Pre-breeding migration of Manx Shearwater *Puffinus puffinus* in western Atlantic: new insight from a survey in Guadeloupe, French West Indies.

by Anthony Levesque & Pierre Yésou, France

The context

Little is known about the migration route followed by Manx Shearwaters from their winter quaters off South America to their breeding colonies in Europe. It is usually assumed that they follow a straight route, crossing the Atlantic Ocean from the northern coast of Brazil and flying straight to the Azores area, then continuing to NW Europe. Both the major handbooks (Cramp & Simmons 1977, del Hoyo *et al.* 1992) and the main monograph devoted to the Manx Shearwater (Brooke 1990) have mapped such a hypothetical route, which implies that the whole migration takes place east of 40°W.

In such a context, it was not surprising that Manx Shearwaters were rarely encountered in the West Indies (Raffaele *et al.* 1998) and, although birds ringed in the British Isles had been recovered in Trinidad, Grenada and Guadeloupe, it was initially proposed that most records should refer to migrants from the small population breeding in NW Atlantic, particularly in Newfoundland (Keith & Keith 2003), as already suggested for Manx Shearwaters observed off southeastern USA (Lee 1995).

The survey

The observations were carried out from 2001 to 2004 from Petite-Terre, in the Guadeloupe archipelago: at 16°15'N – 61°7'W (see map below) is one of the easternmost islands in the Lesser Antilles. Periods of 15 minutes non-stop observation were carried out from the top of a cliff (c. 7m asl), looking through a tripod-mounted telescope (x20-60 zoom lens used at x30 during search). A short rest was systematically taken between two consecutive 15mn-periods, which were designed as to take place within each one-hour period of each day (i.e. 6 to 7am and so on.). The distribution of observation effort was uneven as the main passage periods have been given extra coverage in order to better document the birds' status at that time (Fig. 1), and because of other personnel responsibilities (wardening duties on this Nature Reserve left more free time at early and late hours, Fig. 2). Simultaneous, co-ordinated, observations from the study spot and from a boat using GPS positioning have shown that large birds were detected through the telescope when passing up to 4 NM (nautical miles) off at sea, with much of the observed passage occurring between 1 NM and 3 NM from the islet.

Data obtained during each 15mn-period (including 'zero' data) has been pooled both per hour and per month, leading to the calculation of the mean number of individuals of a given species observed per hour during a given month. Multiplied by the number of hours with daylight and the number of days per month, this allows a rough estimate of the number of birds that have been passing through the study area over a given period.

The senior author is responsible for most of the field work. The junior author, who has long experience with shearwaters and has been particularly involved in the study of taxa related to the Manx Shearwater, joined for ten days in April 2004, mostly to assist in checking the validity of identification characters used in the separation of Manx Shearwater from Audubon's Shearwater *Puffinus lherminieri*.

The results, which concern nine Procellariiformes species, are to be published in the journal *North American Birds* (Levesque & Yésou in prep.).

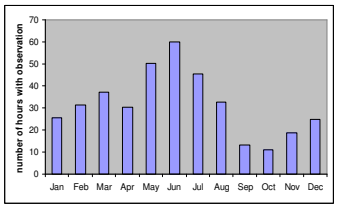


Figure 1. Distribution of observation effort per month (N = 380 hours). The effort was kept low in autumn (down to 11 hours in October, i.e. on average one 15mn observation period every three days) due to the very low frequency of birds detected at that time of the year. Conversely, in order to determine year to year consitency of seabird occurence, the coverage was intensified during months where records from previous years suggested that passage may occur.

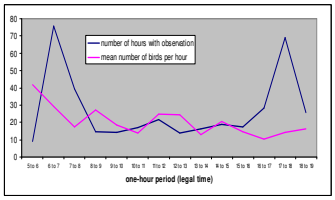
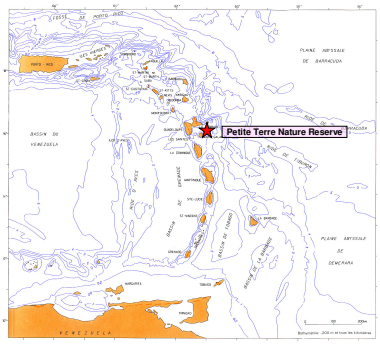


Figure 2. Distribution of observation effort and evolution of average bird frequency through the day. The observation effort peaks in the first and last part of the day due to work schedule on the Nature Reserve, leaving more free time before 8am and after 5pm, local time. Low observation effort in the very first and last hours of the day is linked to seasonnal year variations in dawn and sunset time. The mean number of birds per hour (nine species of Procellariiformes, data pooled) tends to decrease throughout the day (r = – 0.71).



Results

Out of 3330 small shearwaters (either Manx or Audubon's) seen during the four-year survey, only 6% had to be left unidentified. Most identified birds were Manx Shearwaters (N = 2543).

