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CRUISE REPORT

HERRING ACOUSTIC SURVEY: LF/26/91

Vessel: R.V. Lough Foyle
Departure: Monday 14 October, 11h.00, Belfast
Return: Wednesday 16 October, 13h.30
Area of operation: Inshore, Dundrum Bay to Dundalk Bay.

Personnel

M. Armstrong	DANI	(SSO, Scientist-in-charge)
W. Clarke	DANI	(SSO)
P. Green	DANI	(SO)
A. Hayes	DANI	(ASO)
C. Burns	DANI	(ASO)
J. Molloy	DOM,	Dublin
R. Nash	Port Erin Marine Laboratory	

Objectives

To investigate the distribution, abundance, population structure and biological characteristics of adult herring of the Mourne stock, by means of echo-integration and midwater trawling.

Narrative

Monday 14 October

Lough Foyle departed Belfast at 11h.00 and proceeded south to Dundrum Bay where sphere calibrations were carried out prior to commencing the coarse survey grid (Fig. 1) at 20h.20. Transects 1 to 4 were surveyed under relatively calm conditions.

Tuesday 15 October

Transects 5 to 15 of the coarse grid were completed by 08h.50. A fleet of skiffs setting drift-nets off Ballymartin was by-passed shortly after midnight. At 10h.00, trawl #1 off Dundalk Bay caught 210 kg of sprats and 25 kg of juvenile herring. After the trawl, a further sphere calibration was carried out successfully. Transect 16 was then surveyed after which the vessel proceeded to Cranfield Point to commence an intensive survey of the herring spawning grounds (Fig. 2). The trawl was shot on diffuse targets on transect 21, but the station was abandoned because of fouling and damage of the net during shooting. Sea conditions deteriorated during the night in strong SW winds. Transect 26 was reached by midnight.

Wednesday 16 October

Sea conditions deteriorated to the extent that the survey was suspended at the commencement of transect 28 at 02h.15, and the vessel dodged slowly northwards throughout the night. By 08h.00 the forecast was for westerly gales later in the day, and the survey was terminated to allow the vessel to reach Belfast by mid-afternoon.

Methods and results

The survey comprised a coarse grid of transects spaced at intervals of 3 nautical miles, designed to give an overall picture of the distribution of adult herring, and a more intensive grid of 1-mile spaced lines located over the spawning grounds off Annalong and Kilkeel (Figs. 1 and 2). A 38-kHz transducer was towed off the port boom at approx. 8 knots, and the acoustic signal was digitized and integrated by means of the Hadas system. Data were stored on 40 megabyte SyQuest disks and the signal was also stored on digital video tapes. Targets were identified on an ad-hoc basis by trawling with an 18X12 mesh pelagic trawl with fine-mesh liner, towed with 7' steel doors.

Only one trawl was completed; the species composition was determined and length frequencies recorded for herring and sprat (the only species caught). Samples of herring were taken for vertebral counting and for a genetics study.

Few targets indicative of herring were observed. Herring were being caught by skiffs setting drift-nets off Ballymartin, but the fish were at that time close to the seabed and not detectable on the echo-sounder. Sprats appeared to be abundant off Dundalk Bay.

Recommendations for future surveys

The spawning grounds off the Mourne are in very shallow water (20m) over a very rough sea-bed. A high risk of gear-damage would attend trawling in this region with a net having a mouth opening of 12-15m. Further, the apparent tendency of the spawning herring to remain close to the seabed for most of the day and night will result in a potentially large and variable bias in any acoustic estimates of abundance. A spawner survey would be better carried out in September, immediately prior to the movement of fish on the spawning beds, when the fish are in deeper water and rise close to the seabed between dusk and dawn.

Equipment performance

The rigging of the midwater trawl was changed for this survey and the net fished with a mouth opening of about 13 metres during the first tow. The Fishing Master pointed out that this rig should show a slightly larger opening when fishing properly and that this could be attained by changing the setting of the trawl doors.

The EY-200 echosounders, which had recently been serviced by Simrad to allow the Hadas integration software to operate at the recommended gain settings, performed well apart from an apparent fault in operation at short pulse duration, which must be rectified.

