

# **A Strike By Any Other Name**

**A Call for a New Standard Measure of  
Performance in Wildlife Strike Prevention**



**John Weller  
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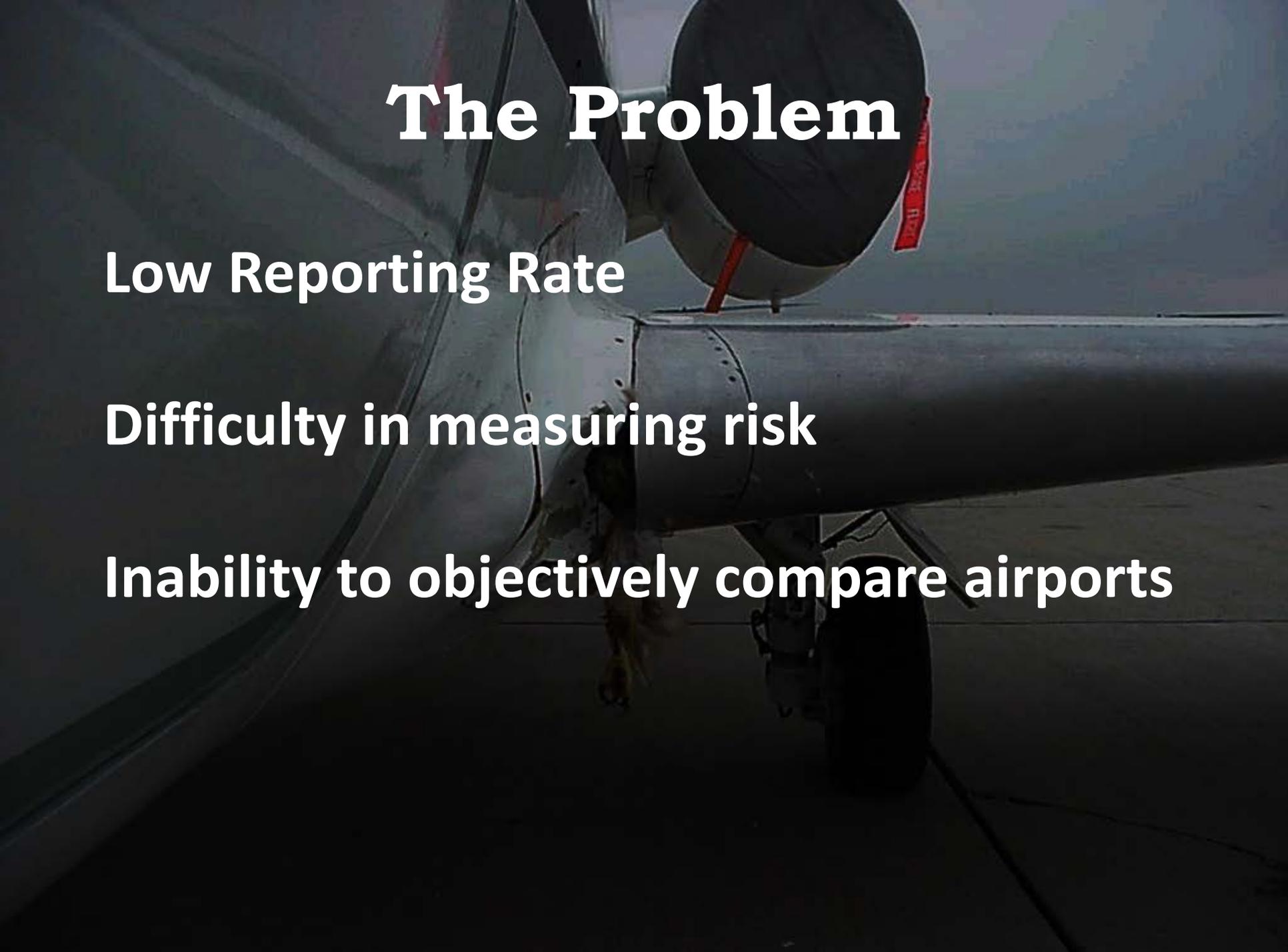


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Defensie



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# **The Problem**

**Low Reporting Rate**

**Difficulty in measuring risk**

**Inability to objectively compare airports**

The ultimate goal is to measure RISK



# The FAA Wildlife Strike Database is open to the public



Wildlife Strike Database and Reporting System

→ Search the Database

→ Submit a Strike Report

→ Edit a Strike Report

Wildlife Hazard Mitigation Program

→ Wildlife Strike Database

→ Wildlife Strike Questions and Answers

→ Wildlife Strike Gallery

→ The Wildlife Strike Problem

→ Wildlife Strike Research and Development

→ Wildlife Management

→ FAA Guidance on Wildlife

→ Wildlife Strike Resources

→ Wildlife Strike News

## Search the FAA Wildlife Strike Database

Start your search by selecting a "State", "Airport", or "Airline". You may limit your search to a specific date range and / or optional search criteria. Click the "Submit" button to view your results in a table.

The table may be sorted by any column, by clicking on the column name. Click once to sort ascending, and again for descending. Results can be exported to Microsoft Excel using the "Export to Excel" button beneath the table.

### View Strike Reports by:

State 
 Airport  OR Airport Code 
 Airline

### Date Range:

From:  To:

### Optional Search Criteria:

Aircraft Type:  Engine Type:   
 List of Damage:  Species:

Results: 93

Records to display per page:

Date	State	Airport	Airline	Aircraft	Engine	Species	Damage
12/15/2013	GA	HARTSFIELD - JACKSON ATLANTA INTL ARPT	UNKNOWN	UNKNOWN		Red-winged blackbird	
