Sceilg Mhichíl Seabird Conservation Monitoring 2021 – summary

National Parks and Wildlife Service

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An Roinn Tithíochta,
Rialtais Áitiúil agus Oidhreachta
Department of Housing,
Local Government and Heritage

Background

Sceilg Mhichíl or Great Skellig is part of Skelligs Special Protection Area designated under the Birds Directive for a range of breeding seabird populations. Facilitated by the Office of Public Works (OPW) the National Parks and Wildlife Service (NPWS) of the Department of Housing, Local Government and Heritage have engaged survey, monitoring and research work on a near annual basis since the early 1990s. Due to the various logistical constraints of living and working on such a remote and exposed offshore island the range of works were largely confined to near annual breeding surveys of a subset of the island's populations and pulsed censuses of other bird populations.

The recently published Sceilg Mhichíl World Heritage Property Management Plan 2020 – 30 recognises the importance of the island's natural heritage alongside its built heritage and now frames the scope of the seabird monitoring and conservation management work for this decade. Under Objective No 4 of the Management Plan is to identify and conserve the natural heritage of the island. Flowing from this objective are 18 specific actions and are set out in Appendix I of this document. The monitoring and conservation management of the island's natural heritage, particularly including its renowned seabird populations feed into other objectives of the Management Plan including: Statutory and Policy; Sustainable tourism and Visitor Management; and Research.

In order for these objectives to be met it was necessary for NPWS to increase the level of on island effort to develop a sustainable and fit for purpose seabird monitoring programme for the period 2020 – 2030. The 2021 breeding season saw for the first time the deployment of dedicate ecological fieldworker to spend prolonged periods of time on the island to fulfil two interrelated roles of:

- On site works advsior

  The OPW and National Monuments Service (NMS) undertake work on the rehabilitation and maintenance of the built heritage of the island. To help ensure that such works are sustainable from a seabird and wider biodiversity conservation perspective the on site works monitor provided real time information and advice with regard to the ecological sensitivities at or close to areas of activity related to the conservation of the island's built heritage

- Seabird and natural history surveyor

  Working with NPWS staff and supported by OPW the ecological fieldworker played an integral role in the further development of the Skellig Michael ecological survey and monitoring programme.

Brian Power of Envirico Ltd was contracted to carry out this work and played an integral role in the 2021 seabird survey and monitoring work as summarised below.

Summary of 2021 Seabird Monitoring

Standard Seabird Survey

The seabird species that nest on the cliffs of Sceilg Mhichíl have been surveyed on a near annual basis since 1990s. The focus of this survey include species such as Kittiwakes, some auks, Fulmar as well as the more dispersed large gulls. Over a two-day period in June and using standard methods, the 2021 survey was completed in good conditions. Figure 1 sets out the 2021 results in a longer time series context for a selection of species. When these trends are compared to the most recent national short-term trends estimates some interesting patterns emerge. Both the island's Fulmar and Guillemot population trends broadly mirror the national estimates and Razorbill which is increasing national seems to be largely stable at Sceilg Mhichíl.

At the national level Kittiwake is one of a minority of birds species whose short-term population estimates is one of decline. It is also in decline across its global range. However and despite the very poor result of 2018, the Sceilg Mhichíl population is one of a net increase since 2010.

