

**Northwest Herring Acoustic Survey
ICES Division VIaS & VIIb**

FSS Pelagics

8th January – 21st January 2004

MRV CELTIC EXPLORER



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January 2004
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Cruise Report: Northwest Herring Acoustic Survey

Cruise Code: CEXP 080104

Start Date: 8th January, Galway.

End Date: 21st January, Killybegs

Vessel: MRV CELTIC EXPLORER

Gear: Single mid-water trawl (22 x 12fm)

ICES Areas: VIaS and VIIb

Personnel:

Ciaran O'Donnell	(Chief Scientist)
Eugene Mullins	(Deck Scientist)
Afra Egan	
Turloch Smith	
Robert Bunn	
Karen Griffin	(Seabed Surveys International)
Patrick O'Driscoll	(Seabed Surveys International)
Simon Bicknell	(MI- Seabed mapping)
Deirdre O'Driscoll	(MI- Seabed mapping)
Marcus Cross	(Liverpool University)
Joanne O'Brian	(IWDG)

Objectives:

- 1). To assess the size of the herring stock in VIaS and VIIb using an EK60 scientific sounder and a 38 kHz mounted within the vessels drop keel. Observe fish marks along the survey track using 18, 120 and 200 kHz
- 2). Collect biological data from herring samples within this area and determine composition of marks using a single pelagic mid-water trawl.

Calibration

See calibration report.

Breakdown of biological data collected

In total 10 hauls were made over the course of the survey. Recorded measurements from biological samples included measured only, length and weight, and aged sample as summarised below.

See Cruise track for haul positions.

Species	Measured Only	Length/ Weight	Aged	Total
Herring	2184	597	320	3101
Mackerel	330	179		509
Sprat	42	54		96
Anchovy	1	1		2
Whiting	304	163		467
Haddock	3	3		6
Red Gurnard	1	1		2
Grey gurnard	8	8		8
Dab	5	5		5
Plaice	1	1		1
Saithe	1	1		1
Total	2880	1013	320	4213

Table 1: Breakdown of biological samples taken from hauls (1-10).

Herring hauls

In total herring were found in 9 out of 10 hauls. The only haul in which they were not present recorded no catch. From the 10 survey hauls made 5 contained over 60% herring by weight, as shown below.

From this a total of 2184 herring were measured, 597 length/weights were recorded and 320 fish were aged. Shown below is the breakdown of catches containing >60% herring by weight of catch.

Haul No.	Total catch (kg)	% Herring	Size range (cm)	Bulk range (cm)	N sample	Area
1	137.5	98	22.5- 33.5	27-29	666	17nmi N of Sheephaven
2	0.562	84	15.5- 27.5	15.5- 27.5	5	11.8nmi N of Horn Hd
6	985.3	79	21.5-29.5	25-27	807	11nmi W of Tory Is
9	495.7	98	22-29.5	24-27	696	11.3nmi N of Easkey
10	1.45	79	24.5-28.5	26-27.5	10	12.1nmi NE of Kilcummin

Table 2: Breakdown of hauls containing >60% herring by weight of sample.

The majority of individuals were made up of maturity stage 4 fish. This would indicate that the bulk of spawning had yet to take place and that the timing of the survey was not late. A number of spent fish were also recorded in the catch but this by no means made up the majority.

Commercial catches taken during the survey period were mainly noted in the south of Donegal Bay along the north Mayo coast where 3 to 4 pairs of boats were targeting spawning fish (MFV's Elaine Croine & Sparkling Star, Glor Na Dunn & Holly B, Eternal Dawn & Celtic Quest). Onshore sampling of these landings was carried out and will be used to compare findings.

When the survey vessel arrived in this area (approximately 72 hrs after) no fish were found in the grounds highlighted by the fishermen. Catches were made to the east of this position (hauls 9&10) and were dominated by spent fish. Hauls made here also occurred further offshore than reports from the fleet.

While working the area along the north coast no vessels were reporting catches from this area and activity was minimal. However 7 hauls were made in this area (hauls 1-7) representing between 5 - 98% herring by weight in each, while catch weight itself was between 11- 960 Kg. While working the area along the north coast and northwest coast the only catches reported were from the area around Aranmore Island and to the northwest of Tory Island. However, northwest and westerly weather meant a movement of the fleet to concentrate on the north Mayo coast where more shelter was provided and there were better signs of fish.

The overall age profile of herring in hauls 1-10 showed a range of 1-8 year olds. Hauls made in the southern area of the survey track were dominated by 3-4 year olds (haul 9 & 10). Whereas in the northern portion of the track 3-6 year olds (haul 1 & 6) were found to be the most common age groups.

When analysed the stomach contents of some herring were found to contain Euphasid shrimp, possibly *Euphasia norveigicus* (northern krill). This was only the case with spent fish which full of these shrimp.

Fat content measurements were also taken on a number of larger herring samples and were found to vary between 2.5- 4% body fat as would be expected for fish at this time of the year.

Length (cm)	VIaS	VIIb
13.5		
14		
14.5		
15		
15.5		
16		
16.5		
17		
17.5		
18		
18.5		
19		
19.5		
20		
20.5		
21		
21.5	3	
22	3	
22.5	5	2
23	5	4
23.5	5	8
24	6	5
24.5	8	15
25	9	18
25.5	13	16
26	13	12
26.5	22	3
27	14	9
27.5	18	4
28	31	1
28.5	41	2
29	15	1
29.5	5	1
30		1
30.5		
31	1	
31.5	1	
32		
32.5		
33		
33.5		
Total	218	102

Table 3: Number of herring aged per 0.5cm length class per ICES division surveyed.

