BSCE 20 / WP 19
Helsinki 1990

MAPPING THE BIRDSTRIKE RISK

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SUMMARY

The Bird Movements and Low-Level Working Group shall initiate maps concerning permanent or temporary bird concentration areas for the information of pilots with the purpose of bird hazard prevention and bird protection. The paper gives a survey of existing bird hazard maps and discusses the limits of mapping the birdstrike risk.

1. Introduction

Attempts of mapping the birdstrike risk go back to the early days of the Bird Movement Working Group. The originally planned bird migration maps have been mostly replaced by bird concentration maps considering the difficulties of mapping the temporary peaks of bird migration. Whereas in North America large and medium sized birds migrate along well defined flyways, only few species (e.g. cranes and storks) are restricted to relatively narrow migration routes in Europe. The main part of bird migration runs in broad front, only temporarily concentrated along geographical diversion lines (coast lines, mountain slopes, passes). Therefore the peaks of bird migration can be better described by temporarily limited warnings than by risk areas in bird hazard maps. On the other hand certain breeding, roosting or wintering areas involve a considerable birdstrike risk to low flying aircraft. These areas can be described very well in maps indicating the kind, the period and the altitude of the risk. Therefore ESCE 19 has recommended the issue respectively the updating of national maps according to Annex 15 of the ICAO Aeronautical Information Services. Information concerning bird sanctuaries, and areas of ornithological importance should be compiled to a corresponding European map.

2. Problems in drawing up bird hazard maps

The scientific and practical problems in drawing up bird hazard maps had been clearly described by Karlsson (ESCE 12/WP 13). Bird concentration areas subjectively defined by ornithologists with regard to the number of bird species and individuals present as breeding, feeding or roosting birds must be evaluated from the flight safety point of view. The question is how many birds of which size and behaviour have to be present in a defined area to involve a birdstrike risk. Furthermore the evaluation of these areas must consider the flight pattern, altitude and velocity of different types of aircraft.

Slow aircraft, especially helicopters, can avoid small concentration areas situated in their flight route, whereas fast aircraft cannot take all small concentration areas into account. Furthermore 1500 ft GND are generally the upper limit of high birdstrike risk above bird concentration areas. Therefore only the areas in the vicinity of airfields/aerodromes are dangerous to civilian jet and prop aircraft, whereas military aircraft flying at low level and helicopters are endangered by all bird concentration areas.

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3. Types of bird hazard maps

Bird concentration areas in the vicinity of airfields/aerodromes should be described at high accuracy considering the temporarily differing numbers of birds and the daily flight patterns. Good examples for this purpose are the airport vicinity maps published in the AIP France RAC 5, 17 September 1984.

Country-wide bird hazard maps are published by many European countries in their national AIPs. Good examples are the Bird Strike Risk Map Belgium (1978), the Mil AIP Denmark RAC 4, and the AIP Netherlands RAC 6. For larger countries detailed information can be hardly included in one map. Either a loss of details must be accepted as in the AIP Germany RAC 3, or a series of maps in a smaller scale is necessary as shown in the "Bird Concentration Areas Sweden", issued by the University of Lund in 1978.

An example of a standardized large-scale bird hazard map called "Birdstrike Danger Areas Europe" issued by the German Military Geophysical Office in 1979 was distributed to all BSCE members. The map includes Central and Western Europe and considers concentration areas of birds (weight generally more than 260 gr) hazardous to aircraft. There is a discrimination between high risk areas with a density exceeding generally 500 birds per sq. km. subdivided with regard to hazards all year, hazards mostly in winter, and hazards mostly in summer (risk period indicated in Roman numerals), and medium risk areas with a density exceeding generally 100 birds per sq. km. In all areas flying below 1500 ft GND will involve a risk.

Maps concerning bird sanctuaries, wildlife reserves or other protected areas of ornithological importance as well as wetland areas of international importance can be published according to special guidelines. A source for such maps may be the Technical Publication No. 9 of the International Council for Bird Preservation "Important Bird Areas in Europe" revised in 1989. In the Federal Republic of Germany a map of protected areas of ornithological importance was distributed to civilian and military air traffic authorities in 1987.

4. Further activities

The Bird Movements and Low-Level Working Group shall initiate maps concerning permanent or temporary bird concentration areas for the information of pilots with the purpose of bird hazard prevention and bird protection.

Guidelines for such maps should be elaborated by the members of the working group. Details of the maps should be decided by the national authorities. The distribution of bird hazard maps should guarantee the practical use of these maps by all air traffic authorities and pilots.