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German Bird Strike Statistics

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Abstract

Since 1998 the DAVVL has been the official collecting centre for bird strike reports in Germany. Thanks to the voluntary supply of reports from airlines the DAVVL had been collecting reliable data even for many more years even before 1998. The typical annual variations of the bird strike development are well known. In 1999 and 2000 there were distinct deviations from the usual annual variations of the reports. The reasons are investigated and presented. It might be concluded that in 1999 reporting problems of a prominent German airline were the reason of the anomalous trend. In 2000 the weather development temporarily occurring in most parts of the country was likely responsible for the deviations from the usual monthly bird strike numbers.

Introduction

The basis of an effective bird control are reliable bird strike statistics. Since 1998 bird strike statistics have in Germany been taken charge of by the German Bird Strike Committee, i.e. the DAVVL e.V., which by the Ministry of Transport has officially been assigned this task, and which was appointed the central German collecting centre for bird strike reporting in Germany.

However, the DAVVL has for more than four years available a wealth of reliable bird strike data comprising the voluntary reports form the major German Airlines and from the German Bundeswehr (Armed Forces). Even if not all of the Airlines have reported their bird strike data and in view of the lack of data from General Aviation the year-to-year similar data and the time development still exhibit the representative nature of the available data.

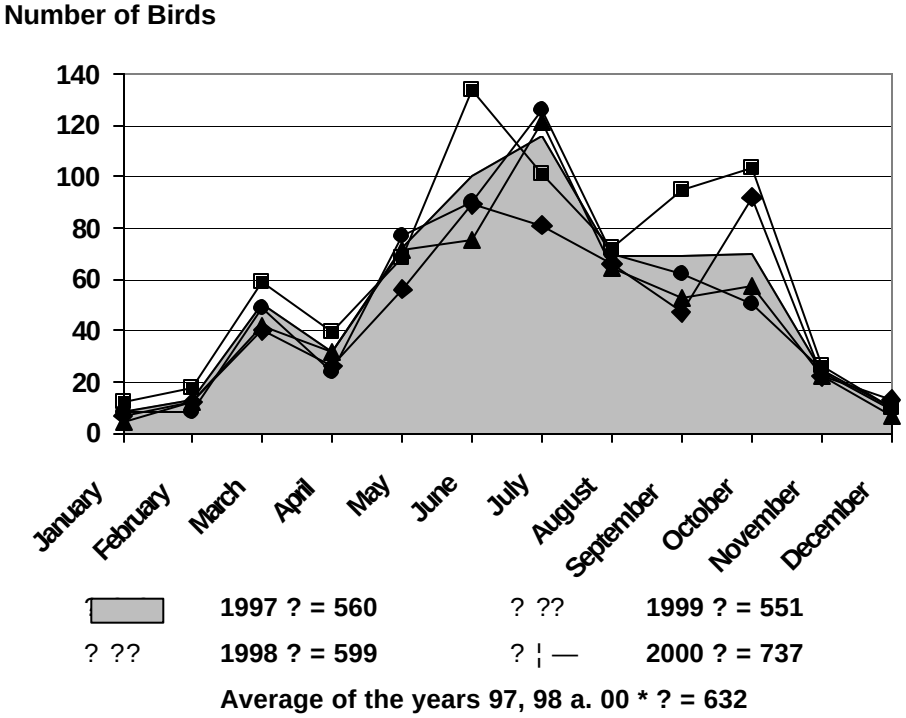
These data reveal that the monthly number of bird strikes during the year follows a typical course, which is characterised by rather low values in winter at the beginning of the year, while these values at the beginning of the large-scale spring-time bird migration show a sudden increase and a first maximum. According to the weather development these data continue to be present in April. However, as soon as in May and June the first juvenile birds start fledging, this process is reflected by a rather sudden increase of the bird strike number which continues up to its maximum occurring in July. Much lower values are observed in August and in September.

However, now autumnal migration gradually develops causing some stagnation or even some minor increase in October. In November and December the bird strike numbers are again rather low. On the average within the recent 4 years there have in Germany been 612 bird strikes per annum with civil aircraft (German marking). Some significant portion of bird strike reports came from a major German Airline. The number of incoming reports from this Airline exerts - due to its major share in aircraft movements some impact on the trend of the statistics of one year.

Annual trends

Considering the development of recent years, the years 1997 and 1998 tended to be similar to long-terms average (Fig. 1). In 1997 561 bird strikes to German aircraft (with German marking) were reported in Germany. And 599 bird strikes were reported in 1998.

