(28) **DISTRIBUTING BIRD HAZARD INFORMATION TO AVIATORS FOR RISK MANAGEMENT: THE WIRELESS FUTURE**

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The United States Air Force (USAF) Avian Hazard Advisory System (AHAS) provided the first mechanism for aircraft pilots to obtain information about the number of birds hazardous to aircraft active in the atmosphere. AHAS is a near real time system that can update no more frequently than once every 6-10 minutes due the volume scanning strategies of the NEXRAD (WSR-88D) radar system. Dedicated bird radar systems such as the Merlin radar, can update as frequently as once every 2-3 seconds, essentially a real time warning system. The challenge becomes how to get real time and near real time information to pilots and decision makers so that bird strikes can be avoided. Mechanisms for transmitting data to aircraft both on the ground and in the air will be discussed. These mechanisms have important implications for future bird strike hazard reduction.

(29) **AUTOMATED ACOUSTIC MONITORING OF BIRD STRIKE HAZARDS**

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Bird-aircraft collisions present a significant threat to military and commercial aircraft, and as bird populations and air traffic continue to grow, and airport/airbase operations continue to expand, the problem will steadily get worse. A majority of the efforts to solve this problem focus specifically on bird mitigation via, e.g., wildlife and environmental management. However, the first step in birdstrike mitigation is timely and accurate detection of avian threats in airport and airbase environments. Rapid detection ensures maximum response reaction time, and correct identification of bird threats ensures that resources are not expended in responding to false alerts. We propose a hybrid birdstrike hazard monitoring system consisting of (1) a set of highly sensitive passive acoustic arrays, adapted from state-of-the-art undersea warfare sensor technology, which can provide accurate source detection, location, and tracking, (2) a radar surveillance system built specifically for bird monitoring (currently available as a commercial system from Detect, Inc.), and (3) a steered parabolic dish or horn-loaded microphone providing high gain, low side-lobe acoustic data for accurate source classification. The system will fuse the outputs of the acoustic and radar detectors to generate a more accurate picture of birdstrike threats than either sensor type can produce on its own. Work on this project is being supported by an Air Force Phase 2 STTR (topic AF02T009).

(30) **SECRETS IN THE FREEZER: STOMACH ANALYSIS OF STRUCK BIRDS PROVIDES CLUES TO AVIAN ATTRACTANTS AT AIRPORTS**

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The more specific our knowledge of bird attractants at airports, the better able we are to predict bird behavior and potentially reduce and prevent bird strikes. A largely unexploited source of such knowledge is the carcasses of birds struck by aircraft. Stomach contents of 78 bird carcasses from strikes at Pease International Tradeport in Portsmouth, NH over a 6-year period were examined. The carcasses represented the following species: 9 American kestrels (*Falco sparverius*), 1 bank swallow (*Riparia riparia*), 30 barn swallows (*Hirundo rustica*), 1 chimney swift (*Chaetura pelagica*), 2 common nighthawks (*Chordeiles minor*), 8 Eastern meadowlarks (*Sturnella magna*), 4 killdeer (*Charadrius vociferus*), 7 horned larks (*Eremophila alpestris*), 1 Lapland longspur (*Calcarius lapponicus*), 11 mourning doves (*Zenaida macroura*), 1 red-tailed hawk (*Buteo jamaicensis*) and 3 upland sandpipers (*Bartramia longicauda*). No stomach was found in 14 of the 78 carcasses. Two carcasses had empty stomachs. Stomach contents of 62 birds were identified to order and family and, where possible, to sub-family or species. Up to three food items in order of prevalence were identified for each individual. The most common food item identified, as well as the most varied (9 families), was beetles, found in 69% of stomachs. Next came seeds (40%), followed by ants (27%), flies (15%), caterpillars (8%) and wasps (7%). Dates and locations of strikes were correlated with food use. Trends emerged for some species, providing valuable information for predicting increased bird activity and applying effective and appropriate control strategies. Knowledge of timing and availability of food at a particular airport could prove useful in recommending habitat modification to reduce the food attractant or in planning harassment and repellent activities. Wider and longer-term studies of this type are needed to realize the full potential of this tool in reducing bird strikes.

(31) PREY BASE MONITORING AND CONTROL TO REDUCE PREDATORY BIRD STRIKES AT PORTLAND INTERNATIONAL AIRPORT

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Portland International Airport (PDX) has a history of strikes with wildlife species that are attracted to the airfield because of abundant prey base. From 1997 to 2003, 201 strikes occurred at PDX with wildlife whose primary food source is small mammals, including red-tailed hawks, American kestrels, various owl species, great blue herons, and coyotes. Necropsies of all of these species have revealed that one of their primary food sources is the grey-tailed vole. Rodenticide baiting with zinc phosphide was done for years at PDX, but with no reduction in strikes. The Port of Portland and the USDA National Wildlife Research Center recently assessed the small mammal situation on the airfield, and planned a strategy to reduce the population at PDX. Components of the strategy include studies to better understand the population dynamics, and development of an integrated pest management plan that includes both habitat and population management. The Port of Portland has implemented many parts of the strategy.