Fishing procedure

Once it was decided to carry out a fishing haul the captain would turn off track and allow 1.5 nmi to turn shoot the net and approach the mark of fish. This was normally carried out by looping back around and towing back over the ground already covered. This provided the captain with a good idea of the terrain he was to tow over and so could be prepared for any sudden rises or areas of rough ground.

The codend of the net was fitted with a two float system. This involved a 4” float tied into the codend and attached to a 12” float which was left outside the net. The idea of this was to give the codend extra buoyancy and prevent unnecessary chaffing on the bottom during the tow. For a breakdown of the fishing gear used and further fishing operations see Celtic Explorer Pelagic Fishing Gear Manual.

During each fishing operation the SIC, deck scientist and gear consultant were on deck to provide the crew with assistance during shooting and hauling.

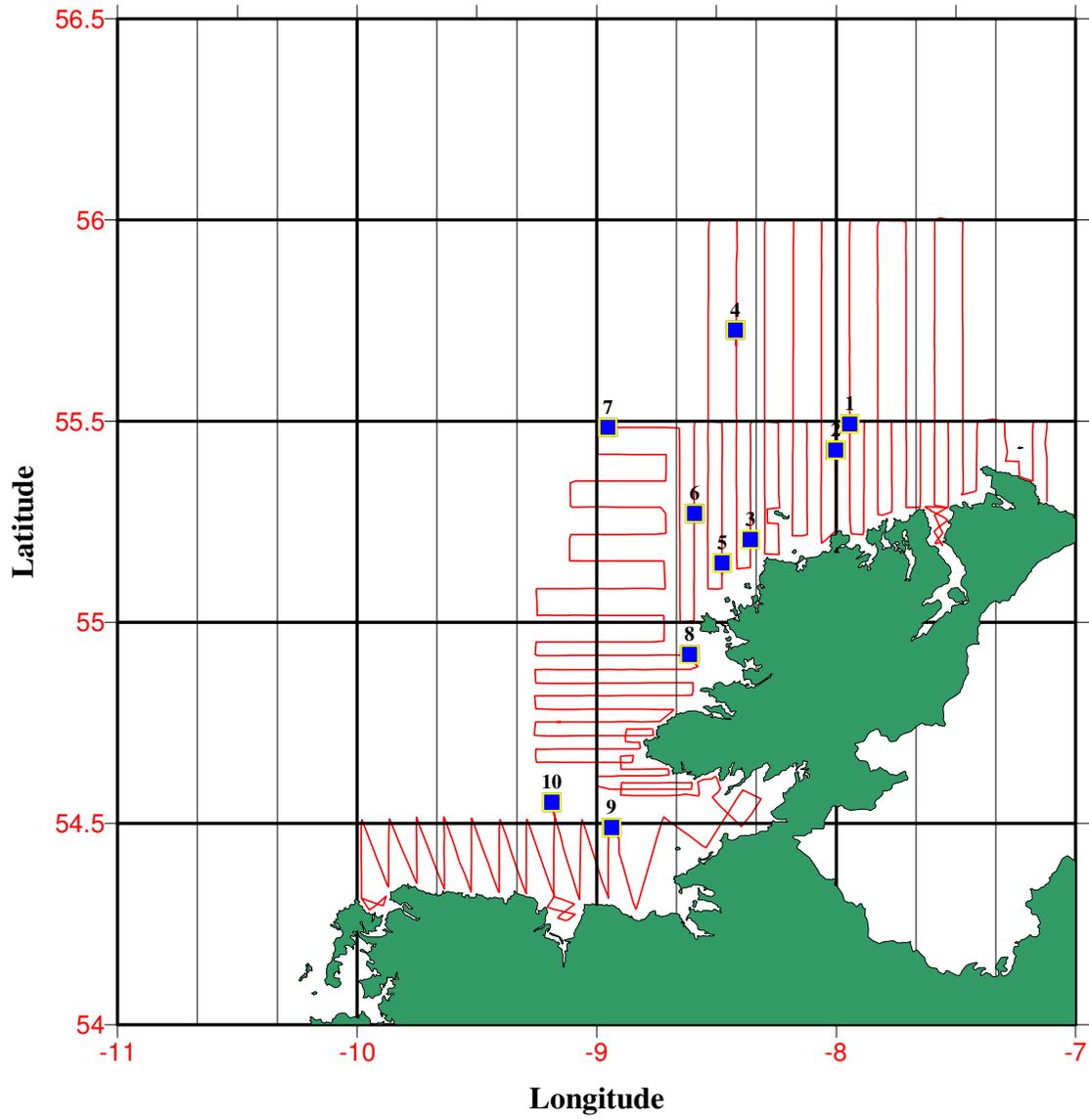
It was agreed between the scientific compliment and the crew the procedures for fishing on insonified fishes as summarised below;

When the person on watch observes a mark of fish or an area of interest they should proceed by the following.

1. Consult the SIC who will make a note of the mark/area in question.
2. If the SIC is not around at the time then contact the Officer of the watch on the bridge. This can be done more efficiently by radio than by physically going to the bridge. A mark will then be made on the plotter showing the exact position and with the most accurate time.
3. The SIC will then decide whether to fish on the mark or not.

PLEASE NOTE: No person is to call a fishing operation without first consulting the SIC.

Cruise track and haul positions for the North West Coast herring acoustic survey, January 2004.



Survey Narrative

Wednesday 7th January

15:00 Meeting with MTDS to discuss the survey programme and the blue whiting gear trails.

16:30 Meeting onboard with FSS pelagic team to discuss the annual work programme and assignment of tasks for working groups and surveys.

18:00 Scientific compliment joined the vessel. Sampling gear loaded onboard and packed away.

Thursday 8th January

09:00 Meeting with SIMRAD technicians about the structure of the training programme and how their time would be partitioned.

