SEEN - BIRD RINGING STATION NETWORK IN CENTRAL AND EASTERN EUROPE, WEST ASIA AND AFRICA

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Monitoring of birds during their migration carried on at ringing stations, is certainly the cheapest and the most widely used method of large-area monitoring (even on continental scale). Nevertheless, there are still many methodical difficulties in it. It has been contended for a long time, whether the number of birds caught at constantly working ringing stations correspond with the real number of migrants, or whether they result from various accidental factors (mostly weather conditions). Final evidence for night migrants came from the comparison of catching results with radar observations (Zehnder and Karlsson 2001), and for tits from the analysis of synchronisation of catching results on large areas (Nowakowski 2003 in press). In both papers it was shown, that numbers of small passerines ringed at ringing stations correspond with real intensity of migration both in a season as a whole and in particular days. This conclusion of course cannot be extended on waders and other groups of birds, which migration is dependent on temporary changing stop-over sites (Meissner 2000). However, even for passerines, the correct interpretation of data obtained at single ringing station is extremely difficult, and often simply impossible. This results from two basic facts:
1. At most of ringing stations a mixture of individuals coming from different, and most often insufficiently identified, breeding areas is caught.
2. In many species the routes of movement for different migratory populations intersect each other (Busse and Maksalon 1986, Remisiewicz et al. 1997).
Consequently, final catching results refer to the average from the intensities of migration of different populations, and multi-year trends – to the sum of, often contradictory, trends occurring in these populations. Thus, it is not known, whether the weak decreasing trend means actually a small decrease of birds number in the large area, or whether it should be interpreted as a small increase in one part of species' area with a catastrophic decrease in other.

Therefore, it is not surprised that there are differences (shown e.g. by Svensson, 1978, Payevsky 2000) in results of long-term monitoring programs done on local breeding populations and at adjacent ringing stations. However, it would be a misunderstanding to think that monitoring during migration does not give useful, from conservational point of view, data about numerical state of a species. In fact, we obtain such data, but under a condition that we can analyse material originating from the whole net of co-operating ringing stations. A perfect example is the Robin (*Erithacus rubecula*). At different ringing stations situated around the Baltic Sea, completely different multi-year trends of birds number – from definitely increasing to clearly decreasing – are noted (fig. 1). This very complicated and at first sight illogical picture reflects unusually complex arrangement of migration routes of this species – in the region of the Baltic sea there is an intersection of routes of migrating groups of birds heading for the Balkan Peninsula, for northern Italy and for Spain (Remisiewicz et al. 1997). As a result, the observers at Rybachy and the Vistula Spit ringing stations (distant only about 133 km from one another), could come into extremely different conclusions about the population of this species in northern Europe (at Rybachy a distinct increasing trend is noted, and at the Vistula Spit – a decreasing one: fig. 1). Nevertheless, an analysis of data from all of the ringing stations shows that in years 1965-1998 the population of Robin in the region of the Baltic sea was stable (Woźniak 1997).

Other kind of interpretational difficulties can be met during analysis of data referring to partial migrants. The Great Tit (*Parus major*) represents a simple system of migration, in which all populations move along parallel routes from north-east to south-west (Likhachev 1957, Payevsky 1971, Hudec 1983, Rezvyi et al. 1995). In north European ringing stations numbers of ringed birds increase, whereas as close as on the southern Baltic coast and in Helgoland in the North Sea a distinct

