SCANS-II CRUISE REPORT

VESSEL: MARS CHASER

AREA Q: WEST SCOTLAND & IRELAND

JUNE 27TH – JULY 29TH

CRUISE LEADER: KELLY MACLEOD

CONTENTS

SUMMARY

- Surveying took place from 29th June – 27th July 2005, inclusive.
- Data before the 29th June should not be included in the analysis.
- 89% of the planned coverage was achieved; Transects 107 (<0.5nm) and 104 (8nm) received no coverage.
- Throughout this cruise, we had particularly poor sighting conditions. A third of all survey effort was carried out in seastate 4 and only 20% was conducted in seastate 2 or below.
- The primary platform recorded 173 sightings of cetaceans and other marine life whilst on-effort.
- The tracker platform recorded 134 sightings of cetaceans and other marine life whilst on-effort.
- The pairings of the primary observers were 1 = Mick Mackey (MM), Julie Andersen (JA) and 2 = Bjarni Mikklesen (BM), Dave Wall (DW).
- Tracker observers were Kelly Macleod (KM), Dylan Walker (DY), Claire Pollock (CP) and Claire Lacey (CL)
- The Big Eyes were very problematic and unusable in swell. When they could not be used, the "BE" tracker observed using naked eye and 7x50.
- To facilitate quick observer rotation, the DR about to leave the post filled in the new observer posts as much as possible and then the replacement DR just checked and stored. The weather information took some time to relay and if the DR waited for this information before storing the rotation, and there were a sighitng in the meantime, then the effort and sighting observer's codes would not match (flagged in the validation). Therefore, the new DR would fill in another effort form with weather information but store it under weather change code, 4. Therefore, at the change over period there are two entries in quick succession: one to give observer rotation and the second to give the weather.
- Sighting numbers 24-26 in the primary sightings table are not present. The counter (and Logger) was at number 23 when the button box stopped working. When it was fixed, it started at 27 and this matched the number on Logger. No sightings have been lost, but the sighting numbers jumped.
- Due to a problem with a) the primary connection to the box and b) PCI-board for tracker buttons, lots of sighting pages opened spontaneously in Logger without button presses on a couple of days. As a result, there are 49 and 54 mistake entries in the primary and tracker databases, respectively.
- On Tuesday 12th July a problem developed with the USB card combo on the DR laptop resulting in failure of the starboard webcam and camera
- From 16th July, the DR laptop was replaced by the cruise leaders personal laptop due to failure of USB ports and loss of webcams & firestores. Everything was successfully reinstalled on the CL laptop and used for the remainder of the survey.
- Occasionally the validation programme would not open the bearing images associated with a tracker sighting. These images have been saved on the folder "Lost Webcams" on the Maxtor. Russell Leaper should be able to tell you how to deal with them.
- Transect 116 is "dog-legged" because of avoidance of seismic vessel array.
- Because of weather conditions we often changed from DP mode to SP mode. Rather than coming off effort in between the two modes (because we were still watching), an effort form was filled in event 9 to symbolise that we switched to single platform, or code 1 to show that we restarted double platform.
- Two new species codes were entered into Logger: WB? – Probable Whitebeaked dolphin and WS? – Probable Whitesided dolphin.

SHIP AND PLATFORM SET-UP

The 42m chase vessel, *Mars Chaser* was an excellent ship. She had a large draft (5m) and much ballast that made her surprising stable. The Captain was very helpful and supportive of all aspects of the project and he and the crew were always ready to help. All observers had their own cabins and the food was adequate. All these factors lead to a happy atmosphere on the ship, which is crucial for a 5-week period.

The tracker platform had been constructed from aluminium and stood on legs on top of the primary platform (plate 1). The size, location and shape of the box were perfect and the tracker observers were well sheltered from the wind by the deflecting shape of the box. The aluminium, however, was too shiny and the reflection from it flooded the webcams. The areas ahead of the tracking stations were painted to minimise the effect from glare (plate 2).

Plate 1: Platform set-up on the Mars Chaser. Trackers observed from the aluminium box and primaries were positioned below.

Plate 2: 7x50 tracker station

The primary observers were separated by the binnacle (plate 2), which meant communication between them was difficult. However, the button box, watch and clipboard were positioned to allow relatively easy access by both observers.

Plate 3: Set-up on the primary platform.

There was a lack of rope onboard the ship! Therefore, we could not tow a length behind the ship with buoys for the primaries to check distances. Primary observers did use measuring sticks throughout the survey to help estimation.

In general, we went on single platform for 30-minutes at lunch so that we could eat in two sittings. At dinner, we stopped at 17:30 until 18:15. The ship would circle and then we could resume where we finished. I felt it was important that we all sat down together for dinner as this allowed us valuable time for discussion and to allow everyone to interact.

GENERAL RESULTS

Survey effort

Surveying took place from Wednesday 29th June up to, and including, Wednesday 27th July 2005.

Despite very poor weather conditions, 89% of the planned coverage was achieved (Table 1). Of this, about 17% was spent in single platform mode only, predominately due to fog or large swell rendering the tracking platform inoperable. Some coverage was attained on all transects (Figure 1); with the exception of transect 107 (<0.5nm long) and 104 (8nm long).

Table 1: Summary of survey effort achieved by vessel Mars Chaser in area Q, west of Scotland and Ireland.

Activity	Type	Planned coverage	Achieved coverage		Surveying time
		Km	Miles	Km	
On Effort		3,271 km	1732.4	2909.9	182:47:45
	Dual Platform		1310.9	2427.7	132:26:01
	Single Platform		260.4	482.2	25:29:31
Off Effort			161.1	298.3	24:52:08

Seastate conditions were only suitable for observing harbour porpoises for about 20% of total survey effort (Table 2). The greatest amount of survey effort was conducted in seastate 4 ie. conditions that are marginal for most species. Some surveying (<2%) was carried out in seastate 5.

Table 2: Summary of percentage survey effort by Beaufort Sea state category. Percentages have been rounded.

Seastate	≤ 1	≤ 2	2.5	≤ 2.5	3	≤ 3	4	≤ 4
% Total effort	6	20.5	16.5	37	27	64	34	98

Sightings

Area Q was considered a low-density area, with few sightings. However, the weather conditions were a contributing factor. The primary and tracker observers recorded 173 and 134 marine animals (cetaceans, sharks, fish etc), respectively (Table 3). The mistake forms were triggered spontaneously by problems with connectors (see Cruise Log). The distribution of sightings for each platform is shown in Figs. 2 and 3.

Table 3: Summary of sightings when on effort in the Logger database 29th June- 27th July 2005.

	Mistake buttons	Data check	Sightings (all species, inc. sharks etc)	Total
Primary	49	4	173	226
Tracker	54	4	134	192

Ten species of cetacean were identified (Table 4). The most frequently sighted cetacean by both primary and tracker observers was the Atlantic whitesided dolphin. Harbour porpoise and common dolphin were also frequently seen. There were large numbers of unidentified dolphins. Identification was very difficult in moderate sighting conditions and when groups were seen far away.

