

# *Gap analysis* no cálculo de prejuízos em colisões com fauna no Brasil



Henrique Rubens Balta de Oliveira  
Assessor de Risco de Fauna do CENIPA



ICAO & IBSC recommend an integrated approach



Quanto custa a aplicação  
destas medidas de  
controle?

Quem paga por elas?



**OAD**

Operador de Aeródromo



Hierarquia de controle populacional de fauna em aeródromos com programas integrados (fonte: Minneapolis St. Paul International Airport)

Quanto a presença de  
fauna custa à operação?  
(prejuízos)

Quem paga por elas?



**OPR**

Operador de Aeronaves



# THE COSTS OF BIRD STRIKES AND BIRD STRIKE PREVENTION

JOHN R. ALLAN

**Abstract:** Collisions between birds (and other wildlife) and aircraft are known to cause substantial losses to the aviation industry in terms of damage and delays every year. Techniques exist to control bird numbers on airfields and hence to reduce the number of wildlife strikes, but they are applied at widely different levels from airport to airport. Some of this variation may be due to differing levels of strike-risk at the different sites, but much of it is due to the unwillingness or inability of the airports concerned to invest in bird strike prevention. Part of the reason for this reluctance to invest in airport bird control is a lack of understanding of the true costs to the airlines in terms of direct damage to aircraft and in delays and cancellations. Previous estimates of the cost of bird strikes have concentrated only on measurable repair costs and have not attempted to assign costs to aircraft delays. My paper uses newly available data from major international airlines to provide the first estimate for the total cost of bird strikes to the world's airline fleet. Much of the data are commercially confidential and sources cannot be quoted nor the accuracy of the data verified. The estimates also rely on information from a very small number of airlines to produce extrapolations for the worldwide costs of damage and delays. Although these are major international carriers, and as representative as possible of the world bird strike problem as a whole, the results should be interpreted with a suitable level of caution. A tentative and probably conservative estimate of US\$1.2 billion per year in damage and delays is the outcome of this calculation. The costs of bird damage are evaluated relative to the ability of managers to pay for bird control programs and the derived benefits thereof. Reasons for the industry's failure to invest further to reduce the costs of bird strikes are examined.

**Key Words:** aircraft, airports, bird strikes, collisions, costs, economics, management, worldwide.

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Allan, John R., "THE COSTS OF BIRD STRIKES AND BIRD STRIKE PREVENTION" (2000). *Human Conflicts with Wildlife:*

*Economic Considerations*. Paper 18.

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# **THE COSTS OF BIRD STRIKES AND BIRD STRIKE PREVENTION**

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Parte das razões que dificultam investimentos em atividades de controle de presença de fauna em aeroportos decorre da falta de compreensão dos custos reais gerados por danos diretos, atrasos e cancelamentos.

Embora os dados usados neste artigo sejam de grandes empresas aéreas, tão representativas quanto possível para retratar o problema mundial, os resultados devem ser interpretados com cautela.



# THE COSTS OF BIRD STRIKES AND BIRD STRIKE PREVENTION

JOHN R. ALLAN

A Organização Civil de Aviação Internacional (OACI) recomenda que os aeroportos atuem para reduzir o risco de colisões com fauna a um **nível razoavelmente possível**.

Este método permite calcular o custo-benefício de investimentos adicionais em gerenciamento de risco de fauna, ilustrando alguns dos problemas inerentes a um sistema onde uma empresa (aeroporto) está gastando recursos para viabilizar que outra (empresa aérea) economize em termos de custos de colisões.

O que significa isto?

Como saber se o que está sendo feito é suficiente?

# Será que temos um bom nível de reporte?

Aplicando o método de Allan (2000) para estimar nossos dados (Brasil):  
2016 (período completo)

Quantidade aproximada de movimentos: 3.100.000  
(Pousos + Decolagens + Arremetidas no solo ou em voo)

Custo estimado por quantidade de movimentos  
 $3.100.000 \times 64,50$  (custo médio de colisão por movimento) =  
**USD 199.950.000**

Custo estimado por quantidade de colisões reportadas  
 $2.194 \times 39,705$  (custo médio por colisão reportada) =  
**USD 87.112.770**



# Será que temos um bom nível de reporte?

$$\frac{\text{Custo estimado por quantidade de movimentos}}{\text{Custo estimado por quantidade de colisões reportadas}}$$