10:00 Meeting with scientific staff to give overview of the cruise and to introduce any members unknown to those onboard. Discussed was the assignment of watches and how to undertake watch protocols. The cruise track was shown with areas of importance highlighted. The calibration and rough timetable of events was also discussed. People were assigned tasks including getting last minute things together and the sorting of wet-lab equipment.

11:00 Safety tour and signing onto vessel.

Rest of day spent rigging the nets and doors and preparing for evening sailing.

17:15 Departed Galway docks. Discussed with the skipper (Phillip Baugh) the proposed plan. As the weather was looking poor it was decided to transfer the herring nets from upper to lower net drum and vice versa in the shelter of Galway Bay. It was also suggested that as the entrance to Killary harbour (proposed area for calibration) is narrow that the skipper would prefer to enter in daylight hours as a result of the weather (Wind F8-9 from the west, swell 4.5-5m also from the west). This allowed time for some EM1002 (seabed mapping) training to take place.

22:00 Departed Galway bay heading for Killary.

Weather very fresh on the passage- gusting up to 72Kts.

Friday 9th January

07:00 Weather still very fresh although settling slightly (Wind F8-9 from the west, swell 4.5-5m also from the west). Approx 25nmi from entrance to Killary.

10:00 6nmi from Killary, swell not as heavy due to the shelter from Inishboffin Island. Wind still gusting up to 40 Kts.

11:10 Entered the mouth of Killary. Slack water due at 12:30. High water 18:58 (Low water 00:50).

12:00 Found area suitable for anchoring showing a depth of 25m.

Position: 53°37.40N and 09°51.10W, just inside the, mouth and approx. 1nmi ESE from the Salmon farm.

Vessel anchored using a 3 point system (2 bow anchors and 1 to the stern). Vessel facing WNW into the wind and also the incoming tide. Wind blowing F8 WNW straight down the fjord.

13:30 Dingy launched to put heaving line under the vessel to attach the calibration sphere. Attached reels units to the rail of the vessel as shown in calibration document.

14:10 CTD drop to test for sound velocity due to temperature and salinity.

At 15m: water temp 9.1°, salinity 33.4 ppt, sound velocity 1484.8 m/s.

15:00 60mm standard copper target lowered for calibrating the 38kHz and centred in the beam path.

15:15 Drop keel lowered approx 1.5m (half way) to eliminate any bubbles, which may have gathered on the keel during passage.

15:30 Started calibration. Range setting of 2m above and below the sphere where echoes traces would be expected, with a sphere depth of 10m

16:15 Calibration complete- good results attained. Beam model updated.

16:45 Vessel dragged stern anchor due to the increasing wind and tidal effects. Anchor repositioned before we could continue with the next calibration.

18:20 Centred 37.1mm tungsten carbide sphere for calibration of the 120kHz frequency.

Range setting of 1.5m above and below the sphere where echoes traces would be expected. The range was reduced from previous calibration as it was now dark and fish activity in the water column had increased – this could lead to a number of false echoes entering into the calibration results.

19:00 Started the 120 kHz calibration.

19:50 Calibration complete - good results attained.

20:00 Started calibration of the 200kHz frequency (using same sphere as for 120kHz calibration).

20:35 Calibration complete. Vessel again started to drag stern anchor in gusting winds (up to 35 Kts) and position had to be altered.

21:00 Calibration of the 18 kHz frequency postponed until the morning as weather unsuitable tonight.

22:30 Stern anchor hauled in for the night to allow vessel to move with changing wind and tide.

Saturday 10th January

07:00 Weather calmer with occasional gusts from the WSW up to 26 Kts.

07:40 Tungsten sphere centred for recalibration of 200kHz. 2m range banding chosen again (as in daylight with little fish activity in water column) and a sphere depth of 10m.

08:40 Had to abandon calibration as vessel swinging too much in the variable winds.

08:45 re-orientated vessel position to face across the fjord to the SW and into the wind.

09:30 Repeated CTD drop to compare conditions of previous day.

At 15m: water temp 9.2°, salinity 33.9 ppt, sound velocity 1485.8 m/s.

10:00 Started calibration of the 18 kHz frequency, using 63mm standard copper target.

Still getting reverberation from transducer – appears as 2 blue bands below where surface layer is displayed. This should be fixed when the vessel is in dry dock (Feb 2004).

10:45 Calibration complete- good results attained

11:00 Safety drill.

11:20 Stared going through the operation of the SSU unit, with SIMRAD engineer.

11:50 Started re-c of the 38 kHz frequency, using 60mm standard copper target.

12:35 Calibration complete.

12:45 Centred sphere for re-calibration of the 120 kHz frequency.

13:20 Began calibration.

14:30 Calibration abandoned due to vessel swinging.

14:35 Continued going through the operation of the SSU unit, with SIMRAD engineer.

15:00 SIMRAD engineers departed. Vessel transfer provided by Cillian Grey (Scuba Dive West).Deirdre O'Driscoll (GSI) boarded vessel.

16:00 Going through calibration results and SSU system with onboard techs (Fergal Dwyer).

19:00 Evening Crew Meeting.

Participants Phillip Baugh (Captain)
John Barry (Gear Superintendent)
Davy Murphy (Boson)
Ted Sweeney (Chief Engineer)
Frankie Griffin (Gear consultant)
Ciaran O'Donnell (SIC)
Eugene Mullins (Deck Scientist)
Karen Griffin (SSI)

Discussion Points:

- Ineffectiveness of the stern anchor in keeping the vessel in position during the calibration procedure. Recommended that a new heavier anchor be purchased for future work.
- Interference from bridge equipment Furuno sounders operating on 28 (low) and 200 kHz (high freq). It was thought that the 28 would and the 200 would not interfere with the 38 kHz on the EK60- will test to see when in the open sea.
- Multibeam operating on 93 & 98 kHz- which could be leading to the interference on the 200 kHz (EK60) especially the 98.
- Licensing for bridge Scanmar monitor – as it keeps flashing up (JB- contact on this)

19:15 Meeting with scientific compliment (FSS) to discuss the operation and running of the EK60, interval logging and other procedures for the survey.

