

# **European Offshore Wind Deployment Centre**

## **Environmental Research & Monitoring Programme**

**Auk tagging and monitoring  
MacArthur Green  
Interim Report 2018**



# MacArthur Green

## Auk tagging 1<sup>st</sup> annual fieldwork report

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## **1 INTRODUCTION**

This study aims to provide detailed and accurate data on the year-round movements of adult guillemots and razorbills, with particular reference to populations likely to interact at some stage of the year with offshore wind farms in the North Sea.

Guillemots and razorbills are among the seabirds considered most vulnerable to displacement by offshore wind farms. Assessing impacts of displacement requires knowledge of the seasonal movements of different populations. Seabird movements during the nonbreeding season are generally much less well understood than those during the breeding season due to the challenges of tracking seabirds over long periods of time. This project aims to collect movement data for common guillemots and razorbills over durations of up to several years using small geolocator tags. The new information will allow more accurate attribution of any assessed impacts to appropriate populations. This will reduce uncertainty in impact assessment, especially where this uncertainty requires more precautionary approaches to impact assessment to be followed.

Geolocator tags offer a simple and cost-effective method for long term tracking of individuals. The tags are small enough to be fitted to a leg ring but have a battery life of up to five years. Geolocator tags record light intensity (and normally also sea surface temperature) on a time base memory chip, allowing daylength and time of sunrise and sunset to be estimated. These data allow the location of the bird to be determined twice per day. The basic method of estimation provides locations that are rather imprecise. However, sea surface temperature (SST) data can also be recorded by these loggers. This can be used to further refine position estimates for seabirds since SST varies considerably among locations.

Guillemots breed in colonies on cliff ledges and under boulders at the foot of cliffs, particularly on islands that are predator-free. Razorbills breed mostly in the same kinds of boulderfields. Adults of both species are long-lived, and come back to the same nest site year after year. A number of ringing groups regularly visit certain accessible colonies to ring guillemots and razorbills, and this study will make use of the considerable expert knowledge of bird ringers. With their help, we will attach tags to the rings that are put onto the birds' legs when they are caught at their colonies, with the aim to catch the same individuals again one or two years later to recover the tag and download data on their daily locations between breeding seasons. From the data, a PhD student will analyse the migration routes and wintering areas used by birds from different breeding areas.

The original aim of the project was to deploy 350 geolocator loggers on breeding guillemots and razorbills at a range of colonies from north-east England to north Scotland in summer 2017. Because two other projects (Hywind and Seatrack) also planned to deploy geolocators on auks at colonies in east Scotland in 2017 (East Caithness and Whinnyfold by Hywind, Isle of May by Seatrack), we agreed a revision to this aim to include some colonies in the west of Scotland and to carry out the work as a collaboration with deployments and data from the Hywind and Seatrack projects combined with the AOWF deployments and data.

## **2 FIELDWORK CARRIED OUT IN 2017**

Fieldwork was extremely successful in 2017, with a total of 436 geolocator tags being deployed on auks (269 on guillemots and 167 on razorbills) at ten different sites (details in Table 1). In total, we

considerably exceeded the original aim of deploying tags on 350 birds in 2017. We used two types of geolocator tag: Biotrack MK3006 tags and Migrate Technology Intigeo C65 or F100 tags. The Migrate Technology tags are smaller than the Biotrack MK3006 tags so were considered particularly suitable for the smaller razorbill, and were deployed on razorbills at Canna, Foula, Fair Isle, Orkney, and Farnes. MK3006 tags were deployed on guillemots at all colonies and on razorbills at East Caithness, Whinnyfold and Isle of May. Another motivation for using tags from two manufacturers was to minimize any potential impact of failure of tags due to engineering defects in a particular batch of tags. Such risks are small, but are further reduced by using tags from more than one manufacturer. Tags were deployed on colour rings, attached by a cable tie through two holes drilled through each colour ring. The colour ring design is a tried and tested one developed by CEH at the Isle of May, and has been found to be successful for both auk species. Tag deployment was licenced by the British Trust for Ornithology (BTO) and tagging was further licenced by Scottish Natural Heritage (SNH) where deployment was at colonies designated as Special Protection Areas (SPA) for these species and so requiring an Appropriate Assessment to ensure that there would be no adverse effect of the fieldwork on the integrity of these protected features.

There were no Health & Safety incidents at any of the colonies where fieldwork was carried out in 2017.

**Table 1. Deployments of geolocator tags on breeding adult auks in June 2017 (sites listed from northwestmost to southeastmost)**

Colony	Tags on guillemots	Tags on razorbills	Total tags	Ringling team
Canna, west Scotland	90	20	110	Highland Ringing Group
Foula, Shetland	40	10	50	Bob Furness
Fair Isle, Shetland	25	21	46	Bob Furness and Fair Isle Bird Observatory
Muckle Skerry, Orkney	0	16	16	Orkney Ringing Group
Halcro Head, South Ronaldsay, Orkney	0	2	2	Orkney Ringing Group
Swona, Orkney	0	12	12	Orkney Ringing Group
East Caithness, NE Scotland	40	30	70	Highland Ringing Group (Hywind funded)
Whinnyfold, E Scotland	40	20	60	CEH (Hywind funded)
Isle of May, E Scotland	30	30	60	CEH (Seatrack funded)
Inner Farne, Farne Islands, NE England	4	6	10	University of Newcastle and National Trust
<b>TOTALS</b>	<b>269</b>	<b>167</b>	<b>436</b>	