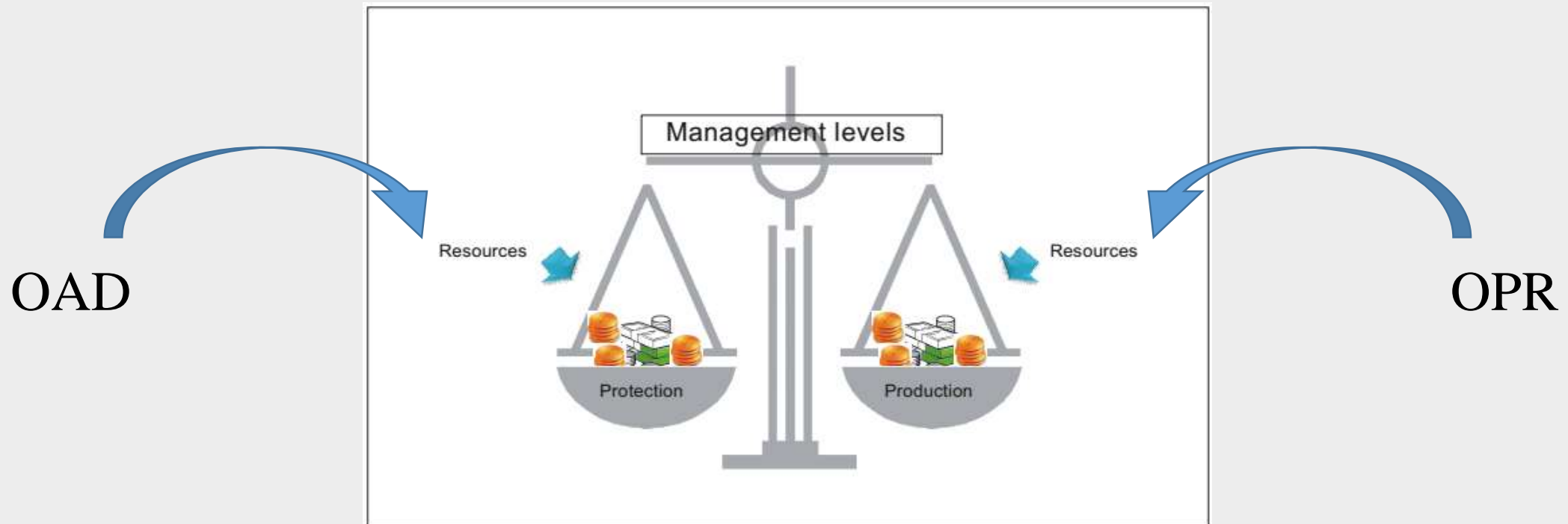
Proporção estimada de colisões reportadas no Brasil

**43,56%** das colisões são reportadas no SIGRA

# Será que os dados reportados tem custos?

2016 (colisões):

75 aeródromos (GRU até Cachoeiro de Itapemirim)



# Será que os dados reportados tem custos?

2016 (colisões):

382 danos/prejuízos (SIM)

319 indeterminado (aeronave)

260 não informado (valor)



= 961 colisões (em 2.194)

1.234 sem danos/prejuízos (NÃO) = 905 colisões

213 com tempo de indisponibilidade da aeronave (AOG)

Tempo total AOG = 6.700 horas

# Será que os dados reportados tem custos?

Custos diretos:

151 com valor informado

(382 – sim / 319 – indeterminado / 260 – não informado / 213 com AOG)

39,52% com valor informado (somente opção SIM)

Média por colisão (custo informado) = USD 24.947,15

Total de colisões (custo informado) = USD 3.767.019,51



# Será que os dados reportados tem custos?

Custos indiretos:

92 colisões com valor informado

(382 – sim / 310 – indeterminado / 260 – não informado / 213 com AOG)

24,08% com valor informado (somente opção SIM)

Média por colisão (custo informado) = USD 54.412,59

Total de colisões (custo informado) = USD 5.005.957,87

# Será que os dados reportados tem custos?

Proporção custos indiretos e diretos (expectativa entre 4-20 vezes):

$$\text{Pela média colisão} = \frac{54.412,59}{24.947,15} = 2,18$$

20% dos eventos (certamente bem menos)

