

**THE EUROPEAN SPACE AGENCY'S FLYSAFE PROJECT,
LOOKING AT THE BIRD STRIKE PROBLEM FROM ANOTHER PERSPECTIVE.**

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ABSTRACT

The bird strike problem is a negative side effect of the aerial mobility of both aircraft and birds. A successful prevention strategy should therefore be based on knowledge of the mobility of both parties involved. While we know all the details of aircraft mobility, surprisingly little is known about the mobility of birds.

Most bird strike prevention on-airfields assumes that birds on the airfield will at some time fly and thus are considered a threat for starting or landing aircraft. Nearly all prevention efforts are therefore aimed at reducing the number of birds on airfields. The fact that, despite increasing efforts, the bird strike ratio (bird strikes per 10.000 air traffic movements) in many countries hardly decreases anymore is an indication that new approaches are needed.

The FlySafe project of the European Space Agency is such a new approach, aimed at increasing the knowledge of bird mobility and making this knowledge available for operational use by military and civil aviation.

Between 2002 and 2005 the RNLAf, University of Amsterdam (UvA) and the Dutch Centre for Field Ornithology (SOVON) worked together to develop the Bird Avoidance Model (BAM) (Bouten et al., 2005; Shamoun-Baranes et al., in press; Shamoun-Baranes et al., 2005). This resulted in a bird migration forecast model for Northern Netherlands that is used within the RNLAf (van Belle et al 2007) in combination with ad-hoc radar measurements of bird migration to avoid bird strikes during low-level training missions.

Inspired by the BAM project, the ESA (European Space Agency) FlySafe project is aimed at further improving flight safety through several activities which together will create an integrated bird warning system. Since bird and aircraft movements are not restricted by national boundaries it also includes facilitating international cooperation and working towards standardization. The activities include improving bird migration models, adding altitude information to them, extending the spatial coverage of models and combining them with measurements into automatically generated nowcasts. These then will be automatically broadcasted to the pilots as BIRDTAM's

FlySafe is testing different potential sensors to monitor bird movements at different scales. One of the sensors being tested is a small scale dedicated bird radar system for the detection of local bird movements around airfields. In the future this should provide warnings to air traffic control and bird control units, enabling them to take timely action. Other sensors being tested include weather radars and satellite tracking of individual birds. The project also includes efforts to calibrate bird migration information extracted from military air defence radars by the ROBIN (Radar Observation of Bird Intensity) system against that of the German BIRDI (Bird Radar Data Interface) system.

Finally all these separate information sources are merged in a system of systems to create a more complete picture of bird mobility for the user.

The nucleus of the current activities is the area of Northern France, Belgium and the Netherlands. We hope that through future expansion the system can become pan-European.

This paper gives a broad overview of the project.

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