

WHERE THE LUNDY SHEARWATERS GO

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There can be few more magical experiences for anyone interested in the natural world than to sit out on the cliffs on an island where Manx Shearwaters breed. By day, there is little to see, save a jumble of ankle-twisting holes amongst the thrift tussocks and long grass. But on a moonless night in summer the slopes come alive with a cacophony of mournful calls as swift shapes fill the air, and the Manx Shearwaters return home to greet their incubating partners or feed their single chicks. On a good night, in a thriving, confident colony, it is a scene that would not be out of place in the remotest parts of the Southern Ocean. It is truly one of Nature's great events, and it happens here, just a few hours from London, on a handful of islands off the west coast of Britain. Most of the world's breeding population of Manx Shearwaters live on Skokholm, Skomer and Rum, with a host of minor island colonies and a few in between. What makes Lundy so interesting is that whilst the number of birds breeding here is still quite small, the potential habitat appears to be enormous, and with the eradication of rats the prospects extremely good. What is more, Shearwaters gather in massive numbers in offshore evening rafts, almost as if waiting to take advantage of the island. One day, perhaps, Lundy may become as magical as the Pembrokeshire strongholds. Indeed, recent survey work suggests that this process may already be underway.

Nevertheless, Shearwaters spend most of their lives at sea, and this is where most of their big life-decisions take place. We can protect them all we like on land, but if we do not know what goes on out there, what resources they depend on and what might threaten them and where, then our conservation efforts can only ever be partially informed. We now know quite a lot about the Shearwaters' life on land (summarised beautifully in Mike Brooke's 1990 book), but very little about its life wandering the oceans. It is with this priority in mind, coupled with a fundamental fascination with how this extraordinary animal survives in and navigates across the open ocean, that my team from Oxford University has been studying the at-sea behaviour of the Manx Shearwater for the last six years or so. And we have arrived at a good time, because advances in technological miniaturization have made it possible in very recent years finally to track such elusive animals.

It is not, however, dead simple. Shearwaters are relatively small birds, around 400g, and they dive to sometimes considerable depths. Spying on their highly active life-style without significant impact cannot be done without careful thought and a light tread. We have been tracking Shearwaters at sea for several years on Skomer and Copeland, and in 2009, with financial help from the RSPB, we started a project transferring some of the techniques we had learnt to the birds of Lundy. After a recce trip in March in which Warden Nicola Saunders showed us around Lundy's colonies, we settled on the slopes between Old Light and The Battery to return in August and make a first attempt to track breeding birds. The aim was to use two tracking methods. First, we would deploy 15g GPS logging devices attached with waterproof tape to the back feathers to try to determine the precise movements of breeding birds on foraging excursions from the



Figure 1. A 2.5g British Antarctic Survey Geolocator attached to a Manx Shearwater's leg. The geolocator records daily positions and flight activity throughout the annual migration.



Figure 2. A 15g GPS logging device attached to a Manx Shearwater's back feathers using marine tape. The device records accurate positions every five minutes to reveal the bird's foraging movements.

