

### **Reception**

#### **Craig Richmond**

My name is Craig Richmond. Some of you would have seen me this morning. Can you hear me back there? I am the Vice President of Airport Operations at the Vancouver Airport. I'm going to talk for just a few minutes about the Wildlife Control Program. Most of you are going to go out there tomorrow and take a look at it, and then we have some distinguished speakers after me. I won't take up more than eight minutes or so. I want to talk a little bit about our airport, just for a minute. And then our Wildlife Control Program, and some of the results we've seen. We've been talking about bird strikes, and we've got some statistics to back up our program. The Vancouver International Airport Authority is a private company. A lot of you from the states don't have very many privatized airports. We're actually a not for profit corporation. We run it like a business, and we take all the money that we make through our operations and throw it back into the airport. The stats are out for 1998. 369,000 take-offs and landings, which puts us twenty-ninth in the world, about 15.5 million passengers. One of the most interesting things about our airport is the mix. Everything from float planes and helicopters to 747s. That's kind of a fuzzy picture of Sea Island. At the bottom part of the photo is where the coast guard base is. That's where you will be going tomorrow. We're located between two arms of the Fraser River, which is the greatest Salmon River in the world, so we're very cognizant of the environmental responsibilities that we have, and also right on the Pacific Migratory flyway, which is one of the reasons why I am speaking to you today. So our Wildlife Control Program includes a supervisor, thirteen people, four vehicles, the associated equipment, and they are basically free ranging. They are one of the few wildlife control departments in Canada to have carte blanche from the tower. They only talk to them when they need to, and they race around and keep the birds away from the flight paths. And most of our program is pretty standard stuff. We do harassment. We use noise, visual where possible, we've even tried some chemical, and occasionally we have to harass them extremely. Just to give you a little bit of an idea of everything that we use, in red is what we have used or tried, everything from shotguns to flares. Rockets and shell crackers, for obvious reasons, haven't worked around the airport. But we definitely use the propane cannons, and you'll see those tomorrow. And here are some other things. They may work at your airport, sometimes different things work at different airports, as you know. But those are the ones that we've found, in red, that really do work for us. But what's non-standard? I guess the big point is what do we do that's different? Well, the first thing is, our wildlife control program is not just a shotgun in the back of a pickup, and somebody who does it part-time. It's actually dedicated, an integral part of the operation. In fact, we are integrating this more and more into the operation, into everything like even low visibility operations. I can't tell you how important this is, to be committed to a full-time Wildlife Control Program. It's twenty-four hours per day, seven days a week, three hundred sixty-five days a year, the guys are out there, either plotting where the birds are flying, or scaring them away from the runways. And I don't think there are very many places that do that. We log about five hundred clicks, per twenty-four hours per vehicle in this pursuit of the birds. And I spend about six hundred thousand dollars a year, six hundred and ten after tonight's do. And we have a willingness to try anything reasonable, and if anyone has an idea, and one of the reasons why Dave loves to come to these conferences is that he finds something new every time. Try anything once, as we all know, nine out of ten of them won't work, and the one that does works for three days until the birds get used to it. So you have to keep trying, and keep changing what you're doing. For example, we have a large migrating population at night. And so we have tried, several years ago, a second-generation night vision equipment, which we're not able to take off the island, or sell. And, in fact, it works very well. At night, the guys can actually spot birds in the air and in the ditches, and therefore control them. One of the other things that we do is habitat modification. I don't want to go into this in detail, but certainly you're going to see some papers, you probably already have seen some today, regarding the idea of long grass, or differently cut grass to discourage the birds. I mean, you've got to look at it from the bird's point of view. He's flying up from Sacramento, he's tired, he comes across the Fraser Delta, a lot of it's built up, and he sees this big, nice green golf course. I mean, they just love to come to the airport, so we have to try to discourage them. We actually have some test plots of thirty-six inch grass. I'll show you a little map of that. That's Sea Island, and in the areas in green we've got a big test plot, and the results are encouraging so far. It's going to be a little bit difficult for people to get used to the idea of an airport that

