

Letters

WILDLIFE

Mass mortality of puffins, linked to starvation

INVESTIGATION of wildlife mass mortality events is fundamentally important in order to assess whether they signal an underlying significant change in the supporting ecosystem (Duff and others 2010). During the latter half of March 2013 a mass mortality of auks occurred between the Moray Firth and Lincolnshire. This incident was unusual because the species predominantly affected was the puffin (*Fratercula arctica*). Body counts conducted by volunteers totalled 3055 dead puffins along the Scottish shore and 1553 along the coastline of northeast England, following an exceptional period of strong to gale force east to south-east winds and rough seas over most of the last two weeks in March (Harris and Elkins 2013). Postmortem examination of 71 birds from Scotland found all to be emaciated with empty stomachs and with no obvious signs of trauma.

Beaches in Lincolnshire were visited on March 29, where along the tide-line several dead auks and large numbers of marine shells were found, including an almost constant line of sea urchin shells (Fig 1). Eight auks, including three puffins, were examined by the Diseases of Wildlife Scheme. This Defra-funded scheme investigates unusual disease and mortality in wild species in England and Wales. The findings in all birds were consistent with starvation; they were thin with no obvious body fat deposits and no food in their gizzards. Similar findings were recorded in 17 puffins and 15 other auks from five locations examined by SAC Consulting Veterinary Services (T. Pennycott, personal communication). Avian influenza virus was not detected and the histopathology of several tissues revealed no underlying disease processes.

The incident was unusual because puffins, while not the most common auk species in the region, suffered the highest mortality. The mortality timeline was closely related to the two-week period of stormy weather and on-shore easterly winds. Few fresh corpses were reported once calmer weather commenced at the beginning of April. Puffins normally feed within the top 20 metres of the sea, while other auks dive deeper for food (Harris and

Wanless 2011). The crustacean mortality appeared significant and, although it is not known when these animals died, the mortality was probably associated with the stormy weather. We assume that puffins catch food by sight and that, if in-shore and close to breeding colonies, storm-driven turbulence in the water may have prevented this. Why did the puffins not move away? They may have had a strong preference to stay close to the breeding colony coast or may not have been able to fly or swim away in persistent storms; several were moulting flight feathers (Harris and Elkins 2013) and, terminally, they may have been too weak to fly.

Our hypothesis, based on circumstantial evidence, was that starvation occurred as a result of several factors occurring concurrently: puffins concentrating in-shore near to their breeding colonies with prey disruption in those areas (limited data suggest that at this time of year they eat mainly small fish with some crustacea and polychaete worms [Harris and Wanless 2011]); difficulty sight-hunting in turbulent waters; and effective reduction in the mobility of the birds. These factors are likely to be linked to the persistently stormy weather. If they form at least part of the cause, then they would not tend to suggest the involvement of a previously unidentified long-term change in the marine ecosystem in this area of the North Sea. The effect on numbers of breeding puffins seems to be minimal based on recent counts; however, the longer-term effects of this incident remain to be seen.

This unusual wildlife mortality event highlighted the essential need for rapid response and coordination between government and non-government specialist organisations, working together with local public volunteers. Coordination of activity, including site visits with collection of samples, is required as soon as an unusual wildlife mortality event is identified because carcasses quickly decompose and are rapidly removed by scavenger species.

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FIG 1: Beach near Mablethorpe, Lincolnshire, where dead puffins were found, showing the tideline mass mortality of sea urchin

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