

New standards for prevention of wildlife strike hazard at Italian airports: results of the first year of application

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Circolare ENAC APT-01B Regolamento per la Costruzione e l'Esercizio degli Aeroporti.

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- Organisation;
- Wildlife attractions in the surroundings of airports subject to restrictions;
- Wildlife strike reporting;
- Airport ecological assessment;
- Airport wildlife/habitat management plan;
- Identification of the surrounding attractions;
- Annual reporting (*incl. risk assessment*).



Wildlife strike reporting

- Aircraft operators, aerodrome operators, maintenance stations and ATC have to report all the events occurred to ENAC and aerodrome operator;
- Wildlife reporting forms are attached to the Circular APT01-B;
- All the events occurred in Italy are reported to ICAO according to IBIS.



Airport ecological assessment

- An airport ecological assessment has to be performed by each aerodrome operator for each airport;
- The following must be included:
 - Aerodrome environmental assessment;
 - Species' 12 months presence, number of individuals, areas of concentration, habitat/time preference, etc;
 - Risk assessment;
 - Identification of possible wildlife attractions.



Airport wildlife/habitat management plan

- An airport wildlife/habitat management plan has to be issued by the aerodrome operator. It must be approved by ENAC;
- The following must be included:
 - Aerodrome operator organization;
 - Human resources and available devices;
 - Training programs;
 - Detailed procedures.



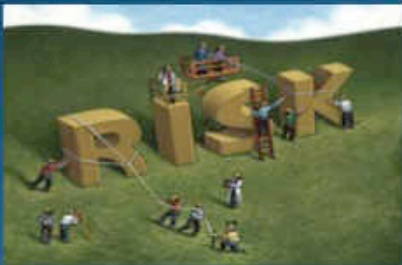
Identification of the surrounding attractions

- Standard;
- Guidelines to identify/evaluate attractions;
- Indication for compliance:
 - Official agreements with local stakeholders (municipalities, industry, agricultural associations, etc.);
 - Use of GIS and land cover detailed maps;
 - Participation to all territorial boards and promotion of opened workshops on wildlife risk hazard.



Annual reporting

- Wildlife strikes and monitoring analysis;
- Habitat and wildlife control performance;
- Airport wildlife risk assessment:
 - Calculation of BRI (Birdstrike Risk Index) as the standard risk assessment index.



What is BRI?

- Joined project (Univ. of Venice, SAVE, ENAC);
- Considered information:
 - Ecological characteristics of the airport bird community;
 - Local history of wildlife strikes;
 - Their effects on flight;
 - Local flight traffic.



Parameters to calculate BRI

- Mean daily number of observed individuals per species;
- Number of wildlife strikes per species and their effect on flight;
- Mean number of flights per month.



How to calculate BRI

Classification of wildlife species into 17 functional groups:

1. Grebes and divers
2. Cormorant, swans and geese
3. Herons, storks, flamingoes
4. Ducks, pheasants, rallids
5. Birds of prey - large
6. Birds of prey - small
7. Seabirds - large
8. Seabirds - small
9. Waders
10. Doves
11. Owls
12. Swifts and swallows
13. Corvids
14. Non-flocking Passerines
15. Flocking Passerines
16. Small mammals (<10 Kg)
17. Large mammals (>10 Kg)

The historical risk associated to a species, or Group Factor (**GF**)

$$\longrightarrow GF_i = \overline{W}_i \cdot Ag_i \cdot \frac{BS_i}{TFN} \cdot EOF_i^{.95}$$

The actual Group Specific Risk (**GSR**)

$$\longrightarrow GSR_j = \frac{GF_j}{\sum_{i=1..N} GF_i} \cdot DB_j$$

The **BRI** (version 2)

$$\longrightarrow BRI2 = \left(\frac{\sum_{i=1..N} GSR_i \cdot DF}{TFN} \right)$$

- i indicates a species group;
- N is the group total;
- \overline{W} the average weight of the i^{th} group;
- Ag the group specific aggregation index;
- BS is the mean value of impacts recorded per year;
- TFN is the mean value of flights per year;
- \overline{TFN} is its monthly average;
- DB_j represents the mean daily number of birds of the i^{th} group;
- DF is the mean daily flight traffic calculated on a monthly basis;
- $EOF^{.95}$, is the 95th percentile of the EOF (Effect On Flight).