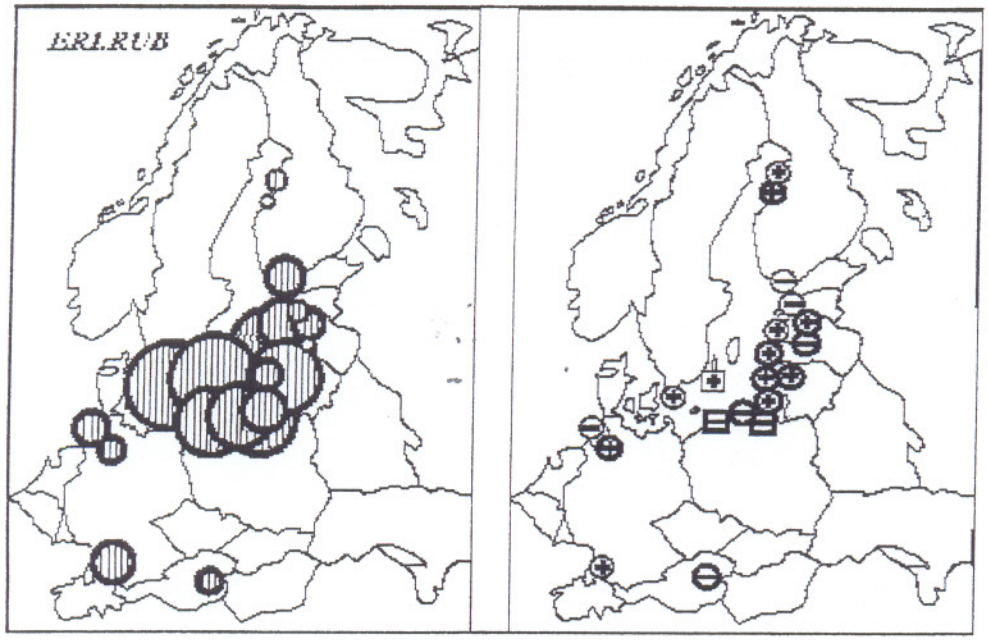

Fig. 1. Average numbers per season (left) and multi-year trends of population dynamics (right) of Robins caught at North and Central-European ringing stations. The area of each circle is proportional to the number of individuals caught. Trends are given for the whole period of time when data was available. ("+" - increasing trend, "-" - decreasing trend). Stations working for over 30 years are marked with squares, other stations - with circles. Statistically significant trends are presented in bold.

decrease is observed (fig. 2). These changes however, most probably can not be interpreted as populations fluctuations. Although the increase in number of birds ringed in Finland can possibly reflect the increase in local population, the decrease at stations situated more southerly should rather be interpreted as a change of migration behaviours: shortening of distance of movements for populations from north Russia, Estonia and Latvia, and, possibly, decrease in share of migrants in central European populations. Exactly the same tendencies can be observed in the Blue Tit (*Parus caeruleus* -fig. 3). Data presented at both figures originate from long-term studies conducted in years 1961-1998. An interesting fact is that in recent years in both mentioned species there have been a spectacular increase in number of birds caught at Polish ringing stations situated on the southern Baltic sea coast. Especially in the case of Blue Tit, this increase completely changed a several-tens-year decreasing trend. This way, we came to the last of basic methodical problems: the length of monitoring period. This problem refers to "migrational" as well as to breeding monitoring.

Nowadays, the Science is financed from grants and based on 2-3-year research projects. For clerks deciding about money a perspective of a 10-year period seems beyond their mind. However, the numbers in animal populations (including birds, of course) fluctuate in multi-year periods. For example, in years 1961-1988 in the Vistula Spit ringing station repeated increases and decreases of migration intensity of the Goldcrest (*Regulus regulus*) were noted (Busse 1990). If the research had begun in 1963 and had been conducted "only" for 12 years, until 1974 one would have observed over 20-fold increase in number of migrating Goldcrests. However, a researcher beginning work in 1974 would have observed a dramatic 15-year decrease in number of migrants and he certainly would have alarmed environmental organisations about threatening of this species with extinction. In both periods the result would have been highly statistically significant. However, in years 1961-1998 from 20 ringing stations in central and northern Europe, five with statistically significant increasing trends and five with decreasing ones were noted (fig. 4). On the Vistula Spit there were not any statistically significant changes. Generally, the population of this species in the studied area should be regarded as stable, although the recorded differences between ringing stations are undoubtedly of great interest for the researchers.