Common dolphin

Long-finned Pilot whales

Bottlenose dolphin

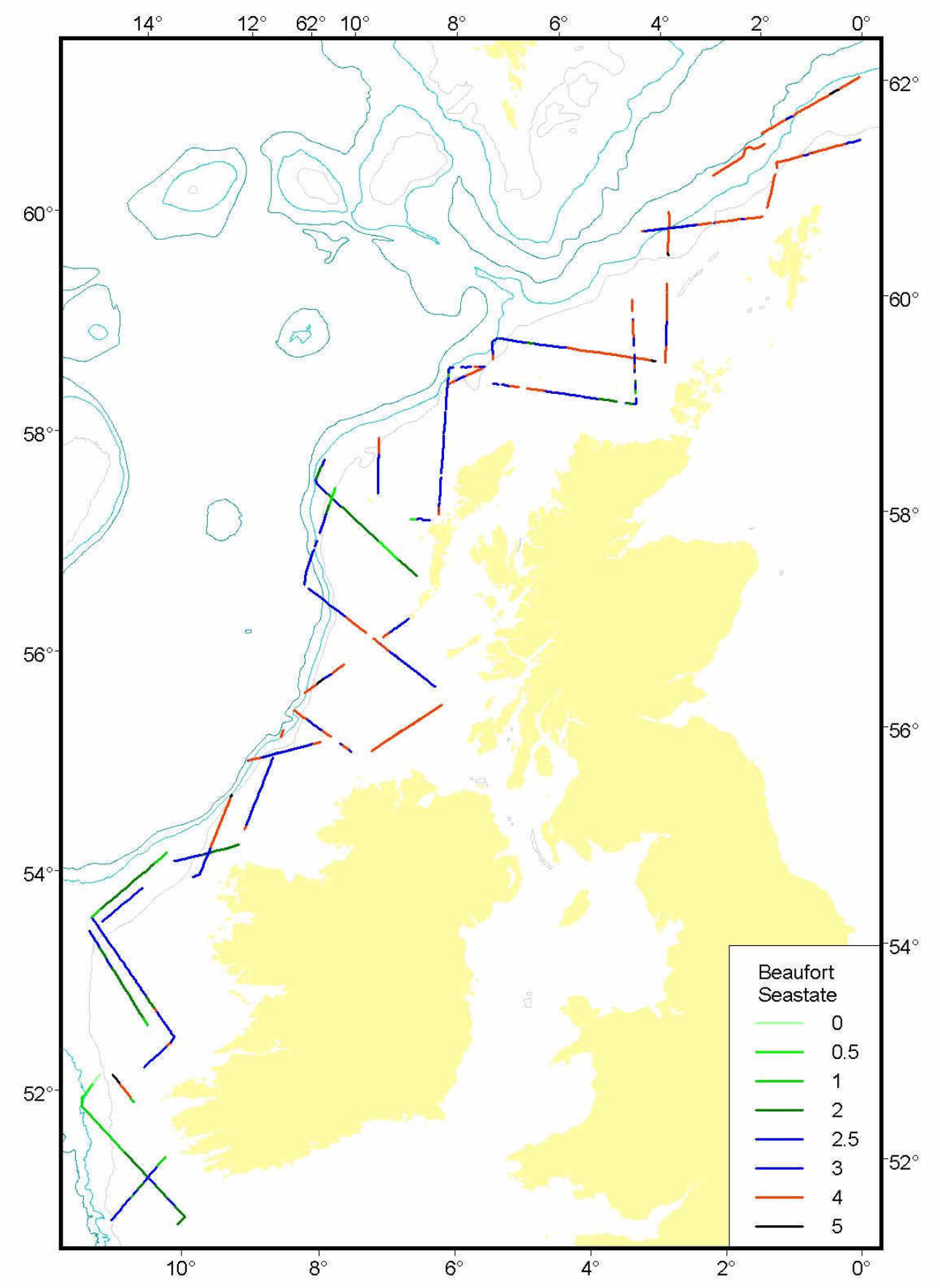


Figure 1: Distribution of survey effort by Beaufort seastate.

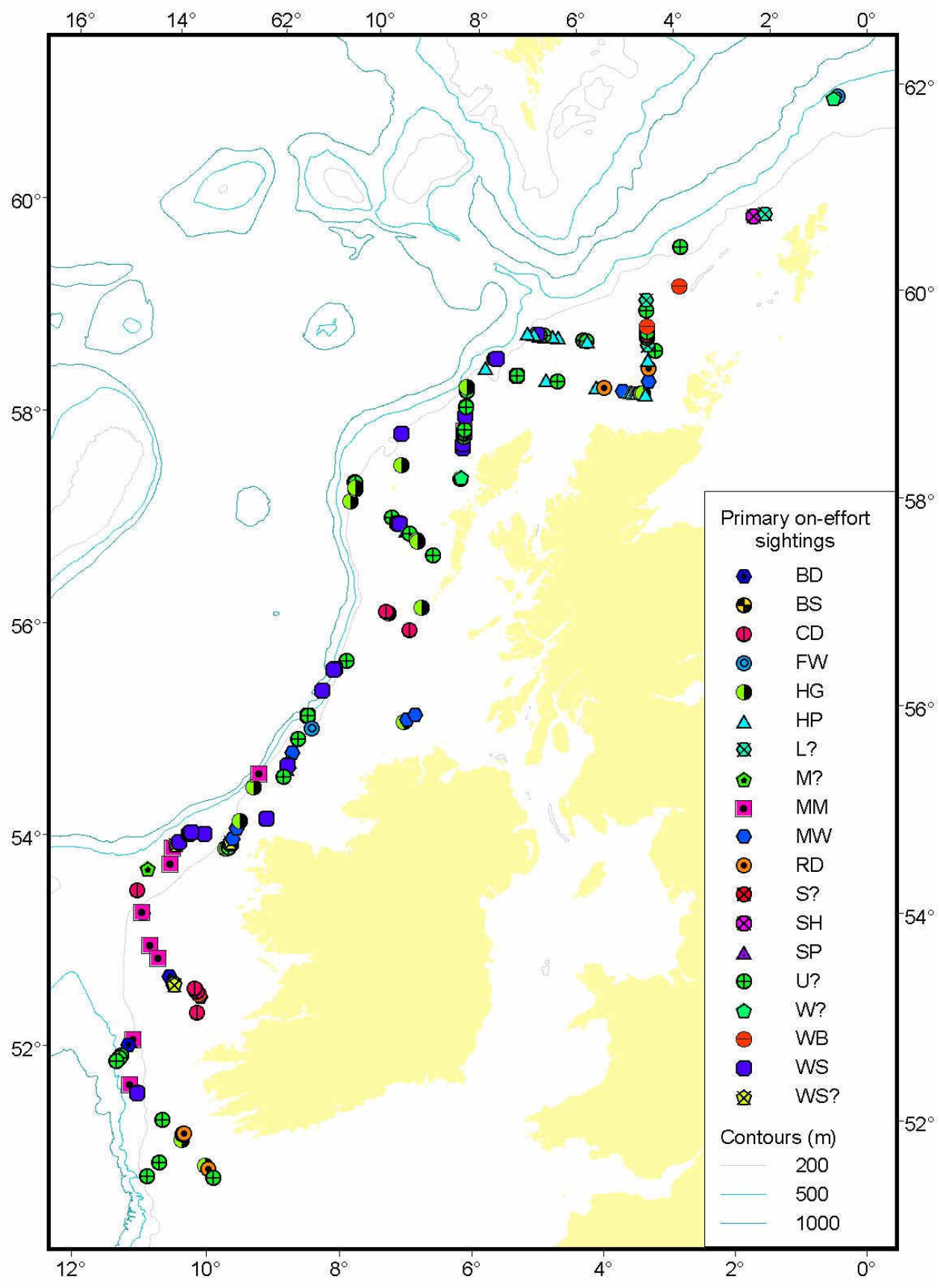


Figure 2: Primary sightings made whilst on-effort.