12/01/2013	GA	HARTSFIELD - JACKSON ATLANTA INTL ARPT	DELTA AIR LINES	B-737-800	D	European starling	N
11/29/2013	GA	HARTSFIELD - JACKSON ATLANTA INTL ARPT	UNKNOWN	UNKNOWN		European starling	
11/11/2013	GA	HARTSFIELD - JACKSON ATLANTA INTL ARPT	UNKNOWN	UNKNOWN		Red-winged blackbird	
11/08/2013	GA	HARTSFIELD - JACKSON ATLANTA INTL ARPT	UNKNOWN	UNKNOWN		European starling	
10/18/2013	GA	HARTSFIELD - JACKSON ATLANTA INTL ARPT	UNKNOWN	UNKNOWN		Northern flicker	
10/18/2013	GA	HARTSFIELD - JACKSON ATLANTA INTL ARPT	UPS AIRLINES	A-300	D	Killdeer	N
10/17/2013	GA	HARTSFIELD - JACKSON ATLANTA INTL ARPT	UNKNOWN	UNKNOWN		Ruby-crowned kinglet	
10/16/2013	GA	HARTSFIELD - JACKSON ATLANTA INTL ARPT	AIRTRAN AIRWAYS	B-717-200	D	Unknown bird - small	N
10/07/2013	GA	HARTSFIELD - JACKSON ATLANTA INTL ARPT	AIRTRAN AIRWAYS	B-717-200	D	Unknown bird - small	N
10/07/2013	GA	HARTSFIELD - JACKSON ATLANTA INTL ARPT	AMERICAN AIRLINES	MD-83	D	Unknown bird - small	N
10/07/2013	GA	HARTSFIELD - JACKSON ATLANTA INTL ARPT	AMERICAN AIRLINES	MD-82	D	Unknown bird - small	N
09/27/2013	GA	HARTSFIELD - JACKSON ATLANTA INTL ARPT	DELTA AIR LINES	B-757-200	D	Unknown bird	N
09/26/2013	GA	HARTSFIELD - JACKSON ATLANTA INTL ARPT	UNKNOWN	UNKNOWN		Peregrine falcon	
09/25/2013	GA	HARTSFIELD - JACKSON ATLANTA INTL ARPT	DELTA AIR LINES	DC-9-30	D	Microbats	N
09/17/2013	GA	HARTSFIELD - JACKSON ATLANTA INTL ARPT	FRONTIER AIRLINES	A-319	D	Unknown bird	N
09/17/2013	GA	HARTSFIELD - JACKSON ATLANTA INTL ARPT	UPS AIRLINES	B-767-300	D	Unknown bird - small	N
09/16/2013	GA	HARTSFIELD - JACKSON ATLANTA INTL ARPT	AIRTRAN AIRWAYS	B-737-700	D	Canada warbler	N
09/09/2013	GA	HARTSFIELD - JACKSON ATLANTA INTL ARPT	DELTA AIR LINES	MD-88	D	Mourning dove	
09/07/2013	GA	HARTSFIELD - JACKSON ATLANTA INTL ARPT	DELTA AIR LINES	DC-9-30	D	European starling	
09/07/2013	GA	HARTSFIELD - JACKSON ATLANTA INTL ARPT	UNKNOWN	UNKNOWN		Microbats	