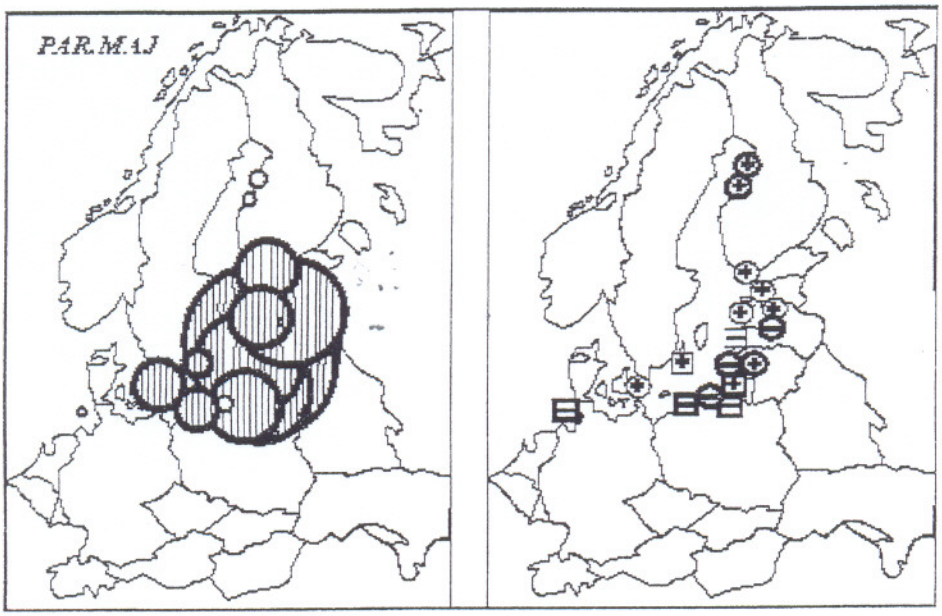

Fig. 2. Average numbers per season (left) and multi-year trends of population dynamics (right) of Great Tits caught at North and Central-European ringing stations. Explanations as at Figure 1.

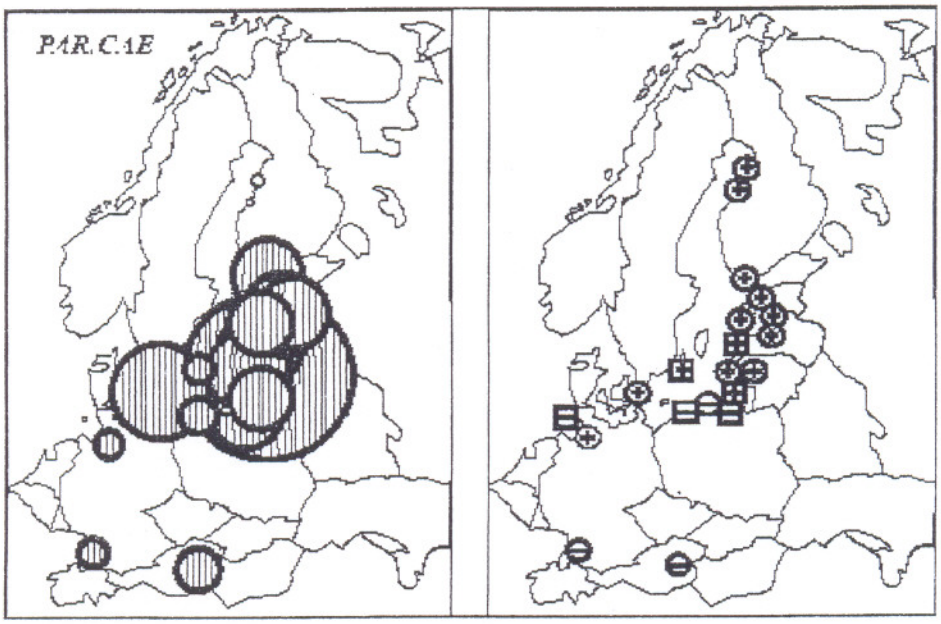

Fig. 3. Average numbers per season (left) and multi-year trends of population dynamics (right) of Blue Tits caught at North and Central-European ringing stations. Explanations as at Figure 1.

What is also interesting, different elements of migration biology most likely also fluctuate in multi-year periods. For example, Nowakowski (2001) showed that in years 1961-1997, a statistically significant decrease in speed of the Great Tit migration occurred, although in the meantime there were even 11-year statistically significant increases in this parameter. In central Poland it was noted, that migration of the Blackcap (*Sylvia atricapilla*) was about three days later in the nineties than in the eighties (Nowakowski 1999). It can be related to the general warming up of the climate, or it can be also a result of multi-year fluctuations of the dates of the beginning of migration.

