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In Confidence: Not to be quoted without reference to the Laboratory

FRV "Clupea"

Cruise 7/78

Report

3 - 28 July 1978

Personnel

J Main	SSO		
G I Sangster	SO		
E Wright	ASO	17 - 28	Part time
A J Tough	PTO IV	3 - 14	" "
P J Barkel	PTO IV		

Visiting Gear Experts

France	J. Brabant	3 - 7	Part time
Netherlands	N Pronk	10 - 14	" "
W F A	T McDonald	17 - 21	" "
Norway	L Karlson	24 - 28	" "

Objectives

To make direct observations and television video tape recordings of 4 gears used commercially in 4 ICES countries.

Procedure

"Clupea" worked for the whole of the exercise in the Moray Firth where suitable diving depths in clear water could be obtained.

Week 1. "Clupea" sailed to the Dornoch Firth at 1140 hours on Monday 3 July with a northerly gale forecast but with the chance that work would be possible with an offshore wind. The French high opening 3 bridle trawl was shot in deep water to gain experience in the handling technique. This practice was adopted for all 4 trawls prior to starting diving and filming trials. Only one dive was possible during the first three days even with an offshore wind, and only 5 dives with the towed underwater vehicle and the television were made on this French gear but underwater conditions were excellent and video tapes illustrating the whole gear were completed.

The direct observations led to a few alterations to the trawl to improve contact of the ground rig with the sea bed and the attachment points of the flat otterboards were adjusted to improve contact and spread of the gear. A number of strain points in the netting were observed in the square and belly at the quarters.

Sprat and sandeels were recorded escaping in the extension piece and cod end. Sprats were also observed escaping between the spreading wires outside the wing end but inside the sand cloud.

The best headline height observed was 4.75 m towing at 2.2 knots and 4.25 m at 3.5 knots using flat boards with 75 fathoms of trawl warp at 10 to 13 fathoms depth.

"Clupea" returned to Buckie at 1130 hours on Friday 7 July.

Week 2. "Clupea" sailed on Monday 1440 hours for the Dornoch Firth. The Dutch rope belly trawl which was normally operated using a net drum from a stern trawler was

rigged for side trawling and some adaption of the shooting technique was required due to a very heavy chain ground rope and the net having no floats. One kite at each wing end and one in the centre of the headline was the only lift provided. The chain and rope belly tended to roll up whilst coming around during shooting, this was observed by free diving at all stages of the shooting procedure.

During the week 11 hauls were made providing 9 video tapes recording various aspects of the gear. Again a number of adjustments were made to improve the ground contact of the trawl and the behaviour of the polyvalent boards. Video tapes illustrating the rising ropes from the chain groundrope and of the trawl boards on their face and back were obtained. The best headline height observed was 5.75 m towing at 3.2 knots with polyvalent boards and 75 fathoms of trawl warp out at 10 fms depth. The angle of the belly of the net just behind the rising ropes from the chain footrope was measured and showed an inclination of between 5° and 7°.

Week 3. "Clupea" sailed on Monday at 2045 hours for Spey Bay where a free dive was made on the WFA Duthie trawl which had been sent direct to Buckie from a commercial fishing vessel. The net had obviously been well used and had been repeatedly repaired. The first dive showed that the footrope was 2 metres off the sea bed at the wing ends with the centre of the bosom just touching. A large pouch at the end of the belly of the net had masses of sprats gill meshed.

Because the WFA required direct comparison of these observations with ones made on a model in the flume tank at Hull an extension was added to the television cable to allow video recordings to be made back as far as the headline and footrope of the gear.

Three hauls were made in the Spey Bay area on the Tuesday with the third one coming foul on a large boulder badly damaging the trawl and breaking the TV cable.

Whilst repairs were being made to the net and a new television cable fitted to the vehicle, "Clupea" sailed to the Dornoch Firth.

When the gear had been adjusted to improve ground contact and spread, the gear measurements compared favourably with those obtained in the WFA flume tank experiments. Again a number of valuable video tape recordings were obtained for further study.

"Clupea" docked on Thursday night at 2330 hours.

Week 4. "Clupea" sailed at 1600 hours from Buckie and proceeded to Spey Bay where one haul with the Norwegian shrimp trawl was made. The remainder of the week's work was conducted in Burghead Bay where large quantities of sprats and sandeels were found in shallow water (10 fathoms).

This shrimp trawl was fitted wit[illegible]rator panel ji[illegible]e codend designed to allow shrimps to pass through but direct the fish up a[illegible]ond codend fitted on the top panel. Video film of sprats and sandeels being directed up the rising panel into the codend were made and showed this rising panel operating relatively well for roundfish but flatfish did not rise up the panel. The separator panel was found to rise steeper than designed at a measured 60° instead of the expected 40° and the impression from the observations is that 40° would improve the separation.

The upper coderd was removed and video film of sprats and sandeels passing out of the gear at this point illustrated this selection behaviour.

On one haul a mass of jellyfish were caught on and burst the rising panel allowing everything to pass into the shrimp bag. The dimensions of this trawl were measured at various speeds including flow measurements inside and outside of the net and at the top of the rising parel.

Video film of a salmon swimming with ease in the mouth of the net in front of

the bobbin rig was obtained on one occasion. A total of 10 video tapes were obtained for the week.

"Clupea" docked at 1700 hours on Thursday 21 July and unloaded Friday 22 July.

The tapes are now being studied and analysed. Copies and edited versions of the video tapes will be made of each net and sent to the laboratories cooperating i the project.

J Main
10 October 1978

Seen in draft: G Geddes