

raiden suurempi rasitus ja alttius vihollisille pesimäaikana sekä niiden pienemmästä koosta aiheutuva heikompi talvenkestävyys.

Rengastusaineistoihin perustuvat tulokset talitiaisen vuosikuolevuudesta Englannissa, Hollannissa, Sveitsissä, Tanskassa ja Suomessa ovat päätyneet hyvin samanlaisiin arvoihin, mikä tukee ensipesijöiden osuuden käyttökel- poisuutta aikuiskuolleisuuden mittana. Menetelmä sopisi epäilemättä moniin lajeihin.

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## Constancy of breeding performance of the Pied Flycatcher *Ficedula hypoleuca* in different habitats and nest-boxes in Finnish Lapland

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In this preliminary note we examine the relationship between habitat and the breeding performance of the Pied Flycatcher at the northern limit of the species range. At Kälpijärvi in NW Finnish Lapland (69°03'N, 20°50'E), a nest-box study has been in progress since 1966 (e.g. Järvinen 1980). There have been about 150 nest-boxes annually, in a variety of habitats in mountain birch woodland. Since the population of hole-nesters is relatively sparse and fluctuates extensively, the same boxes are not occupied each year. Although some boxes have clearly been preferred to others during the 16 study years, only three of them have been occupied by the Pied Flycatcher so often that, for instance, it is possible to calculate nest-box productivity reliably.

The three boxes (nos. 147, 148 and 149) were situated linearly in mountain birch woodland about 150 m apart, and their exposure, altitude, and height above the ground were the same. Number 147 was in an open and relatively unproductive wood with a poorly

developed bush layer, whereas numbers 148 and 149 were in closed and relatively productive woods with a thick bush layer. All three boxes were of the same type. In making pair-wise comparisons, only the same years were considered ( $N = 9$ ). Each year different females bred in the boxes, so the results were not influenced by the constancy of the breeding performance of the same female.

The onset of laying was significantly earlier (2 days) in box 147 in an open birch wood than in box 148 in a closed birch wood, while there was no difference between the two boxes situated in the closed birch woods (nos. 148 and 149, Table 1).

At Kälpijärvi productive and unproductive birch woods form a mosaic with patches of some tens or hundreds of square metres. Since the Pied Flycatcher forages in a wider area than this, it is unlikely that differences in food abundance between the habitats were responsible for the observed difference in the date of laying. It is more probable that the phenological state of the wood plays a role: open and

TABLE 1. Breeding data for the Pied Flycatcher at Kilpisjärvi in three nest-boxes during nine years. Pair-wise comparisons (open vs. closed wood, and closed vs. closed wood) were made between the same years (for boxes 147/148 years 1967, 70, 71, 72, 74, 77, 79, 80 and 81, for boxes 148/149 years 1967, 69, 70, 71, 73, 74, 75, 79 and 81).

	Box no. 147 Open wood	Box no. 148 Closed wood	Box no. 148 Closed wood	Box no. 149 Closed wood
Mean date of laying (June)	7.8±5.5 $t = 2.55, P < 0.05$	9.9±5.8	12.5±7.0 $t = 0.30, NS$	12.9±5.1
Eggs laid/ year	6.33±0.71 $t = 2.31, P < 0.05$	5.67±0.71	5.75±0.71 $t = 2.05, P < 0.10$	5.38±0.52
Fledglings/ year	4.22±2.99 $\chi^2 = 0.05, NS$	3.89±2.47	5.14±1.35 $\chi^2 = 0.02, NS$	4.71±1.25

light woods are less wintery in late May than closed and shady woods with bushes, and so the former type is preferred by the first arrivals.

Productive habitats (not always "closed") seem to be preferred to unproductive ones at Kilpisjärvi (Järvinen 1978). Lightness, connected with early melting of the snow cover, is probably another important factor in the habitat selection of the Pied Flycatcher in Lapland. Theoretically (Fretwell 1972:112), it could be thought that unproductive, possibly suboptimal habitats are occupied only in years of high density, but this does not hold true for the Pied Flycatcher at Kilpisjärvi (Table 2).

Average clutch size was also significantly greater in the nest-box (no. 147) situated in the open wood than in the nest-box (no. 148) in the closed wood (Table 1). This is not surprising, since the clutch size of the Pied Flycatcher seems to be determined by the calendar (v. Haartman 1967, Järvinen & Lindén 1980).

In contrast, there were no significant differences in the number of fledglings/year between the nest-boxes or the habitats (Table 1). So

the only 'advantage' of choosing (by males) a nest-box in an open habitat seems to be the early date of laying and large clutch size. Success in the later breeding stages seems to compensate for the poor start in closed birch woods.