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doesn't look exactly like a well-maintained golf course. But this long grass really does discourage the waterfowl. We also have a real biological focus. There are some people here from LGL, they've helped us to develop that. And we use a lot of technology, information technology, to track things. I'll just give you a couple of examples. This is how we track the movement of the birds. You can note the red dot. We'll show you that in that area, those were the flight paths, and the percentages, of the eagle movements. Down here we have obviously a large one over the south runway, and if we have enough of this data, we've just been tracking now for a year or so. If we get this every three or four years, we should be able to develop a very, very effective database of the actual movement of the birds on the island. And we'll be able to use that. This is another example of the data that we gather. These numbers correspond to bird species and the movements. And again, after several years of gathering this data, we will be able to really put together an effective control program. We already can tell you what our high risk days will be, such as when the tide is high, when the moon is out, when there is cloud cover, we really know what birds are coming around. And also we have a Snow Goose problem, this just shows them, they were here, they're now out there, and they want back. We've been doing that for a couple of years now and I'm very happy to say that since we've been doing it and when we've been doing it, we haven't had a single Snow Goose strike. So, in stark terms how have we done? Well, we've got some data from 1997 and we had forty-one strikes. How does that compare? Here are some major airports in Canada, certainly not intending to cast aspersions on their programs, but with the millions of birds, literally millions, that migrate through Vancouver, with the one million that we actually log as having moved, hitting forty-one of them, and having a strike rate of about 1.4 per ten thousand take-offs and landings is pretty reasonable. I'm right on my time. So anyway, birds are always going to be a problem at YVR. And in fact, we all know that bird populations are increasing. We're going to fight a battle with the birds for a long time. So, what do you do and how do you minimize that risk? You have good people. You train them. You give them the resources to do their job. You have a good program, and you stay committed to it. And you don't falter and you don't ever let yourself become fatalistic or complacent. Thank you very much.

*Applause*

### **Richard Dolbeer**

Craig Richmond, I want to thank you very much. I would like to give a round of applause for Craig, for the Vancouver International Airport has sponsored this buffet tonight, which I think is very nice. I'm looking forward to our field trip there tomorrow, where we'll see first-hand the things we've talked about tonight. So if we could have a round of applause for Craig Richmond.

*Applause*

If I can have your attention please, I would like to introduce our two speakers for tonight. Our first speaker for tonight is Mr. Tommy McFall, who is Managing Director, Safety and Environment for American Airlines. Tommy is a graduate of Oklahoma State University. He was a US navy pilot and flight instructor, before joining Braniff International Airways in 1978. He became an accident investigator with the National Transportation Safety Board, following that assignment. He was the manager of flight safety at American Airlines for twelve years before assuming his present position with American Airlines in 1995. I would like to welcome Tommy.

*Applause*

### **Tommy McFall**

Thanks very much. I had to put on my glasses so I can read my PowerPoint presentation. This morning as I was flying up here, I was in the airplane, and we were talking with the flight attendant. And she realized that I was an employee, and she said, "What are you going to Vancouver for?" and I said, "Well, I'm going to go talk to a lot of really smart people about birds." And she looked at me like I was crazy. I explained to her what the deal was with the bird hazards, all the things that went on, and from a flight

