

Executive Summary: Review of the Conflict between Migratory Birds and the Electricity Power Grids in the African-Eurasian Region

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Power lines constitute one of the major causes of unnatural deaths for birds in large parts of the African-Eurasian region, with an estimated many millions of victims each year. The main causes of death are from electrocution and collisions, each of which affects different species.

Electrocution of a bird occurs when it bridges the gap between two energized components or an energized and an earthed (also called ‘grounded’) component of the pole structure. This results in a short circuit, with current flowing through the bird’s body, and electrocution. Electrocution mainly involves larger species that perch or nest on wires or poles, with low to medium voltage lines posing the greatest risk; this is due to the close spacing of the structures. Consequently, large birds of prey and storks, particularly in habitats where perches and nest sites are limited, are at most risk. Most incidences occur during the breeding season and in the months proceeding, when young birds are most affected.

A bird collision occurs when a flying bird physically collides with an overhead cable. The bird is typically killed by the impact with the cable, the subsequent impact with the ground, or dies from the resulting injuries. Collisions can occur at all above ground lines, although most commonly at high voltage lines; this is due to the relative abundance of wires in multiple vertical layers. Fast-flying species with poor manoeuvrability and poor forward vision are thought to be the most frequent victims. Furthermore, collision risk is highest during periods of limited visibility, such as twilight or at night.

In addition to direct mortality resulting from electrocution and collision, power lines can influence birds through disturbance and habitat loss. In contrast, structure associated with power lines may provide benefits to birds through providing nesting and perching sites, particularly in open habitats. These effects, however, are minor in comparison to the negative effects of electrocution and collision.

The exact numbers of birds killed through electrocution or collisions with power lines is difficult to estimate, although, depending on the size of the grid and species present, up to 10,000 electrocutions and many 100,000s collisions are thought to occur per country in the African-Eurasian region each year.

Although a large number of studies, including previous reviews, have been published, inconsistencies between studies, difficulties in accessing reports and the anecdotal character of much of the information are the main factors limiting better estimates of the scale of the problem. The same applies for the solutions to avoid electrocution and various measures to mitigate collisions.

In order to address the current uncertainty as to the extent of the problem of power line related bird mortality in the African-Eurasian region, the secretariats of the Convention on the Conservation of Migratory Species of Wild Animals (UNEP/CMS) and the Agreement on the Conservation of African-Eurasian Migratory Waterbirds (UNEP/AEWA) commissioned a review covering all aspects of the conflict between migratory birds and electricity power grids, and guidelines for mitigating and avoiding this conflict within the African-Eurasian region.

This review aims to present an up-to-date overview of the nature, scale and impact of the electrocution and collision of birds across the African-Eurasian region, including a summary of the aspects involved and gaps in knowledge. It also includes recommendations for actions to reduce the level of bird mortality. Technical and legislative solutions as well as suggestions for evaluating and monitoring the effectiveness of mitigation and preventive measures are covered in the separate guidelines document ‘Guidelines on how to avoid or mitigate impact of electricity power grids on migratory birds in the African-Eurasian region’.

This review includes information gathered through a questionnaire, which was sent to a range of parties across the African-Eurasian region, and through literature searches of both published and non-published material. Combining the information available with the extent of above ground power line networks in the region, large gaps in the knowledge become apparent. In particular, much is still unknown, or at least not readily available, on the extent of bird mortality through electrocution and collision and its impact on bird populations in Asia and Africa. Although more information exists for Europe, this is often based on anecdotal reports or poorly designed studies with limited temporal or spatial effort and a lack of control for biases. Furthermore, information is largely limited to rare or large, conspicuous species.

Few international conservation instruments have specific recommendations and actions formulated for their Parties on the problems of bird electrocution and collision in relation to the construction of new power lines or existing power line transects. The texts that do exist contain only general aspects of conservation, although some Action Plans, Resolutions and Recommendations and information documents distributed among Parties and others, give special attention to the problems of electrocution and collision. These, however, often focus on specific habitats or species. Almost all countries have legislation that brings the construction of power lines under a regime of an Environmental Impact Assessment (EIA), which should take into account existing habitat and wildlife conservation legislation, including for birds. Specific mention of the problems of electrocution or collision is rare.

Actions to reduce the level of power line mortality have included routing all low to medium voltage power lines underground, avoiding key areas for birds, avoiding routes that transect major or key flyways, the removal of redundant power lines and, for existing power lines, the use of preventative and mitigation measures.

Preventative and mitigation measures have proven to be effective in reducing the level of mortality from both electrocution and collisions. The insulation of cables close to poles, replacement of dangerous structures with bird-safe designs and the addition of safe perches, at a safe distance from energized structures, can prevent electrocutions. Similarly, measures such as using line configurations with wires in a small number of planes and no ground wires or the addition of high contrast, reflective or moving markers have been shown to lessen the risk of collision.

The sheer extent of the region's power line networks renders it impossible to mitigate the impact on birds along its full length, or even at the national level. Therefore, a strategic approach is recommended, which prioritizes potentially problematic sections of power lines using priority lists of areas and species of conservation concern. In order to ensure consistency with this approach, standardized protocols for research and monitoring should be established.

Existing power lines should be examined on their risks for bird electrocution and collision using standardized protocols and wherever possible appropriate mitigation measures should be put into place.

In the first instance, voluntary arrangements between government agencies, NGOs and electricity companies aimed at reducing the impact of power lines on bird populations, should be established. This could lead to Memoranda of Understanding (MoU), and possibly later policy and actions, aimed at reducing the level of mortality resulting from electrocution and collision. National Working Groups should be established to review the national situation, and discuss priority actions for mitigation measures.

Finally, in order to provide Parties with the most up-to-date information on the best possible mitigation techniques and measures, it is recommended to produce an update on this Review report and Guidelines in the near future.