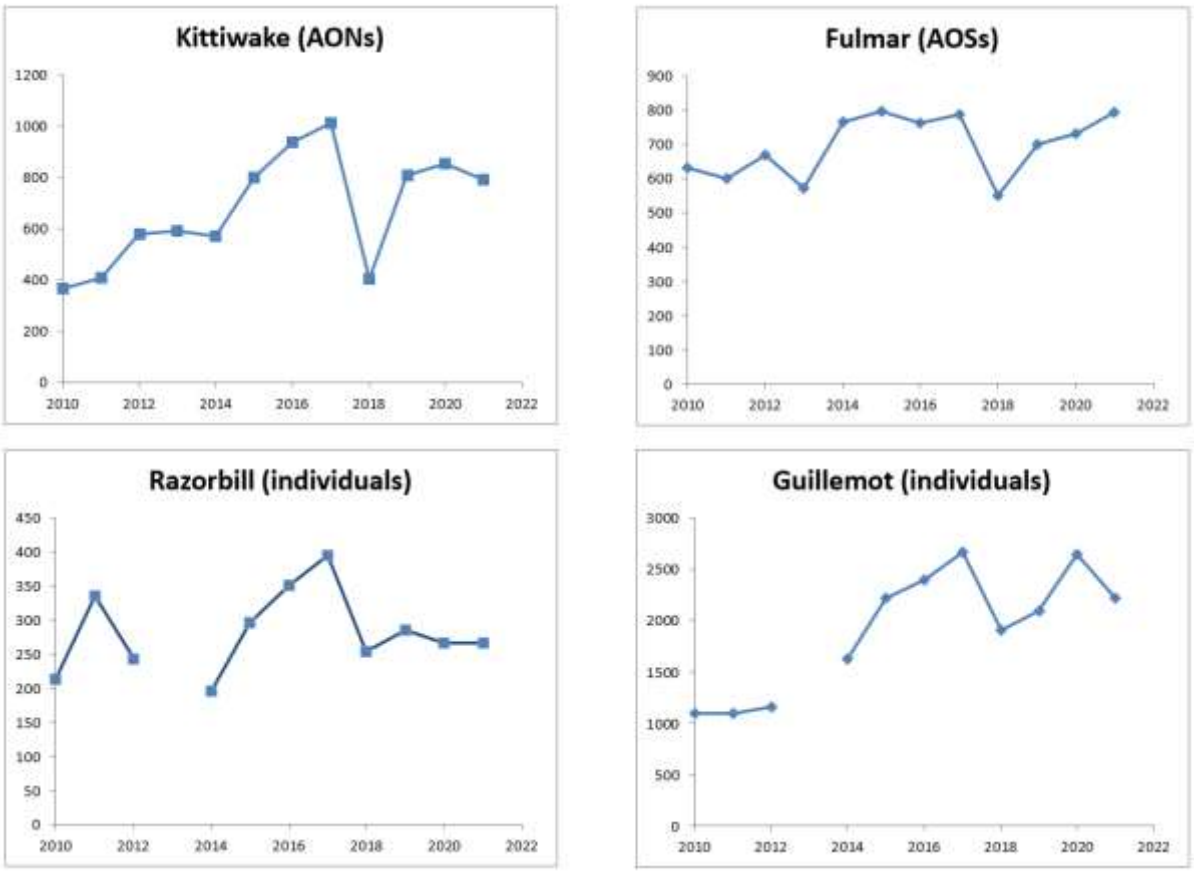

Figure 1 Population trends of a selection of cliff nesting seabirds on Sceilg Mhichíl 2010 – 2021

Kittiwake Productivity Monitoring

As noted above, Kittiwake is in decline both at the national and global scales. Regular estimates of the size of a species breeding population at different geographic scales provides an important basis to help assess its conservation status. The addition of associated productivity data, especially for those long-lived animals such as seabirds further enable the identification of drivers of population change and for production of evidence based recommendations of measures to help halt declines.

The Kittiwakes of Sceilg Mhichíl is one of only a handful of colonies around Ireland that is the focus of annual productivity monitoring. To date three discreet Kittiwake sub-colonies are monitored on the island (see Figure 2).