That there were no differences in nesting success between the nest-boxes in open and closed habitats or between the two boxes in closed habitats is in accordance with the earlier observation that in productive birch woods (not always "closed") the mean number of fledglings is 3.37 ( $N = 196$ ) and in unproductive woods 3.35 ( $N = 104$ ; Järvinen 1980). This note supports the view that in Lappish mountain birch woods any influence that the habitat may have on nesting success is masked by the stronger influence of adverse weather (Valanne et al. 1968, Järvinen 1980).

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#### Selostus: Kirjosiepon pesinnän biotooppi- ja pönttövakioisuudesta Kilpisjärveillä

TABLE 2. Selection of breeding habitat of the Pied Flycatcher in a favourable high-density year (1974), and in an unfavourable low-density year (1975).  $\chi^2 = 0.013, P = 0.91$ .

	Unproductive birch wood	Productive birch wood
Favourable	19 pairs	31 pairs
Unfavourable	11 pairs	17 pairs

Kolmessa n. 150 metrin päässä toisistaan olevassa pöntössä pesi eri siepponaaras yhdeksänä vuonna. Kaksi pöntöstä oli tiheässä ja reheväkössä, yksi harvassa ja karuhkossa tunturi-koivikossa. Harvassa koivikossa muninta alkoi keskimäärin kaksi vuorokautta aikaisemmin kuin tiheässä koivikossa, mutta tiheässä koivikossa olleiden pönttöjen välillä ei havaittu eroja muninta-ajassa (taul. 1). Harvasta koivikosta lumi sulaa aikaisemmin kuin tiheästä, ja kirjosiepon oletetaan tästä syystä asettuvan ensin harvoihin, vähemmän talvisiin koivikoihin.

Aikaisemmin kirjosiepon on todettu suosivan Kilpisjärvellä reheviä koivikoita (jotka eivät aina ole tiheitä). Tämän tiedonannon tulokset viittaavat siihen, että valoisuus on myös tärkeä tekijä lajin biotoopinvalinnassa Lapissa. Taulukossa 2 osoitetaan lisäksi, ettei karujen pesimäbiotooppien valinta riipu kannan tiheydestä. Harvan ja tiheän kannan aikana yksilöt näyttävät asettuvan reheviin ja karuihin koivikoihin samassa suhteessa.

Keskimääräinen munamäärä oli suurin harvassa koivikossa olevassa pöntössä (taul. 1), mikä selitetään aikaisen muninnan avulla (ns. kalenteriefekti). Sen sijaan lentoaikastuotossa ei havaittu pönttöjen ja biotooppien välisiä eroja (taul. 1), joten ainoa 'hyöty' kirjosiepolle avoimen biotoopin valinnasta näyttää olevan aikainen muninta ja suuri munamäärä. Tulos on yhdenmukainen aikaisempien Kilpisjärvellä saatujen tulosten kanssa, joiden mukaan biotoopin rehevyys tai karuus ei vaikuta lentoaikastuottoon, ja tukee olettamusta, että Lapissa epäedullinen sää vaikuttaa pääasiassa kirjosiepon pesinnän onnistumiseen.

## The life history of a female Whooper Swan *Cygnus cygnus*

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In November 1970, a policeman telephoned me from Kuusamo (66°N) and asked what should be done with two cygnets abandoned by their parents. One of the birds was found on a snow-covered field, the other in a small, almost frozen brook. The birds were sent to southern Finland and were kept over the winter in the Aulanko nature reserve (61°N), where they became completely tame. On 21 May 1971 the birds were ringed and released on the nearby Tyköljänjärvi, a eutrophic lake with extensive *Equisetum limosum* stands, providing a good summer habitat for Whooper Swans. Here the birds stayed throughout the summer, keeping within a very small area of only some hectares. They spent most of the time just resting, especially during their moulting period. When the moult was over in August they made trips to other parts of the lake, expanding their area to 150 ha.

As the birds did not migrate with their parents in the first autumn, they were not able to leave the lake in 1971 either. At the end of November they were transported by car to Bölsviken on the southern coast, a regular resting site of migrating Whooper Swans. Here the birds immediately joined the

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other swans. After a month the bay was frozen and the swans left the area, accompanied by one of the tame birds.

The other tame swan walked to a local farm and was taken in. Again it was kept over the winter in the Aulanko reserve and released in 1972 on Tyköljänjärvi. It left the lake, however, and was found in various parts of southern Finland up to late June 1972, after which no further observations have been reported.

The other swan (which later proved to be a female) came back from the migration to a lake lying about 40 km NE of Tyköljänjärvi, where it had spent the previous summer. It was loved and fed by the people living around the lake, but in the autumn it did not migrate south and was kept in the Aulanko nature reserve again. Summer 1973 the bird spent on Tyköljänjärvi, where its habits were as in 1971. This autumn it migrated south with transient Whooper Swans and came back in 1974 to the lake Keihäsjärvi in Kuru (61° 47'N), 75 km N of Tyköljänjärvi.

It arrived alone in 1974 but later paired with a male. The bird was now four years old and sexually mature. It nested on Keihäs-