attendant's perspective, she didn't really have any appreciation for all the things that you all do and all the things that have to do with running an airport. As we were talking she looked at me, and she was actually very sincere. She said, "you know, it's hard for me to believe that it's the year 2000, and it seems to me that the birds are winning." And I said, "you know, I think you may be right." And then, after listening this afternoon to all of the things that you people have been doing and then looking across the hall at the exhibits, it suddenly just sort of struck me, all the things that are out there with new technology. Because I have to admit to you that I am behind on the technology that is out there and I'm quite pleased to see the kind of energy and assets and imagination that goes into this. And I can assure you, I wish that all of the airports that American Airlines flew to had the sort of program that you all have here in Vancouver. I think this is outstanding. I also heard some conversations today about what was called S-type and Moose-type maneuvering, and I'm going to speculate that if we stay here until 9:00 that we will probably be able to see some S-type and Moose-type maneuvering, right here in this very room. And those of you who have cameras might want to document that for future publications. I also have been thinking about opportunities here. A lot of you are probably familiar with the Enhanced Ground Proximity Warning System or EGPWS, which is the device that warns of approaching terrain with a modified and improved ground proximity warning system. I've decided to call Allied Signals as soon as I get back and ask them if they couldn't work on what I'm going to call the Enhanced Bird Warning System, the EBWS. So Al, I think that you guys ought to write a recommendation along that line and we can get to the bottom of this. Let me get started in a serious way of telling you why I really am a believer in this. You know, the difference between a recession and depression is, the depression is you've lost your job. A recession is my neighbour lost his. Well, people who believe in bird strikes are probably one of those who have survived them. One day in 1974 I was flying a TA-4, which is a single engine navy jet. This was the two-seat version, had one seat in front and one at the back, and I was an instructor. We were going from South Texas out to the West Coast. It was awful duty, but someone had to go to San Diego for the weekend so I volunteered to do that. We got to Albuquerque to get fuel, and I had a student on the front seat and he had not flown at any high altitude airports. We were just in South Texas where it is basically a sea level environment, so I thought, "well, let's do a few touch and goes, and get this kid some experience in the airplane at a higher altitude." So we got in the pattern and did three or four touch and goes, and I'm in the back thinking, "what is this guy doing? Is he leaving with his speed brakes out, something's wrong, the airplane is just not performing." And I personally thought, "well, it's just the altitude and I'm underestimating the effect on the airplane." We landed, went inside, got our sandwich, came back out, signed for the fuel, the student gets in the front seat. I climb in the backseat, and for those of you familiar with the TA-4 and of course, the people who are as old as I am know what the hell an TA-4 is. The intake was right here behind your shoulder. So as you sat in the airplane, we actually had to wear covers over our pockets so the engine didn't suck your pencils out of the pocket of your flight suit. That's true. Everything I say is true. So I'm climbing in this airplane and I smell this odor and I'm thinking, "you know, what is that smell." I'm from Oklahoma and I grew up doing what kids from Oklahoma do. I thought, "you know, this smells like someone just cleaned a squirrel or a rabbit or something." If just had that smell. And if you've never smelled it, I'm talking to you and you'll never understand what I mean, but if you have you know exactly what I'm talking about. So I took my helmet off and took my gear off, and you can't see the engine in an TA-4, you have to crawl back in there. So I crawled inside there with my flashlight, and right there on the bullet nose there's a piece of meat as big as my fist. And I looked in there, and probably half the fan blades in the first stage had hunks about half as big as my fist out of them. And I remember laying there at that intake, smelling that bird carcass going, "well maybe this is why the engine isn't running so well." It wouldn't have been that bad but that was the only engine that I had when I left. And when you start with one you're really concerned about its health. Let's talk briefly about how airlines look at this. I've got to tell you, Mr. Dunn and I were talking about what the airline position is, and Al was harassing me from the NTSB earlier about what the airlines were doing, and I have to tell you that I'm going to go back to my airline tomorrow, with a bit of a different attitude about this whole problem. And I want to try to describe to you how that works in the airline. We have two types of damage that we refer to. We call them controllable and uncontrollable. Uncontrollable damages are things that, just like it sounds, we cannot control. About three years ago we had a hailstorm come through the DFW Airport area and damaged about forty airplanes. It did twenty, thirty million dollars worth of damage in one night, one hour. That's uncontrollable. Only the Lord can take care of that for you. The tornadoes that just went through Oklahoma, uncontrollable damage. Bird strikes, we refer to as uncontrollable damage. Not because they're uncontrollable, but they are uncontrollable for us. Controlled damages are more of the