Effect On Flight ranking

EOF Value	Category	Description
1	None	None
2	Minor	Delay
3	Substantial	Precautionary landing, aborted take-off
4	Serious	Engine(s) shutdown, forced landing, vision obscured
5	Catastrophic	Damage sustained makes it inadvisable to restore aircraft

For more information about BRI:

Soldatini C., Albores-Barajas Y.V., Lovato T., Andreon A., Torricelli P., Montemaggiori A., Corsa C. & V. Georgalas (2011) Wildlife Strike Risk Assessment in Several Italian Airports: Lessons from BRI and a New Methodology Implementation. PLoS ONE 6 (12) - <http://bit.ly/tX6IOR>

Wildlife Strike in Italy



Short-toed eagle (*Circaetus gallicus*)
Rome Fiumicino – 24 August 2007

Italian airports

101 airports

48 certified by ENAC

41 regularly operative

29 < 50,000 flights/year

8 50,001-100,000 flights/year

4 > 100,000 flights/year

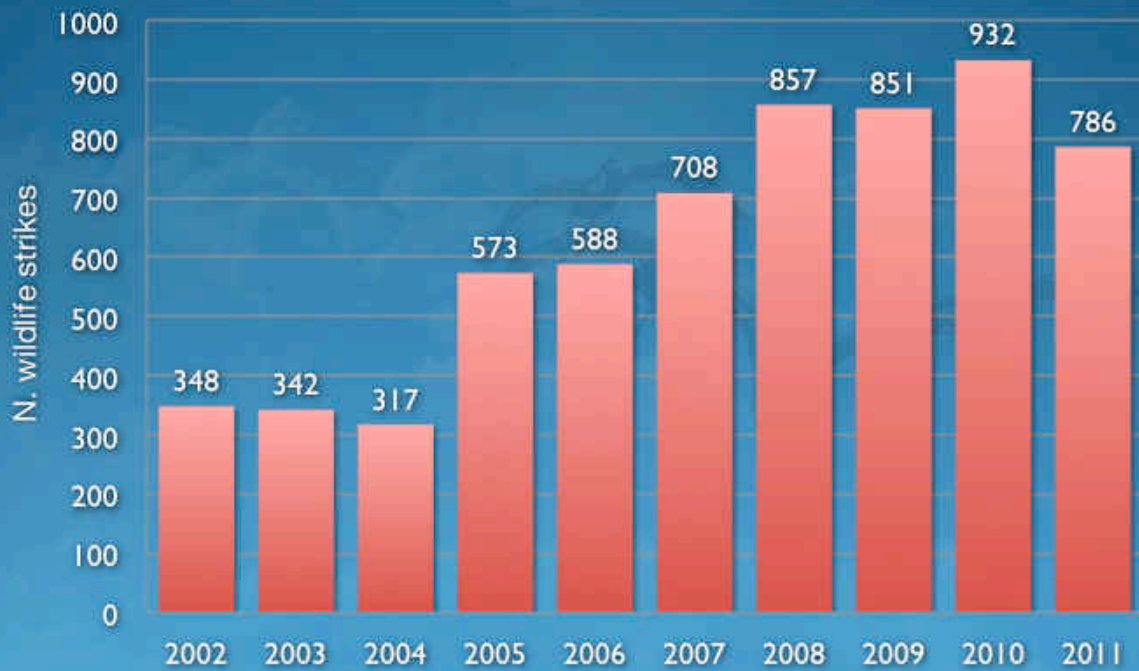
24 Coastal airports

17 Inland airports

● < 50,000 flights/year
● 50,001 - 99,999 flights/year
● > 100,000 flights/year

How many wildlife strikes occur in Italy

N = 6,302 (2002 - 2011)



