# 2.9. Bird Strike Situation in German Air Force.

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## Birdstrike Situation in German Air Force.

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### 1. Organisation

German Air Force is represented in DAVVL(=German Board Prevention of Birdstrikes) by the Amt für Wehrgeophysik,Dezernat Wehrbiologie(=Office for Military Geophysics,Dept.Military Biology). This office is responsib for all problems involved in birdstrikes.

In order to get a basis for provisions against birdstrikes various schoo and academies of GAF are involved in courses and that with:

a) Flight Safety Officers and Flight Safety Assistants.
b) Meteorological Staffs(Forecaster,Assistant Forecaster,Observer).
c) Radar and Tower Controller(GCA).
d) AIS - Staffs.
e) ATC - Officers.
f) Radar Master Controller.
g) People involved in bird scaring on airfields.

### 2. Technical Provisions

The Office of Military Geophysics advises Technical Staffs and Instituts as to the newest technical developments relativ to airwortheness problems.

### 3. Provisions on airfields

For all airfields and their surrounding ecological research was finished; all airfields are visited every 2 or 4 years in order to check the perfor mance of provisions ordered or recommended.
The following provisions proved favourable for scaring birds:

a) Removal of garbage dumps(against crows and gulls) and swampy areas by drainage or planning(against lapwings and waterfowl).
b) Handling of grassland areas so that the number of cutting grass is mini mized,the crops are destroyed and the grass-length is not shorter than 10-20 cm(against crows,gulls,starlings,lapwings).In some cases growth prohibiting substances proved successful.
c) Agricultural use and sheep-grazing not allowed(=decreasing populations of starlings,crows,gulls and sparrows).
d) Provisions against earthworms,larvas,insects,mice a.s.o. by chemical substances(= decreasing populations of gulls,starlings,lapwings,hawks and falcons).

e) Removal of nests from crows, starlings, sleeping places by changing the ecological background.

f) Removal of special shrubbs and trees(= against thrushes and pigeons)

g) Special hunting on crows and gulls as well as trapping crows and hawks; experiments trapping gulls were successful and continue.

h) Hangars with nesting birds were checked.

i) Observing short distance flights or movements of birds by 10 cm radar is difficult but very helpful for warning take-off and landing. Training of radar controllers proved necessary. The observation result of single airfields were different. After finishing training action will be repeated over 2 years in order to get representative results; moreover GAF has the opinion that radar observation of airfield birds in the surrounding will be one of the main tasks of controllers in future. It will be possible without neglecting other tasks. During the last 3 years many birdstrikes could be avoided by radar controllers which were trained completely.

k) It proved very important and useful to contact the "birdstrike-authorities" at all purposes in the surrounding of airfields. In Germany we had problems within these areas with forestry, agriculture, artificial lakes, water reservoirs. By ecological research in most cases it could be avoided that increasing danger happened by special use of surrounding areas.

m) Evaluation of birdstrike-information-leaves proved useful because the various indications give knowledge about danger areas, endangered heights, dates, times, speeds, damages a.s.o.

n) Chemical repellents on grasland areas proved successful but were forbidden by natural conservation authorities although within 4 years research birds never died by use of these substances.

o) Pyrotechnical installations of various kind were very effective when installation places were changed daily, frequency was changed from time to time, type of installation was changed and general application was combined with small shot shooting.

p) Electroacoustical devices had different success depending on bird species, bird population, duration and frequency of application. At the moment a new installation is tested which produces artificial cries of various birds. The advantage of this device is the transportability(weight only appx. 4 kg, price ca. 2.000.- DM, range nearly 1500 m).

q) A highly important action was to check the runway daily by car. We found a lot of dead birds but also a lot of dead deer and game.