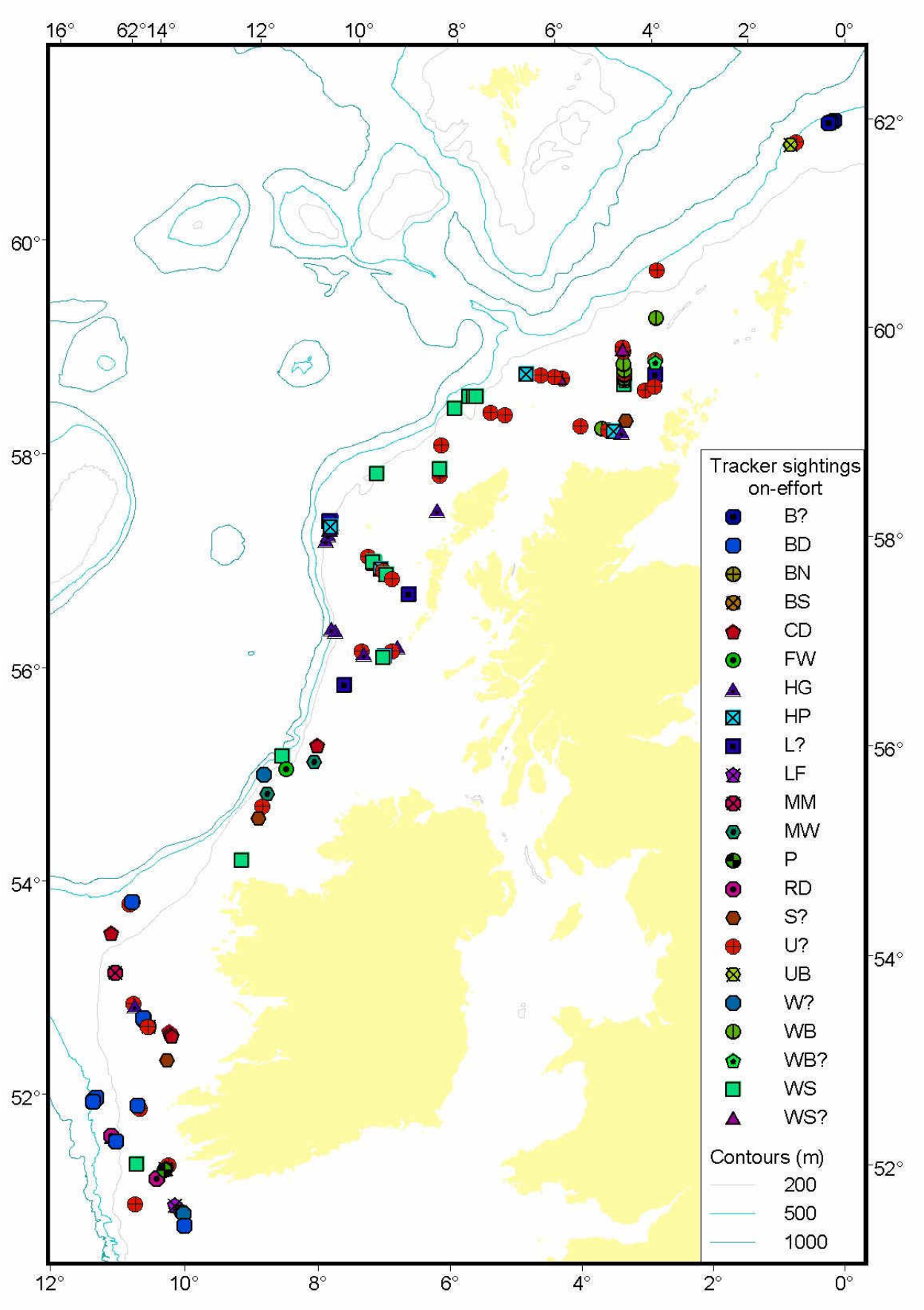


Figure 3: Tracker sightings made whilst on-effort.

Table 4: Summary of sightings by species for each platform for 29th June- 28th July 2005.

Species Code	Species	Number of primary sightings	Number of tracker sightings
B?	"Big" cetacean	0	3
BD	Bottlenose dolphin	3	11
BS	Basking shark	1	2
CD	Common dolphin	18	9
FW	Fin whale	2	1
HG	Grey seal	18	14
HP	Harbour porpoise	20	4
L?	Lagenorhynchus sp.	3	7
LF	Long-finned pilot whale	0	3
M?	"Medium" cetacean	1	
MM	Sun fish	10	1
MW	Minke whale	10	2
OT	Other	1	1
P?	Patterned dolphin		1
RD	Risso's dolphin	5	4
S?	"Small" cetacean	1	4
SH	Unidentified shark	1	
SP	Sperm whale	1	1
U?	Unidentified dolphin	47	36
UB	Unidentified beaked whale	0	1
W?	Unidentified whale (blow)	3	2
WB	Whitebeaked dolphin	5	6
WB?	Probable Whitebeaked dolphin	0	2
WS	Whitesided dolphin	23	16
WS?	Probable whitesided dolphin	3	4

Distance and Angle experiments

One training session and two experiments were conducted. The first training (Figure 4) took place before the start of the survey, followed by an experiment mid-way and another at the end of the survey. The radar reflection buoy and radar had to be used in all cases because it was not possible to use the video range on the training and first experiment (see Cruise Log) and the same approach was used on the last experiment for consistency. During the training, each of the observers took it in turns to use the angle boards. Twenty trials for each pair of observers were conducted during the experiment. It was not possible to do a second training after the mid-way experiment due to increasing weather conditions and the difficulties with detecting the radar buoy. The ship was manoeuvred as much as possible to get a range of distances and angles.

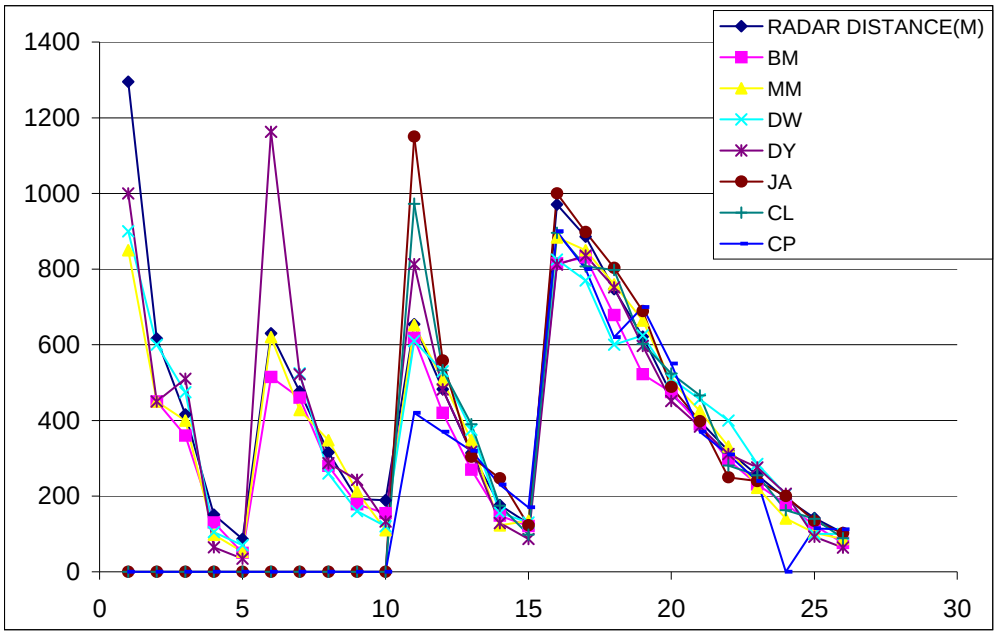
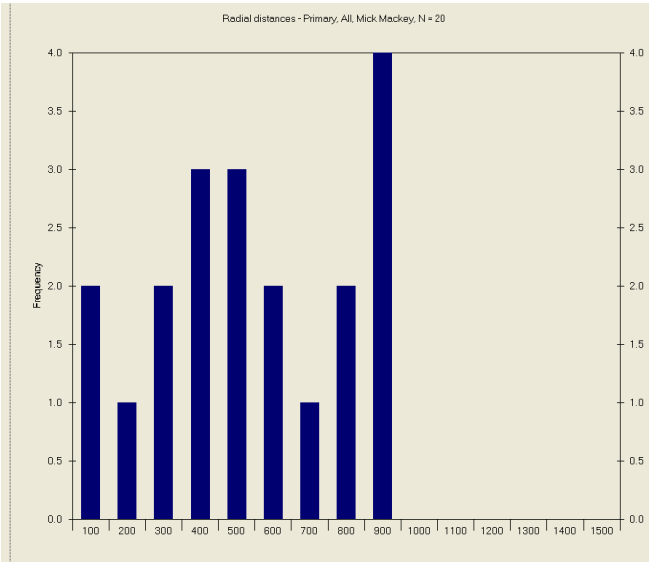
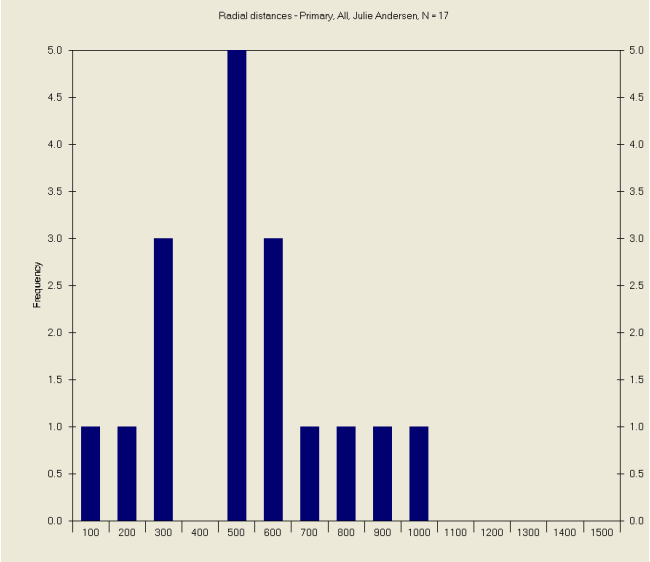