19:50 Re-assessment of the cruise track in relation to the time lost so far due to weather. Some legs to the East of Malin Head dropped to concentrate on more important known areas of distribution.

21:00 Stopped for the night.

Sunday 11th January

07:00 Assessed weather conditions to see if it was suitable to carry out second calibration of the 18, 120 & 200 kHz. Weather too rough. Gusts of 72 Kts from the WSW noted in Killary during the night.
Weather this morning gusting up to 46 Kts.

10:00 Looked into further adjustments into cruise track.

28 nmi added to track to cover an area around Glengad Head where fish were reported in the last few days. Have to re-assess the tracks covering the Stanton bank as they cross into UK territorial waters.

11:00 Working on calibration document for future surveys.

14:00 Weather has not calmed by any significant amount.

17:00 As above

19:00 Daily meeting with the crew –

Participants As previous meeting.

Discussion Points:

- Departure time and weather situation for the next 48Hrs (Departure time 09:00)
- Bridge notification procedure for fishing operations
- Dry lab notification for turning on track
- Rough passage expected tomorrow – reminder for all staff to tie down loose equipment both in dry/wet labs and also in cabins.
- Licensing for bridge Scanmar monitor – as it keeps flashing up (JB- contact on this)
- Sounder interference from the bridge- which bridge sounders can and cannot be used due to interference.
- Silent mode operation while searching but will **have to** return to normal mode for extra power during fishing operations- what will be the effects of this on the fish behaviour ?

- Doors to be rigged tomorrow morning before being mounted aft ready to shoot- will take some pictures of door rigs & doors here.
- Possibility of having a trial shot somewhere to test that the rigging of the doors (from the plan) is satisfactory or will require more adjustment. Also just to see how the doors react to the net and vice-versa. Before we begin the track and spot fish on track. -Outcome on this was we would have to wait and see if an opportunity would arise,

Monday 12th January

07:00 Final rigging of the trawl doors. Will test the gear to see all is well.

08:30 Raising anchors (2 bow anchors). Problem as “bight” in anchor chain which is preventing the smooth lifting of the anchors.

09:30 Finally underway.

11:10 Weather conditions outside the lee of Inishboffin. Wind F8, gusting F9 (30-35 Kts), from a W and WSW direction. Swell same direction 4-4.5m.

13:00 Systems running at present:

EK60 38 & 200 kHz

SP70

Furuno 200 kHz (bridge sounder)

EM1002

SSU

Interference showing on the 200 kHz but not the 38, so all can run as expected.

16:00 Contacted the following for crab/static gear positions:

KFO

Norbert Fox (N. Mayo static gear coordinator for the KFO)

Burtonport Fishermans Co-op – Gerard Breslin

Malin Head Fishermans Co-op – Jimmy White

Hugh McBride’s office (MFV: Heather Jane II, Amy Jane & Peadar Elaine II)

Ross Classen (MFV Aine Myre)

MFV Naimh Aine

The above are to send in pot positions via fax or Inmarsat C.

18:00 Formulated watch timetable for the coming days and posted.

19:00 Daily meeting with the crew –

Participants As previous meeting.

Discussion Points:

- Notification of pot men and the relaying of their gear positions.
- Scanmar licensing issue- contacted JB today, he will look into it.
- Trial shot of gear in the lee of Malin Head before we start the track. Will have to wait and see what conditions are like on site. Frankie recommended towing into the tide for best results due to strong tidal push in this area.
- Weather forecast set to improve over the next few days.
- ETA to start point 02:00
- Maximum cruising speed in silent mode approx. 9.5-10.5 Kts depending on weather. Max. Theoretical cruising speed for reliable data collection 11 Kts (cavitation is thought to occur above this speed).

Tuesday 13th January

01:00 Entered area to the NW of Glengad Head (4 nmi). Currently in deep water >50m will try a shot here along the 50m contour.

01:30 Shot gear and towed to the W.

Speed 4.2 Kts, 125m of warp shot. Currently no pockets on the doors for the door sensors so as a result have place a set of sensors on the head and footropes to determine gear spread. Spread relatively constant on both with a spread of 38-39m noted.

Problem: Signal being received, but no picture on the net sonde.

01:45 Hauled back to investigate the problem.

Transducer cable slightly damaged. The link between the transducer and the headline is poor and needs to be replaced with a workable option i.e. 4" strainer as originally suggested !

Minor adjustments to the nets made while transducer is being fixed.

03:10 Second attempt at shot, in the same area but towing back to the ESE.

Towing speed 3.5 Kts, 250m of warp shot, spread Heads: 41-ish m and the Foots: 41-ish m. Headline line height not very good with an opening of max 10m (pair fishing same net would reach 18m, we would normally single boat fishing reach 14m)

Net Design (IC Trawl)

No slack allowed for on the footrope- this leads to a ridged footrope and will require cutting of the chain in 4 parts to allow more flexibility.

Added an extra 6ft of chain to the bridles to help extend gear spread (with an extra foot trailing that can be included if required).

2 x 0.5 t clumps either side and 98 Kg of chain on footrope but still only a 10m opening – why ?

04:15 Net hauled back and coiled on the deck ready for a quick shot if fish are encountered.

04:35 TRACK STARTED.

Weather: wind F2-3 (9 Kts) form the S, swell 2-3m from the W.

10:30 Spoke with JB and DS about the Scanmar problem.

