

2009 Bird Strike North America Conference Program

Presented By



11th Joint Meeting of
Bird Strike Committee
USA & Canada

September 14-17, 2009
Victoria, BC Canada



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WELCOME

Bird Strike Committee Canada and Bird Strike Committee USA are very pleased to welcome you to the 2009 Bird Strike North America Conference in Victoria, British Columbia. This is the eleventh combined meeting of Bird Strike Committee USA and Bird Strike Committee Canada. This year there are over 41 papers in 9 technical sessions, as well as exhibitor displays and posters. There will also be lots of time to reconnect with old friends and colleagues and to meet new ones. We hope you enjoy the conference sessions, the special events and your stay in the beautiful city of Victoria.

Gary F. Searing, Co-chair, 2009 Bird Strike North America Conference
Scott Snow, Co-chair, 2009 Bird Strike North America Conference

INTRODUCTION TO VICTORIA

Welcome to Victoria - the "City of Gardens". This intimate, sophisticated seaside city is the vacation capital of Canada and the premiere tourist spot in the Pacific Northwest. Victoria is situated on the southern tip of Vancouver Island and sparkles in one of Canada's mildest climates. Victoria's unique character is deeply rooted in its 150-year history - a history full of colourful people and fascinating tales. The city's British colonial heritage is still very prominent, but contemporary Victoria has a distinctly Pacific Northwest flavour. Today, Victoria is best known as the capital city of British Columbia, and as a world-renowned tourism destination.

It is impossible to visit Victoria and Vancouver Island without touring the area. By simply arriving to the Island by air or water, you have already experienced incredible vistas and a mystique that makes you want to see and learn more.

LOCATION

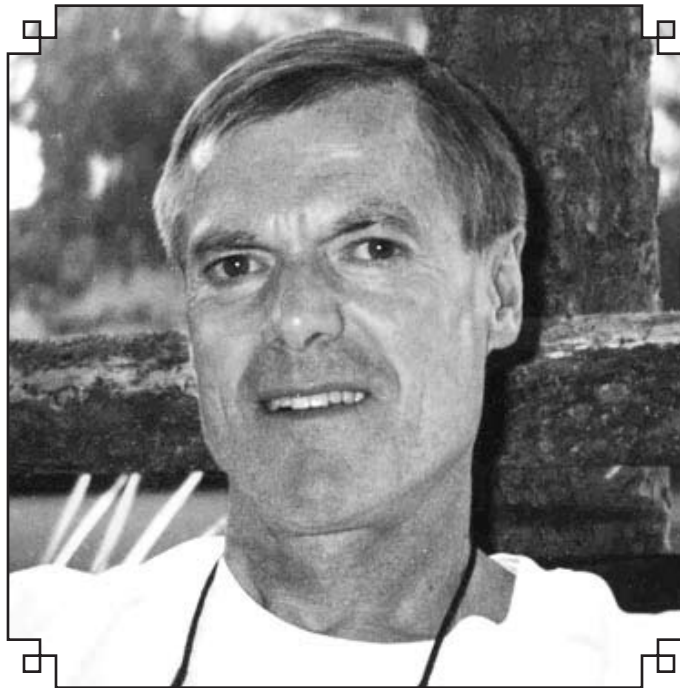
Delta Victoria Ocean Pointe Resort

All meetings and functions provided take place at the Delta Victoria Ocean Pointe Resort

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Victoria, British Columbia
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***The 2009 Bird Strike North America Conference is
dedicated to the memory of...***

Bruce MacKinnon



1948 – 2008

***Bruce's vision for wildlife management and aviation
safety will live on in his friends and colleagues as we
continue to meet at Bird Strike Conferences.
Thank you to Bruce's family, friends and colleagues
who have contributed to the Bruce MacKinnon
Memorial Scholarship***

REFRESHMENT & MEAL SERVICE

(Included in the registration fee)

All refreshments breaks are held in the Harbour Room and the Harbour Patio with the exhibits and posters

Monday, September 14, 2009	Morning Coffee & Tea, 2 Refreshment Breaks and Welcome Reception
Tuesday, September 15, 2009	Morning Coffee & Tea, 1 Refreshment Break and Buffet Luncheon
Wednesday, September 16, 2009	Morning Coffee & Tea and 2 Refreshment Breaks
Thursday, September 17, 2009	Morning Coffee & Tea, 1 Refreshment Break and Buffet Luncheon

HOSPITALITY DESK

Located in the Foyer

Day	Time
Monday, September 14, 2009	7:30 am - 5:00 pm
Tuesday, September 15, 2009	8:00 am - 1:00 pm
Wednesday, September 16, 2009	8:00 am - 5:00 pm
Thursday, September 17, 2009	8:00 am - 2:30 pm

A hospitality desk, located next to the Conference Desk, will be available on-site at the Delta Victoria Ocean Pointe Resort in the foyer by the Ballroom. Our staff will be pleased to answer any questions. Please also visit the Concierge Desk in the hotel lobby as the Concierge staff will be able to assist you in booking tours if you have not already made arrangements directly with any tour companies. On Tuesday, September 15, 2009 there is free time allocated in the program after lunch (Lunch is from 12:10 pm – 2:00 pm) to see the sights of Victoria.

EXHIBITS

Thank you to the 2009 Bird Strike North America Conference exhibitors. Please visit their booths at the Harbour Room and Patio to find out more about their great products and services.

Hours:

Monday, September 14, 2009	7:45 am - 8:00 pm
Tuesday, September 15, 2009	8:00 am - 2:00 pm
Wednesday, September 16, 2009	8:00 am - 4:30 pm
Thursday, September 17, 2009	8:00 am - 1:00 pm

Posters are also available for viewing during these times.

Exhibits

Accipiter Radar Technologies

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With offices in Canada and the U.S. Falcon Environmental Services provides the industry sector with wildlife control and risk assessment programs. See www.falcon.bz

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Volairus (formerly Winfield Solutions) has been providing Wildlife Management and associated Safety Management Systems (SMS) software to both large and small airports since 1999.



POSTER PRESENTATIONS

Poster boards are located in the Harbour Patio

Are Visual and Radar Bird Sampling Techniques Correlated?

Mr. Christopher Bowser and Dr. Robert Beason

To evaluate the similarities between visual “bird-count” sampling technique and automated radar data collection technique we compared the numbers of birds that were detected by each sampling technique within the same time frame. We found that radar detected 71% of the individuals that were recorded during visual observations when the bird did not land within visual observation range. The reasons for non-detection of the remaining birds were because the birds were outside the radar beam, were small birds too far (> 2 km) from the radar to detect, or were over areas of high ground clutter. A comparison of the total number of birds detected by each technique showed that because the radar monitors all sampling sites simultaneously, it detected more than 50 times the number of birds per hour as visual sampling. Visual sampling reported additional birds near the ground that were never within the radar’s beam pattern and radar sampling recorded birds that were not seen by the visual observer because the observer was looking in a different direction. Within this study we found that each technique has biases: visual towards lower-flying birds and radar towards higher-flying birds. Traditional visual sampling and radar monitoring provide complementary pictures of avian hazards on an airfield.

Native and Naturalized Turf Species Suitable for Use on Airfields Managed for Wildlife Hazards

Ms. Kristin Dorsch

Habitat management is an important component of an integrated approach for reducing wildlife hazards on airfields. This research examines alternative turf species that are either native or naturalized in the Northeastern US. Native turf species tend to not be attractive to wildlife due to their low palatability and seed production. Some of the species to be tested include Pennsylvania Sedge, *Carex pennsylvanica*, Little Bluestem, *Schizachyrium scoparium*, Crinkled Hair Grass, *Deschampsia flexuosa*, and Purple Love Grass, *Eragrostis spectabilis*. A greenhouse study will be carried out prior to the setting up of field plots in the spring to check suitability for hydroseeding, germination and early vigor. Field plots will be established at several airports and monitored for wildlife attraction by insects (i.e. grubs, a food source for other animals), birds (specifically Canada Geese and gulls) and mammals (specifically White tailed deer, coyote and rodents). The overall goal of the project is to provide recommendations for turf management at General Aviation Airports that can be used as part of a wildlife hazard management plan; however, results of the work can be utilized by other larger or smaller airfields with similar concerns.