The result as to the number of birdstrikes on airfields(GAF) and during round airfield procedure was:
Decreasing number of birdstrikes on airfields:
41(1968) -- 37(1969) -- 36(1970) -- 31(1971),that means a rate related to every 10000 flying hours:
1.05(1968) -- 0.85(1969) -- 0.79(1970) -- 0.77(1971), or rate related to every 10000 take off/landings:
0.42(1968) -- 0.32(1969) -- 0.29(1970) -- 0.28(1971) , or

Rate of damages related to 10000 take off/landings:

0.15(1968) - 0.07(1969) -- 0.03(1970) -- 0.0027(1971)

Decreasing number of birdstrikes at round airfield procedure:(GAF areas)

27(1968) -- 17(1969) -- 32(1970) -- 17(1971), that means a rate related to every 10000 flying hours:

0.69(1968) -- 0.39(1969) -- 0.70(1970) -- 0.42(1971), or rate related to every 10000 take off/landings:
0.30(1968) -- 0.15(1969) -- 0.20(1970) -- 0.15(1971), or
rate related to damage and every 10000 take off/landings:
0.11(1968) -- 0.60(1969) -- 1.00(1970) -- 0.045(1971)

This may be the result of the scaring methods and provisions and the exchange of bird populations: small birds like passerines instead of bigger birds like crows and gulls, by changing the use of airfields and landscape.

4. Prevention of "inflight"-birdstrikes.

In GAF 15 radar station(23,10 cm) have been ordered to make bird observations (polaroid) round the year,day and night,every 3 hours, but in case of observed migration every 1 hour. Ten stations are full in work at the moment, 5 stations observe from time to time.
Evaluation of photos did not make difficulties because the most stations were visited and people was instructed. All stations have test photos corresponding to their station for comparing purposes.
Radar observation with GAF weather radar stations on airfields have been planned(20 stations); beginning in 1973/1974) as soon as radar devices have been delivered.
Moreover bird movements are observed by nearly 1000 visual observers.
All observation informations are given to central weather office in Wahn.In case more than intensity 3 is reached a birdtam is published(1971 nearly 250 birdtam) indicating only "bird movement"(no intensities), dangered areas in GEOREF-indications(f.i.Kilo Foxtrott) and/or longitude/latitude,dangered

height(f.i."up to 3000 ft" or"between 2000 and 3000 ft") and validity(always 4 hours). These birdtam are transmitted by weather network and AFTN. On saturdays and Sundays as well as between 23.00 and 04.00(Z) no birdtam are published.

The procedure,valid for flying staffs(since march 1rst,1972) is the following: no flights into areas and in flight levels which are referred in the birdtam; exception: in case that an airfield is situated within a birdtam area take off and landing is allowed in case that these areas are flown through on the shortest way and no formation flights are started.

Moreover since june 1971 Office of Military Geophysics publishes so-called birdstrike-risk-forecasts on the basis of weather situation exspected within the next 24 hours. This forecast is made by a biologist together with some meteorologists and forecasters in charge. The method establishing the forecast is based upon 11 weather situations, f.i.heigh pressure influence Middle Europe, heigh pressure N-,W-,E-,S-Europe,low pressure influence frontside,warm sector,rear side,N-flank and through front or rear side as well as of meteorological parameters which are characteristic for these situations and saison of year, biological background for birds etc. In case no birdtam are available for the briefing of flying units these forecasts serve as general information without responsibility and flight restrictions.

Moreover every 14 days long range bird movement forecasts are published on the basis of weather development exspected, saison, momentaneous bird movement situation and experience. These forecasts whose evaluation with EDV is prepared, serve for general information of flying units.

All informations about bird movements in Germany and Europe serve as a basis of advisory at flight and operational planning.

The result as to the number of birdstrikes during flight over Germany, Netherlands and Belgium, from which birdtam are available, was the following:

Number of birdstrikes inflight(e.m.countries GAF):

129(1968) -- 129(1969) -- 167(1970) -- 162(1971)

Rate related to every 10000 flying hours:

3.4(1968) -- 3.0(1969) -- 3.7(1970) -- 4.0(1971)

Rate of damage related to 10000 flying hours:

1.5(1968) -- 1.4(1969) -- 1.3(1970) -- 1.5(1971)

Rate of heavier damage related to 10000 flying hours:
1.0(1968) -- 0.76(1969) -- 0.64(1970) -- 0.8(1971)