frontal zones and their potential influence on the early life of fish has mainly been on tidal mixing fronts, but the 2004 study emphasized the potential importance of fronts driven by salinity differences. While the tidal mixing fronts are related to the establishment of thermoclines, and hence the warming of surface waters during the spring/summer period, the salinity fronts are found year-round, and are especially strong during the winter periods of high freshwater outlet from rivers. The fish species that spawns early in the year might therefore orient their spawning in relation to salinity/water density gradients. Such linkage was suggested by the 2004 findings (Munk *et al*., 2009), and it would be relevant to investigate this further by including the 2009 data on egg distributions and hydrography in an analysis of biophysical relationships. The surveys from 2004 and 2009 show both common and different patterns in biological and physical measures, hence a combined analysis will strengthen the investigation of linkages. The first steps for such an analysis have been taken, and results of the investigation will be available at the proposed 2011 meeting of the WG.

4.4 Haddock

Haddock have a more northerly distribution than other gadoids, and are an important species in Scottish mixed demersal fisheries. Haddock spawn between February and April in the North Sea (Wright and Gibb 2005) and so the PGEGGS survey should be well timed for this species. Past eggs surveys for haddock have been conducted by the Marine Laboratory, Aberdeen in the 1950s and 1990s (Saville, 1959; Heath *et al*., 2004). An investigation of mature haddock distribution in the 1980s and 1990s from the ICES IBTS data has also been conducted which indicated little change in distribution over these decades with a strong relationship with depth (Hedger *et al*., 2004). As haddock egg distribution data are now complete for the 2004 and 2009 WGEGGS surveys, it would be useful to compare the persistence of spawning areas with these historical studies and investigate the relationship with physical features. Whilst spatial management measures have not yet been considered for North Sea haddock spawning areas, the information could be valuable for future marine spatial planning.

5 Archiving of the WGEGGS survey data in the ICES Database (ToR c)

In 2010, WGDIM created an action plan on the incorporation of egg and larvae data into ICES databases (ICES, 2010). In this document, the WGEGGS dataset was pointed out as the first ichthyoplankton dataset to be archived at ICES. During the 2010 WGEGGS meeting the group discussed with the Data Centre the different variables and values in the dataset.

In 2011, the Data Centre will create an overall database structure for ichthyoplankton data and import the 2004 and 2009 WGEGGS data in the database. Once the database structure has been created, the future aim is that WGEGGS data will be uploaded by the individual countries involved in the WGEGGS survey.

WGEGGS supplied the Data Centre with the values and legal ranges that are specific for the plankton survey, as well as the calculations for standard output required by WGEGGS. Once the database structure has been created and raw data are archived the Data Centre will incorporate these calculations. WGEGGS has appointed a data coordinator, Cindy van Damme, who will be in contact with the Data Centre and check the standard output.

6 Future of WGEGGS

In the planning meeting in 2008, WGEGGS considered undertaking egg surveys of the North Sea at 5 year intervals to 'map' the spawning grounds of cod and plaice. The intention was to determine if changes in spawning locations were occurring or whether the relative contribution from substocks was changing. WGEGGS envisioned that these surveys would be 'dedicated' egg sampling surveys with a primary goal of determining egg abundances and distributions. A number of these surveys were, combined with ongoing surveys; the 1st Quarter IBTS and the ICES Herring larvae survey (HELA) (see ICES, 2009b). While dedicated surveys are less likely to be available for research on the distribution of eggs and larvae such a combination of surveys is a feasible way to cover the important task of distribution of cod and plaice eggs and spawning locations.

As a consequence WGEGGS looked at the feasibility of obtaining egg samples from standard surveys. The surveys need to cover the whole North Sea at an appropriate time of year to capture the spawning locations of cod and plaice and other fish species. The only surveys to cover the whole North Sea are the IBTS and the only survey at an appropriate time (in the window January to early April) is the 1st quarter IBTS. During 2009 the egg surveys were undertaken during the Norwegian and Danish 1st quarter IBTS. In both cases the surveys were accomplished without compromising the time schedule of the routine bottom-trawl sampling or the MIK sampling for herring larvae.

