

Up shit creek: new sampling method reveals foraging decisions of a specialised seabird

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Sandwich Terns are really picky when it comes to food. In Belgian and Dutch waters, they almost exclusively feed on two fish-groups: Clupeids and Sandeels. But this doesn't mean that by knowing this, their ecology is completely unravelled! If we like to know why for example their chicks are dying or thriving, growing fast or rather slow, we have to conduct long term research. We've been studying their breeding and feeding ecology for the last 15 years and still learn exciting things each year!

The study of the diet of the chicks is relatively straightforward. In a breeding colony, we place a hide and watch the adults feeding their chicks. We write down the species and length of each fish brought to the chicks and do this for several days, at least 8 hours a day... This way, we end up with a pretty good idea of what the chicks have been feeding on.

On the other hand, it's not so easy to study the diet of adult Sandwich Terns (and of most of the other species of seabirds for all that matters). The foraging occurs far out at sea, out of sight except for the most intrepid of observers. As a consequence, not many studies of the adult diet of seabirds are available, especially not in combination with that of their chicks.

Luckily, incubating adult Sandwich Terns have the habit of defecating next to the nest. As a result, after three to four weeks of incubation, a thick crust of faeces has formed around the nest. In there are the remains of all prey eaten in four weeks (mainly otoliths or fish ear bones). This is why we went up shit creek. We collected this faeces crust just before the chicks hatched (end of May) to compare with the chicks diet. Of this, we learned that while the species composition of the chick and adult diets is roughly the same, there is a profound difference between the fish sizes chicks and adults eat. The chicks get the big fishes, while the adults eat the left-overs.

We realised that the scientific problem with combining these two methods is that the samples of chick and adult diets are not taken within the same period of time: the adult sample in May, the samples of the chicks mainly in June. Especially because around the end of May, a shift in the size class of the Clupeids in the North Sea occurs, with bigger fishes becoming more abundant, an innovation to the sampling method was necessary. We had to be able to take long series of consecutive samples of the adult diet during the breeding season. The solution was simple, but took some trial and error. We just had to place clay plates between the nests of incubating adults and empty them every two to three days. Now we had an exact idea of the time-frame of the adults' faeces samples.

We have been using this sampling method for three years now in the Dutch Delta area and learned that after the chicks have hatched, the adults keep on eating small fish and feed the big fish to their chicks. Also, by studying the adult diet in this way, we noticed it gives an indication of prey availability for the chicks and helps us to identify the prey-composition to species level. This way, a small adaptation in sampling method helped to get a better insight in the ecology of this threatened seabird!

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