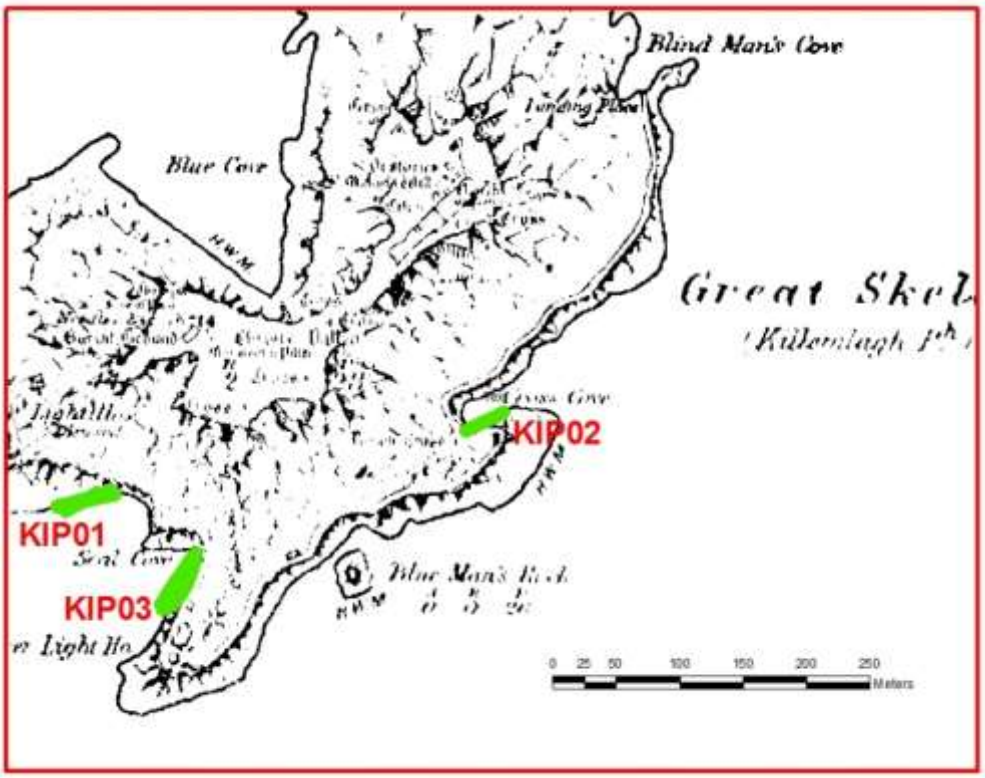

Figure 2 Kittiwake productivity monitoring plots 2021

Based on UK data it has been reported that 0.8 fledglings per pair were needed to maintain the size of these colonies. At Sceilg Mhichíl, sub-colonies KIP01 and KIP03 were estimated to have a productivity rate of 0.77 and 0.88 fledglings per pair respectively, both of which are quite close to this theoretical minimum threshold.

Sub-colony KIP02 was an outlier with an estimated productivity rate of 0.26 fledglings per pair. This pattern holds with previous years' data. Further work is required to see if this chronically low value is reflective of an on-island pressure (e.g. predation by large gulls) as opposed to an indicator of the more general marine environment.

Storm Petrel Survey

Compared to other seabird species the particular breeding ecology of Storm Petrel makes the derivation of robust breeding parameters quite challenging and significant data gaps exists in terms overall breeding population estimates at the site and sub-site scales as well as estimating breeding productivity and describing phenological patterns. On Sceilg Mhichíl this species nests in the crevices of the walls and steps of the built heritage as well under boulders, rock crevices and in burrows.

Over the course of two summers of 2020 and 2021 a full island wide breeding survey of Storm Petrel was achieved. The primary focus of survey effort was the built heritage which produced a population estimate of 2,341 – 2,973 pairs. The densities of Storm Petrel nest sites situated within natural cracks and crevices and under boulders is significantly smaller than the built heritage habitat. However the extent of this potential habitat is much larger (see Figure 2). Based on a limited amount of survey effort a 'natural nesting' density was estimated and when this is extrapolated to the estimated amount of potential natural nesting habitat then crude population estimate of circa 5,000 pairs was derived.

