Praeger Grant 2021

Wesley Smyth

Submission Date	Nov 29, 2021
1. Title:	Mr
First name:	Wesley
Surname:	Smyth
2.	
3. Year awarded	2021
4. Title of project	The search for Scottish Lovage! A botanical survey of the outer Copeland Islands.
5. Summary of your findings including what you consider to be the key achievements from your grant. This should include, if applicable, any impact or applications of your findings.	The Copeland Islands sit off the north-east County Down coast close to the entrance to Belfast Lough. They comprise Copeland Island (162 hectares) - referred to as Big Copeland and in private ownership; Lighthouse Island (23 hectares) - owned by the National Trust and leased to Copeland Bird Observatory (CBO) on a long-term lease; and Mew Island (17 hectares) – though actually a collection of twelve low-lying islands interspersed with shallow tidal mudflats - owned by the Commissioners of Irish Lights (CIL). The group of islands have been designated as an Area of Special Scientific Interest (ASSI) by reason of their flora, fauna and geological features, and a Special Protection Area (SPA), with the qualifying species being Arctic Tern (Sterna paradisaea) and Manx shearwater (Puffinus puffinus). CBO, which manages Lighthouse Island, has been in existence since 1954. It is one of the British bird observatories working under the guidance of the British Trust for Ornithology and the Bird Observatories Council. Its main aims are to collect data on migratory and breeding birds, to manage the island for the benefit of birds, and to develop and manage a conservation education programme. It is managed and operated on a part-time basis by local volunteer ornithologists. CBO has a license agreement with CIL to 'facilitate the observatory in carrying out ornithological research and management of the vegetation ('on Mew') to encourage and protect wild birds…'. In addition to bird recording, since 1954 CBO has compiled an extensive list of the vascular plants of Lighthouse and Mew Islands. Except for a targeted visit by the Botanical Society of Britain & Ireland (BSBI) county recorder in 2016, and a 1999 visit to Mew Island by a team of botanists from the Northern Ireland Environmental Agency (NIEA), most plant species recording has been carried out on an ad hoc basis by interested observers. As of 2020 the dataset contained 273 species. It is possible, however, that some of these records may be inaccurate, while a number of species may no longer be present. With the support of the Praeger grant from the Royal Irish Academy, CBO arranged for a team of botanists to undertake a botanical survey of the two

Outer Copeland Islands (Lighthouse and Mew). The aim was to establish a base-line plant list to inform future habitat management decisions and encourage greater outreach on the island beyond bird recording.

The islands were visited on 6 July and 24 August by a team of botanists. The islands were split into 5 sections to facilitate the survey, with species present and additional field notes recorded.

In total, the survey recorded 224 species across both islands (138 on Lighthouse Island and 86 on Mew). This included 20 species never previously recorded on Lighthouse Island and 11 new species on Mew; in addition, the survey confirmed the presence of 16 species not recently recorded (> 20 years) on Lighthouse Island and 1 species on Mew [Sharp-Flowered rush, Juncus acutiflorus – previously recorded on Mew in 1995].

A few of these were casual species that have probably been introduced. The presence of Raphanus raphanistrum ssp. maritimus confirms the northwards expansion of this southerly species along the Northern Irish coastline. Several species were not seen during the current survey, including Scot's Lovage Ligusticum scoticum, which was recorded from Mew Island in 1878, and the much more recently recorded Atriplex portulacoides.

Other species previously recorded that were not refound during the 2021 survey may have been missed during the survey or may have disappeared from the islands altogether. Three factors may explain why some species were not seen –

i. the timing of the survey. Some early flowering species (e.g. Cerastium spp) were probably no longer visible in July;
ii. weather conditions. The exceptionally dry spring in 2021 undoubtedly exacerbated (i) above and even later flowering species may not have been visible, as much of the vegetation was brown and burnt off in July when the main survey took place.
iii. Habit change driven by long-term climatic factors.

