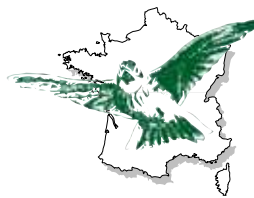


Alauda

Revue internationale d'Ornithologie

www.mnhn.fr/assoc/seof/



SEOF



Volume 76

Numéro 1

Année 2008

Société d'Études Ornithologiques de France

Muséum National d'Histoire Naturelle

3873: STATUS AND CONSERVATION REQUIREMENTS OF MANX SHEARWATERS *Puffinus puffinus* ON TENERIFE (CANARY ISLANDS)

Statut et exigences pour la conservation du Puffin des Anglais à Tenerife (îles Canaries).

The Manx Shearwater *Puffinus puffinus* breeds almost exclusively in the eastern North Atlantic islands. Its breeding population exceeds 350,000 pairs and there is no evidence to suggest that the species has declined overall. Although breeding range is bigger than 50,000 km², more than 90% of the breeding population is concentrated in a relatively few sites (BIRDLIFE INTERNATIONAL, 2004). In the Macaronesian archipelagos (Azores, Madeira and the Canaries), estimations varied between 1,865 and 3,740 breeding pairs (BIRDLIFE INTERNATIONAL, 2004). Canary Islands (27°37'-29°25'N and 13°20'-18°19'W) constitute the southern extremity of its breeding range (HAMER, 2003). Although in this archipelago, the only confirmed breeding data were reported for La Palma and Tenerife islands (MARTÍN *et al.*, 1989; HERNÁNDEZ *et al.*, 1990), its breeding is also suspected but not proven in La Gomera and El Hierro islands (MARTÍN & LORENZO, 2001). The Canary Islands Manx Shearwaters are also the smallest in size of the various populations in Europe (ZONFRILLO *et al.*, 2001).

In the Macaronesian archipelagos the nesting burrows of Manx Shearwater are usually located on the edge of cliffs and inaccessible ledges of ravines within laurel forest habitat (MARTÍN & LORENZO, 2001; ZONFRILLO *et al.*, 2001). This forest is mainly influenced by north-easterly humid trade winds and therefore located in the north-facing slope. Due to nocturnal behaviour at their colonies and the often steep and inaccessible breeding habitat they occupy (at least in the Macaronesian archipelagos), its true range and population size is largely unknown (CRAMP, 1998; HAMER, 2003).

We here update the status of Manx Shearwater in Tenerife Island (the largest of the Canarian archipelago) and its conservation status based on 'listening stations'. We also present data from collected and rescued birds by *Centro de Recuperación de Fauna Silvestre de Tenerife "La Tahonilla"* (Cabildo de Tenerife, onwards CRFS-"La Tahonilla").

Listening stations were situated in 27 sites with historical published data on the presence of the species or in potential breeding habitat (MARTÍN & LORENZO, 2001; *pers. obs.* FIG. 1). During the period March to June 2006, we set up at least one listening station in

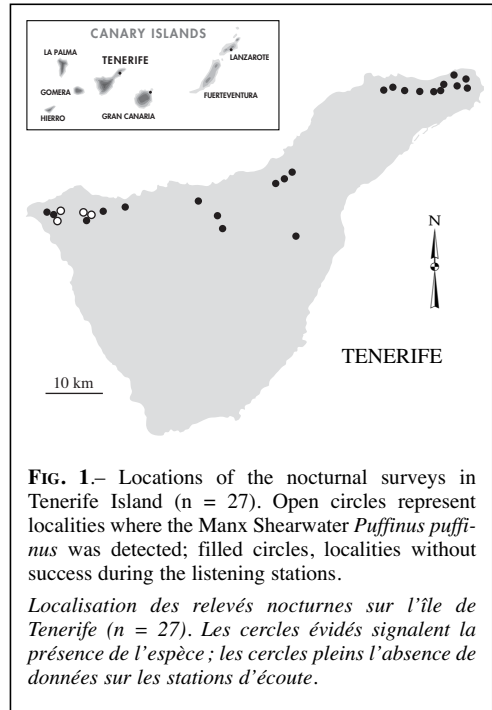


FIG. 1.— Locations of the nocturnal surveys in Tenerife Island (n = 27). Open circles represent localities where the Manx Shearwater *Puffinus puffinus* was detected; filled circles, localities without success during the listening stations.

Localisation des relevés nocturnes sur l'île de Tenerife (n = 27). Les cercles évidés signalent la présence de l'espèce ; les cercles pleins l'absence de données sur les stations d'écoute.

each selected site. The first calls of the species at night start approximately one hour after sunset (CÁMARA, 2001; *pers. obs.*), therefore, after this time, we recorded the number of shearwater calls into ten minute periods during two hours. Because moonlight affects Procellariiformes activity (IMBER, 1975; BRETIGNOLLE, 1990; CRAMP, 1998; LE CORRE *et al.*, 2002; *pers. obs.*), moonless nights were selected for nocturnal surveys. Furthermore, data from CRFS-"La Tahonilla" on the numbers, age and localities of light-attracted birds, were used to evaluate the status and distribution of the species.

A total of 58 hours of listening was undertaken, one of the most intensive effort made in the Canaries to determine breeding sites and the population size of this shearwater. The number of vocalizations was always very low (less than two individuals at the same time). We only detect birds in four places located in the Teno massif (northwest part of the island, FIG. 1), one of them corresponded with the only confirmed breeding site on the entire island, discovered in 1989 by HERNÁNDEZ *et al.* (1990). These authors found four occupied burrows and a signs of predation by rats in another three.