# The Problem

The public compares strike rates

The media compares strike rates

Professionals compare strike rates



# The Problem

Airport A

Airport B



**Airport A**



**5 Strikes this year**

**Airport B**



**50 strikes this year**

# Airport A



# Airport B



## Types of Strikes

**5 Strikes this year**

**50 strikes this year**

**Airport A**



**Airport B**



**Difference in Reporting Rates**

**5 Strikes this year**

**50 strikes this year**



**Many airports do not report carcasses**  
**Many do not track down airline reports**

# Airport A



# Airport B



## Difference in Movements

**5 Strikes this year**

**50 strikes this year**

# Airport A



**5 Strikes**

**10,000 movements**

**5 strikes/10,000 mv**

**+1 additional strike**

**6 strikes/10,000 mv**

**↑ 20 %**

# Airport B



**50 strikes**

**100,000 movements**

**5 strikes/10,000 mv**

**+1 additional strike**

**5.1 strikes/10,000 mv**

**↑ 2 %**

# Airport A Airline X



# Airport B Airline Y



## Difference in Airline Cultures

5 Strikes this year

50 strikes this year

# Airport A



5 Strikes this year

# Airport B



50 strikes this year

All Strikes Are Counted as "1"

If the ultimate goal is to measure RISK:



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$\text{Risk} = \text{probability} \times \text{severity}$



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Proffered measure =  
damage & effect on flight

If the ultimate goal is to measure RISK:

$\text{Risk} = \text{Probability} \times \text{Severity}$

Proffered measure =  
damage & effect on flight

Problem = rarity of events

≈ 8% of reported strikes  
cause damage or negative EOF  
(estimated 39% of strikes are reported)