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human factors-related things. Lots of controlled damage has to do with people. Excessive speed on the ramp is the primary example. Failure to comply with the correct procedures, not setting the brakes, not chocking vehicles. Those are controllable damages. We depend on you, in the airport environment, to take care of the controlled damage phenomenon of the bird strike. Now we can do some things better to help you. One thing I have learned from the day is that no one really knows how big this problem is. I had some information from DFW. I had some information from American Airlines. I had information from the Flight Safety Foundation. I had information from our insurance underwriters. They're all different. Every one of them are different. That tells me that we don't know. Different airlines have different ways of measuring the damages. So if you get ten airlines and we're all sitting around this table and we're all talking about our bird strike phenomenon and our expenses, you're going to ask yourself, "are they all from the same country?" They don't have anywhere near the same experience but they're all going to the same airports. The reason is we have different ways of measuring it. We can do a better job. I've talked with several people today about the lack of reporting. A Flight Safety Foundation document that I read today estimates that only twenty percent of these bird strikes get reported. Well that makes it pretty tough for people like you, in the business, to try to control it if you're only getting reports on twenty percent of it. And I think that's one of the things that the airlines can do a better job for you, and I'm going to do what I can to try to make that a little bit better. I'm not sure how we will, or how we will get it on our list of all the other things that are important that we have to do tonight before the sun sets. But I will tell you that I am going to do what I can to give it a little more visibility among my counterparts. Speaking of counterparts, John Kern I understand, told you to ask me anything that you wanted to know. Well, John is a liar. He's a nice guy, but you can't trust him at all. One thing you can count on is this. Mr. Dunn just told me that there are more deer alive in the United States than there was when Columbus got here. Well, that tells you something about the problem. I speculate that the same is true of the birds. One thing I do know for a fact, we've all seen that Boeing chart that talks about the increased tempo of operations, there's going to be more flights. No one knows how many, but there are certainly going to be more. There are more widebodies. So for every given bird strike opportunity, there are more people in those airplanes, and more people equates to cost if that airplane goes down. So this threat is definitely getting worse. What's the risk? There are two types of risk in my view. One is just the pure damage risk. And I'll give you a couple of examples of those. They are damages that cost us money, cost us out of service time, but they do not result in an accident. Now I picked this piece of paper up this morning, at 7:15 am every morning American Airlines has a conference call, and that's 5:15 local time so if I start to yawn off toward the end of this conversation you'll know why that is. But at 7:15 we talk about everything that happened the day before. On Mondays we talk about everything on Friday, Saturday and Sunday. We didn't do this so I could read it today. This is a typical Monday's report. DFW to Minneapolis/ St. Paul F-100 at Minneapolis/ St. Paul, which is what we call a found on arrival, which assuming that they did a good inspection of the airplane when it departed for DFW, one can assume that it either occurred departing DFW or arriving Minneapolis/ St. Paul. Since I have to deal with the people from DFW everyday I'm going to assume that it was Minneapolis/ St. Paul. At least in public, in this venue. Bird strike damage, beyond limits, to number three leading edge slat. A slat is a device on the leading edge of the wing, similar to flaps. Aircraft out of serviceable repair. 767, London Heathrow to Chicago, at Chicago found evidence of bird strike in the number one engine. Aircraft out of service for inspection and engine boroscope. I didn't stay around long enough this morning to find out what happened in the boroscope. It was either an engine change or some kind of engine repair. Either way the airplane was out of service for a matter of hours or perhaps days. If you take a 767 out of services, ladies and gentlemen, it costs a huge amount of money to fix and a huge amount of money to watch it sit there, because people in that terminal are not getting on it. They're going to the competition. They're going to a hotel. They're going home. They're not happy. Passenger Bill of Rights issues gets into the issue. There are no spare airplanes, ladies and gentlemen. In this day and age at American Airlines, United Airlines, Delta Airlines, the term spare airplane is like spare children. There's no such thing. There were two additional bird strikes that caused no damage, that just hit the airplane and bounced off. So we had four on Sunday alone. And it was not that unusual of a Sunday. The second category of damages are the ones that result in catastrophic accidents. There has been a lot of discussion about the AWACS airplanes, the two accidents that occurred because of those bird strikes. One that I thought was very interesting was the B-1 bomber in 1987. Just to depart for a little bit, I'm very interested in naval aviation, just because I did it for seven years and once you do that for a while, it's hard to forget it, you know it's just that experience. And I read a lot of magazines and I find, especially in carrier aviation, they have not thought of any new ways to