In 1999, however, the summer-time and autumnal development showed some conspicuous deviation from the long-term average. Particularly worth noticing was the absence of a summer-time maximum in July, its value being reduces by approximately one third as compared with the immediately preceding years. On the other hand, the October value was by somewhat more than one third higher than the values of the two preceding years. In Germany there was reported a total of 551 bird strikes, which is 19 percent below the 1997 to 2000 average of 612 bird strikes per annum.



** The course of the average number of bird strikes of the years 97, 98 and 00 is nearly the same as the course of the long-term average number of bird strike s of the years 89-98 (Fig. 2). Only the level is higher than in the period of 89-98 because of the increased aircraft movements of the last years.*

Fig. 1: Annual courses of bird strikes of the years 1997, 1998, 1999 and 2000 and the average of the years 1997, 1998 and 2000

The development of bird strikes in 2000 had its highest maximum again in June. It should, however, be noted that this maximum in that year was much more distinct exceeding the spring-time and autumnal values, as compared with 1999, in quite a different way. In October there was also some increase of the bird strike figures, however, somewhat lower as compared with 1999.

The reasons

What had happened, and why such unusual figures?
At first sight, the unusually warm summer might have been responsible. However, warm and dry weather generally enhances particularly successful breeding of the birds. Since the juvenile birds - inexperienced in aircraft encountering - become at an increasing rate the victims of bird strikes, and because they are responsible for the unusual summer-time bird strike maximum, the extraordinarily low bird strike rate in July of 1999 cannot be explained by the weather development, which ought to have caused an increase as compared with the multi-annual average. The extreme October maximum, however, can be explained by the weather development, i.e. assuming that a multitude of migratory birds due to the warm September

have started their return flights not until October, but then in some rather concentrated flights, which appears to be corroborated by radar-based bird migration observations. The German Bundeswehr (Armed Forces) - in spite of the BIRDTAM warning system - in October having suffered from a higher number of bird strike than in the preceding months of the same year (which is more or less an atypical phenomenon), the assumption of a retarded high-density bird migration in October 1999 in Germany seems to be justified.

A more detailed analysis of the origin of bird strike reports brought some light into the causes of this atypical development. The above-mentioned major German airline had in 1999 recorded only 75% of the bird strikes in Germany as compared with the average of the years 1997 to 2000. Considering the distribution of this airline's reports over the year 1999, we notice that this airline owing to its high share in aircraft movements within Germany - has its impact on the course of the overall statistics. The remaining German airlines and German General Aviation are more or less approaching the curves of long-terms averages, with even some distinct maximum in summer in July (Fig. 2).

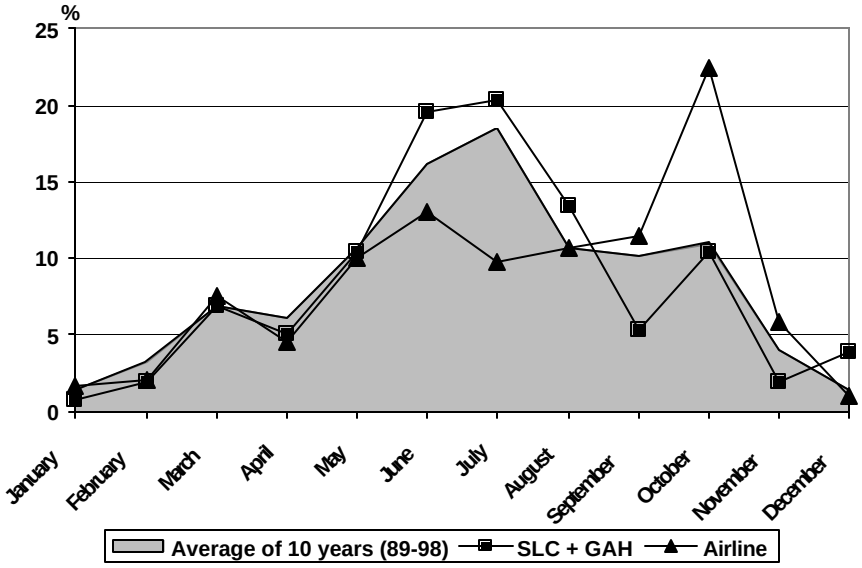


Fig. 2 Percentage allocation of monthly bird strikes of a German airline and of the sum of all other German airlines including General Aviation of the year 1999 in comparison to the one of the last 10 years

An analysis of the bird strike rates and of the damages was rather helpful in further fact finding. With a lower number of bird strikes and a constant number of aircraft movements the bird strike rate (i.e. strikes per 10.000 aircraft movements) must for mathematical reasons be decreasing. The calculation of this parameter shows that this did happen even with the above-mentioned airline (? bird strike rates = -2.16). We could then also expect the number of bird strike-related damages to aircraft (i.e. the so-called damage rate defined as the damage per 10.000 aircraft movements) to decrease in a similar way. But, just this did **not** happen! The damage rate remained rather constant instead (? damage rates =- 0.18).