GEESE-OFF: Totally Natural Garlic Oil Spray Chases Geese from Grass Surrounding Runway Areas

Mr. Bill Milne

Natural Garlic Oil makes grass bitter and Canada geese move on to non-treated areas. Geese can be encouraged to move on to other locations, especially when grassy areas surrounding runways are sprayed with garlic oil, early in the spring, prior to them moulting their flight feathers and on a routine basis thereafter. Application is best done on grass that is maintained and trimmed on a regular basis, as geese prefer to feed on short grass. A Canadian airport test application is being done this spring.

Garlic oil has been found to repel European Starlings and has recently been exempt from pesticide requirements in Europe. It also has been effective in Muskoka lakes in Ontario for deterring Canada Geese from cottage and golf properties when the properties were sprayed for mosquito control with Mosquito-Less (www.mosquitoless.ca). Health Canada PMRA does not require permits when natural garlic oil used for mosquito control, and are open to testing for geese.

Marine Corps Air Station Iwakuni Bird Strike awareness poster

Mr. Grant Killmer

This BASH poster was created specifically for MCAS Iwakuni, Japan. The poster was constructed as an informative and educational tool that highlights the biggest threats to MCAS Iwakuni, outlines some of the basic components of the Air Station’s BASH program and also illustrates one of the recent Bird Strikes that took place recently.



POSTER PRESENTATIONS

Poster boards are located in the Harbour Patio

Modeling Ecological Niches for Wildlife Species Occurring Within Airport Environments

Ms. Claire Patterson-Abrolat

Every species has a range of environmental factors governing whether or not it can survive in a given area. Ecological Niche Modeling (ENM) has proved to be a valuable tool for decision-making in many fields, including the effects of climate change on biodiversity, and assessing the geographic potential of invasive alien species, areas requiring protection, and the likelihood finding rare or endemic species.

A number of challenges currently face airport managers. These include looking critically at the contribution of airports to global warming, minimizing the presence of wildlife species through habitat manipulation techniques, the demand for air travel, and increasing human development around airport environments.

Airports Company South Africa (ACSA), in conjunction with the Endangered Wildlife Trust, recently introduced the use of Global Positioning Systems to collect and monitor wildlife presence on their airfields. Expanding the use of this data to guide long-term decision making and planning processes using tools such as ENM is currently being investigated. ENM stimulates novel and exciting uses of biodiversity data amalgamated from various sources and thus allows for broader opportunities and scenarios under which data can be used. This poster presentation will look at the contribution of ENM to the major challenges facing airport managers.

Welcome Aboard: Identification of US Navy/Marine Birdstrikes at Smithsonian

Mr. James Whatton

Although the United States Navy and the Smithsonian Institution's Feather Identification Lab have had a long history of working together to identify birdstrikes, it was not until October 2008 that an official interagency agreement between the US Navy Southeast Region and SI was initiated. Since that time, we have received a variety of birdstrike remains ranging from whole feathers to alcohol swipes of blood smears collected and sent by Navy, USDA Biologists, and Marine Corps personnel for identification. Through the first six months of the partnership, we have received over 100 cases from 20 different Navy and Marine Corps bases. We have identified approximately 90 species of birds (82% identified to species level; 94% identified to a higher order of classification). The methods of identification included: whole feathers (49%), DNA barcoding (32%), feather microstructure (5%), and combinations of the three methods (14%). Based on the information presented in this poster, the US Navy birdstrike identification program is experiencing excellent participation from the field and is a much-needed asset to the US Navy/Marine Corps BASH program.

The Altitudinal Distribution of Identified Bird Strikes

Ms. Sandra E Wright

The flight altitudes of 363 birds (102 species) were recorded as birdstrikes to civil aircraft in the United States above 500 feet from January 1990 through September 2008, identified to species by Smithsonian Institution personnel, and logged into the FAA Wildlife Strike Database. The highest altitude recorded was for a Snow Goose (*Chen caerulescens*) at 15,000 ft. The second highest altitudes were a Northern Pintail (*Anas acuta*) and a Blue-winged Teal (*Anas discors*), both at 14,000 ft. Many of the Passeriformes species were recorded up to 6,000 ft and a few were higher. The highest passerines were American Robin (*Turdus migratorius*), Horned Lark (*Eremophila alpestris*), and House Sparrow (*Passer domesticus*) at 7,000 ft, Barn Swallow (*Hirundo rustica*) at 8,500 ft, House Wren (*Troglodytes aedon*) at 9,000 ft, and the highest was a Fox Sparrow (*Passerella iliaca*) at 11,000 ft. About two-thirds of the identified strikes involved single birds. Only a few of the multiple strikes involved more than 10 birds.



CONFERENCE PROGRAM

Monday, September 14, 2009

Morning Coffee & Tea

Harbour Room & Patio

07:45 AM – 08:45 AM

Exhibits Open & Posters Available for Viewing

Harbour Room & Patio

07:45 AM - 08:00 PM

Opening Remarks

Ballroom

08:45 AM - 09:10 AM

Welcome to the 2009 Bird Strike North America Conference
Mr. Gary Searing and Mr. Scott Snow, Program Committee Co-Chairs

Welcome from Victoria International Airport
Mr. Richard Paquette, President & CEO

Welcome to Victoria, British Columbia
Mr. Dean Fortin, Mayor of Victoria

Welcome from Title Sponsor, Accipiter Radar Technologies
Mr. Timothy J. Nohara, President & CEO

Session 1: Risks & Strategies to Reduce Risk

Ballroom

09:10 AM - 09:55 AM

Moderator: Eugene LeBoeuf

9:10 am Successful Strategies for Aviation Wildlife Mitigation

Mr. Paul Eschenfelder

Between October 2007 and January 2009 there were four catastrophic accidents caused by collisions between aircraft and birds in the United States. Four aircraft were destroyed and 15 people killed in these accidents. In North America we place great emphasis on airport wildlife control; however none of these accidents would have been affected by improved airport wildlife control. This reveals a gap in our safety management plan for preventing/reducing wildlife hazards to aircraft. This paper explains, using case studies, successful aviation mitigation methodologies used in the past to mitigate other aviation hazards such as wind shear, volcanic ash and ground deicing. There is no reason that aviation wildlife mitigation should not adopt and use these successful aviation strategies to close the gap currently existing and improve safety. Unfortunately, too many working in this field have little knowledge of aviation safety strategies and therefore are groping in the dark for solutions. The understanding and application of successful methodologies is integral to any solution for this hazard.

9:35 am Amplified Bird-Strike Risks Related to Population Increases of Large Birds in North America

Mr. Richard Dolbeer

Bird-aircraft collisions (bird strikes) are an increasing safety and economic concern to the civil aviation industry. The U.S. Federal Aviation Administration has developed airworthiness standards using a single 4-lb bird mass as the maximum that must be tested for most engines and other components. However, most of the 36 bird species in North America with body masses greater than 4 lbs, including 13 of the 14 species over 8 lbs, have shown substantial population increases in the past 40 years. As one example, the resident Canada goose (10 lbs) population has increased 20-fold from 1970 to 2008; 43% of the reported strikes with this species involve multiple birds.

Airworthiness standards should be reevaluated to address the threat posed by increased populations of large flocking birds, especially since current standards do not require an engine to maintain power after ingesting a 4-lb bird. Also, increased research and development is needed in the deployment of bird-detecting radar to warn pilots of flocks of birds and techniques to make aircrafts more visible to birds. Finally, wildlife biologists should increase efforts to reduce or disperse populations of these large birds in airport environments. For resident Canada geese, management programs may be needed to reduce populations in many urban areas.

