Tiedonantoja • Brief reports

Population trends in the Redstart *Phoenicurus phoenicurus* in northern Fennoscandia

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In several areas in Central Europe (Berndt & Winkel 1979, Berthold & Querner 1979), England (Sharrock 1976) and southern and central Finland (O. Järvinen et al. 1977, O. Järvinen & Väisänen 1978, v. Haartman 1978, 1981) the breeding populations of the Redstart *Phoenicurus phoenicurus* have greatly decreased during the last three decades.

Have similar changes also occurred at the northern edge of the species' range? Here I try to answer this question using my own material from Kilpisjärvi (about 69°03'N), NW Finnish Lapland, as well as that from Ammarnäs (about 65°58'N), Swedish Lapland, published by Enemar (1980, Table 2; all calculations in this paper are mine). Both these areas lie in the subalpine mountain birch forest zone (see e.g. A. Järvinen 1980, Enemar 1980). Kilpisjärvi lies some 100 km northwest of the nearest coniferous forests, but at Ammarnäs coniferous forests grow on the lowlands.

The Redstart prefers nest-boxes with large entrance holes (e.g. A. Järvinen 1978, Enemar 1980). At Ammarnäs the annual number of such boxes was 96 (1968—78), and at Kilpisjärvi it was 54 in 1969 and 70 in 1970—80. Omitting the year 1969 at Kilpisjärvi or raising its pair number by 1—2 pairs does not greatly affect the results.

The numbers of breeding pairs at Kilpisjärvi and Ammarnäs are presented in Fig. 1, together with the number of breeding pairs per 1000 nest-boxes in Braunschweig, Germany, in 1968—78 (Berndt & Winkel 1979). The two populations in northern Fennoscandia fluctuated almost identically ($r=0.960$, $P<0.001$, $df=8$). Both populations were declining, although the decrease was not significantly linear ($r=-0.484$ for Kilpisjärvi and -0.443 for Ammarnäs). The decrease has been especially pronounced from 1975 onwards: at Kilpisjärvi the mean was 12.1 ± 5.1 *(SD)* pairs/year in 1969—75, but only 4.8 ± 2.2 pairs/year in 1976—80 ($t=2.99$, $P<0.02$). The central European (Berndt & Winkel 1979) and south Finnish (v. Haartman 1978, O. Järvinen & Väisänen 1978) populations possibly started to decline earlier than those in Lapland, but further studies are needed to clarify this point.

At the very limit of the species' range (Kilpisjärvi) the coefficient of variation in density seemed to be greater (c. 61 %) than further south (Ammarnäs; c. 38 %). It may be noted that at Ammarnäs in pure birch forests the rate of fluctuation was somewhat greater (c. 50 %) than in coniferous or mixed forests (c. 41 %). These observations agree with the idea that populations in marginal and/or suboptimal areas fluctuate more than in optimal ones (e.g. Kalela 1944; for the Redstart, see O. Järvinen 1979).

On the other hand, both in forests with natural nest sites and in forests with nest-boxes the average density of Redstarts was clearly lower at Kilpisjärvi (about 1 and 1.5 pairs/km², respectively; A. Järvinen, unpubl.) than at Ammarnäs (about 10 and 5 p/km², respectively; Enemar 1980). According to Enemar (1980), the reason for the relatively low density in the nest-box area at Ammarnäs was probably the high amount of natural nest sites available.

Two main explanations have been proposed to account for the declining population trends in the Redstart: (1) the decrease is due to the decreased area of old forests on the breeding grounds (O. Järvinen et al. 1977, O. Järvinen & Väisänen 1978), or (2) it is due to changes that have occurred during migration and/or in the wintering quarters in northern Africa, south of the Sahara (Sharrock 1976, Berndt & Winkel 1979). Of course, these two sets of factors may have operated in parallel.

Since the site-tenacious Redstart (Ruiter 1941) has declined in areas that are far apart and not affected by forestry or other human activities (e.g. in northern Lapland and Germany), it appears that changes outside the breeding areas have played the greater role. Like Berndt & Winkel (1979), I could not attribute the observed trend at Kilpisjärvi to weakened production of young.