Licence corrupt screen appearing after 5 mins- allowing no further viewing of screen.

11:00 Spoke with Chris Joyce (Barry Electronics) about the suitability of current Net sonde for Blue whg trials- Outcome it is suitable.

Crow's nest requirements:

- Suitable comfortable chair- perhaps foldaway that is bolted to the bulkhead ?
- Latch and safety mechanism for opening and closing the trap door.
- Internal power source (s)
- Phone terminal and phone
- Drop down small table for laptop etc.
- Small shelf /tidy for ID books/papers etc.

14:30 Slack tide. 17 nmi N on first outbound leg to the NNW of Malin Head. All quiet.

15:00 First offshore inter-transect 30 nmi out. All quiet.

17:30 Weather freshening Wind F 8-9 (30-38 Kts) from the W. Swell picking up also. Gales forecast for the next 24hrs.

19:00 Daily meeting with the crew –

Participants As previous meeting.

Discussion Points:

- Scanmar problem temporarily sorted out.
- EK60 running well in weather.
- Request to swans on B Whg gear- clumps weight, inclusion of barrel swivels into bridles (also for herring net).
- Cuts to be made in the herring footrope chain to allow for more flexibility.
- Crow's nest requirements raised:

Crow's nest requirements:

- Suitable comfortable chair- perhaps foldaway that is bolted to the bulkhead ?
- Latch and safety mechanism for opening and closing the trap door.
- Internal power source (s)
- Phone terminal and phone
- Drop down small table for laptop etc.
- Small shelf /tidy for ID books/papers etc.

21:00 Entering Lough Swilly- little signs of life. Currently high tide.

21:30 Dunree Head – as above

22:00 EM1002 went down and caused the EK60 and SSU to freeze. Slowed vessel right down so as not to cover ground while EK60 non-operational. Assessed the problem and fixed it.

22:50 Back on track .

23:15 Leaving the Swilly no signs of life recorded. Lashed down the net to prepare for high swells expected on offshore leg.

Wednesday 14th January

09:30 Weather wind 23-29 Kts from the WSW. Swell 2-3.5m from the W.

Lots of skipping in the magnified area of echogram, although doesn't seem to be showing on main frame of picture. Still working on the SSU to try and see if this is involved.

10:30 MFV Regina Ponti on the radio giving us positions of where they have sighted herring on the offshore legs. Legs that we are yet to cover.

General Observations on vessel behaviour:

- No picture skipping on the EK60 with the weather on the stern quarters or in a following sea
- Also no skipping when the weather is side on – normal speed here 9-10 Kts.
- Skipping seems to occur most when we are steaming into the weather- this also has a marked effect on our speed – down to 4-5 Kts.

Weather currently wind F 7-8 from the west, speed 8 Kts, weather on starboard side- no skipping.

12:30 8 nmi NW of the Swilly- approaching the area around the Limeburner Rock. No signs of life.

13:05 Noting a small very patchy dots with some red well spaced apart (3 over last 2 nmi). Not dense enough for a shot but will monitor. One spike of very poor density on the 38 kHz, tall but thin and of no significant amount. Area 8 nmi to the N of Malmore Head.

15:00 Noted 2 small but good density clumps (8 m tall) tight between 2 peaks- too tight for a shot. Ground to uneven to shot E to W. Rough in all directions.

17:00 No signs as we head offshore again, N of Malmore Head.

19:00 Daily meeting with the crew –

Participants As previous meeting.

Discussion Points:

- Blue whiting net: Frankie to ring Swan's to finalise some changes i.e. lighter brailer and fixings. Also the inclusion of a headline bag capable of holding 2 net sondes (traweye & 50 kHz).
- Inclusion into the pennants of both herring and B whg gear 2 barrel swivels to prevent twisting on shooting and hauling.- this was confirmed with Bernie (Swan's)
- Swan staff memeber to come out on the vessel during trials to help oversee.
- Scanmar gear still causing a problem and not working sufficiently.
- Trials- from Killybegs closest point to the shelf is 67 nmi. May be worth heading to an area closer to Galway for steaming home after trials complete. This would save time in the long run.

21:00 **HAUL 01** Noting heavy scatter tight along the bottom and extending up to 17m, showing some reds but mainly yellows and greens. Area 26 nmi to the N of Sheephaven Bay. Ground type pebbles and gravel. Catch: 137.5 Kg, 98% herring, maturity stages 4-5 mainly with some 7 & 8's. Skipper allowed 1.5 nmi run up to mark.

Problems:

Auto-trawl not working at all, this means manual control of the warps with less sensitivity.

Transducer damaged AGAIN. Control of hauling handed over to cab- gear ran away and ripped transducer mountings. THIS MUST BE FIXED !!

23:00 EK60 skipping again for unknown reason- bottom lost had to slow right down. Fergal and PO'D working on this.

Thursday 15th January

01:30 EK60 skipping again for unknown reason- bottom lost had to slow right down. Fergal and PO'D working on this.

03:30 Problem occurred again.

07:09 Wreck unmarked spotted 55°27.95N & 08°03.73W

08:20 5 nmi to the E of Tory Island- light scatter only.

09:00 Turning inshore by Tramore Bay/Horn Head- all quiet.

10:25 **HAUL 02** Two good density spikes noted 11 m tall over clean ground (pebbles/ gravel) 11.8 nmi to the N of Horn Head. Skipper allowed 1.5 nmi run up to mark.

Again auto-trawl and Scanmar systems were down. Towed over mark but only managed to clip the top of each. Looked as if couple of baskets of fish had gone into net. Catch: 0.562 Kg (5 herring and 1 mackerel !) Contacted J Boyd after the shot to try and get a commercial sample from any vessel fishing in this area to substantiate the mark noted.

12:15 EK60 blackout- no ping response.

