

MAINTAINING A USER-FRIENDLY INTERFACE USING THE
AIRPORT WILDLIFE HAZARD MITIGATION WEBSITE

By:

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PRESENTED FOR THE
2004 FAA WORLDWIDE AIRPORT TECHNOLOGY TRANSFER CONFERENCE
Atlantic City, New Jersey, USA

April 2004

INTRODUCTION

The Airport Wildlife Hazard Mitigation Website¹ was established by Embry-Riddle Aeronautical University (Prescott, AZ) in October 1999 under contract from the William J. Hughes FAA Technical Center in Atlantic City, NJ. The objectives of the website are:

- To provide the aviation community with a large variety of sources of information concerning the risks that wildlife present to aviation safety and associated topics.
- To provide a user-friendly interface whereby airport, flight, operations, safety, and/or maintenance personnel may report wildlife strikes (in many airports a daily occurrence) on-line.
- To provide tool for airport, operators, biologists, engine and airframe manufacturer personnel to analyze the risks wildlife present.
- To provide users an opportunity to register with the on-line community for electronic dissemination of items of interest, coming events and community news.

SOURCES OF INFORMATION

The website home page has 12 sections dedicated to providing a wide variety of information surrounding the hazards that wildlife present to aviation. These sections are:(1) General Information, (2) News, (3) Meetings, (4) Bird Identification, (5) R & D Activities, (6) Resources, (7) Education, (8) Training, (9) Jobs, (10) Forum, (11) Strike Photos, and (12) Feedback.

General Information – The General Information Section itself is sub-divided into 11 sub-sections as described below:

Overview of the Bird Strike Problem – Brief discussion of the wildlife/aircraft strike problem with links to more thorough discussions from a number of different sources including the FAA, Transport Canada and the Airline Pilots Association.

Wildlife Management Information – Discussion of a number of passive strategies to minimize wildlife on or near airports with links to a number of references.

Current Hazard Assessment Systems – Discussion and links to the two systems that are currently being used for estimating wildlife strike hazard: (1) the U.S. Air Force's Bird Avoidance Model (BAM), and (2) the Avian Research Laboratory's Avian Hazard Advisory System (AHAS). These tools provide information regarding bird strike risk, and allow pilots to make informed decisions about their routes with regards to wildlife strike risk.

¹ Airport Wildlife Hazard Mitigation Home Page is located at <http://wildlife-mitigation.tc.faa.gov>. A mirror (redundant) site is located at <http://wildlife.pr.erau.edu>.

Bird Identification Information – Discussion of the importance of species identification and proper procedures to submit unidentified remains to the Smithsonian Institution, Division of Birds. This service is provided without charge to all US registered aircraft regardless of the strike location and strikes at US airports regardless of carrier registration.

FAA Wildlife Strike Database – Links to Summary Reports of Strikes published by the FAA and USDA/Wildlife Services.

FAA Wildlife Management Guidelines – Currently contains a link to the Certified Airport Operator's responsibilities with respect to hazardous wildlife issues (14 CFR 139 Section 139.337).

International Bird Strike Information – Brief discussion of work being done by civilian and military activities outside of the US.

Research and Development – Detailed discussions of various ongoing R & D activities to minimize the risks wildlife present to aviation.

Education – Links to universities offering degree programs or other training/assistance in wildlife damage control and other topics related to wildlife hazard mitigation at airports.

Pictures – A sampling of photos showing the damage caused by collisions of aircraft with birds.

Resources – An extensive listing of documents, sites, papers, reports and associated material relating to the hazards wildlife present to aviation.

News – This area is dedicated to posting the most current news related to wildlife control and environmental issues at airports.

Meetings – This area is dedicated to posting/publicizing information about upcoming meetings dealing with topics related to wildlife control at airports.

Bird Identification – This area is an alternate link to the *Bird Identification Information* discussed above.

R & D Activities – This area is an alternate link to the *Research and Development Activities* discussed above.

Resources – This area is an alternate link to the *Resources* discussed above.

Education – This area is an alternate link to the *Education* discussed above.

Training – This area is dedicated to posting/publicizing information about upcoming training events in wildlife management/wildlife control.

Jobs – This area is dedicated posting/publicizing information about available jobs related to airport wildlife control.

Forum – This area is dedicated to the posting of problems and/or ideas to brainstorm with other users of this site or other users who have encountered a similar problem.

Strike Photos – An alternate link to the *Pictures* (of aircraft damage due to wildlife strikes) discussed above.