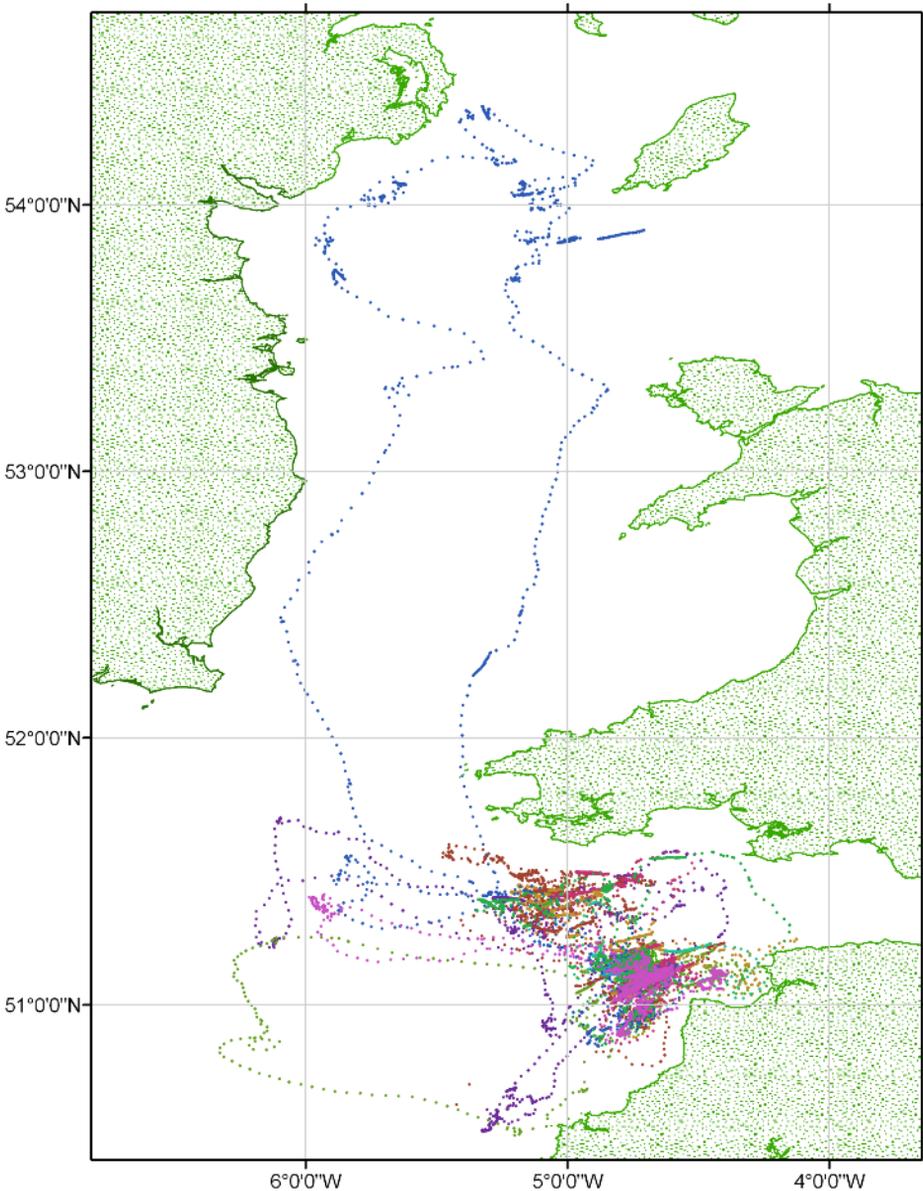


Figure 3. Plot of ten individual Manx Shearwater foraging excursions during chick-rearing on Lundy Island. Each colour is a separate bird, and locations are five minutes apart. The data clearly show roosting areas west of Lundy, an intense foraging area northwest of Lundy, and the occurrence of occasional long-distance foraging movements into the Irish Sea.

nest (see Figure 1, and Guilford *et al.*, 2008). Second, we would deploy 2.5g British Antarctic Survey Geolocators, archival light logging devices from which it is possible to reconstruct a migratory path, attached to custom fashioned Darvik leg rings (see Figure 2, and Guilford *et al.*, 2009). On 1 August 2009 work began in earnest. During the first few nights we caught birds as they came back to their nest, first letting them feed the chick and then catching them on the way out of the burrow with a purse net. We deployed 15 GPS loggers and 19 Geolocators.

And then we waited nervously. For night after night, gloriously clear skies allowed a big moon to shine brightly on the island. This was not good Shearwater weather. Being extremely vulnerable to predators on land, Shearwaters tend to avoid landfall on bright nights just as they avoid it during the day. Instead, as our data eventually showed, they sat and rafted offshore night after night, and waited just as we did. The colony was virtually silent. In fact it was not until many sleepless nights later, on 10 August, that conditions 'improved', and birds, including ours, started returning in numbers.

By 12 August we had recovered 11 of the 15 trackers, ten of which contained valuable data showing the exact locations of the birds every five minutes of their excursions at sea (unrecovered devices fall off after about three weeks as the tape that we use to attach them to the back feathers loses its stickiness in seawater – an important failsafe for the birds). Figure 3 shows a plot of these tracks, each individual bird in a different colour. Whilst we cannot yet generalise these results to other stages of the breeding cycle, or even know whether the same behaviour will occur reliably from one year to the next, they provide an interesting first snapshot of the Lundy Shearwater's life at sea. The densest concentration of positions is around Lundy, chiefly to the west of the Island, where the birds roosted on the water for long periods. But there is also a clear concentration of activity to the north west of Lundy in the waters south of Pembrokeshire, and here the pattern of position fixes is much more characteristic of foraging behaviour. At least for the period that we tracked them in 2009, this area of the northern Bristol Channel (coincidentally overlapping with the planned Atlantic Array windfarm project) appears to be an important fishing area for Lundy Shearwaters. In addition, we also see the distinctively bi-modal activity pattern that we have observed in birds from other colonies, Skomer and Copeland, in which whilst most birds forage relatively locally (in Shearwater terms), occasional birds make very long excursions. Figure 3 shows a single bird fishing off Dundalk and the Isle of Man – regular destinations for Skomer and Copeland birds.

Especially with a bird that travels so freely, it is unwise to try to draw firm conclusions from a single episode. In 2010 we will be returning to Lundy to replicate our GPS tracking work for a second year. And in addition, we will hope to recover most of the Geolocators that will have been gathering daily data on each bird's position, and details of their flight activity, throughout the winter and their long migration to South America and back.

Further reading

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