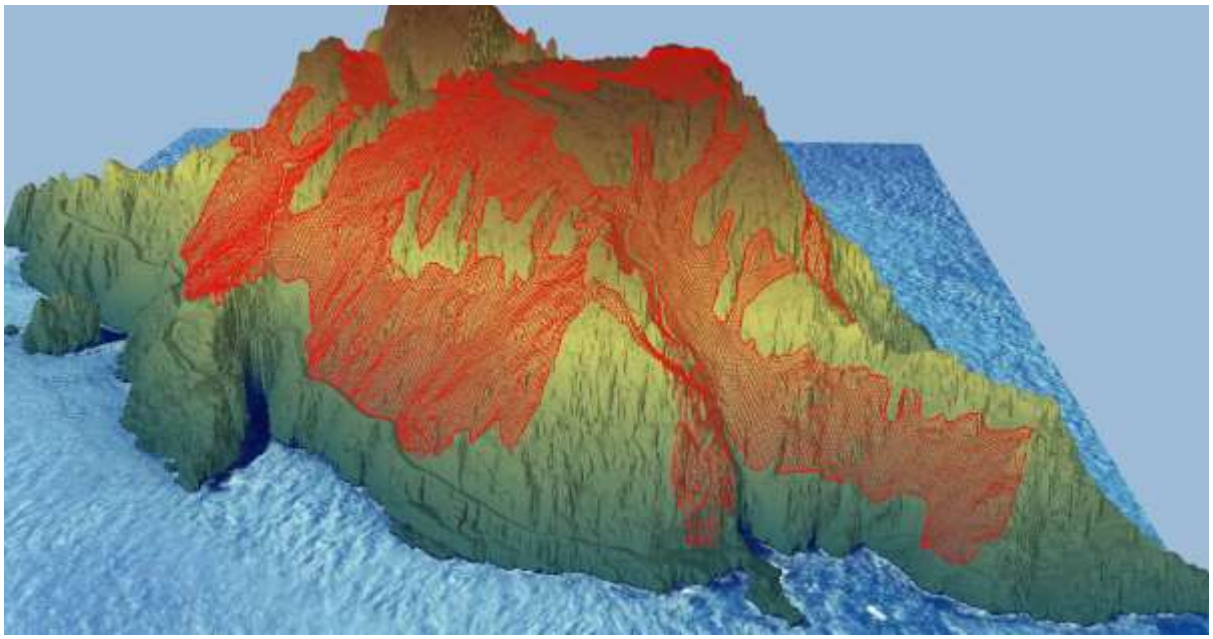

Figure 2 Estimating areas of some of the potential Storm Petrel breeding habitat on Sceilg Mhichíl

Combining the natural and built heritage breeding population estimates an overall island wide population estimate of some 7,500 breeding pairs was arrived at. This is somewhat similar to the first population estimate of circa 10,000 pairs in 2000. However as there are differences in the approach of the 2000 and the 2020-2021 surveys a direct comparison of numbers to estimate change would not be statistically appropriate.

Storm Petrel Monitoring

Due to the constraints of comparing site population estimates from surveys taken 20 or so years apart a complementary monitoring initiative began in 2018. This monitoring work focused on undertaking repeated surveys for Storm Petrel of the three sets of main steps on the island i.e. the North, South and East steps.

So far we have data collected for the breeding seasons of 2018, 2020 and 2021. Preliminary analyses show that the South steps consistently hold more breeding birds when compared to the North and East. However the estimated populations for the North and East steps seem quite stable compared to the South Steps, which seems to have undergone a notable decrease in numbers in 2021 (see Figure 3).