12:30 Problem sorted back on track.

15:50 Just to the E of Tory- light scatter no signs of herring.

16:00 EK60 tripped out again !

16:30 Back on track- problem still has not been identified.

19:00 Daily meeting with the crew –

Participants As previous meeting.

Discussion Points:

- Swan's to have gear ready to load onto the net drum.
- Pockets for the door sensors in hand (Michael Cunningham to deal with this- Swan's whitefish man).
- Auto-trawl problem seems to have been rectified.
- Waiting for Bernie Cunningham (Swan's) to update us on the size of bins they use to store/transport B whg gear.
- We need to order 2 of these larger bins (dimensions as yet unknown) from Paddy Halvin. Standard net bins on order (4 of) are 9' x 4'6" x 5'.
- Frankie spoke with Swan's today and confirmed the following:
 - Won't need such heavy brailer as in commercial rig
 - No middle splitter required and only 22 mm dynex for the top splitter.
 - Half bag cover only
 - Blow out panel to be situated 1 fm above the codend
 - Net can be unloaded from the truck straight onto the explorer net drum.
- We can rig our own life-line from the green rope (as for herring net), no need for heavy dynex.
- Strainer for the headline transducer it was agreed that one should be purchased and store onboard "in the event". Frankie suggested one made from heavy walled 4" stainless. I will check the usage with Chris Joyce (Barry's) to see if this size will fit our need for all purpose use.
- Phillip commented on the success of the fishing operations in terms of how the gear handled.

- Logistics of transporting the herring gear back to Galway.
John Barry and Davy agreed that the doors (herring) could either be chained to the deck or the rail and the new herring net could be binned up and stored on deck. This would allow for the b whg net to be transported on the lower drum back to Galway (we need a bin ready to handle it in Galway !!). I will contact Paddy Halvin to see if he has any of the 4 ordered bins ready for delivery from Greencastle.
Example: A commercial mackerel trawl (with brailer) just about fits into a bin of 9' x 4'6" x 5'

Friday 16th January

02:00 Weather freshening wind F9 from the NE, swell from the N 2-3.5m

03:30 Following the transects to the S, W and just to the N of Tory Island- no signs of life, just blue scatter.

05:15 Just to the N of Tory Island- only light scatter present.

06:35 Just on inbound leg to the W of Tory, 2 nmi- clear screens.

07:30 WNW of Tory - clear screens

07:50 Staring to mark heavy blue scatter 0-10m off the bottom just as the sun begins to rise. Scatter contains small red chips- could be whitefish feeding.

08:30 **HAUL 03** Towed over 2.5 nmi on the blue dust described above. Catch 47 Kg, 94% Whg, 5% herring (non spawning hard fish).

11:50 Clear screens on the 2 nmi spaced transects to the NNW of Tory.

15:15 **HAUL 04** Noting small red chips tight along the bottom (up to 3m). No other marks clearly visible in surrounds. Noting marks for the last 3-3.5 nmi. Wreck located to the S, we intend to tow to the S. Allowed the normal 1.5 nmi run up to shoot the gear. Then towed for 1.75 nmi leaving 0.25 nmi clear of wreck, as positions are only approx on charts.

Catch: 22.49 Kg, 78% Mackerel (medium size), 16% herring (stage 4's), had, whg, g gurns. Note: Herring were found to be feeding on *Euphasia norvegicus* (Northern krill).

Strainer fitted to the headline- At last !!. Still having problems with intermittent footrope signal. Scanmar working well, auto-trawl operational.

17:15 47 nmi NNW of Bloody foreland on the second last long leg. Approx 4 nmi before we turn onto offshore inter-transect . All clear.

19:00 Daily meeting with the crew –

Participants As previous meeting.

Discussion Points:

- Left message (x2) with Paddy Halvin about the net bins. Decided requirements were: 9' x 4'6" x 7' x 2 bins.
- Net transducer it was decided to try a piece of fire hose stuffed with foam to give better signal also suggested was a float behind the net bag to lift the transducer face.
- Transport logistics for end of herring survey: J Barry suggested that the herring doors could be stored on the deck while the net on the lower drum could be wound over the already existing net- as drum capacity would allow for this. This would then leave lower and one upper drum free for use on the b whg trials.

19:20 Current track calculation= 855 nmi to go if cruising at 9 Kts = 4 days without hauls.

21:15 25 nmi NNW of Bloody Foreland- clear screens.

Weather wind SE 4 Kts, swell NE 1.5-2m.

Saturday 17th January

00:00 5 nmi to the N of Aranmore Is over rough ground- clear screens.

00:45 N of the Stag Rocks (area of recent commercial catch)- light scatter.

01:40 **HAUL 05** Just to the N of the Stag rocks. Marking blue scatter with red chips up to 20m off the bottom over rough ground. Showing well on both high and low freq. Catch: 35 Kg, 94% whiting, 3.6 % herring.

03:10 4 nmi to the WNW of Bloody Foreland – clear screens

03:30 Wreck position 55°15.76N & 08°28.61W

07:05 **HAUL 06** Marked good slid red clump stretching along the bottom and up to 4m off. Area 11.7 nmi to the W of Tory Is over fine sand. On shooting marks moved but were track 8° to port using Sonar. Catch: 960 Kg, 79% herring, 20% mackerel (26 cm MN size, mostly 4's and 7's).

12:05 10 nmi N of Aranmore Is – only light scatter.

14:45 **Haul 07** Marked 1 medium density small spike just off the bottom and some smaller ticks etc. in the area 27 nmi WNW of Tory. Towed for 4.8 nmi and caught some dust original mark had dissipated. Catch: 11.34 Kg, 72% Mack, 18% herring (all spent).

18:00 Second leg down on E-W 10nmi transects to the NW of Tory Is- light scatter.