For the Norwegian sampling the IBTS was conducted on the RV "GO Sars" between the 5 February and 1 March 2009. The survey time encompassed gear calibrations, standard IBTS and MIK stations, egg sampling and two standard oceanographic sections. The standard protocol for this survey is for the IBTS trawl stations to be conducted during daylight hours and the MIK sampling during night-time hours. The egg sampling was undertaken using a Gulf VII high speed sampler towed at 4–5 knots. The egg sampling was generally undertaken at night, interlaced with the MIK sampling but because the target was eggs day sampling was also undertaken when the opportunity arose. Sampling was also undertaken whilst steaming between IBTS or MIK stations thus reducing the time lost due to the addition of this sampling programme. In addition, using the Gulf VII meant that the ship did not need to stop for either shooting or hauling the gear, again reducing the time lost between routine sampling stations in undertaking the egg sampling. Especially during the night-time hours, personnel would only be dealing with MIK samples thus the addition of the egg samples did not interfere with the standard work involved with the bottom-trawl operations of the IBTS. Over the entire survey period in all 59 Gulf VII hauls were undertaken with either one or two hauls per ICES statistical square (see ICES, 2009b for station locations).

In regard to personnel, IMR was undertaking standard oceanographic and zooplankton transects and as such plankton specialists were on board. They were able to work on the samples collected for eggs during the night-time hours. In addition there was a specialist who undertook processing the egg samples; however, the addition of at least an extra person would be advantageous. In this survey the eggs needed to be sorted from the samples immediately and identified as to whether they were 'gadoid like' (see Russell, 1976). If they were a gadoid egg or a plaice egg then they were staged according to following the development criteria described for cod (Thompson and Riley, 1981) and plaice (Ryland and Nichols, 1975) and up to 50 stage 1A or 1B

eggs per sample were measured and put in to individual vials filled with alcohol. The remainder of the eggs was preserved in formalin for identification at a later stage.

For Danish egg sampling during the IBTS 1st quarter 2009, the Bongo net haul took place immediately after the MIK-haul for herring larvae. Generally, the extra time necessary to include the Bongo net haul could be accounted for in the planning of night steaming time and only in a few cases the Bongo haul had to be cancelled due to time constraints. Launching of gears was taken care of by crew members on watch, while two extra persons took care of all procedures concerning handling and preservation of MIK and Bongo hauls. The procedure of sorting gadoid eggs for later DNA identification was planned, and could have been carried out by the staff, but useable eggs were too few, due to very low densities of gadoid eggs in the area covered.

Considerations for the incorporation of fish egg sampling into the 1st quarter IBTS.

1) The addition of staff with knowledge of plankton sampling.

2) If egg identification, staging and measuring is needed then the equipment (including laboratory space) and competence needs to be present on board the research vessel.

3) The ability to switch easily between sampling with MIK and either Gulf or Bongo samplers.

WGEGGS recommends to Regional Coordination Meeting (RCM) to request support funding under the DCF for sampling, analysis and genetic screening of the ichthyoplankton of the future WGEGGS surveys in conjunction with IBTS and HELA surveys. WGEGGS fulfils the criteria for DCF surveys (SGR10-03, which met in Brussels, 4–8 October 2010). This unique survey is internationally coordinated and harmonized, and covers the whole of the North Sea management area. The data are important for fisheries and ecosystem based management and will be made available to the relevant assessment groups through the ICES DATRAS database.

Also the ichthyoplankton sampling adds further value to the IBTS by providing information on the spawning grounds of cod, plaice and other fish species, which is considered as a high priority for Ecosystem Based Approach to Management by the Bergen Declaration Meeting of Scientific Experts.

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Annex 1: List of participants

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Annex 2: Agenda

Agenda WGEGGS 9–11 November 2010

ToR's

a) Analyse and review the results of the 2009 North Sea cod and plaice egg surveys;

b) Compare the results from the 2004 and 2009 surveys to assess whether there has been a change in spawning distribution of the target species;

c) Review archiving of the 2004 and 2009 North Sea ichthyoplankton survey data within the ICES DATRAS database.