A factor affecting the annual numbers of

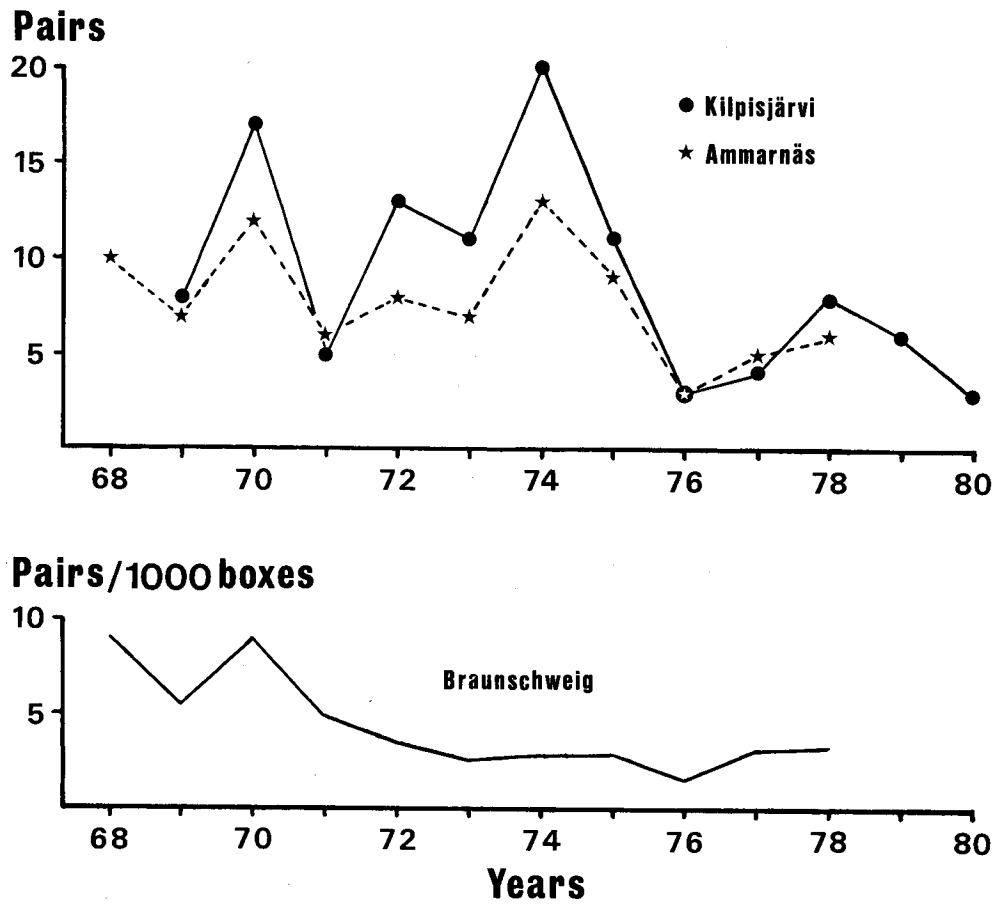

FIG. 1. Population trends in the Redstart at Kilpisjärvi, Ammarnäs (Enemar 1980) and Braunschweig (Berndt & Winkel 1979; pine forests).

breeding Redstart pairs, especially in the far North, is apparently the spring weather. For instance, prior to the decline of the population at Kilpisjärvi in 1976—80, the densities were highest after warm springs (A. Järvinen 1978). However, spring weather cannot explain the overall decline of the population, since in 1978—80 the springs were milder than average (Finnish Meteorological Office), and yet the Redstart did not recover from its losses.

Acknowledgements. I wish to express my sincere gratitude to Olavi Hildén and Risto A. Väisänen for reading the manuscript.

Selostus: Leppälinnun kannanvaihteluista Pohjois-Fennoskandiassa

Keski-Euroopassa, Englannissa sekä Etelä- ja Keski-Suomessa leppälintupopulaatioiden on todettu selvästi pienentyneen viime vuosikymmeninä. Kilpisjärvellä (69°N) ja Ammarnäsissä (66°N; Enemar 1980) kerätyt aineistot pöntöissä pesivistä populaatioista osoittavat vähentymistä tapahtuneen myös lajin levinneisyysalueen pohjoisosissa (kuva 1). Kilpisjärvellä ja Ammarnäsissä pesivien parien määrä vaihteli samansuuntaisesti vuosittain (r=0.960), mutta Kilpisjärvellä vaihtelun suuruus (variaatiokerroin n. 61 %) oli suurempi kuin Ammarnäsissä