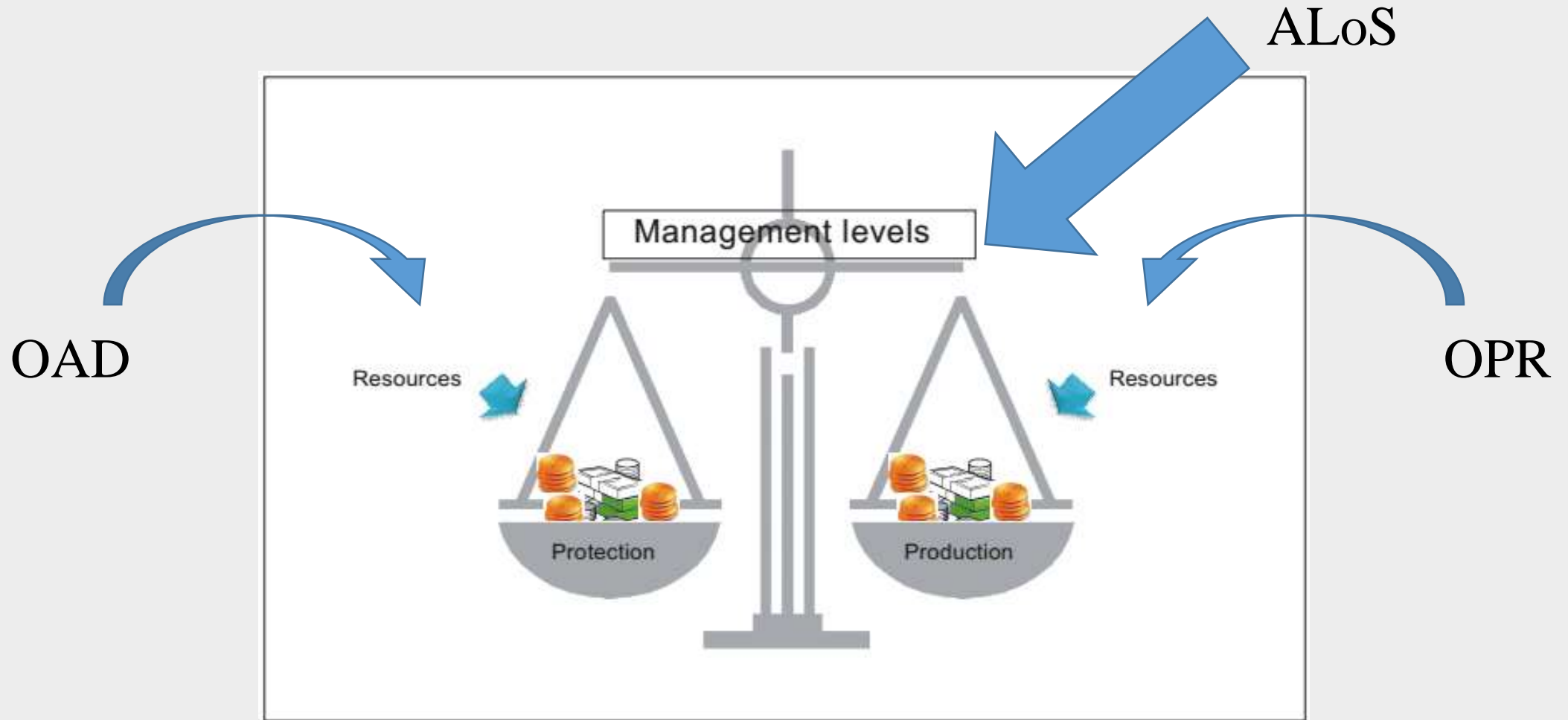
40% dos eventos (talvez menos)

$$\text{Pela média total de colisões} = \frac{5.005.957,87}{3.767.019,51} = 1,32$$

20% dos eventos (certamente bem menos)

40% dos eventos (talvez menos)

# Conclusões



# Conclusões

SIGRA está cada vez mais sólido (mais de 40% de reportes recebidos)

Custos diretos são pouco reportados

Custos indiretos são muito pouco reportados

Dificuldade de realizar análise de custo-benefício eficaz para aplicar medidas de controle

Pouco conhecimento sobre “como” calcular custos (especialmente, indiretos)

Dificuldade em determinar nível adequado de segurança (ALoS)

Dificuldade em separar custos por aeródromos para obter investimento do OAD para reduzir presença de fauna



# Helping Brazil Move Forward



How the global aviation industry can help Brazil progress:

- IATA could encourage or require aircraft operators to provide strike cost calculations (direct and indirect) to the national databank to help SARP implementation
- ICAO could encourage or require the national regulator to develop Acceptable Levels of Safety for Wildlife Strike Risk

# Obrigado Dúvidas?

Henrique Rubens Balta de Oliveira

+55-61-3364-8839

+55-61-98210-9111

[riscodafauna.cenipa@fab.mil.br](mailto:riscodafauna.cenipa@fab.mil.br) / [henrique.poker@yahoo.com.br](mailto:henrique.poker@yahoo.com.br)

