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MRV *Alba na Mara*

Survey 1619A

## **PROGRAMME**

24-30 September 2019

**Loading:** Oban, 21 September 2019

**Boarding:** Oban, 23 September 2019

**Unloading:** Troon, 30 September 2019

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 (Lab 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.

**Project:** 7 days, SP02B / 20232

### **Gear**

2 x Jackson Rockhopper Trawl BT158 with 50 mm Cod end + Spare

Scanmar net sensors – trawl width, height, and depth (x 2 units)

Baited camera frames – (x 1)

2 x Day grab, grab table

2 x Reverser bottles

## **Background and Objectives**

1619A will conduct a benthic survey of juvenile common skate within and around the Loch Sunart to the Sound of Jura Nature Conservation Marine Protected Area (hereafter referred to as MPA). The primary objective of 1619A is to assess the presence of juvenile common skate within the MPA and the type of habitat juveniles are associated with. This survey is, therefore, necessary to estimate the efficiency of the management measure at protecting this Priority Marine Feature (PMF) during the entirety of its life-cycle. The study will utilise two sampling methods: demersal tows and baited-camera to assess the presence of Juvenile skate. Habitat will be characterised using a combination of hydro-acoustic recordings (RoxAnn) for seabed classification and sediment grab samples. Data from these surveys is needed for the monitoring and development of the Scottish MPA network and will inform the development of species distribution models to study differences in habitat requirements between adults and juveniles. Skate sampled in the trawl will be measured and tagged and a genetic sample will be collected (for further analyses of population structure) before being released.

A second objective of this survey is to develop and calibrate a non-invasive method to assess PMF presence and abundance using eDNA. DNA will be extracted from water samples collected at set depths with reverser bottles and from sediment samples from the grabs mentioned above. Samples will be used post-survey to analyse the presence and amount of DNA corresponding to common skate. If successful, this approach may be used at a larger scale to gain knowledge of species distribution.

Specific survey objectives are as follows:

1. To assess the presence of juvenile skate using two different sampling methods.
2. To record substrate features at the point of sampling.
3. To collect DNA from water and sediment samples to develop and calibrate a non-invasive detection method.
4. To collect genetic material and tag individuals to investigate issues relating to stock structure and population processes.

## **Embarkation**

Scientists will join the vessel on 23 September around 12:00 (BST). Weather permitting *Alba na Mara* will depart the following morning, heading for the first survey site. **IMPORTANT NOTE:** It is essential that the wet lab freezer is completely empty before embarkation.

## **Survey Work:**

The survey will be split into three distinct activities – demersal trawling, baited camera work, and water/sediment sampling - which will be performed at each station (except demersal trawling in restricted areas).

### **1. Demersal Fishing Survey**

The demersal survey (10-15 minute tows) will assess the abundance, length-frequency-distribution, and weight-at-length of common skate at four fixed sites (3-5 tows per site) just outside of the MPA (Figure 1- Trawl boxes). Scanmar units will be fitted to the wings and head line of the BT158 trawl to ensure the net is fishing correctly. All common skates will be measured and a fin clip will be collected for further genetic analyses. Each individual will be screened for the presence of tags, if no tag is present the fish will be tagged (PIT tags) before being returned.

### **2. Baited Cameras**

In addition to demersal survey sites (Figure 1- Trawl boxes), baited underwater video camera frames will be deployed in the MPA (Figure 1 Camera boxes) during daylight hours. These will be left in the water for approx. 1.5 hours before being retrieved. Footage will be downloaded to external media at the end of each working day. Presence of common skate, life-stage (juvenile/adult) and substrate type (assessed visually) will be classified post-survey.

### **3. Substrate Classification**

To further aid the classification of the substrate at each sampling site, 1619A will also acquire RoxAnn records of the surveyed area and a Day grab will be deployed. Sediment samples will be collected from each grab and stored in the freezer. These will be analysed on return to the laboratory to determine particle size distribution in the sediment at each sample location.

### **4. eDNA Samples**

Sediment and water samples will be collected to investigate feasibility of detection of flapper skate using environmental DNA shed in marine environment. Sediment samples will be collected using day grab and subsamples will be taken using sterile 50 ml falcon tubes. Water samples will be collected using reverser bottles within 5 m and at 10 m from the seabed. Collected water will be filtered through 0.8 micron filters using sterile 50 ml syringe. Sediment and filter samples will be stored at -20°C.

### **Operations**

Survey operations will take place between the hours of 07:00 and 19:00 (all times BST). Stations will be surveyed depending on the prevailing weather conditions i.e. if wind strengths or wave heights are adverse, a precautionary approach will be adopted and those with adequate shelter from the weather will be selected. Alternatively, in poorer weather the trawl survey may be prioritised over other activities.

The vessel will leave the study area on 29 September to allow sufficient time to travel to Troon. Unloading will occur in Troon on Monday 30 September. Scientists will disembark at this time.

Normal contact will be maintained with the Laboratory.

Submitted:  
T Regnier  
29 August 2019

Approved:  
I Gibb  
31 August 2019

**Figure 1:** 2019 survey sites within and outside of the Loch Sunart to the Sound of Jura Nature Conservation Marine Protected Area.