(n. 38 %). Koska leppälintu on paikkauskollinen ja sen pesivien parien määrät ovat pienentyneet kaukana toisistaan sijaitsevilla alueilla (esim. Keski-Euroopassa ja pohjoisimmassa Lapissa), joilla ei ole harjoitettu metsänhoitoa tai muuta ihmisen luontoa voimakkaasti muuttavaa toimintaa, muuttomatkalla tai Afrikan talvehtimisalueilla vaikuttaneet tekijät lienevät olleet suurin syy kannan romahdukseen. Keski-Euroopassa ja Kilpisjärvellä poikastuoton ei ole havaittu heikentyneen. Myöskään kevätsäät eivät selitä Lapin kantojen viimeaikaista pienenemistä: pesimäkaudet 1978—80 olivat keskimääräistä suotuisammat, mutta tästä huolimatta leppälintukannat eivät kohonneet entiselle tasolleen.

References

BERNDT, R. & W. WINKEL 1979: Zur Populationsentwicklung von Blaumeise (Parus caeruleus), Kleiber (Sitta europaea), Gartenrotschwanz (Phoenicurus phoenicurus) und Wendehals (Jynx torquilla) in mitteleuropäischen Untersuchungsgebieten von 1927 bis 1978. — Vogelwelt 100:55—69.

BERTHOLD, P. & U. QUERNER 1979: Über Bestandsentwicklung und Fluktuationsrate von Kleinvogelpopulationen: Fünfjährige Untersuchungen in Mitteleuropa. — Ornis Fennica 56:110—123.

ENEMAR, A. 1980: Ett försök att med specialholkar få rödstjärten Phoenicurus phoenicurus att häcka tätare än normalt i fjällbjörkskog i södra Lappland (Summary: A trial with special nest-boxes to get the Redstart Phoenicurus phoenicurus to breed with higher than normal density in subalpine birch forest in southern Lapland). — Vår Fågelvärld 39:231—236.

v. HAARTMAN, L. 1978: Changes in the bird fauna in Finland and their causes. — Fennia 150:25—32.

v. HAARTMAN, L. 1981: Co-evolution of the Cuckoo Cuculus canorus and a regular Cuckoo host. — Ornis Fennica 58:1—10.

JÄRVINEN, A. 1978: Leppälinnun Phoenicurus phoenicurus populaatiodynamiikasta pohjoisella äärialueella (Summary: Population dynamics of the Redstart in a subarctic area). — Ornis Fennica 55:69—76.

JÄRVINEN, A. 1980: Population dynamics in the Pied Flycatcher Ficedula hypoleuca at subarctic Kilpisjärvi, Finnish Lapland. — Ornis Fennica 57:17—25.

JÄRVINEN, O. 1979: Geographical gradients of stability in European land bird communities. — Oecologia (Berl.) 38:51—69.

JÄRVINEN, O., K. KUUSELA & R. A. VÄISÄNEN 1977: Metsien rakenteen muutoksen vaikutus pesimälinnustoomme viimeisten 30 vuoden aikana (Summary: Effects of modern forestry on the numbers of breeding birds in Finland in 1945—75). — Silva Fennica 11:284—294.

JÄRVINEN, O. & R. A. VÄISÄNEN 1978: Long-term population changes of the most abundant south Finnish forest birds during the past 50 years. — J. Ornithol. 119:441—449.

KALELA, O. 1944: Zur Frage der Ausbreitungstendenz der Tiere. — Ann. Zool. Soc. 'Vanamo' 10:1—23.

RUITER, C. J. S. 1941: Waarnemingen omtrent de levenswijze van de Gekraagde Rootstaart, Phoenicurus ph. phoenicurus (L.). — Ardea 30:175—214.

SHARROCK, J. T. R. 1976: The Atlas of breeding birds in Britain and Ireland. — Aylesbury.

Flocking of male Capercaillie *Tetrao urogallus* at feeding sites in Ostrobothnia, W Finland

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"Flocking" is regarded here as living in flocks, and its initiation is referred to as "flock formation" (see also Pulliainen 1981). Koskimies (1957) found that the intensity of flocking in the Capercaillie increased from south to north in Finland, and he assumed that this was due to a difference in the distribution of certain important habitat types (see also Seiskari & Koskimies 1955). Pulliainen (1981) studied 707 occurrences of the Capercaillie in Finnish Lapland and observed that in winter the species forms pure male, pure female and mixed flocks. The male flocks tended to be the smallest and the mixed flocks the largest, and all three kinds decreased in size from September-December to January-March. The present authors had an