

Annex 5f: IHLS

1 International herring larvae surveys

1.1 Review of larvae surveys in 2015

1.1.1 North Sea

The main spawning grounds of North Sea autumn spawning herring are monitored annually in the International herring larvae surveys. They are treated as four sub areas (Orkney/Shetlands, Buchan, Central North Sea and Southern North Sea). The first two sub areas should be sampled twice, the last two sub areas three times during the spawning season in different half month intervals (Table 5e.1). The standard gear is a GULF III or GULF VII sampler and stations are approximately 10 nautical miles apart.

The abundance of newly hatched larvae (less than 10 mm total length; 11 mm for the Southern North Sea) is used as the basis for the index calculation. To estimate larval abundance, the mean number of larvae per square meter as obtained from the ichthyoplankton hauls is raised to rectangles of 30x30 nautical miles and the corresponding surface area. These values are summed up within the given sub area and provide the larval abundance per sub area for one interval.

However, since the middle of the 1990s, survey participation and effort is too low to monitor the whole spawning season. In the last two decades, almost only the Netherlands and Germany participated in the herring larvae surveys.

The herring larvae sampling period is still in progress at the time of the WGIPS meeting in January. So far, five units and time periods out of ten were covered in the 2015/16 period, as given below.

Table 5e.1: Areas and time periods covered during the 2015/2016 herring larvae surveys:

AREA / PERIOD	1-15 SEPTEMBER	16-30 SEPTEMBER	1-15 OCTOBER
Orkney / Shetland	--	Germany	
Buchan	--	Netherlands	
Central North Sea	--	Netherlands	--
	16-31 DECEMBER	1-15 JANUARY	16-31 JANUARY
Southern North Sea	Netherlands	Germany	Netherlands

For most of the herring larvae surveys in the North Sea, sample examination and larvae measurements have not yet been completed; therefore, it is not possible to give an overview on the final survey results. Figure 5e.1 shows the herring larvae distribution as obtained by the German survey in the Orkney/Shetlands and the Buchan area in the second half of September 2015.

As in previous years, the available information will be summarized and presented at the Herring Assessment Working Group (HAWG) meeting in March 2016.

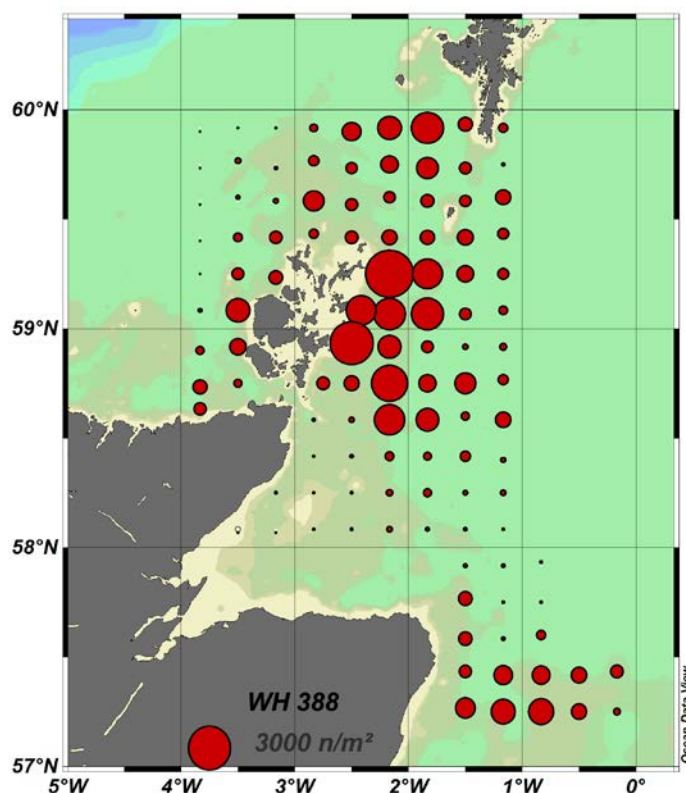


Figure 5e.1: Abundance of herring larvae per square metre (all sizes, n/m^2), as obtained by the German survey in the Orkney/Shetlands and Buchan area (second half of September 2015). The symbol size is equal to 3 000 larvae/ m^2 . WH 388 refers to the national cruise number.

1.2 Coordination of herring larvae surveys in the North Sea in 2016

At the time of the WGIPS meeting, only the participation of the Netherlands and Germany is confirmed for the next herring larvae survey period in the North Sea. Due to limitations in available ship time, none of the areas will be covered neither in the first half of September nor in October. Sampling will be done in the second half of September by Germany in the Orkney/Shetland area and by the Netherlands in the Buchan area and the Central North Sea. The whole spawning activity of Downs herring will be monitored in three surveys from the middle of December 2016 to the end of January 2017. A preliminary timetable for the next sampling period is presented as follows:

Table 3.2.1: Areas and time periods for the 2016 herring larvae surveys:

AREA / PERIOD	1-15 SEPTEMBER	16-30 SEPTEMBER	1-15 OCTOBER
Orkney / Shetland	--	Germany	
Buchan	--	Netherlands	
Central North Sea	--	Netherlands	--
	16-31 December	1-15 January	16-31 January
Southern North Sea	Netherlands	Germany	Netherlands

1.2.1 Irish Sea

Herring larvae surveys of the northern Irish Sea (ICES area VIIaN) have been carried out by the Agri-Food and Biosciences Institute (AFBI), formerly the Department of Agriculture and Rural Development for Northern Ireland (DARD), in November each year since 1993. The surveys have been carried out onboard the RV “Corystes” since 2005, and prior to that on the smaller RV “Lough Foyle”.