wreck airplanes. None. It just costs more. That's it. So, tell me what's new about bird strikes. Nothing. I read a deal the other way that Orville Wright chased a bird in 1908 and he chopped it up with his propeller. And then we have a B-1 bomber that goes down in 1987 because of a bird strike to a flight control of some sort. And birds could bring down the most advanced airplane we have flying today. This thing is just never going to go away. Mr. Dunn and I had a conversation about this. That's probably why the airlines and some of the other people in the business, maybe even your bosses, don't take it as serious as we would like to or as we know we should because it is something that has just been there forever. And that's one of our challenges. My record search indicated that since 1960, there's been ten fatal bird strike related accidents. That's a lot of accidents. If you start looking at the records and say, "well, how many wind shear accidents were there." Well, after the accident in 1985 at DFW Airport, we did a lot of work on wind shear stuff. CFIT, Controlled Flight Into Terrain accidents. American Airlines, unfortunately, had one in Columbia in 1995. Lots of stuff has happened with CFIT. So these are the kinds of things that we need to start looking at. Define the costs. I've talked a little bit about the difficulty of defining the costs. Briefly, I think you all understand this, you got direct costs and indirect costs. My example of the 767 and the F-100 are good ones. It is very difficult to measure indirect costs. You can measure the direct costs very easily, if you have an accountant that works in your maintenance department. It's very tough to do the indirect costs and that's why people say, "well, I don't know what it is, maybe four to one, maybe three to one, maybe ten to one." No one knows. We do know, I am sure that it is higher than any of us think. Especially if you look at goodwill to passengers. And after all, that is what we're there to do, is it not? To serve our passengers. And they're your passengers, too. We do have that in common. Finding fault. We've discussed all of these things. Oh, I do want to have two numbers here that struck me. As was reading things and thinking about this presentation, two things kind of hit me in the face. Now I'm from Oklahoma, so I've been really paying attention to the Oklahoma Tornado. Would you be surprised if I told you that the total cost to rebuild everything wrecked in the tornadoes in Oklahoma last week is less than Swiss-Air 111. Less. Swiss-Air 111 litigation will cost more than all the tornado rebuilding in Oklahoma in the next year. Insurance people estimate and it's absolutely the truth, with wide body airplanes, the increasing costs of litigation, and all the other issues that go into it that we have no control over, a one billion-dollar loss in this industry is not out of the question. One billion dollars for one accident. You cannot afford to be invited to that party. None of us can. Having been involved in a litigation that followed our accident after Cali, Columbia I can tell you, I have been involved in litigation when I worked for the NTSB. Fortunately, I've never been involved in litigation having to do with Tommy McFall. And then I got deeply involved in litigation following our accident in Columbia. It is the ugliest experience that you will ever go through. It is the ugliest experience you will ever ask your employees to go through. You need to find ways to insulate yourself against that risk. They're out here. There are things that we can do to lessen that risk and that's what it's all about here today, ladies and gentlemen, is managing the risk of the birds. Let's just step through a little game here and I'll be very brief with this. I made up this accident. It does have some areas that are the same as some other accidents that we've discussed. But, let's just say that an airport anywhere has a bird problem. Either they've got a BASH team that internally wrote about the problem, or they've got airlines that are out there writing letters about it, or they've got people who are just recognizing it and talking about it all the time. And they've got a problem. Then an airplane takes off, notes a lot of bird activity in the takeoff path, makes a report to the tower. Another airplane clears himself or gets cleared to takeoff. The tower fails to pass on that warning. The second airplane has an accident, for one reason or another is unable to get back to the airport, flies into the ground on the way, fatal to all aboard. Who's going to come to the party? This is Tommy McFall's analysis, based on a little bit of experience, and a little bit of guess work, but I think I am very accurate. You can be assured that because the airport knew that there was a problem, or as the lawyers like to say, should have known about the problem, the airport operator will definitely be very near the top of the list. Second will be whoever runs the tower for failure to pass on that warning to the second airplane. Assuming the pilot did anything wrong at all, anything even perceived to be wrong, he and his company will be brought into the affair. If there are any issues about the engine or its certification, the engine manufacturers and the certification people within FAA will be there with you. That's just the beginning of the list. But that's exactly how it works. I want to read a quote from one of our insurance people that I found to be very interesting as I look for the right words to explain some of these legal things. And not being a lawyer and I try not to attempt that. This is a quote from the insurance lawyers, regarding fault of airport operators. "As to whether an airport operator and/or air traffic control authority might be found legally liable following a bird strike accident, the simple answer

