Institute of Baltic Sea Fisheries (TI-OF)

Alter Hafen Süd 2, 18069 Rostock Telefon 0381 8116-136 Telefax 0381 8116-199 10.08.2016 daniel.stepputtis@thuenen.de

Cruise Report
FRV „Walther Herwig III" Cruise WH393
03.03.2016-14.03.2016

Selectivity studies at Grand Sole Bank

Scientist in charge: Dr. Daniel Stepputtis

In a nutshell

The cruise was conducted within as pilot cruise of a cooperation between the Thünen-Institute of Baltic Sea Fisheries (working group of gear technology), the Instituto Español de Oceanografía Vigo and ARVI (Cooperativa de armadores de pesca del Puerto de Vigo).
The aim of the cruise was to address the bycatch problem in Celtic Sea (Grand Sole Bank) mixed OTB (Bottom Otter Trawl) fisheries by means of improvements on fishing technology, especially codend selectivity. Therefore selectivity investigations were planned using the cover codend method to estimate the selectivity of different codends. Additional experiments using the FISHSELECT method were conducted to estimate and understand the theoretical selectivity properties of different species in different nettings and opening angles.
The cruise was heavily hampered by bad weather, which made it almost impossible to carry out hauls in the investigation area. Wind and sea state allowed the deployment of the gear only during very short time windows. Only four hauls were conducted during the entire cruise.
Apart from the poor weather conditions, the selectivity experiments were also hampered due to technical problems with the gear itself. The used trawl was a scaled standard commercial gear used in this fishery, where a cover codend was fitted to be able to sample the specimen, escaped from the main codend. Unfortunately, the cover codend was broken during the hauls, whereas it was not possible to finally solve these problems during the cruise. Nevertheless, caught species were successfully used for the FISHSELECT method.

Narrative and results

Unwanted bycatches are problematic from an economical, ecological and ethical point of view. Therefore, a central aspect of the new EU common fisheries policy (CFP) was the implementation of a landing obligation (discard ban) from 2015 onwards. This means that it is obligatory for fisheries to land all catches (implementation started with some fisheries and TAC-species) and count catches on the relevant quota (TAC). Consequently, this should result in economic incentives for the fishery to reduce unwanted bycatches.
Since several years, the Thünen-institute of Baltic Sea Fisheries works on different strategies to avoid unwanted bycatches. Here, gear technology plays a central role and several new concepts were developed. Special challenges are fisheries with catches

consisting not only of the target species (so called 'mixed fisheries'). Since these species often have different morphological properties, as well as different behavior, it is often not possible to offer sufficient escapement possibilities to different species in the codend alone. An example is the unwanted bycatch of flatfish in the roundfish-fishery (e.g. in the Baltic).
Whereas, the developed concepts (e.g. FRESWIND; FLEX; STIPED) were tested and improved in the Baltic Sea, they can be potentially applied to other fisheries worldwide. Consequently, we partly expand the geographical scope of the work to selected other areas and fisheries. Within this context some cruises will be conducted to the North Sea and the waters southwest of Ireland (Grand Sole Bank). Some fisheries in these areas have high bycatch rates. It is the aim to reduce the catch of unwanted bycatches in these areas by using the concepts, developed in the Baltic Sea (adapted to the specific needs).

This cruise was conducted within the framework of a collaborative project between partners from Germany and Spain. The cruise addressed the bycatch problem in Celtic Sea (Grand Sole Bank) mixed OTB (Bottom Otter Trawl) fisheries by means of improvements on fishing technology. In particular, the project focus on the fleet targeting Megrim, Monkfish and Hake, which discard rate could reach 75% of the total catch (estimations by Instituto Espanol de Oceanografia, IEO). The main aim of this collaboration is to reduce the unwanted bycatch in this fishery through the improvement of codend selectivity. With the aim to almost simulate commercial catch conditions. Therefore the Spanish partners provided an adapted commercial gear.

FRV „Walter Herwig III" was equipped with the scientific equipment and fishing gears on March 2nd and scientific crew boarded. Initially, it was planned to leave the harbor early morning at March 3rd. Due to logistic problems, the departure had to be postponed until the evening of that day, when the vessel left Bremerhaven. The overall cruise track can be seen in **Figure 1**).