It is also likely, however, that some species have been lost from the islands as a result of habitat changes over time. The expansion of Bracken on the one hand, fluctuations in rabbit populations and the impact of breeding gulls are all factors that can have a serious impact on individual species and vegetation communities.

Lighthouse Island is a mixture of rocky coastline, cliff, sloping maritime grassland and wet flushes. The eastern edge rises steeply forming cliffs. Mew Island is very different from Lighthouse Island, being low-lying, rocky and very indented by channels that are submerged by high tides. Both islands, however, share many of the same species. Around the shore, maritime lichens dominate the rocks above the High-Water Mark. Inland of this zone, vascular plants have colonised crevices and pockets of soils. Saltmarsh occurs around the shore, with strandline communities present where drift deposits accumulate. To the landward side, there are stony outcrops with a very thin soil cover, often very heavily rabbit grazed with large areas of bare ground and colonisation by ruderal species. On Lighthouse Island, the cliffs to the east are generally sparse in vegetation cover. Over much of the two islands Pteridium aquilinum is the dominant species, with short grassland generally confined to the paths and other mown areas where invasion by Pteridium aquilinum is prevented. Some areas are too wet for Pteridium aquilinum to colonise. Tree cover is largely confined to Lighthouse Island, where Sambucus nigra scrub has become well established in several areas, and other parts of the island have been planted with a wide variety of tree species.

CBO currently implements a programme of habitat management. This is focused around mowing the extensive network of paths on the island to facilitate bird ringing activities.

It is clear from previous descriptions that the flora of the islands has changed over time, and that both islands have become dominated by rank vegetation – in particular Pteridium aquilinum. This may explain some of the apparent species' losses over the recent past. The current management regime is succeeding in controlling Pteridium aquilinum encroachment into the path network, but much of Lighthouse Island and Mew Island is dominated by the species. Although Pteridium aquilinum is a native species, it is an aggressive coloniser of dry soils and can eliminate many of the more sensitive species. The spread of Pteridium aquilinum and the increase in the rankness of the sward may well be due, in part, to fluctuations in rabbit populations and the expansion of nesting by large gull species. Climate change may also be a contributory factor, as Pteridium aquilinum is frost-sensitive. Whatever factors are responsible, the result has been that more species-rich areas of grassland have been lost.

CBO is keen to develop the current management regime to control Pteridium aquilinum and other rank vegetation, as this would enhance the overall biodiversity of the islands. A range of potential options for reducing the extent of Pteridium aquilinum are being considered, including regular and more extensive scything/mowing, rolling, and/or chemical spraying.

The islands' primary interests are their bird populations, but these depend upon the vegetation and habitats that are present, and how these are changing. This survey has met fully its goals of establishing a verified base-line vascular list for the outer islands, and this work has enabled CBO to develop further the conversation surrounding habitat management on the two outer Copeland Islands. CBO will build on study by implementing an annual vascular plant survey – and will extend surveying further to include the lower order plants (algae, bryophytes, mosses).

As the need for monitoring becomes even more critical when management works are undertaken, CBO will use the results of these RIA sponsored surveys as a baseline against which to record the effectiveness of future management interventions.

6. Please provide an image which can be used by the RIA in grant publications, website etc.

7. a) Please tell us about any academic articles, books or other scholarly publications associated with this project, and any dissemination of your research at academic conferences, workshops or other events that you have been involved in, or plan to:

The results of the survey will be forwarded to the County Down BSBI recorder.

8. Please outline details of any

No collaborations.

collaborations with national or international, or academic partners:	
9. Please tell us about any additional funding that you may have received from other government sources, trusts, EU funding or any other sources including the amount of the grant:	Nil. This was a self-contained survey.
10. Please tell us about any engagement activities and communication about your research (inc. public open days, public lectures, work with museum/gallery/science centre, citizen science, work with teachers or schools, interviews on tv/radio, social media projects or any other relevant activities)	CBO plan to present the findings of the survey in an upcoming CBO webinar. They will also be presented in an article in the 2021 CBO annual report.