19:00 Daily meeting with the crew –

Participants As previous meeting.

Discussion Points:

- Timing of the survey seems to be right with the occurrence of stage 4's as the main maturity stage, some but not near as many 7's present. One sample of fish (n=21) were found to be all spent from HAUL 06. This is further substantiated by the fact that the majority of mark shot on containing herring were inside the 55°5 on the north coast- this would indicate that those present are in on or near the spawning grounds.
- Headline winch pressure seems to be as it should and we are now attaining the desired headline height of 15m.
- Track update: 713 nmi to go. The timing indicates 3 days or 4 including fishing. This would leave us arriving back into Killybegs sometime on the weds night the 21st.
- Herring pennants – need to get barrel swivel put in now for future surveys.
- Phillip asked about the wet lab. It was agreed that if we should get too large a sample than required then the bulk could be slipped over the stern while retaining a sample. This matter was brought up due to the fact that not adequate discard system is in place for such an event or a foul haul.

Sunday 18th January

06:30 All quiet as we descend the 4 nmi spaced W-E transects.

10:00 Begin working on the net making the following adjustments:

Added approx 5 fm of heavy link galvanised chain to the breast of the trawl.

Removed chain from the area around the lug ends of the wings.

The overall effect is that the footrope will be slightly lighter than before, but the weight has been redistributed more centrally. The chain around the lug ends close to the foot ends and footrope was starting to show signs of wear due to rubbing on the ground (spare link 1 ft of chain close to the clump was well polished after each tow as was/is the clump weights).

12:30 Spoke with Eric Murphy (MFV Eliane Croine). Eric reported spawning fish in the Downpatrick Head area position: 55°20.21 ish N & 09° 30.50 ish W. 3 pairs working in the area including the MFV Eternal Dawn and the MFV Celtic Quest (Dennis Boyle). Fish area reportedly marking during the day and night.

12:35 **HAUL 08** Noted one distinct spike of fish up to 11.5m tall over very rough ground. Shot the gear and towed towards where we had first marked the fish. Mark had dispersed to a much smaller scatter. Nothing noted going back into the net. Hard to track any fish on the sonar due to the unevenness of the ground and the shallowness of the water (33m). Catch: ZERO.

14:30 Total track left to complete 575 nmi (approx 2 d, 16 hrs without fishing @ 9 kts)

15:45 Passed over a very dense blood red spike of fish 25m tall and extremely dense. Turned to go back over before we shot on it and could not locate it again. Did 3 passes over the area with the sonar set at 30 kHz with a 40° angle and a 600m range and still could not find it. The tide was mid way to the high (19:00) and running in an N – S direction this was factored in when searching. Hopefully we will encounter the same fish on the more southern lines. The only consolation being that it was fish and could be assigned the possibly herring category.

16:20 Resumed track- third transect down on E-W transects, 12 nmi to the NW of Glen Head.

19:00 Daily meeting with the crew –
Participants As previous meeting.

Discussion Points:

- Track left to complete = 575 nmi (2 d 16 hrs @ 9 kts, with no fishing)
- Received fishing positions from Elaine Croine (Eric Murphy)
- Sonar SP70 – who knows how to use this piece of equipment properly ? Perhaps the scientific compliment needs training on this- J Bres. AS this sonar has scientific out put ? Also need some extra manuals for this.
- SP70 low frequency long-range sonar. More suitable for hunting small marks is a high frequency sonar operating around 100 kHz- Frankie Griffin. This may have been the problem today when we couldn't locate a mark of fish we passed over and hunted for, for nearly 1 hr !!
- Problem still there when we are punching into weather EK60 gapping even at low speeds (~5 Kts). Need to address this problem. Captain says when we are heading into the weather we don't have enough power on silent mode and can only make about 5 kts.
- Steaming time from Stags to Killybegs ~ 6Hrs.
- Herring net Problems:
 - Again (as in demersal gear) ropes don't seem to have been stretched before mounting
 - Chain far too tight on footrope
 - 312 twine used when we specified 408
 - Need to create a snagging list to avert these problems for the next net

22:40 6 nmi WNW of Glen Head – practically clear screens. Cruising at 5 kts into the weather. Weather wind F 6 from the W, swell 2-3m from the W.

04:30 Ek60 crashed showing error signs that software was corrupt.

04:50 Problem solved- back underway.

Monday 19th January

09:00 Approaching Glen Bay area along the last of the 2 nmi spaced W-E transects. End of this transect starts the 1 nmi spaced run which continues down to Fintra.
Weather wind F 6 from the W, swell 2-3m from the W.

10:00 Turning N along Glen Bay inshore – all quiet. No other pelagic vessels in the area.

12:00 5.8 nmi WNW of Rathlin O'Bryne Is.

16:05 Just W of Rathlin O'Bryne Is. Prior to turning onto inshore inter-transect. Noted good mark tight along the bottom up to 4m and spread over approx 10-15m over extremely rough ground. Position 55°40.05 N and 08°53.79 W. Could not shoot due to the presence of crab gear in the area.

18:05 Skipping trials

EK 60 Gapping Trials

Gapping trials were carried out on the 19.01.04 at 18:00

Weather conditions as reported from the bridge at the time of trials:

Wind: 20 kts from the West
Swell: 2-3m also from the West.

Vessels SEAPATH system:

Heave: 2.7m
Pitch: 2m
Roll: 1.06m

Gapping was found to be most prolific as the vessel steamed into the weather. With a following sea, beam to, or on the vessels quarters the same problems were not encountered to such an extent.

The transducer face is positioned on the drop keel unit. When fully extended this is 8.8m below the waters surface. The drop keel itself extends to 3m and the vessels draft at this point is 5.8m.