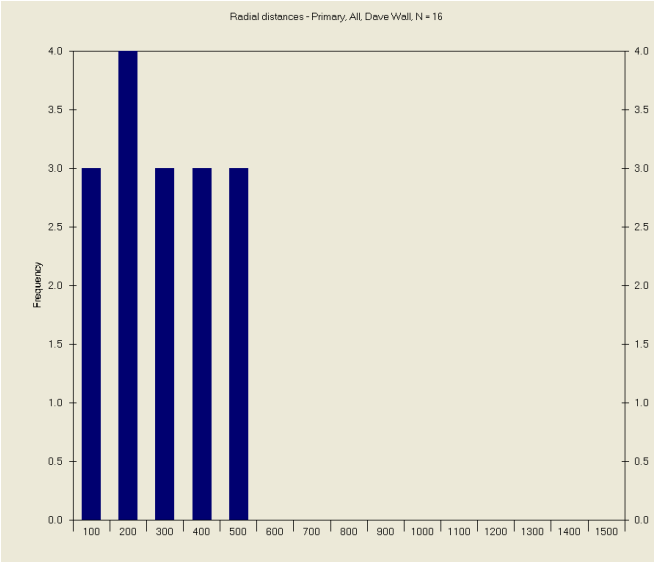
Figure 4: Distance training, June 28th 2005. The more "erratic" estimators were placed on the tracking platform; they also happened to be those observers with some experience of extended searching through binoculars.

Data Plots

Plots of radial distances were used to check the searching behaviour of the primaries to ensure they are searching, and therefore sighting, predominately within 500m. For example, radial distance plots (Figure 5) suggested that team 1 (top) were detecting animals much further away than team 2 (bottom); suggesting they may have been searching outwith the 500m sector. This allowed this potential problem to be detected and discussed with the observers.







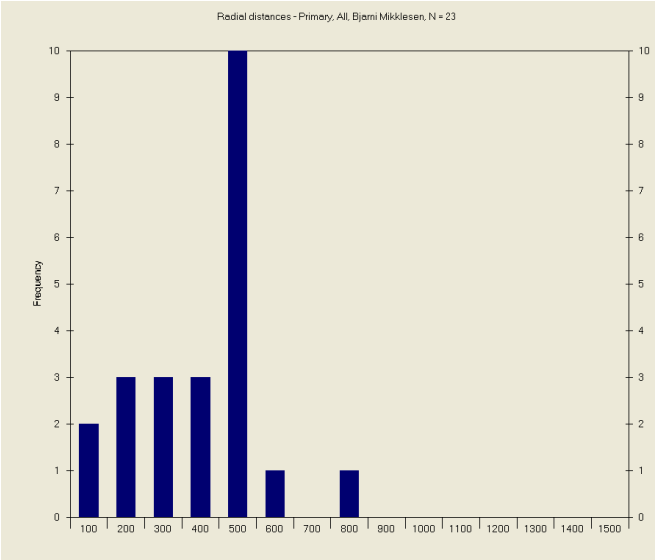
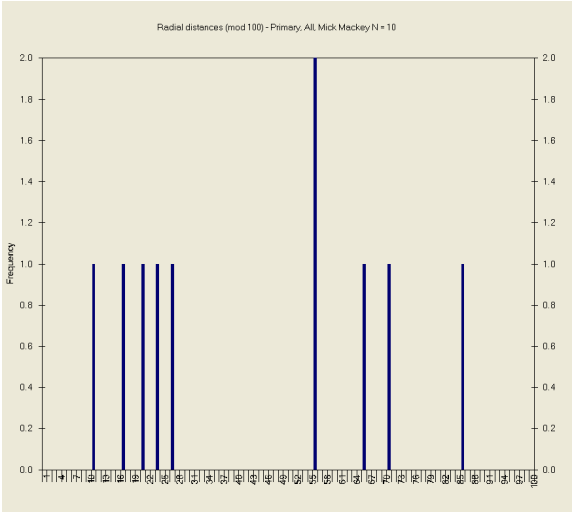
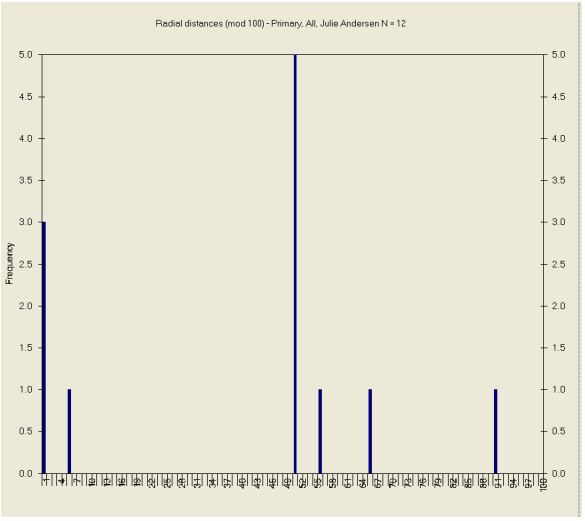
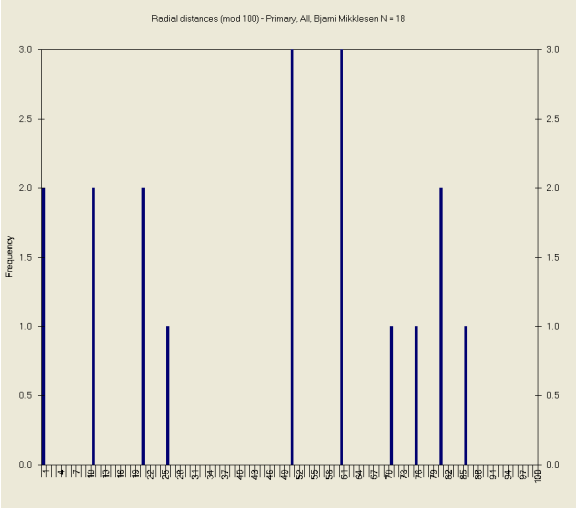


Figure 5: Radial distance plots for primary observations up to July 12th.

The data plot function of the validation programme was also used periodically to check the primary data for rounding of distances (e.g. Figure 6) and angles. Again, any problems were identified and rectified.







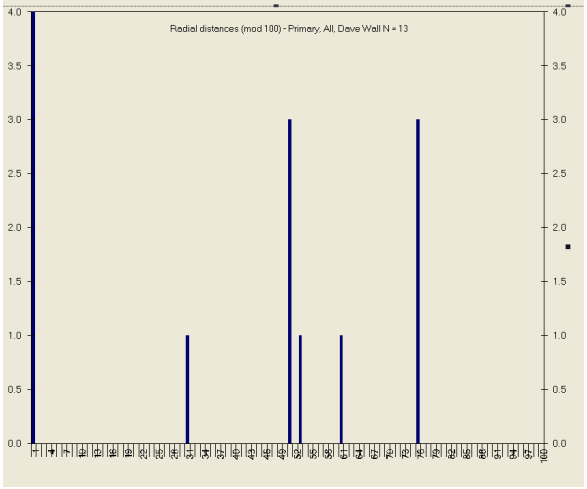


Figure 6: Diagnostic plots for primary observers: sightings from 29th June – 8th July 2005 inc.

Validation

The process of validating sightings was extremely time consuming. The program worked well the majority of the time. However, one problem was that it would not always show the re-sightings associated with a particular sighting even when you asked for “all records” to be shown. Both video and bearing images would occasionally not open automatically in the program; this was particularly true for the video. However, all data have been validated.

ACOUSTIC SUMMARY

Acoustic Technician: Mick Mackey.

Summary:

Acoustic surveys using RainbowClick and Whistle programmes were successfully conducted between June 30th and July 27th 2005. Acoustic data was collected in tandem with both double-platform and single-platform visual surveys. Additional acoustic surveys were conducted as the vessel steamed between the pre-determined transects lines, and when the hydrophone remained deployed overnight. All acoustic data collected during SCANS-II were backed-up on the Maxtor external hard drive each evening following the cessation of visual surveys. The associated Logger database was also backed-up as separate files on a nightly basis.

