R1/12

Not to be cited without prior reference to the FRS Marine Laboratory, Aberdeen

FRV *Scotia*

Cruise 0907S

Report

6-26 June 2007

Personnel

A McLay (In Charge)
A Weetman
N Campbell
L Allan
M Burns (Part 1)
J Drewery
C Shand
J Elson Visitor CEFAS (Part 1)

Objectives

1. To obtain estimates of the abundance and distribution of *Nephrops* burrows in the Fladen Ground, the North Minch, the South Minch, Stanton Banks and the Firth of Clyde. If time permits stations in the Sound of Jura, the Noup and at Devil's Hole will also be surveyed.

2. To use the TV footage to record occurrence of other benthic fauna and evidence of commercial trawling activity.

3. To collect sediment samples at each station.

4. To carry out *Nephrops* trawling, one haul in each sediment stratum in each of the main survey areas, and to obtain samples for size composition analysis and biological features.

5. To collect samples of *Nephrops* for comparison of reproductive condition and morphometrics in different survey areas (functional units)

6. To conduct video transects in the Buzzard Field site as part of data required baseline data for the Serpent Project.

7. To further test the Visual Works software and recording equipment for future use in *Nephrops* UWTV surveys.

Outurn by project: 21 days RV0707

Narrative

Scotia sailed from Aberdeen at 9.40 on 6 June and arrived at the Buzzard Oilfield at 14.30. Three deployments of the underwater TV (UWTV) sledge along transects in the vicinity of the rig and manifold and a fourth in the adjacent control area were completed by 18.30.

Scotia then steamed to the SW corner of the Fladen Ground where the *Nephrops* burrow UWTV survey started at 19.30. Early problems with the mini-grab sampler were resolved and three TV survey tows were completed before midnight. Work in the Fladen continued over the next 5 days. Weather conditions and visibility were generally good and 67 UWTV tows were successfully completed. Sediment samples were obtained from all survey locations. Four fishing tows (duration ca. 90 mins) were conducted, at least one in each of the mapped sediment strata.

Scotia left the Fladen on the morning of 11 June, steaming through the Pentland Firth and around Cape Wrath to arrive at the first station in the North Minch at ca. 21.00. Three UWTV survey tows and a fishing tow were completed by 01.30 (12 June) and the survey continued on the east side of the North Minch throughout the night and the following day. Two survey tows were aborted because of rough ground and further tow was curtailed because of a trawler fishing in the area. Nineteen UWTV tows and a further fishing tow were completed before weather conditions (a northerly wind) precluded further work. It was decided to move to the South Minch which would be more sheltered. A course was set and Scotia arrived on station on the east side of the South Minch in the early hours of 13 June.

Worked continued but throughout the night but tows at three of the first seven stations had to be abandoned because the substrate, which although mapped as soft, was found to be unsuitable for sledge deployment, particularly in the Sound of Canna. Work in the morning of 13 June was delayed to allow for repairs to camera and odometer wheel. Fourteen UWTV 14 tows and one fishing tow on the east side of the South Minch, and a further 5 stations on the west side, finishing at Barra Head, were completed by 14.30 on 14 June before Scotia headed for Stanton Banks.

Work at Stanton Banks started at 16.00 on 14 June and was completed by 02.00 on 15 June. Scotia then headed for the Clyde arriving on station at 13.30. Conditions were poor and visibility limited, but 7 UWTV tows in the outer area of the Clyde and one 45 min fishing tow west of Ailsa Craig were carried out before Scotia headed to Greenock for the half landing on 16 June.

Scotia sailed from Greenock at 08.00 on 17 June working at stations at the top of the Clyde and then down the east side. A 2nd fishing tow (40mins) was carried out at ca. 21.30. Weather conditions were good and the survey of stations in the Clyde was completed by 23.30 on 18 June.

Scotia then steamed round to the Sound of Jura where 10 UWTV and 2 fishing tows were completed by 17.00 on June 19. Thereafter, taking a course through the Firth of Lorne and the Coryvreckan, Scotia proceeded to the South Minch, where tows at the remaining UWTV stations and a second fishing tow were completed by 24.00 on 20 June. Thereafter, Scotia returned to the North Minch picking up remaining southerly stations and those in the Torridon area before working at stations on the west side during 22 June.

