

Herring spawning grounds – and marine constructions

Summing up current knowledge of spatial distribution of spawning sites; spawning times and planned marine construction work
- plus -
Room for improvement...!

PRAC letter – and response

“...the Pelagic RAC would like to establish what the terms “seabed disturbance activities” and “negative seabed impacts” imply? Our assumption is that ICES is not indicating that traditional fishing methods are being highlighted, but rather the expansion of new technology like the offshore renewable energy sector is causing concern.”

HAWG agreed that the formulation needed tightening – we changed the text to specify the ‘activities’ to anthropogenic influences other than traditional fishing

Advice text 2013

HAWG appreciated that the previous formulation were too wide and narrowed the text to read: “...that activities such as seabed extraction on the spawning grounds of the herring are vulnerable to anthropogenic influences as gravel extraction and any particular activity that may maintain a resilient herring population. There is scientific information (Croft, 1979; 1996) to support the advice that no gravel extraction should occur in areas with spawning grounds.”

Too much text... just to show that we did change our text in the advice following a discussion with off-set in the PRAC letter to HAWG

PRAC letter – and response

“The Pelagic RAC would also like to know whether ICES has information on the exact locations of herring spawning grounds. If not, is this an area where input from the Pelagic RAC could help provide information on where these important areas can be found?”

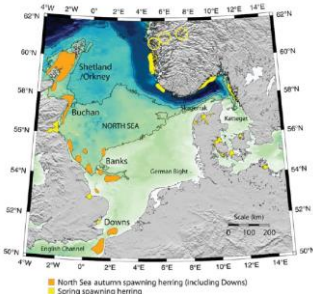
This is (also) why I’m here today...

- HAWG highly appreciates this approach by Pelagic RAC
- We are starting up a WD containing what we know
- Hope then to present, discuss and improve this with the PRAC; adding information based on the observations from members of the PRAC – perhaps a ‘mapping session’?
- The intention is that this document then will form the base for further exploration of hitherto un-described spawning grounds as a collaborative project between the Pelagic RAC and relevant Institutes.

North Sea spawning grounds

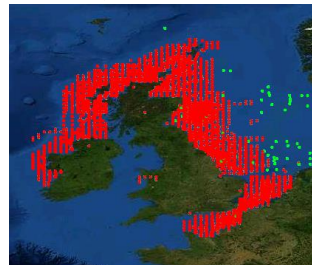
The North Sea is relatively well examined in terms of the spatial distribution of spawning grounds

Herring abandon and re-populate spawning grounds depending on various factors (stock size, environmental conditions, etc.)



Larval distributions (NS)

So how do we know this?
Combination of ‘historical knowledge’, mapping projects and larval surveys:



International Herring Larval Survey (IHLS):
– 1972-2013
– ~ 10 km grid
– ~ 35 000 hauls
– Covering most spawning grounds at spawning time

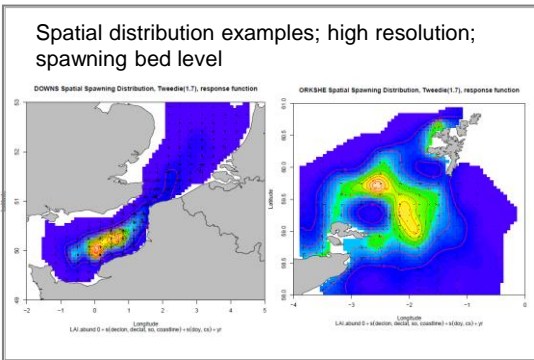
Larval distributions (NS)

- Data analysis tricky, though:
 - Highly variable coverage due to
 - Changes in funding (esp post 1990)
 - Bad weather
 - Vessel availability
 - Data has challenging statistical properties
 - Non-normally distributed – can't "just average"
 - Strong correlations
 - High proportions of zeros
 - And do we catch all the larvae?

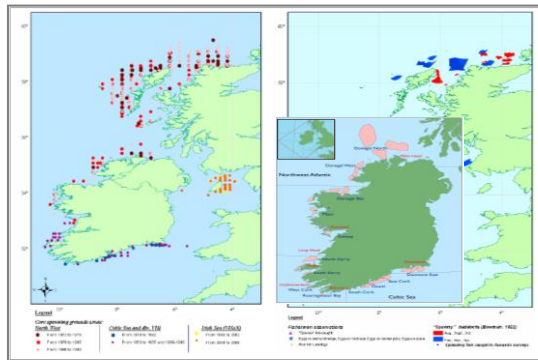
Larval distributions (NS)

- Number of larvae caught depends on
 - Length of haul
 - Spatial position (on or off the spawning grounds?)
 - Timing of haul (where in the spawning season?)
 - Time of day (e.g. day-time gear avoidance)
 - Year (lots of larvae some year, other years not)
 - Phase of the moon ? (can synchronise spawning)
 - Local mortality rates
- Can separate and model these effects using "Generalised Additive Models" (GAMs)

Larval distributions (NS)



Celtic Sea(s) spawning grounds



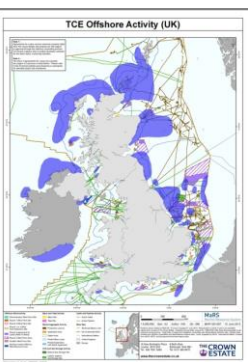
Planned constructions

It was not trivial to give 'pro bono' advice; why advice on marine construction when not asked to – and not knowing if this is a potential problem?

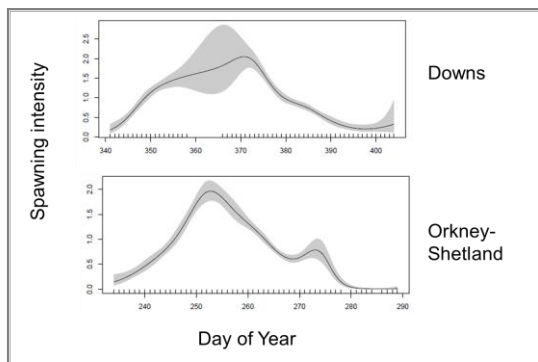
For the Celtic Sea(s): No applications for construction of structures close to spawning beds, to date. However there are a number of applications coming up for salmon farms, some of which may be close spawning grounds.

So far, the planned UK offshore activity as taken from the <http://www.thecrownestate.co.uk> does collide with spawning grounds:

Thus potentially we will need to give advice related to Marine Spatial Planning



What we do know...



What we don't know...

HAWG asks the Experts:

Do we have all potential spawning grounds covered in time and space?

The flexibility in choice of spawning bed and what may determine this needs to be examined

Recommendation to Working Group on the Effects of Extraction of Marine Sediments on the Marine Ecosystem (WGEXT) concerning the **evaluation of the effect of gravel extraction and other bottom-disturbing activities on herring spawning grounds for herring spawning success.**

Specifically we need to know, how long a restoration period that can be expected after bottom disturbing activities; in terms of fauna, literature indicates several months

Where does that leave us?

