

Sixteen year study of remote sea birds shows sub-annual breeding to maximise offspring

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(Phys.org) —A bird species that makes its breeding home on a remote Atlantic island has been shown to breed consistently for the first time with a cycle of less than a year, following a 16-year study by University of Birmingham researchers – potentially to maximise the total number of offspring they produce.

The study reveals that the Ascension Island sooty tern (*Onychoprion fuscatus*) breeds sub-annually at both a population and an individual level – despite other populations of sooty terns elsewhere having an annual cycle.

The researchers, from the School of Biosciences at the University of Birmingham, say that the results demonstrate that some species, such as the Ascension Island sooty terns, can severely shorten the courtship phase of their breeding cycle to maximise the number of times they can reproduce.

The study looked at 17,000 adult birds which were caught and ringed while incubating across the 16-year period, and by re-trapping over 3,000 of them which were incubating during subsequent breeding attempts, their sub-annual breeding was demonstrated.

Most animal species have an annual breeding cycle which matches the most favourable ecological conditions in which to raise their young, thus maximising the chances of their offspring's survival. The sooty tern on Ascension Island appears able to adjust its physiology under what

appears to be weak ecological constraints thereby minimising the time taken between breeding attempts.

The birds on Ascension Island have longer foraging ranges to locate prey during breeding compared with their counterparts that forage over less deep seas. This leads to longer incubation shifts for the birds, of up to seven days, compared to one or two days for birds elsewhere in the range.

The birds must moult to retain the quality of their plumage which is especially important as they migrate vast distances between breeding seasons. As both moulting and breeding expend a considerable amount of energy, the two do not overlap. by reducing their cycle to alternating periods of moult and breeding, and by minimising their courtship phase, the [birds](#) can re-establish pairing on returning to Ascension Island and copulate before departing to prepare at sea for egg laying back on the island.

Dr Jim Reynolds, lecturer on lecturer in Ornithology and Animal Conservation at the University of Birmingham, who worked on the study, said: "The absence of a strong ecological signal that normally synchronises species with favourable conditions means that the Ascension Island sooty terns have a lower breeding success than their counterparts that breed on an annual cycle, but the timing provides each individual with the chance potentially to breed more often during their lifetimes and potentially to increase the total number of offspring they produce."

The researchers now say further study of other species [breeding](#) sub-annually is urgently needed to find the definitive explanation for the phenomenon.

The results of the study, the Sub-Annual Breeding Cycle of a Tropical

Seabird are published in *PLoS ONE*.

More information: Reynolds SJ, Martin GR, Dawson A, Wearn CP, Hughes BJ (2014) "The Sub-Annual Breeding Cycle of a Tropical Seabird." *PLoS ONE* 9(4): e93582. [DOI: 10.1371/journal.pone.0093582](https://doi.org/10.1371/journal.pone.0093582)

Provided by University of Birmingham

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