

4.12. POLISH ORNITHOLOGICAL INVESTIGATIONS HAVING SOME SIGNIFICANCE  
TO BIRD STRIKE PROBLEMS.  
DR. M. LUNIAK, POLAND

Maciej LUNIAK  
Inst. of Zoology, Polish Acad. of Sc.  
POLAND, 00-950 WARSZAWA, Wilcza 54

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No ornithological investigations in Poland have been undertaken concerned directly with the task of protecting civil aviation against birds. Several works, however, provide some information which could be useful for solving bird strike problems. Here belong:

1. Researches on distribution and ecology of the species causing  
hazard to aircraft

Mainly Corvidae, gulls and starling, then geese, ducks, pigeons, lapwing, crane, heron and stork should be considered the most important birds in question in Poland. In regard to these species the following data are known: - The distribution of breeding colonies of the rook /1963 and 1972 inventories - ca 1.2 million pairs/, the distribution of breeding population of the white stork /1958 - ca 20 thousand pairs,- and 1974 inventories/ and the distribution of the common heron main colonies. There are many data concerning concentration places of migrating geese, ducks, crane and wintering ducks. Comparatively less data about the distribution of colonies of the black headed gull /growing in number/, the roosting places of gulls, Corvidae and starling have been collected. Some papers provide materials on local movements and ecological factors determining the occurrence of Laridae /Bień, Dobrowolski, 1961; Manikowski, 1969, 1971/ and Corvidae /Busse, 1962; Grodziński, 1971; Jakubiec, 1972; Pinowski, Wasilewski, 1962/. Researches on Corvidae are being carried out /B. Jabłoński, M. Józefik, Z. Jakubiec, M. Wieloch/

2. Researches on migrations

Yearly ca 80 thousand birds are ringed in Poland by Ornith. Station of the Inst. of Zoology. Reports are published in Acta Ornith. The ringing results analyses published so far concern: - common heron /Rydzewski, 1956; Swirski, 1956/, Corvidae /Busse, 1963, 1969/, starling /Rydzewski, 1960; Gromadzki, Kania, in print/, Turdidae /Gromadzki, 1964/. The following species are being worked out: - Laridae /A. Krugasiewicz/, Anatidae /J. B. Szczepski/, coot /E. Nowak/, chaffinch /W. Kania/, robin /M. Gromadzki, B. Olech/, dunlin /R. Zajac/.

Migrations along the Polish Baltic coast have been investigated by the "Baltic Operation" team since 1960. Every year 5-10 camps /with 3-5 men in each/ work during the whole period of fall migration and 1-2 camps work during spring migration. All camps carry out visual observations for 15 min. every hour from sunrise till dawn and catch birds by means of 30-60 mist-nets /each camp/, ringing and taking biometrical measurements. Some camps use helgoland-type traps and traps for waders. The technical methods applied by the Baltic Operation have been described by Busse and Kania /1970/. 3 foreign national sections /Estonian SSR, Latvian SSR and GDR/ have joined the Baltic Operation recently and thus created a chain of research points from the Gulf of Finland up to the Hiddensee in GDR. Ringing reports of the Polish Section are published in Acta Ornith., Notatki Ornit. and The Ring. First analyses based on Baltic Operation materials have been published by Busse /1972/ and Manikowski /1972/.

The project "Corvidae Operation" was organised by the Ornith. Station of the Inst. of Zoology in 1971 and 1972. Its aim was to obtain a picture of fall migration of Corvidae across Poland. In 1971 there were 18 and in 1972 there were 9 points of constant observations and ca 300 holiday observations points. 3 teams of observers counted birds twice a week from train locomotives moving along 4 constant routes across the whole country. The results concerning the time, quantity, altitude, directions and meteorological ~~pen~~ determination of the local and migratory flights of Corvidae will be published in Acta Ornith.

Sierakowski, Pinowski and Wolański /1969/ described the spring migration of the crane over Poland. They used ca 300 reports sent by cooperators from various places over the country.

### 3. Research on methods of scaring birds

Józefik /1972/ presented a new conception of scaring birds by means of electrorepellents. In his opinion the efficiency of methods used at present is decreasing proportionately to the frequency of their use because scaring methods are not connected immediately with the negative stimulus. Electrorepellents give immediately a strong painful shock. This negative stimulus should be associated with an internationally accepted prop - Józefik proposes a red silvered glass ball hanging above the protected object. The efficiency of such a method will increase when it is widely used throughout the continent

Thus, in time, birds learn not to fear scaring and they habituate.

and when the "tradition" to avoid objects marked with the proposed prop is handed down from the generation to generation. Józefik in his experiments on starlings found that electrorepellents using a voltage of 8-20 kV, pulse duration max. up to 0,1 sek., intensity ca 100 micr.A and frequency 1-10 Hz are most suitable. On touching an electrode a bird gets a painful shock, escapes and alarms other members of the flock. The tests have shown that starlings quickly learn to avoid places marked with the signal and they retain well what they have learned. Experiments with electrorepellents are being continued.

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