

4.8. VISIBLE BIRD MIGRATION AND WEATHER.
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Quantitative observations on visible migration have been undertaken on a large scale in many European countries, particularly in Holland, Sweden, England and Finland. In Sweden regular observations during the whole autumn took place at Falsterbo, the southwesternmost peninsula of Sweden, in 1942-1944 (Rudebeck 1950), and in 1949-1960 (Ulfstrand et al. 1974), and at Ottenby, the southernmost point of the island of Öland, in 1947-1956 (Edelstam 1972). Furthermore, observations during both spring and autumn have been carried out from 1958 to 1972 at Kalmar sound, between Öland and the mainland, but the results have not yet been published.

As far as attempts to correlate bird migratory activity with different weather variables this technique of observing migration has at least one serious drawback; the birds often migrate above visual range, and the proportion doing so varies with weather. The bird migration at high altitudes preferably is studied on radar. However, as radar does not record movements at low altitudes, it is obvious that the two techniques are wholly or partly complementary. One cannot, on present evidence, decide which technique generally will encompass the major part of diurnal migration.

In contrast to radar records of bird migration, visible observations have the advantage of allowing separation of different species. Furthermore, considering air-safety, a major proportion of the collisions between birds and aircraft occur at low altitudes, generally well within visible observation range, but sometimes below radar coverage. Thus, there are good reasons to pay close attention to the extensive data on visible migration available from the studies cited above.

The Swedish Air Force, Board of Civil Aviation, Ornithological Society of Skåne, including Falsterbo Bird Station, and the Department of Animal Ecology at the University of Lund participate in a project to investigate the influence of weather on bird migration ultimately aiming at a model for

predicting significant bird movements in southern Sweden on the basis of daily weather forecasts. The data on bird migration at Falsterbo from 1949 to 1960 have been fed into a computer (the presentation by Ulfstrand et al. 1974 is mainly composed of edited outprints from this computer) and multivariate statistical analyses of bird migration/weather correlations for different bird species are in progress.

It is important to investigate to what extent the data on visible bird migration at Falsterbo are representative for other regions and localities in southern Sweden. During three autumns (1971-73) simultaneous field observations at, besides Falsterbo, four to eight observation sites were organized during a study period of three weeks each autumn, and a total of 15 different sites in southern Sweden have been used for field observations during these three years. All these data are presently being analysed. Simultaneously with the field observations radar screens from different stations (totally six stations in the three years) have been filmed to provide data on high-altitude migration. A preliminary report on the relation between visible migration, as recorded by the field observers, and high-altitude migration, analysed from radar films, has been published (Alerstam & Ulfstrand 1972). Further analyses of the influence of weather on high-altitude migration are in progress.

For some species field and radar records on migratory activity are highly correlated, making it possible to identify the radar echoes with certain bird species and map, in space and time, the migratory pattern over southern Scandinavia of the wood pigeon Columba palumbus during the autumn (Alerstam & Ulfstrand in press) as well as the crane Grus grus (Alerstam & Bauer 1973) and the eider Somateria mollissima in spring (Alerstam et al. in press). Even if the migratory pattern of most species cannot be studied in such detail as for those mentioned above, there are good reasons to expect that reliable forecasts of the migratory activity may be achieved for many species.

In summary: in Sweden the relation between bird migration and weather are analysed primarily on the basis of visible data (in the first place from Falsterbo Bird Station). For reasons discussed, these data have to be treated with due circumspection when used for the purpose of forecasting migratory activity over different regions. Extensive field and radar observations over much of southern Sweden during three recent years have provided data for a proper evaluation. A few species, that can be specifically identified on the radar are amenable to particularly detailed analysis.

References:

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