

First results of Crane - migration in autumn 1966 and course of Crane - migration in spring 1967 based on Radar- and visual observations

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During the meeting of the radar working group at the Hague in December 1966, I gave a short report about the radarobservations we made in autumn 1966 in the German Federal Republic. All together we received more than 8000 reports about the Crane-migration in fall 1966. The most reports came from observers of the German Airforce. The examination of the reports shows that a bit more than 30 000 Cranes did flight across the Federal Republic. The main part cross Lower-Saxony and Northrhine-Westfalie, that means the direction Hannover - Essen - Düsseldorf - Cologne. Only a smaller part did flight across Hessian and Rhineland-Palatine. This was the reason, that we did not have much crane-echos on the radarscreen at Neunkirchner Höhe, south of Frankfurt. The few pictures we made on the radarscreen at Deister near Hannover, were full of migrating cranes. Good results had also the military radarstations, which most were situated on the northtrak of the crane-migration.

After this two crane migrationtimes (fall 1966 and spring 1967) our military radarpersonal is able to follow the crane during the flight. They worked out a special scheme, who gave good results. They were able to find out the speed of the cranes, the flightdirection and had a good estimation about the altitude.

In fall 66 the crane-migration took place in two waves. The first one was between the 14th and 18th of october, the second wave was between the 26th and 30th of the same month. 2/3 of the cranes, this were about 20 000, came through with the second wave.

During the first hours in the morning we had only a very few crane groups. At 11.00<sup>h</sup> bigger flocks were observed. The main reports we received about observations of flying cranes were dated from the late afternoon. The maximum was at 18.00<sup>h</sup>. During the early night also a fast migration was observed by radar. The average amount of the flightaltitude was between 600 and 1 200 ft. The speed fluctated between 30 and 60 m/h.

The crane-migration in spring 1967 took place in March. In radio-broadcasts, television and newspaper we asked again the people of Germany to give us reports about the crane-migration. The reports, we received were less against the reports from fall 1966. So far as I can see, we had about 1 000 reports only. The numbers of cranes which crossed Western Germany from SW to NE we estimated, were about 10 to 15 000. But on the radarscreen the GAF observed a lot of cranes, which did flight above the clouds, so that visual groundobservers could not see the groups on their way to breedingplaces in North and East Europe. In contrast to the migration in fall 1966, the spring migration took place mostly in one wave. The most observations were made during the 7th and 11th of March. The first group was observed on the 26th of February, the latest on 10th of April. Radar-pictures were made from the GAF and at the radarstation Neunkirchner Höhe.

Now a few words to migration and weather. In connection with the GAF, the Federal Weather Office at Frankfurt and the study of the lokalweathermaps we try to find a result. We did use the weather dates of the following 18 lokal weatherstations: Hamburg, Bremen, Soltau, Cloppenburg, Hannover, Osnabrück, Münster, Gütersloh, Essen, Kassel, Köln, Aachen, Gießen, Koblenz, Ffm.-Flughafen, Trier, Würzburg und Neustadt/Weinstrasse.

In the first days of October we had in the breeding grounds of the cranes in North- and East Europe  $-3^{\circ}\text{C}$ . and an airpressure of 1010mb. We suppose that in these days the cranes did leave their breeding grounds. On the 14th high pressure center moved along the Eastsea to Russia. At the same time the temperature did fall down from  $10^{\circ}\text{C}$  to  $4^{\circ}\text{C}$ . We think, that this did stimulate the cranes on their roosts at the isle of Rügen and the swamps near the Müritz to start for their migration, to cross the Federal Republik. On the 17th the airtemperature increase to  $12^{\circ}\text{C}$ .

The weathersituation was the following, when the second wave did start on the 26th of October: The Northsea lowpressure-center did move with a highpressure-trough on his backside to SW-direction. In this situation cold air from polaric zones did reach Middle Europe and the airtemperature drop to  $5^{\circ}\text{C}$ . This was the day on with mass

of the Cranes did leave the roosts at Rügen and Müritz. This meteorological situation did change on the 30th of October.

So far as we could see, is a high pressure trough in connection with a sudden fall of temperature to about 5°C the stimulant for the migration of the cranes. We found less connection between direction of wind and this velocity and the beginning of the crane-migration.

This short paper should give you an expression in the research-work we did do on that special part of the birdstrike problem.

At last I want to show you a few slides about the crane-migration in fall 1966 and spring 1967.

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