there's life in the OLD BIRD

Geriatric sex and ageing

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Longevity is a subject that fascinates people, perhaps because of our obsession with death. People often ask how long a particular bird species lives but, like most interesting questions, there is no simple answer. As a rough rule of thumb, the average life expectancy of a bird can be estimated as: -1/natural log of the annual survival rate.

Thus, for a Bronze Mannikin, where only roughly 35 per cent of birds survive each year, the average life expectancy is about one year. This is not the same as maximum longevity (the oldest age recorded for a particular species), which is what most people want to know (it's around four years for the Bronze Mannikin).

The problem with estimating maximum longevity is that very old individuals are rare, so to get a reasonable estimate of maximum longevity, we need to ring huge numbers of birds as chicks. Fewer than one in 10 000 Common Starlings lives beyond 10 years, but of the 13 million or so ringed in Europe, one has reached the age of 23 years. This suggests that starlings don't age in the same way as humans – if they did, given that more than one in 10 000 humans reach 90, we'd expect some people to reach 200. Yet despite the best efforts of modern medicine, barely one in a billion humans reaches 110.

One reason for this apparent discrepancy is that Common Starlings in Europe live in a tough, highly seasonal environment, replete with predators and diseases. If they lived in safe, sheltered environments they might live longer (and indeed they probably do so in southern Africa). Captive birds often live longer than those in the wild, with some large parrots surviving for more than 80 years. Another possible reason for the difference between starlings and humans is that human females stop reproducing at between 40 and 50 years of age. This removes any direct selective advantage to genes favouring longevity (although there may be cultural advantages to having wise elders to guide the tribe).

What happens in birds? Is there evidence of senescence and menopause in long-lived individuals? The best place to study these questions is among albatrosses and other long-lived, colonial seabirds that are relatively easy to observe in large numbers. Of course, even among these seabirds, many birds die in their first year, and perhaps only half of all birds reach breeding age (about 10 years for most albatrosses). But those that do learn to make a living at sea sufficient to breed successfully have a good chance of surviving from year to year – provided they stay clear of longlines and other fishing gear.

left *Laysan Albatross 'Wisdom', the oldest known wild bird, broods her latest chick on Midway Island.*

opposite, top *Wisdom's chick, three weeks old and growing rapidly.*

With natural mortality rates as low as two per cent per year, we might expect some albatrosses to live for a very long time indeed. Quite how long is still open to debate – we haven't been ringing birds long enough to know for sure how long birds live. The oldest well-documented wild bird is thought to be 'Wisdom', a Laysan Albatross first ringed on Midway Island in the North Pacific Ocean in 1956. At the time, she was incubating an egg, and thus was at least five years old (and most probably more than 10 years old). That makes her currently at least 62 years old and it's not unreasonable to expect that there are other, even older albatrosses out there.

Remarkably, Wisdom hatched a chick in early 2013, her sixth in as many years. Over the past half century she has probably raised more than 30 chicks and flown close on five million kilometres.

Is this level of productivity typical of very old birds? Several seabird populations have been studied for more than 40 years and, in most cases, reproductive output decreases among birds older than about 30 years. However, this is not invariably the case; unlike albatrosses and fulmars, Snow Petrels show little evidence of reduced reproductive success among old individuals.

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Among those species that do show evidence of reproductive senescence, what is the cause? The population of Wandering Albatrosses on the Crozet Islands has been the subject of several studies on the effects of ageing. Researchers have been unable to find any strong evidence of physiological ageing similar to that found in humans, however foraging efficiency of old breeders is markedly lower than that of birds in their prime. A similar pattern has been found among old Grey-headed Albatrosses breeding on South Georgia. It thus appears that long-lived individuals experience some degree of physical deterioration that reduces their foraging ability several years before they actually die. Interestingly, while breeding, old male Wandering Albatrosses also forage in colder Antarctic waters than younger males, but the reason for this difference is unknown.

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NEW SAFETY NET FOR SEABIRDS

At around 18 million hectares, the new Marine Protected Area (MPA) declared in April 2013 in the South African territorial waters around the Marion and Prince Edward islands is gigantic. These islands are internationally renowned for their important seabird colonies, including holding nearly half the world's Wandering Albatrosses, 13 per cent of the world's King Penguins, and one of the highest numbers of breeding seabird species (26) of any island in the world.

Protecting the oceans is uniquely difficult because large parts of the ocean, the so-called high seas, are beyond national jurisdiction and all nations are able to use and exploit them. But within territorial waters, MPAs are a critical tool that governments can use for protecting the oceans and ensuring sustainable use. The design of the MPA is a pragmatic, balanced one, with zones providing various levels of protection. So while limited commercial fishing is allowed in some places, in others there's a strict ban on any extractive use. The 12-nautical-mile no-take zone around both islands will help to ensure that seabird species such as the Gentoo Penguin and Crozet Shag, which feed exclusively within this area and which have suffered large decreases in recent times, will not face additional pressures from new activities in their feeding ranges.

BirdLife International lists the islands as an Important Bird Area in recognition of their irreplaceable biodiversity value. BirdLife is also working at identifying marine Important Bird Areas across the world's oceans, and the new MPA overlaps with several proposed marine IBAs.

ROSS WANLESS

CROZET SHAG ROSS WANLESS