Sampling is carried out on a systematic grid of stations covering the spawning grounds and surrounding regions in the NE and NW Irish Sea (Figure 3.1.3.1). Larvae are sampled using a Gulf-VII high-speed plankton sampler with 280 µm net. Mean catch-rates (nos.m⁻²) are calculated over stations to give separate indices of abundance for the NE and NW Irish Sea. Larval production rates (standardized to a larva of 6 mm), and birth date distributions, are computed based on the mean density of larvae by length class.

A growth-rate of 0.35 mm day⁻¹ and instantaneous mortality of 0.14 day⁻¹ are assumed based on estimates made in 1993–1997.

The 2015 survey was conducted in fair to good weather conditions. The spatial distribution of herring larvae was similar to previous years, with high abundances to the north of the Isle of Man and in the Douglas bank area. Evidence of a more southerly dispersal of larvae was provided by the relatively high abundances of larvae in the southern stations. A number of larvae were encountered in the vicinity of the Mourne spawning grounds off the Northern Irish coast.

The point estimate of production in the north-eastern Irish Sea for 2015 (2.06 x 10¹² larvae) was an increase from last year but still below the time series mean (Figure 3.1.3.2). The advanced stage of development of many of the larvae suggested earlier hatching and possible good growth rates of larvae. The index is used as an indicator of spawning-stock biomass in the assessment of Irish Sea herring by the Herring Assessment Working Group (HAWG).

The 2016 survey is scheduled to take place Oct 31st- 6th November.

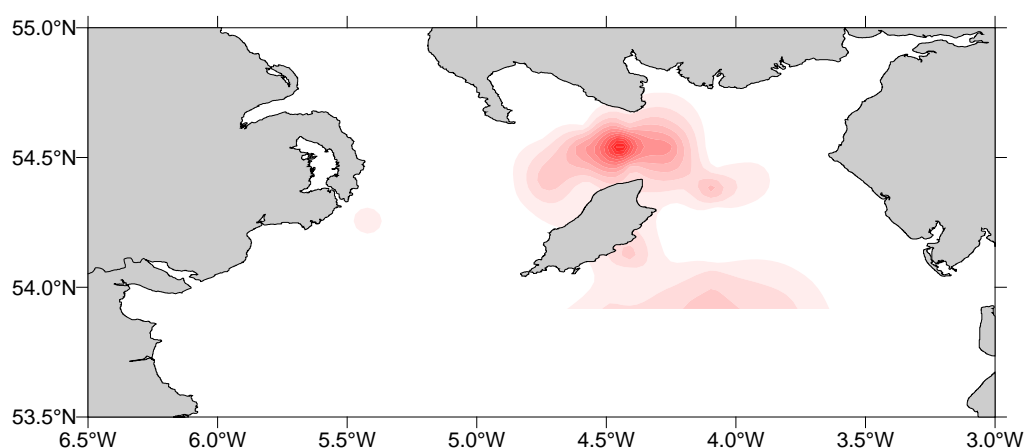


Figure 1.2.1.1: Estimates of larval herring abundance in the Northern Irish Sea in 2015. Intensity of shading is proportional to larva abundance.

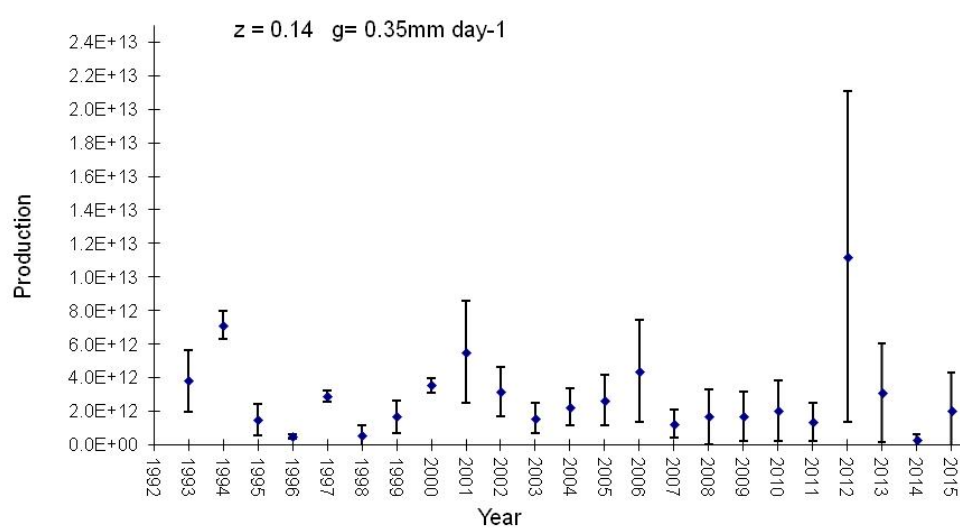


Figure 1.2.1.2: Estimates of larval herring production in the NE Irish Sea from 1993 to 2015. Error bars denote 1 standard error (calculated from coefficients of variation of the estimates of abundance, but not including uncertainty in growth or mortality).