Feedback – This area is dedicated to providing users an opportunity to provide feedback concerning questions, new material users have to offer, comments on existing material contained in the website, and reporting of technical problems users may encounter while browsing the site.

STRIKE REPORTING

To develop strategies to minimize the risk wildlife present to civil aviation, reporting of all wildlife strikes is imperative². Although no mandatory reporting requirement currently exists, any personnel aware of a collision between some wildlife and any aircraft, regardless of size, are encouraged to file a “Bird/Other Wildlife Strike Report” (FAA Form 5200-7). This form is widely available in hard copy (and also through the web site) although electronic reporting is encouraged through the website as illustrated in Figure 1.



Figure 1 – Electronic Reporting Website Icons

Immediate reporting is desired since events and circumstances surrounding the strike are still fresh in the observer’s mind. Note that provision is also provided where the submitter may revise the submitted electronic strike report as more facts become known; for example, time out-of-service, repair costs, etc.

² Although the primary risks are birds, mammals such as deer, fox, and coyotes also present a significant risk.

Once submitted electronically (either the original or revised report), an email notification is sent to concerned FAA and USDA/Wildlife Services personnel³. In the event of reported aircraft damage and/or personnel injury/fatality, additional email notifications are also automatically generated. The email contains a link to a mirror-formatted copy of the electronically submitted strike report that is immediately available to notified personnel. Bird identification personnel at the Smithsonian Institute are also electronically notified if the submitter has collected any available remains and intends to forward these remains to the Smithsonian for identification. Species identification is considered a critical element in formulation of mitigation strategies. This service is provided without charge to all United States registered aircraft owners/operators, regardless of where the strike occurred, and to all aircraft owners/operators when the strike occurred at a US airport. On-line retrieval of all electronic strike reports filed since April 2001 is provided to all authorized FAA personnel for historical purposes.

Whether filed electronically or submitted hardcopy through the US Mail, all reports are thoroughly researched by the USDA/Wildlife Services personnel at the Sandusky (OH) Field Station. Each report is reviewed for completeness and accuracy (as well as possibly redundancy in the event multiple reports for the same incident are filed). When the report is sufficiently completed, the data is entered in the FAA National Wildlife Aircraft Strike Database that is currently maintained off-line in MS Office ACCESS format as shown in Figure 2. The database currently contains 52,759 documented and researched strike reports dating back to January 1990. Reports are currently added at a rate of approximately 6,000 per year. To provide a more thorough picture of strikes at commercial US airports, effort has been initiated to include military strikes reported at joint civilian/military airports. The database currently contains some 5,000 USAF reported strikes.

Earliest	Latest	Number
1/3/1990	7/31/2003	52,759

of Strike Report(s) in Database

Figure 2 – The FAA National Wildlife Aircraft Strike Database in ACCESS Format

³ Entry of the reported data into the FAA National Wildlife Aircraft Strike Database has been delegated under a joint Memorandum of Understanding to the USDA/Wildlife Services located at the Sandusky (OH) Field Station [1].

Periodically (usually once per month), this database is uploaded on-line which is available through the website to all authorized FAA, local government, airport, operator, biologists, engine and airframe manufacturer's personnel. In addition, summarized database information (without specific airport or operator identification) is available to the general public by species, by state and by year.

ON-LINE DATABASE ACCESS

To make the widest dissemination of the FAA National Wildlife Aircraft Strike Database available for analysis and to contribute to strategies to minimize the risk wildlife presents to aviation, the database was put on-line in July 2002. There are currently 8 separate entrances to the on-line database, seven of which require prior FAA authorization to access. The 8th is available to the general public without prior authorization. Depending on need, the various entrances present limited views of the database as a whole. The current available entrances are shown in Figure 3. Area 51 is a highly restricted access download area for the dissemination of the ACCESS database to a small number of authorized agencies.

Access to the FAA National Wildlife Aircraft Strike Database

- [Area P - Public Access](#)
- Authorized Personnel Only
(All require Passwords)**
 - [Area 51](#)
 - [Authorized FAA Personnel](#)
 - [Authorized Airport Personnel](#)
 - [Authorized Operator \(Airline\) Personnel](#)
 - [Authorized Wildlife Services Personnel](#)
 - [Authorized Engine Manufacturer Personnel](#)
 - [Authorized Airframe Manufacturer Personnel](#)
 - [Authorized Government Agencies Personnel](#)

Figure 3 – On-Line Access (and Various Entrances) to the FAA National Wildlife Aircraft Strike Database

Each entrance shown above has a variety of pull-down lists to create queries to access data contained in the database. As an example, Authorized Operator Personnel are presented a Query Selection Menu with a sample selection as shown in Figure 4.