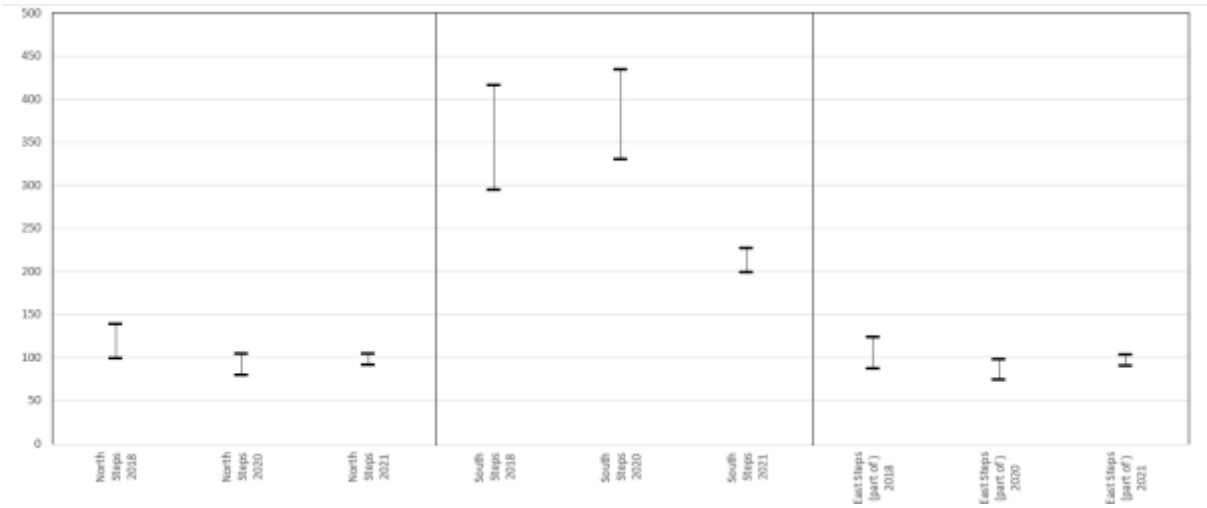

Figure 3 Storm Petrel breeding populaiton estimates (in pairs) of the North, South and East steps for the period 2018, 2020 and 2021

A more intensive Storm Petrel monitoring study was piloted in 2021, where the fate of 33 nesting attempts were tracked across the island. The use of an infrared endoscope was instrumental in the collection of data (see photo to the left).

It is envisaged that this particular work stream will continue to accumulate data over the coming years and will allow for a robust analysis to characterise the pressures acting on this species including impact of mice as potential nest predators and anthropogenic disturbance. The Storm Petrel breeding season is a protracted one. The study

was interrupted during the latter part of the season with the island inaccessible due to weather and sea conditions. No access to the island was available from 15th September through until the 11th October. During this period the majority of active focal nests were vacated, no judgement can be made on the success or failure of these nests.

Manx Shearwater Survey

The first Manx Shearwater survey of the island occurred in 2001 and led to the production of a population estimate of 561 – 1,077 pairs. A repeat survey was carried out on during May and June of 2021. Informed by the 2021 survey and based on an examination of aerial imagery and on island observations a number of areas of potentially suitable Manx Shearwater breeding habitat was identified.

These areas were divided into two broad categories: 'Accessible by foot' and 'Rope access required'. Those areas accessible by foot were completely surveyed (see Figure 4). Areas where rope access was required were assessed individually and as much terrain as possible covered. The area of these sections was measured and combined with the total area of similar habitat to extrapolate a total number of active burrows.

Five Manx Shearwaters attempted to breed in the Beehive Huts and when this is added to the formal survey findings a total of 412 – 936 breeding pairs is estimated. As per the Storm Petrel survey work the contemporary population range for Manx Shearwater overlaps with the historical one indicating a broad stability but a more precise comparison of both population estimates is inadvisable due to likely differences in survey and analytical approaches.

Figure 4 Some of the Manx Shearwater plots surveyed in 2021

Leach's Petrel Survey

Leach's Petrel are regularly recorded in flight around Sceilg Mhichíl and, in the past, have been suspected of breeding here. On 29 July 2021 a formal survey consisting of six transects on open ground ranging from 25 to 35 meters and two wall transects of 54 meters in total were surveyed via tape playback. No positive responses were recorded.

Fulmar Productivity Monitoring

The fate of 51 Fulmar breeding attempts were monitored across four plots in 2021 (see Figure X). The estimated fledging rate ranged from 0.22 to 0.83 fledglings per pair (FUP_A and FUP_D respectively) producing an overall island estimate of 0.47 (± 0.14 SE) fledglings per pair. This estimate is broadly in line with the long-term average as estimated for Britain and Ireland.

