THE BIRD STRIKE HAZARD (BASH) PROGRAM

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The hazards birds pose to aircraft has been of concern to the Air Force for more than 20 years. After losing several aircraft due to bird strikes in the early 1960's, the Air Force formed a team to evaluate bird hazards to Air Force aircraft. The team, from the Air Force Weapons Laboratory (AFWL) at Kirtland AFB NM, handed over this mission to the Bird Aircraft Strike Hazard (BASH) Team at HQ Air Force Engineering and Services Center (AFESC) at Tyndall AFB in 1975. In 1986 (October) the BASH team moved to Bolling AFB, Washington DC.

The Air Force sustains significant losses each year to bird strikes. Since 1964 we have had 25 bird strikes that resulted in aircraft losses. In the last 12 months alone we have lost an F-16, two F-4's, a B-1, and six crewmen to birds on low level missions.

All aircraft are susceptible to bird strikes in every flight profile. Smaller, high-speed aircraft are the most likely victims, but even large planes can be knocked down by bird strikes. Birds are not entirely unpredictable, however, and strikes are more likely to occur at particular times of year or times of day and around bird concentration areas. We can reduce losses by controlling or avoiding the predictable bird hazard.

A large variety of species have been involved in bird strikes throughout the world, but several groups present the majority of hazards. In the United States raptors, gulls, waterfowl, starlings, blackbirds, and pigeons cause the most problems. Gulls are involved in more strikes than any other group and are responsible for 40% of the worlds' bird/aircraft collisions. Large, slow-flying, or flocking species present the greatest hazards to aircraft operations.

Habitat management and population control are the most important methods of reducing bird strikes. Habitat management includes managing airfield turf, forests, landfills, water sources, and grazing and cropland. Airfield grass maintained between 7 and 14 inches in height discourages flocking bird species from using airfields. Flocking birds will not remain in tall grass because the lack of visibility disrupts flock integrity and prevents predator detection. Long grass is also effective in reducing bird populations because grass offers little nutritional value to birds and obscures invertebrate food sources such as insects. Selective application of herbicides to control weeds, and fertilizer to promote grass growth, may be necessary to obtain the desired airfield turf.

Birds can be dispersed using bioacoustics and pyrotechnics. Bioacoustics are taped distress or alarm calls of real birds. These audio tapes of birds in distress are effective on gulls, blackbirds, starlings, and several other species. The use of bioacoustics is one of the most practical and effective methods of bird dispersal available today. The main advantage of this technique is that if properly used, birds do not appear to habituate the use of distress or alarm calls. In many situations, these calls may be the most effective repulsion techniques available, especially if combined with other techniques such as pyrotechnics. Pyrotechnics are 12-gauge scare cartridges that produce a secondary explosion to frighten

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birds from the area. The scare cartridges are launched from either an open-bore shotgun or a pyrotechnic pistol (M-8 Very pistol) with a steel sleeve insert to modify the gun to the 12-gauge size. Pyrotechnics are effective in dispersing most bird species.

The BASH team provides direct on-site assistance to help our bases develop their BASH programs. Our operational and environmental recommendations are based on years of data on Air Force bird strikes. We help each base tailor its program to its own unique operational and environmental conditions. Other agencies also help our installations, such as the Animal Damage Control Unit of the U.S. Department of Agriculture. The U.S. Fish and Wildlife Service, Soil Conservation Service, and Forest Service often have knowledgeable people who can assist the Air Force.

We are actively planning for the future and developing improved techniques to reduce bird strike hazards. Our on-going projects included expanding our efforts in the low level area. We evaluate low level routes for BASH potential by segment or by entire routes using a Bird Avoidance Model (BAM). The BAM is a predictive model which measures the relative risk of a bird strike based on waterfowl and bird of prey population data. We provide this information to safety and operations to aid in mission planning. Local flight schedules are altered to avoid times and areas of bird concentrations. We are also investigating temporal and geographic distributions and movements of birds in the Pacific region. These data will be incorporated into the BAM and used to evaluate training routes in that area

Radar bird detection systems have a high potential for reducing bird strikes. Many radars can detect birds and, if properly interpreted, can provide usable warnings. The Next Generation Weather Radar or NEXRAD, for instance, should be able to track migratory birds across the U.S. without affecting its weather warning capability.

We are evaluating bird responses to different color lights. Preliminary results indicate that birds do not respond to white lights and are even attracted to red lights. We intend to study the effects of other colors and of varying intensities of light.

Low level mission planning for bird strike reduction is becoming more important and we are developing improved techniques for the future.

The bottom line is: we are in business to save Air Force resources and make the skies safer for our flyers.