Refreshment Break

Harbour Room & Patio

09:55 AM - 10:30 AM

Exhibits and Posters available for viewing

Sponsored by



Session 2: Aircraft Design & Consequences

Ballroom

10:30 AM - 11:50 AM

Moderator: Eugene LeBoeuf

10:30 am Large Air Transport Jet Engine Design Considerations for Large and Flocking Bird Encounters

Mr. Christopher Demers

The manufacturers of large commercial turbofan engines have many factors to consider during the design, certification and operation of modern jet engines. Safe outcomes after encounters with birds are one of the most important challenges faced by any OEM.

A brief history of the bird strike threat on Pratt & Whitney engines will be provided to put the progress of engine structural developments in perspective. The effects of ingesting bird(s) into an operating engine will be presented using both certification standards and case histories.

Pratt & Whitney's efforts to translate bird strike physics into engine design features, and the development and validation of those features, will be discussed along with the importance of diligent bird strike reporting for continued improvements in large turbofan bird strike capabilities.

10:50 am Does the Type of Aircraft Influence the Number of Bird Strikes?

Mr. Tom Kelly

The recent changeover in air traffic at Dublin Airport, Ireland, from one dominated by the Boeing 737 Series 200-500, to the current situation where the highest frequencies of movements involve the Airbus 320 and the Boeing 737-800, has coincided with a marked alteration in the pattern of bird strikes. Thus, whereas in the past most strikes involved the B 737-200, many more are now recorded from the A 320 as compared with the B 737-800. For example, in 2006 there were 3.8 confirmed bird strikes per 10,000 aircraft movements associated with the A 320 as compared to 1.54 per 10,000 aircraft movements recorded from the B 737-800. This unexpected trend has been fully sustained in 2007 and 2008. In this presentation, we provide a detailed comparative analysis of the pattern of bird strikes involving the two types of aircraft at Dublin Airport – including time of day, time of year, phase of flight, and species struck over the 2005 to 2008 interval. The results will form part of a more wide-ranging study of the reasons why almost twice the number of bird strikes is now being recorded from the Airbus 320 as compared with the Boeing 737- 800.

11:10 am Serious Birdstrike Accidents to Canadian and U.S. Military Aircraft, 1928-2008: Numbers & Circumstances

Mr. W. John Richardson and Mr. Tim West

We summarize 125 serious bird-related accidents to Canadian and U.S. military aircraft, considering accidents where the aircraft was destroyed or damaged beyond repair (dbr), or with fatalities (F). The known totals are 20 Canadian and 105 U.S. accidents: 20 pre-1950, 50 in 1950–1979, and 55 subsequently (early records incomplete).

Of 20 known pre-1950 accidents, 19 aircrafts were piston-engined. The first known U.S. loss of a jet to birds was in 1946 (P-80A, dbr). Pre-1950 accidents involved at least 12 single-, 6 twin-, and 2 four-engined aircraft, with at least 13F (3 ground). Of the four-engine aircraft, a USAAF Liberator landed safely after a fatal windscreen penetration; an RCAF Halifax crashed.

Of 20 known accidents to Canadian aircraft, 11 were in Alberta or Saskatchewan (2F) and 9 in Europe. Canadian aircrew were also involved in 4 RAF (U.K.) birdstrike accidents during the 1940s (1F), and in the U.S. and NATO E-3 AWACS accidents (2F).

Of 105 known U.S. accidents, 69+ were in the U.S., 1 in Canada, 11 in Europe, 7 in Asia, 5 elsewhere, and 12 at uncertain locations. There were at least 66F (3 ground). In four of these accidents, one crewman died but the aircraft landed safely.

11:30 am Bird Strike Problems & Controlling Measures Adopted at Tribhuvan International Airport (TIA), Kathmandu, Nepal

Mr. Ram Mani Thapaliya

Tribhuvan International Airport (TIA) is affected by Birds and wildlife hazard problems. Because of bird movements at TIA, some bird strikes incidents occurred in 1996, 2001 and 2003. CBIN has taken this case seriously from the viewpoint of safety of life and aircrafts. We did this investigation by request from CAA Nepal with the help of RONA and Dr. Richard Dolbeer. We found search for food, search for water, shelter and playgrounds for birds were the causes of bird strikes at TIA.

Our results meant that birds are using this habitant because of rivers, jungles, communities and garbage. In addition, we found other wildlife hazards such as monkeys, dogs, cows, buffalos, rats, rodents, earthworms and cats at TIA.

There are a total of 39 species of birds at TIA including pariah kite, house crow, serpent eagle, black kite, common myna, blue rock, pigeon, eurasian, tree sparrow, paddy-field pipit, white wagtail, black drongo, house sparrow are permanent resident of TIA in all 4 seasons.

To address the problems and to adopt bird strike controlling measures, ICAO should monitor and supervise bird strike programs of CAA Nepal. IBSC should inspire the working organization in the field of Bird strike programs.

Lunch On Own

Lunch On Own

11:50 AM - 01:45 PM

Please visit the Hospitality Desk in the foyer or the Concierge Desk in the hotel lobby for some excellent restaurant recommendations!

Session 3: Populations, Management & the Courts

Ballroom

01:45 PM - 02:45 PM

Moderator: Scott Snow

1:45 pm One Size Fits All: Completing One Risk Analysis for 22 Northern Airports

Mr. Ron Huizer, Mr. Terry Kelly and Ms. Kristi Quinn

The paper describes a single wildlife risk assessment that was completed for 22 northern aerodromes in Manitoba in order to comply with the Canadian Aviation Regulations. The assessment is the basis for a comprehensive wildlife management program for the provincially operated airports. The airports are located near bodies of water and lagoons and dumps, all of which attract hazardous flocking species.

The low traffic levels and scarcity of strike data presented methodological challenges, making it difficult to undertake a risk assessment for each site individually. By pooling data available for all sites, similar in size, operations and geography, a comprehensive approach to risk management was completed. Data were collected by mail-out survey, followed-up by telephone interviews and on-site surveys.

Some key findings included:

- 88% of the strikes at the 22 airports occurred from May to October;
- Of the 43 reported strikes, 27 involved multiple birds, including 13 medium- to large-sized birds; and
- The number of flights has remained static, yet reported strikes have increased between 2003-2007.

The risk assessment will be used: to develop AWMPs addressing the most significant risk; as a baseline measure to improve risk mitigation strategies; and to support provincial policies regarding the location of hazardous land-use near remote airports.

2:05 pm Bird Risk Assessment Using Integrated Data from Bird Surveys Conducted in Various Chinese Airports

Ms. Zhang Jie and Mr. Li Jing

The birds at airports are threatening the flight safety for their special living place. In China, various bird species appeared at airports and vicinity. However, not all the species are equally hazardous to aviation because of their features. During 2004-2005 we selected 24 wildlife species or species groups (e.g., swallows [Hirundo spp.]) which were observed at >/10 of 32 airports and vicinity in the respective bird surveys conducted in various regions of China. We assessed the 24 groups for relative risk to aircraft based on the variables including strikes reported, meeting probability distributing rating, major damages, body mass and behavior. Domestic pigeon, swallows and herons (Ardeidae, primarily Egretta garzetta, Nycticorax nycticorax) were the 3 highest risk species in most regions of China, and buntings (Emberiza spp.), Grey Nightjar (Caprimulgus indicus) and Wagtail (Motacilla spp.) were the 3 lowest risk species. We believe the assessment results provide a useful guide for the airport operators in prioritizing management actions by the highest risk species to reduce bird strikes, and a helpful reference for bird strike managers and researchers all over China to pay more attention to the highest risk species. Otherwise, it shows a necessity to increase the identification of species struck by aircraft to improve the assessment system on strike data.