Select Only Those Criteria of Interest:

Operator AMERICAN AIRLINES

Date(s)
From: Month JAN Day 1 Year 2002
To: Month DEC Day 31 Year 2002

Airport BALTIMORE WASH INTL

or

Airport Code Select (US Airport Codes are preceded with either a "K" or "P".)

Aircraft Select

Viewing Options:

Hits Ordered By Date

Ordering Ascending

Figure 4 – Operator Query Select Menu (Typical)

Upon submittal, the user would view a summary hit status as shown in Figure 5.

Incident Date	Operator	Airport	Aircraft	Damage Code*	R'way
03-28-2002	AMERICAN AIRLINES	BALTIMORE WASH INTL (KBWI)	B-737-800	N	10
05-05-2002	AMERICAN AIRLINES	BALTIMORE WASH INTL (KBWI)	B-757-200	N	10
05-31-2002	AMERICAN AIRLINES	BALTIMORE WASH INTL (KBWI)	MD-80	N	
07-18-2002	AMERICAN AIRLINES	BALTIMORE WASH INTL (KBWI)	MD-80	N	
08-20-2002	AMERICAN AIRLINES	BALTIMORE WASH INTL (KBWI)	MD-80	N	28
08-26-2002	AMERICAN AIRLINES	BALTIMORE WASH INTL (KBWI)	MD-80		10
10-11-2002	AMERICAN AIRLINES	BALTIMORE WASH INTL (KBWI)	B-737	M	10
11-26-2002	AMERICAN AIRLINES	BALTIMORE WASH INTL (KBWI)	B-757-200	M	10

Figure 5 – Example Hit Return for Query Selected in Figure 4

Note that each of the hits (each hit is a reported strike) has its Incident Date as a link. Clicking on any would return the user to a limited view of the detailed strike report as shown in Figure 6.

FAA NATIONAL WILDLIFE STRIKE DATABASE INDIVIDUAL STRIKE REPORT (Short Form O)				
Incident Date: 03-28-2002	Operator: AMERICAN AIRLINES	Time of Day: NIGHT	Time:	Ref Nr: 40861
Airport: BALTIMORE WASH INTL		State: MD	FAA Region: AEA	Damage Code*: N
Aircraft Type: B-737-800				
Registration Nr: N969AN	Flight Nr:	Runway: 10	Height (Ft): 800	Speed (Kts): 160
Phase of Flt: APPROACH	Effect on Flight: NONE	Other Effect:	Sky: NO CLOUD	Precipitation: NONE
Species**: UNKNOWN BIRD	Nr Seen: 1	Nr Struck: 1	Size: MEDIUM	
Remarks: SAW BIRD IN CLOSE (LDG LITES PICKED UP SHAPE) LOUD BANG HEARD IN COCKPIT. NO EFFECT TO ENGS OR A/C. UNEVENTFUL LDG.				
Aircraft Out of Service (Hrs):	Cost of Repairs (US\$):	Other Costs (US \$):		

Figure 6 – Limited View of a Detailed Strike Report Selected from Figure 5

The viewer may view any or all of the strike reports from Figure 5 as shown in Figure 6. In addition, the user is presented an option to download all returned hits and load into MS Office EXCEL for detailed further analysis off-line. An example (partial view) is shown in Figure 7.

americanairlines191.xls									
	A	B	C	D	E	F	G	H	I
1	Ref Nr	Operator	Incident Date	Time of Day	Time	Airport	State	FAA Region	Dama
2	40861	AMERICAN AIRLINES	3/28/2002	Night		BALTIMORE WASH INTL	MD	AEA	N
3	41642	AMERICAN AIRLINES	5/5/2002	Night	2215	BALTIMORE WASH INTL	MD	AEA	N
4	42334	AMERICAN AIRLINES	5/31/2002			BALTIMORE WASH INTL	MD	AEA	N
5	43276	AMERICAN AIRLINES	7/18/2002			BALTIMORE WASH INTL	MD	AEA	N
6	44180	AMERICAN AIRLINES	8/20/2002	Day	735	BALTIMORE WASH INTL	MD	AEA	N
7	46417	AMERICAN AIRLINES	8/26/2002	Day	1338	BALTIMORE WASH INTL	MD	AEA	
8	45407	AMERICAN AIRLINES	10/11/2002		1828	BALTIMORE WASH INTL	MD	AEA	M
9	46460	AMERICAN AIRLINES	11/26/2002	Night	2200	BALTIMORE WASH INTL	MD	AEA	M
10									
11	Source: FAA National Wildlife Strike Database - Version 4.0 B dated 10-17-2003								
12	Downloaded - Sat Nov 29 2003 11:49:12 MST								
13									

Figure 7 – Downloaded EXCEL Spreadsheet (Partial View) from Summary Hit Return Shown in Figure 5

Other entrances shown in Figure 5 are similar in nature with the exception of FAA Authorized Personnel which make the complete detailed strike report available.

