

In Confidence: not to be quoted without reference to the Laboratory.

FRV "Clupea"
Cruise 19/79

Report

30 July - 24 August 1979

Objectives

- a) To obtain instrumented measurements of scallop dredge fore and aft inclinations for a range of warp length/depth ratios and towing speeds.
- b) To compare the catching performances of two modified dredges and a standard dredge.
- c) To obtain underwater TV recordings of the dredges in operation.

Gear tested and compared

- a) Standard 1.219m (4ft) Scallop dredge.
- b) 1.219 m scallop dredge with V-shaped tooth bar.
- c) Standard 1.219 m scallop dredge with trash-vent attachment.

Narrative

Scientific staff joined Clupea on 30 July when scallop dredging and scientific equipment was loaded. Clupea sailed from Aberdeen that day at 1430 hours for Spey Bay. Instruments and recorders were installed and calibrated en route.

The following morning warp hauling tensions were measured before going to the Buckie area to pick up the ship's commander by rubber boat on his return from annual leave. With weather conditions deteriorating that side of the Moray Firth, Clupea proceeded to Dornoch Firth. Instrumented hauls were conducted in the area Dornoch Firth to Helmsdale until Clupea went to Buckie for the weekend. Scientific staff returned to Aberdeen on 3 August and rejoined Clupea at Buckie on 6 August.

Clupea then sailed that day at 0920 hours for the West Coast. Comparative scallop dredging commenced the next day off N W Skye (Vaternish Point to Moonen Bay). With westerly gales forecast Clupea went to Rhum and anchored for the night in L. Sresort. The following day Clupea worked the north side of Canna, N W Mull (Calish Point) and E Colonsay. Proceeding south the next day hauls were made off N Islay (Rubha Bholsa) S Islay (Port Ellen), W Kintyre (Machrihanish Bay) and S Kintyre (Polliwilline Bay). On 10 August after working in Kilbrannan Sound Clupea tied up in Campbeltown at 1840 hours for the weekend. On 13 August work was resumed off S Arran (Drumadoon Point to Whiting Bay) and then course was set for Gigha. With worsening weather conditions and an imminent severe SW gale warning Clupea turned back to shelter for the night in Machrihanish Bay. The weather having moderated by the following morning, Clupea worked west of Gigha and northwards to L Sween. With NW gales then forecast, Clupea anchored for the night in Loch-na-Mile, E Jura. Work continued the next day off E Jura and E Islay (Tarbert to Claggan Bay) and then Clupea went to Brodick, E Arran, for the night. The next day work continued off the Ayrshire coast (Heads of Ayr to Girvan Bay). By late afternoon weather conditions had become unsuitable for work and with SW gales forecast, Clupea returned to Brodick for the night. On 17 August Clupea worked off S Arran before tying up in Campbeltown at 1415 hours for the weekend.

Mr Priestly, with underwater TV equipment, joined Clupea at 1800 hours on 18 August and Mr Doniny arrived at 2000 hours on 19 August. Mr Galloway who was also due to join Clupea on 19 August did not arrive and Clupea left Campbeltown for S Arran without him at 0630 hours on 20 August.

Clupea worked off S Arran using underwater TV equipment to observe the dredges in operation until weather conditions became unsuitable for using the TV equipment. With SE gales forecast to veer NE, Clupea steamed to lower L Fyne and worked in Strondoir Bay before going to East Loch Tarbert for the night. The following day work continued in Kilbrannan Sound (Skipness Bay to Carradale) before going to Campbeltown to disembark Mr Downing at 1730 hours. Clupea departed Campbeltown at 2140 hours and made passage to Buckie.

Clupea tied up in Buckie at 1300 hours on 23 August. All gear and scientific equipment was unloaded immediately to allow the ship to be prepared for the presentation of the Imperial Service Medal to Leading Seaman J Thaine the next morning. Scientific staff departed Clupea at 1400 hours and returned to Aberdeen.

Results

In all, sixty one dredge hauls were made. Of these, eight were instrumented hauls using three and four standard dredge arrays, forty-five were with the modified and standard dredges fished together as a three-dredge array, and eight were observation hauls using underwater TV.

a) Instrumentation: measurements of dredge fore and aft inclinations for a range of towing speeds, depths and warp lengths were obtained and suggest that a warp length/depth ratio of about 3 maintains a zero dredge inclination for both three and four dredge arrays. Measured warp towing loads agree with previous measurements, with three and four dredge arrays respectively, 0.55 ton and 0.60 ton at 2 knots, 0.60 ton and 0.70 ton at 3 knots. For those hauls when hauling loads were measured, catches were small and warp hauling stress appeared to be not significantly greater than towing stress.

b) Comparative fishing: Catches of scallops per haul were generally small. The best haul, 87 scallops, was made at Moonen Bay. Total catch of scallops, stones and rubbish shown in Table 1 indicates that where as the standard dredge caught more stones and rubbish by far than did the two modified dredges, it also caught markedly more scallops.

Table 1

Dredge type	Scallops	Stones and rubbish baskets
Standard (a)	381	62
Modified (b)	248	38
Modified (c)	177	11

c) TV observations: The remote controlled TV system is still under development and useful experience of its manoeuvring capability was gained. Seven tapes of underwater gear observations were obtained.

Detailed analysis of all results will be undertaken later.