

e-distribuzione



# KNOWLEDGE *and* PREVENTION of ELECTROCUTION of BIRDS





*Electrocution represents one of the most important anthropogenic threats to birds with medium-large wingspans. It is a permanent cause of mortality and is ubiquitous on a planetary level; it affects birds in the areas they usually frequent, along the migratory routes they follow and when they make erratic and dispersive movements.*

Anytime,  
anywhere



Every year, eagles, vultures, hawks and storks die in large numbers from electrocution all around the world. The phenomenon often affects species in danger of extinction or threatened. A large study concluded in 2024 found that electrocution is the leading cause of anthropogenic mortality for large birds of prey along the Eurasian and African flyway. In Europe, where the vast and homogeneous diffusion of the electricity grid causes particularly serious negative effects, 47% of cases of unnatural mortality among large migrants are due to electrocution.

### International Conventions

*In 2002, the Conference of the Parties (COP) operating under the Convention on the Conservation of Migratory Species (CMS or Bonn Convention) approved a first resolution on the electrocution of migratory birds (No. 7.4).*

*In 2004, the Standing Committee established by the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) adopted a recommendation calling for the implementation of appropriate measures to reduce bird mortality caused by power lines (No. 110).*

*In 2022, the International Union for Conservation of Nature (IUCN) published detailed guidelines to prevent and mitigate wildlife mortality associated with energy distribution networks.*

## The impact of numbers

In Spain, a country at the forefront of knowledge of the phenomenon of electrocution of avifauna and

its mitigation, many bird populations are monitored with the use of GPS devices and this favours the identification of cases of electrocution. It is estimated that only 15% of real cases emerge.

The Spanish Ministry of the Environment estimates that 39,000 birds die from electrocution every year, of which 33,000 are birds of prey; much higher numbers are calculated from other organisms (up to 333,700 birds).

Between 1999 and 2022, Spanish regions recorded 25,547 cases of electrocution against 110 bird species, 64% of which are endangered or threatened birds of prey (16,350).

Among these, the Bonelli's eagle, the imperial eagle and the red kite stand out.

Among non-raptors, the white stork is the most affected species.



In Italy every year, the electrocution of avifauna causes a significant loss of individuals of threatened species such as the Egyptian vulture, the Bonelli's eagle, the lanner, the red kite, the golden eagle and the griffon vulture. This emerges from the GPS monitoring developed as part of the population reintroduction and restocking programmes, which allows the detection of incidents and, in the long term, the identification of areas in which the phenomenon is particularly virulent.

The fact that Italy does not have a database on electrocution cases and that the specimens belonging to vulnerable species monitored with GPS are a limited number, so prevents us from fully assessing the impact of the problem and makes it difficult to plan adequate mitigation strategies.

## Electrocution and avifauna in Italy



Egyptian vulture	<b>CR</b>	<i>Neophron percnopterus</i>
Bonelli's eagle	<b>EN</b>	<i>Aquila fasciata</i>
Lanner falcon	<b>EN</b>	<i>Falco biarmicus</i>
Red kite	<b>VU</b>	<i>Milvus milvus</i>
Griffon vulture	<b>NT</b>	<i>Gyps fulvus</i>
Golden eagle	<b>NT</b>	<i>Aquila chrysaetos</i>

Red List of Birds  
breeding in Italy (2021)

**CR** Critically Endangered **VU** Vulnerable  
**EN** Endangered **NT** Near Threatened



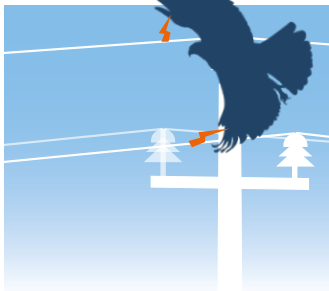
## Conservation status of some species of diurnal birds of prey vulnerable to electrocution



### Why do birds die from electrocution?

In Italy, bird electrocution is mainly caused by medium voltage power lines with exposed (non-insulated) conductors. These lines distribute electricity with a voltage of 15,000 - 20,000 volts to end users, to whom it is supplied after transformation into low voltage in secondary substations. Most supports are made of reinforced concrete and steel pylons or poles. Many species of birds use these supports as perches to rest, to spend the night or to spot prey in the surrounding areas. Some species choose them as nesting sites.

Electrocution occurs when two conductors or, and this is the most frequent case, a bare conductor and the metal structure that supports the insulators are touched simultaneously. The greatest risk occurs during the landing and take-off phases from the supports.