As of November 2003, there have been over 5,300 on-line queries generated with the request distribution shown in Figure 8. (Please be aware Level IIF (Government Agencies) was added in November, 2003.)

FAA National Wildlife Aircraft Strike Database Query Select Statistics/Activity Log As of Sat Nov 29, 2003 12:02:29 MST (On-Line July 22, 2002)								
Cumulative Summary of Query Requests (All Levels)								
Level I (FAA)	Level IIA (Airports)	Level IIB (Oper's)	Level IIC (USDA/WS)	Level IID (Engine)	Level IIE (Airframe)	Level IIF (Govt Agencies)	Level IIIA (By State)	Level IIIB (By Year)
292	436	132	1929	9	4	1	1422	1105
Total Queries Requested - 5330 Average Nr of Queries Requested per Business Day - 14.9								
Cumulative Summary of Individual Strike Report Requests (All Levels)								
Level I	Level IIA	Level IIB	Level IIC	Level IID	Level IIE	Level IIF	Level IIIA	Level IIIB
270	557	569	1712	12	3	1	N/A	N/A
Total Strike Reports Requested - 3124 Average Nr of Strike Reports Requested per Business Day - 8.7								

Figure 8 – On-Line Query Request Distribution (From July 22, 2001 to Nov 29, 2003)

ON-LINE COMMUNITY

In order to disseminate items of interest, coming events and community news, an On-Line Community has been established and is open to any visitor to our web site as shown in Figure 8:



Figure 8 – Web Site Invitation to Join the On-Line Community

Upon clicking the link shown in Figure 8, the user is presented a brief application as shown in Figure 9:



Figure 9 – Application to Join the On-Line Community

There are, as of November 2003, 108 members of the On-Line Community from a wide variety of domestic as well as foreign organizations. A sampling of the current membership is shown in Figure 10:

Felix Rivera	Puerto Rico Ports Authority	pasofino55@hotmail.com
Sharon Gordon	Port of Portland	gordos@portptld.com
Fernando Pinto	Aena/Aeropuerto de Bilbao	fpinto@aena.es
Eladio L. García	Universidad Autónoma de Madrid	eladio.garcia@uam.es
Mertens Marvin		mertensmarvin16@hotmail.com
Gilbert Clark Jr.	MSY Ops - Wildlife Control Manager	gilbertc@flymsy.com
Geoffrey Gaskin	MSY Ops - Wildlife Control Officer	geoffrey@flymsy.com
Marcy Heacker-Skeans	Smithsonian Institution	heacker-skeans@nsmh.si.edu
Mike Orrson	flight instructor	clipperpilot@yahoo.com
Phyllis Skeeter Griffin	State of Hawaii DOTA-HIA	phyllis.griffin@hawaii.gov
Mike Jamison	Australian Transport Safety Bureau	mike.jamieson@atsb.gov.au
Vladislav Lourye	Volga-Dnepr Airlines, Russia	lourye@vda.ru
Nick Murray		nmurray@ecosure.com.au
VALTER BATTISTONI	BIRD STRIKE COMMITTEE ITALY	v.battistoni@enac.rupa.it
Eduardo Chacin	IATA	chacine@iata.org
Total Registration - 108		

Figure 10 – Sampling of Membership to the On-Line Community

FUTURE PLANS

Planning is currently underway to augment the on-line database access with a graphical interface. In addition to a discrete listing of all strikes returned by the user's query, an option will be provided to show graphically all strikes superimposed on a map of the United States (including Alaska and Hawaii). The map of the US will be clickable by State allowing the viewer to obtain a more detailed image of all strikes within that state. This graphical interface will

present analysts the ability to view strike patterns with a wide variety of variables including species, seasons, migration patterns, etc.

REFERENCES

1. *Memorandum of Agreement between the Federal Aviation Administration, the U.S. Air Force, the U.S. Army, the U.S. Environmental Protection Agency, the U.S. Fish and Wildlife Service, and the U.S. Department of Agriculture to Address Aircraft-Wildlife Strikes*, dated December 17, 2002