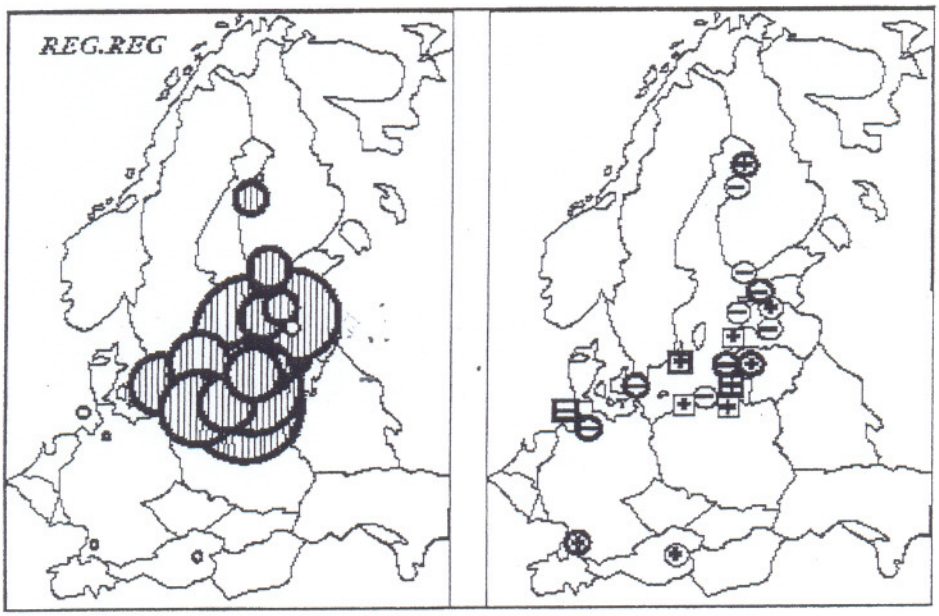

Fig. 4. Average numbers per season (left) and multi-year trends of population dynamics (right) of Goldcrests caught at North and Central-European ringing stations. Explanations as at Figure 1.

Although several-tens-year cycles of the numbers of different animal species have been well-known for a long time, we know nothing about fluctuations in longer periods. The Siberian Thrush (*Zoothera sibirica*) appears in Poland only exceptionally, but existing reports on observations of this species can be joined in about 50-year cycle. Is this only a chance, or an effect of unknown phenomenon – it is hard to say as for now.

Summing up: ringing stations give interesting and reliable data related to changes in numbers of different species, even on continental scale, and, more widely – give interesting data about changes of different elements of biology of birds migration. Nevertheless, the correct interpretation of the obtained data is possible only under four following conditions:
1. The net of ringing stations has to be relatively dense and cover possibly large area.
2. Stations have to work in long periods of time – at least tens of years.
3. Each station should work with definite methodical systems (e.g. continuous work with constant number of traps and with checking of surrounding environment)
4. Methodology of work, as far as possible, should be similar at all stations, so that comparison of obtained results would be possible.

Up to now, these conditions were realized to lesser or greater extent in western and northern Europe. Unfortunately, large areas in eastern and south-eastern Europe were investigated only randomly. As it was shown by Busse (2001), firstly, such situation made a wrong impression that migration of passerines in Europe takes place mostly in direction from north-east to south-west. Secondly, the correct monitoring of European populations of singing birds was impossible.

These conclusions led to decision about establishing SE European Bird Migration Network (SEEN) in 1996. At present, the net involves 37 stations in 18 countries on three continents (fig. 5) and it develops constantly. A very important member is Russia, with 5 ringing stations co-operating in SEEN (including the oldest and still working Rossitten-Rybachy station, which recently has celebrated its 100th anniversary). Each year we receive several new applications from stations already existing in different countries. We also managed to initiate activity of several new constantly working ringing stations, in countries where up to now the research of bird migration was rather expeditionary. It is worth to mention here two Turkish stations (Manyas i Cernek), two in Jordan (Dhleil, Azraq) and Wadi El Rayan station in Egypt. Stations in Palestine unfortunately had to suspend activity because of