Likely only 3.1% of actual strikes

# **The New Standard**

**Risk = Probability x Severity**

**“Average Mass per Strike”**

**Mass = Severity  
Per Strike = Probability**

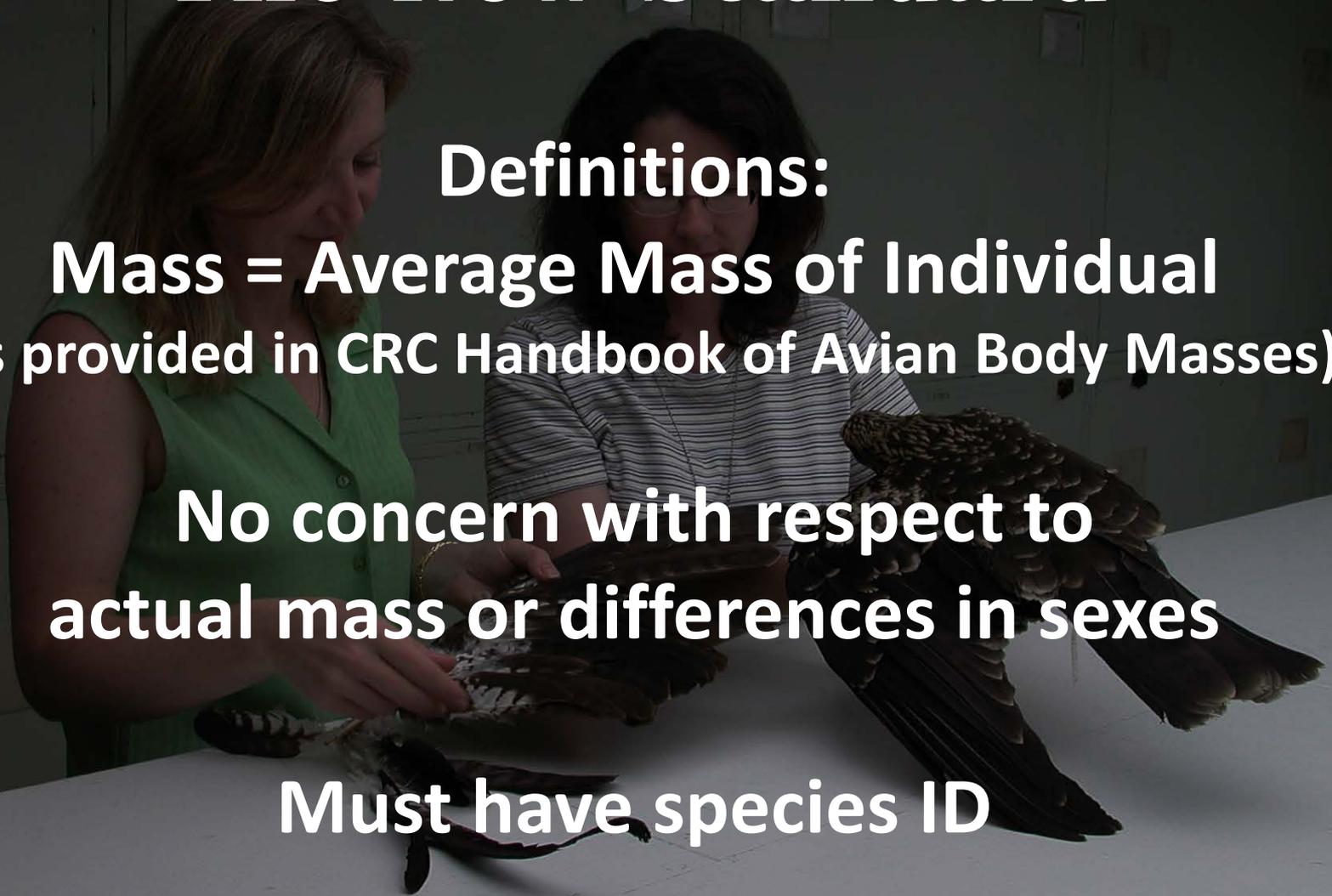
# The New Standard

**Definitions:**

**Mass = Average Mass of Individual**  
(as provided in CRC Handbook of Avian Body Masses)

**No concern with respect to  
actual mass or differences in sexes**

**Must have species ID**



# The New Standard

Scientific Name	Common Name	Mean (gms)	♀
<b>Family Eurylaimidae</b>			
Smithornis capensis	African Broadbill	23.2	
Smithornis sharpei	Gray-headed Broadbill	37.5	
Smithornis rufolateralis	Rufous-sided Broadbill	20.5 & 17.7	19.1
Pseudocalyptomena graueri	Grauer's Broadbill	32.5 & 31.1	31.8
Corydon sumatranus	Dusky Broadbill	140	
Cymbirhynchus macrorhynchos	Black-and-red Broadbill	59.4	
Eurylaimus javanicus	Banded Broadbill	78.2	
Eurylaimus ochromalus	Black-and-yellow Broadbill	33.3	
Eurylaimus steerii	Wattled Broadbill		
Eurylaimus samarensis	Visayan Broadbill	27.1	
Psarisomus dalhousiae	Long-tailed Broadbill	67	
Serilophus lunatus	Silver-breasted Broadbill	34	
Calyptomena viridis	Green Broadbill	58.5	
Calyptomena hosii	Hose's Broadbill		
Calyptomena whiteheadi	Whitehead's Broadbill		
<b>Family Philepittidae</b>			
Philepitta castanea	Velvet Asity	35.4	
Philepitta schlegeli	Schlegel's Asity	27.9	
Neodrepanis coruscans	Sunbird Asity	6.5	
Neodrepanis hypoxanthus	Yellow-bellied Asity	7.1	

