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MRV *Scotia*

Survey 1514/1614S

**PROGRAMME**

11-23 October 2014

**Ports**

**Loading:** Aberdeen, 8 October 2014
**Departure:** Aberdeen, 11 October 2014
**Arrival and unloading:** Aberdeen, 23 October 2014

**In setting the survey programme and specific objectives, etc the Scientist-in-Charge needs to be aware of the restrictions on working hours and the need to build in adequate rest days and rest breaks as set out in Marine Scotland's Working Time Policy (Notice 34/03). In addition, the Scientist-in-Charge must formally review the risk assessments for the survey with staff on-board before work is commenced.**

In the interest of efficient data management it is now mandatory to return the survey report, to I Gibb and the Survey Summary Report (old ROSCOP form) to M Geldart, within four weeks of a survey ending. In the case of the Survey Summary Report a nil return is required, if appropriate

**Personnel**

| | |
|---|---|
| P Copland | (SIC) |
| E Armstrong | |
| L Ritchie | |
| R Gillespie-Mules | |
| M O'Malley | (TBC, 13 - 23 October) |
| P Fernandes | (Aberdeen University) |
| A Fenwick | (Aberdeen University) |
| N Fallon | (Aberdeen University) |
| J Lawrence | (St. Andrews University) |

**Estimated days by project:** 13 days – SU02NP (20158)

**Sampling Gear**

Midwater trawl PT160 x 2
Edgetech broadband towed system
Seabird 911 CTD
Go-pro camera system with additional sensors (depth, temp, attitude etc)
Towed hydrophone array

**Overall Objectives**

- To investigate the use of a broadband system as a means to determine mackerel size.
- To estimate mackerel density and abundance.
- To study distribution of cetaceans and their relationship to mackerel shoals.

**Specific Objectives**

1. Calibration of Broadband system.
2. Obtain acoustic data from mackerel using the broadband system.
3. Obtain echosounder recordings of mackerel schools and map their distribution.
4. Obtain biological samples of mackerel from schools by trawling.
5. Calibrate Sv and TS gains on the Simrad EK60.
6. Deploy a Go-Pro camera system with additional sensors into the mackerel schools to observe behaviour.
7. Observe marine mammal distribution and activity during daylight hours.
8. Obtain towed hydrophone recordings of mammal vocalisation during survey transects.

**Procedure**

All gear will be loaded in Aberdeen on 8 October. The vessel will depart Aberdeen on 11 October and make passage for Loch Erribol, where a calibration of all drop keel mounted acoustic transducers will take place (approximately 8-12 hours at anchor). Crew training and trial deployments of fishing gear will take place en route to calibration site as convenient for the fishing master.

In addition, during calibration, an investigation of the acoustic output of the broadband system will be attempted using a standard target below the suspended towed body. In the event that there is insufficient depth for this exercise in the selected anchorage, and weather permits, this may be done in the open sea with the vessel drifting. Time period for the broadband system investigation is unknown as we have not attempted this exercise before.

*Scotia* will make her way to the survey area after the calibration has been completed. The proposed survey area is shown in Figure 1. However, this is based on the expected position of the Scottish pelagic fleet which will be fishing for mackerel at this time. Contact will be maintained with the fleet using email, cell phone and radio communication and the survey area/design may be altered to reflect any changes in the fish distribution. The survey will follow a pattern of parallel transects running east/west, at normal steaming speed (approximately 10.5 knots) until an area with suitable shoals is found. Work using the broadband system will then be concentrated in that area.

A small boat transfer/port call will be made, as convenient, to embark Mike O'Malley after 13 October. This is likely to be from Scalloway or Lerwick depending on the progress of the survey and position of the mackerel.

Acoustic data will be collected at four frequencies (18, 38, 120 and 200 kHz) on a 24 hour basis. While transecting, a towed hydrophone array will be deployed over the stern of the vessel and will be recovered prior to any fishing operations.

Fish shoals seen on the echosounder will be identified using a pelagic trawl (PT160). Trawling operations will be carried out up to twice per day at anytime between 0900 and 2100. The vessels netsonde systems will be required to monitor catch density and position of shoals in the water column during trawling. The SH80 sonar will be used to collect acoustic data and direct fishing operations.

Biological sampling of all species caught will be carried out as per standard sampling protocol.

A vertical CTD dip will be carried out immediately following a pelagic trawl, this will require the vessel to use its DP system to remain on station.

Deployment into mackerel schools of the fishing rod mounted Go-Pro camera/sensor system will be done either in DP or with vessel drifting depending on the conditions. Where schools are shallow the GO-Pro system may be net mounted during tows.

The ships thermosalinograph will be run continuously to obtain sea surface temperature and salinity throughout the survey area.

*Scotia* will be unloaded of fishing and scientific gear on her return to Aberdeen on Thursday 23 October.

Submitted:
P Copland
01 October 2014.

Approved:
I Gibb
02 October 2014.

**Figure 1:** Provisional Survey track 1514/1614S.