In view of the probability of bird strike-related **damages** to aircraft entailing a report to the DAVVL collecting centre, the **damage rate** is found by a more reliable calculation than the total number of bird strikes or the bird strike rate. The assumption appears to be justified that not all bird strikes in June and July 1999 that did **not** cause any damage, had been reported by airline pilots or got lost within the reporting channels. This assumption could therefore be corroborated since the German Bundeswehr (Armed Forces) in the anomalous June and July 1999 had recorded even more bird strikes than during their ten-year average (Fig. 3), which again reflects the presence of a greater number of juvenile birds. The results from the

remaining airlines and from General Aviation appear to be similar as regards to their rather great bird strike numbers in summer of 1999. Hence, the problems arising within the reporting system of the above-mentioned airline are suggested to be responsible for the rather anomalous data of 1999 due to its greater share in aircraft movements.

In the year 2000 there occurred a surprisingly high total number of bird strikes. The DAVVL had in that year received 737 bird strike reports altogether from Germany concerning aircraft registered in Germany. This number exceeds the annual average figure of 612 bird strikes by 20 percent.

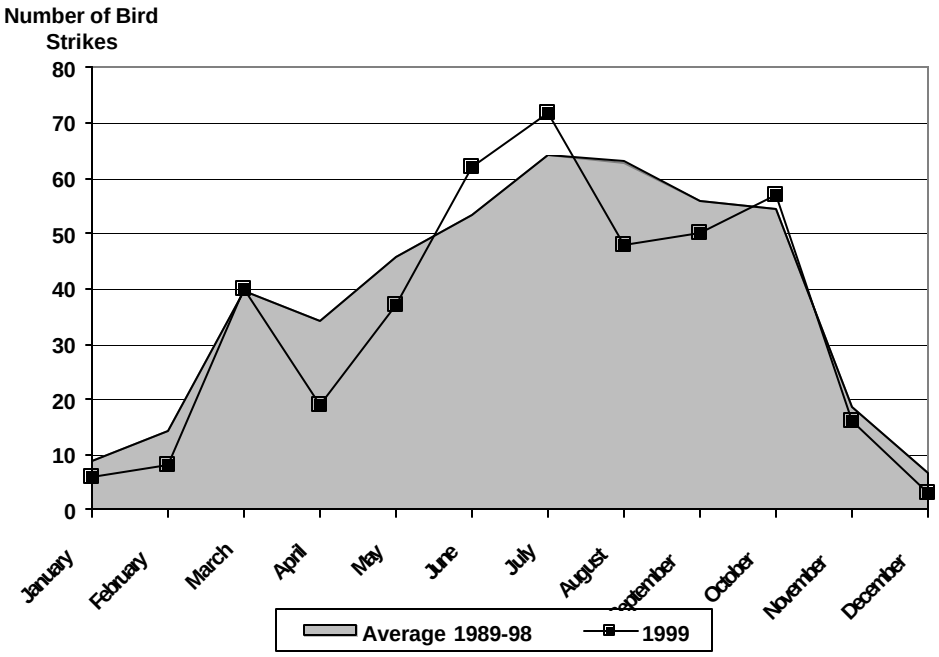


Fig. 3: Percentage allocation of monthly bird strikes of the German Armed Forces and of the average percentage allocation of the last 10 years

The monthly distribution with its June summertime maximum and with a further autumnal, though higher, maximum in October was equal to the distribution of the preceding year. In this case the weather development of early summer and the real summer rather than the reporting behaviour of the airline was responsible for the course of monthly distribution.

Summery weather development in the year 2000 in Germany occurred as early as in April. May and the first half of June had rather fine weather. But thereafter summer was hardly perceivable, i.e. weather was cold, precipitation made you more or less forget the pleasant summer days. Birds in that year started rather early their breeding season and were - due to the favourable spring-time and summer weather conditions very successful. As early as in June many juvenile birds were fledging, causing great numbers of bird/aircraft collisions. Due to bad weather in July their flying activities were impeded, which gave reason to a lower number of bird strikes. The early but then prolonged return migration in autumn was suggested to be responsible for that distinct autumnal maximum.

And there is still one more point that should not be neglected as concerns the increasing number of bird strikes. Startled by the numbers of the preceding year, the DAVVL in 2000 increased its efforts to improve the pilots' awareness of the rather serious flight safety problem caused by the bird strike situation. The DAVVL homepage, workshops and communication with the German Air Traffic Service and with airports are designed to promote the recognition of the bird strike problem. We are hopeful of such development being continued in coming years.