Before leaving the North Minch, 8 sediment samples were obtained using the day grab from an area in the northern North Minch which is fished by *Nephrops* trawlers but which is not mapped as having suitable sediment according to BGS chart. Scotia then steamed to the Noup to complete 11 UWTV stations and 1 fishing tow before returning to Fladen, arriving east of the Holes at 18.00 on 23 June. Three exploratory UWTV tows were carried out in an area of sediment in the NE of the Fladen ground in an area of sediment not included in the stock assessment and not included in previous Scotia surveys. Thereafter, UWTV tows were conducted at a further 10 additional stations within the main ground.

Because of deteriorating weather and with time in hand, Scotia left the Fladen mid-afternoon on 24 June and headed for the Moray Firth. The intention was to survey the outermost stations of the *Clupea* UWTV survey planned for July and to take advantage of *Scotia's* fishing capability to obtain samples of *Nephrops* in the Firth. In the event, weather precluded use of the UWTV sledge. Two fishing tows were conducted. The first in 90 metres was successful. During a second tow in the Southern Trench on 25 June the trawl was damaged beyond on-board repair. In view of the deteriorating, weather *Scotia* steamed for Aberdeen, dodging off Fraserburgh before entering port.

Survey positions and sampling summary

The number of UWTV tows and fishing tows carried out in each of the *Nephrops* functional unit are summarised in the following table and realised tow positions are shown in the charts below (fishing tows are shown as a blue line).

Area	Number of UWTV tows	Number of fishing tows
Fladen	82	4
North Minch	38	2
South Minch	41	3
Stanton Banks	9	1
Clyde	42	2
Sound of Jura	10	2
Noup	11	1

Nephrops burrow counts from over 50% of 233 relevant UWTV recordings were completed, independently verified by two trained staff members, whilst at sea. Analysis of the TV footage and work up of the data will be completed at the Laboratory.

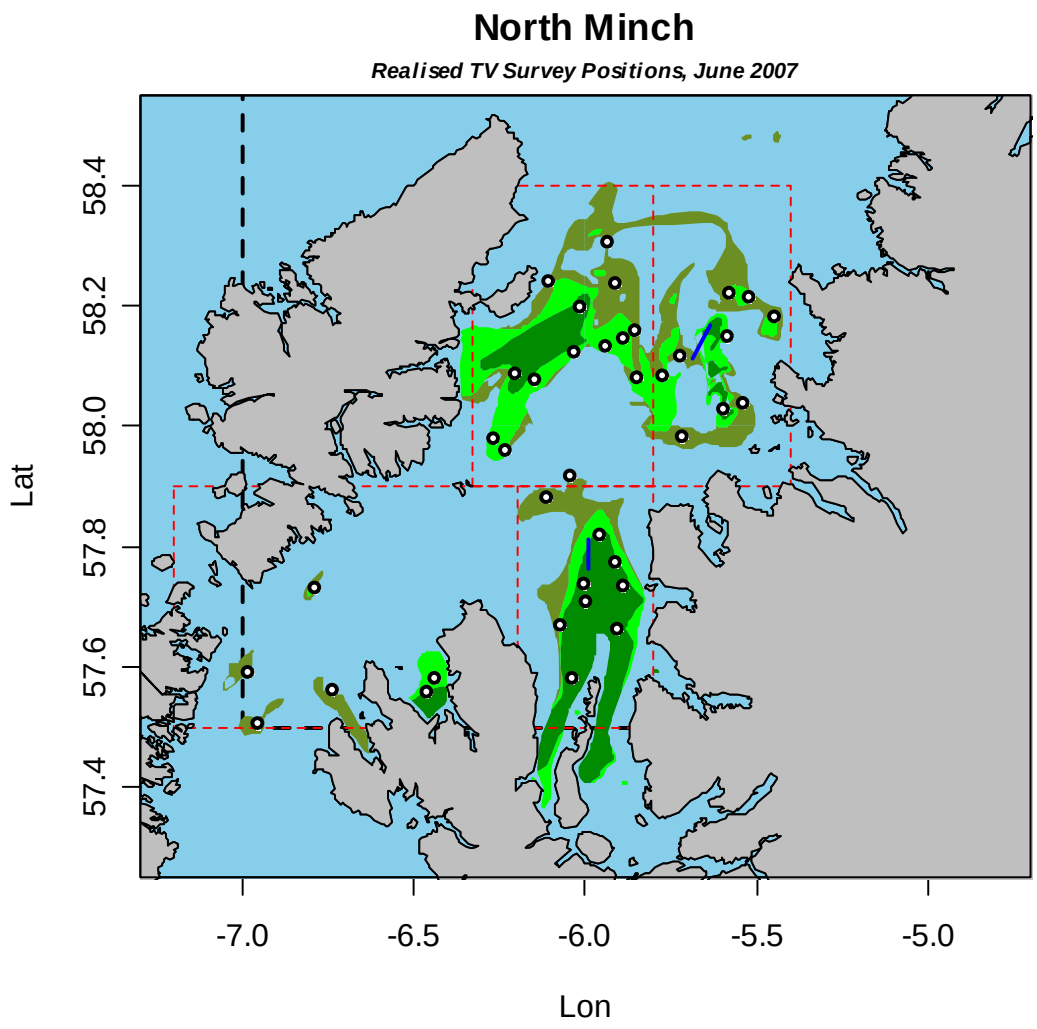
The majority of survey tows were recorded using Visual Works software. Recordings of the quality required to accurately identify and count *Nephrops* burrows were not achieved even under good visibility conditions. Other seabed features and fish were, however, clear discernible.