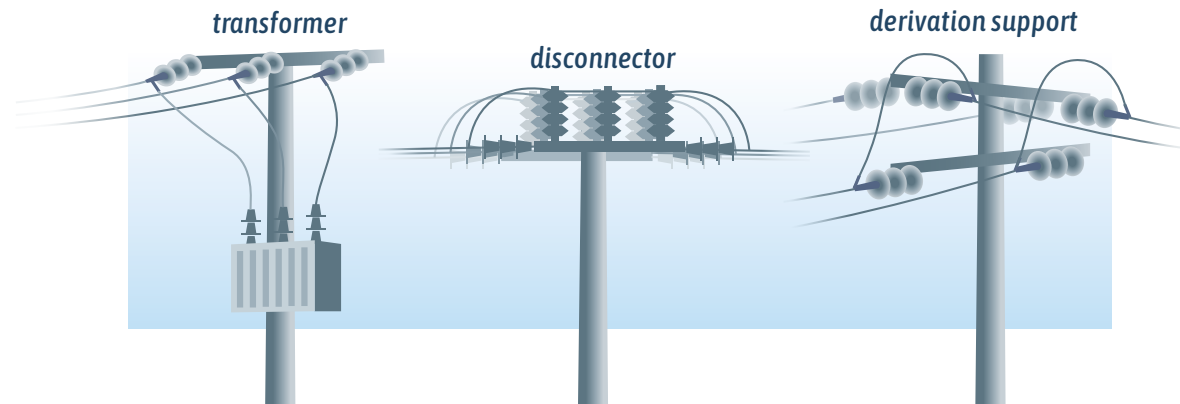
## Who risks more

Young or inexperienced birds are more vulnerable to electrocution. Rain or high air humidity and particular situations, such as a prey between the legs and the emission of jets of semiliquid excrement (streamer), increase the risk of electrocution, favouring the formation of an electric arc between the animal's body and the conductor closest to it. The habit of some gregarious species, for example vultures and kites, of perching together on nearby supports and sections of cable can favour the occurrence of episodes of simultaneous electrocution of several specimens.



The risk of electrocution depends primarily on the type of electricity structure (support, clamps and insulators). The greatest risks are determined by the supports with pin insulators (particularly widespread in Italy), the branch junctions of the lines, the disconnectors and the pole-mounted transformers. Supports with suspended insulators, as in power lines with alternating brackets, and supports with boxer and V-brackets are less dangerous because the distance between the conductors and the points where birds can perch is wide enough. The location of power lines also affects the level of risk. Very insidious are the supports installed in open areas with the presence of few trees, because they often constitute the only perches available, or those placed in sensitive areas such as the surroundings of nesting sites or areas where vulnerable species are concentrated (such as migratory bottlenecks, dormitories, feeding areas).

### The structures most at risk







## The effectiveness of insulation

Young Egyptian vulture released into the wild with the LIFE Egyptian vulture project, victim of electrocution due to non-insulated support.



Young Egyptian vulture in the Murgia Materana Park, where all the lines have been made safe for the avifauna by E-Distribuzione.

**Compared to many other European countries, Italy is one step behind in preventing and mitigating the phenomenon of bird electrocution. Below are some of the essential measures for an effective and long-term approach.**

- Produce adequate legislation to define structural standards to be adopted in sensitive sites for the insulation of existing lines and the construction of new ones.
- Create a national database on electrocution cases.
- Identify sensitive areas for the conservation of vulnerable and threatened species. Activate GPS monitoring campaigns of vulnerable species to identify the main hot-spots for electrocution.
- Define sensitivity maps to identify priority areas for mitigation interventions.
- Establish coordination tables between electricity distribution companies, public entities and relevant actors in biodiversity conservation to develop shared road maps to mitigate the problem.
- Provide adequate funding for the gradual insulation of dangerous power lines.
- Provide for the financing of insulation interventions on power lines in sensitive areas as a compensation measure for projects that negatively impact on biodiversity.

## Guidelines for an Italian strategy



A power line insulated as part of the LIFE Egyptian vulture project in Laterza (TA).

## Threat mitigation

More complex and expensive, but decisive, are the structural modifications of the support, which have the aim of widening the distance between conductors and between conductors and any support points for the birds (e.g. lengthening the insulating chains). The ideal solutions to adopt on new or renewed lines are: burying the lines (where possible); use insulated cable (Elicord type); install supports with a “bird-safe” design. E-Distribuzione is already adopting these measures in particularly sensitive areas for birdlife.

