



ScienceWatch – Changing with the Times

Last year I described a study showing that blue tits (*Parus caeruleus*) from the French mainland were at a reproductive disadvantage if they strayed to the nearby island of Corsica. This is because the island caterpillars preyed upon by the tits hatch earlier than those on the mainland and the mainland tits arrive too early to take full advantage of the brief abundance of food as compared to tits that normally breed on the island (*The Early Bird Misses the Late Worm*, Sept. '01). Now comes a study in the April 1, 2002 issue of *Science*, which says that this is not the whole story. According to Fabrizio Grieco, Arie van Noordwijk and Marcel Visser of the Center for Terrestrial Ecology, Heteren, Netherlands, blue tits that breed too early or too late to take advantage of the local peak in food abundance quickly learn they have made a mistake. The following year these birds adjust their arrival time to better coincide with the population burst of the local prey.

For birds like the tits, which take advantage of an explosion of insect prey lasting only two weeks to feed their young, it is crucial to synchronize their reproduction so hatching occurs when food is most abundant. Other studies showed birds start laying eggs in response to obvious cues such as day length, temperature and leaf budding. Grieco and his colleagues decided to test whether or not the food abundance of the previous year could influence breeding time the next. They followed 11 pairs during their first two nesting years in boxes set out in a Netherlands forest. During their first year six pairs (experimental) were supplemented with caterpillars and mealworms as soon as the first egg hatched. The remaining five pairs (control) were not supplemented.



Because of inexperience and the challenges of finding a mate, birds in this area normally breed too late in their first year to be synchronized with the peak of caterpillar abundance. However, they advance their laying in the second year. If environmental cues cause this resetting than both groups should breed sooner. But the researchers found that the food-supplemented females again laid their eggs late during the second year. In contrast, females in the non-supplemented control group adjusted their timing and laid eggs earlier.

Apparently, control pairs remembered they were too late the first year and moved up their egg laying time to coincide with the caterpillar peak during the following year. Conversely, the pairs given food the first year behaved as if they were already in synchrony with caterpillar hatching and did not adjust their timing in the second year to coincide with the natural abundance of prey.

Other reports have indicated that global warming can cause birds to be out of phase with normally synchronous phenomena. For example, American robins (*Turdus migratorius*)

are now arriving in the Colorado Rocky Mountains 14 days earlier than they did in 1981; however, the higher altitudes remain snow-covered for 18 days after the robins arrive, making foraging difficult (*Global Warming-The Birds Eye View*, April '00). Such reports have caused concerns among scientists that many species will be unable to adjust to these climate changes, arriving too early to breed successfully. Evidently, the blue tit, which breeds in a wide variety of habitats, is able to adapt its breeding time to local environmental conditions. If blue tits can do it, the hope is that many others can too. Global warming appears inevitable, so we will find out.

Saul Scheinbach