2:25 pm Resurrecting the North American Bird Strike Advisory System Strategic Plan

Dr. Russell P. DeFusco

Most bird strike reduction efforts are conducted in the airfield environment and have been successful at reducing such hazards. These efforts must continue. However, many strikes and a disproportionate amount of damage are also recorded in the off-airfield environment where much work is needed. Off-airfield mishaps include several recent fatal accidents and the US Airways crash in the Hudson River earlier this year. Further research, development, implementation of new regulations, procedures, and training are needed. Integrated remote detection, warning, and communications systems must address these hazards. Efforts began in 2005 to integrate widely disparate systems under one overarching umbrella for the United States and Canada. Mr. Bruce MacKinnon of Transport Canada sponsored the effort that was joined by the FAA, USAF, and some international partners to develop a North American Bird Strike Advisory System Strategic Plan. The planning document was prepared, but support to institute the recommendations and implement the plan never materialized. Mr. MacKinnon always intended to resurrect the effort when the opportunity was presented. The New York mishap has presented that opportunity and it is now time to re-examine the plan. A central tenet was the establishment of a Bird Strike Advisory Center that fits the proposal now initiated by Embry-Riddle Aeronautical University. This paper revisits the earlier efforts and summarizes the framework already established under the strategic planning document that should now be part of an integrated system of bird hazard advisories at all levels across North America and beyond.

Refreshment Break

Harbour Room & Patio

02:45 PM - 03:30 PM

Exhibits and Posters available for viewing

Session 3: Populations, Management & the Courts (continued)

Ballroom

03:30 PM - 04:30 PM

Moderator: Scott Snow

3:30 pm The Relationship Between National Bird Populations and Birdstrike Risk

Mr. Andy Baxter

Birdstrike risk is dictated by a combination of the hazard a bird poses to an aircraft (generally its size or flocking behaviour) and the probability that such a bird will come into contact with an aircraft (population size and local movements). Changing agricultural practices, climate, habitat and human populations have all resulted in significant increases or decreases in the national populations of different birds. In the UK, trends in some species have been marked and may show correlations with the number of birdstrikes encountered. This paper examines the possibilities of using long-term national population trends to develop models to predict birdstrike risk in the future.

3:50 pm National Bird Population Statistics as a Tool for Strategic Bird Management Decisions

Mr. John Allan and Mr. Andy Baxter

Bird management on and around aerodromes has developed over many years and has often focused on techniques designed to manage the risk from particular species. In the UK, for example, waterbody management was originally designed to prevent gull roost formations through a reduction in areas of large, open water. Irregularised embankments or the addition of islands was not considered to constitute a risk to other species. At the time of those management efforts, Canada Geese were low in number and were not present around aerodromes. Today, modern methods of deterring other species from aerodromes may be presenting habitats that are suitable for new species that are currently increasing. By evaluating national bird population trends and statistics in combination with potential risk, long-term strategic management decisions to prevent future birdstrike risks may be taken. This paper examines the decision tools available to prevent future risk from birds arising in the aerodrome environment

Tuesday, September 15, 2009

Today's Presenter Gifts are Sponsored By DeTect Canada



Bird Strike Association of Canada Meeting

Ballroom

08:00 AM - 09:00 AM

Mr. Gary Searing

The Bird Strike Association of Canada is dedicated to advancements in the field of wildlife hazard mitigation at airports. The Association consists of individuals and organizations with responsibilities for and/or interests in the management of wildlife hazards at airports. The Association provides a forum for communication of news, and discussion among members of ideas and information that will enable those responsible for airport wildlife risk reduction to better perform their roles and to stay connected with others conducting airport wildlife mitigation work throughout Canada. Membership is open to public and private organizations and to individuals.

Morning Coffee & Tea

Harbour Room & Patio

08:00 AM - 09:00 AM

Exhibits Open & Posters Available for Viewing

Harbour Room & Patio

08:00 AM - 02:00 PM

Session 4: Radar Technology

Ballroom

09:00 AM - 10:20 AM

Moderator: Steve Osmeik

9:00 am Beale AFB and the Utilization of Bird Radar in Identifying Wildlife Hazards, Seasonal Bird Movements and Daily Operations

Mr. James Laughlin

Beale AFB's deployment of Bird Radar is intended to assist in the prevention of bird strikes and facilitate the assessment of potential wildlife hazards affecting Beale's flightline. Radar information is displayed in real time and is jointly monitored by the Supervisor of Flying (SOF) in the tower and on the ground by the BASH Manager (USDA Representative). Analyzed avian reports provide critical data identifying wintering waterfowl movements directly caused by local agriculture, for which agricultural practices will likely be altered. These avian reports also recognized bird utilization of a local beaver pond and identified movements directly transecting both approach/departure ends and the runway. Beaver populations are being managed and under formal consultation with the USFWS the dam will likely be removed. Daily avian report data is incorporated into the flight scheduling process and is built into the Operational Risk Management (ORM) Process. It will eventually be included in the Go-No-Go for the unmanned RQ4 Global Hawk. Avian data reports provide long-term data sets that produce statistics on hourly, daily, monthly and yearly peak bird movements giving Beale the opportunity to project and select optimum and least optimum times of flight.

9:20 am Avian Radar for Evaluating Wildlife Hazard Mitigation Measures Employed at Seattle-Tacoma Airport Stormwater Ponds

Mr. Steve Osmek

Sea-Tac Airport (SEA) uses netted/bottom-lined stormwater detention ponds to minimize vegetation growth, concerns related to hazardous bird attractants, and long-term maintenance costs. Research was needed to ensure this BMP did not compromise aviation safety by causing birds to repeatedly fly over ponds when attempting to get below the netting. During fall 2008, 1000 hours of sampling effort was archived from each radar and post-processed to compare the average time (seconds) targets spent over a BMP-pond versus its paired control site. Paired sites were located an equal distance from the radar antenna. Radar-1 data collected from the altitude range 240-450 feet above runway level (ARL) yielded no significant differences between the 3 paired sites (mean = 9.5-10.0 s/visit, $p > 0.15$). Radar-2 was not used. Radar-3 data collected from the altitude range 0-400 feet ARL, indicated targets spent significantly less time over both BMP-ponds than their controls (both $p < 0.05$, $n = 133-769$; BMP = 4.60 and 4.75 s/visit versus control = 6.10 and 6.15 s/visit, respectively). Although evaluating the SEA pond BMP was important, equally valuable for validating avian radar performance was that Lora Lake, a known wildlife attractant, was found to have 3.1-4.5 times more targets detected daily than the other 3 sites using Radar-3.

9:40 am Ornithological Knowledge Derived from Sensor Based Bird Migration Detections over Central Europe

Mr. Wilhelm Ruhe

It is well understood that especially during spring and fall; migrating birds pose a great risk to enroute aircraft operations over Central Europe, when billions of birds pass through the area. Very little of the bird migration is visible by the human eye itself. The German Armed Forces therefore put a system in place that takes data from three-dimensional radar systems in a real time warning system in order to detect hazardous bird concentrations countrywide and guide military flight operations to prevent enroute bird strikes. Additional systems are tested to detect bird migration in different scales. All these data also form a great basis for the analysis and understanding of the nature of bird migration. Techniques will be described and examples will be given on the spatial, altitudinal and temporal distributions of bird migration.

10:00 am Integrating Avian Radar into the Aviation Operating Environment

Capt. Richard Sowden and Capt. Paul Eschenfelder

Avian radar technology has matured to the point where robust data and analysis tools are now able to provide the aviation industry with high quality information to support bird strike risk mitigation activities. The aviation operating environment is dynamic and challenging with complex interactions between the primary bird strike risk mitigation stakeholders; airport operators, air traffic service providers and flight crews. The transfer of this proof of concept technology into a suite of tools that is integrated into the aviation industry requires the engagement and support of the user community in the next critical evolutionary step of this emerging technology. This paper examines the current and near-term future capabilities of avian radar technology and develops the fundamental framework for the practical, strategic and tactical use of the information to maximize strike risk mitigation while ensuring that overall flight safety is maintained or enhanced.