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is yes. The successful action taken against an airport, following the loss caused by a bird strike, highlights the possibility that an authority may be found liable. The judge noted that "the defendants owed the plaintiffs, the aircraft operator, the common duty of care. That is the duty to take care when carrying on the activities at the airport, as was reasonable in the circumstances. And he found that the defendants had failed in their duty, and that there must be judgement for the plaintiffs for the damages. Reasonable in the circumstances. Very tough language to get by. Can be termed to say virtually anything. It translates into "you're probably going to lose". Bottom line here folks is this, I have many times said to my staff and other people "safety is sales." When you're in my position, running safety for an airline, there is no way that I can keep up with the technologies that are out there. There's no way that I can have all the best people in all the right places. The hardest part about the safety job, and I would say to you in this room, who are obviously believers or you wouldn't be here, the hardest part of your job, when you go back home is selling this stuff. Because it costs money and it is not immediately apparent that it's a good idea, and there's going to be no immediate return on the investment that you can show somebody in return for investing this six hundred and ten thousand dollars a year, including the food. So I will tell you this in closing. Two reasons. One is it's the right thing to do because you owe it to your customers, you owe it to your passengers, you owe it to your airlines, and we owe it to you to work with you in the effort. Secondly, it's very good business to do it. It is extraordinarily bad business not to take the bird strike threat seriously, from your perspective in the airport environment, whether you are in charge of the firefighters, in charge of the police officers, or in charge of the bankbook. Thanks very much.

*Applause*

### **Richard Dolbeer**

Thank you, Tommy for that speech. I would like as the final part of our program tonight, to introduce Michael Dunn, who is the Under Secretary of Agriculture for the United States. He is the Under Secretary of Agriculture in the Marketing and Regulatory Program, which ensures the safety of our food supply in the United States. He oversees the organization I work for, Animal and Plant Health Inspection Service, and it also includes human health and safety, with regard to wildlife diseases and wildlife interactions with humans at airports. I am honoured that our Under Secretary has shown a very strong interest in this program. This will be the third Bird Strike Committee meeting that he's attended. And in working with our agency, within the US Department of Agriculture, he has been a leader in supporting programs implemented by our agency and by others, that will improve aviation safety with regard to wildlife hazards. I'm honoured that he's taken time out of his busy schedule to come here tonight and say a few words to us. With that I would like to introduce Michael Dunn.