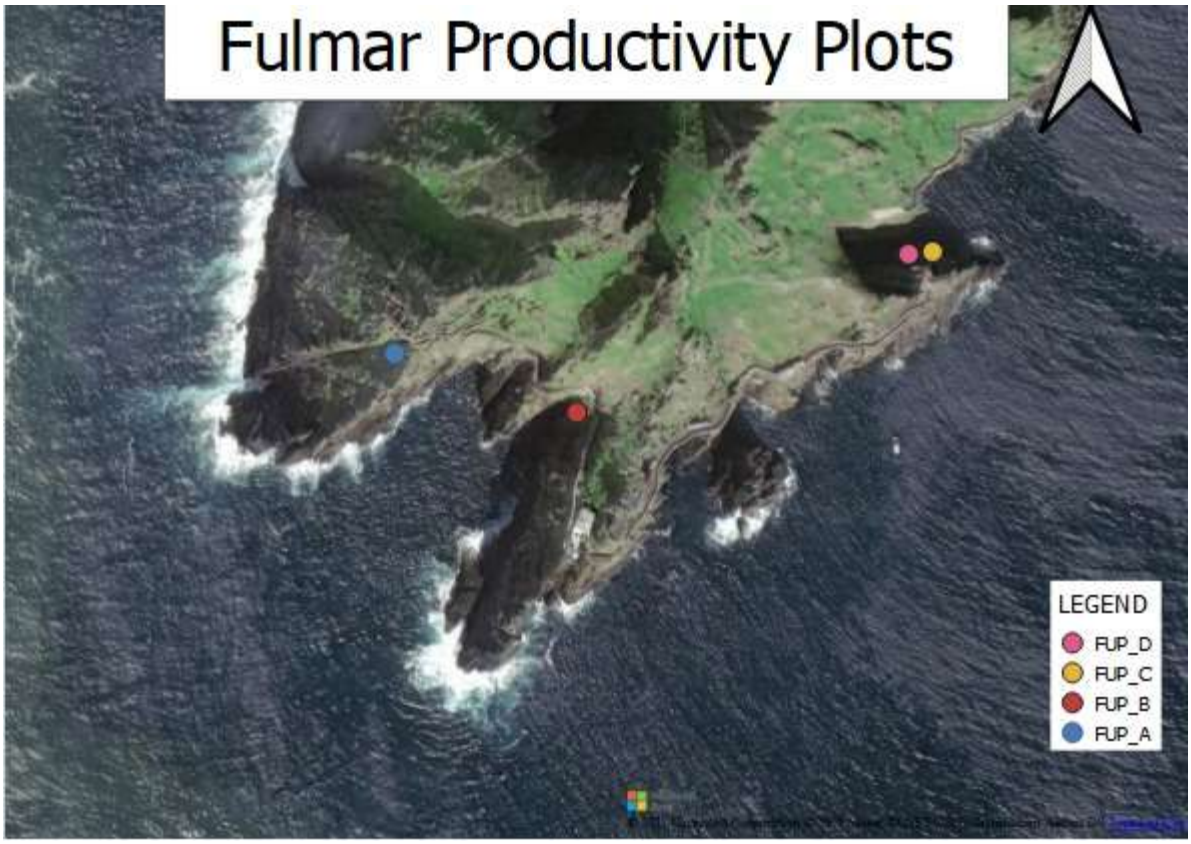

Figure X Approximate locations of the fours Fulmar prodcutivity monityring plots in 2021. Note FUP_D was the only plot direclty above the Lighthouse road

The choice of the four plots were informed by: overall numbers of Fulmar attempting to breed; availability of appropriate vantage points to determine breeding outcomes for each focal nest sites; and location of plots in the context of OPW works in 2021.

Puffin and Manx Shearwater Productivity Monitoring

Relying primarily on an endoscope, a total of 30 apparently occupied Puffin burrows and 26 Manx Shearwater burrows were monitored

A further five Manx Shearwater nesting in the Beehive Huts were also monitored

Burrows chosen were based on suitability for monitoring and representative in terms of proximity to potential human disturbance

Challenges included the relatively late start to the on-island presence of the fieldworker; movement of the chicks within the burrow away from the endoscope's reach and maintaining an adequate presence on the island past mid-September

Looking towards 2022

Compared to previous years a relatively very large overall seabird survey and monitoring effort was accomplished under the first two years of the Management Plan 2020 – 2030

In particular with regard to the 2021 field season the extent and depth of the knowledge gained at this site was unprecedented and the Brian Power played a strong role in this success story

It is now important to maintain momentum and build on last year's work in collecting robust data that will "inform the management of both public access and the works programme in monitoring potential effects of human activities".