Refreshment Break

Harbour Room & Patio

10:20 AM - 10:50 AM

Exhibits and Posters available for viewing

Session 4: Radar Technology (continued)

Ballroom

10:50 AM - 12:10 PM

Moderator: Steve Osmek

10:50 am A New Generation of Bird Radar Systems, Solid State Radar Technology

Mr. Adam T. Kelly

In late 2008, commercially available solid state marine radars became available on the commercial market and started being deployed in aircraft-birdstrike avoidance radars. This new generation of low-cost bird radar sensors offer a new level of performance and capability over the magnetron-based marine radar sensor that have long been the standard used in bird radars. Advantages of solid state radars include increased bird detection ranges, enhanced bird detection in high clutter environments, and "all weather" bird detection. The systems also are upgradeable and will support future technology enhancements including frequency diversity and Doppler signal processing which will be available in late 2009 and early 2010.

This presentation will present technical data on and review the advantages of the solid state technology and how it applies to bird radars for aircraft-bird strike risk management that will include performance comparison data for solid state and magnetron systems. The variable frequency capability of solid state radars also makes it possible to deploy a truly "all weather" bird radar that can detect and track birds in conditions where conventional X-band bird radar systems are effectively "blind". This includes bird detection in wet fog and into moderate rain events, periods when birds can be active and which represents the most dangerous period for birdstrikes as bird control units, air traffic controllers and pilots cannot see birds and the birds cannot readily "see and avoid" aircraft.

11:10 am Integration of Real-Time Bird Radar Information into Commercial Air Traffic Control

Mr. Albert Froneman and Mr. Ronald Merritt

The new King Shaka Airport in Durban, South Africa is located 3 kilometers from a European barn swallow roost of 3-5 million birds that winter there from October through April. During design, concerns were raised about the potential risk to aircraft from bird-aircraft strikes and potential mortality to the barn swallow population. In 2007, the airport conducted an avian radar survey to collect data on bird movement patterns, altitudes, and densities to develop a risk assessment, recommendations for mitigation and management, and a draft BASH plan for the airport that included a deployment plan and concept-of-operations (CONOPS) for installation of an aircraft-birdstrike avoidance radar at the airport to provide real-time bird detection and operational risk advisories to aircrafts.

In 2008, the airport issued a competitive Request for Proposal for supply, installation and support of a bird radar system to support airport operations and provide real-time information on bird activity and birdstrike risk advisories to air traffic control. Consequently, a system was ordered in October 2008. The system - a DeTect MERLIN Aircraft Birdstrike Avoidance Radar - was delivered in December 2008 and is operating at the airport with a real-time display in the air traffic control tower delivering automated birdstrike risk advisories to controllers that includes a custom developed swallow risk prediction algorithm. This installation is the first known use of a real-time bird radar information in a commercial airport control tower and the presentation will present the "lessons learned" from this project.

11:30 am Revolutionizing Airport Bird Strike Prevention with the ROBIN Lite Search & Track Bird Radar

Mr. Addy Borst

TNO in the Netherlands developed the new generation avian radar ROBIN Lite. A new FMCW (Frequency Modulated Continuous Wave) radar technology has been used for the vertical radar. This is a coherent/Doppler radar technology, which has some inherent advantages. One of them is that the vertical radar birds can be tracked continuously and the wing beat frequency can be defined enabling classification of the bird species. Moreover, ROBIN Lite discriminates between different birds inside a

flock to a high extent. As far as we know, ROBIN Lite is the world's first non-military search & track bird radar.

As exact position and altitude of birds around the airport are now available, the calculation of intersecting of 3D bird tracks with aircraft take off/landing trajectories can be calculated. Preventive and early warnings can now be brought to the attention of ATC and Bird Control units. This might be revolutionizing bird strike prevention. The ROBIN Lite system is fully remote controllable and bird information is visualized to remote users in various ways like realtime Google Earth, streaming video, etc. Moreover, relational (biological) databases are updated continuously with all bird migration information. ROBIN Lite has been in experimental use at Woensdrecht AFB of RNLAf as part of the FlySafe project of the European Space Agency (ESA) since 2007. Moreover, operations at Amsterdam Schiphol Airport are planning to start in the first half of 2009.

11:50 am Could Avian Radar Have Prevented US Airways Flight 1549's Bird Strike?

Mr. Timothy J. Nohara

The heroic ditching in the Hudson River of U.S. Airway's Flight 1549 following multiple bird strikes with Canada geese has increased public awareness of bird aircraft strike hazards (BASH); and has focused attention on new tools such as avian radar to help improve aviation safety. Numerous reports in the media have suggested that had avian radars been deployed at LaGuardia Airport, this bird strike could have been avoided. Indeed, there is mounting evidence supporting avian radar's ability to provide wildlife control personnel with greatly improved bird situational awareness, which can be used to reduce bird hazards around airports for improved safety. However, can avian radar provide pilots with the ability to sense and avoid specific bird hazards? The question is timely, requires careful consideration, and is the subject of this paper. Using the Hudson incident as a case study, this paper examines the system requirements of a conceptual avian radar system designed to support such a sense and avoid capability, followed by a look at the ability of today's avian radars to meet them.

Networking Lunch

Harbour Room & Patio

12:10 PM – 02:00 PM

Exhibits and Posters available for viewing

Working Groups

Ballroom

01:00 PM - 02:00 PM

Working Group on Regulation
Interim Chair: Mike O'Donnell

Working Group on Technology
Interim Chair: Dr. Russell P. DeFusco

Working Group on Training
Interim Chair: Capt. Paul Eschenfelder

Bird Strike Committee USA Steering Committee Meeting

Ballroom

02:00 PM - 03:30 PM

Free Time to Explore Victoria!

Free Time

02:00 PM - onward

Please visit the Concierge Desk in the hotel lobby for some great tour and siteseeing ideas. Staff will be able to arrange tours for you.

Wednesday, September 16, 2009

Bird Strike Committee USA/Canada Meeting

Ballroom

08:00 AM - 09:00 AM

Mr. John Ostrom and Mr. Gary Searing

This meeting is for committee members only.

Morning Coffee & Tea

Harbour Room & Patio

08:00 AM - 09:00 AM

Exhibits Open & Posters Available for Viewing

Harbour Room & Patio

08:00 AM - 04:30 PM

Session 5: Methodology

Ballroom

09:00 AM - 10:00 AM

Moderator: Mark Adam

9:00 am Birdstrike Identification: Updates From the Smithsonian Feather Identification Lab

Ms. Marcy Heacker

The Smithsonian Feather Identification Lab is constantly seeking to improve identification methods for birdstrike analysis. The Lab identifies around 4,000 birdstrike cases a year for military and civil aviation, representing a 23% increase in caseload since 2005. Further, the addition of DNA analysis in 2006 has increased the Lab's species-level identifications by approximately 20%. The effect of DNA analysis is also reflected in a 55% decrease in microscopic examinations that are frequently accurate to general taxonomic level (ex. Passeriformes). Because birdstrike remains are so variable, 12% of current identifications actually utilize a combination of methods (whole feather, microscopic feather, and/or DNA analysis). Applying multiple tools of identification also increases ID accuracy and verifies traditional species identification techniques. Since the implementation of DNA analysis, there has been a 38% decrease in the number of cases submitted that have only whole feathers; possibly suggesting a misinterpretation in recommended field-collecting methods. With greater education on bird strike issues and high profile cases, like U.S. Airways flight 1549, more opportunities are developing to analyze birdstrike species. This presentation reviews the improvements in identification techniques, proper field sample collecting, and discusses future possibilities for birdstrike identification.

9:20 am Osprey In the Big Apple: Field Testing an Anti-perching Device

Ms. Laura Francoeur, Mr. Gordy Sabine and Mr. Brian Washburn

Osprey populations in the northeastern U.S. have expanded in recent years, notably in areas adjacent to John F. Kennedy International Airport (JFKIA). Osprey frequently use the JFK airfield, often perching on FAA radio antenna towers to eat fish. The airport worked with Birdzoff™ to develop and field test a non-metallic anti-perching device to prevent osprey from perching on the towers. Installation of anti-perching devices was completed on three radio antenna towers in May 2008 (at a cost of \$9 per foot and 20 hours of labor) and all fish scales were removed from the ground at the base of the towers. Following the installation, the 3 towers were monitored for perching osprey and

bases of the towers for presence of fish scales (May-October 2008). No osprey were observed perching on the towers and no fish scales were found at the tower bases. Although the devices successfully reduced osprey perching (by 100%) from 2007 to 2008, osprey collisions with aircraft were not reduced or eliminated (4 in 2007 and 3 in 2008). Osprey were frequently observed using other areas of the airport. The anti-perching devices are one component of an integrated program to reduce osprey-aircraft collisions at JFKIA.