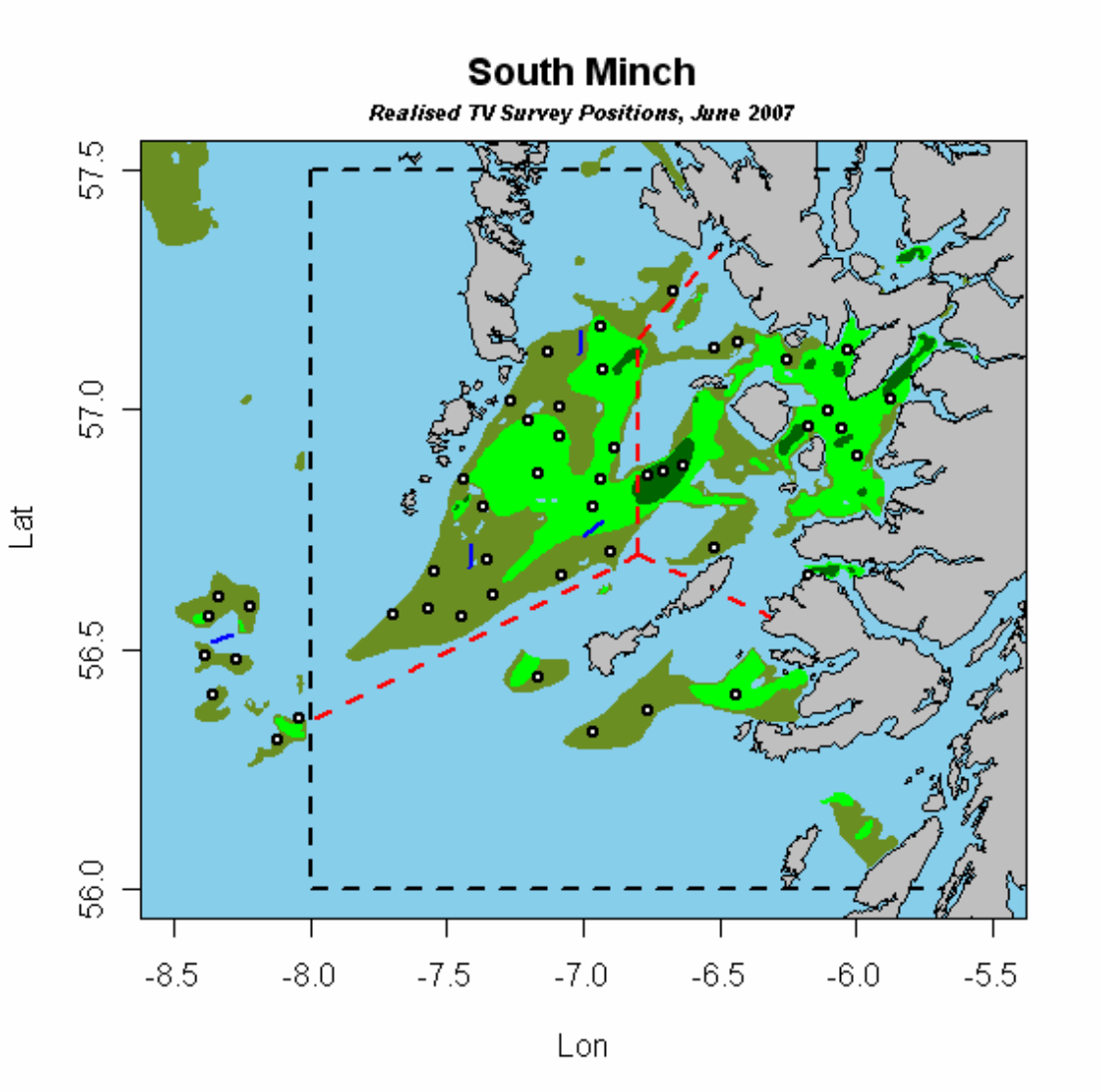
A total of 237 sediment samples were taken during the course of the cruise. These will be analysed at the Laboratory. Results will used to improve sediment maps and survey, design and analysed in relation to *Nephrops* size data.