### **3 FIELDWORK CONDITIONS AT DIFFERENT SITES AFFECTING DEPLOYMENTS**

#### **3.1 Canna**

Guillemots and razorbills had an exceptionally good breeding season at Canna, with large numbers of birds at colonies, high breeding success, and early fledging of chicks. A large and experienced team of Highland Ringing Group members were able to deploy all of the geolocator tags made available to them: 90 guillemot tags and 20 razorbill tags. Prospects for recovery of these tags in 2018 are very good, as the study sites allow a high retrap rate of breeding adults.

#### **3.2 Foula**

The 2017 breeding season was a very poor one for seabirds in Shetland, with complete failure of several species that was evidently due to a shortage of suitable small fish (especially sandeels). Guillemot and razorbill breeding numbers attending colony sites within the island were lower than anticipated, and the timing of breeding was unusually late, which is also often a sign of chronic shortage of food. Adult attendance of chicks was also unusually low, with many small chicks left unattended while adults were making exceptionally long foraging trips trying to find food for their chicks. With considerable effort, 40 guillemots and 10 razorbills were tagged at colonies in Heddlicliff and Sneck. The totals tagged at these sites were limited by numbers that were safely accessible. To put this in context, we ringed 400 adult guillemots and 200 adult razorbills at these sites in 1980 when the population reached peak numbers and breeding success was high. Other colonies in Foula, at Noup and west of Sneck, require a ladder and Via Ferrata to access safely, and those were not available in 2017 as it was not anticipated that birds would be available in such reduced numbers. However, it will be possible to install ladder and Via Ferrata access to those sites in 2018, which should allow similar or larger numbers to be tagged in 2018. Prospects for recovery of tags from birds equipped at Foula in 2017 are reasonable, although the stress of breeding in such a poor season as prevailing in 2017 may result in some birds not attending nest sites in 2018 to recover body condition, while adult attendance may again be low in 2018 if food supplies have not recovered. Particular thanks are due to Foula Ranger, Sheila Gear, for advice on access to these colonies at Foula, and for fieldwork assistance from Sam Buckton, Churchill College, University of Cambridge and Euan Furness, Clare College, University of Cambridge.

#### **3.3 Sumburgh**

It had been intended to work with Shetland Ringing Group to tag guillemots at Sumburgh, south mainland Shetland. Unfortunately, due to the exceptionally late and poor breeding season in 2017, the visit to ring birds at Sumburgh which had been expected to take place in late June was postponed until the unusually late date of 8 July, and as a result it was not possible to tag birds at that colony in 2017.

#### **3.4 Fair Isle**

Fair Isle, like other parts of Shetland, also experienced a very poor breeding season for seabirds in 2017. Breeding of auks was unusually late. However, 25 guillemots and 21 razorbills were tagged at two of the most accessible sites where Fair Isle Bird Observatory (FIBO) routinely monitor auk numbers, timing of breeding and breeding success. One of these is accessible by footpath equipped with a Via Ferrata allowing safe access on foot, while the other is accessible by small boat into a sheltered geo where landing is easy under most summer weather conditions. Tagging was led by Bob

Furness, with considerable help from the FIBO staff. It is likely that FIBO staff will be able to recover some tags in 2018 during their regular visits to these colonies, and Bob Furness will visit in June 2018 to assist with tag recovery and further deployments.

### **3.5 Orkney**

Orkney Ringing Group do not have access to suitable colonies of guillemots to catch breeding adults. However, they do have access to razorbill colonies, at Muckle Skerry, Halcro Head, South Ronaldsay, and Swona. At those colonies, Orkney Ringing Group deployed all the 30 razorbill tags provided to them. In addition, they recovered five geolocator tags from these birds that they had deployed in previous years, funded by Marine Scotland. It is hoped that data from those deployments can be incorporated into this project as the comparison of migrations and wintering areas used by the same individuals in different years will be valuable. Orkney Ringing Group anticipate good prospects of recovering tags deployed in 2017 at these colonies, providing weather conditions permit landing at these sites.

### **3.6 East Caithness, Whinnyfold, and Isle of May**

Tagging at these sites was coordinated by CEH, though led by Highland Ringing Group at East Caithness. Breeding success of auks was reasonable at these sites and tagging went well. Prospects for recovery of tags in 2018 seem good.

### **3.7 Farne Islands**

Fieldwork at the Farnes was coordinated by Newcastle University. Unfortunately, the site (on the Wideopens) that was the main target proved to have very few razorbills. It is possible they had been washed out by a combination of rain and high tides earlier in the season. Other sites on the Farnes proved difficult to access, so the 2017 totals fell short of what had been anticipated, with only 4 guillemots and 6 razorbills tagged.

### **3.8 Other sites**

We may be able to add some further sites to the project for tag deployments in 2018, such as Colonsay, Shiants, and Treshnish Isles, but obviously with such successful deployment at ten sites, the top priority for 2018 will be recovery of tags from birds at those ten sites in 2018 and further tag deployments at those same sites.