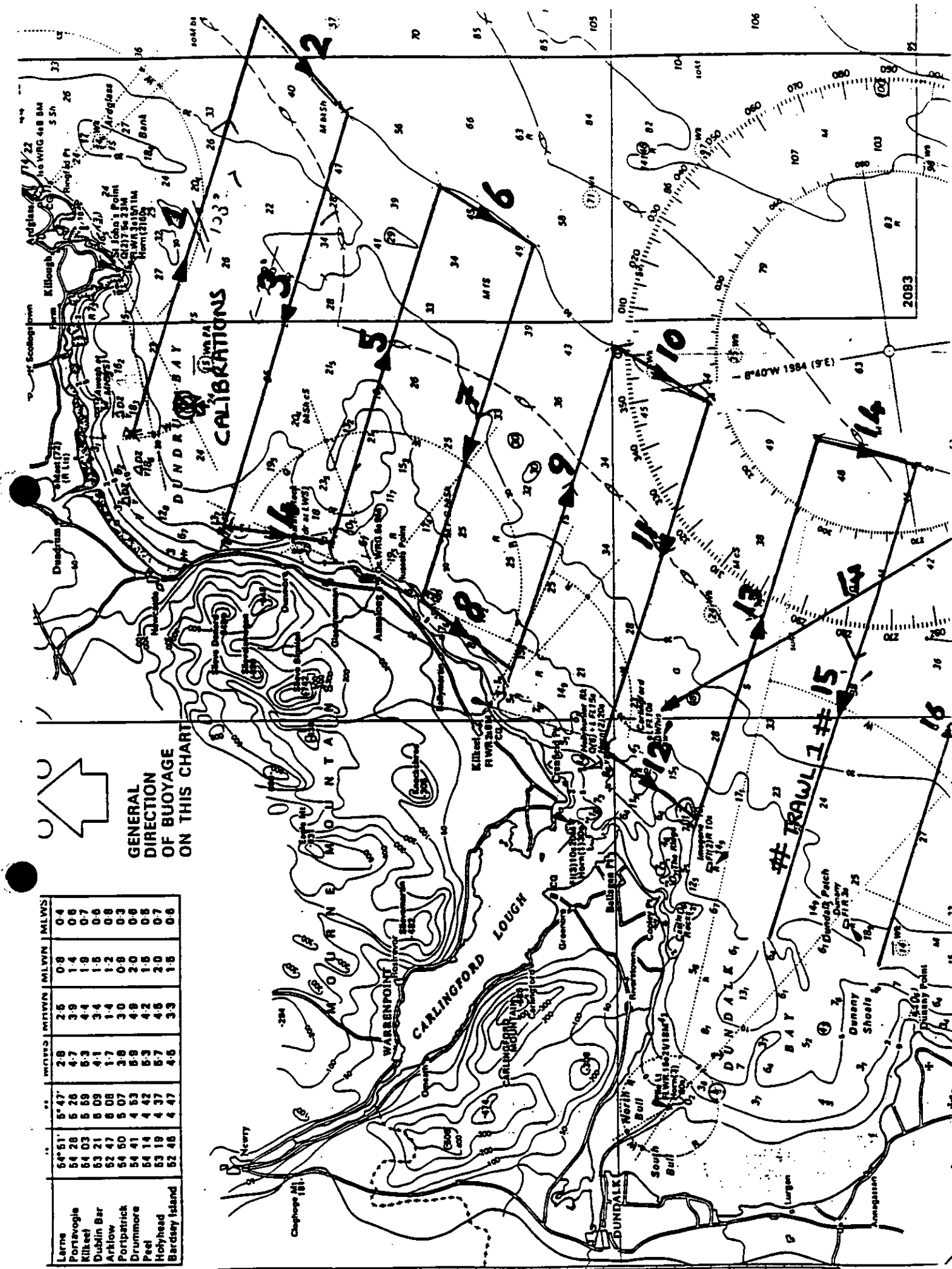
The second calibration at Dundalk Bay gave a strong and consistent sphere echo. The following data were recorded at 38 kHz, using a copper sphere with target strength -33.6 dB located at 9m below transducer T22311:

Peak voltage of sphere echo.....8960 mV
Instrument factor k.....0.00000030

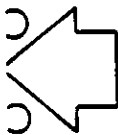
The calibration file TSCALOC2.TEX was created based on analysis of the calibration data files TSCAL40F.DTA (40 Log R) and TSCAL20F.DTA (20 Log R).

Scientist-in-charge.....*M.J. Amos*..... Date.....