Hydrophone Position:

The length of the hydrophone was measured at the end of the survey and its approximate position behind the ship was determined. The distal end of the hydrophone (i.e. at the end of the depth sensor) was situated 180m beyond the vessel's stern.

Problems Encountered:

NMEA Server.

When the acoustic computer was switched at the start of each day, the NMEA server occasionally failed to recognise the COM port. On each of these occasions, I pulled out the GPS plug and replaced it again. This practice was enough to kick-start the NMEA into action each time.

Hydrophone Depth.

When the vessel was travelling at 10 knots the hydrophone failed to sink lower than 4-5m below the surface. As the survey had to be conducted at 10knots, the only way to lower the hydrophone was to apply weights. Weights were applied at to the end of the stabilising rope and halfway along the cable's length. The application of weights had limited success – the cable remaining at ~5m below the surface.

Weather-related Noise.

The relatively shallow position of the hydrophone's elements left it susceptible to the effects of the weather and the resulting sea state. During periods of relatively high swell (>1m) and moderate wind (>Force 3), both mid-frequency and high-frequency detections were affected. Towards the end of the trip, RainbowClick failed to cope with the excess weather-related detections and crashed as a result. On these occasions, I left RainbowClick idle until the ship slowed or the weather improved. Although Whistle was hampered by weather noise, it never crashed and was left on when the vessel was on survey or in transit.

Post-cruise Computer Crash.

On the completion of the final transect line (27/07/05), the acoustic computer began to make a humming noise and crashed. The computer was switched on and off a number of times without remedying the situation. The hydrophone and buffer box were then disconnected from the computer, allowing the successful back-up of the final day's data (except for the Click files of the 27/07/05).

GPS-extension cable Connection Corrosion.

When dismantling all the equipment at the end of the survey, the connection between the GPS and the extension cable was severely corroded. Care was taken at the start of the survey to seal the connections from the elements using electrical tape. This action appears to have been only partially successful.

Detections:

The following comments are based on the acoustic data that I managed to look at during the surveys.

RainbowClick.

Harbour porpoise clicks were detected on at least two occasions. Both acoustic encounters coincided with the visual detection of harbour porpoise

Whistle.

Mid-frequency detections of dolphins were encountered on a number of occasions throughout the survey. Acoustic encounters coincided with visual sightings of common dolphins, bottlenose dolphins, Atlantic white-sided dolphins, white-beaked dolphins and long-finned pilot whales. If the acoustic encounters were observed at the time of detection the associated Wav recorder was switched to continuous mode until the detection ceased. Specific identifications of visual sightings were generally included in the Logger's comments section. Additional detections of man-made noises

were also detected and recorded. The dates and times of cetacean vocalisations and man-made noises recorded during the first week of the survey are described in the pre-analysis table.

PROBLEMS & CONSIDERATIONS FOR FUTURE CRUISES

Survey design

Survey time was frequently lost by long passage times between transects. On the best survey day of the cruise, we lost four hours travelling to the next transect! Transects also ran overland (especially offshore islands) and into very shallow waters. These problems are a consequence of using a computer generated design and it would be worth investigating how these issues can be resolved for future designs.

Visual system

When the visual data system worked, then it was excellent! The visual data collection system was, in my mind, revolutionary and did aid the collection, collation and validation of the data in real time.

The manuals were excellent. I was able to set up the whole system on my laptop with the aid of the manuals (although they were a bit of a minefield!) and a lot of trial and error.

The buttons and webcams worked very effectively. The automation of angle reading should be used on future cruises, as it's a reliable and easy system to set up.

However, my view is that the system was not robust enough for the weather conditions encountered, at least on Mars Chaser operating to the west of UK and Ireland. The system worked well on the pilot survey and it appears that it also worked very well on the Skagerak vessel during the main surveys working in the "sheltered" area of the Inner Seas.

To highlight the problems with the visual system:

- Fragility of the connectors: the pins in the connector linking the DR laptop to the primary button box were very malleable. If the connector is forced and the pins bend/pushed into the connector, then the button box and audio may fail. This problem arose on Mars Chaser and caused lots of primary sighting pages to open in Logger.
- When shutting down Logger, we would frequently get an error page (the "blue screen of death"!). It was likely that this was a Windows problem caused by conflict within the system with the software, connections etc. to the laptop. This ultimately led to complete failure of our DR laptop's ComboBus card and loss of stbd webcam and camera.
- Cables (especially from cameras) would easily come unplugged. The system has to be rebooted once the cables are plugged back in which means some survey time is lost in doing this.

The number of problems could be reduced by:

- One of the observers should have a lot of technical/IT experience.
- More thorough testing on the pilot survey to collect larger volumes of data to ensure the system withstands it.
- Conducting a pilot survey in an area that resembles those likely to be encountered on the main survey.

Big Eye Binoculars

The BEs were extremely difficult to use when there was swell. The Mars Chaser BEs were damaged in transit and we had to use them as a monocular. In addition, the box containing the stand had been damaged and some parts to the mount had been lost in transit. The BEs on Mars Chaser were, therefore, particularly difficult to use.

The BEs needed handles. This was recognised after the pilot survey and a design discussed. However, the task of having them made was not clearly handed over and they never materialised. We made handles onboard ship, which did help in controlling the BEs. A designed frame should also have space for the buttons as they were cumbersome and difficult to reach attached on the BE stand.

The eyepieces were very hard and observers had to be careful not to get a bruised nose and eyes!

A rigid mount with BE is not workable in areas of swell. BE observers could not scan effectively and would frequently have to abandon them and search naked eye/7x50.

Video Range

The video on the 7x50 frame seemed to be much too low and there was little overlap with its field-of-view and that of the binoculars. Even after adjusting (bending) the frame, this made little difference. Consequently, few images captured animals and horizon.

Because of the difficulties associated with the BEs, the success of the Canon camera was limited.

The firestores were temperamental. The last week of survey effort the post firestore stopped worked (showing "stalled" on the firestore page of Logger). This problem is supposedly due to the camera not being connected properly. All connections were checked, yet the firestore continued to stall.

Validation

The program behaved strangely sometimes and did not show sightings or re-sightings that were in the database, even on request of all records.

Could not find video images (to be expected sometimes) or, sometimes, bearing images.

Due to a problem with the software, only the DR laptop could be used for validation of tracker and effort sightings. The key technical people were overloaded with tasks prior to the survey and in future surveys, tasks should be more strictly delegated to ensure that there is adequate time for the technical persons to check crucial survey software and kit.

It would be good if more than one table at a time could be looked at in the validation programme. For example, we would frequently get the error that the sighting numbers of a duplicate would not correspond in the primary and tracker tables. It would be quicker if you could open the other table and make the necessary change rather than closing one, opening the other and the re-opening the original.

Networking

Our network hub was faulty and we could only network from the DR laptop to one other using a cable for direct link. Every effort should be made to test all crucial equipment prior to the survey on future cruises.

Theory v practice

During the training, there were several "conflicts" between cruise leader and observers in the early stages due to the "rigidity" of the manuals. Two cases in particular which observer's rebuked occurred where the manual stated:

1. All surfacings should be recorded as resightings: CL stressed that this was, in practice, not feasible. If the resighting button is pressed for every resighting when they are occurring in very quick succession, there is no time to give even the basic information. It is also not recorded because the continual button presses interrupt previous recordings. I told my observers to be sensible and press the resight button only after they have ensured the basic information (resight, reticle) had been given.
2. Trackers should work together and only track one animal/group at a time: I preferred that the BE would not cooperate with the 7x50 tracker when they detected an animal/group. The 7x50 binoculars are much better for tracking and if a group is detected then it's best to keep on them. It would be fruitless to have the Big Eyes try and help. It's more effective to keep the BE searching ahead and if they detect a group, have the 7x 50 tracker help as they move closer. In this way, it would be possible that two tracks are happening simultaneously. The 7x50 tracker would sometimes ask the BE tracker to try and find the animals to help with identification.

Whilst discussion on the above points showed that the observers read the manual very well (!), they were argumentative and reluctant to adopt the approach I suggested. To resolve it, I had to speak to David Borchers to get his approval on my approach.