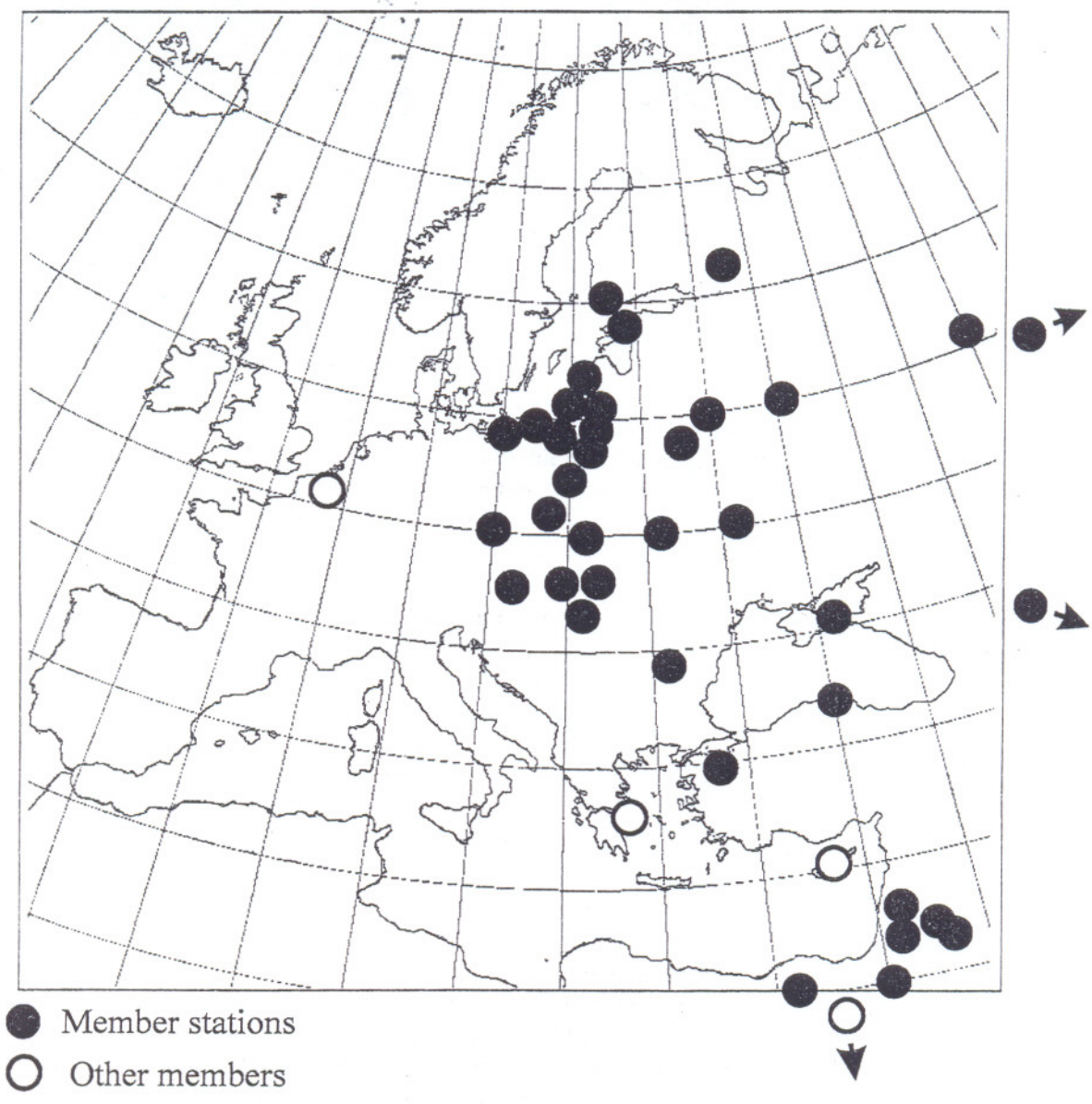

Fig. 5. Distribution of bird ringing stations which joined SE European Bird Migration Network (SEEN).

political situation. More over, most of mentioned stations work in one methodical standard, and obtained data can be directly compared.

SEEN began also the greatest on the world programme of collecting data about directional preferences of migrating birds, which was possible due to applying of a new cheap and easy in use experimental cage proposed by Busse (Busse 1995, Busse and Trocińska 1999). Data collected in this way will allow to initiate studies on large-area and long-term variability of directional preferences of migrating passerines – so far poorly studied problem because of lack of adequate investigative techniques.

One can hope, that activity of SEEN will allow to draw a new, considerably more precise picture of passerines' migration in Europe, western Asia and eastern Africa, and to monitor populations breeding in and migrating through this area.

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