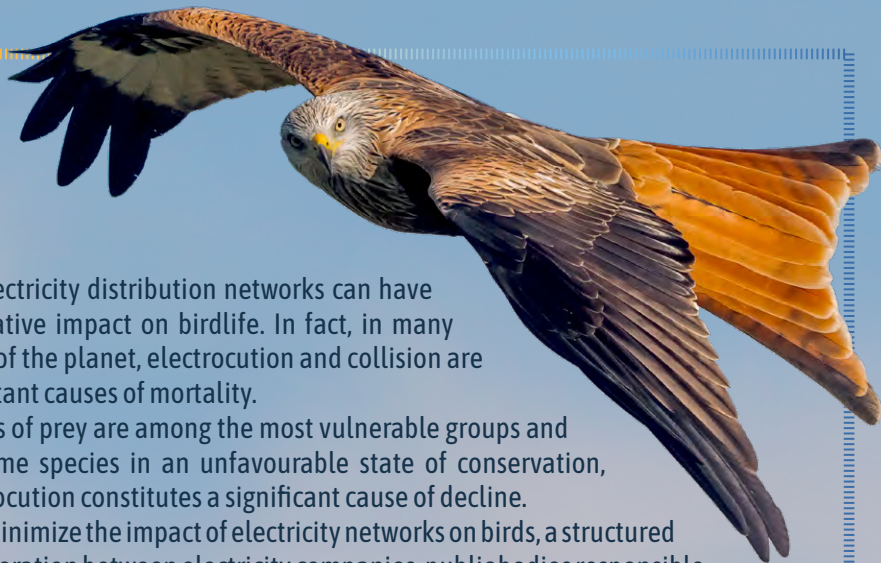
The risk of electrocution for birds on existing power lines can be mitigated or eliminated by applying insulating sheaths or covers on the conductor cables near the supports and insulating covers on the live elements of the appropriate supports; the intervention is completed by covering the remaining active parts with suitable anti-UV insulating tapes. In short: all live elements within 1.5 meters of the supports must be insulated. These modifications are effective and relatively simple from a technical point of view, have low costs and a considerable duration over time.

The commitment of E-Distribuzione to mitigate the risk of electrocution for avifauna also takes the form of participation in LIFE Nature projects. In recent years, insulation interventions have been carried out on 1,096 elements of medium voltage power lines located in Southern Italy as part of the LIFE Egyptian vulture project, dedicated to the Egyptian vulture, and on 293 elements as part of the LIFE MILVUS project, aimed at the reintroduction of the red kite in the Aspromonte National Park.

Other interventions are carried out with LIFE Abilas and LIFE Safe for Vultures projects in Sardinia and LIFE Lanner in Lazio, aimed at improving the conservation of Bonelli's eagle, griffon vulture and lanner falcon.

## E-Distribuzione and LIFE projects





**E**lectricity distribution networks can have a negative impact on birdlife. In fact, in many areas of the planet, electrocution and collision are important causes of mortality.

Birds of prey are among the most vulnerable groups and for some species in an unfavourable state of conservation, electrocution constitutes a significant cause of decline.

To minimize the impact of electricity networks on birds, a structured collaboration between electricity companies, public bodies responsible for protecting biodiversity, the scientific and conservation world, civil society and companies in the sector is necessary.

Only a synergy between the actors involved can lead to electricity networks that are as safe as possible for birdlife.

### Read more

Ceccolini G., Cenerini A., 2018. *Prontuario per la mitigazione del rischio di elettrocuzione dell'avifauna. LIFE EGYPTIAN VULTURE (LIFE16 NAT/IT/000659). e-distribuzione S.p.A. Roma.*  
For download: <https://tinyurl.com/29w2a877>

GREFA, 2022. *Libro Blanco de la electrocución en España. Análisis y propuestas, dos años después (2020-2022) AQUILA a-LIFE (LIFE06 NAT/ES/000235).* Madrid.

For download: <https://tinyurl.com/mr3c7nmw>

Martín Martín, J., Garrido López, J.R., Clavero Sousa, H. and Barrios, V. (eds.), 2022. *Wildlife and power lines. Guidelines for preventing and mitigating wildlife mortality associated with electricity distribution networks.* Gland, Switzerland: IUCN.

For download: <https://tinyurl.com/473vea6k>



[www.lifemilvusproject.it/en/](http://www.lifemilvusproject.it/en/)

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