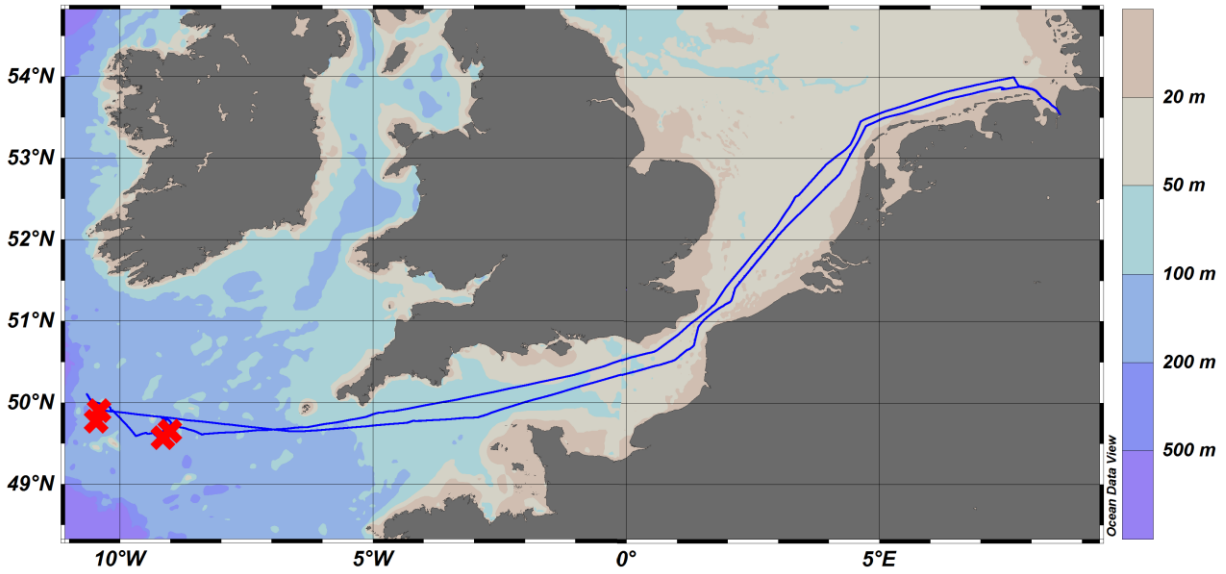

Figure 1: FRV „Walther Herwig III" Cruise WH363: cruise track.

The vessel arrived at the fishing grounds in the afternoon of March 6th, whereas due to very poor weather conditions, the start of fishing activities had to be delayed until the afternoon of March 7th, when winds eased (waves where still rather high). During this haul, the cover codend was damaged and needed to repair. After repair of the net, a second haul was conducted at 08.03.2016, resulting in another damage of the cover codend. During the 08.03.2016, the weather conditions turned worse again and no fishing was possible until the last possible fishing day before steaming back. During the 10.03.2016, two hauls were conducted, whereas the cover codend was not used.

Due to missing data from the cover codend, all four hauls could not be used for estimation of selectivity parameters.

Nevertheless, the catch of all hauls was used to conduct theoretical selectivity studies using the FISHSELECT-method. The case of FISHSELECT method, as used during this cruise included fall-through experiments using netting with a given range of mesh size and opening angles, performed for a number of species. These species included Megrim (*Lepidorhombus whiffiagonis*), Hake (*Merluccius merluccius*), Scad/Horse Mackerel (*Trachurus trachurus*), Lesser spotted Dogfish (*Scyliorhinus canicula*) and Spurdog (*Squalus acanthias*). For shark species, care was taken during the data sampling to achieve a survival probability as highest as possible (keeping in a water tank, short sampling and immediate release).

After the last haul, the vessel had to leave the fishing grounds to arrive in time in Bremerhaven. After arrival in the late afternoon of March 14th, the scientific equipment was unloaded and the scientific crew left the vessel.

Table 1: FRV „Walter Herwig III“ Cruise WH393: station list (all hauls conducted with “Rapantra” trawl

Haul	Date and time	Geogr. Position (shooting)	comment
1	07.03.2016 14:59-16:15	49°40.050’N 009°00.463’W	Cover codend broken
2	08.03.2016 09:00 11:18	49°33.821’N 009°10.848’W	Cover codend broken
3	09.03.2016 07:07-08:51	49°54.630’N 010°27.143’W	No cover codend used
4	09.03.2016 13:00-14:36	49°54.498’N 010°27.363’W	No cover codend used

Personnel

	name	task	institute
1	Dr. Daniel Stepputtis	Cruise leader	TI-OF
2	Juan Santos	Scientist / person in charge for experiments	TI-OF
3	Annemarie Schütz	Technician / media designer	TI-OF
4	Kerstin Schöps	Technician	TI-OF
5	Stefanie Haase	Student	TI-OF
6	Dr. Saeid Gorgin	Scientist	Gorgan University Iran
7	David Tully	Scientist / Observer	Marine Institute Ireland
8	José Carlos Fernández Franco	Scientist	ARVI
9	Adriana Nogueira Gassent	Scientist	ARVI
10	Dr. Andreas Hermann	Scientist/Electronic Engineer	TI-OF
11	Lea Wietrzynski	Internship	TI-OF
12	Christian Schmidt	Internship	TI-OF

Last, but not least:
Ich bedanke mich bei Kapitän Jürgen Vandrei und Besatzung für die auf dieser Fahrt gute Zusammenarbeit.
Special thanks to the colleagues from the Thünen-Institute and to our guests and partners from Iran, Spain and Ireland.

Dr. D.Stepputtis
Scientist in charge