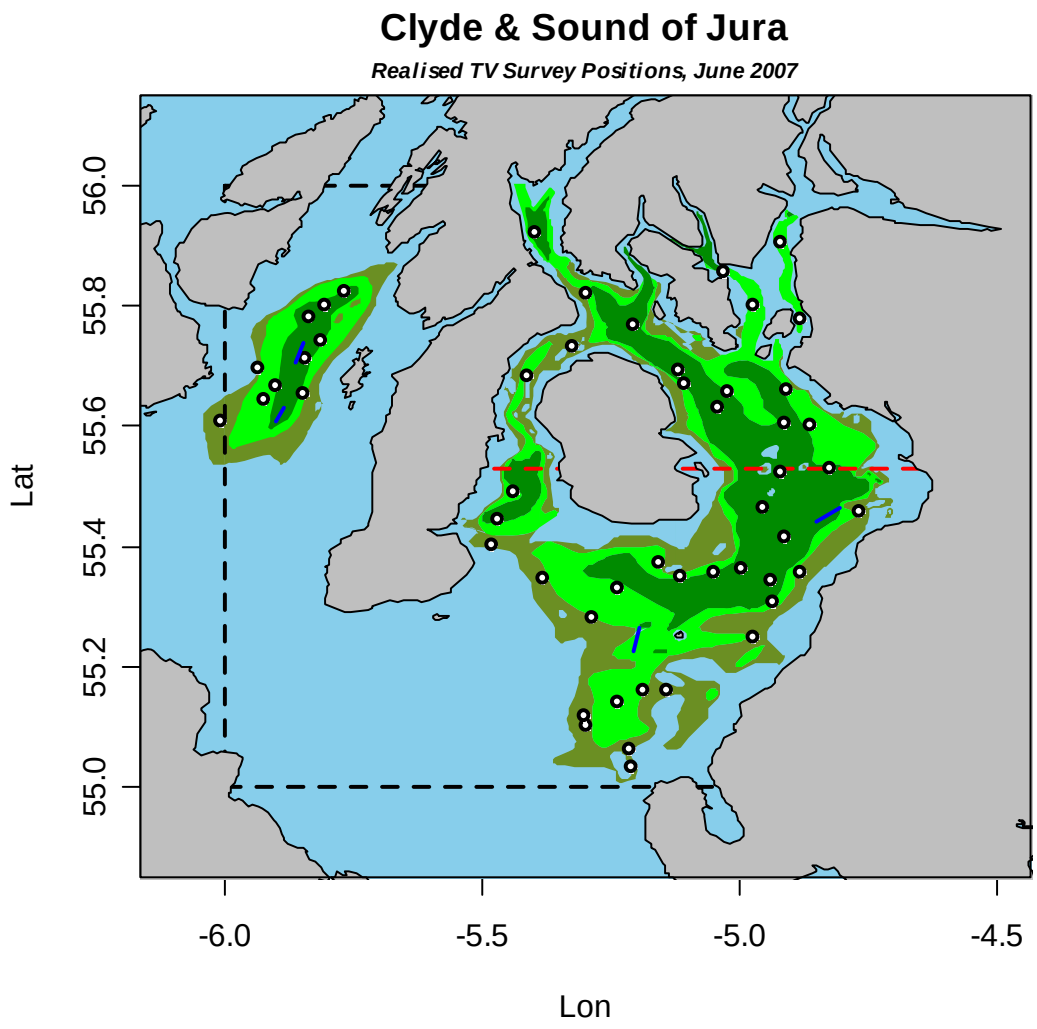
Data recorded from the trawls included species catch compositions. *Nephrops* catches were sampled to determine length frequency distributions for males and females in each functional unit. Additional morphometric measurements (5 on each male and 4 on each female) on 10 individuals in each length cm group in samples from each functional unit were made. These data will be used to update length weight relationships, will be reported to ICES study and working groups and as biological data collected under the Data Collection Regulation.