Other points of discussion:

- Agreement on how and who will work up and publish the 2009 data, including co-authorship
- Future of WGEGGS and possibilities for another survey

Tuesday

Start 9:00 ICES headquarters Biscay Room, 4th floor

- Agenda
- Short round on 2009 surveys
- Results 2009 survey (all data in the data file?)
- Work up of the 2009 data
- Publications 2009 data
- Producing maps for report
- Agreement on report writing

Wednesday

- WGEGGS data in ICES database
- Report writing

Thursday

- Future of WGEGGS
- Report writing

Finish 17:00

Annex 3: WGEGGS terms of reference for the next meeting

The **Working Group on North Sea Cod and Plaice Egg Surveys in the North Sea** (WGEGGS), chaired by Cindy van Damme, The Netherlands will meet in Sete, France, 18–20 November 2011 to:

a) Review publication of the results of the 2009 North Sea cod and plaice egg surveys;

b) Review the archiving of the 2004 and 2009 North Sea ichthyoplankton survey data within the ICES DATRAS database;

c) Review the need and plan future surveys.

WGEGGS will report (via SSGESST) by 13 January 2012 to the attention of the SCICOM, ACOM and WGISUR.

Supporting Information

Priority	The surveys are important in that they provide information on spawning locations of cod, plaice and other commercial and non-commercial species. These results are important in relation to ongoing ecosystem based management issues. Consequently, these activities are considered to have a high priority.
Scientific justification and relation to action plan	Term of Reference a) In 2010 production of scientific papers on the 2009 results was started and there is a need to evaluate the progress and final publication of the papers. Term of Reference b) In 2010 WGDIM and ICES Data Centre modified the DATRAS database to incorporate ichthyoplankton survey data. Not all of the 2009 survey data were available during the 2010 meeting. The 2009 survey data need to be finalized and send to the Data Centre for incorporation into DATRAS. Term of Reference c) The rationale for establishing coordinated international North Sea ichthyoplankton surveys was presented in the report of PGEGGS which met in IJmuiden from 24-26 June 2003 and endorsed by the LRC. WGEGGS recommends the continuance of the survey time-series by future surveys through incorporation into the IBTS and HELA surveys, following the ICES ecosystem appraoch based surveys plan. The survey can be conducted in accordance with IBTS and HELA surveys and WGEGGS recommends to undertake a survey every 3 years for monitoring spawning areas of main fish species, which has been recommended as a high priority for Ecosystem Based Approach to Management by the Bergen Declaration Meeting of Scientific Experts.
Resource requirements	ICES secretariat support for WGEGGS reports only and advice from the ICES Data Centre is required archival of the survey data.
Participants:	The Group is normally attended by some 5–10 members and guests.
Secretariat facilities	None.
Financial:	No financial implications.
Linkages to advisory committees	Data are required by the ICES Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak.
Linkages to other committees or groups	No formal linkages.

Linkages to other organizations	No formal linkages.

Annex 4: Recommendations

RECOMMENDATION	FOR FOLLOW UP BY:
1. WGEGGS should meet in 2011 to review publication of the results of the 2009 North Sea cod and plaice egg surveys.	WGEGGS
2. WGEGGS recommends to undertake an ichthyoplankton survey every 3 years in conjunction with IBTS and HELA surveys for monitoring spawning areas of main fish species, which has been recommended as a high priority for Ecosystem Based Approach to Management by the Bergen Declaration Meeting of Scientific Experts.	WGEGGS, IBTSWG, WGIPS, SCICOM
3. WGEGGS recommends to RCM to request support funding under the DCF for sampling, analysis and genetic screening of the ichthyoplankton of the future WGEGGS surveys in conjunction with IBTS and HELA surveys.	RCM
4. WGEGGS recommends to archive the 2004 and 2009 North Sea ichthyoplankton survey data	WGEGGS data coordinator, ICES Data Centre
5. WGEGGS recommends the Data Centre to upload the 2004 and 2009 survey data in DATRAS database	ICES Data Centre
6. WGEGGS recommends that Cindy van Damme, IMARES, is appointed as data coordinator for the WGEGGS survey data.	WGEGGS