*Applause*

### **Michael Dunn**

Thank you very much Richard. I appreciate the kind introduction. Craig, thank you very much for being such a great host here tonight. The food was fantastic. We appreciate it. As Richard said, this is the third Bird Strike meeting that I've been to. And I've noticed something that happens at every one of them, that there are more of us here for these meetings. And I think that's because more and more folks understand that this is a serious problem. You know, we have documented about \$210 million per year in annual cost for civil aviation as a result of bird strikes in the United States. But more importantly, ladies and gentlemen, there have been documented over 300 fatalities as a result of bird strikes. And Tommy, I disagree with you. I don't think that those are uncontrollable events. I think Craig, what you have demonstrated here, that there is action that can be taken, and there is an opportunity to minimize the damage and to protect the public. And that's what Bobby Acord and Richard try to do at Wildlife Services. Bobby Acord brought in a newsclip the other day and had a picture of Fabio, a male model in it. He was on a roller coaster and hit a bird and got sixteen stitches on his famous nose. Bobby wanted to sign him up as the poster boy for bird strikes. But in seriousness, ladies and gentlemen, we need to do all that we can do to cut back on these potentially fatal accidents. Wildlife Service's programs work to

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minimize wildlife hazards at the airports and military installations across the country. Wildlife Services has continually worked to upgrade its wildlife management methods. Let me give you some examples as to why I think these are controllable actions. In 1997, Wildlife Services developed a software package to assist biologists at airport to develop wildlife hazard management plans and to report bird strikes. Software was presented at last year's Bird Strike USA Committee meeting, and is now being packaged and released to Wildlife Services personnel in the near future, so that it can be used at airports across the United States. Personnel from Wildlife Services' National Wildlife Research Centre have worked in cooperation with the US Air Force on another promising initiative. To reduce the occurrence of bird strikes to military aircraft, they have worked with the US Air Force to develop a new bird avoidance model, to reduce bird strikes to military aircraft. To enable us to analyze wildlife strike problems and to develop effective strategies to prevent them, we must have accurate information about strike occurrences. Since 1995, the National Wildlife Research Centre, working with FAA, has managed the FAA's wildlife strike reporting system. The database allows biologists to better define problems by species, time of year, and other issues that contribute to incidents of bird strikes. So that science-based management and preventative plans can be developed. So far the Centre has handled over 300 requests for information on wildlife strikes nationwide. The Centre recently completed a 7-year analysis of recorded wildlife strikes to civilian aircraft in the United States. In cooperation with the FAA, between 1991 and 1997, an average of 2400 strikes to civilian aircraft were reported each year. However, as Tommy pointed out, we believe that less than twenty percent of the strikes are reported. Based on the information we've collected so far, we estimate the economic loss from bird strikes to civilian aircraft far exceeds the \$210 million per year figure I cited earlier. Wildlife Services' efforts to minimize bird strike damage has yielded impressive results. For example, a gull management program was initiated at JFK International Airport, where bird collisions with aircraft has been a serious problem. From 1979 to August of 1997, bird strikes at JFK International resulted in sixty-one aborted take-offs, fifty-four incidents involving engine damage, and the program has succeeded in reducing gull strikes at JFK by more than seventy-five percent from its previous years. Similarly, APHIS activities at Chicago O'Hare International have also yielded successes. In 1997 Wildlife Services Staff in Chicago O'Hare received the US Department of Agriculture's Award for Superior Service for protecting public safety at the world's busiest airport. The award recognized that the Wildlife Services implemented an effective wildlife hazard management program that reduced gull populations by seventy-seven percent, and waterfowl strikes by eighty-eight percent. In addition, the program personnel began the capture and release program for hazardous raptors in 1996. That has had a sixty-eight percent reduction in raptor damage in the first year. Ladies and gentlemen, I think it is controllable. But I think we are just at the very beginning. Birds and other animals know no international boundaries. The same waterfowl and migratory birds that are problems here in Canada pose a threat to us in the United States, and in Mexico and South America. I am delighted to be a participant at this conference, and I pledge to all of you that I will support your efforts to reduce the hazards and economic losses to aviation caused by birds and other wildlife.

*Applause*