9:40 am Social Media, Bird Strikes, and Aviation Safety Policy

Dr. Todd Curtis

The January 2009 US Airways in the Hudson River in New York was an excellent example of how social media applications like Twitter and YouTube affect how the public finds out about aviation safety related events. The intense media attention around the FAA's proposal to restrict public access to their bird and wildlife strike database represented a different opportunity to use automated online search tools to identify opportunities to promote a better public understanding of bird strike related aviation safety issues.

When many bird strike related organizations first launched their web site, that was about all the online presence that was needed. However, with the rise of the use of social media technology that allows users to tailor how they find and use information, having a web site is no longer enough. Many of the most useful tools in the social media arena are relatively simple to use, often free, and can greatly expand the ability of an organization to reach an online audience. Examples from the work of the AirSafe.com Foundation will show how even the smallest aviation safety organization can use evolving online media technology to enhance their ability to maintain a high public profile.

Refreshment Break

Harbour Room & Patio

10:00 AM - 10:30 AM

Exhibits and Posters available for viewing

Sponsored by



Session 5: Methodology (continued)

Ballroom

10:30 AM - 11:50 AM

Moderator: Mark Adam

10:30 am Responses of Gulls to a Remote Control Operated Hawk Model: Implications for Bird Strikes

Mr. Paolo Iori, Mr. Alessandro Montemaggiore and Mr. Esteban Fernandez-Juricic

One strategy to minimize the incidence of bird strikes is the reduction of the abundance of birds in and around airport property. A method that can accomplish this without causing the mortality of the target species should elicit behavioural reactions that would drive birds away on a temporal or continuous basis. Falco-Robot GBRS (© Bird Raptor Internacional SL) is a novel radio controlled flying system that resembles a Goshawk and triggers escape responses of species that forage or generally flock in groups. We tested the effectiveness of Falco-Robot GBRS in the field by simulating attacks to ringed-billed gulls in North America and herring gulls in Europe. We equipped Falco-Robot GBRS with an onboard camera and recorded the behavioural reactions of gulls foraging in flocks with cameras on the ground. This system allowed us to record the probabilities of gulls leaving the area and the speed of the reaction to Falco-Robot GBRS. These responses are relevant because they indicate how quickly the system can reduce collision risks compared to other methods and the effectiveness at the population level to generate short-term responses. We investigated the

conditions (flock size, distance between flock members, and attacks to the periphery or center of the flock) that enhanced the speed of the responses. We will describe our results and derive specific management recommendations that can be applied at airports.

10:50am Hangar Pigeon Control - Netting vs. Trapping

Ms. Rebecca Rushing

Airfields worldwide continue to face the risk that feral pigeons pose to aircraft and flight operations. These birds having adapted to urban life are often found in manmade structures that they use for nesting and roosting. Airfield hangars in particular are ideal for this purpose with the numbers of birds often reaching the hundreds. Although populations in airfield hangars can be dynamic, shifting throughout the year, pigeons are ever-present, well established and difficult to remove.

Pigeons/doves are listed as one of the top four groups of birds struck most often by aircrafts, with pigeons specifically causing the most damage. The issue of how to manage pigeon populations in hangars and the airfield environment is of critical concern to managing their bird strike risks. Airfields have unsuccessfully attempted controlling pigeon populations using netting, trapping, lethal control measures or a combination of all of these to minimize the risk this species poses to flight safety. This presentation will address the successful approach implemented at Hurlburt Airfield and the pros/cons of various methods of pigeon control. The presentation will look at the successful means and methods of starting a pigeon control program and the important considerations in formulating a comprehensive and successful strategy.

11:10 am Reaction of Birds to Perching Deterrents: Can a Bird Learn by Watching?

Mr. Thomas Seamans

Birds perching on fences, signs, light fixtures and ledges are a problem at airports and other locations where these birds are not desired. Large-scale killing of nuisance birds is often undesirable or impractical thus, there is considerable demand for effective non-lethal techniques to deter bird use of these sites. Potential perch deterrents include shock strips and erratically moving air hoses, however these deterrents have not been subjected to experimental observations. Additionally, it is not known if birds learn to avoid perching deterrents by observing conspecifics interacting with deterrents or if they have to experience the deterrent before they avoid the perch. We describe a series of experiments utilizing electric shock strips and erratically moving air hoses in which we exposed flocks of naive, experienced and mixed flocks of experienced and naive birds to perch deterrents. We are currently analyzing the data to determine efficacy of the products and to determine if learning occurs through the observation of conspecifics. Initial results indicate that birds have to experience the deterrent before they avoid the protected perch. Airport biologists may be able to use the information from this research to more effectively apply perching deterrents on their airports.

11:30 am Rapid Long-term Resident Canada Goose Dispersal Using Alarm Call Playback with Pyrotechnic Reinforcement

Mr. Philip Whitford

Increasing Canada geese create increased air strike potential. Successful new methods for dispersing resident geese from sprouting crops should be equally effective near airports. From May 16 - August 28, 2007, alarm/alert call playback from GOOSEBUSTER® call units, Bird-X Inc, Chicago Il., was used with one minute delayed reinforcement by cracker shells to reduce goose numbers at a sewage treatment plant, and farms evidencing heavy summer crop loss near Horicon Marsh, Wisconsin. Using call units coupled with pyrotechnics, produced the most rapid method for inducing long term site avoidance by geese reported to date. Geese vacated areas > 1 square km within 4 days of first tests. Pretest Goose/gosling densities on all three sites tested were in excess of 200 bird/km² Goose presence dropped from >14445 goose hours/week to < 53.6/week, and from >36000 to < 200 goose/hr/month, for the sewage plant and largest farm, respectively, in only 4 days and three uses of calls and shells, each. Numbers remained at lowest levels, and no sign of habituation to the method was observed during 100+ days. This method should provide effective long-term displacement of Canada geese near/on airports with < 2 hours of human effort/month, based on this study.

Lunch On Own

Lunch On Own

11:50 AM - 01:45 PM

Please visit the Hospitality Desk in the foyer or the Concierge Desk in the hotel lobby for some excellent restaurant recommendations!

Session 6: Habitat Management and Land Use

Ballroom

01:45 PM - 02:45 PM

Moderator: Dave Ball

1:45pm **Development of High Alkaloid Endophytic Turf Type Fescues and Ryegrasses for the Aviation Industry**

Mr. Christopher G. L. Pennell

Six years of development of unique novel endophyte enhanced turf type grasses for wildlife management especially in the aviation industry to reduce bird strikes has been undertaken in New Zealand. This paper demonstrates the effects of grasses containing unique fungal endophytes on herbivorous, insectivorous and omnivorous birds that visit airfields and surrounding parklands for foraging. A trial of specially selected endophyte enhanced turf type fescue sown at Christchurch international airport has shown a significant reduction ($P < 0.05$) in bird number visits in its first year.

Trials with finches (*Carduelis choris*) showed a 30 to 40% reduction in feeding when exposed to endophytic seed. Gulls (*Larus dominicus*) were initially consuming 60% endophyte feed but by the end of the trial were consuming only 30% confirming learned avoidance behaviour to treated endophyte feed. Wild Canada geese (*Branta canadensis*) were used to test the effect on herbivorous birds on novel endophyte containing grass in a field trial where birds visited regularly. Results of this trial have shown a significant ($P < 0.001$) repellence to novel endophyte fescue and ryegrass test plants.

Establishment novel endophyte enhanced grasses for bird management at airports is now a reality with new sowings being undertaken on airfields in New Zealand.