The definition of group and subgroup needs more clarification. The suggested manor to deal with large groups in the manual is not sufficient. Also, the procedure for trackers regarding group size and subgroups size in terms of entering the data on logger needs clarifying i.e. manual says (p 12) to get total group size and individual subgroups on commentary but its not clear how this would be entered into the database via the data validation system if you are only tracking one of the subgroups. This will be crucial for surveys where large groups of delphinids are expected.

CRUISE LOG

Monday 27th June 2005

Breakfast at 7:30am.Waiting for shipment and one observer to arrive. Other observers reading manuals. Shipment arrives 10:30 – big eye stand missing and big eyes damaged! Not a perfect start! There is no wood onboard for primary shelter or seating so I have to go shopping with the ship manager. Return 14:00 with all items – you have to go a long way to shop in the Faroe Islands! Afternoon is spent setting up the platforms and measuring platform and observer heights. At 9pm settle down to the observer presentation. A discussion on the methods ensues, especially about "what to do if…." scenarios. Finish 11pm and observers off to bed.

I set up DR laptop with vessel specific settings and plan for the following day – hope to do distance experiment using radar and/or video range in the afternoon. If all goes well will continue to the start of the trackline ready for Wednesday morning. Forecast is west-southwest 3-4 so not too bad.

Prepared waypoints into degrees decimal for captain & next of kin list.

Bed was sometime past midnight.

Tuesday 28th June 2005

Spent the morning in Midvagur harbour completing the platform set up and setting up all visual equipment. Switch on for testing and some training given to observers in port. Leave port at around 3:30pm and head east through the fjords to find sheltered spot for distance training. Test button presses as data checks and other species for practice. Today's data should be removed from db and not used in analysis.

Distance training – attach Percy porpoise to buoy with radar reflector. Hope to be able to use video range technique for distance training. Four observers on the primary and 4 observers (including CL) on the tracker: CL at the DR station to collect video information, one tracking with 7 x 50, one with laser range finder binoculars (courtesy of one of the observers) and the other writing down the distances in communication with the bridge from the radar. After 10 trails, it was still not possible to use the video range kit – the image was not showing on the screen. So, radar alone was used. All observers were on the primary platform for a further 16 trials.

After the trials, we had to go to Torshavn to pick up the repaired bridge plotter. Arrived at 8:30pm and so we were able to get ashore for an hour. As soon as back on board, start steaming to start of transect 117. It's a 12-hour steam but hope to be on station by 10am tomorrow morning.

I look at the results of the distance training to help decide the best persons for the primary and tracker platform. As expected, the training shows that all improve as the trials progress. However, some observers are clearly more "erratic" distance estimators than others and I assign these to tracker platform. None of the observers showed clear sign of bias in their estimates.

Wednesday 29th June 2005

6:00am breakfast, aiming for a 7:00 am start. Three hours are available for training on passage to the start of transect 117.

I decide observers for each platform, taking into account their experience, wishes and yesterday's training:

Primary: Pair 1 = Bjarni Mikklesen (BM), Dave Wall (DW); Pair 2 = Mick Mackey (MM), Julie Andersen (JA)

Tracker: Kelly Macleod (KM), Claire Lacey (CL), Dylan Walker (DY) and Claire Pollock (CP).

Observer training takes place on passage to start of 117 and 3 primary and 1 tracker sighting are made. We arrive on station at 10am but experience some problems with the visual equipment (mainly camera related). Whilst fixing, we deploy and test hydrophone.

We can finally go on effort at 1pm; seastate was 3 but quickly climbed to 5 and so we are off effort by 3:30 ish. Keeps climbing to 7. It should be noted that the primary starboard observer couldn't search the full 10ºport to 90º starboard because of the leg of the tracker platform obscures. However, the effective search sector is still 10ºport to 85º starboard and so the obstruction is minimal.

Spend the afternoon doing validation training until 8-ish. Two problems encountered concerning validation:

1. The validation programme looks for an older version of a file created post pilot survey (April).
2. Personal computers are asked for "frame.network" file when the validation programme is installed on their PCs.
3. Network hub is not responding although computers can "see" each other just through a cable.

Most people had to retire due to a little seasickness and so problems will be fixed tomorrow. One Maxtor was set up for the DR computer and the days data backed up. Still needs to be validated tomorrow.

Thursday 30th June.

Breakfast was 7:00 am. Call Russell to find solution to afor mentioned problems. Number one has to be solved by renaming the db on the DR laptop to its name during the pilot survey before validation is attempted (ridiculous name! "Skagerak(Russels_takehome_edits_version2)" or something similar!). Subsequently, tracker data can only be validated on the DR laptop. Primary and effort can be validated via network to acoustics PC and/or other laptop.

6am forecast was not good and so I thought it unlikely that we would be able to work. However, wind is still SE and behind us if we head west. Decide to take transect 118 westwards to northwest Hebrides. Seastate is predominantly 4 but occasionally 5. Decide to continue on effort as it's good practice and we have very little data and therefore, no validation to finish off. All observers are keen and already acquired their sea legs!

Weather decreases over the day and so it was possible to complete transect 118 by 19:30. Have a safety drill with the crew and then a team briefing to discuss the day. It's the first day of proper operation and it's clear that some observers are still unsure about parts of the procedure. Later, the data are backed up and validated. Only primary can be validated - remains a problem with the tracker and effort datasets. Will be resolved tomorrow. Bed at 11: 30 pm – an early night!

(Our Estonian chef is running out of vegetarian ideas! I make him a recipe list although fear will have to do a turn in the galley before the 5 weeks are over!)

Friday 1st July.

6am breakfast. Seems to be problem after problem today. Start at 7am on track 119. However, logger problems in that it can't find the database and forms vanished! I retrieve the backed up version from last night and copy into the DR logger folder, deleting all other databases. Problem solved.

Only about an hour on effort when the rain comes down. Off effort – decide to try and play with hydrophone. It's towing much too highly in the water coloumn; 2 or 3m as opposed to 7-8m. Try tying on lead weights at the end and mid-way along cable to make it sink.

Back on effort after the rain has passed but very briefly before reaching end leg 119. This transect received very little coverage.

During this period, primary button box stops working. I check all connections and reinstall the card using Inscal. Still not working – the problem is much simpler! One of the primaries forced the cable to connect and bent the pins! So, I had to have my first moan at them! They did set about fixing it and straightened the pins. All working again by time back on effort at 12:50. Decided to bag the primary box, allowing us to keep it connected at all times.

I call a cruise meeting in the evening. Lots of complaints regarding the big eyes and observers do not want to use them. Have suggested we try and find a solution to making them easier to use and then reassess. Also reiterated the importance of searching far ahead.

Weather forecast at 18:00 is force 4-5 increasing to 7, gale 8. Decide to go down transect 115 doing acoustic survey. Wait at the end in the morning and see what's happening.

Saturday 2nd July.

Wake at 5:45am to check weather. Looks ok – Force 3, low long swell. Wake everyone and ask skipper to turn about at the end of 115. Early morning forecast still giving gale warnings but decide to head northwest anyway. After 3 hours surveying rain comes in and we go off effort. Mid-day forecast says "severe gale soon" for Hebrides so we decide to turn ship around and run to St. Kilda.

We get caught on the way back – it's amazing how quickly the sea builds. I sit on the bridge with the Mate for the inward journey; sea pounding at the flanks of the ship and spray drowning the bridge. At 6 nm from Kilda, the islands aren't visible! We only see them when almost on top of them. Go to an anchorage and glad for the shelter from a severe gale force 9.

Bjarni and I make handles for the Big Eyes – we hope this will make them easier to use. Did the days data backup and validation. Don't seem to be having any luck with the video yet. I guess in sea states 3-4 it becomes incredibly difficult to pick out the animals. Also, I keep repeating the need for quick and clear commentaries but it doesn't seem to be hitting home! Will talk with observers again about it tomorrow. Also, the lag in time between the observer rotation and the information being stored in logger is too long due to the slowness of observers in giving weather assessment. I have insisted that the DR about to leave the post fill in the new observer posts as much as possible and then the replacement DR just checks and then stores. The new DR then fills in another effort form with weather information but stored under weather change code, 4.

The wind is very strong and increasing. Anchorage is deep – we keep drifting! Not going to be a very restful night. The 6pm forecast is giving 7-9 in Hebrides for the next twelve hours but easing in Malin. We'll see what the 6am forecast brings and decide to make a run south or just shift anchorage and sit it out.