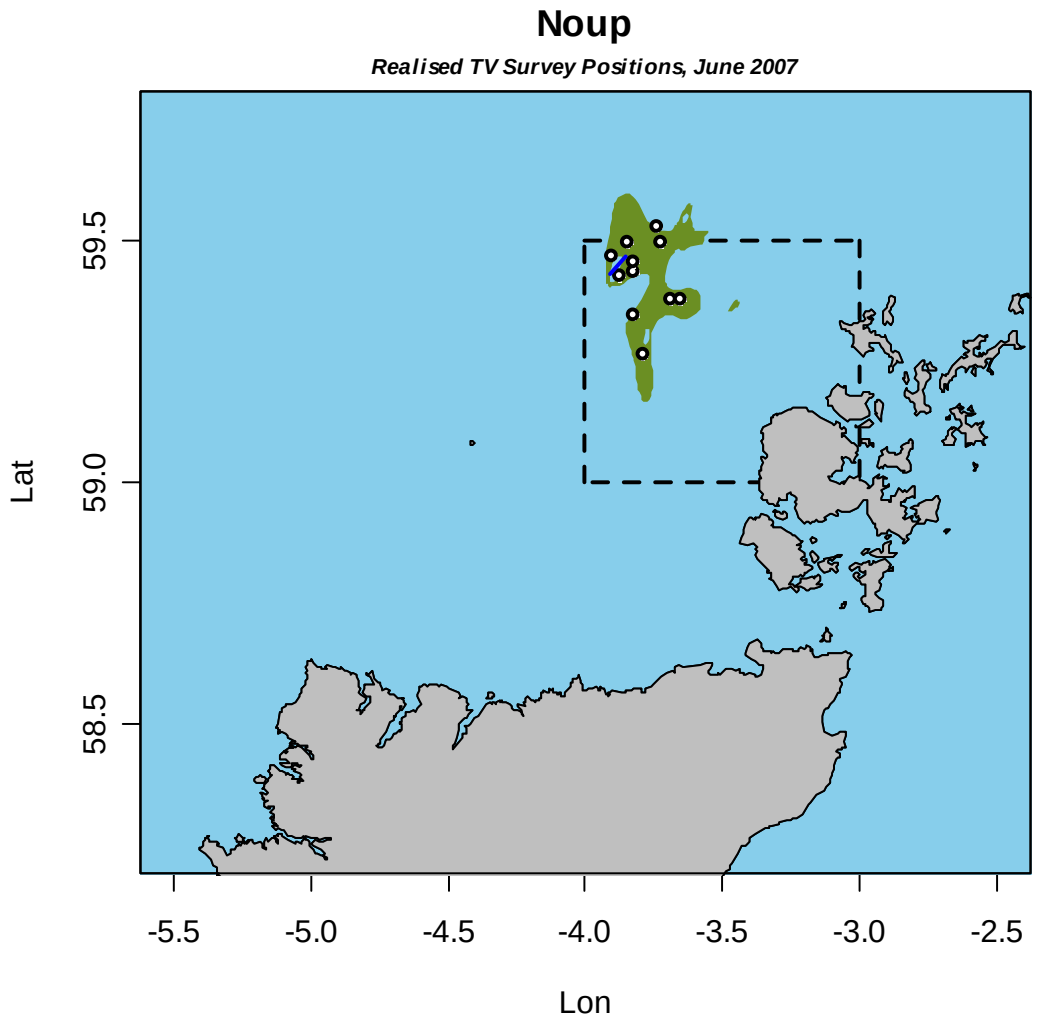
In addition, 20 twenty water samples were obtained to determine whether the dinoflagellate *Karenia mikimotoi* was present in waters in the South Minch / Stanton Banks area. Filtered samples were returned to Dr E Bressnan at FRS Marine Laboratory.

