

The minimum subsistence of the Great Tit *Parus major*

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The minimum area required by a species for a pair to bring up a brood is far from easy to establish. In forest species it is usually impossible, for even if some species are strictly limited to a certain forest type for breeding, they may well search for food in adjacent, less suitable areas. Parks in a city may be so isolated as to hinder foraging outside them, but being man-made they can hardly be considered representative. Small fields surrounded by forest may better represent a true insular situation, but nowadays the extensive use of pesticides in agriculture may make these areas quite unnatural; a modern field, devoid of weeds, with a strongly restricted insect fauna is from a biological standpoint something of a desert, no matter how productive it may look to the farmer. Archipelagoes again, may be of two kinds. Either the islands are sparse, as in Greece, but too large to offer easily recognized minimum area problems, or, as often in the Finnish archipelagoes, the islands are small but so densely distributed that foraging birds can easily fly from one to the other.

On 18 June 1984 we came upon a small wooded island which had precisely the characteristics required to establish the minimum area of its inhabitants. On the map this islet is named Nölökärs haren (printing error for harun?). It is situated in the parish of Houtskär in the archipelago of SW Finland, at about 60°19'N lat., 21°25'E long. It bears a wood consisting of deciduous trees, mainly alder interspersed with bird cherry, which almost reaches the shoreline. Here and there are open spaces, where grow *Anthus sylvestris* and *Vincetoxicum* (*Cynanchum*) *hirundinaria*. More shady sites abound with that gigantic relative of the lily of the valley *Polygonatum multiflorum* (reported by O. Eklund, 1958, Bidrag till kännedom af Finlands Natur och Folk, 101:1—324, to reach its highest abundance in our SW archipelago, precisely in Houtskär). The island is maximally c. 125 m long and 80 m broad, with an area of 0.70—0.75 ha.

The isolation of the island is shown by the following facts. The nearest islands lie 400 m to the SW (Nölöskär), and a good 700 m to the WNW (Härteholm). According to the map, both are rocky and covered by conifer forest. The distance to the nearest deciduous wood (Österskär, contiguous with Nölöskär) is c. 600 m, and the distance to the nearest inhabited area (on Leklot/Leikluoto) 2000 m.

On the islet the following pairs or equivalents were observed: *Fringilla coelebs* 1, *Motacilla alba* 1, *Parus major* 1. Whether the Chaffinch was represented by a single male or pair was not checked. The White Wagtail is almost ubiquitous on islands and islets of this archipelago. The Great Tit was represented by a pair with fledged young begging uninterruptedly. The male sang now and then fragmentarily and *sotto voce*.

The young were too small to have been brought to the islet from outside. At Lemsjöholm, only 23 km away, egg-laying started on 2—9 May in this year, the median being 6 May. With 10 eggs, 15 days of incubation, and 19 days of nestling life (L. v. Haartman, 1969, Comment. Biol. 32:1—

187), most broods have fledged by about the day of our visit, with the earliest ones 5 days earlier.

Nor is it possible that the parents had, more than occasionally, brought food for the young from outside the island. The shortest trip to and from an adjacent island would have demanded close to 1 km of flight over open water. If the number of feedings given daily by each parent is assumed to be 250, and the flight speed 40 km p.h., this would imply no less than 6 full hours of extra flight, which is out of the question for the parents to afford. In addition, we should remember that Great Tits, like other members of the genus, do not pass as readily over open fields as the Wagtail and the Chaffinch. It may therefore be concluded, that the pair had to support itself and its offspring on the 3/4 ha offered by the islet.

This corresponds to a density of 1.33 pairs/ha. On the Finnish mainland densities of this magnitude do not seem to occur, or are at any rate exceptional. In a luxuriant park at Lemsjöholm, long left nearly uncultivated, the density in 1969 was 3 pairs/4.8 ha. (L. v. Haartman, 1971, Orn. Fenn. 48:93—100), i.e. only half the density on the islet, though the birds in the park were able to feed outside its borders on sites which were not occupied by Great Tits. This indicates that the Great Tit claims territories that are larger than needed for the subsistence of the pair and its young.

It should, however, be borne in mind that neither the number of fledged young on the islet, nor their future fate was known. Further, the isolated pair ruled the roost on the islet, being free from competition with Blue Tits *Parus caeruleus* and Pied Flycatchers *Ficedula hypoleuca*, whose food items and feeding habits partly overlap with those of the Great Tit.

Selostus: Talitiaisen toimeentulominimistä

Houtskarın (Houtskär) saaristosta löytyi 18.6.1984 0.70–0.75 ha suuruisesta yksinäisestä saaresta talitiaisen äsken lentokykäiseksi tullut poikue. Saaren metsä koostui pääasiallisesti lepidistä ja tuomista. Aluskasvillisuus oli paikoin hyvin rehevää.

Poikaset olivat liian pieniä, jotta ne olisivat voineet lentää saarelle muualta. Lähinnä olevat kaksi saarta olivat 400 ja 700 m:n päässä, eivätkä liene olleet tiaiselle sopivia. Noin kilometrin pituinen matka – vieläpä ulapan yli – ravinnon keräämistä varten olisi talitiaisille ilmeisesti ollut mahdottomuus. Vanhemmat poikasineen nähtävästi elivät saaren tarjoamien edellytysten varassa.

Mantereella (esim. Lempisaaren rehevässä puistossa) talitiaisten populaatioiheys aniharvoin, jos milloinkaan, ylittää n. 3 paria 5 hehtaarilla. Tämän johdosta voi kysyä, ylittävätkö talitiaisten reviirit säännöllisesti parien toimeentulominimin.

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