

following seeding of grasses. During 2001, Canada geese showed no foraging preference between the fescue and ryegrass plots. However, after two additional growing seasons, the tall fescue formed a monoculture in the fescue plots. During 2003, Canada geese fed almost exclusively in the ryegrass plots and avoided foraging the tall fescue plots. Our findings suggest tall fescue might be a favorable species for airfields and other areas where Canada geese are unwanted. For renovations and new seedings on airfields, plants should be carefully selected that are not attractive to wildlife, are adapted to the local climate and soils, and can be maintained (e.g., mowing). Additional research is needed to better define existing and new plants (e.g., grasses, trees) and their management that will readily establish in the various geographic regions in the United States but are undesirable to wildlife.

(25) THE WILDLIFE HAZARD CONTROL TOUR OF BWI: RESULTS OF FIVE YEARS OF COOPERATIVE EFFORTS BETWEEN MARYLAND AVIATION ADMINISTRATION AND USDA, WILDLIFE SERVICES

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USDA entered into a cooperative service agreement with MAA at BWI Airport and Martin State Airport in October 1999 to help alleviate hazards found on/near the airport environment. As an operating condition required by CFR 139, BWI Airport has an FAA approved Wildlife Hazard Management Plan that serves as a guideline to MAA personnel at both airports. USDA and MAA have been working together to develop unique habitat management techniques for new construction and future development, land use planning, effective bird barriers and exclusion devices on MAA property, and to provide continuous education and awareness to airport tenants and vendors. The outdoor field trip at BWI will begin at the newly constructed Consolidated Rental Car Facility. After reviewing many building plans, USDA recommendations, FAA guidance, Maryland's land use regulations to identify wildlife hazard management goals, and the scope of MAA's authority to evaluate public and private development projects within the BWI Airport Zone, the goal of avoiding a possible influx of wildlife populations was accomplished. On the airfield, solutions to problems have included the use of exclusion netting and wire grid systems. The BWI Fire & Rescue building that was infested with Barn Swallows alleviated their problem with the use of exclusion netting. During the Wildlife Hazard Assessment in 2000, the stormwater management pond located adjacent to the fire department was found to attract large flocks of geese throughout the year. BWI successfully installed an overhead wire grid system (10 x 5 ft. spacing) to deter geese. USDA and MAA continue to be proactive and resourceful in their efforts to provide a safe environment for the traveling public and to accommodate BWI's dynamic changing environment.

(26) TOWARD AN INTEGRATED NORTH AMERICAN BIRD AVOIDANCE SYSTEM: ORGANIZATIONAL AND TECHNOLOGY UPDATE

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A disproportionate amount of bird strike damage to both civil and military aircraft occurs off versus on airfield property. As bird control efforts or population management can rarely be

accomplished in the off-airfield environment, avoiding birds in flight remains the only viable option. Progress has been made in this area, but much remains to be done. Bird avoidance in time and space is scale dependent. Long range planning can be addressed by such systems as the USAF's Bird Avoidance Model. Near real time, regional advisories are provided by the Avian Hazard Advisory System. Real time and localized advisories are addressed with mobile avian radars, airport surveillance radars, and other systems under research and development. Effort is now underway to integrate all these disparate systems under one overarching umbrella for Canada and the United States. The USAF Academy Institute for Information Technology Applications now hosts a new program to consolidate such efforts. The US BAM and the new Alaska BAM are maintained and updated, new integration of BAM and AHAS internet map server applications, development of small to large scale bird detection radars, and communication networks for control programs and ultimately to be projected into cockpits fall under the new research and development purview. Department of Defense, Federal Aviation Administration, Transport Canada, Canadian Defense Forces, and various contractors are initial participants in the efforts. The ultimate goals are to end competition and incompatibility between systems and to create a unified North American Bird Avoidance System for all users.

(27) CURRENT STATUS OF THE GERMAN REAL TIME BIRD AVOIDANCE SYSTEM

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Collisions between birds and aircraft are a serious flight safety issue especially in military low-level flight operations. Remote sensing techniques using radars are the most sophisticated and efficient methods available to continuously monitor bird concentrations in a broad spatial coverage. Data from the operational German Air Defense Radar System Network has been made available and a system has been employed to detect bird flocks during migration. This information provides the main data source for the real time Bird Hazard Warning System, a system that became extraordinarily efficient in bird avoidance. Military 3-D air defense radar technology has proven optimal because of its specific design towards individual target recognition and high resolution in all three dimensions. Altitudinal information on bird concentrations is extremely important during migration periods, as enormous bird concentrations have been observed in altitudes even beyond 10,000 ft AGL, an altitude not usually considered as potentially dangerous in respect to bird collisions. Using existing technology and infrastructure whenever possible makes the avoidance system extremely cost effective. Recent developments and the implementation of a widely digitized and automated bird strike warning and expert system for data analysis, the existing air defense radar network, as well as the cooperative use of communications networks provides real time bird strike warning messages (BIRDTAM=Bird Notices to Airmen in analogy to NOTAM) to decision makers and pilots directly into the cockpit. According to German Military Flight Operations Regulations jet aircraft operations are prohibited in valid BIRDTAM regions. Both, reliable BIRDTAM and strict regulations proved to be the best bird strike avoidance strategy in military aviation. In civil aviation BIRDTAM messages are delivered to pilots via air traffic control networks, raising their level of awareness and preparedness. An outline on the technical and organizational structure of the German Forces currently operated real time bird hazard warning system will be presented.