AN INITIAL ESTIMATE OF AGE AT FIRST RETURN AND BREEDING IN MADEIRAN STORM-PETRELS *OCEANODROMA CASTRO*

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Bried J. & Bolton M. 2005. An initial estimate of age at first return and breeding in Madeiran Storm-petrels *Oceanodroma castro*. Atlantic Seabirds 7(2) 71-74. *The Madeiran Storm-petrel* Oceanodroma castro *is classified as "Rare" in Europe; however, its population dynamics and its demographic parameters remain unknown. Here, we provide the first estimates of the age at first return to the colony and age at first breeding in this species, using our data from a five-year demographic study conducted in the Azores (subtropical northern Atlantic). On average, Madeiran Storm-petrels return to their birth colony during their third year. They can breed when two years old, and the reproductive performances of first-time breeders are similar to those of experienced individuals.*

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INTRODUCTION

The Madeiran Storm-petrel *Oceanodroma castro* is regarded as a "Species of Conservation Concern" (Category 3) with a status of "Rare" in the Western Palearctic, with a breeding population of less than 10, 000 pairs (Burfield & Van Bommel 2004). Its European population is small (3700 pairs) and apparently declined between 1970 and 1990. Estimating a species' demographic parameters is a prerequisite for biological conservation, but the population dynamics of Madeiran Storm-petrels remain largely unknown. Here, we provide the first estimates of age of first return to the colony and age of first breeding in this species, using the data from a five-year demographic study in the Azores (subtropical northern Atlantic).

METHODS

Field work was conducted on Praia islet (39°03'N, 27°57'W), a 0.12 km^2 islet situated in the Azores archipelago, between 2000 and 2004. Two seasonal

populations of Madeiran Storm-petrels breed on the islet (Monteiro *et al.* 1999; Bolton *et al.* 2004) and use the same nests (authors' unpubl. data). So far, no exchange of individuals has been recorded between these populations (Monteiro & Furness 1998, authors' unpubl. data), whose breeding numbers are quite small: 100 pairs during the hot season (i.e. April-early September) and 200 pairs in the cool season (late August-February; see Monteiro *et al.* 1999, Bolton *et al.* 2004). During each breeding season, we thoroughly inspected potential suitable nesting sites during incubation (mid-June for the hot season population, early December for the cool season population) to check for the presence of adults. Concomitantly, we captured non-breeding prospectors at night, using mist nests. Breeders and prospectors were either ringed or identified from their ring number if ringed earlier. Chicks were ringed before fledging (in late July-early August for the hot season population and in late January-early February for the cool season population).

RESULTS

In the hot season population, 543 breeders and prospectors and 114 chicks have been ringed since 2000. Three two-year old individuals were mist-netted in June 2003. In 2004, four birds of known age were found occupying a nest. The first, found on 13 June, was three years old. Its brood patch was entirely free of down, but the nest contained no egg; during a second visit on 31 July, we found the nest unattended and, again, without egg. Therefore, and also because brood patches do occasionally occur in non-breeding petrels (Warham 1990), this individual was probably a non-breeder. Two other individuals, 4 years old and 2 years old, made their first breeding attempt. The older bird was found incubating on 18 June, but its nest was empty on 31 July. The younger individual had no egg on 14 and 17 June, but it was found incubating in the same nest on 31 July, and a healthy *ca* 5-week old chick (age estimated from 64-mm wing length) was found on 10 September. The fourth individual, which had been ringed as a chick in August 2000, was found incubating on 13 June 2004. A breeding attempt involving the partner of this individual had already been witnessed in the same nest in 2003, but it is unclear if this attempt also involved the four-year old individual. The chick hatched relatively late in the 2003 season, but it fledged successfully. On 10 September 2004, an almost fully grown chick in good condition was found in this nest.

When considering the cool season population, we have ringed 1008 breeders and prospectors and 144 chicks since 2000. On 5 February 2003, we found the remains of a ringed individual preyed on by a vagrant Short-eared Owl *Asio flammeus*. This individual had been ringed as a chick in January 2001,

indicating that it had returned to the colony two years after fledging. Two other two-year old birds were mist-netted on 23 and 25 November 2004, respectively.

We conclude therefore that Madeiran Storm-petrels may commence breeding when 2 years old. Because neither of the breeders had been captured earlier, and excluding the fourth hot season individual which might actually have returned in 2003, we could estimate the age at first return at 2.3 ± 0.7 years ($n = 9$).

DISCUSSION

Our estimated age of first return and age of first breeding are consistent with the fact that petrels are long-lived species (Warham 1990). Similar results were found in other storm-petrel species (Jouventin & Mougin 1981; Schreiber & Burger 2002; G. Hémery pers. comm.). Because of our small sample size, our results must be regarded as preliminary, and they need to be refined by continuing our long-term monitoring. Late breeding by the two-year old bird (and by the last hot season individual if, indeed, it did breed in 2003) is in accordance with the fact that young and/or first-time breeders tend to lay relatively late in the season (see Brooke 1978; Nelson 1978; Haymes & Blokpoel 1980; González-Solís *et al.* 2004). However, the hatching success of these three individuals (66.7%) was similar to that observed in the 58 other nests found occupied by breeders in 2004 (69.0%). This result was somewhat surprising, given that in long-lived species, first-time breeders often have lower reproductive performances than their more experienced and/or older conspecifics (Curio 1983).

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EERSTE SCHATTING VAN DE LEEFTIJD WAAROP MADEIRASTORMVOGELTJES *OCEANODROMA CASTRO* VOOR HET EERST NAAR DE KOLONIE TERUGKEREN EN BROEDEN

Madeirastormvogeltje Oceanodroma castro *wordt geklassificeerd als "Rare" (zeldzaam) in Europa. De populatiedynamica en demografische parameters van deze soort zijn echter onbekend. Op basis van de gegevens die zijn verzameld tijdens een vijfjarige studie op de Azoren, presenteren we in dit artikel de eerste schattingen van de leeftijd waarop Madeirastormvogeltjes voor het eerst naar de kolonie terugkeren en ze voor het eerst broeden. Madeirastormvogeltjes keren gemiddeld in het derde jaar terug naar de geboortekolonie. Ze kunnen broeden als ze twee jaar oud zijn. Het reproductiesucces van 'nieuwe' broedvogels is gelijk aan dat van ervaren broedvogels.*

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