Early bird catches the worm...for dinner

October 10 2013

A great tit in Wytham Woods.

(Phys.org) —Birds, such as great and blue tits, scout for food in the morning but only return to eat it in late afternoon to maximise their chances of evading predators in the day without starving to death overnight, Oxford University research has found.

This 'early bird' strategy was revealed by a team studying the winter foraging behaviour of birds in Wytham Woods, near Oxford. The researchers fitted over 2,000 birds with tiny PIT radio tags. They then used 101 feeders which detected these tags and captured the exact time individual birds found each feeder. By moving 36 of these feeders around the forest throughout the day, and recording the results, the team showed that birds gathered information about new food sources during the morning so that they could then eat it later in the day.

The birds studied were a mixture of great tits (Parus major), blue tits

(Cyanistes caeruleus), marsh tits (Poecile palustris), coal tits (Periparus ater), and nuthatches (Sitta europaea). A report of the research is published in the Royal Society journal *Biology Letters* this week.

'Birds have to store body fat to avoid starving during the cold winter nights, but this can make them slower and less manoeuvrable so that they are more likely to be caught by predators,' said Damien Farine of Oxford University's Department of Zoology, who led the research. 'So there is a trade-off, where birds need to remain lean enough in order to "outrun" their predators, or at least the next slowest bird, during the day but also store enough fat to survive each night.'

The team knew from previous studies at Wytham Woods that, when the predation risk appears high, birds delay putting on fat until late in the day. The researchers wanted to test the idea that, instead of simply 'idly waiting' until the afternoon, birds were actively seeking out new sources of food to work out where their next meal was coming from.

'We used new tracking technologies to investigate how great tits, blue tits , and other common garden birds balance the competing risks of predation and starvation,' said Damien Farine. 'Our results show that these birds display very different patterns of food discovery in the morning and afternoon – very few new food sources were found during the afternoon, whereas nearly every new food source that we put out during the morning was quickly discovered. It supports the idea of an "early bird" strategy of scouting for food early on so that they can return to feast a couple of hours before dusk in preparation for a long winter's night.'

Winter is a tough time for small garden birds as not only is there less natural food available but their predators, such as the sparrowhawk, are keen to stock up their own fat reserves and so are hunting every day. The short days and long cold nights mean that small birds can lose around

10% of their body weight over a single night so that individuals failing to pile on the grams on even one day can starve and won't be around to pass on their genes the next summer.

'Because small birds can't reproduce without surviving the winter, they have evolved a complex set of behaviours that enables them to maximise their chance of both surviving predators and avoiding starvation,' said Damien Farine 'It's a good example of how animals alter their behaviour to respond to constantly changing environmental conditions. It also shows how new technologies, like tiny PIT tags, are enabling us to explore questions about animal survival strategies at an unprecedented scale.'

More information: rsbl.royalsocietypublishing.or … content/9/6/20130578

Provided by Oxford University