Ship's Master.....*[Signature]*..... Date..... *16. X 91*



GENERAL DIRECTION OF BUOYAGE ON THIS CHART



	54° 51'	5' 47"	28	2.5	0.8	0.4
Larne	54 28	5 26	4.7	3.9	1.4	0.6
Portlaoige	54 03	5 59	6.3	4.4	1.9	0.7
Kilkeel	53 21	6 09	4.1	3.4	1.5	0.6
Dublin Bar	52 47	6 08	1.7	1.4	1.2	0.8
Arklow	54 50	5 07	3.8	3.0	0.8	0.3
Portpatrick	54 01	4 53	5.8	4.8	2.0	0.8
Drummore	54 14	4 42	5.3	4.2	1.5	0.6
Peel	53 19	4 37	5.7	4.5	2.0	0.7
Holyhead	52 48	4 47	4.5	3.3	1.5	0.6
Bardsey Island						

FIGURE 1. Phase I survey Grid (coarse)
(soundings in metres)

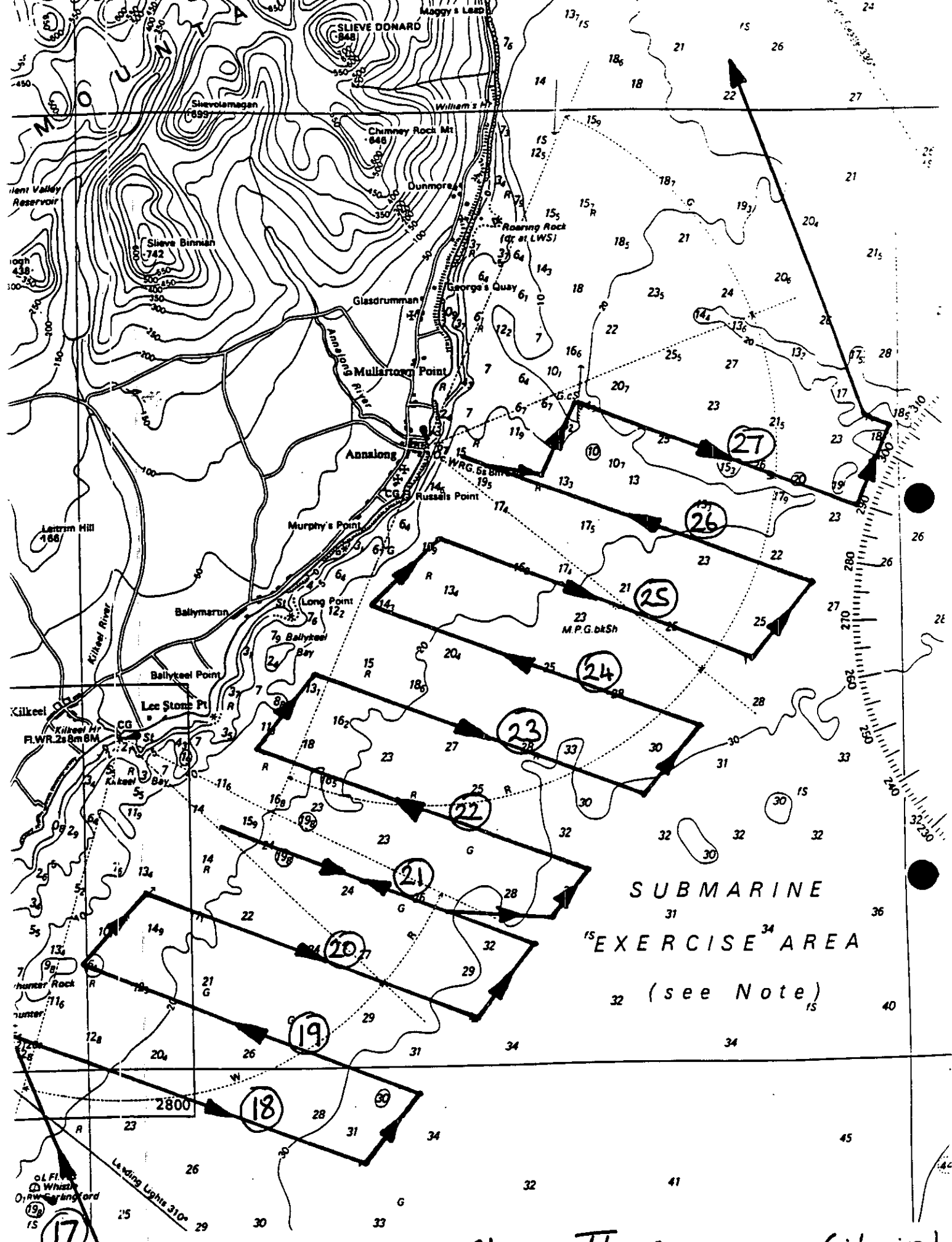


FIGURE 2 : Phase II SURVEY GRID (intensive)
 (soundings in metres)

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