

# Refurbishment of European Storm-petrel nest boxes on Mousa, Shetland

Zoe Deakin, Cardiff University

Nocturnal, burrow-nesting seabirds are difficult to monitor as they are active at colonies only during darkness and visual inspection of natural nest sites is usually not possible. The smallest Atlantic seabird, the European Storm-petrel (*Hydrobates pelagicus*; hereafter 'Storm-petrel'), nests in deep crevices on remote islands, returns to the colony only at night and is sensitive to disturbance (Scott 1970; Brooke 2004; Bolton *et al.* 2010). The largest UK storm petrel colony is on Mousa (60°00'N 01°11'W), a 180-hectare island lying 1 km off the southeast coast of the Shetland mainland. Mousa holds approximately 11,800 breeding pairs of Storm-petrel (Bolton *et al.*, 2010) and is designated under the EU Birds Directive as a Special Protection Area (SPA) due to its internationally important breeding numbers of the species.

To aid the study and monitoring of storm petrels on Mousa, 81 specially-designed nest boxes were installed by staff from Glasgow University in 1992 (Bolton 1996), with a further 29 added in later years. These boxes were designed to minimise disturbance to breeding storm petrels during research activities and have enabled detailed studies of storm petrel breeding biology and behaviour (Bolton 1995a, 1995b, 1996). All the nest boxes are accessible from above and this enables an observer to check the status of the nest site without disturbing any birds inside. Hatching and fledging success rates for pairs breeding in nest boxes do not differ from those in natural sites (Bolton 1996). Since 1994, the nest boxes have been used as part of annual storm petrel chick-ringing carried out by Shetland Ringing Group, but little maintenance of the nest boxes has been carried out in that time. This is currently one of very few studies to ring storm petrels of known age and provides important information on demographic rates (Okill and Bolton 2005). Since 2014, the Mousa nest boxes have been used in the first GPS tracking study of Storm-petrels in the UK (Bolton 2020).

Although they are constructed of durable PVC plastic, after 25 years of use, the condition of Mousa's storm petrel nest boxes had deteriorated and many were leaking, providing poor conditions for nesting. Observation windows had become obscured with dirt, meaning nests could not be observed without removing the lids and risking additional disturbance to breeding birds.

During 23–30 May 2018, Mark Bolton and I carried out an audit of the nest boxes on Mousa and performed the necessary maintenance. 22 boxes required major repairs, including re-gluing sections and waterproofing with silicone sealant (Figure 1). 21 boxes were found to be damp and two were very wet. One of these wet boxes was removed as the section of wall it was located in had become completely waterlogged. Ventilation holes were added to

some boxes to reduce condensation. Three boxes were completely full of sand and these were emptied. All observation windows were cleaned.

**Figure 1.** A Storm-petrel nest box (A) before repair, (B) after repair, and (C) in situ. A large stone would then cover the nest box in (C) to ensure it was out of sight and protected from the weather.



We returned to Mousa in July and August 2018 to continue the GPS tracking study of breeding Storm-petrels. We deployed nine GPS tags on Storm-petrels in nest boxes with small chicks. All nine GPS tags were successfully retrieved, and all adults continued to feed their chicks. Further tracking was planned for 2020, although the COVID-19 pandemic prevented this work from taking place. Having been refurbished, we expect the Mousa nest boxes to continue to be used in Storm-petrel research and monitoring in the years to come.

I am incredibly grateful to the Seabird Group for awarding me a grant, which enabled the trip to Mousa in May 2018 for the nest box refurbishment work. During this trip we were also able to carry out a night of Storm-petrel ringing and collected 28 Storm-petrel diet samples, at a time of year when researchers are not normally present on the island. I would also like to thank Rodney and Darron of the Mousa Boat, for transport to the island.

**Figure 2.** Storm-petrel nest boxes on Mousa, Shetland, occupied by (A) an adult and (B) a chick, in August 2018. Lids have been removed for monitoring purposes.



### References

Bolton, M. 1995a. Experimental evidence for regulation of food delivery to storm petrel, *Hydrobates pelagicus*, nestlings: the role of chick body condition. *Animal Behaviour* 50: 231–236. doi: 10.1006/anbe.1995.0235.

Bolton, M. 1995b. Food delivery to nestling storm petrels: limitation or regulation? *Functional Ecology* 9: 161–170.

Bolton, M. 1996. Energy expenditure, body-weight and foraging performance of storm petrels *Hydrobates pelagicus* breeding in artificial nesting chambers. *Ibis* 138: 405–409. doi: 10.1111/j.1474-919X.1996.tb08058.x.

Bolton, M. 2020. GPS tracking reveals highly consistent use of restricted foraging areas by

European Storm-petrels *Hydrobates pelagicus* breeding at the largest UK colony: implications for conservation management. *Bird Conservation International*: 1–18. doi: 10.1017/S0959270920000374.

Bolton, M. *et al.* 2010. Playback re-survey and demographic modelling indicate a substantial increase in breeding European Storm-petrels *Hydrobates pelagicus* at the largest UK colony, Mousa, Shetland. *Seabird* 23: 14–24.

Brooke, M. 2004. *Albatrosses and Petrels Across the World*. Oxford, UK: Oxford University Press.

Okill, D. J. and Bolton, M. 2005. Ages of Storm Petrels *Hydrobates pelagicus* prospecting potential breeding colonies. *Ringing and Migration* 22: 205–208. doi: 10.1080/03078698.2005.9674334.

Scott, D. A. 1970. The breeding biology of the storm petrel *Hydrobates pelagicus*. DPhil thesis, University of Oxford.