Bed at 11:15pm.

Sunday 3rd July

Up at 6.00am to hear weather forecast. Don't really need to because can see for myself! Storm force 10 – unbelievable! Even in our little bay it does not offer complete shelter and the wind is whipping spray over the ship. The ship is also drifting on its anchor and so a single engine is kept on to keep us in a safe position. Captain is keen to move to the anchorage on the other side of the island but the wind is still blowing from the southeast.

So, at anchor for the day. The trackers go through the data and look at the video in more detail. There appears to be a mismatch between sighting times and video file times suggesting the firestores were not set up properly on the first 2 days of surveying. For example, on Thursday a sighting at 14:45 was labelled 15:11 on the files from the firestore even though the video clip start time corresponds with the button press time. I corrected Friday morning and now the timing match is good.

Primary sightings also have a problem, probably linked to the damage done to the primary button box cable on Friday. The sighting numbers in the database are not in the right order and rows 24-26 not present. It was at 23 when the button box stopped working. When it was fixed, it started at 27 and this matched the number on logger. No sightings have been lost, but the sighting numbers have jumped. Will keep a check on this on the next survey day.

Monday 4th July

Leave the anchorage at 10am and head out to transect 110. Very bumpy; very big swell. Cannot do any surveying and just sit at the start line, waiting for tomorrow and hoping the swell will drop. Many people feeling a bit sick due to huge swell.

Tuesday 5th July

6:00 am breakfast, 7:00am start. Weather is excellent compared to the last few days! The swell is still quite big and long but manageable. Low seastates all day. A few sightings, mainly whitesided dolphins. Had major problems with the primary button box. It began opening pages randomly and so lots of mistake forms in the database. Decided to unplug and try to fix this evening – but I'm no electrician! Managed to complete transects 110, 111 and start 112 today. Saw three basking sharks off the southern Hebrides – a very nice sighting! We finish surveying at 21:15pm and then do the backups and start validation. Don't want to work on too late because early start tomorrow – I feel everyone is really tired already. Just trying to stand up in heavy seas and swell really takes it out of you.

Wednesday 6th July.

Up 5:50am. Weather not great so all get an extra hour in bed! Do validation – seems the videos were plugged into the wrong firestores yesterday! But additional to that, the video seems to take some images and not others? It materialises over the course of the day that the cameras were unplugged yesterday and then plugged back in but Logger not rebooted! I'm beginning to feel like I have to be on the platform constantly to watch what's occurring…

We fix the cable and primary button box. Also fix the networking problem so we can at least have one laptop networked to the DR laptop. Our network hub is duff and useless!

We get some survey effort in at 5pm but the swell is massive! Transect 112. Single platform only. Sea state veers from a 3-5. End at 8pm ish due to rain.

Thursday 7th July

6:00am breakfast for 7 start on the platform.

Off northwest Ireland heading out on 113. Seastate good but still a very big swell and fog patches. Everything running smoothly today except for the weather. Transects 113 and 108 completed but predominantly in primary platform mode. Had some common and whitesided dolphin sightings. An incredible minke whale sighting quite close to the ship.

Finish about 7pm due to thick fog. About 10nm from the end of 108 but will reduce speed and finish it with the hydrophone still in tow.

Friday 8th July

Breakfast 6:00am, aiming to start at 7am but raining. Eventually get on effort at 8am and complete 109 by 11:30am.

Resume effort after lunch at 12 but only for an hour. A nice sighting of a bottlenose dolphin, quite close to the ship during this period. It leapt clear affording all a good view. Off effort just before 1pm because of fog. We finally have calm seas but we just can't see!

At about 14:00 we resume effort until 17:10. Patchy fog and mainly single platform effort along transect 106. I'll try and redo on the northward survey. We resumed effort at 18:15 after dinner but only until 19:15 when the fog descended again.

Hoping for a better day tomorrow although the forecast is much the same. Finished work about 21:00 and then all settled for a DVD and tot of rum! (Friday night after all!). Good atmosphere onboard and all working well, although all

very tired. We've had a tough couple of weeks battling with weather and few sightings. The lack of encounters off the Outer Hebrides didn't really surprise me as I saw very little when I worked out there 1998-2001. It seems outer shelf of Ireland is much the same.

I'm planning a port call for next week – perhaps Wednesday if the forecast says this isn't going to be the only good weather day of the month! Hope to get into Galway on our northward track but will have to take on a pilot. Will find out more tomorrow.

Saturday 9th July

A slow start to the day due to fog. We started on transect 105. However, by the afternoon it lifts and perfect seas – just no animals! It seems the outer shelf west of Scotland and Ireland is as baron as the southern North Sea! We finally get a sighting at about 16:30 of a group of 20 or so bottlenose dolphins. After dinner I call a meeting, as there seems to be lots of discussion amongst the observers on how they should or shouldn't have handled the sighting. That is a problem that cruise leaders have in that they are sometimes excluded from discussion amongst observers which may lead to them thinking they can do things a certain way. However, clarified everything. I guess part of the confusion comes from the fact that this was the first encounter we'd had with a "large group" since starting the cruise. However, I'm sure we are in for some more as we go further south tomorrow.

Another early start tomorrow and hope to finish all remaining legs of the southward survey 1.

The validation is very slow. Without the hub working, it's taking the observers ages to go through just a few records. It's painful! We are only able to network to one other laptop without the hub and this can only be used for primary and effort data. All tracker validation must be done on the DR laptop because of the problem with the software.

Sunday 10th July 2005

All up for 6:30am but the fog is still with us. At the start of the short leg 104 so I decide that we'll take the 3-hour steam west to the start of the longer transect 101 & 102 in a vain hope that the fog may be less far offshore. How wrong can you be! It's like soup everywhere.

We spend the morning finishing validation and I begin to go over the videos again to see if there is any more that are of use before deleting some of them. Finally get on effort at 2 ish but mainly primary effort. Some great bottlenose dolphin encounters and tracks. We also saw several blue sharks and the number of sunfish we've seen this trip continues to grow. Off effort again at about 17:00 because the fog is back.

Sunday dinner at 17:30 – we love Sundays! It means we get wine and ice cream! Still can't see further than your own nose outside and so not surveying after dinner. We decide to have a game of "Mars Chaser basketball" and skittles on the aft deck. The girls come out as the champs of course.

Hydrophone brought in at 20:30 and tomorrows rota is prepared. Very little validation from today so I let them (and me!) have a night off!

I almost can' t bear to go to sleep tonight for fear of waking and seeing the fog at the porthole again. It's strange living three days of your life bobbing about on a ship trapped in a grey bubble.

Monday 11th July 2005

Up at 6:00am. Fog is clear and it's a glorious day! Wake everyone and begin effort at 7:00am on leg 102. Compete this and leg 103 by 16:00. Not that many sightings considering the perfect sighting conditions so I guess this is indicative of the low densities of animals in these waters.

It's a 4-hour steam to the start of the new leg and so we do validation in between. Start leg 202.

Tuesday 12th July 2005

Morning starts well with clear skies and calm seas. Up at 6:00am and on effort for 7:30am. Problem with the USB card combo and so we've lost the starboard webcam and camera. Speak to Russell who reserves a replacement card for me to pick up in Galway tomorrow. So, critical that all angles read off the angle board and reticles given. Finish leg 202 and then a couple of hours off to the next leg. See pilot whales on route.

Fog comes in the afternoon so off effort. Resume at 16:00 till 18:00 and get 201 finished. Short passage to 203 but seastate really builds and was became a 5: off effort. We steam along 203 slowly with the hydrophone out but no visual surveying. Will return here for Friday.

Head towards Galway for our day off!

Wednesday 13th July.

Half landing! Alongside in Galway at 11:30am. All have lunch ashore and then disperse to shop, walk around etc. Meet for night out at 7pm – go for beers, curry and club! Great night – all have a good time! Back onboard ship about 2am.

Pick up new Combo Card and try to get it working – no joy.

Thursday 14th July.

Out of the lock by 11am and head toward islands in the Bay for the distance and angle experiment. Quite choppy so need shelter but if we don't do it here then don't know where else we can do it because we'll be offshore. Find some shelter and run the distance and angle experiment with 2 primary observers at a time. I have to use the radar again and the buoy because we can't use the video without the card combo working. Complete 20 passes of the buoy for each pair of observers. When finished we head out to the start of the next transect – will be in position by morning.