Trials were therefore carried out as we steamed into the weather from an inshore position. The vessel was running on silent mode at the time and therefore had limited power output as compared to normal running. Maximum speed attained during this trial was 8.5 kts.

The vessels speed was increased from 3 knots up to a maximum of 8.5 kts. The vessels speed was increased at 1 kts intervals, at each interval a screen grab was taken to show the level of gapping.

Results of these trials were forwarded onto Are Johansson at Simrad.

19:00 Daily meeting with the crew –

Participants As previous meeting.

Discussion Points:

- Track update- currently close to Rathlin O'Bryne Is. And about to enter further into the Bay. Still on track for Weds.
- Paul Loshier- spoke with him today. He will pick up Swan's doors from Galway and transport them back to Swan's as he has to bring up some gear to the vessel anyway.
- Spoke with Paddy Halvin – our regular sized bins will not be ready until the end of the month. Ordered the oversize bins and told him to contact M/C regarding pickup etc.
- E-mailed and rang Bernie at Swan's confirmed barrel swivel inclusion into both sets of pennants, requested rigging diagram for 6m doors.
- Contacted Thorboron to get rigging diagram for sensors for herring doors- received.
- Got quote for welding door sensors for 1 set of doors: €675 (€115 materials, €560 labour for 2 men) Fucking outrageous price !!
- Confirmed with J Bres about skipping and formulated a doc. with Fergal and sent to Are at Simrad. Will also take a copy to PGHERS to show P Fernandes.
- Confirmed with D Stokes the delivery of Trawleye and Scanmar updated software to Killbegs.
- Very quick turn around on Sunday 5th – lab will be emptied on Sunday, nets etc will be de-mobed on Monday 6th.
- Sent email to M/C with update etc.

22:20 Close to Fintra- all quiet.

Tuesday 20th January

00:00 Just to the S of Muckcross Head and heading towards our tracks by Fintra.

Herring catches here by the small pelagic vessels in late Dec.

02:00 At the back of St. Johns point- all quiet.

08:00 **HAUL 09** 11.3 nmi N of Easkey. Marking heavy blue scatter with patches of red and yellow mixed through over sandy, gravelly ground. Good marks noted going back into the net. Catch:496 Kg, 99.8% herring (high proportion of spents) and 0.2% sprat.

12:30 Just coming in on tracks by Lenadoon point- all quiet.

14:00 **HAUL 10** Area 12 nmi to the N of Killala started to mark similar scatter to that noted for HAUL 09 but not as dense. Area 3 nmi from the N end of zig-zag. Extended track a further 2 nmi to the N until scatter began to fade and then turned and returned to area where we marked the thickest spots. Towed to the N for 25 mins through a very watery scatter with little or nothing going back into the net. Catch: 1.4 Kg, 79% herring (spents) and 18% mackerel.

15:00 MFV “K Mar K” (Kevin Mclusky) – Cleopatra from Killybegs radioed to inform us of his pot positions in the area. Reported Hugo Boyle and partner were fishing the Downpatrick area.

19:00 Daily meeting with the crew –

Participants As previous meeting.

Discussion Points:

- Rigging diagrams for Poly-Ice doors arrived from Bernie (Swan’s) as well as door sensor mounting positions. Looks as if no burning of door is required for mounting and so Ted (engineer) will undertake the job. Materials permitting.
- Need to email Thyboron to get both sets of angle details for mounting onto Herring doors.
- Need to email DS with what gear needs to come off the vessel on Monday’s DEMOB.
- Phillip says track will be complete at 14:30 without anymore shots.
- On Sunday due to arrive in Galway at 6am and depart again at 7am. FSS will have to be ready to depart ASAP.
- Need to confirm with Phillip the numbers that will be returning to Galway – Remind those leaving to clean up behind them !
- Phone Barry’s ask about 4” strainer and what would they recommend for B whg gear.

Wednesday 21st January

00:00 NW of Killala – all quiet.

02:30 In area where commercial catches were reported less than 72 Hrs ago. 2 nmi to the N of Downpatrick Head. No vessels in the area.

05:00 As we worked to the W on pair of vessel past us to the E- searching.

09:30 Coming inshore W of the Stags all quiet- blue scatter.

11:00 On N end of last zig-zag before we head S into Broadhaven Bay.

13:30 FINISHED SURVEY TRACK.

14:15 Saw the Holly B and the Glor Na Dunn fishing to the W of Killala.

19:00 Daily meeting with the crew –

Participants As previous meeting.

Discussion Points:

- Swan's- have asked them to deliver the net bins first to allow us to clear some deck space before the rest of the gear arrives. Will phone to confirm arrival time for nets/doors etc.
- 4 x 250 Kg clumps to be delivered. This will give us an overall onboard clump weighting of 2,000 Kg.
- Frankie to make up an extras list for chandlery etc.
- Barry's- Chris Joyce to check stocks to see if he has any 6 “ strainers in stock as the 2 x 8 “ ones we have are too big- aim to do a direct swap. Chris said cable is 11.1mm (6t strain) cable and anything smaller than a 4” may cause the cable to kink.
- Eoin Byrne- picked up sensors this evening and will return in the morning to begin welding job. Frankie and Tedc to liase with them on this.
- Need some balls of twine for each size on new net (2 x balls for wing ends as meshes are so big).
- Paul Loshier due down about 10am and may possibly bring the herring doors back to Galway by road.
- Spoke with J Bres. – He is to contact John Simmonds about EK60 skipping, has already contacted P Fern. about the this and how it relates to the Scotia – problem not half as bad on Scotia. Also Paddy to send files (replay files) to Are. JB also to contact Simrad about this.

19:30 Arrived Killybegs- E side of town pier (opp side to Eugenes Lab) by auction hall.

21:00 Going for beers !!