**Airport A**



**5 Strikes this year**

**Airport B**



**50 strikes this year**

# Airport A



# Airport B



<b>Canada Goose</b>	<b>3500 gms</b>
<b>Pigeon</b>	<b>350 gms</b>
<b>Black Vulture</b>	<b>1900 gms</b>
<b>Red-tailed Hawk</b>	<b>1100 gms</b>
<b>Meadowlark</b>	<b>93 gms</b>

---

**1388 gms/strike**

<b>14 Swallow Strikes</b>	<b>13 gms</b>
<b>2 Pigeon Strikes</b>	<b>350 gms</b>
<b>22 Meadowlark</b>	<b>93 gms</b>
<b>5 Kestrels</b>	<b>116 gms</b>
<b>7 Sparrows</b>	<b>12 gms</b>

---

**71.8 gms/strike**

**Airport A**



**5 Strikes this year**

**Airport B**



**5 strikes this year**

# Airport A



# Airport B



Swallow (1)	13 gms
Pigeon (1)	350 gms
Meadowlark (1)	93 gms
Kestrel (1)	116 gms
Sparrow (1)	12 gms

---

116.8 gms/strike

Swallow (1)	13 gms
Pigeon (12)	350 gms
Meadowlark (1)	93 gms
Kestrel (1)	116 gms
Sparrow (1)	12 gms

---

886.8 gms/strike

## Airport A

Canada Goose	3500 gms
Pigeon	350 gms
Black Vulture	1900 gms
Red-tailed Hawk	1100 gms
Meadowlark	93 gms

---

1388 gms/strike

+ 1 strike

(Red-winged Blackbird)

(52 gms)

1166 gms/strike

(↑ 20 %)

## Airport B

14 Swallow Strikes	13 gms
2 Pigeon Strikes	350 gms
22 Meadowlark	93 gms
5 Kestrels	116 gms
7 Sparrows	12 gms

---

71.8 gms/strike

+ 1 strike

(Red-winged Blackbird)

(52 gms)

71.45 gms/strike

(↑ 2 %)

# Incentivizes Reporting

One way to bring down average mass/strike

Most unreported strikes are with small birds



A photograph of a Ryanair airplane on a runway. The aircraft is white with blue and yellow accents. The word "RYANAIR" is written in large blue letters along the side of the fuselage. A small bird is perched on the fuselage near the wing. The background shows a clear blue sky and a runway with some snow or ice patches.

Accounts for Multiple Strike

Mass for a strike is additive

1 strike with 10 birds of 200 gms =  
1 strike with 1 bird of 2000 gms

$$E = \frac{1}{2} mv^2$$

Some of the worst birdstrike accidents have  
happened with a bird species = 78 grams

## Benefits

Accounts for rarity of damaging strikes  
(Mass/strike represents “potential” severity)

Accounts for variances in airport sizes  
(Differing movement rates)

Incentivizes reporting of all strikes  
(Voluntary vs. mandatory unimportant)

## Benefits

Best represents SMS goals  
(Lowering risk below acceptable level)

Universal across all airfields  
(Location, usage, aircraft type, military/civilian)

Eliminates most weaknesses of strikes/10,000  
(Voluntary vs. mandatory unimportant)

## Limits

Must have species ID  
(Difficult in 3<sup>rd</sup> world locations)

Change in reporting culture  
(Puts the onus on the airfield for reports)

Doesn't represent risk of species present  
(Only represents species struck)

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