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A review of the occurrence of bats (Chiroptera) on islands in the North East Atlantic and on North Sea installations

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The bats recorded from Iceland, the Faroe Islands, the Shetland Islands, the Orkney Islands, and North Sea installations are reviewed to the end of 2012. In total 12 species have been positively identified, while a considerable proportion of all records are sightings of unidentified bats. Eight of the species are European in origin and four originate from the New World. The largest number of species (8) has been recorded in Iceland, but the greatest number of individuals (180) has been found in Orkney. The bat invasion on the Faroe Islands in 2010 is without precedence, when 70 observations of a minimum of 45 individuals were noted. Most bat observations in the study area occurred in the autumn, with fewer in the spring. Most observations were of single animals, but there were also sightings of up to 12 individuals. There has been a marked increase in bat records in the past three decades. We discuss whether this is a real increase, or due to improved communications, increased public awareness, increased shipping, changes in weather patterns and/or the effects of climate change. All factors appear to be involved.

Key words: Iceland, Faroes, Shetlands, Orkneys, North Sea, vagrancy, ship-assistance, climate change, invasion, identification problems

INTRODUCTION

The order Chiroptera is widespread through most parts of the World. The greatest proportion of families, genera and species are found in the tropics and sub-tropics, with a lower proportion in temperate zones. Within temperate zones, the number of species decreases with increasing latitude. In temperate zones, insectivorous bats are restricted to those areas with good supplies of food to sustain them through the spring and summer breeding periods and enable them to build up adequate fat reserves in the late summer and autumn ready for hibernation through the winter (Yalden and Morris, 1975; Hill and Smith, 1984; Rolland *et al*., 2014).

Migratory behaviour and vagrancy are particularly well-known in birds and bats (Ahlén, 1997; Hutterer *et al*., 2005; Ahlén *et al*., 2009), in which the ability to fly makes it easier to disperse outside their normal range. Bats employ a variety of strategies to make best use of the available habitats. Some species occupy relatively small territories, travelling only short distances in search of food and between breeding roosts and winter hibernacula, while other species migrate for medium to long distances, in order to exploit resource-rich areas.

The North East Atlantic islands, comprising Iceland with its fluctuation between subarctic winters and temperate summers and the Faroe, Shetland and Orkney islands with temperate but cool winters and summers, with one exception do not have resident populations of bats. Nor are the islands considered to be on normal migration routes, although stragglers do reach them on occasion. The species involved and the frequency of these occurrences undoubtedly depends on the distance from their normal range, but a number of other factors, such as population numbers, vagrancy, and unintentional transport by humans, are also important. In the long run, global environmental changes such as climate change may also modify traditional distribution patterns.

The present study examines records of bats from the North East Atlantic islands of Iceland and the