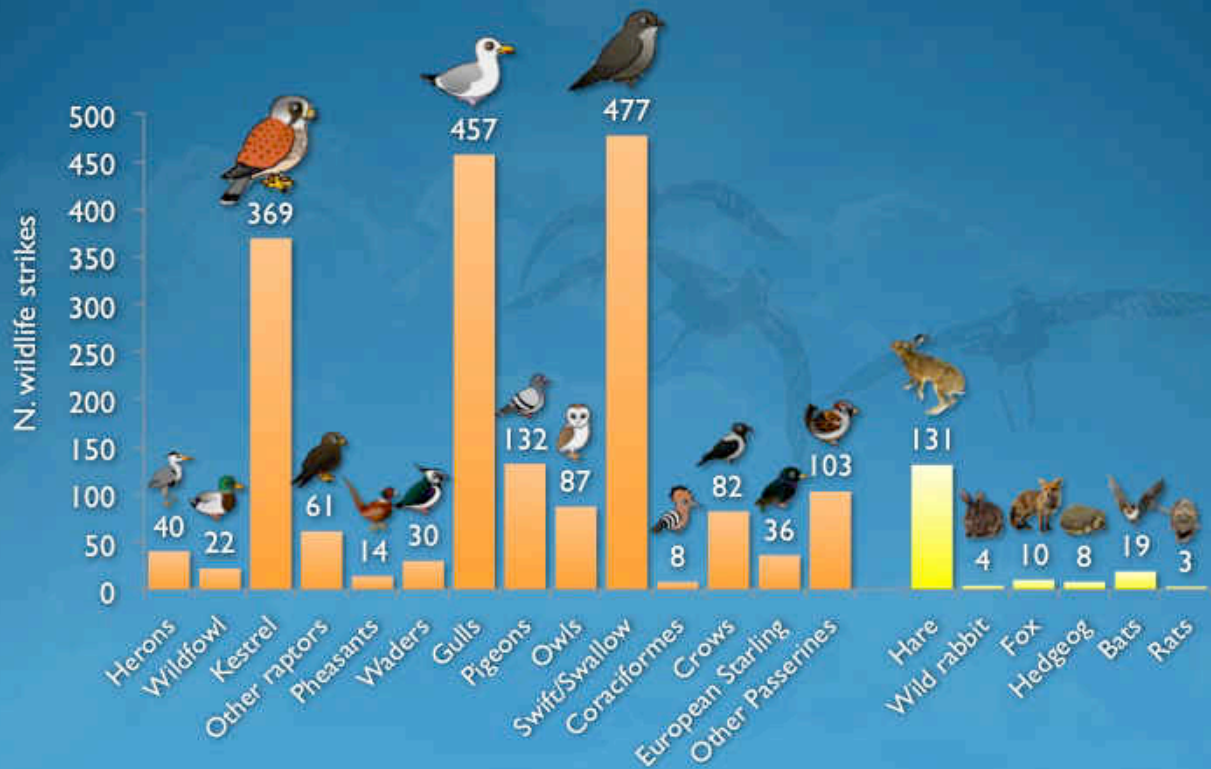
Where do strikes occur in Italy

N = 2,810 (2008 - 2011)



Who causes the strikes in Italy

N= 2,093 (2006-2010)



Wildlife strike occurrence per species in Italy

N= 1,366 (2008 - 2011)



Most frequently monitored/struck species (2009-2011)



BRI vs No. of strikes/10,000 mov. (2009-2011)

29 airports

17 < 50,000 flights/year

8 50,001-100,000 flights/year

4 > 100,000 flights/year

16 Coastal airports

13 Inland airports





Risk Trend (2009-2011)

No. of strikes/
10,000 mov

BRI



Need for further action (2009-2011)

No. of strikes/
10,000 mov

BRI



Conclusion

- The new standards appear to have been accepted by airport managers without too many criticisms;
- Removal of wildlife attractions outside airports already started in a few sites;
- The new risk index (BRI) was implemented in 90% of the Italian airports;
- BRI seems to be more conservative than the previous index in order to assess the need of further action against wildlife strike risk;
- BRI is giving good management information in various airports.