2:05 pm **Wetland Mitigation in an Airfield Environment: Meeting Water Quality Regulations without Increasing Wildlife Hazards**

Mr. Patrick Viehoever, Mr. Laurence Schafer and Mr. Mike Linnell

In 2003, USDA Wildlife Services (WS) began monitoring hazardous bird use at existing and future mitigation wetlands enhanced by the Port of Seattle (POS) at Seattle-Tacoma International Airport. Sites were established as part of mitigation requirements for the construction of a new runway. Mitigation recommendations developed by WS and the POS included: planting of scrub-shrub vegetation to better exclude hazardous birds, installation of exclusion wires, relocation of Miller Creek, and construction of a regional detention facility. One control and seven mitigation sites were surveyed twice weekly and the presence of hazardous birds was recorded using a tablet computer tool developed by WS. Wildlife use was recorded before, during and after construction and planting. Surveys demonstrated a general reduction in the hazardous wildlife use at the mitigation sites as vegetation matured and became denser. Several sites showed a substantial reduction in hazardous wildlife use post treatment. Bird use at Vacca Farms in 2008 was nearly 70% less than the 5-year average. Use at the control site was reduced in 2008 as well but to a lesser degree than at the experimental sites. Reduced bird use at mitigation sites suggests that proper habitat management can meet regulatory requirements for water quality without increasing hazardous wildlife use of the area.

2:25 pm Re-examining Airport Land Use from a Wildlife and Economic Perspective: What are the Options?

Mr. Travis DeVault

The choice of land cover at airports depends on air-operations safety regulations, economic considerations, location, and wildlife-hazard management. To reduce costs associated with turf-grass maintenance, many airports in the USA (especially general aviation airports) lease substantial portions of airport properties for production of row crops and small grains, despite wildlife-associated hazards ostensibly inherent to these land-cover types.

Our objectives were to

- 1) to review legislation that affects land use at airports and surrounding communities relative to managing and reducing wildlife hazards to aviation; and
- 2) identify information gaps and future research needs relative to regulated land uses on and near airports, and the effects on wildlife populations.

We show that international guidelines for land-use practices on and near airports with regard to wildlife hazards to aviation are often vague, conflicting, and ill-supported scientifically. However, we suggest that revenue-producing options for airports are available in some traditional agricultural crops and biofuel plantings. Also, biofuel options might allow airports to selectively manage for nonhazardous wildlife species and maintain esthetics. Land uses at airports influence wildlife populations, therefore by understanding and incorporating these effects into planning airport managers can prioritize safety, revenue, and conservation goals.

Refreshment Break

Harbour Room & Patio

02:45 PM - 03:30 PM

Exhibits and Posters available for viewing

Session 6: Habitat Management and Land Use (continued)

Ballroom

03:30 PM - 04:30 PM

Moderator: Dave Ball

3:30 pm Gravel Pit Lakes Near Airfields - Their Attractivity to Waterfowl and Flight Safety Concerns

Dr. Heinrich Weitz

Gravel pit lakes near airports can raise the bird strike risk. On the other hand, there is often a strong economic pressure to exploit high quality gravel deposits. In order to get reliable data a gravel mining area close to an airfield in southern Germany has been investigated with respect to the attractivity and species succession of those lakes for waterfowl.

Apart from the size of a lake bird numbers and species composition were influenced by its structure and the amount of food. Depending on these results, ways of making those lakes less attractive for waterfowl are discussed.

3:50 pm A Ground-Up Approach to Habitat Management at Airports

Ms. Theresa Kissane

Habitat management at airports is increasingly important as a means of decreasing bird abundances and improving the safety of air travel. We tested soil manipulation as a habitat alteration to reduce local bird activity during 2006-2008. To test the effects of soil type on local bird activity, we conducted bird surveys on experimental plots with either intact topsoil or "stripped" subsoil. We found that birds visited topsoil plots (mean=2.53 birds/hr) more often than subsoil plots (mean=1.23 birds/hr). Additionally, we removed and sampled soil cores to determine invertebrate abundance within each

soil type. Topsoil plots supported a greater biomass of invertebrates than subsoil plots (means=0.39 g/50 cm³, 0.21 g/50 cm³, respectively). Both insectivorous and herbivorous birds had lower activity on subsoil, indicating that vegetation and reduced invertebrate biomass may have influenced bird activity. Our results support removal of topsoil as a means of reducing local bird abundance at airports.

4:10 pm Avian Response to Grassland Management on Military Airfields in the Northeastern U.S.

Ms. Kimberly Peters

A better knowledge of how various avian species respond to habitat management actions on airfields will have benefits for both conservation and air safety. To address this need, we studied the relationships among avian habitat use, grassland management, and vegetation characteristics on three military airfields in the Northeastern U.S. We performed transect surveys (line-distance sampling) and took vegetation measurements bi-monthly during fall migration 2007, and spring migration and breeding seasons 2008. We also recorded mowing activity on the three sites through cooperative agreements with grassland management crews. Conservation-priority species abundance exhibited a positive relationship to mean vegetation height up to about 20 inches, after which it declined. Collision risk species decreased in abundance with increasing vegetation height. The relationship between total avian density and vegetation height varied among airfields, and models incorporating management history alone were weaker than those incorporating vegetation parameters. Suggestions for future directions in the realm of DoD airfield management and research are discussed, including: (1) a clear definition of management targets, (2) convergence on an acceptable system for assigning collision-risk, (3) the adoption of a more rigorous, adaptive management approach in order to minimize confounding effects, and (4) collaboration among stakeholders in a structured, multi-criteria decision making context.

Thursday, September 17, 2009

Military Breakout Session

Ballroom

08:00 AM - 09:00 AM

Morning Coffee & Tea

Harbour Room & Patio

08:00 AM - 09:00 AM

Exhibits Open & Posters Available for Viewing

Harbour Room & Patio

08:00 AM - 01:00 PM

Session 7: Wildlife Management

Ballroom

09:00 AM - 10:00 AM

Moderator: Gary Searing

9:00 am Documenting Wildlife Management Practices at Western Canadian Airports

Ms. Gayle Hesse, Mr. Roy V. Rea and Ms. Annie Booth

Aviation professionals recognize that as the risk of wildlife aircraft collisions increases, the likelihood of a major wildlife aircraft collision that incurs significant human fatalities and serious aircraft damage also rises. We conducted a survey of airports in British Columbia, Alberta and Saskatchewan to document and explore: Airport Wildlife Management Plans (AWMPs); commonly found wildlife attractants; frequently seen birds and animals; wildlife control countermeasure uses and outcomes; and animal strike record keeping systems. Of 38 airports, 71.1% had AWMPs. Ditches and ground cover were the most commonly named attractants. Rodents, crows, ravens, and small songbirds were the most commonly seen wildlife species. Maintaining long grass was the most routinely used countermeasure, however, we noted conflicting responses regarding an appropriate deterrent grass length. Removing diverse habitat had the highest success ranking. Of 38 airports, 76.3% kept strike records and used these records for risk analyses, AWMP development, and measurement of AWMP effectiveness. We recommend that airports ensure their compliance with the Canadian Aviation Regulations regarding strike records, risk analyses, and AWMPs. Additionally, airports must strive to improve wildlife strike, activity and countermeasure recording and reporting, reduce attractants, become involved in adjacent land use planning and design and implement mitigation projects so that results can be objectively measured and evaluated.

9:20 am Challenges of Controlling Wildlife in Tropical Countries Airports

Mr. George Amutete

Airports in tropical countries are faced with unique wildlife problems that make wildlife hazard control a unique challenge. Most of higher taxonomical categories, which have significant implication to aviation safety, have many more species in tropical regions than in higher-latitude communities. The richness of species in tropical regions is positively correlated to diverse behavioral patterns and size both that influence the rate and severity of wildlife strikes. Unfortunately, most of the portable technological innovations aimed at curbing the wildlife strike problems are generated and fine-tuned to have impact on problem species found in the higher-latitudes. This paper examines some of the challenges of controlling wildlife in airports in tropical regions and recommends that since people travel universally measures to curb wildlife menace should be researched and tested collaboratively

in order to develop universal aviation safety. Thus, aviation safety research and development in respect to wildlife hazards should be expanded to deserving tropical regions.

