

Fifth in a series of *Feature Articles*

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Small is beautiful: The use of 18 gram solar powered PTTs on Cory's Shearwaters

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Cory's Shearwaters belong to the family *Procelariidae*, weighing on average 750–1100 grams. This species comes to nest in the NE Atlantic and from ring returns (over 40,000 in 33 years) we know that many birds migrate to South America and some to Africa. However, the major question of their migratory routes remained unanswered until the use of extra light satellite transmitters. PTTs small enough to be used on Cory's Shearwaters were only developed in the mid-nineties.

In 1997 a team from the National Natural History Museum in Paris, working with the Natural Park of Madeira and ourselves (project co-funded by EU-Life Project B4-3200/P/94765), made a first attempt to use Microwave Telemetry's 20 gram battery powered PTTs on incubating Cory's Shearwaters, on Selvagem Grande. The results, although promising, were inconclusive and all birds carrying PTTs were lost. The problem appears to have been the method of attachment.

During the breeding season of 1998, ten wooden replicas of the PTTs were put on birds for trial, from selected nests at Baía das Cagarras, Selvagem Grande. Instead of the harnesses used in the first attempt, replicas were glued to the back of the birds with fast drying epoxy-resin. In order to increase adherence, a small area between the wings was prepared by cutting some of the feathers away so that the replica would fit into a space where the feather stubs were only some 7 mm high. As soon as the glue dried, the birds were returned to their nest, where they quickly settled and continued to incubate. The application of the replicas was always carried out mid-morning when there was least bird activity in the area, thus diminishing the risk of the bird flying off after handling.

On 14, 15 and 16 June 1999, five real battery powered PTTs were put on some of the same birds, (Fig. 1) which had been fitted with the replicas in the previous year (three males and two females). The PTTs were programmed for continuous transmission. Birds were removed from the nest where they were incubating an egg and their weights and rings checked. Males weighed 870–1030 g and females 750–850 g. The transmitter's weight accounted for 2.9 percent of body weight of the lightest female.

The results were spectacular. All birds equipped with PTTs left for sea when relieved by their partner, and not before, and behaved normally. Of the five breeding pairs, only one failed, which was due to the incubating bird (with no PTT) breaking the egg.

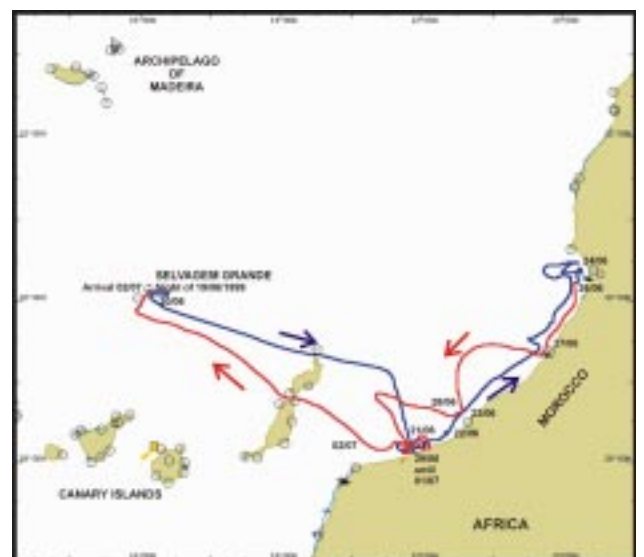
The route taken by two of the birds is shown in Figs. 2A and B. All birds flew southeast, passing by the eastern group of the Canary Islands towards the African coast. The number of days at sea ranged from 12 to 19, with distances covered ranging from 2,622 km to 4,252 km. No significant differences between males and females were found.



Figure 1: The major question of migratory routes of Cory's Shearwaters remained unanswered until the use of extra light PTTs.



Figure 2A and B: The routes of two Cory's Shearwaters fitted with a battery operated 20 gram PTTs, deployed in June 1999.



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