The first record of Manx Shearwater for Guadeloupe was a corpse found washed ashore at Désirade island on 30 April 1997, which had been ringed in 1978 as a flying bird (born before that year, age otherwise unknown) at a colony in Saint Kilda, Scotland (Keith & Keith 2003, J. Clark/BTO pers. comm.), and no bird was recorded alive in waters surrounding Guadeloupe until 2001 (Levesque & Jaffard, 2002). Thus it was a great surprise when the Manx Shearwater proved to be the most abundant Procellariiformes species (34% of all tubenoses recorded and 40% of all shearwaters), and probably the most abundant of all seabirds off Guadeloupe, although no systematized counts of terns and noddies have been undertaken.

The Manx Shearwater has been recorded from 5 November to 10 June, sometimes in small flocks of up to 18 birds together, but remained scarce outside the spring passage which occured from February to May, peaking in March (Fig. 3). The highest count was on 3 March 2004 when 597 birds were recorded in 4 hours during strong north-easterlies (wind speed up to 80 kmph) which had begun the previous day.

From these observations, it can be estimated that on average an amazing 26.000 Manx Shearwaters are passing by the observation spot in February-May each year, 72% of them in March. There is much yearly variation in passage intensity, however, and only c. 18.000 birds have occured in 2002 but over 33.000 in 2004.

Discussion

The above estimates can be disputed with regard to the fact that huge movements of Manx Shearwaters passing off the observation spot have occasionally been given extra coverage: this may lead to slightly higher estimates than in a case of a strict protocol where observation are conducted over pre-defined periods.

Anyway, this survey has brought to light that Manx Shearwaters regularly migrate close to the Lesser Antilles by the thousands. In such a pelagic species, movements detected from land are part of a wider context. Then can we conceive that much higher numbers, possibly 100.000 Manx Shearwaters or more, are passing offshore in West Indian waters ?

The observed and infered numbers are such that the presence of Manx Shearwaters off the Lesser Antilles can no longer be related to the small and declining population which breeds in the NW Atlantic. Obviously, the spring movement observed each year off the Lesser Antilles is part of the pre-breeding migration of the European population of Manx Shearwater. We suggest that these birds leave the South American waters by following the Gulf Stream, along which feeding conditions may be of interest to these birds during their return journey to Europe. Which proportion of the population actually follow this western route and at which latitude do these birds turn eastward are questions still to be solved.

This previously unsuspected migration route was brought to light thanks to sea-watching, a way of bird recording almost ignored in the Lesser Antilles until this survey. In North America, similar land-based observations of seabirds moving past North Carolina (Buckley 1973) were forerunners to the development of important vessel-born studies of bird distribution and biology at sea in this area. Will seabird benefit from a similar attention off the Antilles ?

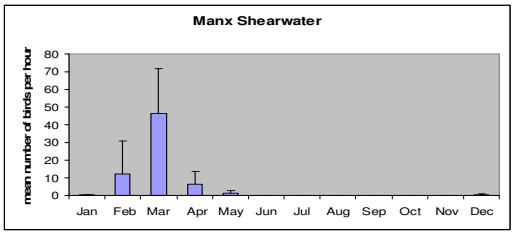


Figure 3. Monthly frequency of Manx Shearwaters *Puffinus puffinus* passing within a 4 NM distance off Petite-Terre, Guadeloupe, 2001-2004.

Brooke M. de L., 1990. *The Manx Shearwater*. Poyser, London. – Buckley P.A. 1973. *American Birds* 27: 8-10. – Cramp S. & Simmons K.E.L. 1977. *Handbook of the Birds of the Western Palearctic*, vol. 1.Oxford Univ. Press, Oxford. – del Hoyo J., Elliot A. & Sargatal J., Eds. *Handbook of the Birds of the World*, vol 1. Lynx Ed., Barcelona – Keith A.R. & Keith L.W. 2003. *J. Carribean Ornithology* 16: 26-30. – Lee D. S. 1995. *Marine Ornithology* 23: 107-119. – Raffaele H., Wiley J., Garrido O., Keith A. & Raffaele J. 1998. *A Guide to the Birds of the West Indies*. Helm, London.

Anthony Levesque
Réserve naturelle des Ilets de Petite-Terre
Labrousse
F – 97190 Gosier, Guadeloupe
anthony.levesque@wanadoo.fr

Pierre Yésou
ONCFS
53 rue Russeil
F – 44000 Nantes
p.yesou@oncfs.gouv.fr

Second International Manx Shearwater Workshop: Studies on Manx Shearwater *Puffinus puffinus* and related Petrel species, Belfast, Northern Ireland, 2nd – 4th August 2005
Organised by Copeland Bird Observatory