9:40 am Just When You Thought You Knew Your Target Species, Look What Happened to Us!

Ms. Della G. Bennet

In 1985, an Air New Zealand 747 on rotation (V1) struck a flock of black-backed gulls (*Larus dominicanus*), damaging 3 engines. Due to this incident, Christchurch International Airport Limited (CIAL) formed a wildlife management committee and the Airport Fire Service commenced bird harassment duties. In 2006, CIAL underwent a risk assessment and bird control audit by Central Science Laboratory to bring the wildlife control programme in line with international best practice. One recommendation was to employ a full-time wildlife control officer. When I commenced as the wildlife control officer in February 2007, the hazardous bird species were already clearly identified and airfield improvements were underway.

But just when you think you know your target species, look what happened to us. In July 2007, not only had the feral pigeon (*Columba livia*) numbers over flying the airport significantly increased, but by 2008, Canada geese (*Branta canadensis moffitti*) had moved to the top of the bird hazard list.

This paper will cover the methods being used to control bird numbers, including the sponsoring of a Canada goose shoot and will discuss a Wildlife Protection Review regarding shifting Canada geese from Schedule 1 (New Zealand Government, Department of Conservation) - protected game bird species for recreational hunting to Schedule 3 - which provides protection but will allow for their numbers to be proactively managed.

Refreshment Break

Harbour Room & Patio

10:00 AM - 10:30 AM

Exhibits and Posters available for viewing

Session 7: Wildlife Management (continued)

Ballroom

10:30 AM - 10:50 AM

Moderator: Gary Searing

10:30 am Airfield Construction Projects: How to Predict and Manage the Impact on Wildlife Hazards

Ms. Karen Voltura

Construction and paving projects can have a significant impact on airfield wildlife hazards and lead to increases in the overall risk of wildlife strikes. Two large runway projects at military airfields are used to illustrate how planning, construction-site modifications and follow-up can minimize the impacts on your wildlife program. The fundamental work was done during planning stages. It was essential to be specific about the final desired outcome and include details on vegetation and seeding in the initial contract. When possible, we used the opportunity to bundle in smaller drainage and vegetation projects. The timing of the project influenced planning for the seasonal wildlife hazards that might be encountered and consultation with nearby airports that recently completed projects was used to predict and prevent wildlife issues. During construction, the sites were monitored for increases in standing water, overgrown vegetation, fence breaches and disturbances such as temporary roads. Once the major construction was complete, re-establishment of turf was crucial, as was the elimination of any temporary wildlife attractants. Lastly, we had to accept that some of this was beyond our control and we modified the emphasis of the wildlife control program to deal with the resulting increases in wildlife hazards.

Session 8: Raptor Relocation

Ballroom

10:50 AM - 11:30 AM

Moderator: James Stephen

10:50 am Raptors on Three Royal Netherlands Air Force Airbases

Mr. Arie Dekker

Habitat management schemes aim to reduce the attractiveness of airfields for dominant problem species like gulls and waders. The effectiveness of the poor grass management scheme against raptors is assessed using data on raptor numbers and strikes on three airbases (1987-2008). In addition, the results of a trapping program are discussed.

Against a marked reduction of the overall number of birds (65 - 85%), the numbers of Kestrel (*Falco tinnunculus*) and Buzzard (*Buteo buteo*) (> 99% of all raptors) remained mostly stable. This suggests that the scheme is ineffective against raptors. At the same time, it means that there are no adverse effects either. Except for the Buzzard on one airbase, peak presences of raptors and strikes decreased during the second half of the 22-year period. This suggests a delayed affect on biomass, rodents and indirectly on raptors.

Of all raptors, only Kestrels are dominantly present in bird strike statistics (116 strikes against 27 Buzzard strikes), coinciding with the peak of presence on airfields in July - September when there is an influx of young dispersing birds. In a trapping and replacement scheme involving 991 Kestrels only 5.9% of the birds were re-trapped after having been replaced over only 10 Km.

11:10 am Raptors, Rodents and Rare Weather: Managing Increased Migratory Raptor Populations at McConnell AFB, Kansas

Ms. Lauren Caister

Migratory raptor populations at McConnell Air Force Base in Kansas, increased dramatically in the 2008-2009 winter season, with more than a 200% increase in the number of large hawks observed on the airfield, compared to equivalent seasons in the past 3 years. This increase resulted in frequent interruptions and/or cessations of flying operations.

The primary cause was determined to be a local explosion of both Hispid Cotton Rats (*Sigmodon hispidus*) and Prairie Voles (*Microtus ochrogaster*). The cotton rat explosion was a result of record-breaking rainfall in 2008, while the explosion of voles followed the natural 3-5 year cycle. This overabundance of prey coupled with an unusually warm winter provided an ideal wintering habitat for the raptors.

Because harassment proved futile, the solution seemed to be to address the rodent populations, through the use of rodenticides. However, the selection and application of a viable rodenticide, for a military airfield, presented a new set of problems. The final solution for non-lethal control of the raptors was to attempt relocations. Because of the migratory nature of the hawks, short distance relocations (70-120 miles) were preformed. This presentation will cover the problems, solutions, and results of our efforts to control the migratory raptor populations.

Networking Lunch

Harbour Room & Patio

11:30 AM - 01:00 PM

Exhibits and Posters available for viewing

Session 9: Off Airport Management & Control

Ballroom

01:00 PM - 01:40 AM

Moderator: Jim Stephen

1:00 pm Expanding the Boundaries of Your Wildlife Program through Community Outreach

Ms. Rebecca Ryan

It is becoming increasingly common for wildlife hazards to originate outside airport boundaries. Resident Canada geese and large bird roosts are often a significant concern for nearby businesses, housing developments, golf courses, and municipal facilities as well as the airport. We have worked with several U.S. Air Force bases to educate and involve local businesses and communities in resolving problems with wildlife hazards. Town hall informational meetings hosted by the airport can offer advice and assistance in implementing wildlife control measures. Airports can work with on-site staff, local agencies or cooperative extensions to offer signage, seminars in plant selection and landscaping for wildlife management and on permitting and techniques for harassment, egg oiling and addling. Emphasize the safety aspects of these programs and encourage involvement of airlines and pilots that can speak on a personal level as to the impact of wildlife hazards on flight safety. Airports can coordinate with business owners, local developers, landscaping businesses and pond management companies to offer group rates, discounts or incentives for carrying out wildlife control measures and programs at little to no cost to the airport. Successful programs can be efficient, cost effective and result in positive and constructive relationships between the airport and the surrounding community.

1:20 pm Beyond the Fence: Lessons Learned from Flight 1549

Mr. Nicholas B. Carter

As the crash of US Airways Flight 1549 clearly demonstrated, even the best of wildlife control programs on an airfield may not prevent the most serious of bird strike incidents. Many of the most damaging strikes occur outside the airfield fence, along with many of the bird species posing the greatest risk to aircraft (geese, ducks, vultures, etc.). Yet this area often times goes completely neglected by a wildlife control program.

The principal problem with wildlife control efforts outside the airfield is that generally these lands are owned by private entities. We have endeavored, from Israel to the Midwest United States, to engage local landowners in their cooperation in all aspects of wildlife control - from access onto their property, modifications in farming practices, notifications of bird presence, etc.

This presentation will address the problems and solutions to extending wildlife control efforts outside of the airfield limits, to a distance of more than 5 miles and the strategies involved with selective harassment of bird species and securing the cooperation of the local community. We will explore the political, economic, and social motivations of each of the parties and the successful methods we have employed in acquiring the support of an airfield's neighbors.

Closing Remarks

Ballroom

01:40 PM - 01:55 PM

Mr. Gary Searing and Mr. John Ostrom

Invitation to 2010 meeting in USA - Salt Lake City, Utah



Thank you for attending the 2009 Bird Strike North America Conference. We look forward to seeing you at future conferences.

Conference Papers

are posted on the website.

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