The work for 2022 will build upon the 2021 survey and monitoring projects but no further island wide censuses of Storm Petrel or Manx Shearwater is planned for in the near term

In addition to the standard seabird survey of mid-June 2022 there is a need to undertake an island wide census of Puffin in April and May of 2022

Collecting a sufficient amount of useful data on the three burrow nesters (i.e. Puffin, Manx Shearwater and Storm Petrel) to adequately characterise anthropogenic pressures continues to be a challenge. To address this the following is recommended:

- Ensure that the works adviser/ecological surveyor is up and running on the island early (by mid-April if possible) and remains on as late as possible (early – mid October)
- Concerted effort to install artificial nest sites for Manx Shearwater, Storm Petrel and Puffin at the beginning and end phases of the breeding season
- That NPWS Science staff and OPW staff (in particular rope access support) continue to work with, and provide support to Brian at key times during the 2022 season e.g. Puffin Survey, Standard Seabird Survey and Storm Petrel Steps monitoring

Appendix I

The Sceilg Mhichíl World Heritage Property Management Plan 2020 – 30.

Objective 4: To identify and conserve the natural heritage of the island

Rationale:

Sceilg Mhichíl has a rich natural heritage. In particular, it is a seabird breeding area of international significance, a fact recognised by its designation as a SPA and as a nature reserve. The introduction of alien species could have significant detrimental effects on the island's biodiversity, so it is critical to prevent such arrivals. It is also important to monitor seabird numbers, to survey other biodiversity and to prevent disturbance or damage occasioned by human activity.

Actions

- **A4.1** Prepare site-specific conservation objectives for the bird species for which the Skelligs SPA has been designated. Include quantitative conservation objectives attributes and targets.

- **A4.2** Maintain close cooperation between the SMIG, the property management team, the NPWS and the Guide team.

- **A4.3** Secure ministerial consent, underpinned by relevant scientific data and analyses, for relevant interventions as required.

- **A4.4** Ensure an ecological assessment is undertaken for any project or activity which might significantly impact on the biodiversity of the island (including screening for Appropriate Assessment if necessary, for any plan or project likely to have a significant effect on the species and their habitats for which the SPA has been designated) so that nature conservation issues are considered alongside built heritage.

- **A4.5** Continue to develop the seabird-monitoring programme, with particular attention to burrow-nesting seabirds, in order to derive, among other things, robust population estimates, population trends and the identification of pressures acting on the populations. Such data will inform the management of both public access and the works programme in monitoring potential effects of human activities.

- **A4.6** On an annual basis, carry out a census of all cliff-nesting seabird species and estimate the breeding productivity of Sceilg Mhichíl's kittiwake population.

- **A4.7** Ensure that the value of the seabird data collected at Sceilg Mhichíl is optimised by contributing to national and international seabird survey and monitoring initiatives.

- **A4.8** Participate in national and international seabird survey and monitoring initiatives.

- **A4.9** Implement, and if necessary update, the biosecurity action plan to deal with accidental or deliberate introductions of predator species.

- **A4.10** Exclude recreational and other non-essential helicopter flights from an exclusion zone of 1 kilometre surrounding Skelligs SPA.

- **A4.11** Finalise and publish a vegetation survey, including an investigation of species that may have been cultivated by the monks.

- **A4.12** Promote and undertake survey, research and, where needed, conservation work of other biodiversity taxa on the island.

- **A4.13** Research the impacts of mice and rabbits on the biodiversity and archaeological heritage of the islands. Consider whether eradication is necessary.

- **A4.14** Develop guidance for boat operators to follow to reduce potential impacts on wildlife on Sceilg Mhichíl and in the surrounding waters.

- **A4.15** Within one year of installation of lighting arrangements for the operation of the Lower Lighthouse complex, review those lighting arrangements and, if necessary and where practicable, within a further one year implement lighting measures, such as use of blinds, downward lighting, to reduce the risk of bird strikes.

- **A4.16** Continued supervision of wall maintenance by an ornithologist to ensure that burrow entrances remain accessible to breeding birds (in particular storm petrel), with the objective of maintaining/increasing the net amount of potential breeding chambers in the walls overall, which are subjected to maintenance works.

- **A4.17** Works/research programmes will be subject to site-specific mitigation measures. This may include, for example, conducting pre-works surveys to establish the location of any burrows utilised for nesting in the works area, the marking of such burrows so they may be avoided, and avoiding certain time-periods where birds may be more susceptible to disturbance.

- **A4.18** Assess the impacts of visitors and related activities in Year 5 of the plan period, informed by the monitoring data collected in the first four years, and take any necessary action on foot of such an assessment.