From information reported by CRFS-"La Tahonilla", and our unpublished data, in the period 1998-2006 a

minimum of 23 birds were dazzled by community lighting and grounded in Tenerife (see TABLE I). Despite the higher light pollution concentrated in the south of the island (location of the capital and main tourist cities), 74% of dazzled birds ($n = 17$) were found in the north facing slope. However, 30% of dazzled birds ($n = 7$) were found in the largest tourist municipality (Puerto de La Cruz) on the north coast. These data support the negative effect of light pollution as reported in Procellariiformes (IMBER, 1975; REED *et al.*, 1985; ZONFRILLO *et al.*, 2001; LE CORRE *et al.*, 2002). Fledglings were mainly dazzled and grounded between 15th July and 13th August (Mean \pm SD = 25th July \pm 9.6 days; FIG. 2). This agrees with the fledging date reported by MARTÍN & LORENZO (2001). Furthermore, it coincides with many popular celebrations, in which light pollution increases, and includes fireworks, fairsgrounds and additional decorative street lighting.

Anecdotal accounts of the species in the past (see MARTÍN & LORENZO, 2001), suggest distribution range and population size has suffered a notable recent reduction on Tenerife. Like in other Procellariiformes, multiple factors could be involved in this reduction, such as the presence of introduced predators (rats and cats) near the colonies (MOORS & ATKINSON, 1984; BROOKE, 1990; HAMER, 2003), or the increase of light pollution (IMBER, 1975; REED *et al.*, 1985; LE CORRE *et al.*, 2002). Changes in feeding resources in potential foraging areas at sea as at the Saharan Bank (BAILLIE *et al.*, 2004; CAMPHUYSEN & VAN DER MEER, 2005) may also have an effect.

Results of these preliminary nocturnal surveys and the low number of dazzled juveniles by artificial lights clearly indicate that current population of Manx Shearwater in Tenerife is very small and a notable contraction of its range could also be inferred. Although an abundant seabird in northern Europe (BIRDLIFE INTERNATIONAL, 2004), conserva-

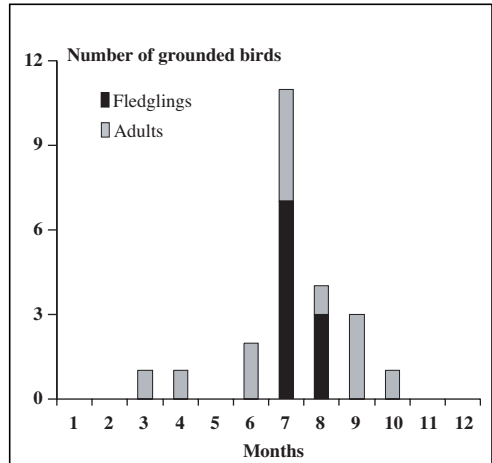


FIG. 2.— Annual distribution of the dazzled Manx Shearwaters *Puffinus puffinus* in Tenerife, Canary Islands (1998–2006). Pooled data of *Centro de Recuperación de Fauna Silvestre “La Tahonilla”* (Cabildo de Tenerife) and personal data. 1 is for January, 12 for December.

Répartition annuelle des données de Puffins des Anglais (jeunes et adultes) entre le 1^{er} janvier et le 12 décembre, de 1998 à 2006.

tion of its marginal colonies is important because genetic divergence may operate within these populations as consequence of isolation (see GÓMEZ-DÍAZ *et al.*, 2006 for *Calonectris diomedea*).

Foraging strategies using telemetry, perhaps attached to rescued birds when released, dietary studies, effects of alien predators and methods of limiting light pollution in public lighting require urgent study to understand and conserve this small population before it is totally exterminated.

TABLE I.— Individuals of Manx Shearwater (*Puffinus puffinus*) collected in Tenerife Island by the personnel of the *Centro de Recuperación de Fauna Silvestre “La Tahonilla”* (Cabildo de Tenerife) and our own data.

Puffin des Anglais (jeunes et adultes) collectés par le personnel du Centre de sauvetage “La Tahonilla” et données personnelles.

AGE	YEARS									TOTAL
	1998	1999	2000	2001	2002	2003	2004	2005	2006	
Fledglings	2	2	0	2	0	1	1	0	2	10
Adults	1	1	1	1	2	2	2	1	2	13

ACKNOWLEDGEMENTS

Rut MARTÍNEZ, Aurelio ACEVEDO, Joaquín VIZCAÍNO, Juan P. CASTRO, Miguel FERNÁNDEZ DEL CASTILLO, Daniela VALENTINOVA, Rubén FUENTES, Marta GONZÁLEZ, Sergio GONZÁLEZ, José L. HERRERA, Benito GONZÁLEZ, Nereida HERRERA, Vanessa REYES, Candelaria RODRÍGUEZ, María C. MARTÍN, Beatriz PINEDO, Acórán HERNÁNDEZ, Demelza FELIPE & Juan C. ADAM helped in the nocturnal surveys. Special thanks to staff of *Centro de Recuperación de Fauna Silvestre "La Tahonilla" - Cabildo de Tenerife*, who provided us with data of dazzled birds, and all the anonymous persons who kindly helped in rescuing the birds. Thanks to Dr. Bernard ZONFRILLO for comment on early drafts of this manuscript.

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