Laptop sees the new card but still can't use it – giving error that not enough resources for the device. Clean up hard drive and phone several people for help but not getting any response!

Very bumpy sea with a confused swell. Awful!

Friday 15th July

Start at 7:00am. Big swell but sea state is quite good. Everyone's feeling a bit shaky – the swell is uncomfortable and turning us green! We plod on for the entire day though and get transects 203 and 204 completed. Stop at 1800.

I receive an e-mail form Russell re. the Combo card problem. It seems it's likely to be a software problem with Windows and the only solution would be to reformat the hard drive on the DR laptop. Have opted to try and get the system working on my personal laptop; if it works we'll use it and if not we'll carry on with the DR laptop but without obviously without a starboard camera and webcam. Spend the evening installing drivers etc. and trying to figure out how it all works! The observers are validating. We had a busy 5 minutes this morning with lots of common dolphins. Other than that, a very quiet day. Seems this area really is quite empty!

Saturday 16th July

Start at 7:30am to give me time to try out my laptop instead of the DR laptop. Get the counters, buttons and sound cards working but still missing GPS and starboard webcam and firestore. Decide to use the DR laptop for the first transect 205. Very quiet morning with hardly any sightings.

After 205, have a 2-hour steam to 208. I try setting up my laptop again. Get all working briefly before the firestore causes crash. Decide to disable the firestore port and leave everything else set up. Will use my laptop from now on as at least we have the stbd webcam back and so it's superior to the DR laptop. Quiet afternoon again with few sightings. Weather is good until after dinner when he fog sets in. All observers are looking a little disgruntled – hardly surprising giving the continued run of weather problems and working in what appears to be a low density block. It would be good to have a social night but when you have to be up at 5.45 every morning it gets exhausting!

Sunday 17th July

A foggy start to the day but at last, we get underway about 10ish. Mainly single platform because of fog patches. However, sea state continues to build and we're off effort early afternoon. It gets really bumpy and all we have to look forward to is our Sunday dinner! Sunday's are traditionally ice cream and wine day! We also make it our party night (the weather usually obliges by being reliably rubbish!) and tonight we have a mini "fame academy"……

Monday 18th July.

Still sat at the start of 206 with bad weather. Sea state 7- gale 8. Forecast is the same for all areas, i.e. Shannon – Fair Isle, and so there is no where to go. Just have to wait. The swell must be 5-6m because as we stand on the aft deck watching it approach. It looks taller than the ship! Incredible.

Tuesday 19th July

The weather is still raging but showing some signs of easing. The mid-day forecast promises a decrease to sea state 4 later and so by the morning we should be ready to start again.

Making sure all the validation is complete. The program behaves strangely sometimes and doesn't show sightings or resightings that are in the database. Sometimes, it also does not open the audio files or bearing images. The bearing images that could not be opened through the program have been stored in two folders "Lost Webcams" on the DR laptop and "Lost webcams ii" on the new DR laptop (mine). (later all backed-up into one folder "Lost Webcams" in Final Backup on the visual Maxtor).

Since swapping DR laptop, we are also having trouble networking again and can't get past the password stage. Trying to contact Phil LeFeuvre in SMRU to see what he suggests.

Wednesday 20th July

Start at 7am. Weather not too bad – at least there is less swell than I thought and sea state about 3-4 although increases to 5 for a time.

Start and finish leg 206. An amazing encounter with a mixed group of pilot whales and whitesided dolphins as we were setting up the tracker platform – typical! Noted it in the incidental sightings form. Whilst on effort we had an encounter with fin whale and then a few minke whales.

At the end of the track we had a two our steam to the next transect. I played with the video and firestores again and finally got them working! Just fiddling with COM ports and moving things around – what a game! Hopefully they will continue to work until the end of the trip. Still using my laptop as DR laptop as I haven't received the all clear from Doug with regard reformatting the original DR laptop. However, this is fine given everything is now set up on my machine. The only problem we have is that we have trouble networking to my PC.

We finish transect 211 at 19:35 and pack up. Have a meeting in the mess at 19:45 to discuss the day and plans for tomorrow. Forecast is predicting a force 3 – please, let it happen! I hope to be able to head northwest and get off west of Outer Hebrides by the end of the day.

Had one problem today with the counters and Logger. It opened 10-20 pages for each of the primary and tracker platforms. All had a mistake code and Logger closed and rebooted. No apparent problems after this.

Thursday 21st July.

A full day; we start at 7am and survey until 22:30. However, very few sightings and these were predominantly grey seals. The evening saw the best weather conditions with seastate dropping to 1. Finally we sight a porpoise! It's in deep water and not detected acoustically. Complete transect 210 and almost make it to the end of 209 before the light goes.

Friday 22nd July.

Start at 7:00am and heading into Hebrides on track 214. Then turn northwest along 213. Unfortunately we are heading into the swell and it makes the Big Eyes impossible to use. The "spare" tracker stays on the platform and observes with a combination of naked eye and 7 x 50s, helping the DI. Complete this track before dinner and then turn and finish 212.

Quite a good day in terms of weather and sightings. Weather began sea state 4 but decreased to 2. However, swell in the range of 2-3m. Many white sided dolphin groups, all associated with gannets. Feeding and calves observed. Sightings occurred both on the continental shelf and in deeper water. Finished 212 at 19:40. It was an hours steam to the start of the new transect and so decided to call it a day. Quite a bit of validation to do and only my laptop (the now DR laptop) to do it on. Despite a number of messages left at SMRU and attempts to contact IT, no response! We are unable to network my laptop because of a password problem.

Saturday 23rd July.

It's "porpoise day"! Finally we catch up with the little fellas! Visual and acoustic detections. Start at 7:00am on transect 218, heading east towards the Orkney Islands. As well as encountering porpoises, we see several groups of Whitebeaked dolphins also. Had to add a code to logger for "probable Whitebeaked dolphins" (WB?). We finished 218 by late afternoon and continued onto 217, heading northwards. Weather has been good all day and so we survey until 21:15, partway along 217. End survey, back up and some validation is done. However, all pretty tired and head to our bunks by 23:30. Another 6:00am breakfast tomorrow....

We have a new observer in our ranks...."Mr Fibble" (he's actually just a stuffed sock with electrical tape for eyes and a manic grin. He ain't popular with the ladies.....!).

Sunday 24th July

Up 6:00am and start survey at 7:00am. Heading northwards trying to complete 217. However, quite strong wind heading northeast so more or less on the nose. Seastate is 5. I stop effort at 7:40am and decide to head east to take us onto transect 117; this is one of the southbound legs of survey 1 that we hardly covered. When we reach the line and head south, the wind is behind us and seastate is 3-4, dropping to 2.5 as we near the Northern Isles. A few sightings on route of dolphins. Transect 117 was finished at 14:30 and then we headed north again back to the end point of 217 this morning. Hoping that we can finish the leg off this evening when the wind tends to drop.

Wind still quite strong. Sea state 5 so no survey effort.

Monday 25th July.

Up at 6:00am and optimistic for a 7:00am start. Sea state is 5 and big swell so no survey effort.

Tuesday 26th July

Must have been the longest day ever! Big swell and seastate was mainly 4, 3 at times. Lack of time pressed us to go on and try and get some coverage. The swell and seastate had improved by late afternoon. However, not a single sighting! What a long day! Completed 215, 216 and 120.

Should be the last day of surveying tomorrow. I hope for a great day so we can end on a high…….

Wednesday 27th July

Start at 7:30am. Weather not great. Mainly 4, at times 5. Does decrease into the afternoon. Lots of whale blows in the morning which are probably fin whales, although a few unidentified. We finish the last two northern most transects by 6:30pm.

Weather forecast for tomorrow is still N-NE 4 to 5, so I decide that we might as well head back for the Faroes. We have managed to get some effort on all transects which I think is pretty good given the weather we've had. We'll do the final distance experiments tomorrow.

Thursday 28th July

Approaching the Faroes early morning and arrive at the site for distance experiments just after 10am. Use the same procedure as mid-way experiment: radar and two observers at a time on the primary.

Finish at 2pm and head for Midvagur, the ships homeport. It's the end of the line....

Pack all kit up and ship owner picks it up, ready for shipment on Monday back to SMRU.