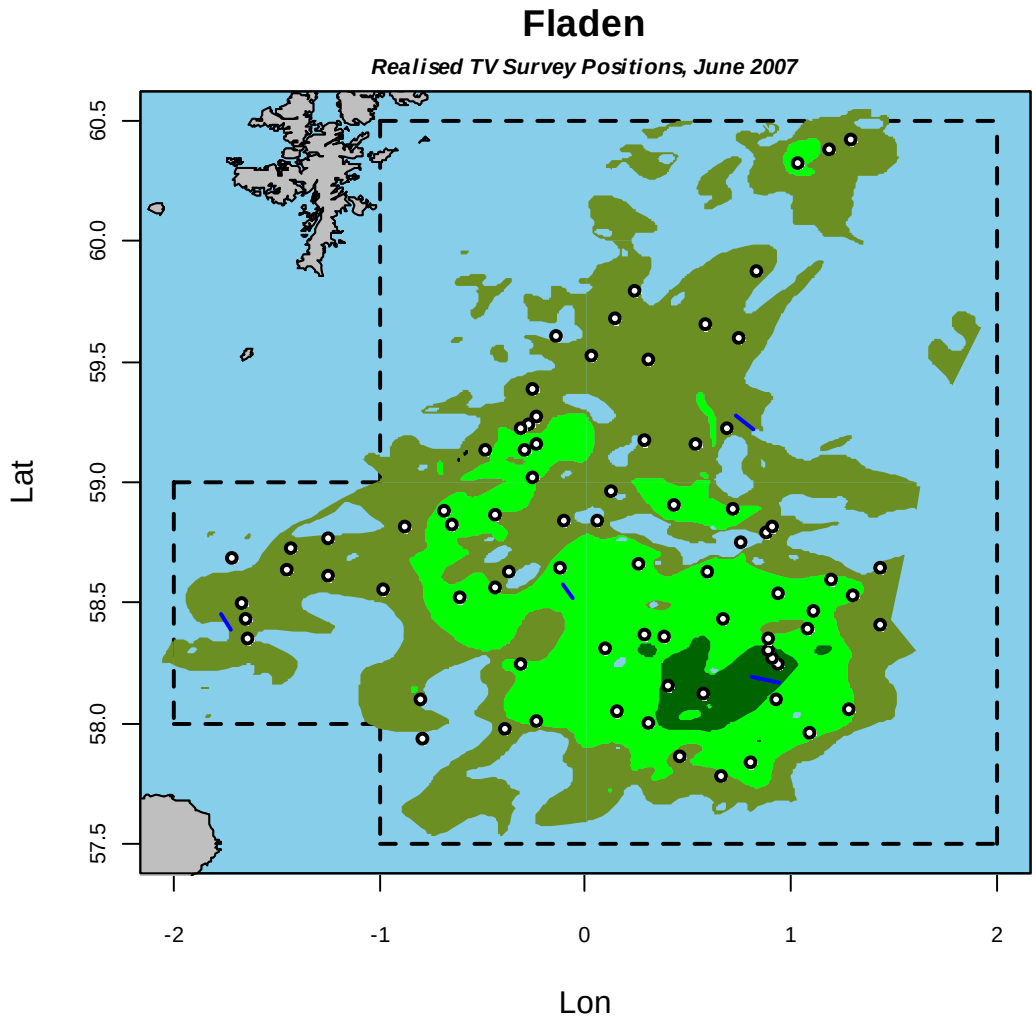
Anne McLay
18 October 2007


North Minch
Realised TV Survey Positions, June 2007
Lat
58.4
58.2
58.0
57.8
57.6
57.4
-7.0
-6.5
-6.0
-5.5
-5.0
Lon


South Minch
Realised TV Survey Positions, June 2007
Lat
57.5
57.0
56.5
56.0
-8.5
-8.0
-7.5
-7.0
-6.5
-6.0
-5.5
Lon


Clyde & Sound of Jura
Realised TV Survey Positions, June 2007
Lat
56.0
55.8
55.6
55.4
55.2
55.0
-6.0
-5.5
-5.0
-4.5
Lon


Noup
Realised TV Survey Positions, June 2007
Lat
59.5
59.0
58.5
-5.5
-5.0
-4.5
-4.0
-3.5
-3.0
-2.5
Lon


Fladen
Realised TV Survey Positions, June 2007
Lat
60.5
60.0
59.5
59.0
58.5
58.0
57.5
-2
-1
0
1
2
Lon